REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

INSTRUCTIONS TO PROPOSERS (ITP)

Final Issued September 15, 2016

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1 —INTRODUCTION

This Request for Proposals (RFP) is issued by the Utah Department of Transportation (the Department) to seek competitive design-build Proposals (Proposals) for the 4 Interchanges on Bangerter Highway (SR-154**)** (the Project). Proposals are invited from, and will be considered from, only those parties (Proposers) who have been notified of their inclusion on the Short-List. A complete and responsive Proposal will contain all required elements detailed is this ITP.

The RFP includes the following components:

- Instructions to Proposers (ITP)
- Part 1 – Agreement
- Part 2 – General Provisions
- Part 3 – Quality Program
- Part 4 – Project Design and Construction Requirements
- Part 5 – Special Provisions and Exceptions
- Part 6 – Third-Party Agreements
- Part 7 – Contract Drawings
- Part 8 – Engineering Data
- Part 9 – Warranty Provisions
- Reference Documents (RD)

The Contract Documents include Parts 1 through 9. The Proposal will also be a Contract Document to the extent set forth in Part 1.3 (Order of Precedence).

1.1. Department Project Goals

The Project goals are as follows:

Minimize Impacts to Bangerter Highway and Provide Mobility through the Project (MOT)

Provide continued and effective flow of traffic through the Project and for each interchange during construction. Use innovative design and construction techniques to deliver the Project with the least possible impacts to the traveling public while maintaining or exceeding the standards for quality. Implement a comprehensive construction phasing and maintenance of traffic (MOT) plan that maintains continuous access to businesses, residences, and schools; provides safe routing for pedestrians and school children; maintains existing vehicle movements throughout construction; and minimizes delay (including duration of impact) to traffic during construction of the Project.

Provide a Technical Approach that Exceeds Project Requirements

Exceed the Department's standards for design and construction to provide additional value to the Project, such as improved functionality and quality, reduced long-term maintenance, elimination of design exceptions and an increased service life. As appropriate, use innovative techniques and methods to provide increased value for the Project. Approach to design and construction should minimize or eliminate risk to the Department, specifically schedule risk associated with right-of-way limitations.

Minimize risk to, and effectively coordinate with Third Party Entities

Minimize Third Party facility relocations and mitigate impacts to Third Parties with an emphasis made to minimize or eliminate impacts to the U.S. Bureau of Reclamation's (USBOR) aqueduct at 9000 South, 7000 South, and 5400 South. Demonstrate effective methods for communicating, coordinating, and partnering to reduce impacts to their Facilities, reduce potential for impacts to the Project schedule, and promote a positive working relationship.

1.2. General Project Description and Obligations of Design-Builder

1.2.1. General Project Description

The Project will consist of designing and constructing four grade separated interchanges at 5400 South, 7000 South, 9000 South and 11400 South. The Project's general key elements consist of (but are not limited to); Maintenance of Traffic (MOT) at each interchange; providing safe facilities for pedestrian and bicycle traffic during and after construction (including pedestrian bridge near 7000 South interchange); Portland Cement Concrete Pavement (PCCP) replacement; protection of the US Bureau of Reclamation (USBOR) Aqueduct; protection and/or relocation of existing utilities.

1.3. RFP Requirements and Proposal Contents

1.3.1. Proposal Contents

The Proposal shall consist of a Technical Proposal and Price Proposal. The Technical Proposal contents are set forth in Appendix ITP-A. The Price Proposal contents are set forth in Appendix ITP-B. Appendix ITP-C includes forms required for the Technical Proposal and Price Proposal.

1.3.1.1. Contract Documents –Design-Builder's Proposal

To the extent set forth in Part 1.3 (Order of Precedence), the Proposal will become part of the Contract Documents. The "Executive Summary and Summary Statement" and Appendix A (Legal and Financial Information) will not become part of the Contract Documents.

The information and completed forms in the Technical Proposal will become part of the Contract. The information in the Price Proposal will also be incorporated into the Contract Documents.

1.3.1.2. Commitments in Technical Proposal

The verbiage used in each Proposal will be interpreted and evaluated by the Department based on the level of commitment provided by Proposer. No consideration will be given to tentative or ambiguous commitments. For example, phrases containing "we may" or "we are considering" will not be considered in the evaluation process because they do not indicate a firm commitment by the Design-Builder.

1.3.2. Proposal Contents and Required Forms

Any failure to provide all the information and all completed forms (in Appendix ITP-C) in the format specified in Appendices ITP-A and ITP-B may result in the Department's rejection of the Proposal. All blank spaces in the Proposal forms must be filled in as noted, and no content changes may be made to the Proposal forms.

1.3.3. Property of the Department

All documents submitted by the Proposer in response to this RFP become the property of the Department and will not be returned to the Proposer, except for the protected records as described in Section 2.8 (Government Records Access and Management Act (GRAMA)). The concepts and ideas in the information contained in the Proposal submitted by the Proposer also become the property of the Department upon payment of the stipend. See Section 2.9 (Proposal Stipend).

1.3.4. Federal Requirements

Funding for this Project includes no federal funds. Certain Contract requirements that are included with federally funded Projects have been included in the Contract Documents for this Project.

1.3.5. Errors

If the Proposer identifies any mistake, error, or ambiguity in the RFP at any time during the procurement process, it is the duty of the Proposer to notify the Department of the recommended correction in writing, in accordance with Section 2.5 (Proposer Questions).

1.4. Definitions

Refer to Contract Documents, Part 1, Appendix A (Acronyms and Definitions List) for the various abbreviations, acronyms, and terms used but not defined herein.

1.5. Improper Conduct

1.5.1. Prohibited Activities

If the Proposer or anyone representing the Proposer offers or gives any advantage, gratuity, bonus, discount, bribe, or loan of any sort to the Department or any of its employees, agents or representatives at any time during this procurement process:

A. The Department will immediately disqualify the Proposer.

B. The Proposer forfeits its Proposal Bond.

C. The Proposer is not entitled to any stipend.

D. The Department may sue the Proposer for damages.

1.5.2. Noncollusive Proposal Certification (Form NC)

By submitting its Proposal, each Proposer and each person signing on behalf of any Proposer certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief:

A. The prices in the Proposal have been arrived at independently without collusion, consultation, communication, or agreement with any other Proposer or with any competitor for the purpose of restricting competition.

B. Unless required by law, the prices that have been quoted in the Proposal have not been and will not be knowingly disclosed by the Proposer, directly or indirectly, to any other Proposer or competitor before opening of Proposals.

C. No attempt has been made or will be made by the Proposer to induce any other person, partnership, or corporation to submit or not to submit a Proposal for the purpose of restricting competition.

D. The named Proposer(s) has not, whether directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action to restrain free competitive bidding in connection with this Proposal.

The Department considers no Proposal for award nor makes no award where there has not been compliance with this section, except as follows:

E. If the Proposer cannot make the foregoing certification, the Proposer must furnish with the Proposal a signed statement that describes in detail the reasons why the certification cannot be made.

F. The Project Director, or designee, determines that such disclosure was not made for the purpose of restricting competition.

None of the following requires a disclosure within the meaning of Section 1.5.2 (B):

G. A Proposer has published price lists, rates, or tariffs covering items being procured.

H. A Proposer has informed prospective customers of proposed or pending publication of new or revised price lists for such items.

I. A Proposer has sold the same items to other customers at the same prices being bid.

A Proposal made by a corporation, joint venture, or other partnership is considered authorized by the board of directors of the Proposer. Authorization is defined as signing and submitting the Proposal, and includes the following declaration of noncollusion on the part of the corporation:

Utah Department of Transportation
Noncollusive Proposal Certification

I declare under penalty of perjury under the laws of the United States and the State of Utah that neither I, nor to the best of my knowledge any member or members of my firm or company, have either directly or indirectly restrained free competition on this Project by entering into any agreement, participating in any collusion, or otherwise taking any action unauthorized by the Utah Department of Transportation with regard to this Contract.

Signing the Proposal certifies compliance with all provisions of the above Noncollusive Proposal Certification. The Proposer shall also sign and submit Form NC (Noncollusion Affidavit) in Appendix ITP-C (Forms). See Appendix ITP-A (Technical Proposal Instructions).

1.6. Language Requirement

Conduct all correspondence regarding the RFP, Proposal, and the Contract in English. If any original documents required for the Proposal are in any other language, provide an English translation. The English version takes precedence in the event of conflict with the original language.

1.7. Proposal Schedule

1.7.1. Anticipated Schedule for Proposal and Contract Award Process

The following is the anticipated schedule for this procurement. The Department reserves the right to alter these dates. All deadlines areas shown in Table ITP-1, prevailing (Daylight or Standard) Mountain Time, unless otherwise noted.

TABLE ITP-1
PROPOSAL AND CONTRACT AWARD SCHEDULE

Event	Time	Date	Location
Issue Draft RFP		8/18/16	
Draft Industry Review Meeting	Assigned by Department	9/8/16	Region 2
Issue Final RFP		9/15/16	
One-on-One Meetings with Proposers	Assigned by Department	10/5/16	Region 2
One-on-One Meetings with Proposers	Assigned by Department	10/19/16	Region 2
One-on-One Meeting with Cities and USBOR	Assigned by Department	10/26/16	Region 2
One-on-One Meetings with Proposers	Assigned by Department	11/14/16	Region 2
Last day for initial submittal of an ATC	5:00 PM	11/9/16	
Last day for Department Responses to initial ATC requests	5:00 PM	11/17/16	
One-on-One Meetings with Proposers	Assigned by Department	11/28/16	Region 2
Last day for Resubmittal of ATCs	5:00 PM	11/29/16	
Last day to submit or resubmit Pass/Fails; Last day to respond to resubmit ATCs	5:00 PM	12/05/16	
Receipt of Proposers' Questions and Clarifications by Department (due date)	5:00 PM	12/1/16	
Issue Date for Final Clarification & Addenda	5:00 PM	12/8/16	
Submittal of Technical & Price Proposals (Proposal Due Date)	2:00 PM	12/22/16	Central Const. Desk
Submittal of Escrowed Proposal Documentation (due date)	1:00 PM	1/10/17	Central Construction
Selection of and Notification of Design-Builder (anticipated date)		1/23/17	
Selected Proposer Escrow Documentation Review	8:00 AM	1/25/17	Central Construction
Notice of Award (anticipated date)		1/26/17	
Proposer Teams' Proposal Debriefings (anticipated date)	TBD	2/16/17	Central
Contract Execution (anticipated date)		2/15/17	

Issuance of Notice To Proceed (NTP) (anticipated date)	2/16/17

1.7.2. Proposal Due Date

Deliver the completed Proposal to the addressee at the address specified in Section 2.7.1 (Submission Requirements), no later than as shown in Table ITP-1 prevailing (Daylight or Standard) Mountain Time, on the date specified in Section 1.7.1 (Anticipated Schedule for Proposal and Contract Award Process) for Submittal of Proposals.

Note that the initial submittal of an Alternative Technical Concept (ATC) must be submitted by the date shown in Table ITP-1 for the Department's consideration. Table ITP-1 identifies the last day that any revision to a previously submitted ATC may be submitted to the Department and the Proposer be assured of the Department's response.

Also, note to assure a "Pass" is achieved for all Pass/Fail criteria, the Department highly encourages early submittal of each Pass/Fail criteria, except for the Legal and Financial Pass/Fail criteria, as the unacceptable Pass/Fail's may require multiple submittals prior to the Proposal Due Date to achieve a "Pass." Table ITP-1 identifies the last day that a Pass/Fail may be submitted to the Department and the Proposer be assured of the Department's response to the Pass/Fail prior to the Proposal Due Date.

1.8. The Proposer's Organization

1.8.1. Changes to Proposer's Organization

In order for a Proposer to remain qualified to submit a Proposal after it has been placed on the Short-List (unless otherwise approved in writing by the Department), Proposer's organization as identified in its Statement of Qualifications (SOQ) must remain intact for the duration of the procurement process. To change the organization represented in the SOQ by adding, substituting for, or deleting a Principal Participant, Key Personnel, and/or Designer, request written permission to do so from the Department at least as soon as possible prior to submitting the Proposal. If the request is to add or substitute a member to the organization, submit with the request that information specified for Principal Participant, Key Personnel, and/or Designer, in the RFQ, as applicable. If the request is to delete a Principal Participant, submit information as may be required by the Department to show that the changed team still meets the RFQ criteria (Pass/Fail and quality). Submit any changes to Key Personnel as soon as possible after release of the RFP.

Any change in Key Personnel must meet the Department's standard of "equal to" or "better than" the qualifications of the individual who was submitted in the Proposer's (SOQ).

1.8.2. Pre-Qualification and Joint Ventures

It is the responsibility of each Proposer to ensure that they are pre-qualified through the UDOT Construction Department and, if applicable, applied for joint venture status with the UDOT Construction Department.

If a Proposer is planning on submitting as a joint venture, it is the responsibility of the Proposer to ensure that they have applied for joint venture bidding through the Department prior to submitting a Proposal in response to the RFP. If applicable, the Proposers are to follow the instructions regarding joint venture bidding: http://www.udot.utah.gov/go/jvbid

Furthermore, all short-listed teams will be required to be pre-qualified through the Construction Department prior to submitting their Proposals in response to the RFP. The list of all currently pre-qualified bidders can be found at the following webpage: http://www.udot.utah.gov/go/prequal

If a Proposer's name, with which they intend to Contract under, is not on the list, they will be required to follow the instructions to apply for pre-qualified status: http://www.udot.utah.gov/go/prequalapp

Proposers need to allow the Department a minimum of 10 Working Days, from the time that all required information is received, to process the Proposer for either pre-qualification status or joint venture status. Please note that these pre-qualification/joint venture requirements are separate from the RFQ and RFP processes and must be completed independently of them.

1.9. Organizational Conflicts and Ineligible Firms

The Proposer accepts responsibility for being aware of the requirements of 23 Code of Federal Regulations (CFR) 636.116 and will include a full disclosure of all potential organizational conflicts of interest in the Proposal.

By submitting its Proposal, each Proposer agrees to make an immediate and full written disclosure to the Department, if an organizational conflict of interest is thereafter discovered. Include a description of the action that the Proposer has taken or proposes to take to avoid or mitigate such conflicts. If an organizational conflict of interest is determined to exist, the Department may, in its discretion, cancel the Contract. If the Proposer was aware of an organizational conflict of interest prior to the award of the Contract and did not disclose the conflict to the Department, the Department may terminate the Contract for default.

No firm that is ineligible for State contracts may be part of any Proposer's team. It is the responsibility of the Proposer to determine eligibility of its team members. In addition, the following firms participated in development of the RFP and may not be part of any Proposer's team:

A. Horrocks Engineers
B. WCEC Engineers
C. HDR
D. Avenue Consultants
E. Integra Realty Services
F. ESI
G. RB&G
H. Gilmore Consulting Services
I. West Ridge Construction Services
J. Kraemer North America
K. Bowen Collins & Associates

2 —PROCUREMENT PROCESS

2.1. Method of Procurement

This RFP is issued and administered pursuant to authority provided in Utah Code §§ 63G-6a-106, 63G-6a-1402 and Utah Administrative Code Rule R916-3. The Contract will be a Design-Build (DB) contract procured using best value as a basis of selection. The intent of the Department is to award the

Contract to the responsive Proposer whose Proposal provides the best value to the State, taking into consideration the price and evaluation criteria identified herein.

The Department procurement process for the Project involves two phases:

A. Request for Qualifications (RFQ) and submittal of Statements of Qualifications, and the subsequent determination of the Short-List.

B. Request for Proposals (RFP) from the Short List and submittal of Proposals, and the subsequent selection of the Design-Builder from the Proposers.

The Proposal evaluation will be based on both Pass/Fail criteria and a combined evaluation of price and technical evaluation criteria.

2.2. Pre-Proposal Informational Meetings

At any time prior to the Proposal Due Date, the Department may hold joint informational meetings (with all Proposers or with individual Proposers). If an individual informational meeting is offered to one or more Proposers, it will be offered to all Proposers.

The Department intends to conduct One-on-One meetings with each Proposer to discuss issues regarding the RFP.

2.2.1. One-on-One Meetings

The Department intends to conduct One-on-One meetings with each Proposer to discuss issues regarding the RFP and Proposer's ATCs. The Department reserves the right to disclose to all Proposers any issues raised during the One-on-One meetings, except to the extent that the Department determines, in its sole discretion, that such disclosure would impair the confidentiality of an ATC or would reveal a Proposer's confidential business strategies.

One-on-One meetings, as shown in Table ITP-1 with the Department will be made available to each Proposer. Each meeting will be held independently with each Proposer. The Department will assign the time and place and notify the Design-Builder. The One-on-One meetings are subject to the following:

A. The meetings are intended to provide Proposers with a better understanding of the RFP.

B. The Department will only discuss a Proposal or ATC with the submitting Proposer.

C. Proposers are not permitted to seek to obtain commitments from the Department in the meetings or otherwise seek to obtain an unfair competitive advantage over any other Proposer. No aspect of these meetings is intended to provide any Proposer with access to information that is not similarly available to other Proposers, and no part of the evaluation of Proposals will be based on the conduct or discussions that occur during these meetings.

D. Nothing stated at any pre-Proposal meeting or included in a written record or summary of a meeting modifies the ITP or any other part of the RFP unless it is incorporated in an Addendum issued pursuant to Section 2.6.1 (Addenda).

E. Official minutes for the meetings will not be kept.

F. The Design-Builder is required to submit an agenda for the meeting at least 48-hours prior to each scheduled meeting. Indicate the disciplines that need to be in attendance.

G. The Design-Builder is required to notify the Department of the discipline leads that need to be in attendance

Persons attending the One-on-One meetings are required to sign an acknowledgment of the foregoing rules. Attendance at meetings remotely via phone or internet conference will not be allowed.

2.2.2. Other Meetings

Additional meetings may be requested by the Department in writing to the Proposers.

2.3. Examination of RFP Package and Work Site

It is the sole responsibility of the Proposer to examine, with appropriate care and diligence prior to submitting its Proposal, the RFP and all conditions which may in any way affect its Proposal or performance under the Contract (if awarded), including final design. This includes responsibility for investigating the condition of existing facilities and the Project Site, including undertaking all activities sufficient to familiarize itself with the surface and subsurface conditions affecting the Project. The Proposer's receipt of Department-furnished information does not relieve the Proposer of such responsibility.

The Department encourages each Proposer to perform additional soil borings and other exploratory investigations on the Project Site, as appropriate, subject to the Proposer securing required permits, rights of entry, or approvals. The submission of a Proposal shall be considered *prima facie* evidence that the Proposer has made the above-described examination and is satisfied as to the conditions to be encountered in performing the Work and as to the requirements of the Contract. Failure by the Proposer to so examine and inform itself shall be at its sole risk, and the Department will provide no relief for any error or omission. Change orders for differing site conditions will not be considered for lack of field investigations during the RFP period.

2.4. Receipt of the Request for Proposal Documents and Other Information

The RFP and other information may be obtained by Proposers who have been notified of their inclusion on the Short-List from the person designated as the Department point of contact in Section 2.4.1 (Department-Designated Point of Contact). The Department will provide access to the RFP on the Project Portal.

2.4.1. Department-Designated Point of Contact

Submit all Project communications (including Request For Clarification's and ATC's) electronically to the Department's point of contact indicated below. Mark all communication with the "4 Interchanges on Bangerter Highway (SR-154)" and "Procurement—Sensitive":

ATTN: **Marwan Farah, PE, Project Director**
UDOT Region 2
2010 South 2760 West
Salt Lake City, UT 84104
Project Email: Bangerter4InterchangesRFP@interchange.udot.utah.gov
Project Portal: https://interchange.udot.utah.gov/cp/12566/4bangerterRFP/SitePages/Home.aspx

The Department will not consider any communication delivered through methods other than those specified in this Section 2.4.1.

2.4.1.1. Communication and Project Portal

The Design-Builder shall only use the communication method described in this Section 2.4.1.1.

The Department established an Interchange (SharePoint) portal method for communication between the Proposers and the Department. All communications regarding the Project and the procurement must be addressed to the Department's designated point of contact identified in Section 2.4.1 (Department-Designated Point of Contact) of this RFP and must be transmitted through the Project Portal by emailing it to the Project Email above. Only communications and submittals posted on the Department's Project Portal will be recognized as being sent by the Proposer and received by the Department unless explicitly stated otherwise in this RFP. The Department will post all communications for procurement, including all Addenda to the RFP and responses to requests for clarifications (RFC's) on the Project Portal. Instructions to obtain access to the Project Portal are included in the RFQ.

2.4.2. Identification of Proposer Authorized Representative

Identify in the Technical Proposal an individual authorized to act on behalf of, and to receive documents, communications, and notices for, the Proposer relating to this procurement ("Proposer Authorized Representative"). If the Proposer Authorized Representative is changed after submission of its Proposal, provide the Department's Designated Point of Contact with the name and address of such new Proposer Authorized Representative, on Form C (Single Point of Contact). Failure to identify a Proposer Authorized Representative in writing may result in Proposer failing to receive important communications from the Department. The Department is not responsible for any such failure.

2.4.3. Rules of Contact

The following rules of contact apply during the Contract procurement process, which began upon the date of issuance of the RFQ and will be completed upon the earliest to occur of (a) execution of the Contract, (b) rejection of all Proposals, or (c) cancellation of this procurement. These rules are designed to promote a fair, unbiased, and legally defensible procurement process. Contact includes face-to-face, telephone, e-mail, text, and formal written communications.

The specific rules of contact are as follows:

A. Proposer and its team members may not communicate with another Proposer or its team members with regard to this RFP or either team's Proposal, with two exceptions:

   1. Subcontractors that are shared between two or more Proposer teams may communicate with their respective team members, so long as those Proposers establish a protocol to ensure that the Subcontractor will not act as a conduit of information between the teams; and

   2. Contact among Proposer teams is allowed during Department-sponsored informational meetings.

B. The Proposers will correspond with the Department regarding this RFP only through the Department's Designated Point of Contact and the Proposer's Authorized Representative.

C. Proposers may not contact Department employees (including department heads, members of the evaluation committee[s], and any official who will or who will potentially participate in the decision to award the Contract) regarding the Project, except through the process identified in Section 2.4.3. (Rules of Contact) Also, Proposers may not contact any stakeholder staff regarding the Project, including employees of:

1) US Bureau Of Reclamation

2) Jordan Valley Water Conservancy District (JVWCD)

3) Cities

a) Taylorsville City

b) West Jordan City

c) South Jordan City

4) Salt Lake County, and

5) Program Management Team as specified in Section 1.9

D. Any communication determined to be improper may result in disqualification, at the sole discretion of the Department.

E. Any official information regarding the Project will be disseminated from the Department on Department letterhead and signed by the Department Designated Point of Contact or through the Project Portal.

F. The Department will not be responsible for or bound by any oral exchange or any other information or exchange that occurs outside the official process specified herein.

2.5. Proposer Questions

Review the RFP and any addenda issued by the Department prior to the Proposal Due Date, and request written clarification or interpretation of any perceived discrepancy, deficiency, ambiguity, error, or omission contained therein, or of any provision that Proposer fails to understand clearly. Failure of Proposer to so examine and inform itself places the Proposer at the sole risk, and the Department will provide no relief for error or omission.

The Department will consider questions submitted in writing by Proposers regarding the RFP, including requests for clarification and requests to correct errors. All questions must be received by the Department at the Project Email specified in Section 2.4.1 (Department Designated Point of Contact) no later than the date specified in Section 1.7.1 (Anticipated Schedule for Proposal and Contract Award Process). Questions received after the deadline will be answered at the sole discretion of the Department. All questions must be submitted on Form CF (RFP Comment Form) in electronic format using Microsoft Word.

2.6. Addenda and Responses to Questions

2.6.1. Addenda

The Department reserves the right, in its sole discretion, to revise, modify, or change the RFP and/or procurement process at any time before the Proposal Due Date. The Department issues such revisions through issuance of an Addendum to the RFP. Any such revisions are bound into and included as part of the Contract only if issued through an Addendum. The Department is responsible for providing Addenda only to the Short-Listed Proposers; persons or firms that obtain the RFP from sources other than the Department bear the sole responsibility for obtaining any Addenda issued by the Department for the Project.

Acknowledge receipt of all Addenda and answers to Proposer questions in the Proposal Letter Form, and verify that the Proposal meets the requirements of the addenda. Failure to acknowledge such receipt may cause the Proposal to be deemed nonresponsive and be rejected. The Department reserves the right to hold group meetings with Proposers and/or One-on-One meetings with each Proposer to discuss any Addendum or response to requests for clarifications. The Department does not anticipate issuing any Addendum later than the date listed in Table ITP-1. However, if the need arises, the Department reserves the right to issue Addenda after such date. If the Department finds it necessary to issue an Addendum after such date, then the cover letter to that specific addendum will set forth any relevant processes or response times necessitated by the Addendum.

2.6.2. Correspondence and Information

No correspondence or information from the Department or anyone representing the Department regarding the RFP or the Proposal process generally has any effect unless it is communicated in accordance with Section 2.4.3 (Rules of Contact).

2.6.3. Responses to Questions

The Department will provide written responses to questions received from Proposers as specified in Section 2.5 (Proposer Questions). Summaries of the questions (without attribution) and responses will be sent to all Proposers. The responses will not be considered part of the Contract, but may be relevant in resolving any ambiguities in the Contract. Inquiries resulting in any modifications to this RFP will be documented in Addenda and will be considered part of the Contract.

2.7. Submission of Proposals

2.7.1. Submission Requirements

Submit Proposals in accordance with the ITP and the following requirements:

A. Enclose the Technical Proposal in one or more sealed containers clearly marked with the name of the Proposer and the words "4 Interchanges on Bangerter Highway (SR-154)" see Appendix ITP-A (Technical Proposal Instructions). Deliver the Technical Proposal to:

Utah Department of Transportation, Attn: Phil Ellsworth
UDOT Contract Administrator (Consultant)
4501 South 2700 West, Fourth Floor
Salt Lake City, UT 84114

Submit the Price Proposal in accordance with Appendix ITP-B.

B. Clearly indicate that this submittal is a Proposal for the "4 Interchanges on Bangerter Highway (SR-154**)**" Department Project No. S-0154(12)11, and clearly mark the Proposer's name and address on the outside of the containers.

C. When sent by U.S. mail or private carrier (e.g., Federal Express, United Parcel Service), send the sealed containers in accordance with this ITP to the Department at the address of and in care of the official specified in this Section 2.7 (Submission of Proposals), in whose office the containers are to be received no later than the time and date specified in Section 1.7.1 (Anticipated Schedule for Proposal and Contract Award Process). In the alternative, a Proposal may be hand-delivered by the Proposer prior to the time and date specified in Section 1.7.1 (Anticipated Schedule for Proposal and Contract Award Process) to the official designated by the Department in Item (A), above.

D. Where certified copies are required, stamp the document or cover with the words "Certified True Copy" and have the stamp oversigned by the Proposer's designated point of contact.

E. It is the responsibility of each Proposer to obtain a receipt (if they so choose), from the Department, acknowledging delivery of the Proposer's Proposals.

2.7.2. Responsive Proposal

Submit a Proposal that provides all the information required by this ITP and its accompanying appendices. Failure to do so may result in disqualification of the Proposal.

Submit the Proposal in the official format that is specified by this ITP and its accompanying appendices, and sign each hardcopy of the Proposal submitted to the Department.

Proposals may be considered non-responsive and be rejected for any of the following reasons:

A. The Proposal is submitted on a paper form or disk other than that furnished or specified by the Department; it is not properly signed; the Proposal Letter Form (in Appendix ITP-C) is altered except as contemplated herein; or any part thereof is deleted from the Proposal package.

B. The Proposal is illegible or contains any omission, erasure, alteration, or item not called for in the RFP or contains any unauthorized addition, conditional or alternate Proposal, or other irregularity of any kind, and the Department determines that such irregularity makes the Proposal incomplete, indefinite, or ambiguous as to its meaning.

C. The Proposer proposes something contrary to the RFP without prior written approval from the Department and the Department does not accept the contrary proposed item.

D. The Proposer adds any provision reserving the right to accept or reject an award or to enter into a Contract following award.

E. The Proposer attempts to limit or modify the form of any bond; the Proposal Guaranty is not provided; and/or requested information deemed material by the Department is not provided.

F. The Proposer fails to achieve a "Pass" rating on any Pass/Fail criteria or sub-criteria.

G. The Department determines the Proposal to be non-responsive in any other respect.

2.7.3. Withdrawal of a Proposal; Proposal Validity Period

A Proposer may withdraw its Proposal only by a written and signed request that is received by the Department prior to the specified time for submitting Proposals. Notify the Department in accordance with Section 2.7.1 (Submission Requirements). Following withdrawal of its Proposal, the Proposer may submit a new Proposal, provided that it is received prior to the specified time for submitting Proposals.

Proposals remain valid for 90 Calendar Days following the Proposal Due Date (the "Contract Award Period"), which period is subject to extension by mutual agreement of the Department and the Proposer(s). No Proposer may withdraw its Proposal prior to the end of the Contract Award Period. Following expiration of the Contract Award Period, a Proposer may withdraw its Proposal without liability unless it has previously been notified of its selection by a Notice of Award issued in accordance with Section 6.1 (Contract Award). The contents of any Proposal that is withdrawn remain the property of the Department. Except as specifically permitted by this ITP or as approved in writing by the Department, any Proposer that withdraws all or any part of its Proposal shall forfeit its Proposal Guaranty.

2.7.4. No Public Opening of Proposals

There will be no public opening of Proposals. After the specified time for submitting Proposals, all Proposals will be opened in the presence of two or more Department-designated individuals and reviewed for responsiveness to the requirements of the RFP.

2.7.5. Late Proposals

The Department will not consider any late Proposals. Proposals received after the deadline for submittal of Proposals will be returned to the Proposer, unopened.

2.8. Government Records Access and Management Act (GRAMA)

The Department will maintain a nonpublic process for the duration of this procurement. Pursuant to Subsection §63G-2-305(6) of the GRAMA, all records related to this procurement, including, but not limited to Statements of Qualifications (SOQs), evaluation, and Short-List procedures, Proposals, evaluation, and selection procedures, and any records created during the evaluation and selection process will remain nonpublic records until the Contract has been executed by all necessary officials of the Design-Builder and the Department.

The Government Records Access and Management Act (GRAMA), Utah Code Ann., §63G-2-101 et seq., provides in part that certain records are protected if properly classified.

Proposers are responsible for determining which information, if any, they wish to be protected under a Claim of Business Confidentiality, and are responsible for taking appropriate action to do so. An entire proposal may not be protected under a Claim of Business Confidentiality.

To protect information under a Claim of Business Confidentiality, the Proposer must, at the time the information is provided to the Department, include a Claim of Business Confidentiality on Form BC. It is the responsibility of the Design-Builder to complete Form BC in accordance with Subsection §63G-2-309.

If nothing in the Proposal is being protected under a Claim of Business Confidentiality, indicate on Form BC by stating "NA" on the submitted form.

2.9. Proposal Stipend

By submitting a Proposal in response to the RFP, submitting an executed Stipend Agreement, Form SA (Stipend Agreement), and accepting the stipend, the Proposer acknowledges that the Department reserves the right to use any ideas or information contained in the Proposal in connection with any Contract awarded for the Project, or in connection with a subsequent procurement.

The Department will offer a stipend in the amount of $300,000 to each unsuccessful Proposer. To qualify as an unsuccessful Proposer, a Proposer will have:

A. Received a rating of "Pass" on all Pass/Fail criteria and an overall technical rating of at least Acceptable (-) for each overall evaluation criteria category.

B. Submitted a responsive Price Proposal.

If the Proposer choses to accept the stipend, the Proposer shall provide an executed Stipend Agreement, Form SA (Stipend Agreement) provided in Appendix ITP-C (Forms), within 10 Days of date of Proposer debrief.

If the procurement is cancelled prior to the Proposal Due Date, each Proposer has the option, to attend an interview (if the Department chooses to conduct interviews) and deliver to the Department the work product of its Proposal preparations to date. There is no specific format required for such work product.

Each Proposer that chooses to attend such an interview and deliver its work product may be paid a portion of the stipend amount, at the Department's discretion, for the work product. The Department pays no portion of the stipend amount if a Proposer chooses to not attend the interview or not deliver its work product.

2.10. Build Alternative

The Base Build and Build Alternative as defined in Part 4-01 – (Project Configuration) are described and should be priced in accordance with ITP Appendices A and B.

Submit a price for the Base Build and Build Alternative. The Base Build and the Build Alternative will only be awarded if it does not exceed Project funding.

Include the Base Build and the Build Alternative in the Proposal schedule.

3 —ALTERNATIVE TECHNICAL CONCEPTS (ATC)

3.1. ATC Goals and Eligibility

Sections 3.1 (ATC Goals and Eligibility) and 3.2 (Pre-Proposal Submission of ATC) set forth a process for pre-Proposal review of Alternative Technical Concepts (ATCs) that conflict with the requirements for design and construction of the Project, or otherwise require a modification of the technical requirements of the Project. This process is intended to:

A. Allow Proposers to incorporate innovation and creativity into the Proposals.
B. Allow the Department to consider Proposer ATCs in making the selection decision.
C. Avoid delays and potential conflicts in the design associated with the deferring of reviews of ATCs to the post-award period.

D. Obtain the best-value for the public.

ATCs eligible for consideration hereunder are limited to those deviations from the requirements of the RFP that result in performance and quality of the end product that is equal to or better than the performance and quality of the end product absent the deviation, as determined by the Department in its sole discretion. The Department will not consider ATCs on the following:

A. Pavement section

B. Bangerter Highway under 11400 South

C. Modifications of Time Components

D. Geosynthetic Reinforced Soil (GRS) Abutments

E. Overhead sign structure design dimensions

F. Location of landings/ramps for the pedestrian bridge

A concept is not eligible for consideration as an ATC if, in the Department's sole judgment, it is premised upon or would require:

A. A reduction in Project scope, performance, or reliability.
B. The addition of a separate Department project to the Contract (such as expansion of the scope of the Project to include additional roadways).
C. An increase in the amount of time required for Completion Deadlines.

Any ATC that, if implemented, would require further environmental evaluation of the Project, may be allowed, provided that the Proposer bears the schedule and cost risk associated with such additional environmental evaluation. If the Proposer is not able to obtain the approvals necessary to implement the ATC, the Proposer is obligated to develop the Project in accordance with existing approvals and without additional cost or extension of time.

Any ATC that has been pre-approved may be included in the Project, subject to the conditions set forth herein.

If a Proposer is unsure whether a concept is consistent with the requirements of the RFP or if that concept would be considered an ATC by the Department, the Department recommends that Proposer submit such a concept for review as an ATC. If a concept is submitted as part of the Proposal that the Department considers to be an ATC, and the Proposer has not received prior ATC approval, the Proposal may be considered non-responsive or the Proposer will be required to revert back to the RFP.

3.2. Pre-Proposal Submission of ATC

Proposers may submit an ATC for review to the Department in accordance with Section 2.4.1.1 (Communication and Project Portal), until the applicable last date and time specified in Section 1.7.1 (Anticipated Schedule for Proposal and Contract Award Process). Submit all ATCs in writing, with a cover sheet identifying the Proposer and stating "4 Interchanges on Bangerter Highway (SR-154**)** — Confidential ATC." Clearly identify the submittal as a request for review of an ATC under this ITP; any submittal not clearly designated as an ATC is not treated as an ATC by the Department.

Include in the electronic ATC submittal a narrative description of the ATC and technical information, including drawings and other information as necessary, as described below. It is the responsibility of the Proposer to confirm the Department's receipt of any ATC submittals prior to the deadline.

3.2.1. Pre-Proposal Requirements

Each ATC submission shall include the following on Form ATC-S (Alternative Technical Concept Submittal):

A sequential ATC number identifying the Proposer and the ATC number (submit multipart or multi-option ATCs as separate individual ATCs with unique sequential numbers). Name the ATC with the following format: ATC #_ Design_Builder Name_ Description.

A. A description and conceptual drawings of the configuration of the ATC or other appropriate descriptive information.
B. References to requirements of the RFP that are inconsistent with the proposed ATC, an explanation of the nature of the deviations from said requirements, and a request for approval of such deviations.
C. The locations where, the ATC will be used on the Project.
D. The analysis justifying use of the ATC and why the deviation, if any, from the requirements of the RFP should be allowed. Explain in detail how the ATC will be used and why the ATC is a benefit to the Project.
E. A preliminary analysis of potential impacts (both during and after construction) including but not limited to user impacts, risks, quality, Right-of-Way, geotechnical, utilities, environmental permitting, local community, safety, design-life, and life-cycle Project and infrastructure costs, including impacts on the cost of repair, maintenance, and operation.

In addition, each ATC submission that proposes materials or material-related processes that are not typically used by the Department, the Design-Builder shall submit information or specifications that address the following:

G. Provide information if this material was used on a State transportation project
H. Provide information about the maintainability and longevity
I. Describe field inspection methods and requirements related to placement activities
J. Describe field and/or laboratory testing methods
K. Describe field and/or laboratory testing frequencies
L. Provide acceptance criteria for the product(s) and any associated Work
M. Provide a discussion and description of all related issues, requirements, and processes for controlling the quality of the Work.

3.2.2. ATC Disclosures

Do not make any public announcement or disclosure to Third-Parties concerning any ATC until after pre-approval (including conditional pre-approval) has been obtained. Following pre-approval (including conditional pre-approval), if a Proposer wishes to make any announcement or disclosure to Third-Parties concerning any ATC, do so by first notifying the Department in writing of its intent to take such action, including details as to date and participants, and then obtaining the Department's prior Approval to proceed with the announcement.

If implementation of an ATC requires approval by a Third-Party (e.g., a governmental authority), the Proposer takes full responsibility for, and bears the full risk of, obtaining any such approvals after award of the Contract and submission of data; provided, however, that the Department retains its role as liaison with any governmental authorities, as more particularly described in the Contract Documents and as may be applicable. If any required Third-Party approval is not subsequently

granted with the result that Proposer is required to comply with the original RFP, Proposer is not entitled to a Change Order for additional compensation or time under the Contract, as applicable.

If the Department determines, based on a proposed ATC or otherwise, that the RFP contains an error, ambiguity, or mistake, the Department reserves the right to modify the RFP to correct the error, ambiguity, or mistake, regardless of any impact on a proposed ATC.

3.2.3. Department Review of Submission of ATCs

The Department may request additional information regarding a proposed ATC at any time and will respond to each Proposer regarding its ATC on or before the applicable last date set forth in Section 1.7.1 (Anticipated Schedule for Proposal and Contract Award Process), provided that the Department has received all required and requested information regarding such ATC.

The Department anticipates that it will provide a response within five Working Days of receiving an ATC. Responses will be limited to one of the following statements:

A. The ATC is acceptable for inclusion in the Proposal.

B. The ATC is not acceptable for inclusion in the Proposal.

C. The ATC is not acceptable in its present form, but may be acceptable upon the satisfaction, in the Department's sole discretion, of certain identified conditions which must be met or clarifications or modifications that must be made through a submittal of a revised ATC.

D. The ATC is conditionally accepted in its present form and may be included in the Proposal upon satisfaction, in the Department's sole discretion, of the identified conditions, clarifications, or modifications.

E. The submittal does not qualify as an ATC but may be included in the Proposal because it appears to be within the requirements of the RFP.

F. The Department requires additional time to further review the ATC, and expects to provide a response to the Design-Builder on *(Date)*.

Approval of an ATC will constitute a change in the specific requirements of the Contract Documents, as applicable, associated with the Approved ATC for the specific Proposer. Each Proposer, by submittal of its Proposal, acknowledges that the opportunity to submit ATCs was offered to all Proposers, and waives any right to object to the Department's determinations regarding acceptability of ATCs.

The Department's rejection of a pre-Proposal submission of an ATC will not entitle Proposer to an extension of the Proposal Due Date or the date that the ATCs are due; however, the foregoing shall not limit the Department's absolute and sole right to modify the Proposal Due Date or any other date in connection with this procurement.

The Department anticipates that its comments provided to a Proposer will be sufficient to enable the Proposer to make any necessary changes to an ATC. However, if a Proposer wishes additional clarifications regarding necessary changes, the Proposer may provide a written request for clarifications under Section 2.5 (Proposer Questions).

3.2.4. Incorporation of ATCs into the Contract Documents

Following Award of the Contract, any ATC that was pre-approved by the Department and incorporated in the Proposal by the successful Proposer is included in the Contract Documents, as

applicable. If the Department responds to any ATC by stating that it would be acceptable if certain conditions were met, those conditions become part of the Contract Documents, as applicable. The Contract Documents are conformed after award, but prior to execution of the Contract, to reflect the ATC, including any Department conditions thereto. Notwithstanding anything to the contrary herein, if Proposer does not comply with one or more Department conditions of pre-approval of an ATC or Proposer fails to obtain a required Third-Party approval of an ATC, the Proposer bears all risk and costs associated with not incorporating the pre-approved ATC and is obligated to comply with the original requirements of the RFP without additional cost or extension of time as set forth in the Contract, as applicable.

During negotiation of the final terms of the Contract (prior to execution of the Contract), any ATC from unsuccessful Proposers may, in the Department's sole discretion, be presented to the selected Proposer for possible incorporation in the Contract Documents, as applicable. In addition, following execution of the Contract, any ATC from unsuccessful Proposers may, in the Department's sole discretion, be presented to the selected Proposer as a Change Order in accordance with the Contract, as applicable.

Whether and when additional Right-of-Way (ROW) or New Environmental Document would be required to implement a Proposer's ATC, Proposers are advised that they shall be solely responsible for all costs and impacts to the Completion Deadlines associated with the acquisition of any such ROW or obtaining any such New Environmental Document.

3.2.5. ATC Confidentiality

Subject to the provisions of GRAMA, ATCs and all communications regarding ATCs remain confidential until the Department decides to select a Proposer or cancel the procurement, at which time all confidentiality rights, if any, are of no further force and effect except as otherwise allowed under GRAMA and applicable law. By submitting a Proposal, Proposer agrees, if it is not selected, to the disclosure of its work product to the successful Proposer when receiving the stipend.

4 —PROPOSAL REQUIREMENTS

See Appendix ITP-A (Technical Proposal Instructions) for outline of Proposal, format, and page limits.

4.1. Legal Authority and Licensing Requirements

Obtain the proper licenses as required by applicable Federal and State laws, rules, and regulations. Provide evidence of proper licensing prior to execution of the Contract by the selected Proposer.

4.2. Currency

Provide the pricing information in the Price Proposal in U.S. currency (dollars) only.

4.3. Proposal Guaranty

4.3.1. Proposal Guaranty Requirements

A Proposal Guaranty is required to accompany any Proposal that is submitted for the Project.

Provide a Proposal Guaranty in the form of an electronic guaranty bond, issued under the legal name of the Proposer or Joint Venture, or provide evidence of securing a cashier's or certified check, for 5 percent of the total amount of the Contract Price made payable to the Utah Department of Transportation and issued from a surety company listed on the United States Department of Treasury Circular 570 before the specified date and time for bid opening.

A. Use Department approved surety clearing house for electronic guaranty bond.

B. Use current version of the UDOT EBS program.

The Proposal Guaranty guarantees that the Proposer will enter into a Contract within a specified period of time and will furnish the required performance and payment bonds. The amount of the Proposal Guaranty will be 5 percent of the Contract Price.

4.3.2. Return of Proposal Guaranty

A Proposal Guaranty presented in the form of a certified bond check, if not forfeited, will be returned as follows:

A. For all Proposers other than the apparent responsive best-value and second-best-value responsive proposers, immediately following the announcement of the apparent best-value determination.

B. For the apparent second-best-value Proposer, if it is not awarded the Contract, ten Working Days after the Contract is executed with the best-value Proposer.

C. For the successful Proposer, after satisfactory Payment and Performance Bonds have been furnished and the Contract has been executed.

A Proposal Guaranty presented in the form of a bond will be returned only upon the request of an unsuccessful Proposer after execution of the Contract. A Proposer is not released from the Proposal obligation because of an alleged error in the preparation of the Proposal unless the Department returns the Proposal Guaranty.

4.3.3. Rights Reserved

Each Proposer understands and agrees, by submitting its Proposal, that the Department reserves the right to reject any and all Proposals, or any part of any Proposal, and that, without written consent of the Department, the Proposal may not be withdrawn during the Contract Award Period (as defined in Section 2.7.3 (Withdrawal of a Proposal; Proposal Validity Period)) or at any time prior to execution and delivery of the Contract if the Proposer has received Notice of Award.

Each Proposer further understands and agrees that it forfeits its Proposal Guaranty if it should:

A. Withdraw any part, or all, of its Proposal except as specifically permitted by this ITP or as approved in writing by the Department.

B. Refuse or be unable to enter into the Contract, as provided under this Section 4.3.

C. Refuse or be unable to furnish adequate and acceptable Performance and Payment Bonds.

D. Refuse or be unable to furnish adequate and acceptable insurance, as provided herein.

E. Refuse or be unable to furnish the Proposal information (in Appendix ITP-A), all pricing information specified (in Appendix ITP-B), or Best-and-Final-Offer (BAFO) documents (in the event of a BAFO).

The Proposer understands that any material alteration of documents specified in this Section 4.3 (Proposal Guaranty) or of the form of the Proposal Bond, other than that requested, will render the Proposal non-responsive.

4.4. Escrowed Proposal Documentation

Requirements regarding the contents of the Escrowed Proposal Documents (EPDs) are set forth in Contract Documents Part 2, Section 23.1 (Escrowed Proposal Documents).

Deliver the Escrowed Proposal Documentation (EPD) together with the signed Escrow Agreement, into escrow not later than the date specified in Section 1.7 (Proposal Schedule). The Proposer may use a third party or the Department to act as the escrow holder. In either scenario Form EPD must be completed.

Deliver a copy of the signed Escrow Agreement (Form EPD, in Appendix ITP-C) within the same time period to:

Utah Department of Transportation
Salt Lake City Construction Division Desk
4501 South 2700 West—Fourth Floor
West Valley City, UT 84119

4.5. Proposal Signatures, Quantities, and Costs

4.5.1. Required Signatures

The Proposer's Authorized Representative is required to sign the Proposal Letter Form (in Appendix ITP-C) and the Price Proposal Cover Sheet (Form PP, also in Appendix ITP-C). If the Proposer is a joint venture (JV), all members of the JV board are required to sign. If any signatures are provided pursuant to a power of attorney, provide the original or a certified copy of the power of attorney together with evidence of authorization.

4.5.2. Quantities of Proposal Documents

Provide the following quantities of the Proposal documents:

A. Price Proposal: one original and a complete set of Escrowed Proposal Documents (see Appendix ITP-B).

B. Technical Proposal (including the Design-Builder's Proposal and Pricing Information and the Supplemental Selection Information): Submit originals and copies as described in Appendix ITP-A (Technical Proposal Instructions). The electronic copy should have the files broken out into the separate sections of the Proposal, as identified in Table ITP-A-1.

4.5.3. Cost of Preparing Proposal

The Proposer bears the cost of preparing the Proposal and any other costs incurred at any time before or during the Proposal process, including costs incurred for any interviews, with the exception of any costs paid in accordance with Section 2.9 (Proposal Stipend).

4.6. Obligation to Award

The Department is under no obligation to award the Contract to the Proposer submitting the lowest priced Proposal or to any Proposer that has been included on the Short-List, or to award the Contract at all.

4.7. Additional Submittals Before Contract Execution

In addition to the copies submitted pursuant to Section 4.5.2 (Quantities of Proposal Documents), the selected Proposer may be required to submit an original and three certified copies of the Technical Proposal (see Appendix ITP-A), the Price Proposal (see Appendix ITP-B), and any BAFO documents to the Department prior to Execution for inclusion in the Contract.

4.8. Resource Availability

The Department is concerned that the resources in terms of people, equipment, material, and supplies planned to be used on the Project (if awarded to the Proposer) be available to the Proposer and not be also committed to other projects. Accordingly, the Proposer is required to:

A. Declare that, to the extent within Proposer's control, if awarded the Contract, the Proposer agrees to reserve the resources shown or indicated in the Proposal for the Project.

B. Declare that the Proposer commits to undertake all reasonable efforts to provide all the Key Personnel identified in its Proposal on a full-time basis for the periods necessary to fulfill their responsibilities.

C. Proposer's statements regarding availability of personnel extend to design personnel. See Form CR (Commitment to Assign Identified Resources to Project) (in Appendix ITP-C).

5 —PROPOSAL EVALUATION

The Department expects to establish a fair and uniform basis for the evaluation of the Proposals in compliance with all applicable legal requirements governing this procurement as well as complying with relevant policies and procedures within the Department. The evaluation and selection process will follow the Department's *Design-Build Selection Manual of Instruction* which is available on the Department's public website.

The Best Value Proposal will be the Proposal which, in the judgment of the Department, best meets the goals of the Project and associated evaluation criteria in the most cost-effective manner as determined through a qualitative evaluation of the Technical Proposal, including Base Build Price + Build Alternative (within the Project funding) + Time (in accordance with ITP Appendix B).

Many of the technical elements to be evaluated are highly important to the Department and could justify selecting as Best Value a Proposal with a highly rated Technical Proposal which does not

include the lowest cost Price Proposal. This will include the analysis and assessment of added value components of each Proposal. The added value analysis may result in a + or – dollar value that is considered in conjunction with the Technical and Price Proposal in making a Best Value selection. However, it is unlikely that a Proposal would be selected if the associated Price Proposal is more than ten percent higher than the Proposal with the lowest Price Proposal.

The key areas will be considered in determining added value as follows:

- Maintenance of Traffic
- Elimination of design exceptions
- Risk reduction in schedule criticality

5.1. Evaluation Criteria

5.1.1. Pass/Fail Criteria

Each Proposal is required to achieve a rating of "Pass" on every Pass/Fail Criteria or sub-criteria listed in Sections 5.1.1.1 through 5.1.1.5 to receive further consideration. Failure to achieve such a "Pass" rating will result in the Proposal being declared non-responsive as described in Section 2.7.2 (Responsive Proposal).

Proposers are encouraged to submit the following pass/fail criteria, except for the Legal and Financial Pass/Fail criteria, for Department review and comment prior to the due date for the Pass/Fail criteria:

5.1.1.1. Key Personnel

The Key Personnel requirements are as follows. The following Key Personnel and qualifications were required to be submitted with the SOQ. Submit with the Proposal the Organizational Chart only, do not resubmit the Key Personnel. Identify the Key Personnel on the Organization Chart.

A. **Project Manager:** Must have the authority to represent, make decisions for, and oversee the performance of the Design-Builder. Should demonstrate a minimum of ten years experience managing at least three projects with similar cost, size, type of work, and complexity as this Project, including Projects on bridges and freeways, including interchanges in urbanized areas. The Project Manager should demonstrate experience managing Projects with funding limitations, compressed timelines, Third-Party coordination, and community information requirements. The Project Manager can hold only this one Key Personnel position. Emphasize Design-Build experience and extensive project management experience with demonstrated collaboration with the owner.

B. **Design Manager:** Must be a Utah-registered professional engineer, at time of contract award, whom is an employee of the Designer and should demonstrate a minimum of ten years experience in managing design for highway and interchange projects with similar scope and complexity as this Project. Emphasize experience in Design-Build, highways, bridges, and interchanges in urbanized areas and projects of similar size, type of work and complexity.

C. **Structures Design Manager:** Must be a Utah-registered professional engineer, at time of contract award, and should demonstrate at least ten years experience in all aspects of bridge design including steel and concrete superstructures, emphasize experience in innovative structures construction techniques that result in high quality projects.

D. **Construction Manager:** Should demonstrate a minimum of ten years experience in managing the site work of similar highway interchange and bridge construction projects. Experience should include work of the nature anticipated in the Project, and emphasize Design-Build, public and environmental sensitivity, utility relocation, demonstrated collaboration with the owner, and maintenance of traffic.

E. **Traffic Operations Manager:** Should demonstrate a minimum of five years experience in maintenance of traffic. Should have experience dealing with highways, interchanges, rerouting of arterials and collector streets, implementing traffic management strategies emphasizing projects of similar size and type. This individual should have the decision-making authority to address real-time traffic control concerns and be able to make changes immediately. Experience should include work of the nature anticipated in the Project, including Design-Build experience. Must be a Utah-registered Professional Engineer and registered Professional Traffic Operations Engineer, at time of Contract Award.

F. **Traffic Control Maintainer:** Should have a minimum of five years demonstrated experience in this role, on at least 3 projects of a similar size, type of work, and complexity as this Project, including five years working on Projects on highways in urbanized areas where Maintenance of Traffic (MOT) was significant. Experience should include work of the nature anticipated in the Project.

G. **Third Party Manager:** Should demonstrate a minimum of eight years experience in Third Party coordination and compliance on large, complex transportation projects. The Third Party Manager should have experience in coordination with Third Parties, preferably those involved with the Project, and effectively communicating with design engineers and construction staff regarding requirements of the associated agreements. Emphasize Design-Build experience with demonstrated collaboration with the owner.

H. **Construction Quality Manager**: Should demonstrate at least eight years of experience in highway construction in quality assurance/quality control activities, including preparation and implementation of quality plans and procedures for construction. Demonstrate ability to coordinate with Department provided Quality Assurance. Emphasize and identify specific quality training and certifications. The Construction Quality Manager can hold only this Key Personnel position. Emphasize Design-Build experience and coordination with UDOT Quality Assurance.

5.1.1.2. Legal

The legal Pass/Fail requirements are as follows:

A. Provision of a properly completed and executed Proposal Letter Form (in Appendix ITP-C).

B. Provision of evidence that the Key Personnel required to hold professional licensure within the State hold the required licenses or that they have the capability to obtain licensure prior to award of the Contract. Include a copy of the relevant license(s).

C. Provision of all other specified forms and documents properly completed, signed (if required), and that do not identify any adverse information; forms and documents must comply with all requirements.

D. No change in the Principal Participants and Key Personnel listed in the Proposer's SOQ since submission of the SOQ, unless previous advisement of any such change by

the Proposer to the Department and a true and correct copy of the consent of the Department to such change is included in the Proposal.

The Proposer shall submit:

E. **Proposal Letter and Related Documents:**

1. Proposal Letter Form, in the form included in Appendix ITP-C (Forms), constituting a firm offer to the Department valid for the number of days specified in said form. The Proposal Letter is to be executed by the Proposer and, if the Proposer is a joint venture (JV), must also be individually signed by each JV member. The Proposer must include evidence of authorization for each signatory, as described in Section 5.1.1.2 (D) (Evidence of Authorization);

2. If the Proposer is a JV, joint and several liability statements signed by each JV member and stating that the JV member is jointly and severally liable for any and all of the duties and obligations of the Proposer assumed under the Proposal and under any Contract arising therefrom, should its Proposal be accepted by the Department. Each JV member must also agree, for the benefit of the Department, to take such action as may be required to avoid dissolution of the JV while any Contract obligations remain outstanding, unless the Department has agreed in writing to such dissolution; and

3. A form of a guaranty will be provided by the Proposer if requested by the Department, concurrently with execution and delivery of the Contract by the Proposer.

F. **Certifications and Affidavits:**

1. Form BC (Claim of Business Confidentiality) identifying confidential information contained in the Proposal, following the instructions provided in Section 2.8 (Government Records Access Management Act (GRAMA)).

2. Form NC (Noncollusion Affidavit) in Appendix ITP-C (Forms), certifying that the Proposal is not the result of, and has not been influenced by, collusion, signed by the Proposer. If the Proposer is a joint venture, this form must also be submitted by each joint venture member;

3. Form IC (Certificate Regarding Ineligible Contractors, in Appendix ITP-C (Forms)), signed by the Proposer and each Principal Participant;

4. Form OC (Opinion of Counsel) in Appendix ITP-C (Forms), certifying that the Proposal as submitted has been reviewed and all items are genuine, accurate, and complete, and if not originals, are true and correct copies of originals, and that all signatures on such items are genuine.

5. Form SR (Statement of Representations in Proposal), indicating that representations made in the Proposal are true and accurate.

G. **Subcontractor Information and Certifications:**

1. Form NS (Named Subcontractors) in Appendix ITP-C (Forms), identifying Major Subcontractors (Subcontractors performing 5% or more of the value of the Work) and Major suppliers (suppliers providing products and materials valued in excess of 5% of the value of the Work), and including the percentage of the Proposal Price that represents anticipated Subcontractor and

supplier participation (not specific dollar value of participation).

2. Form IS (Certificate Regarding Ineligible Subcontractors, in Appendix ITP-C (Forms)), signed by each Subcontractor listed on Form NS, except that Principal Participants shall instead provide Form IC, as noted above.

H. **Evidence of Authorization**

The documentation for this requirement does not need to be submitted again and will be retained from the SOQ unless modified or if changes have been made by the Proposer that would facilitate a resubmittal of the documentation. However, the Proposer must make sure the following have been addressed:

1. Submit notarized Power of Attorney for each Principal Participant authorizing the Principal Participant's representative to sign for that Principal Participant; and
2. Submit notarized Power of Attorney from each Principal Participant authorizing the Proposer's designated point of contact, as identified in the Proposer's Cover Letter, to sign documents for and on behalf of the Proposer's organization;
3. If any Power of Attorney states that it is revocable, it shall specifically state that revocation shall not be effective until written notice has been provided to the Department.
4. Evidence of proper licensing for all Major Contractors to conduct business and perform associated contract Work in the State of Utah;
5. If the Proposer has already been legally constituted, provide full details of the organizational structure and supporting organization/formation documents including a copy, as applicable, of articles of incorporation, limited liability company operating agreement in addition to any joint venture agreement or partnership agreement as applicable; or
6. If the Proposer has not yet been legally formed, provide a brief description of the proposed legal structure and draft copies of the underlying documents, including:
    a) All significant terms of any incorporation, joint venture, limited liability company, or partnership, including the rules relative to the administration of such incorporation, joint venture, limited liability company, or partnership, including dealing with deadlock situations;
    b) Description of how the incorporation, joint venture, limited liability company, or partnership will operate administratively and technically; and
    c) A teaming agreement or comparable document setting forth the equity members' agreement to form the organization.

5.1.1.3. Financial

The financial Pass/Fail requirements are as follows:

A. Provision of Proposal Guaranty meeting the RFP requirements provided in Section 4.3 (Proposal Guaranty).

B. Provision of updated financial information, showing that the Proposer has the financial capacity to undertake design and construction of the Project, including the capability of effectively managing any unanticipated cash flow needs of the Project.

C. Provision of all other specified forms and documents, properly completed and signed (if required), and compliance with any other financial requirements.

The Proposer must provide the following:

D. Financial statements for the Proposer and equity members of Proposer for the three most recent fiscal years, audited by a certified public accountant in accordance with generally accepted accounting principles (GAAP). If the Proposer is a newly formed entity and does not have independent financial statements, financial statements for the equity owners will be sufficient (and the Proposer shall expressly state that the Proposer is a newly formed entity and does not have independent financial statements). Financial statements must be provided in U.S. dollars. If audited financials are not available for an equity owner, the Proposal shall include unaudited financials for such member, certified as true, correct, and accurate by the chief financial officer or treasurer of the entity. Required financial statements shall include:

1. Opinion Letter (Auditor's Report);
2. Balance Sheet;
3. Income Statement;
4. Statement of Changes in Cash Flow; and
5. Footnotes.

E. If any entity for which financial information is submitted as required hereby files reports with the Securities and Exchange Commission, then such financial statements shall be provided through a copy of their annual report on Form 10K. For all subsequent quarters, provide a copy of any report filed on Form 10-Q or Form 8-K which has been filed since the latest filed 10K. Provide information regarding any material changes in financial condition for Proposer and each of its equity members for the past three years and anticipated for the next reporting period. If no material change has occurred and none is pending, the Proposer and/or equity member, as applicable, shall provide a letter from its chief financial officer or treasurer so certifying.

F. If financial statements are prepared in accordance with principles other than U.S. GAAP, provide a letter from the certified public accountant of the applicable entity, discussing the areas of the financial statements that would be affected by a conversion to U.S. GAAP, should be provided.

G. Provide a letter from the chief financial officer or treasurer of the entity or the certified public accountant for each entity for which financial information is submitted, identifying all off balance sheet liabilities.

H. If a Proposer has been advised that a guaranty will be required but has not previously submitted financial statements for the guarantor, financial documents and associated documents for the guarantor for the periods specified in the RFQ and meeting the requirements specified in the RFQ.

I. A description and detailed breakdown of each element of cost that comprise the

Compensable Project Overhead, including information and back-up documentation used to develop the lump sum cost.

5.1.1.4. Other

The Pass/Fail requirements include provision of all required forms included in Appendix ITP-C (Forms), properly completed and signed (if applicable), and provision of all information specified in Appendices ITP-A and ITP-B, in the manner, format, and detail specified, without alteration of the forms, except as expressly permitted by the instructions.

5.1.2. Technical Evaluation Criteria

The technical evaluation criteria detailed below will be evaluated and rated with special attention given to the desired qualities expressed in the statement of each criteria. No Proposal that receives a technical rating of Unacceptable for any overall technical evaluation criteria category will be selected for award.

The ITP evaluation criteria present the relative importance of the technical evaluation criteria relative to the Project goals. The weighting in those criteria denoted as "Critical" are approximately three times the weight of "Important". The criteria denoted as "Significant" are approximately twice the weight of "Important".

5.1.2.1. Maintenance of Traffic

Goal:

Minimize Impacts to Bangerter Highway and Provide Mobility through the Project (MOT)

Provide continued and effective flow of traffic through the Project and for each interchange during construction. Use innovative design and construction techniques to deliver the Project with the least possible impacts to the traveling public while maintaining or exceeding the standards for quality. Implement a comprehensive construction phasing and maintenance of traffic (MOT) plan that maintains continuous access to businesses, residences, and schools; provides safe routing for pedestrians and school children; maintains existing vehicle movements throughout construction; and minimizes delay (including duration of impact) to traffic during construction of the Project.

Submittals:

Narratives

A. Provide an overall description of the proposed maintenance of traffic and construction phasing including a summary of proposed innovations. Focus on an approach that is designed to minimize disruption and maximize safety for the Project.

B. Include a traffic impact and mitigation plan for maintenance of traffic for each construction stage. Include descriptions of detours and plans for full or partial roadway closures.

C. Include a description of maintaining access to properties and a description of an approach that minimizes impacts to business accesses, residences, pedestrians, and schools.

Plans

D. Provide plans showing maintenance of traffic and construction sequencing/phasing; including any necessary temporary construction. **(To be evaluated with the Narratives)**

E. Provide a pedestrian access plan that provides for safe pedestrian routing and includes safe routes for school children to cross the project. **(To be evaluated with the Narratives)**

5.1.2.2. Technical Approach

Goal:

Provide a Technical Approach that Exceeds Project Requirements

Exceed the Department's standards for design and construction to provide additional value to the Project, such as improved functionality and quality, reduced long-term maintenance, elimination of design exceptions and an increased service life. As appropriate, use innovative techniques and methods to provide increased value for the Project. Approach to design and construction should minimize or eliminate risk to the Department, specifically schedule risk associated with right-of-way limitations.

Submittals:

Narratives

A. Provide a description that minimizes or eliminates schedule risks to the Department; include any commitments to provide Project schedule float on critical parcels. Provide milestones in the schedule for all right-of-way limitation dates.

B. Provide a description of design exceptions that have been eliminated. The Department's priority for the design exceptions is below.

1. Proposed 6% grade at 5400 South and/or proposed 6% grade at 9000 South
2. Reduced outside shoulder width along Bangerter Highway (SR-154) at 11400 South on-ramps
3. Reduced shoulder width SB on ramp at 5400 South
4. Reduced inside shoulder for high mast lighting and overhead guide signs at each interchange
5. Not meeting minimum K-value for the sag at 11400 South
6. Reduced inside shoulder width on Bangerter Highway (SR-154) under Old Bingham Highway

C. Describe proposed Project elements that promote improved system functionality, improved quality and safety, increased life of Project elements, and reduced long-term maintenance.

D. Provide an overall description of the proposed design enhancements and innovations that reduce risk.

E. Provide a description to mitigate risks for the Bingham Creek culvert.

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Plans

F. Include plan sheets, profiles, typical sections, situation and layout drawings, and details as necessary to demonstrate the proposed design enhancements. **(To be evaluated with the Narratives)**

1. Do not simply re-propose the Preliminary Engineering Concept (PEC) Plans provided as reference, instead provide plans for design enhancements or improvements to that plan. If the Proposal is to forward the design shown in the Reference Documents without modification, then state that in the narrative. Clearly identify where the Proposal Plans differ from the PEC Plans.

G. Provide proposed Proposal Project Schedule, including ROW, design and construction activities, in PDF and XER formats. **(To be evaluated with the Narratives)**

1. Do not show or submit any price information with the Proposal Project Schedule; include price information only in the Price Proposal (see Appendix ITP-B).

5.1.2.3. Third Party

Goal:
Minimize risk to, and effectively coordinate with Third Party Entities

Minimize Third Party facility relocations and mitigate impacts to Third Parties with an emphasis made to minimize or eliminate impacts to the U.S. Bureau of Reclamation's (USBOR) aqueduct at 9000 South, 7000 South, and 5400 South. Demonstrate effective methods for communicating, coordinating, and partnering to reduce impacts to their Facilities, reduce potential for impacts to the Project schedule, and promote a positive working relationship.

Submittals:

Narratives

A. Provide an overall description of the potential impacts to existing Third Party facilities and the proposed Third Party mitigation and relocation strategies including a summary of proposed innovations to avoid, or mitigate impacts to the Third Party facilities. Include a description of methods to mitigate risk to the Project from Third Party facility and utility relocations.

B. Provide an approach to coordinating with the Jordan Valley Water Conservancy District (JVWCD) and USBOR for design and construction of Project elements within the USBOR aqueduct easement.

1. Include a description of the communication and construction strategies with JVWCD and the USBOR to obtain approvals for design and construction affecting the USBOR aqueduct Easement, including other impacts affecting the USBOR aqueduct Easement.

C. Include a description of Third Party, Department, and Design-Builder communication and coordination that will facilitate scheduling of the Third Party Utility Work, coordinate the design and construction, and expedite the preparation of Supplemental Agreements.

Plans

D. Provide a Utility conflict matrix identifying Third Party Utility impacts, relocations, and mitigation strategies. **(To be evaluated with the Narratives)**

E. Provide plan sheets identifying potential impacts to Third Party Utilities and the anticipated mitigation of those impacts. **(To be evaluated with the Narratives).**

F. Include activities in the Proposal Project Schedule that represent the scheduling of Third Party Work and coordination with the Department, including Supplemental Agreement preparation and execution. **(To be evaluated with the Narratives)**

5.1.3. Price Proposal

Submit Pricing Information as part of the Price Proposal in accordance with Appendix ITP-B (Price Proposal Instructions) for the Project.

Base the Price Proposal on the following assumptions:

A. Contract execution is in accordance with timeframes in Section 6.2 (Execution of Contract). The Design-Builder completes the Work on or before the Completion Deadline.

5.1.3.1. Evaluation Criteria

Specific information to be submitted is identified in Appendix ITP-B (Price Proposal Instructions). The following criteria are considered in the price evaluations:

A. Bid Amount for Award Consideration

Specify the sum for which the Work is performed according to the RFP (the Contract Amount).

The Department reserves the right to reject any Proposal if it determines that the Price Proposal is significantly unbalanced to the potential detriment of the Department.

An unbalanced Proposal is considered to be one (a) which is front-end-loaded or (b) for which the line item amounts or amounts shown in the Price Allocation do not reflect reasonable actual costs, plus a reasonable proportionate share of the Proposer's anticipated profit, overhead costs, and other indirect costs that are anticipated for the performance of the items in question.

The numbers in the cents column may not have any decimal positions (i.e., no fractional cents).

A Price Proposal is deemed unacceptable if the Department determines, in its sole discretion, that the Price Proposal fails to conform to the conditions of the RFP in any manner, including, but not limited to, if the Price Proposal:

B. Is significantly unbalanced relative to the Scope of Work.

C. Does not provide all information in conformance with the ITP.

D. Contains inaccurate, incomplete, and/or unreasonable prices on the Price Allocation (Form PA, in Appendix ITP-C).

The Contract Amount on Form PA becomes the Contract Amount in the executed Contract, unless the Escrowed Proposal Documentation submitted hereunder is subsequently found to have been inaccurate, incomplete, or noncurrent as of the effective date of the certification, in which case the Department is entitled to an adjustment of the Contract Amount, including profit or fee, to exclude any sum by which the Contract Amount was increased because of the defective data.

5.2. Evaluation Guidelines

5.2.1. Price Reasonableness Analysis

Proposers are advised that the Department will independently analyze the price reasonableness and estimate the cost of the Work to ascertain the basis of pricing and to determine whether the proposed price is fair and reasonable.

5.2.2. Technical Evaluation Criteria

Using the evaluation criteria of Section 5.1 (Evaluation Criteria), the technical evaluation criteria, sub-criteria, and elements (not the Pass/Fail criteria) will be evaluated in accordance with the guidelines provided in this Section 5.2.2 (Technical Evaluation Criteria).

The technical evaluation criteria and the overall Proposal will be rated by a qualitative—descriptive (adjectival) method. The following adjectival ratings will be used in the evaluation of each technical evaluation criteria and the technical rating of the overall Proposal:

> **Exceptional:** The Proposer has demonstrated a complete understanding of the subject matter and the Proposal provides exceptional value according to the Project Goals. The Proposal communicates an outstanding commitment to quality by a highly skilled team in all aspects of the Work. The Proposal outlines a strong approach to mitigating Project specific risks and inspires confidence that all Contract requirements will be met or exceeded. The Proposal contains significant strengths and minor Weaknesses, if any
>
> **Good:** The Proposer has demonstrated a strong understanding of the subject matter and the Proposal advances the Project goals to a high level. The Proposal communicates a commitment to quality by an experienced team in all aspects of the Work. The Proposal defines an approach to mitigating Project specific risks with little risk that the Proposer would fail to meet the requirements of the Contract. The Proposal contains strengths that outweigh Weaknesses.
>
> **Acceptable:** The Proposer has demonstrated an adequate understanding of the subject matter and the Proposal meets the Project goals. The Proposal communicates a commitment to quality Work by a qualified team. Project specific risks have been identified and the Proposer has a reasonable probability of successfully completing the Work. The Proposal contains strengths that are offset by Weaknesses.
>
> **Unacceptable:** The Proposer has not demonstrated an understanding of the subject matter and the Proposal presents an approach which does not address the goals of the Project. The Proposal fails to meet stated requirements and/or lacks essential information. The commitment to quality is not adequate, with Work performed by unqualified or unproven teams. Project specific risks are not addressed, and the Proposal generates little confidence that the Project requirements can be met. The Proposal contains Deficiencies, significant Weaknesses and minor strengths, if any.

In assigning ratings, the Department may attach a plus sign ("+") or a minus sign ("-") to any rating to better differentiate the ratings in order to more clearly differentiate the Proposals (e.g., "Exceptional -" and "Good +").

The term "Deficiency," as used herein, means a material failure of a Proposal to meet an RFP requirement or a combination of weaknesses in a Proposal that increases the risk of unsuccessful Contract performance to an unacceptable level.

5.3. Proposal Revisions; Best and Final Offers

The Department reserves the right to hold discussions and to issue one or more requests for Proposal revisions or best and final offers (BAFO), but is under no obligation to do so. The Department may make its selection and award based only on the initial Proposals. If any Proposer requested by the Department to submit a Proposal revision or a BAFO fails to provide a Proposal revision or a BAFO, or delivers a Proposal revision or BAFO that is deemed unacceptable or late, the Department shall have the right to consider as valid such Proposer's initial or previously revised Proposal and to award the Contract to such Proposer based on its initial or previously revised Proposal. All terms and conditions of the Instructions to Proposers applicable to Proposals shall also be applicable to Proposal revisions and BAFOs except as otherwise specified in the request for Proposal revisions or BAFOs.

5.4. Best Value Determination

The Department has determined that award of the Contract based on a best-value determination provides the best opportunity to obtain the right Design-Builder to ensure a successful Project.

The Department's procedures for the evaluation and selection of Proposals are designed to provide a comprehensive evaluation of the technical Proposal that, when combined with price, will result in the selection of the appropriate Design-Builder.

In making this selection, the Department evaluates the evaluation criteria and assigns an overall technical rating for each Proposer. However, it is unlikely that a Proposal would be selected if the associated Price Proposal is more than 10% higher than the Proposal with the lowest Price Proposal.

5.5. Debriefings

Unsuccessful Proposers are welcome to submit a written request to be debriefed. To ensure that the request is granted, submit it to the Department within a reasonable time. Debriefings are provided at the earliest feasible time after a Proposal is selected for award. A procurement official familiar with the rationale for the selection decision conducts the debriefing.

The debriefing is required to:

A. Be limited to discussion of the unsuccessful Proposer's Proposal and may not include specific discussion of a competing Proposal.
B. Be factual and consistent with the evaluation of the unsuccessful Proposer's Proposal.
C. Provide information on areas in which the unsuccessful Proposer's Technical Proposal had weaknesses or deficiencies.

Debriefing may include a summary of the rationale for the selection decision, highlighting such things as strengths, weaknesses, risks, innovations, or enhancements.

5.6. Post-Selection Meetings

The Department may meet with the selected Proposer prior to award at any time after selection.

6 —CONTRACT AWARD AND EXECUTION

6.1. Contract Award

Unless the Department rejects all Proposals or cancels this procurement, the Contract may be awarded to the Proposer that is responsive to the RFP and that provides the best value to the State of Utah, as determined by the Department's Selection Official in accordance with Section 5 (Proposal Evaluation). The Department provides Notice of Award to the successful Proposer in the form of a letter mailed to the address shown on the Proposal, stating that the Proposal has been accepted and the Contract has been awarded. Within 10 Calendar Days after the Department issues the Notice of Award, the selected Proposer is required to notify the Department in writing of the name and address of its agent for service of legal process in Utah and provide the Department, in writing, Proposer's Federal Internal Revenue Service Employer Identification Number or, if Proposer is an individual with no employer identification number, Proposer's Social Security Number. The Proposer is prohibited from changing that authorized agent without giving prior written notice to the Department. Within 15 Calendar Days after the Department provides the selected Proposer with Notice of Award, the selected Proposer is required to deliver to the Department the following items:

A. An original and three certified copies of Volumes 1 through 4 of the Technical Proposal and supplemental information (if requested by the Department) in the format specified in Appendix ITP-A (Technical Proposal Instructions), Table ITP-A-1.

B. Price Proposal (including the Supplemental Price Information, if any) in the format specified in Appendix ITP-B (Price Proposal Instructions) (see Section 4.7 (Additional Submittals before Contract Execution)).

C. Revised Proposal documents, if applicable.

D. Required Payment and Performance Bonds in accordance with Part 2 Section - 27 (Surety Bonds).

E. Insurance certificates.

F. Employment Status Verification (refer to Part 2 Section-14.1(Observing Laws, Rules, and Regulations), Article E);

G. Health Insurance Coverage Certification and Actuary Statement, for the Design-Builder and all identified Subcontractors (at all tiers) with an anticipated subcontract value of $750,000 or more, to be provided on company letterhead (refer to Part 2 Section - 14.1(Observing Laws, Rules, and Regulations), Article H);

H. The fully executed Contract Documents, together with evidence (if not previously provided) as to the authority, power, and capacity of the signatory to bind the Proposer to the Contract.

I. Evidence that the Designer and Contractor are properly licensed, if not previously provided.

J. All other information required as directed in the Notice of Award letter issued by the Department.

Failure to comply with the above may result in cancellation of the Notice of Award and forfeiture of the Proposal Guaranty. Proposers are informed recent laws and Utah Administrative Code require the Design-Builder and its Subcontractors to certify compliance with qualified "Health Insurance

Coverage" requirements and to participate and use the "Employment Verification Status" for the hiring of employees after 7/01/09, which will be required for Contract execution and subsequent Subcontractor acceptance. Proposers are advised to ensure their team members meet these requirements prior to submitting their Proposal in order to avoid cancellation of the Contract as a result of non-compliance.

Refer to Contract Documents Part 1 (Agreement) for a sample of the Agreement that the selected Proposer is required to sign. The Department will use the information in the Proposal to complete the Agreement, and then give the completed Agreement to the selected Proposer to sign the agreement, attach the exhibits, and return it to the Department.

At the time of the return of the executed Contract, the successful Proposer is required to furnish a Payment Bond and a Performance Bond in accordance with Part 2-Section 27 (Surety Bonds), each in a sum equal to the amount specified. The surety and form of the Bonds must be acceptable to the Department.

6.2. Execution of Contract

Execute the Agreement, Part 1(Agreement) of the Contract Documents, provide other required documents including Payment and Performance Bonds, and comply in all respects with the statutory provisions relating to the Contract within 15 Calendar Days of receiving the Contract Documents from the Department.

In case of failure or refusal on the part of the successful Proposer to deliver the duly executed Agreement and other required documents to the Department within the 15 day period, the amount of the Proposal Guaranty may be forfeited and paid to the Department. If the Agreement is not executed by the Department within 45 Calendar Days following receipt from the successful Proposer of the signed Agreement and other required documents, the Proposer is granted the right to withdraw the Proposal without penalty.

If the Department or the successful Proposer fail to execute and deliver the Agreement within the time periods identified above, award of the Contract may be made to the next apparent best-value Proposer, or the Work may be re-advertised and completed under a different contract or otherwise, as the Department may decide.

The Contract does not take effect until the Agreement has been fully signed and executed by all of the parties thereto.

7 —PROTESTS

This section sets forth the protest process with respect to this RFP.

7.1. Written Protests Only

All protests must be in writing, and will follow the requirements in Utah Code Sections 63G-6a-1601 et seq. Deliver a copy of any protest to:

Executive Director
Utah Department of Transportation
4501 South 2700 West, 1st Floor
Box 141245

Salt Lake City, Utah 84114-1245

Any protest not set forth in writing within the time limits specified in §63G-6a-1602 is null and void and will not be considered.

7.2. Protest Contents

All Protests must include:

A. The name, telephone number and address of the Proposer;
B. The Project number;
C. The reasons for the protest;
D. All documentation and evidence supporting the protest

The Protest Official will not be obligated to postpone the Submittal of Proposals due date or selection announcement in order to allow a protestor an opportunity to correct a deficient protest or appeal, unless otherwise required by law or regulation.

8 —DEPARTMENT RIGHTS AND DISCLAIMERS

8.1. Department Rights

The Department may investigate the qualifications of any Proposer under consideration, may require confirmation of information furnished by a Proposer, and may require additional evidence of qualifications to perform the Work described in this RFP. The Department reserves the right, in its sole and absolute discretion, to:

A. Reject any or all Proposals.
B. Issue a new RFP.
C. Cancel, modify, or withdraw the entire RFP.
D. Cancel the award of any Contract before execution without liability.
E. Issue Addenda, supplements, and modifications to the RFP.
F. Modify the RFP process (with appropriate notice to Proposers).
G. Solicit subsequent Proposal Revisions from the Proposers.
H. Appoint an Evaluation and Selection Committee and evaluation teams to review Proposals, and seek the assistance of outside technical experts in Proposal evaluation.
I. Approve or disapprove the use of particular Subcontractors and/or substitutions and/or changes to said Subcontractors from those identified in the SOQ.
J. Revise and modify, at any time before the Proposal Due Date, the factors it considers in evaluating Proposals and to otherwise revise or expand its evaluation methodology. If such revisions or modifications are made, the Department circulates an Addendum to all Proposers on the Short-List setting forth the changes to the evaluation criteria or methodology. The Department may extend the Proposal Due Date if such changes are deemed by the Department, in its sole discretion, to be material and substantive.
K. Hold meetings and exchange correspondence with the Proposers responding to this RFP to seek an improved understanding and evaluation of the Proposals. If individual informational meetings are held, the Department affords all Proposers an opportunity to participate in such meetings.

L. Seek or obtain data from any source that has the potential to improve the understanding and evaluation of the Proposals.

M. Waive weaknesses, discrepancies, informalities, omissions or minor irregularities in Proposals, and seek and receive clarifications to a Proposal.

N. Disqualify any Proposer that changes its proposal or organization (as represented in its SOQ) without written approval from the Department.

O. Hold the Proposals under consideration for the duration of the Contract Award Period.

P. Refuse to consider a Proposal, once submitted, or reject a Proposal if such refusal or rejection is based upon, but not limited to, the following:

1. Failure on the part of a Principal Participant to pay, satisfactorily settle, or provide security for the payment of claims for labor, equipment, material, supplies, or services legally due on previous or ongoing contracts with the Department (or State);

2. Default on the part of a Principal Participant or Designer under previous contracts with the Department (or State);

3. Unsatisfactory performance of previous work by the Proposer, a Principal Participant, and/or Designer under previous contracts with the Department (or State);

4. Debarment or suspension under Department or Federal regulations to the Proposer, a Principal Participant, and/or Designer;

5. Submittal by the Proposer of more than one Proposal in response to this RFP for the same Work under the Proposer's own name or under a different name;

6. Existence of an organizational conflict of interest or evidence of collusion in the preparation of a Proposal or bid for any Department design or construction contract by (a) the Proposer, Principal Participant, Major Contractor, or Designer and (b) other Proposers or bidders for the Contract;

7. Uncompleted work or default on a contract in another jurisdiction for which the Proposer or a Principal Participant is responsible that, in the judgment of the Department, might reasonably be expected to hinder or prevent the prompt completion of additional work if awarded;

8. Any other reason affecting the Proposer's ability to perform, or record of business integrity; and/or

9. The Proposer is not otherwise qualified and eligible to receive an award of the Contract under applicable laws and regulations.

8.2. Department Disclaimers

This RFP does not commit the Department to enter into a Contract, nor does it obligate the Department to pay for any costs incurred in preparation and submission of Proposal(s) or in anticipation of a Contract. By submitting a Proposal, a Proposer disclaims any right to be paid for such costs, except for any costs paid in accordance with Section 2.9 (Proposal Stipend).

In no event is the Department to be bound by, or liable for, any obligations with respect to the Work or the Project until such time (if at all) as the Contract, in form and substance satisfactory to the

Department, has been executed and authorized by the Department and approved by all required authorities and, then, only to the extent set forth in a written Notice To Proceed.

In submitting a Proposal in response to this RFP, the Proposer is specifically acknowledging these disclaimers.

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

INSTRUCTIONS TO PROPOSERS

APPENDIX A:
TECHNICAL PROPOSAL INSTRUCTIONS

Final Issued September 15, 2016

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1—GENERAL INSTRUCTIONS

This Appendix A provides specific instructions for preparing Technical Proposals for the Utah Department of Transportation (Department) 4 Interchanges on Bangerter Highway (SR-154).

Submit the information required by this Appendix A of the Instructions to Proposers (ITP) in the organization and format specified herein.

Organization. Organize the Technical Proposal in separate tabbed sections or volumes in accordance with Table ITP-A-1 (Outline for Submittal of Technical Proposal). Provide the Proposal in three-ring binders, with each binder within each set numbered in "X of Y" fashion. Also label each Proposal set with either "Original" or the Copy number of the Proposal set; label each binder in each set.

Forms. All forms named herein are found in Appendix ITP-C, unless otherwise noted.

Text, Type font, and Pages. Format text in a standard font, a minimum of 10 points in height, and single-spaced. Use 8½ -inch x 11-inch white paper, with simple lettered or numbered dividers for each section. Number each page in each volume consecutively (i.e., 1-1, 1-2,…; 2-1, 2-2…; etc.), and center page numbers at the bottom of each page.

Non-text Items. Submit drawings and sketches on 11-inch x 17-inch and/or 8 ½ -inch x 11-inch white paper. Submit one Proposed Project Schedule on 24 -inch x 36 -inch or 22 –inch x 34 –inch paper, folded and inserted in an envelope or a similar holder that is incorporated into the original volume.

Only submit color photographs, renderings, and brochures that are adequately bound and suitably protected for handling and circulation during review.

Readability. Present information clearly and concisely. Documentation that is difficult to read may be rejected and may lead to disqualification.

Reproducibility. Provide information that is easily reproducible by normal black and white photocopying machines.

Submittal. Provide the Proposal in hard copies and electronic format, and limit number of pages as required in Table ITP-A-2.

2—FORMAT AND ORGANIZATION OF THE TECHNICAL PROPOSAL

The Technical Proposal shall be prepared in accordance with Table ITP-A-1 (Outline for Submittal of Technical Proposal), with covers on the Proposal documents entitled as follows:

[NAME OF PROPOSER]

TECHNICAL PROPOSAL

Volume _____
(Enter title from Table ITP-A-1)

Proposers shall submit a complete and total Proposal including previously submitted Pass/Fail elements, ATCs, and accompanying Department responses and Approval documentation.

3—EXECUTIVE SUMMARY

The Executive Summary is intended for presentation to, and review by, the Department prior to selection of the Design-Builder, and may be released to the news media after selection. Therefore, do not include any information regarding price or any other sensitive or confidential information.

3.1 EXECUTIVE SUMMARY

Include sufficient information in the Executive Summary to familiarize reviewers with the Proposer's Project approach and its ability to satisfy the legal requirements of the Contract. Highlight those items that, in the opinion of the Proposer, represent significant value to the Department and that may distinguish the Proposal from others.

At a minimum, the Executive Summary shall include the following sections:

A. **Legal.** A description of the Proposer's form of organization, identifying the percentage interest held by each of the Principal Participants with a direct equity interest in the Proposer, the lead entity, and all entities that will have joint and several liability for the Contract or that will provide guaranties (if required) to the Department.

B. **Financial.** Information regarding Proposer's financial strength and capability of undertaking and completing the Work.

C. **Technical.** Summary of the project approach and concepts to be utilized in connection with the Work, specifically addressing how the Proposer will forward UDOT's goals for the project.

4—ALTERNATIVE TECHICAL CONCEPTS (ATC) AND BUILD ALTERNATIVE FOR VOLUME 4 OF THE TECHNICAL PROPOSAL

4.1 ALTERNATIVE TECHICAL CONCEPTS

Prepare and Submit:

A. Submit Form ATC-S (Alternative Technical Concept Submittal).

B. Submit the Department's response letter Approving inclusion of any ATC.

4.2 BUILD ALTERNATIVE INFORMATION

The Build Alternative consists of removal of the existing "Thru-Turn" intersection at 5400 South and 4015 West and replacing it with a standard signalized intersection.

Prepare and Submit:

A. Summary of the Work proposed to be completed for the Build Alternative. Include the following information (Limited to 2 pages, not including plan sheets):
   1. A description of the Build Alternative and supporting information describing the construction of the Build Alternative;

2. A detailed description of all the Work required to complete the Build Alternative;
3. The proposed schedule and phasing for completing the Build Alternative as defined in Part 2 (General Provisions).

TABLE ITP-A-1
OUTLINE FOR SUBMITTAL OF TECHNICAL PROPOSAL

Proposal Volume Section	*Volume and Section Titles and Required Information*
	EXECUTIVE SUMMARY
VOL. 1	**LEGAL AND FINANCIAL INFORMATION (PASS/FAIL)**
Sec. 1	Proposal Letter Form; Form BC (Claim of Business Confidentiality) Form C (Single Point of Contact) Form NC (Noncollusion Affidavit) Form IC (Ineligible Contractors) Form LC (Lobbying Certificate) Form OC (Opinion of Counsel) Form NS (Named Subcontractors); and Licensing information. Form IS (Ineligible Subcontractors) Form SR (Statement of Representations) Form CR (Commitment Resources) Relevant Professional Licenses
VOL. 2	**TECHNICAL PROPOSAL INFORMATION**
Sec. 1	**Maintenance of Traffic** Description of the proposed maintenance of traffic and construction phasing including a summary of proposed innovations. Focus on an approach that is designed to minimize disruption and maximize safety for the Project Traffic impact and mitigation plan for maintenance of traffic for each construction stage. Include descriptions of detours and plans for full or partial roadway closures. Description of maintaining access to properties and a description of an approach that minimizes impacts to business accesses, residences, pedestrians, and schools.
Sec. 2	**Technical Approach** Description of the proposed design enhancements and reduction in risk, including a summary of proposed innovations Provide a description of design exceptions that have been eliminated. Description of the proposed Project elements that promote improved system functionality, improved quality and safety, increased life of Project elements, and reduced long-term maintenance. Description to mitigate risks for the Bingham Creek culvert Description that minimizes or eliminates schedule risks to the Department; include any commitments to provide Project schedule float on critical parcels. Provide milestones in the schedule for all right-of-way limitation dates.
Sec. 3	**Third Party coordination and minimization of risk** An approach to coordinating with the Jordan Valley Water Conservancy District (JVWCD) and USBOR for design and construction of Project elements within the USBOR aqueduct easement. 1. Include a description of the communication and construction strategies with JVWCD and the USBOR to obtain approvals for design and construction affecting the USBOR aqueduct Easement, including other impacts affecting the USBOR aqueduct Easement.

TABLE ITP-A-1
OUTLINE FOR SUBMITTAL OF TECHNICAL PROPOSAL

Proposal Volume Section	*Volume and Section Titles and Required Information*
	Description of the potential impacts to existing Third Party facilities and the proposed Third Party mitigation and relocation strategies including a summary of proposed innovations to avoid, or mitigate impacts to the Third Party facilities. Include a description of methods to mitigate risk to the Project from Third Party facility and utility relocations
	Description of Third Party, Department, and Design-Builder communication and coordination that will facilitate scheduling of the Third Party Utility Work, coordinate the design and construction, and expedite the preparation of Supplemental Agreements.
VOL. 3	**Plan Sheets***
Sec. 1	**Maintenance of Traffic**
	MOT and construction sequencing and phasing Plan
	Pedestrian access plan
Sec. 2	**Design**
	Plan sheets, profiles, typical sections, situation and layout drawings strategy, and other details as necessary
Sec. 3	**Third Party**
	Matrix identifying Third Party impacts, relocations, and mitigation strategies
	Plans identifying potential impacts to Third Parties
VOL. 4	**ATC AND BUILD ALTERNATIVE INFORMATION**
Sec. 1	**Alternative Technical Concepts (ATC's)**
	Form ATC-S (Alternative Technical Concept Submittal)
	Department Approval letter with each Form ATC-S
Sec. 2	**Build Alternative**
	Summary of the Build Alternative
APP. A	**LEGAL AND FINANCIAL CONFIDENTIAL INFORMATION (PASS/FAIL)**
Sec. A.1	**Legal Confidential Information for Appendix A**
	Notarized Powers of Attorney; (if required)
	If consortium or joint venture, evidence of joint and severable liability; (if required)
	Organizational Documents (if Required)
Sec. A.2	**Financial Confidential Information for Appendix A**
	Financial Statements;
	CFO or Treasurer Letter
	Additional Financial Documents;
APP. B	**PASS/FAIL ELEMENTS**
Sec. B.1	**Pass/Fail Elements for Appendix B**
	Key Personnel
	Form KP (Key Personnel)
	Department Approval letter, as applicable, with each Pass/Fail Element
APP. C	**SCHEDULE**
Sec. C.1	**CPM Schedule .xer**
Sec. C.2	**Microstation Design Files .dgn**

* Plan sheets are not required to be separated by goal. Provide plan sheets to clearly demonstrate the goals as described in ITP. Include CPM Schedule plot and summary of milestones with this volume.

TABLE ITP-A-2
TECHNICAL PROPOSAL PAGE LIMITS AND NUMBER OF COPIES

Proposal Volume	*Page Limit**	*Number of Copies***
Executive Summary	3 pages total (8 ½" x 11")	One Original and 10 Copies bound together with Volumes 1 and 2.
Volume 1 – Legal & Financial	Limited to the Forms and Letters required.	One Original and 1 Copy. Bind together in the Original and the Copy 1 of 10, with the Executive Summary, and Volume 2.
Volume 2 – Technical Proposal	A maximum of 60 single sided pages (including a maximum of 8 pages 11" x 17"), with the sole exception of tabbed dividers, cover letters, the executive summary, required forms, and appendices.	One Original and 10 Copies bound together with the Executive Summary, and Volume 1.
Volume 3 – Plan Sheets	Limited to the technical content required, no page limit.	One Original and 10 Copies bound separately from the other Volumes. One Original - For the Proposed Project Schedule only one 36 x 24 full-sized plot copy is required.
Volume 4 – ATC Information	Limited to the ATC Information required, no page limit.	One Original and 10 Copies bound separately from the other Volumes.
Appendix A – Legal & Financial Confidential	Limited to the Forms, Letters, and other required elements, no page limit.	One Original bound separately from the other Appendices. May be sealed and marked "Confidential" and addressed to Renee Spooner.
Appendix C – Electronic Files & Schedule .xer	Limited to the Electronic Files requirements, no page limit.	4 USB Flash Drive included with Volume 2, copies 1 of 10 through 4 of 10.

*The Department does not commit to review any information in appendices or exhibits other than that which it requires to be provided, and the Proposal evaluation process will focus on the requested Proposal elements. Proposers must limit the information provided in the Proposal to that which is required in the RFP. Any additional pages or appendices will be removed from the Proposal and returned to the Proposer.

All Volumes and Appendices must also be provided in electronic format on USB Flash Drive with a separate PDF (and other required format files) for each Proposal **volume and section as shown in Table ITP-A-1. Legal and Financial Confidential elements may be included on a separate USB Flash Drive and included in the sealed envelope marked "confidential."

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

INSTRUCTIONS TO PROPOSERS

APPENDIX B:
PRICE PROPOSAL INSTRUCTIONS

Final Issued September 15, 2016

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1—INTRODUCTION

This Appendix ITP-B specifies the pricing information to be submitted by all Proposers. The information will include the Price Proposal Cover Sheet and the other documents associated with the Proposer's price, such as the Escrow Agreement, Proposal Guaranty, Bonds, and Letter of Subcontractor Intent.

The Proposer shall submit all information as specified herein, using the forms and formats specified. Alterations to the forms will be permitted only as specifically allowed in writing by the Department. All forms named herein are found in Appendix ITP-C (Forms), unless otherwise noted.

2—PRICE PROPOSAL

The Proposer shall provide a Price Proposal using the forms listed herein and provided in Appendix ITP-C, and the UDOT Electronic Bid System (EBS) for confidential submittal of price information. Failure to provide the requested information on the forms and in the format specified may result in the Department declaring the Price Proposal nonresponsive.

Upon award, the Price Proposal of the selected Proposer will be incorporated into the Contract, Part 10 (Design-Builder Proposal).

The Price Proposal shall consist of the forms provided in Appendix ITP-C:

A. Form PP (Price Proposal cover sheet) (Submitted with the Escrowed Proposal Documents).

B. Form LSI (Letter of Subcontractor Intent) (Submitted with the Escrowed Proposal Documents).

C. Form EPD (Escrow Agreement) (Submitted with the Escrowed Proposal Documents).

D. Form PA (Price Allocation) (Submitted through UDOT EBS, with the Escrowed Proposal Documents, and submit a copy to the Department after Notice of Award).

E. Form UC (Utility Costs) (Submitted with the Escrowed Proposal Documents, successful Proposer to submit a copy to the Department after Notice of Award).

F. Form BA (Build Alternative) (Submitted with the Escrowed Proposal Documents, successful Proposer to submit a copy to the Department after Notice of Award).

G. Proposal Guaranty (Submitted in the form of a check or through UDOT EBS).

2.1 PRICE PROPOSAL SUBMITTAL

The Proposer shall submit Form PP and Form EPD (provided in Appendix ITP-C) outside of the sealed Escrowed Proposal Documents and deliver them along with the Escrowed Proposal Documents. All other forms, including Form LSI (Provided in Appendix ITP-C) shall be sealed with the Escrowed Proposal Documents and delivered at the time specified in Table ITP-2 in ITP Section 1.7 (Proposal and Contract Award Schedule).

The Proposer shall submit the price information shown on Form PA (Price Allocation) provided in Appendix ITP-C, through the UDOT EBS. Instructions for using the UDOT EBS can be accessed at the following website: http://www.udot.utah.gov/go/bidopeninfo

The Proposer shall securely attach Form PP to the outside of the package containing the forms listed in the preceding paragraph of this Section 2.1 (Price Proposal Submittal). The Proposer shall ensure that all persons signing the Proposal Letter Form sign Form PP (Price Proposal) provided in Appendix ITP-C.

2.2 LETTER OF SUBCONTRACTOR INTENT (FORM LSI)

The Proposer shall complete and submit Form LSI for each subcontractor that the Proposer intends to subcontract with. The Form LSI must be included as specified in the above Section 2.1 (Price Proposal Submittal).

2.3 PRICE ALLOCATION (FORM PA)

The Proposer shall complete and submit the information on Form PA (Price Allocation) provided in Appendix ITP-C, in compliance with the following instructions:

A. Submit the information on Form PA through the UDOT EBS.

B. Provide a lump-sum price for each item listed on Form PA; the items listed on Form PA included in the Contract Amount, are Payment Items, and are to be used in developing the cost-loaded Project Baseline Schedule, which will include discrete schedule activities for payment (see Part 2, Sections 11.1 (Project Baseline Schedules) and 12.1 (Schedule of Values)).

C. For the Mobilization Payment Items on Form PA provide lump—sum prices that are no greater than 5% of the Contract Amount.

D. The Contract Amount must be the total price to complete all Work.

E. The Build Alternative (line item 11 on Form PA) must be the total price from Form BA to complete all Work for the Build Alternative.

2.4 UTILITY COSTS (FORM UC)

The Proposer shall complete and submit the information on Form UC (Utility Costs) provided in Appendix ITP-C. Provide a lump-sum price for each item listed on Form UC; the items listed on Form UC, included on Form PA, are Payment Items, and are to be used in developing the cost-loaded Project Baseline Schedule, which will include discrete schedule activities for payment (see Part 2, Sections 11.1 (Project Baseline Schedules) and 12.1 (Schedule of Values)).

2.5 BUILD ALTERNATIVE (FORM BA)

The Proposer shall complete and submit the information on Form BA (Build Alternative) provided in Appendix IPT-C. Provide a lump-sum price for each item listed on Form BA. If the Build Alternative is exercised, then the items listed on Form BA, summarized on Form PA, are Payment Items and are to be used in developing the cost-loaded Project Baseline Schedule, which will include discrete schedule activities for payment (See Part 2, Sections 11.1 (Project Baseline Schedules) and 12.1 (Schedule of Values)).

3—PROPOSAL GUARANTY

The Proposer shall submit the Proposal Guaranty according to ITP-4.3 (Proposal Guaranty) via

cashier's check, certified check, or through the UDOT EBS by entering a Bond Authorization Code when submitting their bid.

4—ESCROWED PROPOSAL DOCUMENTS

The Proposer shall submit one signed original of Form EPD (Escrow Agreement) provided in Appendix ITP-C, which includes escrow instructions, to the address and by the time specified in ITP-4.4 (Escrowed Proposal Documentation), in accordance with Part 2, Section 23.1 (Escrowed Proposal Documents).

The Proposer should keep a second signed original and deliver a third signed original of Form EPD and the Escrowed Proposal Documentation into escrow with an escrow agent of the Proposer's choosing.

4.1 PROJECT-WIDE UTILITY RELOCATIONS

4.1.1 Utility Costs Included in the Utility Relocations Proposal Line Item

The project intent is to protect in place existing Utility facilities and minimize utility relocations wherever possible. If a Utility relocation is required, the associated cost of the relocation shall be provided out of the Price Proposal costs for the respective utility. Provide lump-sum prices in Form UC (Utility Costs) and Form BA (Build Alternative), for Utility relocations associated with the Build Alternative, for each Utility relocation indicated below in Table ITP-B-1 (Allocation percentages for Utility Relocation Costs). Compute the amount for utility relocation using the following guidelines:

A. Design-Builder Relocation Cost Obligation for the Approved concepts in the Design-Builders Proposal, is the proportion shown in Table ITP-B-1 (Allocation percentages for Utility Relocation Costs) and is the sum of the following costs that are related to a particular utility relocation:

   1. The total cost of design, whether it is done by the Design-Builder, the Utility Owner, or agents of the Utility Owner;

   2. The total cost of construction, including all labor, materials, tools, equipment, and supervision, whether it is done by the Design-Builder, the Utility Owner, or agents of the Utility Owner (but specifically excluding the costs in any way related to maintenance of traffic and traffic control when performed by or on behalf of the Design-Builder); and

   3. Utility Owner indirect costs, including but not limited to, management, overhead, attendance at coordination meetings, design, review of designs prepared by the Design-Builder, inspection, testing, and oversight (these may include labor, materials, and equipment).

B. The utility relocation costs identified in Form UC should be equal to the Design-Builder's cost obligation identified in Table ITP-B-1 (Allocation Percentages for Utility Relocation Costs). The utility relocation costs in Form UC subtotal to Items 6, 7, and 8 in Form PA.

   1. *Item 6: Utility work performed by the Design Builder* – Enter the total amount for Utility Work to be directly performed by the Design-Builder, including Design-Builder's miscellaneous costs.

   2. Item 7: *Department's cost share responsibility for Utility Work performed by*

Third-Parties – Enter the total amount of the Department's cost share responsibility based on the allocation percentages in Table ITP-B-1 for Utility Work performed by Third-Parties. No negative amounts are permitted for the Department's cost share responsibility Utility Work performed by Third-Parties line item. Proposers are advised not to include anticipated Department's cost share responsibility Utility Work performed by Third-Parties costs within other items of the Contract, as unbalancing occurs and the Proposal may be rejected.

3. Refer to Reference Documents for Third Party cost estimates based on the provided concept. These costs are estimates that will be made available to Proposers by addenda to use as they choose in their preparation of their Proposal.

4. *Item 8: Third-Parties' cost share responsibility for Utility Work performed by Design-Builder* – Enter the total amount of Third-Parties' cost share responsibility based on the allocation percentages in Table ITP-B-1 for Utility Work performed by the Design-Builder. This cost is a percentage of the cost listed in Item 7 on Form PA. Enter this value as a negative number/credit (it represents reimbursement from Third-Parties to the Department for Utility Work performed by the Design-Builder).

5. *Items 9a and 9b: Utility Work Cost Share Adjustment* – EBS does not accept negative values. If the total of lines 6, 7, and 8 are positive, input the value into line item 9a and enter 0.01 on line item 9b. If the total of lines 6, 7, and 8 are negative, input the value as a positive number into line item 9b and enter 0.01 on line item 9a. If a value other than 0.01 is entered on 9b, the Department will manually adjust the bid amount for award consideration to account for the correct value. There must be a value of 0.01 in at least one of line items 9a or 9b.

C. The Utility relocation costs for the Build Alternative identified in Form BA (line items 3, 4, and 5) should be equal to the Design-Builder's cost obligation identified in Table ITP-B-1 (Allocation Percentages for Utility Relocation Costs).

1. *Item 3 (3a through 3g): Utility work performed by the Design Builder* – Enter the total amount for Utility Work for each Utility to be directly performed by the Design-Builder, including Design-Builder's miscellaneous costs.

2. Item 4 (4a through 4g): *Department's cost share responsibility for Utility Work performed by Third-Parties* – Enter the total amount of the Department's cost share responsibility based on the allocation percentages in Table ITP-B-1 for Utility Work performed by Third-Parties for each Utility. No negative amounts are permitted for the Department's cost share responsibility Utility Work performed by Third- Parties line items. Proposers are advised not to include anticipated Department's cost share responsibility Utility Work performed by Third- Parties costs within other items of the Contract, as unbalancing occurs and the Proposal may be rejected.

3. Refer to Reference Documents for Third Party cost estimates based on the provided concept. These costs are estimates that will be made available to Proposers by addenda to use as they choose in their preparation of their Proposal.

4. *Item 5 (5a through 5g): Third-Parties' cost share responsibility for Utility Work performed by Design-Builder* – Enter the amount of the Third-Parties' cost share responsibility for each Utility based on the allocation percentages in Table ITP-B-1 for Utility Work performed by the Design-Builder. This cost is a percentage of the cost listed in Item 4 on Form BA. Enter this value as a negative number/credit (it represents reimbursement from Third-Parties to the Department for Utility Work performed by the Design-Builder), if no credit is due for a Utility enter $0.01.

D. Design-Builder Miscellaneous Costs are the total costs incurred by the Design-Builder related to a particular utility relocation for traffic control, maintenance of traffic, line and grade survey, maintenance during construction, coordination with the Utility Owner or agents thereof, and testing and inspection by the Department, including the cost of design oversight and reviews if the design is done by the Utility Owner, but excluding the cost of design or construction if the design or construction is performed by the Design-Builder which cost is included in the Design-Builder Relocation Cost above.

4.1.2 Utility Cost Allocations

No negative amounts are permitted for the Utility Relocations line item. Proposers are advised not to include anticipated Utility Relocation costs within other items of the Contract, as unbalancing occurs and the Proposal may be rejected.

Design Builder is not responsible to include costs for advance utility relocations coordinated by UDOT on Form PA. Design Builder is responsible to work around and coordinate with the advanced utility relocation work.

The following Table ITP-B-1 (Allocation Percentages for Utility Relocation Costs) indicates the responsibilities and cost participation rates to be accounted by the Design-Builder.

Utility relocation incentives and disincentives will be applied as described in Part 2, Section 20.4 (Utility Relocation Incentive/Disincentive). Betterments are not included in Table ITP-B-1; see Part 4-19 (Utilities) for a list of potential betterments.

Table ITP-B-1 – Allocation Percentages for Utility Relocation Costs

ID	*Utility Company*	*Notes*	*Interchange*
01	**AT&T Corp**	***Private Company***	**All Interchanges**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design Builder	
	Construct Relocation	Design Builder except for furnishing cables and hand holds and pulling and splicing	
		AT&T Corp to furnishing cables and hand holds and pulling and splicing	
	UDOT's Cost share	50%	
02	**CenturyLink QC**	***Private Company***	**All Interchanges**
	Type of Agreement	Statewide in lieu of Master Utility Agreement & Project Agreement	
	Design Relocation	CenturyLink QC	
	Construct Relocation	CenturyLink QC	
	UDOT's Cost share	50%	
03	**Comcast Cable**	***Private Company***	**All Interchanges**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Comcast Cable	
	Construct Relocation	Comcast Cable	
	UDOT's Cost share	50%	
04	**Daybreak Secondary Water**	***Private Company***	**11400 South**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder	
	UDOT's Cost share	100%	
05	**First Digital Telcom**	***Private Company***	**All Interchanges**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder except cable/pedestal procurement, pulling, and splicing	
		First Digital Telecom to furnish cable/pedestal procurement, pulling, and splicing	
	UDOT's Cost share	50%	
06	**Granger Hunter Imp. District**	***Local Service District***	**5400 South**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder	
	UDOT's Cost share	100%	
07	**Kearns Improvement District**	***Local Service District***	**5400 South**

Table ITP-B-1 – Allocation Percentages for Utility Relocation Costs

ID	*Utility Company*	*Notes*	*Interchange*
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder	
	UDOT's Cost share	100%	
08	**Manuel Bros., Inc.**	***Private Company***	**All Interchanges**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder	
	UDOT's Cost share	50%	
09	**MCI Communication Services (Verizon Business)**	***Private Company***	**5400 South**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder except cable and pedestal procurement, pulling, and splicing	
		MCI Communication Services to provide cable and pedestal procurement, pulling, and splicing	
	UDOT's Cost share	50%	
10	**Questar Gas Company**	***Private Company***	**All Interchanges**
	Type of Agreement	Statewide Utility Relocation Agreement	
	Design Relocation	Questar	
	Construct Relocation	Questar	
	UDOT's Cost share	50%	
11	**Rocky Mountain Power**	***Private Company***	**All Interchanges**
	Type of Agreement	Statewide Utility Relocation Agreement and Project Agreement Number 1	
	Design Relocation	Rocky Mountain Power	
	Construct Relocation	Design-Builder trenching, conduit, and bedding material for all underground Utility Work	
		Rocky Mountain Power except trenching, conduit, and bedding material for all underground Utility Work	
	UDOT's Cost share	100% at 11400 South	
		83% at 9000 South	
		50% at 7000 South	
		60% at 5400 South	
12	**South Jordan City**	***Municipal Corporation***	**11400 South**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder	

Table ITP-B-1 – Allocation Percentages for Utility Relocation Costs

ID	*Utility Company*	*Notes*	*Interchange*
	UDOT's Cost share	100%	
13	**South Valley Sewer District**	***Political Subdivision***	**11400 South**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder	
	UDOT's Cost share	100%	
14	**Syringa Networks, LLC**	***Private Company***	**All Interchanges**
	Type of Agreement	Telecommunications Facility Exchange Agreement	
	Design Relocation	Design Builder except fiber design	
		Syringa Networks, LLC to provide fiber design	
	Construct Relocation	Design-Builder except fiber procurement and fiber pulling and splicing	
		Syringa Networks, LLC – fiber procurement, pulling, and splicing	
	UDOT's Cost share	100% of UDOT's design and construction	
		Syringa Networks, LLC responsible for 100% of fiber design, fiber procurement, pulling and splicing	
15	**Taylorsville City**	***Municipal Corporation***	**5400 South**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder	
	UDOT's Cost share	100%	
16	**Taylorsville Bennion Improvement District**	***Special Improvement District***	**5400 South**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder	
	UDOT's Cost share	100%	
17	**United States Department of the Interior Bureau of Reclamation and**	***United States of America***	**5400 South, 7000 South, 9000 South**
	Jordan Valley Water Conservancy District	***Local Service District***	
	Type of Agreement	Project Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder	
	UDOT's Cost share	100%	
18	**City of West Jordan**	***Municipal Corporation***	**7000 South, 9000 South**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder	

Table ITP-B-1 – Allocation Percentages for Utility Relocation Costs

ID	*Utility Company*	*Notes*	*Interchange*
	UDOT's Cost share	100%	
20	**Zayo Group LLC.**	***Private Company***	**All Interchanges**
	Type of Agreement	Master Utility Agreement	
	Design Relocation	Design-Builder	
	Construct Relocation	Design-Builder except cable/pedestal procurement, pulling, and splicing	
		Zayo Group LLC cable/pedestal procurement, pulling, and splicing	
	UDOT's Cost share	50%	
	Design-Builder Miscellaneous Costs (DBMC) (all utilities herein)	100% of costs to be included in DB's Bid	

The Design-Builder shall be bound to Utah Law per Utah Code 72-6-116, unless otherwise specifically noted in the master agreement between UDOT and each third party utility company, in-case of discrepancy the executed Master Agreement shall govern.

4.1.3 Utility Relocation Incentive/Disincentive

The utility relocation incentive/disincentive applies to those utility companies listed as being responsible for the relocation design/construction of their facilities and is described in Part 2, Section 20.4 (Utility Relocation Incentive/Disincentive).

A. Payments/deductions to the Design-Builder will be based on the difference between the utility relocation bid amount and the actual utility relocation charges assessed. Payment for the incentive, or a credit for the disincentive, will be made administratively in the project accounting system by an administrative incentive/disincentive detail.

1. DISINCENTIVE - PAYMENTS DEDUCTED FROM THE DESIGN-BUILDER – if applicable, by lump sum. If the accrued utility relocation charges exceed the amount of utility relocation bid by the Design-Builder, the Department will deduct 40% of the difference from moneys due the Design-Builder. These deductions will begin on the first progress payment when the accrued Utility Relocation charges exceed the utility relocation bid by the Design-Builder.

2. INCENTIVE - PAYMENTS TO THE DESIGN-BUILDER - if applicable, by lump sum. If the actual utility relocation charges accrued after completion of the project are less than the utility relocation bid amount, UDOT will pay the Design-Builder 60% of the difference. The maximum payment shall not exceed $100,000.00.

5— BID AMOUNT FOR AWARD CONSIDERATION

The Bid Amount for Award Consideration includes the Base Build and the Build Alternative (as described in Part 4 (Project Configuration)), Time Components, and associated Utility Costs. The

Proposer shall submit the Price Proposal including betterments on the "Submittal of Proposals" date specified in Table ITP-2. The Proposer shall provide pricing for design and construction of the Base Build and the Build Alternative. If the Base Build, Utility Costs, and Build Alternative cannot be priced at or below the Project funding, the Department may not exercise the Build Alternative.

6—PROPOSAL GUARANTY

The Proposer shall submit the Proposal Guaranty according to ITP 4.3 via cashier's check, certified check, or through the UDOT EBS by entering a Bond Authorization Code when submitting their bid.

7—ESCROWED PROPOSAL DOCUMENTS

The Proposer shall submit one signed original of Form EPD (Escrow Agreement) provided in Appendix ITP-C, which includes escrow instructions, to the address and by the time specified in Section ITP-4.4 (Escrowed Proposal Documentation), in accordance with Part 2, Section 23 (Records).

The Proposer should keep a second signed original and deliver a third signed original of Form EPD and the Escrowed Proposal Documentation into escrow with an escrow agent of the Proposer's choosing.

8—FORMAT FOR SUBMITTAL OF PRICING DOCUMENTS

Organize and submit the Price Proposal in the format shown in Table ITP-B-1 (Price Proposal Format), except submit Form EPD per ITP-4.4 (Escrowed Proposal Documentation).

TABLE ITP-B-2 PRICE PROPOSAL FORMAT

Proposal Section	***Description***	***Appendix B Section Reference***
1	Form PP (Price Proposal Cover Sheet) (Submitted with Escrowed Proposal Documents)	2.1
2	Form LSI (Letter of Subcontract Intent) (Submitted in the sealed Escrowed Proposal Documents)	2.2
3	Copy of Form EPD (Escrow Agreement) (original goes to escrow agent)	4
4	Form PA (Price Allocation) (Submitted through EBS, with the Escrowed Proposal Documents, and submit a copy to the Department after Notice of Award)	2.3
5	Form UC (Utility UC) (Submitted with the Escrowed Proposal Documents, and submit a copy to the Department after Notice of Award)	2.4
6	Proposal Guaranty (Submitted through UDOT EBS)	3

9—TIME SUBMITTAL REQUIREMENTS

9.1 SUMMARY

A. This contract contains a procedure for bidding contract time which is part of the Price + Time proposal process, and which provides an incentive/disincentive to the Design Builder for completing the Project and Project Milestones within the time established by the Design Builder and submitted through EBS.

B. This section describes how the time components are to be priced, and how time is used to provide an incentive/disincentive to the Design Builder for timely completion of Project and Project Milestones.

There is no physical work to be accomplished under this item. Time is a bid item, but it is not a pay item. No payment will be made under the time related bid items

9.2 TIME COMPONENT

A. Determine the proposal price for the time component as follows.

1. Measure time in consecutive Calendar Days

2. Start and Finish Milestones

   a. Project – The Start Milestone is defined as March 6, 2017. The Finish Milestone is Substantial Completion as defined in Part 1, Appendix A.

   b. 5400 South Interchange – The Start Milestone is the 5400 S Interchange Start Date as defined in Part 1, Appendix A, this cannot start before the Project Start Milestone. The Finish Milestone is the 5400 S Interchange Completion Date as defined in Part 1, Appendix A.

   c. 7000 South Interchange – The Start Milestone is the 7000 S Interchange Start Date as defined in Part 1, Appendix A, this cannot start before the Project Start Milestone. The Finish Milestone is the 7000 S Interchange Completion Date as defined in Part 1 (Agreement) and Appendix A.

   d. 9000 South Interchange – The Start Milestone is the 9000 S Interchange Start Date as defined in Part 1, Appendix A, this cannot start before the Project Start Milestone. The Finish Milestone is the 9000 S Interchange Completion Date as defined in Part 1, Appendix A.

   e. 11400 South Interchange – The Start Milestone is the 11400 S Interchange Start Date as defined in Part 1, Appendix A, this cannot start before the Project Start Milestone. The Finish Milestone is the 11400 S Interchange Completion Date as defined in Part 1, Appendix A.

3. Determine the time components to complete the Project based upon Table ITP B-3 (Time Components) considering all requirements of the Contract. To determine the number of consecutive Calendar Days for column F, count the number of consecutive Calendar Days between the Start Milestone and Finish Milestone; include the day of the Start Milestone and Finish Milestone in the number of consecutive Calendar Days. In determining the Proposed Calendar Days for column F, a time suspension between the Start Milestone and the Finish Milestone is not allowed.

3. When determining the number of consecutive Calendar Days for column F in Table ITP-B-3 (Time Components), make certain that the Work can be accomplished within the minimum and maximum number of Calendar Days indicated in columns E and F. Bids with Calendar Days that are outside the corresponding limits in column E and F are considered non-responsive. A Proposal schedule that shows a completion date prior to the minimum limit in column D is considered responsive; however, the Proposer shall adjust to the minimum number of Calendar Days in column D for the purpose of calculating the Time component of the bid.
4. Multiply time related cost-rate in Column C by the Calendar Days in column F and enter amount into the respective items in EBS bid file.

B. If the Bidder does not submit a bid for the time components in EBS, the Department will consider the proposal non-responsive.

C. Negative amounts are not permitted for the time related bid items.

D. Bidders are advised not to spread anticipated time costs within other items of the contract, as unbalancing will occur and the bid proposal may be rejected.

TABLE ITP-B-3 TIME COMPONENT

	A	B	C	D	E	F
Project Component	**Start Milestone**	**Finish Milestone**	**Time Related Cost Rate (Dollars per Calendar Day)**	**Minimum Calendar Days**	**Maximum Calendar Days**	**Proposed Calendar Days**
Project (Note 2)	March 6, 2017	Substantial Completion Deadline (See Note 1)	5,000	365	606	
5400 S Interchange	5400 South Interchange Start Date	5400 South Interchange Completion Date (See Note 1)	5,000	0	606	
7000 S Interchange	7000 South Interchange Start Date	7000 South Interchange Completion Date (See Note 1)	10,000	0	256	
9000 S Interchange	9000 South Interchange Start Date	9000 South Interchange Completion Date (See Note 1)	5,000	0	606	
11400 S Interchange	11400 South Interchange Start Date	11400 South Interchange Completion Date (See Note 1)	7,500	0	606	

Note 1: Refer to Part 2, Section 20 (Incentives, Disincentives, and Damages)
Note 2: Project Component includes all Work as defined in Part 1, Appendix A (Acronyms and Definitions List)

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

INSTRUCTIONS TO PROPOSERS
ITP-C:
FORMS

Final Issued September 15, 2016

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Form SA	Stipend Agreement
Form SR	Statement of Representations in Proposal
Form UC	Utility Cost

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FORM ATC-R: ALTERNATIVE TECHNICAL CONCEPT RESPONSE (TO BE COMPLETED BY UDOT)

Project Name: **Project Number:** **Pin Number:**		**Date Received:**	
Design-Builder:		**Date Responded:**	

Subject:

RFP Reference:

Reviewer Comments

Analysis: This solution (is or is not) equal or better than the RFP.

Disposition: Match ITP 3.2.3 – Choose one of the responses A thru F):

A. The ATC is acceptable for inclusion in the Proposal.

B. The ATC is not acceptable for inclusion in the Proposal.

C. The ATC is not acceptable in its present form, but may be acceptable upon the satisfaction, in the Department's sole discretion, of certain identified conditions which must be met or clarifications or modifications that must be made through a submittal of a revised ATC.

D. The ATC is conditionally Approved in its present form and may be included in the Proposal upon satisfaction, in the Department's sole discretion, of the identified conditions, clarifications, or modifications.

E. The submittal does not qualify as an ATC and may be included in the Proposal because it appears to be within the requirements of the RFP.

F. The Department requires additional time to further review the ATC, and expects to provide a response to the Design-Builder on __(Date)__.

FORM ATC-R: ALTERNATIVE TECHNICAL CONCEPT RESPONSE (TO BE COMPLETED BY UDOT)

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FORM ATC-S: ALTERNATIVE TECHNICAL CONCEPT SUBMITTAL

Design-Build Project		**Proposer**	
		ATC No.	
DESCRIPTION - Attach conceptual drawings, include supporting information, as appropriate			
RFP REFERENCES – The section(s) of the RFP that the ATC is deviating from.			
LOCATION - The locations where the ATC will be used on the Project.			

FORM ATC-S: ALTERNATIVE TECHNICAL CONCEPT SUBMITTAL

ANALYSIS/JUSTIFICATION – The analysis justifying use of the ATC and why the deviation, if any, from the requirements of the RFP should be allowed. Explain in detail how the ATC will be used and why the ATC is a benefit to **the Project.**
POTENTIAL IMPACTS – A preliminary analysis of potential impacts (both during and after construction) including but not limited to user impacts, risks, quality, Right-of-Way, geotechnical, utilities, environmental permitting, local community, safety, design-life, and life-cycle Project and infrastructure costs, including impacts on the cost of repair, maintenance, and operation.

FORM ATC-S: ALTERNATIVE TECHNICAL CONCEPT SUBMITTAL

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FORM BA: BUILD ALTERNATIVE

Line No.	Utility ID	Activity		Lump Sum Prices
1		Design		$ -
2		Construction		$ -
3		Utility Work Performed by the Design-Builder (subtotal 3a through 3g)		$ -
3a	02	Century Link	$ -	
3b	08	Kearns Improvement District	$ -	
3c	10	MCI Verizon	$ -	
3d	11	Questar	$ -	
3e	12	Rocky Mountain Power	$ -	
3f	15	South Valley Sewer District	$ -	
3g	16	Syringa	$ -	
		Amount to Add to CONTRACT AMOUNT if Build Alternative is exercised (Total of Items 1 - 3)		**$ -**
INNOVATIVE CONTRACTING - (the following values are not included in the Contract Amount but are included in the evaluation of the Price Proposal and used for administration of the Utility cost share):				
4		Department's cost share responsibility for Utility Work performed by Third-Parties (subtotal 4a through 4g)		$ -
4a	02	Century Link	$ -	
4b	08	Kearns Improvement District	$ -	
4c	10	MCI Verizon	$ -	
4d	11	Questar	$ -	
4e	12	Rocky Mountain Power	$ -	
4f	15	South Valley Sewer District	$ -	
4g	16	Syringa	$ -	
5		Third-Parties' cost share responsibility for Utility Work performed by Design-Builder (credit/negative $) (5a through 5g)		$ -
5a	02	Century Link	$ -	
5b	08	Kearns Improvement District	$ -	
5c	10	MCI Verizon	$ -	
5d	11	Questar	$ -	
5e	12	Rocky Mountain Power	$ -	
5f	15	South Valley Sewer District	$ -	
5g	16	Syringa	$ -	
6		**Total Price for Build Alternative (enter on Form PA line item 11) (Total of Items 1-5)**		**$ -**

Form BC
Claim of Business Confidentiality

Name of Proposer: _____

Pursuant to Utah Code Ann. §§ 63G-2-305(1) and (2), and in accordance with Utah Code Ann. § 63G-2-309, the undersigned asserts a claim of business confidentiality to protect the following information submitted in response to this RFP.

This claim is asserted because this information requires protection as it includes:

☐ Reason A: Trade secrets as defined in Utah Code Ann. § 13-24-2(4) and referenced in Utah Code Ann. § 63G-2-305(1).

☐ Reason B: Commercial information or nonindividual financial information as defined in Utah Code Ann. § 63G-2-305(2)

This statement of reasons supporting the claim of business confidentiality applies to the following information in this response:

DOCUMENT	PAGE	¶	REASON ("A" or "B" above, plus a detailed explanation)

_____ _____
Signature Date

_____
Printed Name and Title

Please use additional sheets if needed. Provide a redacted version of each document identified above, clearly marked "REDACTED VERSION" on all pages.

FORM C: SINGLE POINT OF CONTACT

Proposer's Name: _____

Primary Point of Contact: _____

Company Affiliation: _____

Address: _____

_____

_____

Office Telephone Number: _____

Cell Telephone Number: _____

E-Mail Address: _____

Secondary Point of Contact: _____

Cell Telephone Number: _____

FORM CF: RFP COMMENT FORM

Proposer: _____ **Sheet No. ____ of ___ Sheets**

Part No.	*Section No.*	*Comment(s)*	*Reserved for Department Response*

Proposer: _____ **Sheet No. ____ of ___ Sheets**

Part No.	*Section No.*	*Comment(s)*	*Reserved for Department Response*

FORM CR

COMMITMENT TO ASSIGN IDENTIFIED RESOURCES TO PROJECT

Proposer's Name: _____

Understanding the Department's concern that the personnel resources specifically represented and listed in this Proposal actually be assigned to the Contract (if awarded to this Proposer) and not also be committed to other projects, _____ (Name of Proposer) commits that the personnel resources shown in the Proposal, including Key Personnel, will be available to the extent within this Proposer's control. If awarded the Contract, Proposer further commits that Project staff will be available full or part time, whichever is required to meet the Contract requirements, and that Key Personnel will be committed to the Project to fulfill the responsibilities as described in the Contract and will not change without written agreement from the Department.

In making this commitment, Proposer includes the following reservations: (If made without reservation, enter "NONE").

Signed: _____

Printed Name: _____

Title: _____

Date: _____

(To be executed by the Proposer Authorized Representative)

FORM EPD: ESCROW AGREEMENT

THIS ESCROW AGREEMENT (this Agreement) is made and entered into this _____

day of _____, 20____, by and among _____
(Proposer) and _____

(Escrow Agent) with reference to the following facts:

1. The Utah Department of Transportation (the Department) has issued a Request for Proposals to furnish the design of and to build the UDOT 4 Interchanges on Bangerter Hwy (SR-154**)** Project (the RFP);
2. The Proposer has submitted to the Department a proposal (the Proposal) in response to the RFP;
3. As part of the Proposal, the Proposer is submitting one copy of the Escrowed Proposal Documentation (EPD) in accordance with Part 2 (General Provisions), Section 23 (Records) of the Contract Documents.; and
4. The Proposer is employing the services of the Escrow Agent to act as the escrow holder with regard to the EPD, and the Escrow Agent has agreed to serve as escrow holder under the terms and conditions provided in this Agreement.

NOW THEREFORE, the parties hereby agree as follows:

1. **Deposit.** The Proposer hereby deposits the EPD with the Escrow Agent. The Escrow Agent hereby acknowledges receipt of such EPD, and such EPD shall be held in escrow under the terms and conditions of this Agreement;
2. **Holding of Escrowed Proposal Documentation.** The Escrow Agent shall hold the Escrowed Proposal Documentation in escrow in a designated area at_____. The EPD shall be stored in an area which is locked at all times. The Escrow Agent shall allow access to the EPD, from time to time, only to designated representatives of the Department and the Proposer for purposes of joint review of the EPD by the Department and the Proposer. No access shall be given to either representative from the Department or the Proposer unless representatives from both are present. The Escrow Agent shall provide such access to the Department and the Proposer during the Escrow Agent's business hours upon reasonable advance notice. Marwan Farah or his/her successor, is authorized to request access on behalf of the Department and _____<insert Proposer PM name>____, or his/her successor, is authorized to request access on behalf of Proposer. The Department or the Proposer may change its authorized representative by providing written notice to the other parties. The Escrow Agent shall allow access to only those individuals who are designated in written notices from the authorized representatives designated above;
3. **Release of Escrowed Proposal Documentation.** The Escrow Agent shall release the Escrowed Proposal Documentation as follows:
   a) If the Department does not enter into a contract with Proposer, the Escrow Agent shall release the EPD to the Proposer upon delivery by the Department of a certificate from Marwan Farah, the Department's Project Director certifying that the Department has determined not to enter into a contract with Proposer; or if the Proposer is not the Selected Design-Builder;
   b) If the Department enters into a contract with Proposer, Escrow Agent shall release the EPD to the Proposer upon delivery by the Department of a certificate of release from Marwan Farah the Department's Project Manager..

FORM EPD: ESCROW AGREEMENT

4. **Representation and Warranty.** The Proposer represents and warrants that, prior to delivery of the Escrowed Proposal Documentation to Escrow Agent, the EPD was personally examined by an authorized representative of Proposer and that it meets the requirements of the RFP, including the requirements of Contract Documents, Part 2 (General Provisions) and is sufficient to enable a complete understanding of the interpretation of how Proposer arrived at its Price Proposal;

5. **Rights of Escrow Agent.** If conflicting demands are made or notices serviced upon the Escrow Agent with respect to this escrow, the parties hereto expressly agree that it shall have the absolute right at its election to do either or both of the following:

   a) Withhold and stop all further proceedings in, and performance of, this escrow; or

   b) File a suit in interpleader and obtain an order from the court requiring the parties to interplead and litigate in such court their several claims and rights among themselves;

6. **Notices.** All notices that may or are required to be given or made by either party hereto to the other shall be in writing. Such notices shall be either personally delivered or sent by registered mail, postage prepaid, to:

   If to the Proposer: _____

   _____

   Attn: _____;

   If to the Department: Region 2
   2010 South 2760 West
   West Valley City, UT 84104
   Attention: Marwan Farah, P.E. Project Director

   If to the Escrow Agent: _____

   _____

   Attn: _____;

   or to such other addresses and such other places as any party hereto may from time to time designate by written notice to the others;

8. **Counterparts.** This Agreement may be executed in one or more counterparts, all of which together shall be deemed an original;

9. **Headings.** The title headings of the respective paragraphs of this Agreement are inserted for convenience only, and shall not be deemed to be part of this Agreement or considered in construing this Agreement;

10. **Governing Law.** The laws of the State of Utah shall govern this Agreement; and

11. **Attorney's Fees.** If either the Escrow Agent or Proposer commences or engages in any action by or against the Department directly or indirectly arising out of or in connection with this Agreement, the prevailing party shall be entitled to have and recover from the losing party

FORM EPD: ESCROW AGREEMENT

reasonable attorney's fees and other costs incurred in the action and in preparation for said action and any subsequent appeal.

IN WITNESS WHEREOF, the parties hereto, each intending to be legally bound by this writing, have caused this Agreement to be executed the date first above written.

PROPOSER _____

By: _____

Title: _____

The escrow provided for in this Agreement is hereby accepted, only to the extent of the escrow provisions, by the Escrow Agent.

_____

By: _____

Title:_____

FORM IC: CERTIFICATE REGARDING INELIGIBLE CONTRACTORS

Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion from Transactions Financed in Part by the U.S. Government

I, _____, _____,
Name of Certifying Officer *Title of Certifying Officer*

hereby certify that _____
Name of Contractor

(1) Is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation by any Federal department or agency or from participation in this Project;

(2) Has not within a three-year period preceding this Proposal been convicted of or had a civil judgment rendered against it for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statues, or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Is not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in Paragraph 2 of this certification; and

(4) Has not within a three-year period preceding this Proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

If any Principal Participant is unable to certify to any of the statements in this certification, such prospective Principal Participant shall attach an explanation to this certification.

I hereby certify and affirm the truthfulness and accuracy of the above statement, and I understand that the provisions of 31 United States Code (U.S.C.) §3801 *et seq*. (Administrative Remedies for False Claims and Statements) are applicable hereto.

_____ _____
Signature of Certifying Officer *Name of Contractor*

_____
Street Address

_____
City, State, ZIP Code

_____
Telephone Number

FORM IC: CERTIFICATE REGARDING INELIGIBLE CONTRACTORS

(This page is intentionally blank.)

FORM IS: CERTIFICATE REGARDING INELIGIBLE SUBCONTRACTORS

Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion for Lower-Tier Covered Transactions

(1) The prospective lower-tier participant (Subcontractor) certifies, by submission of its Proposal, that neither it nor any of its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this Project by any Federal department or agency.

(2) Where the prospective lower-tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to its Proposal.

Signed: _____

Name (Print): _____

Company: _____

Date: _____

FORM KP: KEY PERSONNEL INFORMATION

Proposer: _____ **Sheet No. ____ of ____ Sheets**

Position	*Name*	*Education and Professional Registration*	*Parent Firm Name*
Project Manager			
Design Manager			
Utilities/Third-Party Manager			
Structures Design Manager			
Construction Manager			
Traffic Operations Manager			
Traffic Maintainer			
Third Party Manager			
Construction Quality Manager			

FORM LC: LOBBYING CERTIFICATE

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) **No Federal appropriated funds have been paid or will be paid by or on behalf of the undersigned**, to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with the awarding of **ANY** Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement.

(2) **If any funds other than Federal appropriated funds have been paid or will be paid** to any person for making lobbying contacts to an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with **THIS** Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions [as amended by "Government-wide Guidance for New Restrictions on Lobbying," 61 Federal Regulations 1413 (1/19/96). *Note: Language in Paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (Public Law [P.L.] 104-65, to be codified at 2 U.S. Code (U.S.C. 1601, et seq.), as amended by the Lobbying Disclosure Technical Amendments Act of 1998 (P.L. 105-166)]*.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S.C. (as amended by the Lobbying Disclosure Act of 1995, as amended by the Lobbying Disclosure Technical Amendments Act of 1998). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Note: Pursuant to 31 U.S.C. §1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each expenditure or failure.

The Proposer/Design-Builder, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Proposer/Design-Builder understands and agrees that the provisions of 31 U.S.C. §3801, et seq., apply to this certification and disclosure, if any.

Date: _____

Company Name: _____

Signature: _____

Name (Print): _____

Title: _____

NOTE: THE DESIGN-BUILDER IS REQUIRED, PURSUANT TO FEDERAL LAW, TO INCLUDE THE ABOVE LANGUAGE IN SUBCONTRACTS OVER $100,000 AND TO OBTAIN THIS

FORM LC: LOBBYING CERTIFICATE

LOBBYING CERTIFICATE FROM EACH SUBCONTRACTOR BEING PAID $100,000 OR MORE UNDER THIS CONTRACT.

FORM LSI: LETTER OF SUBCONTRACTOR INTENT

_____ intends to subcontract Work to
(Proposer)

_____
(Subcontractor/Consultant)

For the <Project Name> Project, to perform the following type(s) of Work:

_____

_____

_____

_____

_____

_____

The minimum value of the Subcontract is $_____.

For the Proposer:

_____
(Signature)

_____
(Printed Name)

_____
(Title)

_____
(Date)

For the Subcontractor/Consultant:

Confirmed by:

_____
(Signature)

_____
(Printed Name)

_____
(Title)

_____
(Date)

FORM NC: NONCOLLUSION AFFIDAVIT

Proposer: _____

[Duplicate or modify this form as necessary so that it accurately describes the entity making the Proposal and is signed on behalf of the Proposer and, if the Proposer is a joint venture, on behalf of all joint venture members as well as the Proposer.]

STATE OF _____, COUNTY OF _____

Each of the undersigned, being first duly sworn, deposes and says that _____ is the _____ of _____ and _____ is the _____ of _____, which entity(ies) are the _____ of _____, the entity making the foregoing Proposal, that:

The Proposal is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation;

The Proposal is genuine and not collusive or sham;

The Proposer has not directly or indirectly induced or solicited any other Proposer to put in a false or sham Proposal, and has not directly or indirectly colluded, conspired, connived or agreed with any Proposer or anyone else to put in a sham Proposal or that anyone shall refrain from proposing;

The Proposer has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the Proposal Price or any component of the Proposal Price, of the Proposer or any other Proposer, or to fix any overhead, profit, or cost element included in the Price Proposal, or of that of any other Proposer, or to secure any advantage against the Department of anyone interested in the proposed Contract;

All statements contained in the Proposal are true; and, further,

The Proposer has not, directly or indirectly, submitted its Proposal Price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, proposal depository or any member or agent thereof to effectuate a collusive or sham Proposal.

_____	_____
(Signature)	*(Signature*
_____	_____
(Printed Name)	*(Printed Name)*
_____	_____
(Title)	*(Title)*

Subscribed and sworn to before me this _____day of _____, 201__.

Notary Public in and for) .....

) SS .....

said County and State) .....

[Seal] My commission expires: _____.

FORM NS: NAMED SUBCONTRACTORS

Proposer: _____ **Sheet ____ of _____ Sheets**

Specialty/ Assignment & Percentage of Work	*Subcontractor Name and Contact*	*Address of Head Office*	*Telephone and Fax Numbers*	*For Last Two Projects: Project Name, Owner, Owner Contact Name, and Telephone & Fax Numbers*	
				Project 1	*Project 2*

FORM NS: NAMED SUBCONTRACTORS

Proposer: _____ **Sheet ____ of _____ Sheets**

Specialty/ Assignment & Percentage of Work	*Subcontractor Name and Contact*	*Address of Head Office*	*Telephone and Fax Numbers*	*For Last Two Projects: Project Name, Owner, Owner Contact Name, and Telephone & Fax Numbers*	
				Project 1	*Project 2*

For more Subcontractors, use back of page as necessary.

FORM OC: OPINION OF COUNSEL

[Letterhead of Independent Law Firm or In-House Counsel]

Utah Department of Transportation (the Department)

_____

_____

Attn: _____

Re: _____, Proposer

Request for Proposals (RFP) for <Project Name>Project, Project No. <Z-000(00)> (Contract)

Gentlemen:

[Describe relationship to Proposer and its joint venture members, general partners, and any other entities whose approval is required in order to authorize delivery of the proposal.] This letter is provided to you pursuant to ITP-A3.1(B)(4) of the Instructions to Proposers Appendix A contained in the RFP.

In giving this opinion, we have examined _____. We have also considered such questions of law and have examined such documents and instruments and certificates of public officials and individuals who participated in the procurement process as we have deemed necessary or advisable.

In making this response, we have assumed that all items submitted to us or reviewed by us are genuine, accurate, and complete, and if not originals, are true and correct copies of originals, and that all signatures on such items are genuine.

Subject to the foregoing, we are of the opinion that:

1. *[Opinion regarding formation and existence of Proposer and each of its joint venture members and general partners]*.
2. *[Opinion that the Proposer has power and is duly authorized to execute and deliver the Proposal and Contract]*.
3. *[Opinion that the Proposal has been duly and validly executed and delivered, and constitutes a legal, valid, and binding obligation of the Proposer and its joint venture members and /or general partners to enter into the Contract, if awarded]*. *[Updated opinion stating that the Contract has been duly and validly executed and delivered]*.
4. *[Opinion that all required approvals have been obtained with respect to execution and delivery of the Proposal and Contract; and that the Proposal and Contract do not conflict with any agreements to which Proposer or its joint venture members and/or general partners are a party or with any orders, judgements, or decrees by which Proposer or its joint venture members and/or general partners are bound]*.

[Signature of Counsel]

_____ _____

Signature *Date*

FORM PA: PRICE ALLOCATION

Line No.	Activity	Days (input into EBS)	This column not input into EBS	Lump Sum Prices (input into EBS)
1	Compensable Project Overhead		$ -	
2a	Design - 5400 South		$ -	
2b	Design - 7000 South		$ -	
2c	Design - 9000 South		$ -	
2d	Design - 11400 South		$ -	
3	Mobilization (Not to exceed 5% of Contract Amount)		$ -	
4a	Construction - 5400 South		$ -	
4b	Construction - 7000 South		$ -	
4c	Construction - 9000 South		$ -	
4d	Construction - 11400 South		$ -	
5	Project Aesthetics & Landscaping Enhancements (this is for enhancements only and amount does not include baseline aesthetic treatments)		$ 400,000	
6	Utility Work performed by the Design-Builder - Subtotal from Form UC line A		$ -	
			CONTRACT AMOUNT (Total of Items 1 - 6)	**$ 400,000**
INNOVATIVE CONTRACTING - (the following values are not included in the Contract Amount but are included in the evaluation of the Price Proposal and used for administration of the Utility cost share):				
7	Department's cost share responsibility for Utility Work performed by Third-Parties - Subtotal from Form UC line B		$ -	
8	Third-Parties' cost share responsibility for Utility Work performed by Design-Builder (credit/negative $) - Subtotal from Form UC line C		$ -	
	Utility Work Cost Share Adjustment If total of lines 7-8 is positive enter value in line 9a If total of lines 7-8 is negative enter value in line 9b			
9a	9a Positive Value (Total of Items 7 - 8); enter 0.01 if 9b is used			$ -
9b	9b Negative Value (Total of Items 7 - 8); enter 0.01 if 9a is used; enter negatives as a positive value into EBS			$ -
10a	Time Component - Project (Based on column F multiplied by column C From ITP Table B-3) Maximum Days 606, Minimum Days 365		**$5,000**	$ -
10b	Time Component - 5400 S Interchange (Based on column F multiplied by column C From ITP Table B-3) Maximum Days 606		**$5,000**	$ -
10c	Time Component - 7000 S Interchange (Based on column F multiplied by column C From ITP Table B-3) Maximum Days 256		**$10,000**	$ -
10d	Time Component - 9000 S Interchange (Based on column F multiplied by column C From ITP Table B-3) Maximum Days 606		**$5,000**	$ -
10e	Time Component - 11400 S Interchange (Based on column F multiplied by column C From ITP Table B-3) Maximum Days 606		**$7,500**	$ -
11	Build Alternative (Total from line 6 on Form BA)			
			(Total of Items 9 - 11)	**$ -**
			BID AMOUNT FOR AWARD CONSIDERATION (Total of Items 1-6 & 9-11)	**$ 400,000**

FORM PP: PRICE PROPOSAL COVER SHEET

Proposer: _____

This Price Proposal is submitted in response to the Request for Proposals (as it may have been amended), dated _____, 20____, and includes the following:

Section 1: Form PP (Price Proposal Cover Sheet)

Section 2: Form PPS-P (Proposal Periodic Payment Schedule)

Section 3: Form LSI (Letter of Subcontractor Intent)

Section 2: Form EPD (Escrow Agreement)

Section 5: Form PA (Price Allocation), Form BA (Build Alternative Price Allocation)

Section 6: Proposal Guaranty – submitted in the form of a check or entered through UDOT EBS

Signatures of Parties Signing Proposal Letter Form:

Signatures:	*Representing:*	*Date:*
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

PROPOSAL LETTER FORM

Proposer: _____

Address: _____

_____

Telephone: **(_____)** _____

Contractor's License: **No.*** _____ **Classification*** _____

** Not Required When Proposing on Federal-Aid Projects*

To the Utah Department of Transportation:

The undersigned Proposer submits this proposal (the Proposal) in response to that certain Request for Proposals (RFP) for design and construction of the Region 1,2,3,4 UDOT <Project Name> (the Project), issued on _____, 20____, by the Utah Department of Transportation (the Department). This Proposal constitutes an offer to furnish and deliver all the materials and to do all Work and labor required for the design and construction of the Project for the total Proposal Price stated in the Price Allocation (Form PA).

The following individuals are authorized to enter discussions on behalf of the Proposer in connection with this RFP, the Project, and the Contract: _____

_____.

The Proposer agrees:

(A) To keep this Proposal firm for 90 days after the Proposal Due Date without unilaterally varying or amending its terms and without any member or partner withdrawing or any other change being made in the composition of the Proposer's team as submitted, without first obtaining the prior written consent of the Department, which consent may be withheld in the Department's sole discretion;

(B) To execute the form of Contract and to furnish the Payment and Performance Bonds and other documents as required by the RFP within 10 days of the date of the delivery of said form of Contract, conformed for execution, to the successful Proposer by the Department, and, failing to do so, to forfeit the accompanying check or Proposal Bond to the State as liquidated damages, in which case the Department Deputy Director may proceed to award the Contract to others;

(C) To commence Work within 30 days, or such additional time as may be allowed in writing by the Deputy Director, after issuance of a Notice To Proceed under the Contract, and to complete the Work by the completion deadlines specified in Part 1 (Agreement); and

(D) To design and construct the Project and to guarantee all Work performed in accordance with the Contract Documents.

PROPOSAL LETTER FORM

The Proposer declares that it is the only entity or party interested in the Proposal as Principal and that its officers, employees, subsidiaries, or parent corporations, its Principal Participants members, and the officers, employees, subsidiaries, or parent corporations of said Principal Participants:

(Check appropriate box.)

☐ Have not in any way participated in any activities in restraint of trade, or been debarred with relation to public contracts either in the State of Utah or any other state of the United States or on any federally assisted contract during the five-year period immediately preceding this Proposal, or either directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this Contract.

☐ Have participated in activities in restraint of trade with relation to public contracts either in the State of Utah or any other state of the United States or on any federally assisted contracts during the five-year period immediately preceding this Proposal or entered into collusion, or restraint of free competitive bidding on this Contract, but is of the opinion that it is a responsible Proposer entitled to the award of a contract involving public moneys and attach hereto an explanation of the restraint of free trade, restraint of free competitive bidding, or collusion.

The Proposer certifies that it has examined the Site of the proposed Work and has carefully examined and is fully familiar with all of the provisions and documents in the RFP (collectively, the RFP Documents), and is satisfied that such provisions provide sufficient detail regarding the Work to be performed and do not contain internal inconsistencies; that it has carefully checked all the words, figures, and statements in this Proposal; that it has conducted such other field investigations and additional design development which are prudent and reasonable in preparing this Proposal, including a thorough review of all of the RFP Documents; and that it has notified the Department of any deficiencies in or omissions from any RFP Documents or other documents provided by the Department and of any unusual site conditions observed prior to the date hereof.

The Proposer has (____) has not (____), participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 11246, 10925, and 11114 as amended, and that it has (____) has not (____) filed with the Office of Federal Contract Compliance Program all reports due under the applicable filing requirements.

The Proposer has received, understands, and has fully considered all materials posted on the Project Website (www.udot.utah.gov/go/bidopeninfo.com) and the following Addenda and set of questions and answers to the RFP:

Addendum 1 (dated _____)

Addendum 2 (dated _____)

Addendum 3 (dated _____)

Addendum X (dated _____)

Questions and Answers Distribution (issued on _____)

[List other Addenda and other sets of questions and answers, if applicable.]

PROPOSAL LETTER FORM

Each, every, and all of the representations made by the Proposer in the enclosed Proposal are true and correct, and all statements made in the Statement of Qualifications previously delivered to the Department are true and correct as of the date hereof, except as otherwise specified in the Proposal. The Proposer agrees that such Statement of Qualifications, except as expressly modified by the Proposal, is incorporated in the Proposal as if fully set forth herein.

All costs and expenses incurred in preparing this Proposal and participating in the RFP process will be borne solely by the Proposer, except to the extent that the Proposer receives any stipend in accordance with the RFP.

The undersigned affirms that the information provided herein is true and accurate and that any misrepresentations are made under penalty of perjury.

Organization: _____

By: _____ Title: _____

If Proposer is a joint venture, provide signatures by all joint venture members:

JV Member: _____

By: _____ Title: _____

JV Member: _____

By: _____ Title: _____

JV Member: _____

By: _____ Title: _____

JV Member: _____

By: _____ Title: _____

STATE OF _____)

) ss

COUNTY OF _____)

Subscribed and sworn to me on this _____ day of _____, 201__.

_____, **Notary** Public.

My commission expires _____.

PROPOSAL LETTER FORM

(This page is intentionally blank.)

FORM SA: STIPEND AGREEMENT

Proposer: _____

THIS STIPEND AGREEMENT (the Agreement) is made and entered into as of the _____ day of _____, 20____, by and between the State of Utah, acting by and through the Utah Department of Transportation (Department), and _____, a _____ (Proposer), with reference to the following facts:

A. On _____, 20____, the Department issued a Request for Proposals (RFP) for design and construction of the Project No. S-0154(12)11 (the Project), pursuant to procurement authority granted in Utah Code §63-56-36.1.

B. The RFP requires each Proposer to execute and deliver a Stipend Agreement to the Department by the date specified in the RFP.

NOW, THEREFORE, Proposer hereby agrees as follows:

1. Definitions.

All capitalized terms and acronyms used but not defined in this Agreement have the respective meanings set forth in the Instructions to Proposers (ITP) included in the RFP.

2. Work Product.

2.1 The Department hereby retains Proposer to prepare and submit, in response to the RFP and any Best and Final Offer (BAFO) request by the Department, a Proposal and BAFOs that conform in all material respects to the requirements of the RFP and the requests for BAFOs, as determined by the Department, are timely received by the Department, and satisfy the provisions of Section 3.1 below.

2.2 All work performed by Proposer and its team members pursuant to this Agreement shall be considered work for hire, and the Work Product (as defined below) shall become the property of the Department without restriction or limitation on its use. Neither Proposer nor any of its team members shall copyright any of the material developed under this Agreement.

2.3 Proposer agrees that all Work Product is, upon receipt by the Department, the property of the Department. The term "Work Product" shall mean all submittals made by Proposer during the RFP process, including the Proposal, exchanges of information during the pre-proposal and post-proposal period, and any BAFO, and shall specifically include [alternate technical concepts (ATCs)][options] submitted for Department review in accordance with the RFP. However, the term "Work Product" shall specifically exclude (a) Escrowed Proposal Documentation (EPD) and (b) patented rights in previously existing proprietary technology.

2.4 In consideration for the Department's agreement to make payment hereunder, Proposer agrees that the Department shall be entitled to use all Work Product, without any further compensation or consideration to the Proposer, in connection with the RFP and any requests for BAFOs, the Contract Documents, the Project, and future procurements by the Department. Notwithstanding the foregoing, the Department shall not be entitled to use information submitted by Proposer to the Department that has been specifically designated as confidential business information in accordance with ITP.2.6 and that the Department determines is

FORM SA: STIPEND AGREEMENT

exempt from disclosure under the Government Records Access and Management Act (GRAMA), unless the RFP otherwise provides.

2.5 The Department acknowledges that the use of any of the Work Product by the Department or the Design-Builder is at the sole risk and discretion of the Department and the Design-Builder, and shall in no way be deemed to confer liability on the unsuccessful Proposer.

2.6 In accordance with the ITP Section 2.9 and Utah Administrative Code, Rule R916-3-6, _____(Proposer) is awarded a stipulated fee ("stipend") in the amount of $300,000 as consideration for the use of the ideas and technical solutions in _____(Proposer's) proposal.

3. Compensation and Payment.

3.1 Compensation payable to Proposer for the Work Product described herein shall be a maximum of $300,000 if all of the following conditions are met:

a. Proposer's Technical Proposal (including any BAFOs) has achieved a rating of "Pass" on all Pass/Fail evaluation factors and an overall qualitative rating of at least "Acceptable" for all technical evaluation factors;

b. The Proposer has submitted a responsive Price Proposal; and

c. Proposer's Proposal (including any BAFOs) was not selected for award.

3.2 In its sole discretion, the Department may pay compensation to Proposer, in an amount to be determined by the Department, for the Work Product described herein if the procurement is cancelled prior to the Proposal Due Date. Proposers will be provided the opportunity, at their option, of attending an interview and delivering to the Department the Work Product of their Proposal preparations to date. There is no specific format required for such Work Product. Those Proposers that choose to attend the interview and deliver their Work Product may be paid a portion of the stipend amount that the Department deems to be appropriate consideration for the Work Product. No portion of the stipend amount will be paid if a Proposer chooses not to attend the interview or chooses not to deliver its Work Product.

3.3 If the Department awards the Contract to Proposer, Proposer will not be entitled to compensation hereunder.

3.4 Any payment of compensation owing hereunder will be made (i) within 30 days after receipt of a proper invoice submitted to the Department under this Section 3.4 or (ii) if an Award is made, when any complaint against Award is administratively and judicially resolved. Such invoice may not be submitted until one business day after the earlier to occur of (a) posting of the notice of Award, or (b) cancellation of the procurement.

4. Indemnities.

4.1 Subject to the limitations contained in Section 4.2 below, Proposer shall indemnify, protect and hold harmless the Department and its directors, officers, employees, and contractors from, and Proposer shall defend at its own expense, all claims, costs, expenses, liabilities, demands, or suits at law or equity arising in whole or in part from the negligence or willful misconduct of Proposer or any of its agents, officers, employees, representatives, or Subcontractors, or breach of any of Proposer's obligations under this Agreement.

FORM SA: STIPEND AGREEMENT

4.2 This indemnity shall not apply with respect to any claims, demands, or suits arising from use of the Work Product by the Department or its contractors.

5. Compliance With Laws.

5.1 Proposer shall comply with all Federal, State, and local laws, ordinances, rules, and regulations applicable to the work performed or paid for under this Agreement and covenants and agrees that it and its employees shall be bound by the standards of conduct provided in applicable laws, ordinances, rules, and regulations as they relate to work performed under this Agreement. Proposer agrees to incorporate the provisions of this paragraph in any subcontract into which it might enter with reference to the work performed pursuant to this Agreement.

5.2 The Proposer agrees (a) not to discriminate in any manner against an employee or applicant for employment because of race, color, religion, creed, age, sex, marital status, national origin, ancestry or disability of a qualified individual with a disability; (b) to include a provision similar to that contained in subsection (a) in any subcontract except a subcontract for standard commercial supplies or raw materials; and (c) to post and to cause Subcontractors to post in conspicuous places available to employees and applicants for employment, notices setting forth the substance of this clause.

6. Assignment.

Proposer shall not assign this Agreement without the Department's prior written consent. Any assignment of this Agreement without such consent shall be null and void.

7. Miscellaneous.

7.1 Proposer and the Department agree that Proposer, its team members, and their respective employees are not agents of the Department as a result of this Agreement.

7.2 All words used herein in the singular form shall extend to and include the plural. All words used in the plural form shall extend and include the singular. All words used in any gender shall extend to and include all genders.

7.3 This Agreement, together with the RFP, as amended from time to time, the provisions of which are incorporated herein by reference, embodies the entire agreement of the parties with respect to the subject matter hereof. There are no promises, terms, conditions, or obligations other than those contained herein or in the RFP, and this Agreement shall supersede all previous communications, representation, or agreements, either verbal or written, between the parties hereto.

7.4 It is understood and agreed by the parties hereto that if any part, term, or provision of this Agreement is by the courts held to be illegal or in conflict with any law of the State of Utah, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular part, term, or provisions to be invalid.

7.5 This instrument may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

7.6 This Agreement shall be governed by and construed in accordance with the laws of the State of Utah.

FORM SA: STIPEND AGREEMENT

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

STATE OF UTAH by UTAH DEPARTMENT OF TRANSPORTATION

WITNESS:

_____ _____

_____ _____

Approved for Execution: Date: _____

_____
UDOT Project Manager

Approved as to availability of funds:

_____

Approved as to form and legal sufficiency:

_____
Assistant Attorney General

_____
[Signature of Corporation or LLC]

_____
[Signature of Joint Venture or Partner]

FORM SA: STIPEND AGREEMENT

WITNESS:

_____ _____
Proposer Name

_____ _____
Federal ID # or Social Security #

By_____

Member Name_____

By_____ (Seal)

Title:_____

_____
Printed Name

By_____

Member Name_____

By_____ (Seal)

Title:_____

_____
Printed Name

By_____

Member Name_____

By_____ (Seal)

Title:_____

_____
Printed Name

FORM SA: STIPEND AGREEMENT

(This page is intentinally blank.)

Form SR

Statement of Representations in Proposal

Name of Proposer: _____

I, the undersigned, declare that:

1. I am an authorized agent of the Proposer and have authority to submit this statement on behalf of the Proposer.
2. The information and representations provided in this Proposal is true and accurate to the best of my knowledge.
3. Proposer has read the Request for Proposals (RFP) in its entirety and agrees unconditionally to meet all required elements.
4. The Proposer's Proposal is genuine; not made in the interest of, or on behalf of, any undisclosed person, firm, or corporation.
5. Proposer understands and accepts that the approval or rejection of Proposer's request is within the sole discretion of the Utah Department of Transportation and that there is no legal commitment until all due diligence has been performed and a properly authorized contract has been duly and properly executed.
6. Proposer agrees to report immediately in writing to the Utah Department of Transportation any changes to the information contained herein at any time while Proposer's Proposal is under consideration.
7. The information contained in this Proposal and any part thereof, including all documents and instruments delivered or to be delivered to the Utah Department of Transportation is true, accurate and complete. This Proposal includes all information necessary to ensure that the statements therein do not in whole or in part mislead the Utah Department of Transportation as to any material fact.
8. Proposer agrees that, if chosen as the selected Design-Builder, Proposer will abide by all statements in this Proposal.

Signature _____ Date _____

Name & Title _____

FORM UC: UTILITY COSTS

Line No.	Form PA No.	Utility ID	Activity	This column not input into EBS	Lump Sum Prices (to be entered into Form PA)
	6	**Utility Work performed by the Design-Builder**			
		01	AT&T Corp.	$ -	
		02	CenturyLink	$ -	
		03	Comcast Cable	$ -	
		04	Daybreak Secondary Water	$ -	
		05	First Digital Telcom	$ -	
		06	Granger Hunter Improvement District	$ -	
		07	Kearns Improvement District	$ -	
		08	Manuel Bros., Inc.	$ -	
		09	MCI (Verizon Business)	$ -	
		10	Questar Gas Company	$ -	
		11	Rocky Mountain Power 5400 S (exclude Build Alternative)	$ -	
		11	Rocky Mountain Power 7000 S	$ -	
		11	Rocky Mountain Power 9000 S	$ -	
		11	Rocky Mountain Power 11400 S	$ -	
		12a	South Jordan City	$ -	
		12b	South Jordan City Betterment	$ -	
		13	South Valley Sewer District	$ -	
		14	Syringa Networks, LLC	$ -	
		15	Taylorsville City	$ -	
		16a	Taylorsville Bennion Improvement District	$ -	
		16b	Taylorsville Bennion Improvement District Betterment	$ -	
		17	US Bureau of Reclamation	$ -	
		18a	West Jordan City	$ -	
		18b	West Jordan City Betterment - 7000 South	$ -	
		18c	West Jordan City Betterment - 9000 South	$ -	
		19	Zayo Group	$ -	
A	**6**		**Subtotal to be entered on Form PA Item 6a (Subtotal of Utility Work performed by the Design-Builder)**		**$ -**
	7	**Department's cost share responsibility for Utility Work performed by Third-Parties**			
		01	AT&T Corp.	$ -	
		02	CenturyLink	$ -	
		03	Comcast Cable	$ -	
		05	First Digital Telcom	$ -	
		08	Manuel Bros., Inc.	$ -	
		09	MCI (Verizon Business)	$ -	
		10	Questar Gas Company	$ -	
		11	Rocky Mountain Power 5400 S (exclude Build Alternative)	$ -	
		11	Rocky Mountain Power 7000 S	$ -	
		11	Rocky Mountain Power 9000 S	$ -	
		11	Rocky Mountain Power 11400 S	$ -	
		14	Syringa Networks, LLC	$ -	
		19	Zayo Group	$ -	
B	**7**		**Subtotal to be entered on Form PA Item 7 (Subtotal of Department's cost share responsibility for Utility Work performed by Third-Parties)**		**$ -**
	8	**Third-Parties' cost share responsibility for Utility Work performed by Design-Builder (credit/negative $)**			
		01	AT&T Corp.	$ -	
		02	Century Link	$ -	
		03	Comcast Cable	$ -	
		05	First Digital Telcom	$ -	
		08	Manuel Bros., Inc.	$ -	
		09	MCI (Verizon Business)	$ -	
		10	Questar Gas Company	$ -	
		11	Rocky Mountain Power 5400 S (exclude Build Alternative)	$ -	
		11	Rocky Mountain Power 7000 S	$ -	
		11	Rocky Mountain Power 9000 S	$ -	
		11	Rocky Mountain Power 11400 S	$ -	
		12b	South Jordan City Betterment	$ -	
		14	Syringa Networks, LLC	$ -	
		16b	Taylorsville Bennion Improvement District Betterment	$ -	
		18b	West Jordan City Betterment - 7000 South	$ -	
		18c	West Jordan City Betterment - 9000 South	$ -	
		19	Zayo Group	$ -	
C	**8**		**Subtotal to be entered on Form PA Item 8 (Subtotal of Third-Parties' cost share responsibility for Utility Work performed by Design-Builder (credit/negative $))**		**$ -**

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS

PART 1—AGREEMENT

Final Issued September 15, 2016

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APPENDICES

Appendix A Acronyms and Definitions List

DESIGN-BUILD AGREEMENT

THIS DESIGN-BUILD CONTRACT is made and executed in *four (4)* original counterparts this ____ day of _____, 201_ between the Utah Department of Transportation (the "Department") first party, and _____, (the "Design-Builder") second party, with reference to the definitions set forth in Part 1, Appendix A (Acronyms and Definitions List) and the following facts:

RECITALS

A. The Department desires to make improvements to four interchanges on Bangerter Highway (at 5400 South, 7000 South, 9000 South, and 11400 South) in Salt Lake County, Utah, as further described in Part 4, Section 1 (Project Configuration). These improvements shall be implemented in accordance with commitments in the State Environmental Studies (SES).

B. An SES for Bangerter Highway (SR-154); Environmental for Four Locations (Bangerter Highway and 5400 South) dated June 21, 2016 received final approval from Randy Park dated June 27, 2016. Also, an SES for Bangerter Highway (SR-154); Environmental for Four Locations (Bangerter Highway and 7000 South) dated April 28, 2016 received final approval from Randy Park dated May 4, 2016. Also, an SES for Bangerter Highway (SR-154); Environmental for Four Locations (Bangerter Highway and 9000 South) dated May 31, 2016 received final approval from Randy Park dated June 1, 2016. Also, an SES for Bangerter Highway (SR-154); Environmental for Four Locations – 11400 South Interchange dated June 6, 2016 received final approval from Randy Park dated June 7, 2016. The results of the assessments find that this project will NOT cause significant environmental impacts. The final RFP encompasses environmental commitments and mitigation measures set forth in the above referenced documents.

C. The parties intend for the Contract to be a lump-sum, design-build contract obligating the Design-Builder to perform all Work necessary to complete the Project by the deadlines specified herein for the Contract Amount, subject only to certain specified limited exceptions. This is not a Federal Aid Project.

D. If the Design-Builder fails to complete the Project within the time limitations set forth in the Contract Documents or in the event of a Closure not permitted under the Contract Documents, the Department will suffer substantial losses and damages. The Contract Documents therefore provide that the Design-Builder shall pay the Department substantial Liquidated Damages or disincentives if such completions are delayed and shall pay the Department disincentives in the event of a Closure not permitted under the Contract Documents.

E. The Department and the Design-Builder both intend for the Design-Builder to assume full responsibility and liability with respect to the Project, and the Department and the Design-Builder both intend for the Design-Builder to indemnify and hold harmless the Department and others with respect to any defects in the Project.

NOW, THEREFORE, in consideration of the sums to be paid to the Design-Builder by the Department, the foregoing premises and the covenants and agreements set forth within the Contract Documents, the parties hereto agree as follows:

1) CONTRACT COMPONENTS; INTERPRETATION OF CONTRACT DOCUMENTS

1.1 Certain Definitions

Refer to Part 1, Appendix A (Acronyms and Definitions List) for the meaning of various terms and capitalized words used in the Contract Documents.

1.2 Contract Documents

The term "Contract Documents" shall mean the documents listed in Section 1.3 (Order of Precedence), including all appendices and attachments thereto. The Contract Documents contain the entire understanding of the parties with respect to the subject matter hereof and supersede all prior agreements, understandings, statements, representations and negotiations between the parties with respect to its subject matter.

1.3 Order of Precedence

Each of the Contract Documents is an essential part of the Contract, and a requirement occurring in one is as binding as though occurring in all. The components of the Contract Documents are intended to be complementary and to describe and provide for a complete Contract. In the event of any conflict among the Contract Documents, the order of precedence, from highest to lowest, shall be as set forth below:

1. Part 1 (Agreement)
2. Part 2 (General Provisions)
3. Part 6 (Third-Party Agreements)
4. Proposal provisions that exceed the requirements of Part 4 (Project Design and Construction Requirements) as determined by the Department
5. Appendix to Part 4-15 (Roadway)
6. Part 4 (Project Design and Construction Requirements)
7. Proposal provisions that exceed the requirements of Part 7 (Contract Drawings) as determined by the Department
8. Part 7 (Contract Drawings)
9. Proposal provisions that exceed the requirements of Part 5 (Special Provisions and Exceptions) as determined by the Department
10. Part 5 (Special Provisions and Exceptions)
11. Proposal provisions that exceed the requirements of Part 3 (Quality Program) as determined by the Department
12. Part 3 (Quality Program)
13. Proposal provisions that exceed the requirements of Part 9 (Warranty Provisions) as determined by the Department
14. Part 9 (Warranty Provisions)
15. Part 8 (Engineering Data)
16. Appendix to Part 4-06 (Geotechnical)
17. The Proposal to the extent it meets the requirements of the Contract Documents

Proposal provisions that exceed the requirements of the Contract Documents are those that are in addition to or more advantageous to the Department than those contained in the Contract Documents as determined at the sole discretion of the Department.

The body of a Part takes precedence over any conflicting provisions contained in exhibits, attachments or documents incorporated by reference in that Part.

If an Approved ATC or conditionally Approved ATC is incorporated in the Proposal, the ATC shall have the priority of an amendment to the Contract Documents to which the ATC applies.

If there are any conflicts in standards adhere to the standard with the highest priority.

If there is a conflict among or between any provision(s) of the Contract Documents that cannot be resolved by an order of precedence, the Design-Builder shall notify the Department and the Department will determine, in its sole discretion, which requirement(s) applies.

Part 8 (Engineering Data), Geotechnical Investigations, constitutes a Contract Document only to the extent that it includes information that the Design-Builder is entitled to rely on pursuant to Part 2, Section 4 (Differing Site Conditions).

The "Executive Summary and Summary Statement" and Appendix A (Legal and Financial Information) will not become part of the Contract Documents.

1.3.1 Amendments

The Contract shall be amended only by a written instrument duly executed by the parties or their respective successors or assigns.

1.4 Reference Documents (RD)

RDs are for information only and are not Contract Documents to be relied upon by the Design-Builder. The Department has provided RDs, including a conceptual design, to the Design-Builder as part of the RFP for the convenience of the Proposers and the Design-Builder. The Department acknowledges that the Design-Builder may elect to use the RDs in its discretion; however, both parties agree that the Department has not analyzed, gathered, or developed the RDs for accuracy or sufficiency for use, and they may include errors, omissions, inconsistencies, inaccuracies, deficiencies, or other defects. The Design-Builder has no right to rely on the RDs or to assume that the conceptual design is feasible and is a reasonable engineering approach to the Project. The Design-Builder acknowledges that it has other means available to it in gathering, verifying or developing the information provided in the RDs, or in otherwise developing information that may be contained in the RDs and that its failure to employ such efforts necessarily assumes accepting the risk that the RDs are not accurate, complete, or otherwise sufficient for the Design-Builder's purposes. The Design-Builder acknowledges that it prefers such assumption of risk rather than incurring the costs necessary to gather, verify, or otherwise develop the information necessary to confirm or rectify, or otherwise rely on the information provided in the RDs. The Design-Builder agrees that the RDs are not Contract Documents, and that it has assumed any and all risks associated with its use of the RDs for any purpose whatsoever, and that such risks have been accounted for in the Contract Amount.

1.5 Interpretations

In the Contract Documents, where appropriate

1. The terms "General Provisions," "Contract terms," and "Contract requirements" shall be interchangeable, subject to Section 1.3 (Order of Precedence).
2. The singular includes the plural and vice versa.
3. Words not otherwise defined that have well-known technical or construction industry meanings are used in accordance with such recognized meanings.
4. References to Persons include their respective permitted successors and assigns and, in the case of Governmental Persons, Persons succeeding to their respective functions and capacities.
5. Words of either gender include the other gender where appropriate.
6. Use of the word "includes," "including," "included," and "include" shall be deemed to be followed by the words "but not limited to."
7. Headings and organization within the Parts are for convenience only.
8. Portions of the Contract Documents may be written in the imperative. In sentences using the imperative, unless otherwise specifically stated, the subject "the Design-Builder" is

implied, and it is understood the Design-Builder shall perform such Work, comply with the requirements of, furnish such material, or take such action. The word "shall" is also implied, and when implied or stated is to be considered mandatory and pertain to requirements or actions of the Design-Builder.

9. Unless otherwise specified, lists contained in the Contract Documents defining the Project or the Work shall not be deemed all-inclusive.
10. Unless otherwise specified, references to Sections, Appendices, Attachments, and Exhibits are to the document which contains such references.

The Design-Builder acknowledges and agrees that it had the opportunity and obligation, prior to submission of its Proposal, to review the Contract Documents and to bring to the Department's attention any conflicts or ambiguities contained in them. The Design-Builder further acknowledges and agrees that it has independently reviewed the Contract Documents with legal counsel, and that it has the requisite experience and sophistication to understand, interpret and agree to the particular language of the Contract Documents. Accordingly, in the event of an ambiguity in or dispute regarding the interpretation of the Contract Documents, the Contract Documents shall not be construed against the Person that prepared them, and shall be considered as drafted by both parties. The Department's final answers to the questions posed during the proposal process for the Contract shall in no event be deemed part of the Contract Documents except to the extent that the Department has made changes to the Contract Documents in response to such questions.

1.6 Referenced Standards, Codes or Criteria

Except as otherwise specified in the Contract Documents or otherwise directed by the Department, references to standards, codes, or criteria, or to the latest version of standards, codes, or criteria, shall mean the latest version in effect on the RFP Issued Date.

1.7 Omission of Details; Clarification by the Department

The Design-Builder shall not take advantage of any apparent error, omission, ambiguity, inconsistency, inaccuracy, deficiency, inadequacy, or other defect in the Contract. Should it appear that the Work to be done or any matter relative thereto is not sufficiently detailed or explained in the Contract Documents, the Design-Builder shall apply to the Department in writing for such further written explanations as may be necessary and shall conform to the explanation provided. The Design-Builder shall promptly notify the Department of all errors, omissions, ambiguities, inconsistencies, inaccuracies, deficiencies, inadequacies, or other defects that it may discover in the Contract Documents, and shall obtain specific instructions in writing from the Department before proceeding with the Work affected thereby. Any such errors, omissions, ambiguities, inconsistencies, inaccuracies, deficiencies, inadequacies or other defects that are known or should have been known by the Design-Builder are not subject to the change provisions in Part 2, Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work).

1.8 Computation of Days

References to "days" or "Days" contained in the Contract Documents shall mean Calendar Days unless specified otherwise. If the date to perform any act or give any notice specified in the Contract Documents (including the last date for performance or provision of notice "within" a specified time period) falls on a Saturday, Sunday, or Legal Holiday, such act or notice may be timely performed on the next succeeding day that is not one of the above weekend days or Holiday. Notwithstanding the foregoing, requirements contained in the Contract Documents relating to actions to be taken in the event of an emergency and any other requirements for which it is clear that performance is intended to occur on a Calendar Day, including Saturday, Sunday, and Legal Holidays, shall be required to be performed as specified, even though the date in question may fall on one of the above Days.

Documentation submitted after 4 p.m. Mountain Time on a Friday or a day prior to a Department Holiday will not be processed until the following Working Day. If the Department is required to respond within a specified number of Days, Days will not begin to be assessed until after 8 a.m. the next Working Day.

1.9 Standard for Approvals

In all cases where Approvals, acceptances or consents are required to be provided by the Department or Design-Builder, and unless the exercise of sole discretion is expressly allowed, such Approvals, acceptances, or consents shall not be withheld unreasonably.

2) DESIGNATION OF, AND COOPERATION WITH REPRESENTATIVES

2.1 Designation of Representatives

Concurrently with execution hereof, the Department and the Design-Builder shall each designate an individual or individuals who shall be authorized to make decisions and bind the parties on matters relating to the Contract Documents. Such designations may be changed by a subsequent writing delivered to the other party in accordance with Section 3 (Notices and Communications). The parties may also designate technical representatives who shall be authorized to investigate and report on matters relating to the construction of the Project and negotiate on behalf of each of the parties but who do not have authority to bind the Department or the Design-Builder.

2.2 Cooperation

The Design-Builder shall cooperate with the Department and all representatives of the Department designated as described above.

3) NOTICES AND COMMUNICATIONS

3.1 Delivery of Notices

Notices under the Contract Documents shall be in writing and sent via the project email followed by a hard copy to the following addresses (or to such other address as may from time to time be specified in writing by such Person):

3.1.1 Design-Builder's Point of Contact

All correspondence with the Design-Builder shall be sent to the Project Manager or as otherwise directed by such Project Manager. The address for such communications shall be

[Information to be inserted from Design-Builder's Proposal]

Name: _____

Address: _____

City: _____ State: _____ Zip code: _____

Telephone number: _____

E-mail address: _____

Fax number: _____

3.1.2 Department's Primary Contact

All communications to the Department shall be marked with the Department's Project identification number and shall be delivered to the Department's Project Manager, with copies to such additional Persons as may be designated by the Department's Project Manager, at the address set forth below:

ATTN: **Marwan Farah, PE, Project Director**
UDOT Region 2
2010 South 2760 West
Salt Lake City, UT 84104
Project Email: Bangerter4InterchangesRFP@interchange.udot.utah.gov

3.2 Receipt of Notices

Notices shall be deemed received when actually received via email, in the office of the addressee (or by the addressee if personally delivered) or when delivery is refused, as shown on the receipt of the U.S. Postal Service, private carrier or other Person making the delivery. Notwithstanding the foregoing, all other notices received after 9:00 a.m. Mountain Time (as applicable) shall be deemed received on the first Working Day following delivery.

3.3 Copies of Correspondence to the Department

The Design-Builder shall copy the Department on all written correspondence pertaining to the Contract between the Design-Builder and any Person other than the Design-Builder's Subcontractors, consultants and attorneys.

4) TIMES WITHIN WHICH PROJECT SHALL BE COMPLETED

4.1 Time of Essence

Time is of the essence in the performance of the Contract.

4.2 Notice to Proceed (NTP)

The Design-Builder shall begin performance of the Work after receipt of NTP issued by the Department.

4.3 Prerequisites for Start of Construction

The Design-Builder shall not start construction (or recommence construction following any suspension) of any portion of the Project until all the following events have been fully satisfied with respect to the Work proposed to be constructed:

1. The Department has issued NTP.
2. All insurance certificates, OCIP enrollments, and Payment and Performance Bonds required to be delivered to the Department hereunder have been submitted to the Department as applicable and remain in full force and effect.
3. All Governmental Approvals necessary for construction of such portion of the Project have been obtained and all conditions of such Governmental Approvals that are a prerequisite to commencement of such construction have been performed.
4. All necessary rights of access for such portion of the Project have been obtained.
5. Baseline Schedule Approved by the Department as required by Part 2 (General Provisions)

6. Schedule of Values Approved by the Department as required by Part 2 (General Provisions)
7. Site-specific Safety Plan
8. Quality Management Plan Approved by the Department as required by Part 3 (Quality Program)
9. Environmental Protection Program Approved by the Department as required in Part 4-05 (Environmental Compliance)
10. Traffic Management Plan, Approved by the Department as required in Part 4-10 (Maintenance of Traffic)
11. Evidence that the Design-Builder has obtained the accreditation required to be obtained in accordance with Part 3 (Quality Program).
12. Released for Construction Documents have been issued for that portion of the Work.
13. Any additional conditions for construction set forth in the Contract Documents have been fully satisfied.

4.4 Completion Deadlines

The following are the completion deadlines for the Project.

4.4.1 Substantial Completion Deadline

The Design-Builder shall achieve Substantial Completion within ____ Calendar Days from March 6, 2017. Substantial Completion must be achieved no later than November 2, 2018. Said deadlines for Substantial Completion, as it may be extended hereunder, are referred to as the "Substantial Completion Deadline".

4.4.2 Physical Completion Deadline

The Design-Builder shall achieve Physical Completion no later than 60 Days from receipt of Notice of Substantial Completion. Said deadline for Physical Completion, as it may be extended hereunder, is referred to as the "Physical Completion Deadline."

4.4.3 Contract Completion Deadline

The Design-Builder shall achieve Contract Completion no later than 60 Days from receipt of Notice of Physical Completion. Said deadline for Contract Completion, as it may be extended hereunder, is referred to as the "Contract Completion Deadline."

4.4.4 No Time Extensions

Except as otherwise specifically provided in Part 2, Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work), the Department shall have no obligation to extend any Completion Deadline, and the Design-Builder shall not be relieved of its obligation to comply with the Project Schedule and to achieve the applicable Completion Deadlines for any reason.

4.5 Project Milestones

The following are the milestones for the Project.

4.5.1 Start Milestones

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A. 5400 South Interchange Start Date

This is defined in Part 1 Appendix A (Acronyms and Definitions List).

B. 7000 South Interchange Start Date

This is defined in Part 1 Appendix A (Acronyms and Definitions List).

C. 9000 South Interchange Start Date

This is defined in Part 1 Appendix A (Acronyms and Definitions List).

D. 11400 South Interchange Start Date

This is defined in Part 1 Appendix A (Acronyms and Definitions List).

4.5.2 Completion Milestones

A. 5400 South Interchange Completion Date

The Design-Builder shall achieve 5400 South Interchange Completion Date within ____ consecutive Calendar Days from the 5400 South Interchange Start Date. This is defined in Part 1 Appendix A (Acronyms and Definitions List). 5400 South Interchange Completion Date must be achieved no later than the Substantial Completion Deadline.

B. 7000outh S Interchange Completion Date

The Design-Builder shall achieve 7000 South Interchange Completion Date within ____ consecutive Calendar Days from the 7000 South Interchange Start Date. 7000 South Interchange Completion must be achieved no later than November 17, 2017. This is defined in Part 1 Appendix A (Acronyms and Definitions List).

C. 9000 South Interchange Completion Date

The Design-Builder shall achieve 9000 South Interchange Completion Date within ____ consecutive Calendar Days from the 9000 South Interchange Start Date. This is defined in Part 1 Appendix A (Acronyms and Definitions List). 9000 South Interchange Completion Date must be achieved no later than the Substantial Completion Deadline.

D. 11400 South Interchange Completion Date

The Design-Builder shall achieve 11400 South Interchange Date within ____ consecutive Calendar Days from the 11400 South Interchange Start Date. This is defined in Part 1 Appendix A (Acronyms and Definitions List). 11400 South Interchange Completion Date must be achieved no later than the Substantial Completion Deadline.

5) COMPENSATION AND PAYMENT LIMITATION

5.1 Contract Amount

As full compensation for the Work and all other obligations to be performed by the Design-Builder under the Contract Documents, the Department will pay to the Design-Builder the lump sum amount of $_____ *[to be inserted from Design-Builder's Proposal]*. Such amount, as it may be adjusted from time to time to account for Change Orders, is referred to in the Contract Documents as the "Contract Amount." The Contract Amount may be increased or decreased only by a Change Order issued in accordance with Part 2, Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work) or by a Contract amendment. The Contract Amount includes the *[Base Build or the Base Build and the Build Alternative based on Project funding.]*

5.1.1 Items Included in Contract Amount

The Design-Builder acknowledges and agrees that, subject only to the Design-Builder's rights under Part 2, Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work), the Contract Amount includes payment for performance of each and every portion of the Work.

The Design-Builder shall provide a fully functional Project that meets the Contract requirements within the Project Limits defined in Part 7 (Contract Drawings) and shall provide all new elements, including all those for which requirements are included in Part 4 (Project Design and Construction Requirements), except as otherwise specifically excluded in the Contract Documents.

5.2 Schedule of Payment

5.2.1 Limitations on Payment

In no event shall the Department have any obligation to pay the Design-Builder any amount that would result in payment for any Activity in excess of the value for the Activity identified in the Approved Schedule of Values. The Department does not have the obligation to pay the Design-Builder for any Nonconforming Work.

6) KEY PERSONNEL

Project Key Personnel were identified in the RFQ, submitted by the Design-Builder in their SOQ for the Project, for which Sections will be included as a Contract Document as further described in Part 2, Section 8.8 (Key Personnel).

The Design-Builder shall not change any Key Personnel without prior Department Approval and as described in Part 2 (General Provisions).

7) FACILITIES AND SPACE REQUIREMENTS

Items Provided by the Department: The Department will provide office space for the Design-Builder's Project Management, design and field staff for the Project as detailed below. Office facilities, location and size will be at the Department's sole discretion.

1. 10 Number of lockable offices
2. 45 Number of cubicle/workstations
3. 2 Number of conference rooms for Design-Builder's exclusive use
4. 1 Number of conference rooms for shared Design-Builder and Department use
5. Break room
6. Computer network infrastructure (wiring infrastructure)

Facilities and Items Provided by the Design-Builder: The Design-Builder will provide its own router, switches, computer equipment, printers, copiers/plotters, phones, office supplies, appliances (refrigerator, microwave, etc.) and vehicles, except as otherwise specifically noted in the Contract Documents. At the Design-Builder's discretion, the Design-Builder may elect to provide separate field office space.

SIGNATURES

This instrument may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the parties have executed the Contract as of the date and year first set forth above.

Attest: UTAH DEPARTMENT OF TRANSPORTATION

_____ _____

UDOT Administrative Secretary Director of Transportation

Approved:_____

UDOT Contract Administrator

<DESIGN BUILD COMPANY NAME>

_____ _____

Witness to Design-Builder Company Representative Design-Builder Company Representative

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

PART 1, APPENDIX A – ACRONYMS AND DEFINITIONS LIST

Final Issued September 15, 2016

1. Acronyms and Abbreviations

Interpret acronyms and abbreviations used in the Contract as follows:

ACRONYMS	
Abbreviation	***Title or Description***
AAN	American Association of Nurserymen
AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
AGC	(Utah) Associated General Contractors
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMRL	AASHTO Materials Reference Laboratory
ANLA	American Nursery and Landscape Association
ANSI	American National Standards Institute
API	American Petroleum Institute
APL	Accepted Products Listing
ARA	American Railway Association
AREA	American Railway Engineering Association
AREMA	American Railway Engineering and Maintenance-of-Way Association
ASCE	American Society of Civil Engineers
ASLA	American Society of Landscape Architects
ASSE	American Society of Safety Engineers
ASTM	American Society for Testing and Materials (ASTM) International
ATC	Alternative Technical Concept
ATMS	Advanced Traffic Management System
AWG	American wire gauge
AWPA	American Wood Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
BMP	Best management practice
CAR	Corrective Action Report
CCTV	Closed circuit television
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CMS	Changeable Message Signs
CPM	Critical Path Method
CQM	Construction Quality Manager
CSI	Construction Specification Institute
CT	Department’s Communication Team
DB	Design-Build
DBE	Disadvantaged Business Enterprise
DEQ	Department of Environmental Quality

ACRONYMS	
Abbreviation	***Title or Description***
DQM	Design Quality Manager
ECMP	Environmental Compliance and Monitoring Plan
ECS	Environmental Control Supervisor
EEO	Equal Employment Opportunity
EIS	Environmental Impact Statement
EMR	Environmental Monitoring Report
EPP	Environmental Protection Program
EPTP	Environmental Protection Training Plan
SES	State Environmental Study
ESS	Environmental sensor sign
EUSERC	Electric Utility Service Equipment Requirements Committee
FDC	Field Design Change
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration, U.S. Department of Transportation
fps	Feet per second
FRA	Federal Railroad Administration
FSS	Federal Specifications and Standards
GRAMA	Government Records Access and Management Act, Title 63, Title 2
GRC	galvanized rigid conduit
GSA	General Services Administration
HDPE	High-density polyethylene
HMA	Hot-Mix Asphalt
HMWM	High Molecular Weight Methacrylate
I or I-	Interstate (Highway)
IACR	Interstate Access Change Request
ID	identification
IMP	Incident Management Plan
IMSA	International Municipal Signal Association
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
ITP	Instructions to Proposers
ITS	Intelligent transportation system
JV	Joint Venture
LLC	Limited Liability Company
MMF	multi-mode fiber
MOI	Manual of Instruction
MOT	Maintenance of Traffic
MSE	Mechanically-Stabilized Earth
MUTCD	*Manual on Uniform Traffic Control Devices*
N/A	Not applicable
NCHRP	National Cooperative Highway Research Program
NCR	Non-conformance report
NDC	Notice of Design Change
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association

ACRONYMS	
Abbreviation	***Title or Description***
NESC	National Electric Safety Code
NFPA	National Fire Prevention Association
NRC	National Research Council
NTP	Notice To Proceed
NVLAP	National Verification Laboratory Acceptance Program (Bureau of Standards)
OCIP	Owner Controlled Insurance Program
OSHA	(U.S.) Occupational Safety and Health Administration
OTDR	optical time domain reflectometer
OVT	Owner Verification Testing
PCA	Portland Cement Association
PCC	Portland Cement Concrete
PCCP	Portland Cement Concrete Pavement
PCI	Precast/Prestressed Concrete Institute
PCO	Potential Change Order
PDA	Pile Driving Analysis
PDPL	Performance Data Products Listing
PI	Public Involvement
PIP	Public Involvement Plan
PM	Project Manager
POC	Point of Contact
psf	Pounds per square foot
PTI	Post-Tensioning Institute
PUE	Public Utility Easement
QA	Quality Assurance
QC	Quality Control
RCM	UDOT Region Communication's Manager
RCO	Request for Change Order
RCP	Request for Change Proposal
RFC	Released for Construction
RFI	Request(s) for Information
RFP	Request for Proposal
RFQ	Request for Qualifications
RMP	Rocky Mountain Power
RMS	Ramp Metering Station
ROD	Record of Decision
ROW	Right-of-Way
RWIS	Roadway Weather Information System
SAE	Society of Automotive Engineers
SDDM	Structures Design and Detail Manual
SMA	Stone Matrix Asphalt
SMF	single-mode fiber
SOQ	Statement of Qualifications
SOV	Schedule of Values
SPMT	Self-Propelled Modular Transporters
SPUI	Single-Point Urban Interchange
SR	(Utah) State Route

ACRONYMS	
Abbreviation	***Title or Description***
SSPC	The Society for Protective Coatings
SUE	Subsurface Utility Engineering
SWPPP	Storm Water Pollution Prevention Plan
TBD	To Be Determined
TCE	Temporary Construction Easement
TIA	Time Impact Analysis
TMP	Traffic Management Plan
TMS	Traffic Monitoring Station
TOC	(UDOT) Traffic Operations Center
TRB	(NRC) Transportation Research Board
UCRY	Utah Central Railway
UDAQ	Utah Division of Air Quality, UDEQ
UDEQ	Utah Department of Environmental Quality
UDOT	Utah Department of Transportation
UDWQ	Utah Division of Water Quality, UDEQ
UHP	Utah Highway Patrol
UL	Underwriters Laboratory, Inc.
UPDES	Utah Pollution Discharge Elimination System
UPRR	Union Pacific Railroad
USACE (or COE)	U.S. Army Corps of Engineers
USAS	United States of American Standards Institute
USBOR	U.S. Bureau of Reclamation
USC	United States Code
USDOT	U.S. Department of Transportation
UTA	Utah Transit Authority
VIDS	video image detection system
VMS	variable message sign
WBS	Work Breakdown Structure
WIM	weigh-in-motion
WWPA	Western Wood Products Association

2. Definition of Terms and Phrases

Interpret the following phrases and capitalized terms used in the Contract as follows:

Term	***Meaning***
5400 South Interchange Start Date	The date Work begins on the 5400 South and Bangerter Interchange, excluding the Build Alternative (if exercised), demolition of homes identified in Part 4-14 (Right-of-Way), potholing, and geotechnical investigation. Also excluded is clearing, grubbing, and traffic control associated with the Rocky Mountain Power Utility Work. Work may not begin any earlier than March 6, 2017.
5400 South Interchange Completion Date	The date the 5400 South and Bangerter Highway Interchange is complete in accordance with the requirements defined in Part 2, Section 13.1.1.1 (Interchange Completion), excluding the Build Alternative (if exercised).
7000 South Interchange Start Date	The date Work begins on the 7000 South and Bangerter Interchange, excluding demolition of homes identified in Part 4-14 (Right-of-Way), potholing, and geotechnical investigation. Work may not begin any earlier than March 6, 2017.
7000 South Interchange Completion Date	The date the 7000 South and Bangerter Highway Interchange is complete in accordance with the requirements defined in Part 2, Section 13.1.1.1 (Interchange Completion)
9000 South Interchange Start Date	The date Work begins on the 9000 South and Bangerter Interchange, excluding demolition of homes identified in Part 4-14 (Right-of-Way), potholing, and geotechnical investigation. Also excluded is clearing, grubbing, and traffic control associated with the Rocky Mountain Power Utility Work. Work may not begin any earlier than March 6, 2017.
9000 South Interchange Completion Date	The date the 9000 South and Bangerter Highway Interchange is complete in accordance with the requirements defined in Part 2, Section 13.1.1.1 (Interchange Completion).
11400 South Interchange Start Date	The date Work begins on the 11400 South and Bangerter Interchange, excluding demolition of homes identified in Part 4-14 (Right-of-Way), potholing, and geotechnical investigation. Also excluded is clearing, grubbing, and traffic control associated with the Rocky Mountain Power Utility Work. Work may not begin any earlier than March 6, 2017.
11400 South Interchange Completion Date	The date the 11400 South and Bangerter Highway Interchange is complete in accordance with the requirements defined in Part 2, Section 13.1.1.1 (Interchange Completion).
Abandonment	After a Utility Company has decommissioned a Utility, the Work necessary for each Utility (including appurtenances) for a Utility that is not removed, using proper Utility Company and/or industry procedures (e.g., flushing, capping, filling with grout or sand) or other procedures Approved by the Department. Design-Builder is responsible to coordinate with the Utility Company when it is necessary for the Utility Company to be involved in the decommissioning of a Utility (including appurtenances).
Acceleration Cost	The meaning set forth in Part 2, Section 16.6.2 (Limitation on Acceleration Costs and Delay Damages).
Actual Cost	Design-Builder's direct Cost to provide labor, material, equipment (owned or invoiced rental), and administrative overhead necessary for the Work; excludes profit.

Term	*Meaning*
Addenda / Addendum	Supplemental addition, deletions, and modifications to the provision of the RFP after the advertisement date of the RFP.
Affidavit requesting Contract Completion	As described in Part 2, Section 13.6 (Request for Contract Completion).
Affiliate	(i) Any Person that directly or indirectly through one or more intermediaries controls, or is controlled by, or is under common control with the: (A) Design-Builder or (B) any Principal Participant; and (ii) Any Person for which 10 percent or more of the equity interest in such Person is held directly or indirectly, beneficially, or of record by the: (A) Design-Builder, (B) any Principal Participant, or (C) any Affiliate of the Design-Builder under clause (i) of this definition. For purposes of this definition, the term "control" means the possession, directly or indirectly, of the power to cause the direction of the management of a Person, whether through voting securities, by contract, family relationship, or otherwise.
Alternative Technical Concept	The Design-Builder's written request to conduct Work that differs from the design, construction, and/or technical requirements of the Contract, which was included with the Proposal and Approved by the Department.
Approval	Formal conditional determination in writing by the Department's Project Manager that a particular matter or item is good or satisfactory for the Project. Such determination may be based on requirements beyond those set forth in the Contract Documents and may reflect preferences of the Department.
As-Built Documents	Documents that reflect all changes made in the drawings and specifications during the construction process, and show the exact dimensions, geometry, and location (including alignment points) of all elements of the Work completed under the contract.
Award	The Department's acceptance of a Proposal after selection and review of the Design-Builder's EPD.
Betterment	As related to Utilities, a Betterment is generally defined as the upgrading; (e.g., increase in capacity) of a Utility being relocated that is not attributable to the construction of the Project or is made solely for the benefit of and at the election of the Utility Company (not including a technological improvement which is able to achieve such upgrade at a cost equal to or less than the cost of a "like for like" replacement or relocation). The use of new materials or compliance with current standards in the performance of the Utility Work is not considered a Betterment. As related to Third Parties, a Betterment is generally defined as an upgrading (e.g., increase in capacity or update of design of work) or additional work that is conducted for the Third-Party and is not required by construction of the Project and is solely requested for the benefit of the Third Party.
Calendar Day	Any day shown on the calendar, beginning and ending at midnight.
Certification	A written document or affidavit officially declaring confirmation of a statement or information as being true, accurate, or genuine.
Change Order	As defined in Part 2, Section 16.1.1 (Change Orders).
Claim	A separate demand by the Design-Builder for: (i) a time extension that is disputed by the Department, or (ii) payment of money or damages arising from work done by or on behalf of the Design-Builder in connection with the

Term	*Meaning*
	Contract that is disputed by the Department. A claim will cease to be a Claim upon resolution thereof, including resolution by delivery of a Change Order or Contract amendment signed by all parties.
Claims Review Board	A board established by the Department to hear and review unresolved Design-Builder claims as described in Part 2, Section 22.5 (Claims Review Board)
Closure	Any Full Closure or Partial Closure as defined in Part 4-10 (Maintenance of Traffic).
Commission	The Utah Transportation Commission.
Compensable Project Overhead	The lump sum overhead that shall consist of those overhead costs that are in proportion to the time required to complete the work. Compensable Project Overhead shall not include costs that are not related to time, including but not limited to, mobilization, licenses, permits, and other charges that may only be incurred once during the Contract. Compensable Project Overhead shall not apply to subcontractors of any tier, suppliers, fabricators, manufacturers, or other parties associated with the Design-Builder.
Compensable Project Overhead Rate	The Compensable Project Overhead divided by the number of Calendar Days required between NTP and the Contract Completion Date in the Proposal.
Completion Deadline	The date when certain Contract Work is specified to be complete, as defined in Part 1 (Agreement).
Construction Limit	Area within the existing highway right-of-way or construction easements as shown on the ROW Drawings in Part 7 that defines the area available for access by the Design-Builder in accordance with the Contract Documents.
Construction Subcontractor	A subcontractor on the Design-Builder's team that will be responsible for part of the construction of the Project.
Contaminated Groundwater	Extracted groundwater including contaminants above legally-permitted discharge levels so as to require treatment prior to re-use or disposal. Contaminated groundwater, which may legally be re-used without treatment, including use for dust control, or which merely requires dilution prior to re-use or disposal, shall specifically be excluded from the definition.
Contract Amount	The lump sum contract price, which shall initially be the sum of the individual lump-sum amounts as shown on Form PA (Price Allocation) in the Proposal.
Contract Completion	As defined in Part 2, Section 13 (Project Acceptance).
Contract Drawings	The drawings included in Part 7 (Contract Drawings).
Contract or Contract Documents	Written agreement between the Department and the Design-Builder establishing the obligations of the parties for the performance of the Work prescribed. The Contract/Contract Documents include the documents identified in Part 1, Section 1.2 (Contract Documents), all of which constitute one instrument.
Contract Price	See Contract Amount.
Control Point	The meaning set forth in Part 3, Section D (Construction Control Point Inspection).
County	The County or Counties where Work is located.
Critical Path	The series of activities that determine the Project's Substantial Completion Deadline; a delay to any of these activities could delay the finish date of the entire Project. The Department defines the Critical Path as the Longest Path.

Term	*Meaning*
Day	The meaning set forth in Part 1, Section 1.8 (Computation of Days).
Debarment	Action taken by the Department or federal government pursuant to regulations that prohibits a person or company from performing work on a public project.
Defect or Defective Condition	Nonconforming Work.
Delay Damages	As defined in Part 2, Section 16.6.2 (Limitation on Acceleration Costs and Delay Damages).
Department	The Utah Department of Transportation.
Department-Directed Change	A change requested by the Department through a Form C-107.
Design-Build	A project delivery methodology by which the Department contracts with a single firm that has responsibility for the design and construction of a project under a single contract with the Department.
Design Documents	Released for Construction Documents, Design Milestones, and Final Design as defined in Part 3 (Quality Program).
Design-Build Contract	The Design-Build Contract for the 4 Interchanges on Bangerter Highway (SR-154**)** executed by the Department and the Design-Builder including all amendments thereto.
Design-Builder	The individual or legal entity contracting with the Department for the performance of the Work.
Design-Builder-Related Entities	The Design-Builder, Subcontractors, their employees, agents and officers and all other entities and individuals for whom the Design-Builder may be legally or contractually responsible.
Designer	The Principal Participant, Subcontractor, or in-house designer that has primary responsibility for design services for the Project.
Differing Site Conditions	As defined in Part 2, Section 4 (Differing Site Conditions)
Directive Letter	The letter as described in Part 2, Section 16.1.2 (Issuance of a Directive Letter) issued by the Department requesting or regarding a change in Work.
Disadvantaged Business Enterprise (DBE)	A for-profit small business concern as defined in 49 Code of Federal Regulations (CFR) Part 26.
Disincentive or Disincentive Assessment	As defined in Part 2, Section 20 (Incentives, Disincentives, and Damages).
Dispute	Any disagreement between the Department and the Design-Builder arising out of or relating to the Contract Documents, the Work, or the Project, including Claims, disagreements resulting from a change, a delay, a Change Order, any other written orders, or oral orders from the Department, including any direction, instruction, interpretation, or determination by the Department. Dispute does not include claims that are not actionable against the Department by the Design-Builder.
Disruption Damages	The meaning set forth in Part 2, Section 16.6.2 (Limitation on Acceleration Costs and Delay Damages).
Engineer	The UDOT Deputy Director, acting directly or through a duly authorized representative, usually the Resident Engineer or Contract Engineer, responsible

Term	*Meaning*
	for engineering and administration of the contract. A Consultant Engineer hired by the Department for construction project management is considered an extension of the Department and has the same responsibility and authority as a Resident Engineer.
Environmental Compliance	Conformity in fulfilling all of the requirements, provisions, commitments, and restrictions of all applicable Environmental Laws, all Governmental Approvals obtained in connection with the Project, all environmental commitments contained in the Environmental Documents pertaining to the Project, all provisions of Part 4-05 (Environmental Compliance) of the RFP (which includes the Standards for Environmental Compliance contained in Table 5B-1, the Environmental Protection Program (EPP), the Environmental Protection Training Plan (EPTP), and the Environmental Compliance Monitoring and Reporting Plan (ECMP)), and all applicable Federal, State, and local rules and regulations.
Environmental Documents	The 4 Interchanges on Bangerter Highway (SR-154**)** Environmental Documents.
Environmental Laws	All Laws now or hereafter in effect relating to the environment or to emissions, discharges, releases, or threatened releases of Hazardous Substances into the environment, including into the air, surface water or groundwater, or onto land, or relating to the manufacture, processing, distribution, use, treatment, storage, disposal, transport, or handling of Hazardous Substances or otherwise relating to the protection of public health, public welfare, or the natural environmental (including protection of nonhuman forms of life, land, surface water, groundwater, and air), including the statutes listed in the definition of Hazardous Substances; the National Environmental Policy Act, as amended, 42 U.S.C. §§ 4321 et seq.; the Occupational Safety and Health Act, as amended, 29 U.S.C. §§ 651 et seq.; and the Hazardous Materials Transportation Act, as amended, 49 App. U.S.C. §§ 1801; the Endangered Species Act, as amended, 16 U.S.C. §§ 1531 et seq.; the Clean Water Act, 33 U.S.C. §§ 1251, et seq.; the Safe Drinking Water Act, 42 U.S.C. §§ 300f, et seq.; the Migratory Bird Treaty Act, 16 U.S.C. §§ 703 et seq.; and the Eagle Protection Act, 16 U.S.C. § 668, each as amended.
Equal or Better Change Order	The meaning set forth in Part 2, Section 16.2 (Equal or Better Change Orders).
Equipment	All machinery, tools, apparatus, and the fuels, lubricants, batteries, and other supplies and parts needed to use, operate, and maintain these items for use in constructing and completing the work.
Escrow Proposal Documentation	The documentation described in Part 2, Section 23.1 (Escrowed Proposal Documents).
Final Acceptance	As described in Part 2, Section 13 (Project Acceptance).
Force Account Change Order	The meaning set forth in Part 2, Section 16.4 (Force Account Change Orders).
Force Majeure	As defined in Part 2, Section 15.5 (Force Majeure Events).
Governmental Approval	Any approval, authorization, certification, consent, decision, exemption, filing, lease, license, permit, agreement, concession, grant, franchise, registration or ruling, required by or with any Governmental Person in order to design and construct the Project.
Governmental Body	Any federal, state, local, or foreign government; any political subdivision; or

Term	*Meaning*
	any governmental, quasi-governmental, judicial, public, or statutory instrumentality, administrative agency, authority, body, or entity.
Governmental Person	Any federal, state or local government and any political subdivision or any governmental, quasi-governmental, judicial, public or statutory instrumentality, administrative agency, authority, body or entity. The term includes the State and agencies and subdivisions thereof, other than the Department.
Hazardous Substance	Any of the following: (i) Substance, product, waste or other material of any nature whatsoever which is or becomes listed, regulated, or addressed pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, 42 USC Section 9601, et seq. ("CERCLA"); the Hazardous Materials Transportation Act, 49 USC Section 1801, et seq.; the Resource Conservation and Recovery Act, 42 USC Section 6901 et seq. ("RCRA"); the Toxic Substances Control Act, 15 USC Sections 2601 et seq.; the Clean Water Act, 33 USC Sections 1251 et seq.; the Clean Air Act, 42 USC Sections 7401 et seq.; all as amended, or any other federal, state or local statute, law, ordinance, resolution, code, rule, regulation, order or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic or dangerous waste, substance or material, as now or at any time hereafter in effect; (ii) Any substance, product, waste or other material of any nature whatsoever which may give rise to liability under any of the above statutes or under any statutory or common law theory based on negligence, trespass, intentional tort, nuisance or strict liability or under any reported decisions of a state or federal court; (iii) Petroleum or crude oil excluding de minimis amounts and excluding petroleum and petroleum products contained within regularly operated motor vehicles; (iv) Asbestos or asbestos-containing materials in structures and/or other improvements on or in the Site (other than mineral asbestos naturally occurring in the ground); and (v) Lead or lead-containing materials in structures and/or other improvements on or in the Site.
Holidays	As defined in Part 4-10 (Maintenance of Traffic)
Incidental Utility Work	All of the following types of work necessary for the construction of the Project (or undertaken for the convenience of the Design-Builder's construction operations): temporary relocations, relocations of service lines, protection in place of Utilities, removal of abandoned Utilities, abandonment of Utilities, the adjustment of Utility appurtenances (e.g., manholes, valve boxes, and vaults) for line and grade upon completion of roadway work, and removal of Asbestos Cement (AC) pipe including handling, disposal, abatement, and cost to meet DEQ requirements.
Indemnified Parties	Collectively, the Department and its agents, consultants, and their respective successors and assigns and their respective shareholders, officers, directors, agents and employees.
Inspector	An authorized representative of the Department assigned to inspect Work and materials.
Instructions to Proposers	The RFP Document identified as Instructions to Proposers.

Term	*Meaning*
(ITP)	
Items of Archeological or Biological Significance	Historical, archaeological or paleontological objects, features, sites, human remains, or migratory avian species.
Key Personnel	The persons listed in Part 2, Section 8.8 (Key Personnel), subject to revision in accordance with Part 2 (General Provisions).
Law or Laws	Any statute, law, regulation, ordinance, rule, judgment, order, decree, permit, concession, grant, franchise, license, agreement, directive, guideline, policy requirement or other governmental restriction or any similar form of decision of or determination by, or any interpretation or administration of any of the foregoing by, any Governmental Body, which is applicable to or has jurisdiction over the Project or the Work, whether now or hereafter in effect. Herein, "Laws" does not include Governmental Approvals.
Lead Principal Participant	The person who is designated by the Design-Builder as having the lead responsibility for managing the Design-Builder's organization.
Lien	Any pledge, lien, security interest, mortgage, deed of trust or other charge or encumbrance of any kind, or any other type of preferential arrangement (including any agreement to give any of the foregoing, any conditional sale or other title retention agreement, any lease in the nature of a security instrument, and the filing of or agreement to file any financing statement or other instrument intended to perfect a security interest).
Liquidated Damages	As defined in Part 2, Section 20.3 (Liquidated Damages and Closure Disincentives).
Major Contractor	A principal participant, designer, subconsultant, or subcontractor responsible for performing more than 15 percent of the design, or subcontractor responsible for performing more than 20 percent of the Project or contract Work.
Master Utility Agreement	An initial agreement between the Department and any Utility Company that is affected by the Project, under which the parties set forth (1) scope and framework for accomplishing Utility relocations necessary for the Project; (2) allocation and responsibility for the design and construction work between the Design-Builder and the Utility Company; and (3) Utility Company's requirements, including, but not limited to, time frames and commitments for design, material acquisition, engineering review, and construction activities with respect to relocation work. Each Master Utility Agreement has specific terms that provide how the relocation work is paid for and by whom.
Necessary Project Configuration Change	A change to the Project Configuration that is necessary to meet the requirements of the Contract Documents as a result of an error, omission, inconsistency, inaccuracy, deficiency or other defect in the Project Configuration (with the understanding that a change shall be deemed "necessary" only if the error, omission, inconsistency, inaccuracy, deficiency or other defect creates a problem in which the Design-Builder is unable to meet the Contract requirements without a material change in the Project Configuration).
New Environmental Document	Any of the following: (i) A new Governmental Approval of the same type as an Environmental Document; or (ii) A renewal, revision, modification or amendment to one or more of the Environmental Documents.
Nonconforming Work	Work performed that does not meet the requirements of the Contract Documents. Nonconforming Work shall include the failure to perform administrative or management tasks in accordance with the requirements of the

Term	*Meaning*
	Contract Documents.
Notice of Award	Written notice issued to the Design-Builder by the Department that occurs after the Department has reviewed the selected Design-Builder's Escrow Proposal Documents.
Notice of Physical Completion	As defined in Part 2, Section 13.5 (Notice of Physical Completion).
Notice To Proceed	A written notice issued by the Department to the Design-Builder to begin Contract Work, as defined in Part 1, Section 4.2 (Notice To Proceed).
Oversight	As described in Part 2, Section 3.5.2 (Oversight, Audit, Inspection, and Testing by the Department and Others)
Owner Verification Testing (OVT)	Sampling, testing, and inspection performed by the Department or its representative, at a defined frequency, or the purpose of verifying the integrity of the process.
Payment Activities	As defined in Part 2, Section 12.1.2 (Payment Activities)
Payment Bond	The approved form of security executed by the Design-Builder and its Surety or Sureties and furnished to the Department to guarantee payment of all persons named in Utah Code Section 63-56-504(1)(b), with respect to the complete design and construction of the Contract; See Part 2, Section 27 (Surety Bonds)
Payment Item	Lump Sum items in Form PA of the Design-Builder's Proposal
PCO Notice	The potential change order notice as described in Part 2, Section 16.3.4 (Procedures for Design-Builder-Initiated Lump Sum Change Orders)
Performance Bond	The approved form of security executed by the Design-Builder and its Surety or Sureties and furnished to the Department to guarantee completion and full execution of the Work under the Contract; See Part 2, Section 27 (Surety Bonds)
Person	Any individual, corporation, company, voluntary association, partnership, trust, unincorporated organization, or Governmental Person, including the Department.
Physical Completion	As defined in Part 2, Section 13.4 (Physical Completion)
Physical Completion Deadline	The date set forth in Part 1, Section 4.4 (Completion Deadlines)
Plan	An Approved Contract drawing showing the location, type, dimensions, and details of the specified Work. a. **Standard Drawing**: A detailed drawing approved for repetitive use; b. **Working Drawing:** A supplemental design sheet or similar data that the Design-Builder is required to submit to the Department, such as shop drawings, erection Plans, falsework Plans, framework Plans, cofferdam Plans, and bending diagrams for reinforcing steel.
Preliminary Engineering Concept	Conceptual plans developed for bidding purposes; included in the Reference Documents.
Principal Participant	Any of the following: a. A general partner or joint venture member of the Design-Builder; and/or b. An individual or entity holding (directly or indirectly) a 15% or greater

Term	*Meaning*
	interest in the Design-Builder.
Profile Grade	The trace of a vertical plane intersecting the top surface of the proposed wearing surface, usually along the longitudinal centerline of the roadbed. Profile grade means either elevation or gradient of such trace according to the context.
Project	The 4 Interchanges on Bangerter Highway (SR-154**)** as described by the Contract Documents. The 4 interchanges are defined as follows: All Work associated with a specific interchange on the Project as described in Part 4-01 (Project Configuration). The specific interchanges are 5400 South and Bangerter Highway (includes the Build Alternative if exercised), 7000 South and Bangerter Highway, 9000 South and Bangerter Highway, and 11400 South and Bangerter Highway.
Project Baseline Schedule	As defined in Part 2, Section 11.1 (Project Baseline Schedule)
Project Configuration	The mandatory elements of the Project set forth in Part 4-01 (Configuration), subject to Approved modifications thereto contained in the Proposal, where such Approval was obtained in accordance with the Contract.
Project Director	The person, identified in Part 1, Section 3.1.2 (Department's Primary Contact), designated by the Department to direct the Project and to receive delivery of notices to the Department.
Project Float	As defined in Part 2, Section 11.4 (Project Float).
Project Manager	The Design-Builder's authorized representative in responsible charge of the Work.
Project Schedule	Any of the accepted schedules as defined in Part 2, Section 11.1 (Project Baseline Schedule), determined based on context.
Project Site or Site or Work Site	The parcels of ROW identified on the ROW Drawings in Part 7 (Contract Drawings) or upon which the Project is to be constructed and installed, and all other areas in the vicinity used by the Design-Builder for construction Work. For purposes of indemnification, safety and security requirements, and payment for use of equipment, the term "Project Site" and "Site" also includes (i) any areas on which Relocation Work is performed and (ii) any property being temporarily used by the Design-Builder for storage of equipment and/or construction Work.
Proposal	The Design-Builder's written response to the Department's Request for Proposals (RFP) for the Project by the Department.
Proposer	An individual or legal entity submitting a Proposal in response to the Department's Request for Proposals (RFP).

Term	*Meaning*
Quality Acceptance Program	The QC, QA, Oversight, and associated activities performed by the Design-Builder and the Department and their interrelationships to ensure that all work complies with the contract.
Quality Assurance (QA)	All planned and systematic actions to certify and provide evidence of compliance that all Work complies with the requirements of the Contract Documents and that all materials incorporated in the Work, all equipment used, and all elements of the Work will perform satisfactorily for the purpose(s) intended. Actions include design checks and reviews, specification reviews, document control reviews, and working plan reviews; materials Sampling and Testing at the production site and the Project site; oversight of manufacturing/processing facilities and equipment; oversight of on-site equipment; calibration of test equipment; acceptance or rejection of material; and documentation of all activities.
Quality Control (QC)	The total of all activities that are performed by the production staff of the Design-Builder, Designer, Subcontractor, producer, or manufacturer to ensure that a product meets Contract requirements. QC may include design reviews and checks; inspection of material handling and construction; calibration and maintenance of sampling and testing equipment; working Plan review; document control; production process control; any inspection, sampling, and testing done for these purposes; and documentation of QC activities.
Quality Management Plan (QMP)	The plan that sets out the Design-Builder's means of complying with its obligations in relation to QC, which plan shall be provided and maintained in accordance with the Contract requirements.
Quality Program	All Quality processes developed by the Design-Builder and outlined in their Approved QMP to ensure that all Work is in accordance with the Contract, including QC activities.
Reasonable Accuracy	The meaning set forth in Part 4-19C-3 (Subsurface Utility Engineering (SUE) Information – "Reasonable Accuracy").
Recovery Schedule	The schedule described in Part 2, Section 11.1.3 (Recovery Schedule).
Reference Documents (RD)	The collection of information, data, documents and other materials that the Department has made available to the Design-Builder in connection with the Project or the Work (including those contained in the RFP documents) for general or reference information only and without any warranty as to their accuracy, completeness or fitness for any particular purpose. The Reference Documents are not Contract Documents.
Region	One of four geographical subdivisions of the State used to designate or identify the location of the proposed Work.
Released for Construction Documents (RFC)	The Design-Builder's issuance of design documents upon meeting specific requirements in accordance with Part 3 (Quality Program).
Relocation (or relocation)	As used in connection with Utilities, the removal, relocation, abandonment and/or protection in place (including provision of temporary services as necessary) of any Utility that is necessary in order to accommodate or permit construction of the Project; depending on the context, the term also may refer to the relocation of such a Utility from a location that conflicts with the Project to another location.
Remediation Work	Assessment, sampling, containment, remediation and/or off-site disposal of

Term	*Meaning*
	Hazardous Substances on the Project site in accordance with all applicable requirements of Laws and Governmental Approvals regarding the identification, handling, generation, treatment, storage, transfer, and disposal of Hazardous Substances
Removal	All Work necessary to remove any existing Utilities for which leaving the existing Utility in place is not feasible or not allowed, or which is required to be removed in order to accommodate or permit construction of the Project.
Request for Change Order (RCO)	A Design-Builder-initiated request for a Change Order under Part 2, Section 16.3.4 (Procedures for Design-Builder-Initiated Lump Sum Change Orders).
Request for Change Proposal (RCP)	A request issued by the Department under Part 2, Section 16.3.1 (Issuance of Request for Change Proposal by Department).
Request for Proposals (RFP)	The Request for Proposals procurement package, including all Addenda thereto, issued by the Department requesting proposals for the Project.
Request for Qualifications	The written solicitation issued by the Department seeking Statement of Qualifications (SOQs) to be used to identify the Short-list of the most highly qualified proposers to receive and respond to the RFP for the Project.
Right-of-Way (ROW)	Real property or interest acquired for or devoted to transportation purposes for the Project, as shown in ROW Drawings in Part 7 (Contract Drawings).
Right-of-Way Drawings	The documents titled Right-of-Way Drawings provided in Part 7 (Contract Drawings).
Right-of-Way Schedule	The schedule provided as Attachment 14A to Part 4-14 (Right-of-Way)
Roadside	The areas between the outside edges of the shoulders and the ROW boundaries including unpaved median areas between inside shoulders of divided highways and areas within interchanges.
Roadway	The portion of a highway within the construction limits.
Schedule of Values	As defined in Part 2, Section 12.1.1 (Schedule of Values – General)
Shop Drawings	A general term that includes drawings, diagrams, illustrations, samples, schedules, calculation, and other data, which provide details of the construction of the Work.
Short-List	The list of those Proposers who have submitted SOQs that the Department determines, through evaluation of the SOQ, are the most highly qualified Persons and will be invited to submit proposals and response to an RFP.
Shoulder	The portion of the roadway adjacent to the traveled way where vehicles may stop for emergencies and which supports base and surface courses.
Sidewalk	That portion of the roadway constructed exclusively for pedestrian use.
Specialty Subcontractor	Those consultants or subcontractors identified by the Design-Builder to perform work critical to the success of the Project such as the subcontractor for construction of bridges, retaining structures, landscaping or other specialty Work.
Standard Drawing	See Plan.
Standard Specifications	The Utah Department of Transportation 2012 Standard Specification for Road and Bridge Construction, including the 2012 Supplemental Specifications, as amended and as modified by Part 5 (Special Provisions and Exceptions).

Term	*Meaning*
Standards of the Industry	Practices, procedures, methods and standards that: (i) are consistent with current industry practices established for, or employed by, leading participants in the design, construction, operation, and maintenance industries; (ii) comply with applicable laws and applicable industry underwriters' and the fire and life safety codes and standards; and (iii) promote reliability, efficiency, safety and security. Standards of the Industry include taking reasonable steps to assure that sufficient personnel are employed and available to perform the work and that such personnel are adequately skilled, experienced, and trained to design, construct, install, operate, and maintain the work properly and efficiently, and that appropriate coordination, monitoring, and testing is performed to assure that all elements of the work are designed, constructed, and installed so as to function as required by the Contract Documents.
State	The State of Utah.
Statement of Qualifications (SOQ)	The Design-Builder's response to the Department's Request for Qualifications issued on September 17, 2015, as amended.
Subcontract	Any agreement entered into by the Design-Builder and one or more third parties providing for such third-party to perform any part of the Work or provide any materials, equipment, or supplies for any part of the Work, or any such agreement between a Subcontractor and its lower tier Subcontractor or a Supplier and its lower tier Supplier, at any tier.
Subcontractor	An individual or legal entity with whom the Design-Builder has entered into any Subcontract and any other Person with whom any Subcontractor has further subcontracted any part of the Work, at any tier.
Substantial Completion	As defined in Part 2, Section 13.2 (Substantial Completion)
Substantial Completion Deadline	The date set forth in Part 1, Section 4.4 (Completion Deadlines)
Substructure	All of the structure below the girders or main load carrying members of simple and continuous span bridges, including abutments, bent caps, columns, bents, footings, wingwalls, and skewbacks of arches.
Superintendent	The Design-Builder's authorized employee responsible for the construction field Work related to the Project.
Supplemental Agreement (or Supplemental Utility Agreement)	The vehicle for supplementing a Master Utility Agreement between the Department and a Utility Company to provide details for specific Utility relocations, including plans, cost estimates, schedules, and any other elements necessary to define the scope of work for a relocation.
Supplier	Any Person other than employees of the Design-Builder not performing Work at the site that supplies machinery, equipment, materials or systems to the Design-Builder or any Subcontractor in connection with the performance of the Work; Persons who merely transport, pick up, deliver, or carry materials, personnel, parts, or equipment or any other items or persons to or from the site shall not be deemed to be performing Work at the site.
Surety	The legal entity or individual, other than the Design-Builder, executing a bond furnished by the Design-Builder.
Third-Party	A Utility Company, Railroad company, City, County, or other entity which holds an interest in existing or proposed facilities within the limits of influence of the Project.

Term	*Meaning*
Third-Party Agreement	The Utility Agreements (or draft agreements) contained in Part 6 (Third Party Agreements), and any other agreements designated as such by the Department, between the Department and any Utility Companies or other Third-Parties relating to the Project.
Traffic Management Plan (TMP)	The plan described in Part 4-10 (Maintenance of Traffic).
Traveled Way	The portion of the roadway designated for the movement of vehicles, excluding shoulders and auxiliary lanes.
Utility (or utility)	Any privately, publicly, or cooperatively, or municipally owned line, facility, or system for producing, transmitting, or distributing communications, power, heat, natural gas, light, oil, petroleum products, cable television, water, sewer, steam, waste, storm water not connected with the highway drainage, signal systems, and other such products that directly or indirectly serve the public; a particular Utility Company.
Utility Agreement	A Master Utility Agreement (MUA) and/or a Supplemental Agreement, and other agreements entered into with Utility Companies.
Utility Company	The owner or operator of any Utility (including both privately held and publicly held entities, cooperative utilities, municipalities and other governmental agencies).
Utility/Third-Party Delay	Any failure by a Utility Company/Third-Party to meet any time parameters for performance by such Utility Company/Third-Party which are set forth in the applicable Third-Party Agreement (including Supplemental Agreements), which failure by the Utility Company/Third-Party delays the Critical Path so as to impair the Design-Builder's ability to meet a Completion Deadline; provided, however, that: (i) to the extent that such failure is excused under a "force majeure" provision in the applicable MUA ,Supplemental Agreement, or Third-Party Agreements such failure shall not be the basis for calculating a Utility/Third-Party Delay against the Utility Company/Third-Party; however, the Design-Builder shall be entitled to an extension of any Completion Deadline(s); (ii) once the Design-Builder has accepted a particular Utility Company/Third-Party furnished design pursuant to a Supplemental Agreement any subsequent failure by such Utility Company/Third-Party to meet the time parameters in the applicable Supplemental or Third-Party Agreement resulting from any failure of such design to comply with the requirements of the Supplemental or Third-Party Agreement shall not constitute a Utility/Third-Party Delay; and (iii) once the Design-Builder has issued a Construction Inspection Acceptance Letter for construction by a particular Utility Company/Third-Party pursuant to a Supplemental or Third-Party Agreement, any subsequent failure by such Utility Company/Third-Party to meet the time parameters in the applicable Supplemental or Third-Party Agreement resulting from any failure of such construction to comply with the requirements of such Agreement shall not constitute a Utility / Third-Party Delay. Any time parameters set forth in a MUA shall not be the basis for calculating a Utility/Third-Party Delay.
Utility Easements	All permanent easements and/or other permanent interests in real property owned by Utility Companies in connection with existing Utilities.
Utility Owner	See Utility Company.
Utility Work	The Work required under Part 4-19 (Utilities) and including Work related to or

Term	*Meaning*
	affecting Utilities or Utility Companies.
Verification/Verify	The act of substantiating, through the collection of objective evidence by the Department or its designated agent to independently establish Conformity to the Contract.
Warranty	Any warranty made by the Design-Builder in the Contract Documents, including in Part 2, Section 28 (Warranties).
Warranty Bond	As defined in Part 2, Section 27.3 (Bond Terms and Conditions).
Work	All duties and services to be furnished and provided by Design-Builder as required by the Contract Documents, including the administrative, design, engineering, Quality Control, Quality Assurance, Relocation, procurement, legal, professional, manufacturing, supply, installation, construction, supervision, management, testing, verification, labor, materials, equipment, documentation and other efforts necessary or appropriate to achieve Contract Completion except for those efforts which the Contract Documents specify will be performed by the Department or other Persons. Work includes alterations, amendments, or extensions made by Change Order or other written orders of the Department. In certain cases Work is also used to mean the Work Product. This includes the Build Alternative (if exercised).
Work Product	All the data, information, documentation and other work product produced, prepared, obtained or deliverable by or on behalf of the Design-Builder under the Contract, including but not limited to Plans, engineering documents, geotechnical soils and soil boring data, analyses, reports and records, property acquisition files, agreements and documents, engineers' and inspectors' diaries and reports, Utility relocation plans and agreements, ROW record maps and surveys, traffic and revenue studies, and other feasibility data, analyses, studies and reports, correspondence and memoranda relevant to design or construction decisions, contracting plans, air quality monitoring data, environmental reviews, studies and reports, mitigation studies and reports, data, assessments, studies and reports regarding Hazardous Materials investigations, tests, borings, monitoring and analyses, manifests regarding handling, storage or transportation of Hazardous Materials, final quantities, pile driving records, records of accidents and traffic management, field test records and reports, concrete pour records, surfacing depth check records, grade and alignment books, cross-section notes, drainage notes, photographs, false work and form plans, records of construction materials, and any other documents which can be reasonably described as technical or engineering documents. Work Product expressly excludes, however, documents and information which is determined to be exempted or protected from public disclosure under GRAMA.
Working Day	Any Calendar Day, except Saturdays, Sundays, and Holidays.
Working Drawing	See Plan.

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS
PART 2—GENERAL PROVISIONS

Final RFP Issued September 15, 2016

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1— OBLIGATIONS OF THE DESIGN-BUILDER

1.1. Performance Requirements

1.1.1. Performance of Work

All Work necessary to achieve Contract Completion and to meet the Contract Completion Deadline shall be the Design-Builder's sole responsibility, except as otherwise specifically provided in the Contract Documents. Subject to the terms of Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work), the costs of all such materials, services and efforts are included in the Contract Amount.

1.1.2. Performance Standards

The Design-Builder shall furnish the design of the Project in accordance with all professional engineering principles and generally accepted Standards of the Industry that are required of Professional Engineers in Utah, that are identified in the Contract Documents, and that are necessary to meet the terms, conditions, and requirements of the Contract Documents even though such principles and standards are not specifically identified. The Design-Builder shall construct the Project as designed, in a good and workmanlike manner, free from defects, and in accordance with the terms, conditions, and requirements of the Contract Documents.

1.1.3. Performance as Directed

During the course of the Work and notwithstanding the existence of any Dispute, the Design-Builder shall perform as directed by the Department in a diligent manner and without delay, shall abide by the Department's decision or order, and shall comply with all applicable provisions of the Contract Documents. If a Dispute arises regarding such performance or direction, the Dispute shall be resolved in accordance with Section 22 (Partnering and Dispute Resolution). If the Design-Builder receives direction from the Department in a form other than a Directive Letter and the Design-Builder believes that such direction constitutes a change to the Work, the Design-Builder shall request a Directive Letter confirming such direction.

1.2. General Obligations of Design-Builder

The Design-Builder, in addition to performing all other requirements of the Contract Documents, shall

(1) Provide all design and other services, as well as all goods, materials, and labor and undertake all efforts necessary or appropriate (excluding only those services, materials and efforts which the Contract Documents specify will be undertaken by other Persons) to construct the Project and maintain it during construction in accordance with the requirements of the Contract Documents and within the Completion Deadlines. The word "provide" includes and requires the Design-Builder to design, furnish, install, construct and perform all Work necessary for a final, complete, in-place, and fully functional Project which meets all the requirements of the Contract Documents.

(2) At all times provide a Project Manager, who will: (i) have full responsibility for the prosecution of the Work; (ii) act as agent and be a single point of contact in all matters on behalf of the Design-Builder; (iii) be present (or his Approved designee will be present) at the site at all times that Work is performed; and (iv) have authority to make binding decisions for the Design-Builder on all matters relating to the Project.

(3) Obtain all Governmental Approvals (other than the Environmental Documents and certain New Environmental Documents as provided in Section 5.3 (New Environmental Documents to be Obtained by the Department)), including any Governmental Approvals required to implement any Approved ATCs incorporated into the Contract Documents.

(4) Comply with all conditions imposed by and undertake all actions required by and all actions necessary to maintain in full force and effect, all Governmental Approvals, including implementation of all environmental mitigation measures required by the Contract Documents, except to the extent that such responsibility is expressly assigned in the Contract Documents to another Person.
(5) Coordinate with Third Parties regarding the Work and assist the Department in its coordination efforts.
(6) Provide such assistance as is reasonably requested by the Department in dealing with any Person and/or in prosecuting and defending claims or lawsuits in any and all matters against the Department by Third-Parties relating to the Project, which may include providing information and reports regarding the Project, executing declarations and attending meetings and hearings, but which shall in no event be deemed to require the Design-Builder to provide legal services. If the amount of time required to provide assistance becomes unreasonable, the Department may request such assistance at its cost. This obligation is not intended to address and shall not limit the Design-Builder's indemnification obligation under Section 21 (Indemnification).
(7) Comply with all requirements of all applicable Laws.
(8) Cooperate with the Department and other Governmental Persons in the review and oversight of the Project and other matters relating to the Work.
(9) Make payments to Third Parties required by the Contract Documents, if any.
(10) Supervise and be responsible to the Department for acts and omissions of all Design-Builder-Related Entities, as though the Design-Builder directly employed all such Persons.
(11) Take prompt action and measures to effectively mitigate potential loss or damage, including mitigation of delay to the Project and damages due to delay in all circumstances, to the extent reasonably possible, including by re-sequencing, reallocating or redeploying the Design-Builder's forces to other Work, as appropriate.
(12) Pay all applicable federal, State, and local sales, consumer, use, and similar taxes, property taxes, and any other taxes, fees, charges, or levies imposed by a Governmental Person, whether direct or indirect, relating to or incurred in connection with the performance of the Work.

1.3. Representations, Warranties, and Covenants

The Design-Builder further represents, warrants, and covenants for the benefit of the Department as follows:

1.3.1. Maintenance of Professional Qualifications

Throughout the term of the Contract, the Design-Builder shall obtain and maintain, and shall be responsible for Design-Builder-Related Entities to obtain and maintain, all required licenses, certifications, permits, professional ability, approvals, consents and other authorizations to perform the Work, and shall perform the work in accordance with the requirements of the Contract Documents.

1.3.2. Evaluation of Constraints

The Design-Builder has evaluated the constraints affecting delivery of the Project, including the ROW Drawings, ROW Schedule, Utility and other Third-Party facilities, and the conditions of the Environmental Documents, and agrees to deliver the Project within such constraints.

1.3.3. Feasibility of Performance

The Design-Builder has evaluated the feasibility of performing the Work within the time specified herein and for the Contract Amount, and agrees to deliver the Project within the Completion Deadlines.

1.3.4. Review of Site Information

The Design-Builder has, prior to submitting its Proposal, in accordance with prudent and generally accepted engineering and construction practices, reviewed the boring logs provided by the Department in Part 8 (Engineering Data), inspected and examined the Project Site and surrounding locations, and undertaken other appropriate activities sufficient to determine the surface conditions and subsurface conditions affecting the Project, to the extent the Design-Builder deemed necessary for submittal of its Proposal. The Design-Builder acknowledges that it is responsible for obtaining any additional information the Design-Builder needs to perform the Work that has not been provided in the Contract Documents. As a result of its review, inspection, examination, and other activities, the Design-Builder is familiar with and accepts the physical requirements of the Work and the risk allocations associated with such Work set forth in the Contract Documents, including Section 4 (Differing Site Conditions), Section 15 (Change Order Risk Allocation) and Section 16 (Changes in the Work). The Design-Builder acknowledges and agrees that changes in conditions at the Site may occur after the Proposal Due Date, and that the Design-Builder shall not be entitled to any Change Order in connection therewith except as specifically permitted under Sections 4 (Differing Site Conditions), 15 (Change Order Risk Allocation) and 16 (Changes in the Work). Before commencing any Work on a particular aspect of the Project, the Design-Builder shall verify all dimensions and conditions at the Site and shall examine all adjoining work, which may have an impact on such Work. The Design-Builder shall be responsible for ensuring that the Design Documents accurately depict all adjoining dimensions and conditions.

1.3.5. Governmental Approvals

The Design-Builder has no reason to believe that any Governmental Approval required to be obtained by the Design-Builder will not be granted in due course and thereafter remain in effect so as to enable the Work to proceed in accordance with the Contract Documents. If any Governmental Approvals required to be obtained by the Design-Builder must formally be issued in the name of the Department, the Design-Builder shall undertake all efforts to obtain such Governmental Approvals, including execution and delivery of appropriate applications and other documentation in a form Approved by the Department. The Department shall reasonably cooperate with the Design-Builder in obtaining any such Government Approvals at the Design-Builder's sole cost. If the Department obtains any Governmental Approval for the benefit of the Design-Builder at the Design-Builder's request, all costs shall be borne by the Design-Builder. If the Design-Builder is required to assist the Department in obtaining any Governmental Approvals pursuant to Section 5.3 (New Environmental Documents to be Obtained by the Department) that the Department may be obligated to obtain due to a Department-Directed Change, including providing information requested by the Department and participating in meetings regarding such Governmental Approvals, the Design-Builder may seek additional time and money in accordance with Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work).

1.3.6. Progression of Work

The Design-Builder shall at all times schedule and direct its Work to provide an orderly progression of the Work to achieve the Completion Deadlines in accordance with the Project Schedule, including furnishing such employees, materials, facilities and equipment, and working such hours (including extra shifts, overtime operations, Saturdays, Sundays and Legal Holidays) as may be necessary to achieve the Completion Deadlines, all at the Design-Builder's own expense, except as otherwise specifically provided in Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work).

1.3.7. Design and Engineering Personnel

All design and engineering Work furnished by the Design-Builder shall be performed by or under the supervision of Persons licensed to practice the relevant technical profession of architecture, landscape architecture, engineering, geology or surveying in the State, and performed by personnel who are careful,

skilled, experienced, and competent in their respective trades or professions, and professionally qualified to perform the Work.

1.3.8. Licensing

Design-Builder is licensed and shall maintain all such licenses throughout the performance of the Work.

1.3.9. Authorization

The execution, delivery, and performance of the Contract have been duly authorized by all necessary actions of the Design-Builder, and, if applicable, the Design-Builder's members, and will not result in a breach or a Default under their organizational documents or any indenture, loan, credit agreement, or other material agreement or instrument to which they are a party or by which their properties and assets may be bound or affected.

1.3.10. Legal, Valid, and Binding Obligation

The Contract constitutes the legal, valid, and binding obligation of the Design-Builder and, if applicable, of each member of the Design-Builder, enforceable in accordance with its terms.

1.4. False or Fraudulent Statements and Claims

The Design-Builder recognizes that the requirements of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. § 3801 et seq. and the USDOT regulations, "Program Fraud Civil Remedies," 49 CFR Part 31, apply to its actions hereunder. Accordingly, by signing the Contract, the Design-Builder certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, or it may make pertaining to the Contract. In addition to other penalties that may be applicable, the Design-Builder also acknowledges that if it makes a false, fictitious, or fraudulent claim, statement, submission, or certification, the federal government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986, as amended, on the Design-Builder to the extent the federal government deems appropriate.

1.5. Alternative Technical Concepts

Notwithstanding anything in the Contract Documents to the contrary, if an Approved Alternative Technical Concept (ATC) incorporated in the Contract Documents requires additional Governmental Approvals or other Third Party approvals or ROW, and the Design-Builder fails to obtain or comply with such additional approvals or ROW, the Design-Builder shall comply with the requirements of the Contract Documents excluding the ATC without any right to a Change Order or any other basis for a Claim. If an ATC incorporated in the Contract Documents was conditionally Approved and the Design-Builder fails to comply with such identified conditions, the Design-Builder shall comply with the requirements of the Contract Documents excluding the ATC without any right to a Change Order or any other basis for a Claim.

2— INFORMATION SUPPLIED TO DESIGN-BUILDER; RESPONSIBILITY FOR DESIGN; DISCLAIMER

2.1. Information Supplied

The Department has made available to the Design-Builder information, which is described in the Contract Documents and Reference Documents regarding the Project, and has allowed the Design-Builder access

to the Project site prior to submittal of the Design-Builder's Proposal for purposes of inspection, verification, and testing.

2.2. Responsibility for Design

The Design-Builder agrees that it has full responsibility for the design of the Project and that the Design-Builder shall furnish the design of the Project, regardless of the fact that certain conceptual design work occurred and was provided to the Design-Builder prior to the date of execution of the Contract. The Design-Builder specifically acknowledges and agrees to the following:

A. The Design-Builder is not entitled to rely on and has not relied on: (i) the Reference Documents; or (ii) any other documents or information provided by the Department that is not included in the Contract Documents.

B. The Design-Builder's Warranties under Section 28 (Warranties) and indemnities under Section 21 (Indemnification) apply regardless of any error, omission, ambiguity, inconsistency, inaccuracy, deficiency, inadequacy, or other defect in the Project even though they may be related to errors, omissions, ambiguities, inconsistencies, inaccuracies, deficiencies, inadequacies, or other defects in the Project Configuration (subject only to the Design-Builder's right to a Change Order for a Necessary Project Configuration Change) or Reference Documents. While the Design-Builder may be entitled to a Change Order for a Necessary Project Configuration Change, such compensation does not eliminate or modify Design-Builder's Warranties and indemnities for the Work performed in that Change Order.

C. The Project Configuration is preliminary and conceptual in nature.

D. The Design-Builder is responsible for correcting any errors, omissions, ambiguities, inconsistencies, inaccuracies, deficiencies, inadequacies, or other defects in the Project Configuration through the design and/or construction process without any increase in the Contract Amount or extension of a Completion Deadline(s) except in the case of Design-Builder's right to a Change Order for Necessary Project Configuration Changes in accordance with Section 15.6 (Changes in Project Configuration). In such a case, the Design-Builder becomes responsible for the design and construction of the Project Configuration, as amended by the Necessary Project Configuration Change.

2.3. Disclaimer

2.3.1. No Liability Regarding Reference Documents

The Design-Builder understands and agrees that the Department shall not be responsible or liable in any respect for any loss, damage, injury, liability, cost, or cause of action whatsoever suffered by any Design-Builder-Related Entity by reason of any use of any information contained in the Reference Documents or any action or forbearance in reliance thereon. The Design-Builder further acknowledges and agrees that: (i) if and to the extent the Design-Builder or anyone on the Design-Builder's behalf uses any of said information, such use is made at the Design-Builder's sole risk and discretion; and (ii) the Design-Builder is obligated to conduct any and all studies, analyses and investigations as it deems advisable to confirm, recreate, verify, or supplement said information.

2.3.2. No Representation or Warranty Regarding Project Configuration and Reference Documents

The Department does not represent or warrant that the information contained in the Project Configuration and Reference Documents is either complete or accurate or that such information conforms to the requirements of the contract documents.

2.3.3. Professional Licensing Laws

The Department does not intend to contract for, pay for, or receive any design that are in violation of any technical profession licensing laws, and the Design-Builder acknowledges that the Department has no such intent. It is the intent of the parties that the Design-Builder is fully responsible for furnishing the design for the Project, and duly qualified and licensed firm(s) or individuals will perform the design required by the Contract Documents in compliance with the technical profession laws, rules and regulations of Utah. Any references in the Contract Documents to the Design-Builder's responsibilities or obligations to "perform" the design portions of the Work shall be deemed to mean that the Design-Builder shall "furnish" the design for the Project. The terms and provisions of Section 2.3 (Disclaimer) shall control and supersede every other provision of the Contract Documents.

3— CONTROL OF WORK

3.1. Control and Coordination of Work

The Design-Builder shall be solely responsible for and have control over the construction means, methods, techniques, sequences, procedures, and site safety, and shall be solely responsible for planning and coordinating all portions of the Work in accordance with the Contract Documents.

3.2. Safety

The Design-Builder shall be solely responsible for the safety of, and shall provide protection to prevent damage, injury, or loss to, all Persons on or near the Project site or who would reasonably be expected to be affected by the Work, including individuals performing Work, employees of the Department and its consultants, visitors to the Project site, and members of the public who may be affected by the Work. The Design-Builder shall at all times comply with its Safety and Health Program. The Design-Builder shall not commence Work without developing and implementing a Site-specific Safety Plan that addresses safety in connection with the Project and that is consistent with the Utah Department of Transportation Construction Safety and Health Manual, all Laws, the Contract Documents and its Safety and Health Program. The Design-Builder shall immediately notify the Department if the Design-Builder believes that any Contract requirement creates a safety risk.

3.3. Process to be Followed for Discovery of Certain Site Conditions

3.3.1. Notification to the Department

If the Design-Builder becomes aware of (i) any Differing Site Conditions (Section 4); (ii) any on-Site material that the Design-Builder believes may contain Hazardous Substances required to be removed or treated; or (iii) any Items of Archeological or Biological Significance within the Right-of-Way, as a condition precedent to the Design-Builder's right to a Change Order, the Design-Builder shall immediately notify the Department thereof by telephone or in person, to be followed by written notification the following Working Day. The Design-Builder shall have the burden of proving such oral notice was given and when it was given. The Design-Builder's written notification shall advise the Department of any obligation to notify any Governmental Person or other Person required under

applicable Law, Governmental Approval, or the Contract Documents. The Design-Builder shall immediately stop Work in, and secure, the area. Operations that may impact the area shall be temporarily suspended and shall not be resumed at that location unless and until authorized by the Department. In such event, the Department will view the location promptly upon receipt of notification, and will advise the Design-Builder at that time whether to resume Work or whether further investigation is required. Upon the Design-Builder's fulfillment of all applicable requirements of Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work) and subject to the limitations contained therein, the Department shall be responsible for, and agrees to issue Change Orders to compensate the Design-Builder for, any additional costs for and to extend the affected Completion Deadlines as a result of any delay in the Critical Path resulting from the Department's viewing of the location that exceeds three Days (other than Saturday, Sunday or a Legal Holiday).

3.3.2. Further Investigation

The Design-Builder shall promptly conduct such further investigations, as the Department reasonably deems appropriate. As soon as possible but no later than five Days after its initial notice to the Department, the Design-Builder shall advise the Department of any action recommended to be taken regarding the situation in a written remediation plan. If Hazardous Substances are involved, the remediation plan shall describe the type of Remediation Work, if any, that the Design-Builder proposes to undertake with respect thereto. If any Items of Archeological or Biological Significance are discovered, the remediation plan shall advise the Department what course of action the Design-Builder intends to take with respect thereto and whether the location must be fenced off or whether Work can resume. The Department then will either Approve, or require modification of, the Design-Builder's proposed remediation plan.

3.3.3. Recommence Work

The Department shall have the right to require the Design-Builder to recommence Work in the area at any time, even though an investigation may still be ongoing, provided such Work is not in violation of any Laws or Governmental Approvals. The Design-Builder shall promptly recommence Work in the area upon receipt of such notification from the Department. On recommencing Work, the Design-Builder shall follow all applicable procedures contained in the Contract Documents and all other Laws with respect to such Work, consistent with the Department's determination or preliminary determination regarding the nature of the material, resources, species or condition.

3.4. Obligation to Minimize Impacts

The Design-Builder shall ensure that all of its Work and activities undertaken in the performance of the Work will minimize the effect on surrounding or adjacent properties, the environment and the public to the maximum extent practicable.

3.5. Quality Management

3.5.1. Design-Builder Quality Management

The Design-Builder shall perform the quality management necessary to meet its obligations under the Contract Documents.

3.5.2. Oversight, Audit, Inspection, and Testing by the Department and Others

All materials and each part or detail of the Work shall be subject to review, oversight, audit, and testing by the Department and other Persons designated by the Department. When any Third Party is to accept or pay for a portion of the cost of the Work, its respective representatives have the right to review, oversee, audit, inspect and test the Work; and have the right to stop the Work to the extent permitted by Law or

stated in Part 6 (Third-Party Agreements). Such review, oversight, audit, inspection, testing, or intervention does not make such Person a party to the Contract. The Design-Builder hereby consents to such review, oversight, inspection and testing, or intervention by the Department and other Persons. Upon request from the Department, the Design-Builder shall furnish information to such Persons as are designated in such request and shall permit such Persons access to the Project site and all parts of the Work. Failure to provide such information and access to the site and all parts of the Work prior to covering such Work shall result in the Design-Builder uncovering the Work as directed to provide access, without compensation or a time extension.

3.5.3. Obligation to Uncover Finished Work

At all times before Contract Completion, the Design-Builder shall remove or uncover such portions of the finished construction Work as directed by the Department. After examination by the Department, the Design-Builder shall restore the Work to the standard required by the Contract Documents. If the Work exposed or examined is not in conformance with the requirements of the Contract Documents, then the cost of uncovering, removing and restoring the Work, or making good the parts removed, and recovery of any delay to the Critical Path occasioned thereby shall be at the Design-Builder's expense. If Work exposed or examined under this Section 3.5.3 is in conformance with the requirements of the Contract Documents, then the cost of uncovering, removing, and restoring the Work shall be at the Department's expense, and any delay in the Critical Path from uncovering, removing, and restoring Work shall be the Department's responsibility. Notwithstanding the foregoing, the Department may require the Design-Builder to uncover, remove and restore any Work done or materials used without adequate prior notice to and opportunity for prior inspection by the Department, as required by Section 3.5.4 and/or theQuality Management lan (QMP), at the Design-Builder's expense, even if the Work proves acceptable after uncovering.

3.5.4. Control Points

Control Points shall be established at certain stages of the construction process to confirm compliance with specified requirements in accordance with Part 3-4.1 (Control Point Inspection). As Work is accomplished, the Department shall review the Work to determine compliance. The Design-Builder shall provide the Department with a minimum 24 hours' written notice prior to reaching any Control Point.

3.6. Effect of Oversight, Spot Checks, Assessment, Tests, Acceptances, and Approvals

3.6.1. Oversight and Acceptance

The Design-Builder shall not be relieved of its obligation to perform the Work in accordance with the Contract Documents, or any of its other obligations under the Contract Documents, by any action or inaction of the Department, Third Parties, or other Persons, related to review, oversight, spot checks, assessments, reviews, tests, inspections, acceptances, Approvals, or other approvals. Such actions or inaction does not constitute acquiescence for the purposes of Contract Completion of the particular material or Work, or waiver of any legal or equitable right with respect to the particular material or Work. At any time prior to Contract Completion and at the Design-Builder's expense, the Department may reject Work and require the Design-Builder to repair, remove and replace, or otherwise correct any Nonconforming Work and/or identify additional Work which must be done to bring the Project into compliance with Contract requirements, it being understood that oversight, spot checks, assessments, reviews, tests, inspections, acceptances, Approvals, and other approvals by the Department, Third Parties, or other Persons are for their benefit and not to relieve the Design-Builder of its responsibilities for quality control and compliance with the Contract requirements.

3.6.2. No Estoppel

The Department shall not be precluded or estopped, by any measurement, estimate, or certificate made either before or after Contract Completion and payment therefor, from showing that any such measurement, estimate or certificate is incorrectly made or untrue, or from showing the true amount and character of the Work performed and materials furnished by the Design-Builder, or from showing that the Work or materials do not conform in fact to the requirements of the Contract Documents. Notwithstanding any such measurement, estimate or certificate, or payment made in accordance therewith, the Department shall not be precluded or estopped from recovering from the Design-Builder and its Surety such damages as the Department may sustain by reason of the Design-Builder's failure to comply or to have complied with the terms of the Contract Documents.

3.7. Nonconforming Work

3.7.1. Rejection, Removal, and Replacement of Work

Subject to the Department's right, in its sole discretion, to accept Nonconforming Work, the Design-Builder shall repair, remove, replace, or otherwise correct rejected Nonconforming Work so as to comply with the requirements of the Contract Documents, at the Design-Builder's expense and without any time extension, and the Design-Builder shall promptly take all action necessary to prevent similar deficiencies from occurring in the future. The fact that the Department may not have discovered the Nonconforming Work shall not constitute an acceptance of such Nonconforming Work. If the Design-Builder fails to correct any Nonconforming Work within seven Calendar Days of receipt of notice from the Department requesting correction, the Department may, in its sole discretion, cause the Nonconforming Work to be repaired, removed, replaced, or otherwise corrected, and may deduct the cost of doing so from any monies due or to become due the Design-Builder and/or obtain reimbursement from the Design-Builder for such cost.

3.7.2. Nonconforming Work Pay Adjustment

In its sole discretion, the Department may accept any Nonconforming Work or require Design-Builder to repair or restore such Nonconforming Work, in which case the Department shall be entitled to a pay adjustment (or reimbursement of a portion of the Contract Amount, if applicable) or additional assurances (including additional warranties). If the Department accepts any Nonconforming Work, the Department shall be entitled to reimbursement of a portion of the Contract Amount in an amount determined by the Department. In general, the pay adjustment (or reimbursement) shall equal any one or combination of the following, at the Department's election, (i) the amount allocated to such Work in the Approved Schedule of Values (SOV); (ii) the Design-Builder's cost savings associated with its failure to perform the Work in accordance with the Contract requirements; (iii) the amount deemed appropriate by the Department to provide compensation for impacts to affected parties such as inconvenience to the public or future maintenance and/or other costs relating to the Nonconforming Work; or (iv) by the amount indicated for nonconforming work items specified in Part 5 (Special Provisions and Exceptions). In certain events, the Department shall be entitled to a pay adjustment (or reimbursement) as expressly set forth elsewhere in the Contract Documents. All pay adjustments or reimbursements shall be deducted from future payments or shall be payable to the Department within 30 Calendar Days after the Design-Builder's receipt of an invoice therefor.

If the Design-Builder proceeds with Nonconforming Work , then such Work and any subsequent payment (partial or full) for such items of Work will be at the Department's sole discretion.

3.8. Department-Furnished Materials

The Contract Documents provide that certain materials for the Project will be provided by the Department, at no additional cost to the Department or Design-Builder. All Department-furnished materials will be made available during normal business hours at Department-designated sites. The Design-Builder shall be responsible for arranging pick up of, inspecting, determining acceptability of, loading and transporting such materials from the Department-designated sites, and shall bear the risk of loss during such activities. The Design-Builder shall be responsible for any defects or deficiencies discovered after any Department-furnished materials are removed from the Department-designated site.

4— DIFFERING SITE CONDITIONS

4.1. Definition

The term "Differing Site Conditions" shall mean (i) subsurface or latent conditions encountered at the exact boring locations included in Part 8 (Engineering Data) that differ materially from those indicated for such locations; or (ii) physical conditions of an unusual nature, differing materially from those ordinarily encountered in the area and generally recognized as inherent in the type of work provided for in the Contract. The term shall specifically exclude the following:

A. All such conditions of which the Design-Builder had, or should have had, actual or constructive knowledge as of the Proposal Due Date

B. Utility facilities and non-contaminated groundwater

C. Any conditions that constitute or are caused by a Force Majeure event

D. Conditions that could have been discovered by reasonable site investigation or review of other available information prior to the Proposal Due Date

E. Variations in soil moisture content or groundwater levels from that indicated in available reports, borings, or tests

4.2. Responsibilities of the Department

Upon the Design-Builder's fulfillment of all applicable requirements of Section 4 (Differing Site Conditions), Section 15 (Change Order Risk Allocation) and Section 16 (Changes in the Work) and subject to the limitations contained therein, the Department will be responsible for, and agrees to issue Change Orders

A. to compensate the Design-Builder for additional costs incurred by the Design-Builder directly attributable to changes in the scope of the Work arising from Differing Site Conditions;

B. to extend the affected Completion Deadline(s) as the result of any delay in the Critical Path caused by a Differing Site Condition.

4.3. Notification

Notification as to a Differing Site Condition shall be provided in accordance with Section 3.3 (Process to be Followed for Discovery of Certain Site Conditions).

4.4. Limitations on Change Orders

The Design-Builder shall bear the burden of proving that a Differing Site Condition exists, that it could not reasonably have worked around the Differing Site Condition so as to avoid additional cost or time, and that it has mitigated the impacts of any Differing Site Condition. Each request for a Change Order relating to a Differing Site Condition shall be accompanied by a statement signed by a qualified professional setting forth all relevant information relied upon by the Design-Builder with respect to the alleged Differing Site Condition, and stating the efforts undertaken by the Design-Builder to find alternative design or construction solutions to eliminate or minimize the problem and the associated costs.

5— ENVIRONMENTAL COMPLIANCE

In performance of the Work, the Design-Builder shall comply with all requirements of all applicable Environmental Laws and Governmental Approvals, whether obtained by the Department or the Design-Builder. The Design-Builder acknowledges and agrees that it will be responsible for all fines, penalties, defense costs (including reasonable attorney and expert witness fees), Delay Damages, and disincentive assessments that may be assessed in connection with any failure by any Design-Builder-Related Entity to comply with such requirements.

Additional requirements for environmental protection are contained in Part 4-05 (Environmental Compliance).

5.1. Remediation Work

If the Department requests the Design-Builder to perform Remediation Work, the Design-Builder shall perform the Remediation Work with its own forces or with a Subcontractor under Governmental Body oversight as required by Environmental Laws and Governmental Approvals.

5.1.1. Change Orders for Remediation Work

Upon the Design-Builder's fulfillment of all applicable requirements of Sections 5 (Environmental Compliance), 15 (Change Order Risk Allocation), and 16 (Changes in the Work) and subject to the limitations contained therein, the Department shall be responsible for, and agrees to issue Change Orders

A. to compensate the Design-Builder for Remediation Work in accordance with an Approved remediation plan under Section 3.3.2 (Further Investigation); and

C. to extend the affected Completion Deadline(s) as the result of any delay in the Critical Path caused by Remediation Work arising from Hazardous Substances.

5.1.2. Limitations on Change Order Remediation Work

All Change Orders authorized by Section 5.1.1 (Change Orders for Remediation Work) shall be subject to the restrictions, limitations, and procedures set forth in this Section 5.1.2 and Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work). Allowable costs shall be limited to the additional costs associated with the Remediation Work after identification that Hazardous Substances are present and that Remediation Work is consistent with Environmental Laws and Governmental Approvals. The Design-Builder shall take all reasonable steps to minimize any such costs. Compensation for Remediation Work will not be made unless the Design-Builder demonstrates to the Department's satisfaction that the Remediation Work could not have been avoided by reasonable design modifications or construction techniques, and that the Design-Builder's remediation plan for the Remediation Work represents the approach that is most beneficial to the Project and the public and complies with Environmental Laws and Governmental Approvals. The Design-Builder shall provide the Department with such information,

analyses, and certificates as may be requested by the Department in order to enable a determination regarding eligibility for payment. The Department shall not be responsible for issuing a Change Order for: (i) Remediation Work for any spill or release, or threatened spill or release, of Hazardous Substances (a) attributable to the negligence, willful misconduct, or breach of contract by any Design-Builder-Related Entity, or (b) that was brought onto the Project Site by any Design-Builder-Related Entity; (ii) Remediation Work in connection with lead or lead-containing materials in structures and/or other improvements on or in the Project Site; or (iii) pre-existing site contamination that is exacerbated by the negligence, willful misconduct, or breach of Contract by any Design-Builder-Related Entity.

5.2. Mitigation Requirements

The Design-Builder shall be responsible for performance of all environmental mitigation requirements of the Governmental Approvals and of the New Environmental Documents that Section 5.4 (New Environmental Documents to be Obtained by Design-Builder) designates as the Design-Builder's responsibility.

5.3. New Environmental Documents to be Obtained by the Department

The Department shall be responsible for obtaining any New Environmental Documents necessitated by a Department-Directed Change or Necessary Project Configuration Change. The Design-Builder shall provide support services to the Department with respect to obtaining any such New Environmental Documents. Any Change Order covering a Department-Directed Change or a Necessary Project Configuration Change shall include compensation to the Design-Builder for any support services and any changes in the Work resulting from such New Environmental Documents, as well as any time extension necessitated by the Department-Directed Change or Necessary Project Configuration Change, subject to the conditions and limitations contained in Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work).

5.4. New Environmental Documents to be Obtained by Design-Builder

If a New Environmental Document becomes necessary for any reason other than those specified in Section 5.3 (New Environmental Documents to be Obtained by the Department), the Design-Builder shall be fully responsible for support and cost of obtaining the New Environmental Document and any other environmental clearances that may be necessary, and for all requirements resulting therefrom, as well as for any litigation arising in connection therewith, including defense costs (including reasonable attorney and expert witness fees) and Delay Damages. New Environmental Documents include additional noise analysis, modifications to required noise walls, and construction of additional noise walls beyond those identified in the Contract Documents. All required information for New Environmental Documents to be obtained by the Design-Builder shall be prepared and submitted to the Department to obtain the New Environmental Documents. The Design-Builder shall not contact any agencies or Persons regarding New Environmental Documents without the prior permission and participation of the Department.

5.5. Assignment of Third Party Reimbursement for Hazardous Substances Remediation Costs

To the extent that the Design-Builder incurs costs in connection with remediation of Hazardous Substances which are not eligible for a Change Order hereunder but which are eligible for reimbursement from a Third-Party that has not otherwise been released from such liability by the Department, the Department agrees to assign to the Design-Builder any causes of action held by the Department against such Third-Party for reimbursement of such costs. The Design-Builder shall be responsible for identifying any potentially responsible parties. If the Design-Builder wishes to obtain such an assignment

from the Department it shall deliver a notice requesting the same, and shall provide the Department with a form of assignment reasonably acceptable to the Department.

5.6. Environmental Resources of Special Significance

Upon the Design-Builder's fulfillment of all applicable requirements of Sections 5 (Environmental Compliance), 15 (Change Order Risk Allocation), and 16 (Changes in the Work) and subject to the limitations therein, the Department shall be responsible for, and agrees to issue Change Orders

(1) to compensate the Design-Builder for certain additional costs directly attributable to the discovery of items of archeological or biological significance, including threatened or endangered wildlife within the Right-of-Way in accordance with an Approved remediation plan under Section 3.3.2 (Further Investigation), provided that the existence of such resources was not disclosed in the RFP. Such costs include direct costs incurred by the Design-Builder, including site overhead, but exclude profit; and

(2) to extend the affected Completion Deadline(s) as the result of any delay in the Critical Path caused by the discovery of Items of Archeological or Biological Significance within the Right-of-Way, provided that the existence of such resources was not disclosed in the RFP.

5.7. Notification

Notification as to Hazardous Substances on the Project Site and Items of Archeological or Biological Significance within the Right-of-Way shall be provided in accordance with Section 3.3 (Process to be Followed for Discovery of Certain Site Conditions).

6— UTILITY WORK AND THIRD PARTY AGREEMENTS

This Section 6 describes how the risk of increased costs and delays associated with the Utility Work and other Third Parties is allocated between the Department and the Design-Builder through the Change Order process. The Design-Builder shall be entitled to receive a Change Order associated with the Utility Work or Third Party Agreements only as permitted by this Section 6, Section 15 (Change Order Risk Allocation), and Section 16 (Changes in the Work).

6.1. Utility Work

The Design-Builder agrees that: (i) the Contract Amount covers all of the Utility Work to be furnished or performed by the Design-Builder identified in Part 4 (Project Design and Construction Requirements) and Part 6 (Third-Party Agreements) and in this Section 6; and (ii) it is feasible to obtain and/or perform all necessary Utility Work within the time deadlines of the Contract Documents. Accordingly, the Design-Builder shall be entitled to receive a Change Order for additional costs and delays associated with the Utility Work only as permitted by this Section 6 or in circumstances for which such a Change Order is otherwise permitted under Section 15 (Change Order Risk Allocation), such as for Department-Directed Changes that increase the Utility Work. A deductive Change Order for reductions in the Utility Work shall be issued when permitted by Section 6 or in circumstances for which a deductive Change Order is otherwise permitted under Section 15 (Change Order Risk Allocation). The Design-Builder's entitlement to any Change Orders pursuant to this Section 6 shall be subject to the limitations, restrictions and procedures set forth in Section 15 (Change Order Risk Allocation) and Section 16 (Changes in the Work).

6.1.1. Accuracy of Design and Data – "Reasonable Accuracy" Defined

For purposes of this Section 6 (Utility Work and Third Party Agreements), the term "Reasonable Accuracy" shall have the meaning set forth in Part 4-19 (Utilities).

6.1.2. Changes in Utility Work

Increase in Work: Subject to the requirements of Section 15 (Change Order Risk Allocation) and Section 16 (Changes in the Work), the Department shall be responsible for additional costs, excluding Delay Damages, of Relocations of underground Utilities located within the ROW to be Relocated by the Design-Builder that are not indicated in Part 8 (Engineering Data) or are not indicated with Reasonable Accuracy in Part 8 (Engineering Data). The amount of any such Change Order shall be determined in accordance with Section 15 (Change Order Risk Allocation) and Section 16 (Changes in the Work).

Subject to the requirements of Section 15 (Change Order Risk Allocation) and Section 16 (Changes in the Work), the Design-Builder shall be entitled to an extension of any Completion Deadline on account of such lacking or inaccurate information regarding underground Utilities to be Relocated by the Design-Builder.

Notwithstanding the foregoing, the Design-Builder shall be responsible for the cost of Relocations of underground Utilities located within the ROW and shall not be entitled to an extension of a Completion Deadline whether or not they are identified by the Department in Part 8 (Engineering Data) if any one or more of the following applies:

A. A surface inspection of the area would have shown the existence or the likelihood of existence of such Utility (or portion thereof) in the correct location and/or size, as applicable, by reason of above-ground facilities such as buildings, meters or junction boxes or identifying markers;

B. Such Utility is a Service Line (or the portions of a Utility that are Service Lines); or

C. Any costs or delays incurred due to performance of Incidental Utility Work by the Design-Builder.

Partial Inaccuracies: If only a portion of an existing underground Utility to be Relocated by the Design-Builder is shown on the Utility drawing in Part 8 (Engineering Data), then a Change Order shall be allowed only for the resulting increased costs and extension of the Completion Deadlines associated with that portion of the Utility Work to be furnished or performed by the Design-Builder. If an existing underground Utility to be Relocated by the Design-Builder is not indicated at all in Part 8 (Engineering Data), then a Change Order shall be allowed only for the resulting increased costs of the additional Utility Work to be furnished or performed by the Design-Builder.

6.1.3. Change in Allocation of Responsibility Decreasing the Work

Any Utility Work initially included in the Work may be deleted from the Work pursuant to:

A. A Supplemental Agreement providing for the Utility Company to perform Utility Work otherwise assigned to the Design-Builder; or

B. Upon Approval or direction by the Department, Utility Work may be removed from the Work by Change Order without or prior to execution of a Supplemental Agreement.

The Department shall be entitled to a reduction in the Contract Amount to reflect any reduction in the Work pursuant to this Section 6.1.3. Any reduction in the scope of the Work pursuant to this Section 6.1.3 shall not be considered a Department-Directed Change.

6.1.4. Betterments

6.1.4.1. Betterments Included in the Work

Certain Betterments are included in the Utility Work, as described in Part 4-19 (Utilities), Table 19C-4 (Betterment Design and Construction Responsibilities of Design-Builder). It is the Design-Builders

responsibility to determine the final scope, schedule, and authorization to begin the Betterment Work in a separate Supplemental Agreement between **UDOT** and the **City**.

6.1.4.2. Additional Utility Betterments

Additional Betterments may be added to the Work pursuant to this Section 6.1.4.2. All Betterments that have not been identified in the Design-Builder's Utility Work in Part 6 (Third-Party Agreements) shall be added to the Work in Supplemental Agreements to be prepared in accordance with Part 6 (Third-Party Agreements). Any Betterments added to the Work shall be subject to the same standards and requirements as Relocations.

Any Utility Company may request the Department to permit the Design-Builder to perform Utility work relating to Betterments as a part of the Work, at the Utility Company's expense. If the Department Approves any such request, the Design-Builder shall have the obligation to perform such Utility work, with the right to receive additional compensation and, if applicable, an extension of any affected Completion Deadline. Any extension of any Completion Deadline(s) or Contract Amount increase requested for any Betterment shall be subject to the requirements of Section 15 (Change Order Risk Allocation) and Section 16 (Changes in the Work).

If a Utility Company requests that the Design-Builder design and/or construct a Betterment, the Design-Builder shall use its best efforts to negotiate a lump sum price for such Utility work with the Utility Company, in good faith. If the Design-Builder and the Utility Company are unable to agree on a lump sum price, then the Department shall direct the Design-Builder to perform such Utility Work on a Force Account basis pursuant to Section 15 (Change Order Risk Allocation) and Section 16 (Changes in the Work), provided that the conditions set forth in Section 6 (Utility Work and Third Party Agreements) are satisfied.

The amount of any Change Order issued for a Betterment shall be a direct pass-through of the lump sum price negotiated by the Design-Builder and the Utility Company as set forth in the applicable Supplemental Agreement (with no additional overhead or profit) or, if no such price has been negotiated, an amount determined in accordance with Section 15 (Change Order Risk Allocation) and Section 16 (Changes in the Work).

The Department will Approve the addition of a Betterment to the Work only if: (i) the Utility Company has agreed to the addition of such Betterment to the Work; (ii) such Betterment is compatible with the Project; and will not cause delays to the Project (iii) the Utility Company has agreed to reimburse the Department for all the costs thereof; (iv) the Utility Company has agreed as to the method (negotiated lump sum amount, or Force Account cost basis) of pricing such Utility Work; and (v) it is feasible to separate the cost/pricing of the Betterment work from that for any related Utility Work being furnished or performed by the Design-Builder. The Design-Builder shall provide the Department with such information, analyses and certificates as may be requested by the Department in connection with its Approval.

If any Betterment has been added to the Work and the Contract Amount has been increased accordingly by Change Order, but subsequently for any reason the Betterment is deleted from the Work, or the scope of the Design-Builder's Work with regard to such Betterment is materially reduced, then the Department shall be entitled to issue a Change Order reducing the Contract Amount to reflect the value of any reduction in the costs of the Work that is directly attributable to such deletion or reduction.

Any change in the Utility Work pursuant to Section 6.1 (Utility Work) shall not be considered a Department-Directed Change.

6.1.5. Utility Company/Third-Party Delays

Subject to the requirements of Section 15 (Change Order Risk Allocation) and Section 16 (Changes in the Work), the Design-Builder shall be entitled to an extension of a Completion Deadline for delays to the Critical Path associated with Utility Company/Third-Party Delays only in the circumstances described in this Section 6 (Utility Work and Third Party Agreements). The Design-Builder shall give notice to the Department of any circumstances which may lead to a claim of a Utility Company/Third-Party Delay within 72 hours of the Design-Builder's becoming aware that such circumstance has occurred or is likely to occur.

The Design-Builder shall bear 100 percent of the risk of Utility Company/Third-Party Delays, up to an aggregate amount of 10 Calendar Days of Utility Company/Third-Party Delays per Utility Company/Third-Party (regardless of how many Utilities of such Utility Company/Third-Party are causing delay). Subject to Section 6.1.5.2 (Concurrent Delays), if aggregate Utility Company/Third-Party Delays caused by a particular Utility Company/Third-Party exceed 10 Calendar Days, then the risk of aggregate Utility Company/Third-Party Delays in excess of 10 Calendar Days shall be borne equally by each party (i.e., any affected Completion Deadline shall be extended by one Calendar Day for every two Calendar Days of Utility Company/Third-Party Delay in excess of the initial aggregate 10 Calendar Days).

6.1.5.1. Conditions to Extensions for Utility/Third-Party Delays

Conditions Precedent. The Design-Builder shall not be entitled to any extension of any Completion Deadline(s) for a Utility Company/Third-Party Delay, and such Utility Company/Third-Party Delay shall not be counted toward the 10 Calendar Day cap on the Design-Builder's risk per Utility Company/Third-Party unless all of the following conditions are satisfied:

A. The Design-Builder has provided evidence reasonably satisfactory to the Department that: (i) the Design-Builder has fulfilled its obligation under the applicable Utility Company/Third-Party Agreement(s) to coordinate with the Utility Company/Third-Party to prevent or reduce such delays; and (ii) the Design-Builder has otherwise made diligent efforts to obtain the timely cooperation of the Utility Company/Third-Party but has been unable to obtain such timely cooperation.

B. If the Design-Builder is responsible for the Relocation, the Design-Builder has provided a reasonable Relocation plan to the Utility Company/Third-Party and the Design-Builder has obtained, or is in a position to timely obtain, all applicable approvals, authorizations, certifications, consents, exemptions, filings, leases, licenses, permits, registrations, options, and/or rulings required by or with any Governmental Person in order to design and construct such Relocations.

C. No circumstances exist which have delayed or are delaying the affected Relocation, other than those which fit within the definition of a Utility Company/Third-Party Delay.

6.1.5.2. Concurrent Delays

To the extent one or more Utility Company/Third-Party Delays is or are concurrent with another delay to the Critical Path, which is the Design-Builder's responsibility hereunder, but which is not a Utility Company/Third-Party Delay, then such Utility Company/Third-Party Delay(s) shall not be considered in calculating any 10 Calendar Day cap on the Design-Builder's risk. Furthermore, if two or more Utility Company/Third-Party Delays occur concurrently with each other (whether caused by the same Utility Company/Third-Party or by different Utility Companies/Third-Parties), then only one of such Utility Company/Third-Party Delays shall be considered in calculating a 10 Calendar Day cap on the Design-Builder's risk (in selecting between two or more Utility Companies/Third-Parties for such purpose, the Utility Company/Third-Party Delay caused by the Utility Company/Third-Party with the least amount of

accrued Utility Company/Third-Party Delay shall be selected and applied to the 10 Calendar Day cap on the Design-Builder's risk for such Utility Company/Third-Party).

6.1.6. Certain Obligations of Design-Builder

Multiple Relocations of the Same Utility: The Design-Builder shall endeavor to avoid multiple relocations of the same Utility, whether by the Utility Company or by the Design-Builder. After a Utility has been relocated once in order to accommodate the Project based on the Design-Builder's design, the Design-Builder shall be responsible for all costs incurred by either the Design-Builder or the Utility Company in order to subsequently relocate such Utility to accommodate the Project if the subsequent relocation is not caused by a Department-Directed Change or by the Utility Company. If the Utility Company performs such subsequent Relocation at the Department's expense, then the Design-Builder shall reimburse the Department for all amounts paid by the Department to such Utility Company in reimbursement for such subsequent relocation if the subsequent relocation is not caused by a Department-Directed Change or by the Utility Company. If the Design-Builder performs such subsequent Relocation, then the Design-Builder shall not receive any extension of any Completion Deadline or increase in the Contract Amount on account of the performance of such subsequent Relocation if the subsequent relocation is not caused by a Department-Directed Change or by the Utility Company.

Minimizing Costs: In delivering the Project, the Design-Builder shall take all reasonable steps to minimize costs to the Utility Companies and the Department to the extent practicable Utility-Related Right-of-Way Costs.

6.1.6.1. Utility Easements within ROW

With respect to Utility Easements located within the ROW depicted on the ROW Drawings included in Part 7 (Contract Drawings), whether or not such Utility Easements are themselves shown on such ROW Drawings originally included in Part 7 (Contract Drawings), the Department will be responsible for: (i) acquiring such Utility Easements (pursuant to Section 7.1 (Department Obtained Right-of-Way)); and (ii) any other compensation which may be obligated to pay to the Utility Company(s) in compensation for relinquishing the replaced Utility Easements.

6.1.6.2. Necessary Utility Easement Replacement

With respect to Utility Easements for which a replacement easement is necessary to meet the requirements of the Contract Documents with respect to the Project Configuration (with the understanding that a change shall be deemed "necessary" only if the lack of a replacement easement creates a problem in which the Design-Builder is unable to meet the Contract requirements without such replacement easement), the Department will be responsible for: (i) acquiring any necessary replacements therefor; and (ii) any other compensation which may be obligated to pay to the Utility Company(s) in compensation for relinquishing such Utility Easements.

6.1.6.3. Utility Easement Replacement for Design-Builder's Convenience

With respect to all other Utility Easements, the Design-Builder shall be responsible for, and shall reimburse the Department for any such costs incurred by the Department within 30 Calendar Days after receiving an invoice therefor: (A) acquiring any necessary replacements therefor; and (B) any other compensation which may be obligated to pay to the Utility Company(s) in compensation for relinquishing such Utility Easements. The Design-Builder may acquire any replacement Utility Easements under this Section 6.1.6.3 in accordance with Section 7.3.2 (Additional Right-of-Way).

6.1.7. Additional Restrictions on Change Orders

For Relocations, the Design-Builder shall bear the burden of proving that the Relocation cannot reasonably be avoided.

The Design-Builder shall not be entitled to an increase in the Contract Amount for any costs of coordinating with Utility Companies or for assisting the Department in coordinating with Utility Companies.

If the Design-Builder elects to make payments to Utility Companies or to undertake any other efforts that are not required by the terms of the Contract Documents, the Design-Builder shall not be entitled to a Change Order in connection therewith. The Design-Builder shall promptly notify the Department of the terms of any such arrangements.

6.2. Third-Party Agreements

In addition to the Utility Agreements (including agreements with Irrigation and Canal Companies) contained in Part 6 (Third-Party Agreements), the Department has negotiated agreements (or draft agreements) relating to the Project with certain local agencies (the "Local Agency Agreements,") copies of which are included in Part 6 (Third-Party Agreements).

The Design-Builder agrees that the Contract Amount covers performance of the Design-Builder's obligations under the Third-Party Agreements as described in this Section 6.2.

6.2.1. Performance of Obligations Under Local Agency Agreements and RR Agreement

The Design-Builder is responsible for performing all obligations of the Department's Design-Builder, contractors and subcontractors (if contemplated) set forth in the Local Agency Agreements and the obligations therein allocated to the Design-Builder in "Third-Party Agreements, Exceptions to Division of UDOT/Design-Builder Responsibilities" provided in Part 6 (Third-Party Agreements); provided, however, that the Department may, in its sole discretion, exclude any such obligation from the Design-Builder's responsibility by providing written notice thereof to the Design-Builder. To the extent any such obligation is not clear, the Design-Builder shall immediately notify the Department and the Department's interpretation of the obligation shall control. The Design-Builder acknowledges and agrees that the Local Agency Agreements may contain certain Work requirements that are not specified elsewhere in the Contract Documents. The Design-Builder is responsible for addressing all such requirements. The Design-Builder further acknowledges and agrees that it will be required to comply with all requirements of encroachment permits and other permits that it may be required to obtain from the RR and local agencies in connection with the Project, in addition to the specific requirements stated in said agreements.

6.2.2. Third Party Betterments

Certain Betterments are included in the Work, as described in Part 6 (Third-Party Agreements). Additional Betterments may be separately requested by the Third Party and negotiated directly between the Third Party and the Design-Builder.

6.2.3. Design Changes Impacting Local Agency or RR Facilities

The Design-Builder shall reimburse the Department for any amounts payable by the Department to local agencies or the RR due to changes in the design for their facilities from those that have been previously approved by the Local Agency or RR.

6.2.4. Restriction on Change Orders

Any requests for Change Orders relating to Third Party or RR facilities shall be subject to the requirements and limitations contained in Section 15 (Change Order Risk Allocation) and Section 16 (Changes in the Work).

6.3. Amendments to Third-Party Agreements

Any amendment to a Utility Company/Third Party Agreement (including replacing a draft agreement with an executed agreement) shall be considered part of the Contract Documents upon the Department's delivery of a copy to the Design-Builder together with notification stating that the amendment constitutes a Contract Document. Within 14 Calendar Days after receipt of any such amendment that is material, the Design-Builder shall provide a PCO Notice to the Department in accordance with Section 16 (Changes in the Work) if it considers a Department-Directed Change to have occurred as a result thereof. Notwithstanding any contrary provision of the Contract Documents, the Design-Builder's failure to provide the foregoing notice shall constitute a waiver by the Design-Builder of the right to later claim that a Department-Directed Change has occurred with respect to any reallocation of Work responsibility which should have been covered by such notice. For purposes of this Section 6.3, any such amendments delivered during the period after the Proposal Due Date and prior to issuance of NTP shall be deemed to have been delivered to the Design-Builder one day after issuance of NTP. If any such amendment reduced the scope of Work, the Department shall be entitled to a reduction of the Contract Amount.

7— RIGHT-OF-WAY AND ACCESS

7.1. Department Obtained Right-of-Way

The Department has identified certain real property it believes is needed for ROW to construct the Project and anticipates acquiring such ROW. This ROW is depicted in the Right-of-Way Drawings (ROW Drawings) in Part 7 (Contract Drawings). The Department has provided the Right-of-Way Schedule (ROW Schedule) in Part 4-14 (Right-of-Way) to acquire such real property interests. The Department will provide access to the real property identified on the ROW Drawings by the dates in the ROW Schedule.

7.2. Responsibilities of the Department

7.2.1. Notice of Access

The Department will notify the Design-Builder when it has secured access to each parcel identified on the ROW Drawings. Prior to entering any parcel identified on the ROW Drawings, the Design-Builder shall confirm it has received notice from the Department that is has right of access to the parcel. All other property within the Construction Limit shown on the ROW Drawings is available for access by the Design-Builder in accordance with the Contract Documents.

7.2.2. Delay in Providing Access

If the Department fails to provide access in accordance with the ROW Schedule or at any time determines it will be unable to provide access to a parcel(s) in accordance with the ROW Schedule, the Department will notify the Design-Builder of the revised projected date(s) for delivery of access. Upon such notice or, in the absence of such notice, upon the failure to provide access on the date specified on the ROW Schedule, the Design-Builder shall: (i) take immediate action to minimize any cost and time impact and shall work around such parcel until access can be provided, including rescheduling and re-sequencing the Work to minimize or avoid any delay to the Project; and (ii) provide the Department written notice within seven Calendar Days after receipt of such notice or upon the Department's failure to meet the ROW Schedule whether lack of access will result in a delay to a Completion Deadline. Failure to provide such notice shall bar the Design-Builder from asserting a delay under this Section 7.2.2.

7.2.3. Material Errors in Right-of-Way Drawings

Upon the Design-Builder's fulfillment of all applicable requirements of this Section 7 (Right-of-Way and Access), and subject to the limitations contained therein, the Department shall be responsible for, and agrees to issue Change Orders: (i) to compensate the Design-Builder for additional costs directly attributable to material errors in the ROW limits indicated in the ROW Drawings; and (ii) to extend the Completion Deadlines as the result of any delay in the Critical Path affecting a Completion Deadline caused by any such errors. The Design-Builder shall provide written notice to the Department immediately upon discovery of any such material error. The Department, in the Department's sole discretion, shall have the right to cure any such error such as by acquiring additional property.

7.3. Responsibilities of the Design-Builder

If the Design-Builder's Work requires any additional interests in real property other than (i) the parcels and easements acquired by the Department and shown on the ROW Drawings, and (ii) the additional property the Department agrees to acquire in accordance with Section 7.3.2 (Additional Right-of-Way), the real property shall be acquired by the Design-Builder. The Design-Builder shall be responsible for the design and acquisition of the property, easement or ROW. See Part 4-14 (Right-of-Way).

7.3.1. Right-of-Way Schedule

The ROW Schedule shows the minimum dates the Department reserves for acquiring access to the parcels identified on the ROW Drawings for the Project. These dates shall be used by the Design-Builder for scheduling so that no Work shall be shown in the schedule to start on any parcel until the anticipated date of right of entry.

7.3.2. Additional Right-of-Way

7.3.2.1. Due to Department-Directed Change

Any property not identified on the ROW Drawings that is required as the result of a Department-Directed Change or a Necessary Project Configuration Change will be addressed in the respective Department-Directed Change or Necessary Project Configuration Change.

7.3.2.2. Acquisition Process for ROW for Design-Builder's Convenience

Any additional ROW acquired under this Section 7.3.2.2 and not identified on the ROW Drawings and not required under Section 7.3.2.1 (Due to Department-Directed Change) is for the Design-Builder's convenience. ROW required for an ATC is for the Design-Builder's convenience. The Design-Builder shall not be eligible for an increase in the Contract Amount or extension of the Completion Deadlines as a result of any acquisitions of ROW for the Design-Builder's convenience. The Design-Builder may acquire ROW for the Design-Builder's convenience, provided that the Design-Builder demonstrates, to the satisfaction of the Department, in the Department's sole discretion, that such property is required for permanent improvements or temporary interests for the Project, and provided that the Design-Builder agrees that the cost and the schedule for such acquisition is the sole responsibility of the Design-Builder. In the event that the Design-Builder acquires ROW for their convenience, the Design-Builder shall complete the acquisitions and adhere to the process and provisions for ROW acquisition described in Part 4-14, Attachment 14-C (Right-of-Way Acquisition for Design-Builder's Convenience). The Design-Builder shall reimburse the Department for any costs (including the Department's ROW services, attorneys', accountants' and expert witness fees and costs) of acquiring any real property for the Design-Builder's convenience within 30 Calendar Days after receipt of an invoice for such costs.

7.4. Failure to Have Necessary Rights of Access

Do not enter or trespass on public or private property if the necessary rights of access have not been secured. If a Design-Builder-Related Entity enters any property in connection with the Project without having all necessary rights of access, in addition to all other rights and remedies provided by law or equity or available under the Contract or otherwise, the Design-Builder shall be responsible for (i) its costs and all costs incurred by the Department as a result thereof and (ii) any delay to the Completion Deadlines to the extent the Design-Builder-Related Entity's entry onto such property causes, results in, or contributes to a delay by the Department in acquiring said property or parcel, or any other property or parcel owned by the same owner.

7.5. Use of UDOT Lands

Do not assume that any State-owned land outside the Construction Limit is acceptable or available for Project use. The use of such land is acceptable only at the Department's sole discretion and with its prior written consent, and as specified in the conditions for such use. After the Approved use of any such State owned land, return it to its previous condition and free of any Design-Builder-added hazardous material or other harmful material.

8— EQUAL EMPLOYMENT OPPORTUNITY; SUBCONTRACTS; LABOR; KEY PERSONNEL; PROJECT COMMUNICATIONS

The Design-Builder confirms that it has an equal employment opportunity policy ensuring equal employment opportunity without regard to race, color, national origin, sex, age, religion, or disability; and that it maintains no employee facilities segregated on the basis of race, color, religion, or national origin.

8.1. State Equal Employment Opportunity Requirements

8.1.1. Selection of Labor

During the performance of this Contract, do not discriminate against labor from any other State, possession, or territory of the United States.

8.1.2. Employment Practices

During the performance of this Contract, the Design-Builder agrees as follows:

The Design-Builder shall not discriminate against any employee or applicant for employment because of race, religion, sex, color, national origin, age, or disability. Take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age, or disability. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment and recruitment advertising; layoff and termination; rate of pay and other forms of compensation; and selection for training, including apprenticeship. In conspicuous places available to employees and applicants for employment, post notices (to be provided by the Utah Department of Transportation [Department]) setting forth the provisions of this nondiscrimination clause.

The Design-Builder shall, in all solicitations and advertisements for employees placed by or on behalf of the Design-Builder, state that all qualified applicants will receive consideration for employment without regard to race, religion, sex, color, national origin, age, or disability.

Send to each labor union or representative or workers with whom the Design-Builder has a collective bargaining agreement or other contract or understanding a notice (to be provided by the Department) advising them of the Design-Builder's commitments under this section 8.1.2 and post copies of the notice in conspicuous places available to employees and applicants for employment.

In the event of the Design-Builder's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Design-Builder may be declared ineligible for further State contracts.

The Design-Builder shall include the provisions of this Section 8.1.2 in every subcontract or purchase order so that such provision will be binding upon each Subcontractor or vendor. The Design-Builder shall take such action with respect to any subcontract or purchase order as the Department may direct as means of enforcing such provisions, including sanctions for noncompliance.

8.1.3. On the Job Training (OJT) Hours

Not Used.

8.2. Contract Subletting

Design-Builder shall not enter into any Subcontract, nor allow any Subcontractors to enter into a Subcontract, without first notifying the Department of the proposed Subcontractor and Work to be performed by the Subcontractor, at least 10 Calendar Days in advance of execution and delivery of the Subcontract. The Department's failure to object to a Subcontract shall not be construed to relieve the Design-Builder or Surety of any responsibility for fulfilling all of the requirements of the Contract.

Subcontracts, whether committed to in writing or by an informal, unwritten arrangement or transfer of the Contract, or any part of it or its obligations, do not relieve liability under the Contract or its Sureties under the Contract Bonds. As part of its Contract with the Department, the Design-Builder accepts liability for any claims for damages or liability resulting from an act or omission of any person who carried out Work on the Design-Builder's behalf, whether that working relationship is through a Subcontract or carried out by an informal, unwritten agreement. The Design-Builder agrees to defend, hold harmless and indemnify the Department, its employees and the State of Utah for any damages, liability, or other expenses, including but not limited to attorney's fees, discovery and investigative costs, and mediation, arbitration, trial, and court costs which may be incurred by such a person.

Design-Builder shall not allow subcontracted Work to begin until the request to sublet Work is approved by Department.

For all Subcontracts, the Design-Builder shall:

A. Provide for a reduction in retained money equal to the percentage retained in accordance with Section 12.4 (Retention).

B. Include a statement describing the method of distribution of any adjustment due to price increases or decreases using applicable price adjustment specifications for fuel, asphalt, cement, common carrier rates, etc.

Each Subcontract involving performance of services within the State shall require the Subcontractor to (1) comply with Federal and State Laws regarding employment and verification of employment eligibility of persons employed by the Subcontractor, and (2) to certify compliance with the requirements of Utah Code Section 63G-12-302 and this Contract.

Subcontractors entering into a contract valued at $750,000 or greater are required to maintain an offer of qualified health insurance coverage for its employees that live and/or work in the State of Utah and their dependents for the duration of the Project, as required by Utah Code Section 72-6-107.5 and the Utah

Administrative Code R916-5. Refer to Section 8.10 (Health Insurance Coverage) for requirements for demonstration of compliance regarding the offering of "Qualified Health Insurance Coverage" to their employees.

8.3. Subcontracting Requirements

The Design-Builder shall comply with all applicable requirements of the Contract Documents relating to Subcontracts, and shall ensure that all Subcontractors performing Work on the Project comply with all applicable requirements of the Contract Documents relating to subcontracting. The Design-Builder shall not add, delete, or change the role of any Major Contractor without the prior written Approval of the Department.

8.4. Third Party Beneficiary Rights

Each Subcontract shall provide that, pursuant to terms in form and substance satisfactory to the Department, the Department is a Third-Party beneficiary of the Subcontract and shall have the right to enforce all terms of the Subcontract for its own benefit. The Department's Third-Party beneficiary rights shall not operate to make the Department responsible or liable for any breach of the Subcontract by the Design-Builder or for any amounts due and owing under the Subcontract or relieve the Design-Builder from its obligations.

8.5. Subcontract Terms

Each Subcontract shall include terms and conditions sufficient to ensure compliance by the Subcontractor with all applicable requirements of the Contract Documents as well as any other terms that are specifically required by the Contract Documents to be included in the Subcontracts including Sections 18.2 (Design-Builder Responsibilities Upon Termination), 18.9 (Inclusion in Subcontracts) and 19.2.1 (Rights of the Department).

8.6. Subcontract Data

The Design-Builder shall notify the Department, in writing, of the name and address of, and licenses held by, each Subcontractor (excluding Suppliers), as soon as the potential Subcontractor has been identified by the Design-Builder, but in no event less than 14 Calendar Days prior to the scheduled initiation of Work by such proposed Subcontractor. For Subcontracts of or anticipated to be $750,000 or more, the Design-Builder shall include a certification with such notification that the Subcontractor has and will maintain an offer of qualified health insurance coverage for the Subcontractor's employees and the employees' dependents during the duration of the Subcontract. The Design-Builder shall provide the Department with a list of its Subcontractors (including Suppliers) from time to time upon request by the Department; shall allow the Department access to all Subcontracts and records regarding Subcontracts; and shall deliver to the Department, within 10 Calendar Days after execution, copies of all Subcontracts with Major Contractors and, within 10 Calendar Days after receipt of a request from the Department, copies of any other Subcontracts identified in the request.

8.7. Responsibility for Work by Subcontractors

Notwithstanding any Subcontract or agreement with any Subcontractor, the Design-Builder shall be fully responsible for all of the Work. The Department shall not be bound by any Subcontract, and no Subcontract shall include a provision purporting to bind the Department.

8.8. Key Personnel

Key Personnel were identified in the RFQ and included in the Proposer's SOQ for the Project, for which Sections will be a Contract Document to the extent set forth in Part 1 (Agreement), Section 1.3 (Order of Precedence). These Key Personnel are set forth to effectively manage all aspects of the work in a quality, timely, and effective manner and will integrate the organization with the Department in a cohesive, seamless manner.

8.8.1. Department Requests for Additional Key Personnel

The Department may, with the Design-Builder's acceptance, add key positions at no cost to the Department. The Department shall have the right to review the qualifications and character of each individual to be assigned to a key position (including personnel employed by Subcontractors) and to Approve or disapprove use of such key person in such key position prior to the commencement of any Work by such individual or during the prosecution of the Work.

8.8.2. Replacement of Key Personnel

The Design-Builder shall notify the Department in writing of any proposed changes in any Key Personnel, and shall submit to the Department a resume of proposed Key Personnel along with a written request documenting the proposed change and demonstrating, to the Department's satisfaction, that the change shall be equal to or better than the original Key Personnel. Such changes will require prior Approval by the Department; the Design-Builder shall not change any Key Personnel without the prior written Approval of the Department.

8.8.3. Other Projects' Key Personnel

Key Personnel who are currently committed on other projects, that carry owners into this contract term, will need to obtain a letter of release from that project's Project Manager to participate on this Project. If a letter is not obtained, the Design-Builder will be required to replace Key Personnel with equal or better key personnel subject to Department Approval.

8.8.4. Fulfill and Commit to Key Personnel

The Design-Builder acknowledges and agrees that the award of the Contract by the Department to the Design-Builder was based, in large part, on the qualifications and experience of the personnel listed in the Statement of Qualifications and the Proposal, and the Design-Builder's commitment that such individuals would be available to undertake and perform the Work until Contract Completion. The Design-Builder represents, warrants and covenants that such individuals are available for and will fulfill the roles identified for them in the Statement of Qualifications and the Proposal in connection with the Work. Unless otherwise agreed to by the Department in writing, individuals filling Key Personnel roles shall devote a sufficient amount of their time for the applicable role with respect to the prosecution and performance of the Work, and the Design-Builder shall document such commitment to the Department's satisfaction upon the Department's request.

8.9. Character of Workers

All individuals performing the Work shall have the skill and experience and any licenses or certifications required to perform the Work assigned to them. If the Department determines in its sole discretion that any Person employed by the Design-Builder or by any Subcontractor is not performing the Work properly and skillfully in compliance with the applicable standards, or is intemperate or disorderly, then, at the written request of the Department, the Design-Builder or such Subcontractor shall remove such Person and such Person shall not be re-employed on the Project without the prior Approval of the Department. If the Design-Builder or the Subcontractor fails to remove such Person(s) or fails to furnish skilled and

experienced personnel for the proper performance of the Work, then the Department may, in its sole discretion, suspend the affected portion of the Work by delivery of written notice of such suspension to the Design-Builder. Such suspension shall in no way relieve the Design-Builder of any obligation contained in the Contract Documents or entitle the Design-Builder to a Change Order. Once compliance is achieved, the Design-Builder shall be entitled to and shall promptly resume the Work.

8.10. Health Insurance Coverage

The Design-Builder certifies that it is in compliance with Utah Code Section 72-6-107.5 and Utah Administrative Code R916-5 and certifies that it has obtained statements from all Subcontractors on Subcontracts valued or anticipated to be valued at $750,000 or more certifying that they are in compliance with such requirements. The Design-Builder shall require in all Subcontracts valued or anticipated to be valued at $750,000 or more that the Subcontractor certifies compliance with Utah Code Section 72-6-107.5 and Administrative Rule R916-5. The Design-Builder agrees to provide recertifications regarding compliance, and to require its Subcontractors on Subcontracts valued or anticipated to be valued at $750,000 or more to provide recertifications, if requested to do so by the Department pursuant to R916-5.

9— RISK OF LOSS

9.1. Site Security

The Design-Builder shall provide appropriate security for the Project site, including securing any buildings from entry, and shall take all reasonable precautions and provide protection to prevent damage, injury or loss to the Work and materials and equipment to be incorporated therein, as well as all other property at the site, whether owned by the Design-Builder, the Department, or any other Person.

9.2. Maintenance and Repair of Work and On-Site Property

9.2.1. Responsibility of Design-Builder

The Design-Builder shall maintain, rebuild, repair, restore, replace, or otherwise correct all Work (including improvements constructed in whole or in part and including goods, materials, equipment, and supplies which are purchased for permanent installation in, or for use during construction of or maintenance of the Project, regardless of whether the Department has title thereto under the Contract Documents) that is lost, injured or damaged from the date of NTP until the date of acceptance of maintenance liability by the Department or third parties as specified in Section 9.2.2 (Relief from Liability for Maintenance), after which time care, custody and control of the improvements constructed under the Project shall pass to the Department. Additional requirements regarding maintenance during construction are set forth in Part 4-09 (Maintenance During Construction).

9.2.2. Relief from Liability for Maintenance

Responsibility for maintenance of improvements constructed under the Project and not excluded from the Notice of Substantial Completion shall be transferred to the Department as of the date on which the Department issues the Notice of Substantial Completion. Responsibility for maintenance of all remaining improvements constructed under the Project shall be transferred to the Department as of the date on which the Department issues the Notice of Contract Completion. Nothing in this Section 9 (Risk of Loss) shall be construed as waiving the Department's rights to enforce Warranties and other obligations for the Project Work (including Design Documents) that survive any Notice of Completion and/or Notice of Contract Completion and that are unrelated to maintenance of the Project or Force Majeure. Notwithstanding the foregoing, all elements of the Work that will be owned by Persons other than the

Department (such as Utility facilities) will be considered accepted for purposes of maintenance responsibility only as of the date of acceptance of maintenance responsibilities by such Persons.

9.2.3. Failure to Provide Maintenance

If the Department deems the Design-Builder has failed to provide adequate maintenance during construction, the Department will issue an oral notification of said failure. This oral notification will be followed by a written notification to commence and continue correction of such failure. Failure by the Design-Builder to correct the stated deficiency within 24 hours or within the stated amount of time directed by the oral notification or as stated within the Contract Documents may result in the Department performing such work with Department forces without prejudice to other remedies the Department may have. In such case, the Department will deduct such amount from future payments to the Design-Builder, or such amount will be payable to the Department within 30 days after the Design-Builder's receipt of an invoice therefor.

9.3. Injury and Damage to Persons or Off-Site Property

9.3.1. Bodily Injury Claims

The Design-Builder shall assume liability for bodily injury (including death) arising out of negligent acts or omissions that are: associated with the Contract; and caused by the Design-Builder, the Design-Builder's agents, independent contractors, Subcontractors at any tier, suppliers at any tier, or a combination thereof.

9.3.2. Precautions; Restoration

The Design-Builder shall take all reasonable precautions and provide protection to prevent damage, injury or loss to off-Site property, which includes property adjacent to the Project site and property likely to be affected by the Work. The Design-Builder shall restore damaged, injured, or lost property (i) caused by an act or omission of any Design-Builder-Related Entity to a condition similar or equal to that existing before the damage, injury or loss occurred; and (ii) as required under Part 4-20 (Photographs).

Property Damage Claims (other than damage to the Project/Work itself): The Design-Builder shall assume liability for physical loss or damage to Third -Party property (including loss of use resulting from property damage) arising out of negligent acts or omissions that are associated with the Contract and caused by the Design-Builder, the Design-Builder's agents, independent contractors, Subcontractors at any tier, suppliers at any tier, or a combination thereof. Design-Builder shall restore damaged property to a condition similar or equal to that condition existing before the damage, pay to restore the damaged property to that condition, or pay to replace the damaged property.

(1) If government property, the Department will determine whether the Design-Builder's restoration sufficiently corrected the damage.
(2) If private property, the property owner will determine whether the Design-Builder's restoration sufficiently corrected the damage. After restoring damaged property or paying for damaged property as required, Design-Builder shall obtain a release from the property owner and submit the release to the Department. The Department will not issue Contract Completion until the Design-Builder has obtained and submitted the required release unless the property owner acts unreasonably in refusing to issue a release.

9.4. Third-Party Agreements

The Design-Builder shall comply with all provisions in the Third Party Agreements included in Part 6 (Third-Party Agreements).

9.5. Title

The Design-Builder warrants that it owns, or will own, and has, or will have, good and marketable title to all materials, equipment, tools and supplies furnished, or to be furnished, by it and its Subcontractors that become part of the Project or are purchased for the Department for the operation, maintenance, or repair thereof, free and clear of all Liens. Title to all of such materials, equipment, tools and supplies which shall have been delivered to the Site shall pass to the Department upon incorporation into the Work or upon payment by the Department to the Design-Builder for the materials, equipment, tools and supplies furnished, whichever occurs first. Notwithstanding any such passage of title, Design-Builder will protect the title from all Liens or bond claims. Notwithstanding any such passage of title, and from NTP through the Department's issuance of the Notice of Contract Completion, the Design-Builder shall retain sole care, custody, and control of such materials, equipment, tools and supplies, shall exercise due care with respect to these items and the Site as required in Section 9.1 (Site Security), and repair, replace, or otherwise correct such items upon physical loss or damage.

10— PROJECT COMMUNICATIONS

10.1. Project Directory

Provide a directory showing all Key Personnel identified by function within 10 Calendar Days of NTP. The directory shall be updated throughout the course of the Project to remain current. The directory shall include the following information for each person listed: (1) Project title, (2) area of responsibility, (3) office location, (4) e-mail address, and (5) mobile telephone number. For offices identified, provide the following: (1) office address and location, and (2) main office telephone number.

10.2. Organization Chart

The Design-Builder shall provide the Department a Project organization chart within 10 Calendar Days of NTP. The organization chart shall be updated throughout the course of the Project to remain current. The organization chart shall graphically represent the hierarchy and functional interaction and responsibilities of each of the following personnel:

A. All Key Personnel

B. All QC positions

C. Environmental compliance

D. Subcontracts and procurement

E. Design for each discipline

F. Coordination for each Third Party, including Utilities, and other Agencies

G. Safety

H. Project controls

10.3. Project Meetings

Contact the Department within five (5) Calendar Days of receiving Notice to Proceed to schedule a pre-Work meeting. The Design-Builder shall plan for weekly and monthly meetings with the Department to discuss Project progress, issues, and all planned Work. Separate weekly meetings shall include: Quality, Project progress (status), Safety, Utilities, Environmental, and MOT. Monthly meetings shall include: Partnering, Schedule, and Payment Applications. Key Personnel or their designees shall attend meetings

such that each management function is represented in each meeting. The types of meetings, their topics and required attendees shall be mutually developed and agreed upon by the Design-Builder and the Department. The Design-Builder shall prepare and distribute agenda and meeting minutes for all regular meetings. All meeting minutes shall not become final until the Department reviews and provides comments to the minutes, which shall be included in the meeting minutes. The Design-Builder shall provide all meeting facilities unless otherwise agreed.

11— SCHEDULING AND PROGRESS

11.1. Scheduler

The Project Baseline Schedule must be prepared and managed by a scheduler with at least five years experience managing and preparing construction schedules. The scheduler cannot be a Key Personnel.

11.2. Project Baseline Schedules

Project Baseline Schedule shall mean any of the following schedules identified under this Section 11.1 (Project Baseline Schedules). References hereinafter to Project Baseline Schedule shall be any of those identified in this Section 11.1 (Project Baseline Schedules), as determined by context. If any ambiguity exists as to which Project Baseline Schedule is referenced, it shall be determined by the Department.

11.2.1. Baseline Schedule

The Baseline Schedule shall be based upon the Proposal Schedule and shall include the Completion Deadlines as set by the Contract, which shall not be changed except by Change Order. The Baseline Schedule shall be the Design-Builder's original plan for performing the Work from Award through Contract Completion and shall show all activities in sufficient detail to plan, monitor, and evaluate the progress of the Work. The Baseline Schedule shall represent conditions of the Project at NTP.

Once accepted in writing, the Baseline Schedule shall become the schedule against which all progress of the Work shall be measured. The Baseline Schedule shall not change after acceptance except as provided by this Section 11.1. The Baseline Schedule shall be the basis for the monthly Project Schedule Updates.

11.2.2. Revised Baseline Schedules

If substantial changes to the Baseline Schedule are necessary or have been made over time, the Design-Builder may propose or the Department may require that a Revised Baseline Schedule be developed and implemented. Any Revised Baseline Schedule is subject to review and comment by the Department, and the Design-Builder shall either address or respond to such comments to the Department's satisfaction and obtain Acceptance prior to implementation. Each Revised Baseline Schedule shall have a unique name that includes a sequential revision number. This schedule shall show all then-current progress of the Work, including the status of all activities, sequencing, and logic changes, and shall represent the Design-Builder's best knowledge and planning at that time. The Design-Builder acknowledges that the costs required to provide any Revised Baseline Schedules are incorporated into its Project scheduling costs. Once accepted, a Revised Baseline Schedule shall be the basis for all subsequent Project Schedule Updates.

11.2.3. Recovery Schedule

Provide a Recovery Schedule when it becomes apparent that the Work cannot be completed by the contractual Completion Deadline(s) identified as: i) The current Project Schedule Update is projecting

21 or more Calendar Days delay to the Completion Deadline. ii) Activities which were not previously critical become critical, or near-critical activities increase to more than 15% without justification.

The proposed Recovery Schedule shall be based on the latest accepted Project Schedule Update and supplemented by a written recovery plan detailing how delays will be mitigated to achieve Completion Deadline(s) and include a detailed revised resource plan. The Recovery Schedule shall comply with all Project Baseline Schedule requirements.

The Department will notify the Design-Builder within 10 Working Days after receipt of the proposed Recovery Schedule whether the schedule is accepted or returned with comments. The Design-Builder shall promptly address such comments to the Department's satisfaction. Once a Recovery Schedule is accepted, it shall become the current Revised Baseline Schedule. The Department's acceptance of any Recovery Schedule shall not relieve the Design-Builder from its exclusive responsibility for scheduling, managing, and performing the Work within the Completion Deadlines.

The Design-Builder shall provide additional labor, equipment, and/or materials, work additional shifts, and/or expedite procurement to complete the Work within the Completion Deadlines at no additional cost to the Department. The Department may, in its sole discretion and at no additional cost to the Department, require the Recovery Schedule be cost- and resource-loaded in order to be accepted. The Design-Builder acknowledges that the costs required to provide any Recovery Schedule is incorporated into its Project scheduling costs

The Design-Builder's refusal, failure, or neglect to take appropriate action to submit a Recovery Schedule, including a recovery plan and resource plan, shall constitute sufficient evidence that the Design-Builder is not prosecuting the Work, or separable part of the Work, with the diligence that will ensure its completion within the applicable Completion Deadline(s). Such lack of action shall constitute sufficient basis for the Department to withhold the current month's progress payment due and shall constitute grounds for default under Section 19 (DEFAULT).

11.2.4. Baseline Schedule Development

All Project Baseline Schedules referenced in Section 11.1 (Project Baseline Schedules) shall comply with the following:

11.2.4.1. Project Baseline Schedule Pre-Submittal Meeting

A. Conduct a pre-submittal schedule meeting to:

1. Review the requirements of this section prior to submittal of a Project Baseline Schedule.
2. Determine estimate period closing dates upon which the monthly Project Schedule Updates and progress payments will be generated (with Approval of the Department).

B. Attendees shall include, at a minimum, the Design-Builder's Project Manager, Design-Builder's qualified scheduler, and the Department.

C. The Design-Builder may arrange this meeting prior to NTP to facilitate timely development of the Project Baseline Schedule.

11.2.4.2. General Requirements

Provide the Department with the Project Baseline Schedule using Primavera P6 version 8 (software versions as approved by the Department). Provide a Baseline Schedule Narrative as described in this section.

11.2.4.3. Project Baseline Schedule Submission

Establish a sequential numbering system for schedule submittals and associated reports to allow easy identification of Project Baseline Schedule(s), Project Schedule Updates and resubmissions, as acceptable to the Department.

Submit to the Department a Project Baseline Schedule with a Baseline Schedule Narrative in a format acceptable to the Department, to include:

A. One electronic copy of Primavera software file (.XER file).

B. One electronic (PDF file) copy of narrative report.

C. One electronic (PDF file) copy of layouts as generated from Primavera, as outlined in the Baseline Schedule Narrative Requirements in this section.

The Department will review the Project Baseline Schedule and return it as accepted, accepted with comments, or returned with comments for resubmission within 10 Working Days from the date of receipt, unless otherwise noted.

The Design-Builder shall address comments and revise the schedule as necessary to the satisfaction of the Department and return within five Working Days.

No progress payments are made before the Department accepts the Baseline Schedule.

The Design-Builder is solely responsible for planning and executing the Work. The Department's acceptance of a Project Baseline Schedule does not:

1. Imply Approval of any construction methods or relieve the Design-Builder of responsibility to provide sufficient materials, equipment, and labor to complete Work in accordance with the Contract.
2. Attest to the validity of assumptions, activities, relationships, sequences, resource allocations, or any other aspect of the Project Baseline Schedule.

Failure to include any element of work required by the Contract in the accepted Project Baseline Schedule does not relieve the Design-Builder's responsibility to perform such work.

The Project Baseline Schedule does not modify the Contract Documents.

11.2.4.4. Project Baseline Schedule Requirements

A. Define a complete and logical plan that can realistically be accomplished for executing the Work defined in the Contract. Develop a Project Baseline Schedule that reflects the proposed approach to accomplish the Work.

B. Designate the Baseline Schedule Data Date as the day before the Notice to Proceed date, or alternate date as approved by the Department. The Data Date for subsequent Project Baseline Schedule submissions should be the day the estimate period closes or as agreed by the Department.

C. Include a well-defined Work Breakdown Structure (WBS) that clearly communicates Project organization and approach to Work. Each activity must be assigned to a WBS. Provide the preliminary WBS to the Department for review and acceptance prior to Baseline Schedule submittal.

D. Develop and assign Activity Project Codes to all activities in the schedule; begin each Activity Project Code name with the Department's Project Identification Number followed by a dash. Establish code values as agreed upon with the Department in the Baseline Schedule Pre-Submittal Meeting. A guideline for code values is provided in the

following table.

WORK ELEMENT CODE VALUES

Code Value	*Description*
AGGREGATE	Granular, UTBC, Finish
CLEAR&GRUB	Clear & Grub, Removal
DESIGN	Design, multiple disciplines
DEMO	Building demolition, other
DRAINAGE	Pipe, irrigation, ponds
EXCAVATION	Cut, fill, excavate
FLATWORK	Curb, gutter, sidewalks
LANDSCAPE	Topsoil, mulch, seeding
MOT	Maintenance of Traffic
PAVING	PCCP, HMA, OGSC, SMA, lean concrete
PROCURE	Procurement of materials
ROW	Right-of-Way
SIGNALS	Signals, foundations, poles
SIGNING	Signing - Permanent
STRIPING	Striping - Permanent
STRUCTURES	Box culvert, headwall (non-bridge)
SUBSTRUCTURE	Foundation, Columns, Bent, Drilled Shafts, Piles, Abutments (bridge)
SUPERSTRUCTURE	Girders, Deck, Approach Slabs, Parapet, Polymer Overlay (bridge), Membrane with SMA overlay
SURCHARGE	Consolidation & Settlement Times
TRAIL	Trails - Pedestrian & Bike
UTILITY-COMM	Utility Communication
UTILITY-GAS	Utility Gas
UTILITY-POWER	Utility Power
UTILITY-WATER	Utility Water/Irrigation/Sewer
WALLS	Noise, MSE, Retaining
NA	Not Applicable – Not on Mainline, Misc, LOE, etc.

E. Clearly define calendars.

1. Include Department Class I holidays as non-work days.
2. Appropriately account for weather. Account for weather and seasonal conditions within the Project Schedule. Use custom calendars to show weather, seasonal conditions, or seasonal shutdowns.
3. Include calendars that adequately represent non-work days associated with limitations (such as paving, utilities, landscape, etc.).

4. Include a seven day calendar to be utilized for cure, settlement, and other activities as appropriate.
5. Assign calendars consistently among similar activity types.
6. In Primavera, establish Project Calendars. Begin each calendar name with the Department's Project Identification Number followed by a dash.

F. Provide a sufficient number of activities to assure adequate planning and to allow monitoring and evaluation of progress and analysis of time impacts.

1. Define activities to a level of detail acceptable to the Department.
2. A Project Baseline Schedule with less than 500 activities or more than 2,000 activities requires justification by the Design-Builder and approval by the Department.
3. Identify all design packages intended to be Released for Construction, which at a minimum shall have logic ties to the design submittal, review activities and construction Work associated with that design package.
4. Depict and account for the acquiring of permits.
5. Show Maintenance of Traffic (MOT) activities.
6. Show the interaction of all activities, with either the Department or Third-Parties, that affect progress of the Work. Include activities identifying Third-Parties' design, agreement preparation and coordination, review periods (for both Department and the Third-Party), and relocation/construction. See Part 6 (Third-Party Agreements) and Part 4-19 (Utilities).
7. Include separate activities for cure time, major inspection points requiring preparation, submittal periods, and other time consuming activities.
8. Include additional activities as required by the Department at any time throughout the Project.

G. Include NTP, the Completion Deadlines, Project Milestones, and other milestones used by the Design-Builder to manage and track progress.

H. Include activities that define significant interaction points with the Department and other entities such as subcontractors, vendors and suppliers, utilities, local governments, and special service districts. Make schedules from these entities available to the Department when requested.

I. Describe activities so that the scope of work is readily identifiable and progress on each activity can be measured.

1. Provide a unique activity description. Indicate in each activity description its associated scope and location of work (such as type of work, bridge number, station to station locations, side of highway, pipe number, etc.). Also include a verb in the activity description to indicate the action undertaken (such as install, place, fabricate, etc.). Do not use duplicate activity descriptions.
2. Assign a unique activity ID number to all activities. Do not reuse activity numbers.

J. Define the duration of each activity.

1. Activity durations, except milestones, must be one day or longer. Limit the maximum duration of any activity to 30 Calendar Days unless otherwise accepted by the Department. Exceptions may include continuing activities as described in Section 12.1.3 (Continuing Activities), non-work type activities

such as mobilization, fabrication, settlement durations, curing, and long lead procurement items.

2. Use of level of effort (LOE) activities requires Department Approval.
3. Determine the duration for each activity based on the anticipated production rates to complete the Work (quantity divided by reasonable production rates).

K. Clearly identify the relationships and logic between activities to demonstrate the Design-Builder's overall approach to planning, scheduling, and executing the work..

1. Each activity is to have at least one predecessor and one successor activity, except for Contract Execution and Substantial Completion milestones.
2. Do not use unnecessary relationships or excessive ties to end milestones unless justified and Accepted by the Department.
3. Provide a list of activities utilizing lags and the justification for the use of each lag. Do not utilize any negative lags.

L. Design-Builder shall not use calendar dates to "logically" begin or complete any activity unless those specified calendar dates are identified in the Contract Documents.

M. Do not use Constraints to control activities unless accepted by the Department.

N. Do not manipulate project total float through adjusting calendars, extending activity durations, or any other such methodology.

O. Use of negative float is not allowed in the Baseline Project Schedule.

P. Clearly show the Critical Path, as calculated by the software.

1. Show activities on the Critical Path in red. In Primavera use the longest path schedule option setting to define critical activities.
2. Use the retained logic schedule option setting in Primavera to calculate the Critical Path.
3. Do not use the leveling resources schedule option.
4. Progress the Project Schedule (by using the Schedule function under Tools in Primavera) to the current Data Date prior to submission with no further modifications made to the schedule following progression.

Q. Limit near-critical activities to 15 percent of the construction activities not including LOE, milestones, etc. Near-critical activities are those with total float of 15 days or less.

1. If more than 15 percent of the activities in the baseline schedule are near-critical, then provide justification for acceptance by the Department.

R. Cost-load the Project Baseline Schedule.

1. Include cost-loaded activities (Payment Activities) for all activities in the Project Baseline Schedules for which payment is requested. Cost-loaded activities will be the basis for the Schedule of Values described in Section 12.1 (Schedule of Values).
2. The Contract Amount shall be allocated to accurately reflect the Design-Builder's cost for such activities and shall not artificially inflate, imbalance, or front-load Payment Activities.
3. When requested by the Department, the Design-Builder shall substantiate Payment Activity values with data that will validate their accuracy.

4. The value of the cost-loaded activities in the Project Baseline Schedule shall equal values shown on the Form PA (Price Allocation) and Form UC (Utility Cost) and and shall equal the total Contract Amount.
5. Provide sufficient number of activities so that budget of any one activity does not exceed $200,000.00, unless otherwise Approved by the Department.
6. The Design-Builder may find it beneficial to place significant portions of the Project that will be completed by a separate Subcontractor and/or that represent significant differences in crafts and/or trades, such as Utility Relocations, in separate Payment Activities.
7. Create Resource IDs and Resource Names in Primavera that are based on Form PA (Price Allocation) Payment Items.
8. In Primavera begin each Resource ID with the Department Project Identification Number followed by a dash.
9. Define costs as Material Resource Type.
10. Each resource (Form PA Payment Item) should be allocated and assigned to activities in the appropriate quantity to accomplish the Work within the activity duration.

11.2.5. Accelerated Project Baseline Schedule

If the Design-Builder wishes to propose an accelerated schedule for early completion, the Design-Builder must request in writing that the Department identify additional Department costs required to support the accelerated schedule such as increased staff for inspection, testing, and overtime.

A. The Design-Builder is responsible for paying for these added costs unless waived by the Department on the basis of other benefits accrued to the Department.

B. The acceptance of an early completion schedule is at the sole discretion of the Department.

11.2.6. Project Baseline Schedule Narrative Requirements

Prepare and include with the Baseline Schedule or any revised Baseline Schedule a schedule narrative report (document) describing the Design-Builder's plan and schedule for achieving the Contract requirements and objectives for all Work.

The narrative shall describe the methods of operation, resources to be employed, time frames for the design and construction, and time frames for accomplishment of specified milestones, and Completion Deadlines. Include a Resource Plan as described below.

Address the following items in all Baseline, Revised Baseline, or Recovery Schedule narratives unless otherwise agreed by the Department:

A. Describe the construction philosophy supporting the approach to the work outlined in the Project Baseline Schedule.

B. Describe the approach used to apply relationships between activities, such as: physical or chronological relationships between work activities; sequencing due to crew or equipment resources; or, timing of work based on limitations (such as ROW, environmental, utilities, etc.).

C. Describe any limited resources, potential conflicts, or other items that may affect the schedule and how they may be resolved.

D. Describe the Critical Path and identify challenges, risks, or issues that may arise associated with the Critical Path.

E. Describe how coordination will be handled with entities such as subcontractors, vendors and suppliers, utilities, local governments, and special service districts.

F. Describe activity coding structures and how they will be used.

G. Include a resource plan which documents in detail the types and quantities of resources needed to prosecute all aspects of the Work, including work crews, equipment, specialized personnel, materials and QC efforts.

H. Provide list of applicable activities and justification for usage of:

1. Activities with durations exceeding 30 days.
2. Constraints.
3. Unusual calendars.
4. Lag.
5. Near-critical activities, if more than 15 percent of the activities in the baseline schedule are near-critical.

I. Along with the baseline narrative, include layouts generated from Primavera (PDF files) to illustrate the following:

1. Layout to demonstrate Design-Builder's approach to work (based on WBS or other applicable coding). At a minimum include columns for activity id, activity name, start, finish, original duration, remaining duration, total float, longest path, budgeted cost, and Gantt chart/linear plot. Sort by start date.
2. Longest Path layout; sort by start date.
3. Other layouts or reports as agreed upon in the Pre-Submittal Meeting.

11.3. Project Schedule Updates

11.3.1. Monthly Progress Meetings

A. Conduct monthly progress meetings to review and discuss the status of the Project. Discuss Critical Path and changes in the Critical Path, changes in sequencing or approach to Work, change orders, and potential delay. Address current and potential issues with the intent of finding the most effective solutions to problems.

B. Attendees shall include, at a minimum, the Design-Builder's project manager, Design-Builder's scheduler, and the Department.

C. Record an action item list that specifies who is responsible for resolving existing or pending issues and the date by which the issue must be resolved to avoid Contract/Project delays.

11.3.2. Submission of Project Schedule Updates

A. Submit a Project Schedule Update each month within five Working Days of the close of the pay estimate period during the life of the Contract.

B. Submit to the Department a Project Schedule Update with Schedule Narrative and accompanying layouts or reports, to include:

1. One electronic copy of Primavera software file (.XER file) compatible with version Department is using.
2. One electronic copy of narrative report.

3. One electronic (PDF file) copy of layouts as generated from Primavera, as outlined in the Project Schedule Update Narrative Requirements in this section.

C. The Department will review the Project Schedule Update and return it as either accepted, accepted with comments, or returned with comments for resubmission within five Working Days from the date of receipt.

1. The Design-Builder is to address comments and revise the schedule as necessary to the satisfaction of the Department.
2. If a Project Schedule Update is returned by the Department with comments for resubmission, then it is the responsibility of the Design-Builder to revise and resubmit the Project Schedule Update no later than five Working Days from being returned by the Department. Upon receipt of the revised Project Schedule Update, the Department has five Working Days to review the revised Project Schedule Update and return it as either accepted, accepted with comments, or returned with comments for resubmission.

D. The Department does not process a progress payment until an acceptable Project Schedule Update has been received, reviewed, and accepted.

1. Upon acceptance of the Project Schedule Update, the Department has an additional five Working Days to complete review of the progress payment.

E. Failure to include any element of Work required by the Contract in the Schedule Updates does not relieve the Design-Builder's responsibility to perform such Work.

F. The Project Schedule Updates do not modify the Contract Documents.

G. The schedule impacts arising from the Department's time to review submittal revisions caused by noncompliance with Contract requirements, or resubmittals at the discretion of the Design-Builder, is borne by the Design-Builder.

11.3.3. Project Schedule Update Requirements

A. Comply with all Project Baseline Schedule requirements.

B. Designate the Data Date as one day after the estimate period closing date for the monthly Project Schedule Update and Progress Payment.

C. Show actual progress for each activity through the period closing date and the planned execution for the remainder of the Work:

1. Actual start dates and remaining duration for activities in progress; and actual finish dates for completed activities.
2. Projected sequences of activities for remaining Work.
3. Revised relationships and durations for unfinished activities, if warranted.
4. A well-defined Critical Path, as calculated by the software.

D. Accurately reflect "as-built" information for each activity shown in the Project Schedule Update.

E. Review cost-loaded activities and activities throughout the project and adjust costs as needed in Project Schedule Updates to account for changes to the Contract Amount. Throughout the Project, total budget and at completion cost in the schedule shall match the Contract Amount inclusive of all authorized Change Orders.

1. Add Change Orders as Approved by the Department into the schedule with appropriate activities, resources, and units/budget to represent the modified scope of work.
2. When the Design-Builder adds or splits out activities in the course of revising a Project Schedule Update,the budgeted units/costs and resources for those activities must also be reallocated to represent appropriate quantity/cost to accomplish the Work..

F. Accurately represent all planning changes, adjustments, or revisions in sequencing and timing of remaining Work.

G. If work is performed out of sequence, the Design-Builder is required to implement logic changes consistent with the retained logic method of scheduling to allow the out-of-sequence work to proceed.

H. If more than 15 percent of the activities in a Project Schedule Update become near-critical, then a recovery plan may be requested by the Department.

I. Through submittal of the Project Schedule Update, the Design-Builder may demonstrate proposed modifications to planned work that require adding or deleting activities, changing activity descriptions, or revising activity durations or logic. Provide the reason or justification for the changes as described in the narrative requirements. The Department will review the justification for proposed changes and either accept or reject the proposed modifications as part of the Project Schedule Update review.

1. Make every effort to minimize the number of changes.
2. No changes are to disrupt the integrity or comparative relationship between current and previous accepted Project Baseline Schedules or Schedule Updates.
3. Do not change or reuse activity IDs; activity IDs are unique identifiers.
4. Activity descriptions may be revised for clarification, but are not to be altered to signify a different scope than originally represented.
5. Changes to Critical and near-Critical Paths should be carefully analyzed as to the cause of the change to verify such changes were intended by the Design-Builder as part of revisions to planned work.
6. If any changes impact the Critical Path, or result in extension of the Completion Deadline(s) as compared to the previously accepted Project Schedule Update, then the Design-Builder is required to submit a time impact analysis as described in the Time Impact Analysis paragraph within Section 16.5 (Contents of Change Orders).

J. Ensure the schedule has been progressed to the Data Date prior to submission with no further modifications made to the schedule following progression.

11.3.4. Project Schedule Update Narrative Requirements

The Design-Builder shall prepare and include with the Project Schedule Update a schedule narrative report describing the status of the Work in detail. The report shall:

A. Describe the work performed during the current estimate period.

B. Explain deviations between the work planned and the work performed for the previous period.

C. Describe the work to be accomplished during the next period.

D. Describe the current Critical Path of the project, and explain any changes to the Critical Path as compared to the previous update.

E. Explain changes to the schedule since the previous update. Provide the reason or justification for the changes, and describe any resulting affects or impacts to the Project Schedule, particularly for activities on critical or near-critical paths. Explain:

1. Added or deleted activities.
2. Changes to activity durations.
3. Revisions to actual start/finish dates as accepted by the Department in previous updates.
4. Relationship or logic revisions that result in significant increases or decreases in activity float or changes to float for groups of related activities.
5. Calendar changes.
6. Addition or deletion of constraints.
7. Changes to activity coding.
8. Changes to lags and justification for use of lag.
9. Changes to activity unit/budget allocations.
10. Changes to resource allocations.

F. Provide status on pending items applicable to the schedule.

1. Permits, easements, agreements.
2. Contract changes or time adjustments.
3. Time Impact Analysis.
4. Material procurement for long-lead items.

G. Describe current and anticipated problems or delays:

1. Cause of the problem or delay.
2. Impact or potential impact to planned work, durations, milestones, or completion dates.
3. Corrective action taken to date.
4. Design-Builder's plan to mitigate or resolve problem.
5. Identify action the Department needs to take and timeline for actions to be taken to avoid or mitigate the problem.
6. Discussion of problems or delay in the Project Schedule Update narrative does not relieve the Design-Builder of complying with contractual requirements regarding notification and documentation of claims.

H. Along with the Project Schedule Update narrative, include PDF layouts generated from Primavera to illustrate the following:

1. Layout to demonstrate Design-Builder's approach and progress of work based on WBS or other applicable coding. At a minimum include columns for activity ID, activity name, start, finish, original duration, remaining duration, total float, longest path, budgeted cost, and the Gantt chart/linear plot.
2. Longest Path layout.
3. Other layouts or reports as agreed upon with the Department in the Monthly Schedule Update Meeting.

11.4. Look-Ahead Detail Schedule

The Look-Ahead Detail Schedule is a schedule that spans at least one week backward-looking and three weeks forward-looking (rolling period of at least 21 Calendar Days):

A. The Look-Ahead Detail Schedule shall be based on the current Project Schedule Update and provide a more detailed breakdown of planned schedule activities for the purpose of materials inspection and testing. Any deviations from the current contract schedule must be clearly noted and explained.

B. The Look-Ahead Detail Schedule shall reference the associated Project Schedule activity ID numbers and define specific daily operations for all Work activities scheduled to be performed during the three-week period.

The Look-Ahead Detail Schedule shall be submitted to the Department on a weekly basis and provided at the weekly construction/coordination meeting.

11.5. Project Float

Total Project float is defined as the cumulative length of time activities can be delayed before they affect a Completion Deadline.

A. Float is a shared commodity between the Design-Builder and the Department and not for the exclusive use or financial benefit of either party.

B. Either party has full use of the project float until it is depleted.

C. Changes or delays to activities in the schedule with Float that do not cause Completion Deadlines to be delayed shall not be justification for an extension of any Completion Deadline.

12— INVOICING AND PAYMENT

12.1. Schedule of Values

12.1.1. General

A. The Schedule of Values (SOV) is a detailed itemized list of Payment Activities for which the Design-Builder desires to be paid that establishes the value or cost of each detailed part of the Work. A Schedule of Values shall be derived from the cost-loaded, accepted Baseline Schedule. The Design-Builder shall allocate the Contract Amount in the SOV consistent with the Proposal Price Allocation (Form PA) and the Utility Cost Form (Form UC). The Department may verify the amounts by review of the Escrowed Proposal Documents. The Design-Builder shall submit the SOV for Approval with the Baseline Schedule.

The purpose of cost-loading the Project Schedule is to associate schedule activities to Payment Activities in order to monitor progress for making payment; however, once established, the SOV may be updated and maintained separately from the Project Schedule. The SOV may contain more items for payment than the project schedule has activities (see Section 12.1.2 (Payment Activities)). The Department may, at its discretion, require a Revised Baseline Schedule or a Recovery Schedule when the SOV is changed.

12.1.2. Payment Activities

The Design-Builder shall attach costs to those activities in the Project Baseline Schedule for which the Design-Builder desires to be paid. Payment Activities shall have identical IDs and Activity Descriptions

as activities in the Project Baseline Schedule. All Payment Activities shall be incorporated into one of the Payment Items in Form PA (Price Allocation) and Form UC (Utility Costs). Incorporate Change Orders into new or revised Payment Activities as they are Approved; new or revised Payment Activities must be agreed upon with the Department. If the Design-Builder anticipates requesting payment for stored-materials, include these materials as Payment Activities. Cost-loading of activities is described in Section 11.2.4 (Baseline Schedule Development).

12.1.3. Continuing Activities

The SOV shall include Payment Activities sufficient to cover all efforts necessary to fulfill all Contract requirements and successfully complete the Work for the following continuing activities:

A. Project Management
B. Quality Control
C. Safety and security
D. Maintenance During Construction
E. Environmental
F. Insurance

The total value for the continuing activities, except Quality Control, and Insurance, shall be equal to the value of Compensable Project Overhead listed on Form PA (Price Allocation) and shall be distributed so as to capture estimated expenditures in equal monthly increments within each continuing activity from NTP until Contract Completion.

12.2. Progress, Invoicing, and Payment

12.2.1. Measurement of Progress

Payments shall be made for Payment Activities and no payment is made until the Payment Activity is at least 50, 90 or 100 percent complete. The Department will consider payment of 50 percent of the budgeted amount when at least 50 percent of the physical progress of a Payment Activity is achieved in accordance with the Contract requirements. The Department will consider payment of 90 percent of the budgeted amount when 90-100 percent of the physical progress of a Payment Activity is achieved in accordance with the Contract requirements but required documentation is pending. Full payment of the budgeted amount will be paid when a payment activity is 100 percent complete and all required documentation is received and substantiated by the Department.

For continuing activities, payment shall be made for the amount apportioned for the period in which payment is being requested.

The amount payable to the Design-Builder for bond premiums is a dollar-for-dollar pass-through of the Design-Builder's costs (not to exceed the amount shown in the Payment Activities for such premiums). Where a Payment Activity requires submittal of a bond, the Payment Activity is met when the bond has been provided in the amount and under the terms required in the Contract and by a Surety that the Department accepts;

Invoice mobilization at the amount listed in Proposal Price Allocation Form PA upon issuance of NTP.

The Department will not pay for direct costs of equipment used to construct the Project. The Design-Builder shall allocate costs for equipment, whether new, used, or rented, as part of the activities with which the equipment is associated.

12.2.2. Power for In-place Equipment

Power necessary for Project illumination, ATMS, and signals for in-place equipment (equipment that is affixed to the land or permanent structures) that is being utilized prior to Contract Completion and paying the providers for such power is the responsibility of the Department. Arranging, notifying, and coordinating with the Department and provider for such power is the responsibility of the Design-Builder.

12.2.3. Progress Reports

The Design-Builder shall provide Progress Reports monthly along with the Request for Progress Payment. No Request for Progress Payment will be processed unless accompanied by the Progress Report.

The Design-Builder shall include the following in the monthly Progress Reports, in concurrence with the Project Schedule Update and narrative report:

A. Totals of materials incorporated into the Project from execution through the reporting period, the Department shall approved the list of material prior to the first Progress Report. If the Department requires additional material totals than agreed upon initially, the Design-Builder will include them in the list of materials. The following are examples of material totals to be provided:

B. Fill incorporated into the Project, in cubic yards

C. Concrete paving placed, in square yards

D. Lane miles completed

E. Length of pipe installed (of any size diameter)

F. Number of craft and total workers employed to work directly on the Project (including construction and professional services subcontractors)

G. A summary of executed Change Orders that includes the amount paid to date for each

H. Milestones achieved during the period

I. Summary of Project accidents (frequency and severity) and corrective actions taken

J. Progress photographs to show activity and improvements

K. The total monthly labor hours for craft labor and non-construction personnel by classification of management, engineering, and other technical personnel used on the Project.

With each monthly Progress Report, the Design-Builder shall provide a certificate signed by the Project Manager certifying the following:

L. All Work, including that of designers, Subcontractors, Suppliers, and fabricators, has been checked and/or inspected and that all Work, except as specifically noted in the certification, conforms to the requirements of the Contract

M. Records that provide evidence of compliance with Contract requirements are available

N. Nonconformances are being documented and resolved

O. Significant and/ or systemic problems are being investigated and actions taken to prevent their recurrence

P. Submittals are confirmed to meet all requirements prior to delivery and request for progress payment

Q. The Quality Program and all of the measures and procedures provided therein are functioning properly and are being followed

12.2.4. Request for Progress Payment

Submit a request for progress payment within five Working days following the estimate period closing date, or other agreed-upon date, containing the amount claimed to be payable for each Payment Activity. Requests for progress payment shall be submitted both electronically and in hardcopy format using forms agreed upon by the Department. Reference Part 2, Appendix F (Request for Periodic Payment – Form 01282C). Include with each request, the Approved SOV updated with partially and fully completed Payment Activities (50, 90, or 100 percent), that are incorporated into associated items in the Request for Progress Payment Form. Provide supporting documentation for the amount claimed payable.

Upon receipt of a Request for Progress Payment, the Department will review the submitted Request for Progress Payment and within five Working Days provide comments to the Design-Builder that lists any discrepancies and other amounts intended to be deducted.

Meet to review requests for progress payment and Department comments and attempt to resolve any outstanding issues regarding Payment Activities with the Department.

Submit a revised request for progress payment to address any outstanding issues identified by the Department. If the Design-Builder includes items for payment that remain unresolved, the Department will either (i) notify the Design-Builder that unresolved items in the request for progress payment remain, and request a resubmittal of the Request for Progress Payment, or (ii) deduct those amounts the Department asserts are not eligible for payment, and process the request for progress payment. The Department shall notify the Design-Builder of any such deductions.

12.2.4.1. Certification for Progress Payment

Requests for Progress Payment shall be certified by the Design-Builder's Project Manager that all amounts being requested are true and correct, inspection and testing in accordance with the Quality Program is complete, there are no outstanding NCRs, all certifications of compliance are submitted, and the Work is completed per the Contract Requirements. No Request for Progress Payment will be processed without such certification.

12.2.4.2. Documents Required to be Provided with the Request for Progress Payment

The following documents shall be submitted with each Request for Progress Payment application. No Request for Progress Payment will be processed without such documents:

A. The monthly Progress Report as defined in Section 12.2.3 (Progress Reports).

12.2.4.3. Payment Limitations and Partial Suspension of Payment

The Department will not pay for Work unless the following conditions are met with respect to such Work:

A. Released for Construction Documents are on Site for the Work being performed;

B. Released for Construction Documents have been checked and reviewed, and design documentation has been maintained, in accordance with the Contract Documents;

C. Construction Work has been inspected and sampling and testing conducted in accordance with Contract Documents; and

D. Nonconforming Work Items are corrected and/or resolved to the satisfaction of the Department

On any Request for Progress Payment, the Department may suspend or deduct amounts otherwise due to Design-Builder for that period's apportionment for any continuing activity for anything that does not conform to the Contract requirements or any of the following:

E. Failure to meet Contract provisions regarding Key Personnel or to staff the Project adequately and with sufficiently skilled personnel
F. Failure to maintain construction documentation so that it is complete and records and reports are submitted and/or retained in accordance with Contract Documents
G. Failure to maintain and track as-built information monthly.
H. Failure to provide or to meet Contract requirements regarding Project Schedules, including timely submittal of Project Schedule Updates
I. Failure to conduct or attend Project meetings with appropriate personnel, including Key Personnel
J. Failure to meet Contract requirements regarding the Quality Program, including for management, design, or construction related functions
K. Failure to provide timely or adequate facilities as required by the Contract
L. Failure to meet Contractual, Department, State, and federal requirements regarding safety, including holding of safety meetings and submittal of reports
M. Failure to adequately support the Department's Public Information efforts as required by the Contract
N. Failure to provide required types and levels of insurance
O. Serious disruptions to necessary traffic control and access through the Project site occur
P. Noncompliance with environmental requirements that leads to citations, fines, and/or other penalties by environmental authorities
Q. Serious disruptions to the Department's access to the Project site or use of facilities provided for the Department's use
R. Unacceptable Safety performance as evidenced by the Design-Builder's accident record
S. Continued reports of blocked vehicular and/or pedestrian access to properties

No payment will be made for design or construction Work necessary to correct Nonconforming Work.

If the Design-Builder fails to completely prosecute Work of a Payment Activity, the Department may deduct that Payment Activity amount from the next successive month for the corresponding Payment Activity(ies).

Payment Activities for Work arising from Change Orders are subject to Department Approval.

12.2.5. Processing and Payment

12.2.5.1. Processing of Requests for Progress Payment

Once the Department reviews and Approves the Request for Progress Payment, the Department will sign and date and return a copy of the Request for Progress Payment cover sheet with any corrections noted and proceed with processing the Request for Progress Payment. From the date signed, the Department will make payment on Approved amounts within 14 Calendar Days.

12.2.5.2. Amounts Withheld

No payment will be made for Payment Activity items in increments of anything other than 50, 90, or 100 percent. Payment will not be made for items that are Nonconforming unless the Department agrees that a pay adjustment may be made for Nonconforming Work in accordance with Section 12.3 (Cost Adjustments).

12.2.6. Partial Payment for Material Delivered to the Site of work

Upon application by the Design-Builder, using Form 01282A provided as Appendix D, and Approval by

the Department, payments for the Actual Cost of certain material may be made to the Design-Builder prior to incorporation of such material in the permanent Work. To be eligible for partial payment, material must meet all of the following conditions:

A. Be included on the List of materials found within this Section 12.2.6.

B. Have a minimum material cost of $20,000 per item or group of like items.

C. Be material that is incorporated into permanent Structures or features of the Project.

D. Be in a condition that is ready for on-Site installation without further fabrication or processing.

E. Be delivered and stored at the Site of Work or at a site and in a manner approved by the Department.

F. Be material that is stored a minimum of 60 Calendar Days.

G. With application for partial payments, provide documentation as follows:

1. Bill(s) of sale or vouchers indicating the actual dollar value paid by the Design-Builder for the material as stored;
2. Certification of Title (Appendix E (Form 01282B)) showing that title to the material, without encumbrances, is in the name of the Design-Builder and that title is warranted to the Utah Department of Transportation;
3. Documented evidence of acceptability of the material; and
4. If the material is stored on private property, a release and waiver covering such material (Appendix E (Form 01282B)), and providing access to the storage site, which release and waiver shall be executed by the property owner in favor of the Utah Department of Transportation or its agents.

When applying for partial payment of products that are claimed to be in short supply or unique to the Project, include documentation supporting that claim, to the satisfaction of the Department. The amount of partial payments do not exceed the total invoice amount for stored material, nor can the partial payment for material relating to any Payment Activity exceed 85 percent of the price for that item. The quantity of material for which payments are made cannot exceed the estimated quantity for that item. The making of partial payments is not deemed to be an acceptance of material, nor does it relieve the Design-Builder of responsibility for such material.

The Design-Builder is responsible for assuring that only those materials which comply with the Specifications are incorporated into the Project. All costs associated with handling, transportation, and storage of material, including any storage site rental, security, and weather protection, are borne by the Design-Builder. Any materials, other than those that are determined by the Department to be unique to the Project, that are not incorporated into the Project remain the property of the Design-Builder.

List of Materials:

1. Iron, steel, and aluminum products (including all metal components of railings and bridge superstructures)
2. Precast and prestressed concrete products
3. Pipe and underdrain products
4. Concrete, steel, and timber piles and appurtenances
5. Traffic signal, traffic control, signing, and lighting components
6. Cable, wire, and conduit
7. Impact attenuator components

8. Material manufactured to meet specific, unique requirements of the Project (to be determined by the Department)

12.2.7. Certification for Periodic Payment

Within 14 Calendar Days of receipt of a request for progress payment in accordance with Section 12.2.4 (Request for Progress Payment), unless payment is pending acceptance of the Project schedule update, the Department will issue, with a copy to the Design-Builder, a periodic payment certificate showing the amount of any periodic payment the Department considers payable by the Department to the Design-Builder. The amount of such a periodic payment certificate is the sum of the following:

A. The amounts shown to be due by reference to the Project Baseline Schedule. The amounts determined by the Department to be due in respect of the following:

1. Additional cost incurred and payable in accordance with the Contract;
2. Work executed pursuant to a Force Account Change Order; and
3. Any other amount or allowance to which the Design-Builder is entitled under the Contract, unless account has been or is taken of such amount or allowance by way of a Change Order of an SOV under Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work); less:

a. The retention monies as provided for in Section 12.4 (Retention);
b. Any amounts certified for payment on certificates previously issued;
c. Any amounts recoverable from the Design-Builder and deductible from amounts due in accordance with the Contract; and
d. Any amounts withheld under the terms of the Contract because the Design-Builder failed to provide the monthly progress report in the form and detail required in the Contract or failed to provide a revised Project Baseline Schedule that the Department has accepted.

At the same time the Department will countersign the certificate in Appendix F (Form 01282C), to be based on the draft submitted by the Design-Builder pursuant to Section 12.2.4 (Request for Progress Payment), amended as necessary, certifying the Payment Activities the Department considers the Design-Builder to have met. The Department has the power to omit from any such certificate the value of any Work with which the Department may, for the time being, be dissatisfied. The Department may by any certificate delete, correct, or modify any previously certified sum or statement of fact.

12.3. Cost Adjustments

12.3.1. Pay Adjustment Factors for Quality

Pay adjustments for Work quality shall be made as provided in Section 12.3.2 (Price Reductions for Nonconforming Work).

A pay adjustment for Nonconforming Work accepted by the Department does not affect the Design-Builder's warranty obligations under the Contract.

12.3.2. Price Reductions for Nonconforming Work

Work deviations from the specification, if accepted by the Department, will result in reductions of the Contract Price as specified below.

Unit prices for materials are not utilized in the payment structure of this Contract. However, unit prices

for reductions are required to utilize the pay factors, daily deductions, and rejection values identified in the UDOT 2012 Standard Specifications and Special Provisions relating to price reductions. Unit prices for reductions listed in Part 5 (Special Provisions and Exceptions) shall be applied as unit prices, daily deductions, or rejection values as listed. Reductions per unit of Nonconforming Work allowed to remain in place by the Department which are not covered by specification, special provision, or Part 5 (Special Provisions and Exceptions) shall be determined by the Department. The Design-Builder shall be provided the opportunity to accept the reduction or remove and replace the Nonconforming Work. Girder defects will be assessed for price reductions based on long term durability and maintenance concerns.

12.4. Retention

The Department deducts and retains five percent from each monthly invoice under Section 12.2 (Progress, Invoicing, and Payment) through Contract Completion, subject to the following:

12.4.1. Release of Retention to Subcontractors

(1) The Department will release retention being withheld for Work performed by Subcontractors, upon receipt of an Approved application from the Design-Builder under Section 12.4.1(2). The Department's release of such retention shall not relieve the Design-Builder of its contractual obligations relating to the Work.

(2) Subcontractors: Upon satisfactory completion of all Work to be performed by a Subcontractor, including provision of appropriate releases, certificates and other evidence of the Subcontractor's compliance with all applicable requirements of the Contract Documents, the Design-Builder shall (i) submit an application to the Department for the release of the retention attributed to the Subcontractor's Work stating that the Subcontractor has completed all Work required to be performed under its Subcontract, stating the amount withheld by the Design-Builder under the Subcontract and providing all backup information and stop notice and Lien releases as may be required by the Department and (ii) return all moneys withheld as retention from the Subcontractor, even if Work to be performed by the Design-Builder or other Subcontractors is not completed and has not been accepted, within 30 days following receipt of payment from the Department for the completed Subcontractor Work. The Design-Builder shall, by appropriate agreement with each Subcontractor, require each first tier Subcontractor to make payments to sub-subcontractors and Suppliers in a similar manner.

(3) Design Subcontractors: Upon issuance of all Released for Construction drawings completed by a Design Subcontractor. Include evidence of the Design Subcontractor's compliance with all applicable requirements of the Contract Documents. The Design-Builder shall (i) submit an application to the Department for the release of the retention attributed to the Design Subcontractor under the Design line item in Form PA stating that the Design Subcontractor has completed all Work required for the Released for Construction documents under its Subcontract, stating the amount withheld by the Design-Builder under the Subcontract and providing all backup information and stop notice and Lien releases as may be required by the Department and (ii) return all moneys withheld as retention from the Design Subcontractor, even if Work to be performed by the Design-Builder or other Subcontractors is not completed and has not been accepted, within 30 days following receipt of payment from the Department for the completed Design Subcontractor Work. The Design-Builder shall, by appropriate agreement with each Design Subcontractor, require each first tier Subcontractor to make payments to sub-subcontractors and Suppliers in a similar manner.

12.5. Other Deductions

The Department may deduct from any amounts otherwise owing to Design-Builder, including each monthly progress payment and the final payment, the following:

A. Any anticipated or accrued losses, liability, Liquidated Damages, Disincentives, or other damages for which Design-Builder is responsible hereunder.

B. The estimated or actual cost, as determined by the Department, of remedying any Nonconforming Work or otherwise remedying any breach of contract by the Design-Builder.

C. The amount of any outstanding claim relating to the Work.

D. The estimated amount, as determined by the Department, or the amount identified in the SOV for Work that the Design-Builder is obligated to perform under the Contract that the Design-Builder has failed to perform, whichever is greater.

E. Any other sums which the Department is entitled to recover from the Design-Builder under the terms of the Contract.

F. In addition to the above, with regard to final payment, the amount the Department deems advisable to retain to cover any existing or threatened Disputes, Claims, Liens and stop notices relating to the Project, or the cost of any uncompleted Work (including uncompleted Warranty Work).

The Department's failure to deduct from a progress payment or final payment any amount that the Department is entitled to recover from the Design-Builder under the Contract shall not constitute a waiver of the Department's right to such amounts.

12.6. Prompt Payment to Subcontractors

12.6.1. Subcontracts

Include in the subcontract language a clause agreeing to pay all retainage owed to the subcontractor for satisfactory completion of the Work within 30 Calendar Days after receiving payment from the Department.

12.6.2. Progress Payments

Pay subcontractors for satisfactory performance of subcontracted work no later than 30 Calendar Days after receiving payment from the Department.

Enter the dates that payments are sent to the subcontractor into the UDOT PDBS Subcontractor Payment Screen within 30 Calendar Days of receiving payment from the Department. The Department considers the entry of payment dates into PDBS as an affidavit certifying prompt payment by the Design-Builder.

A. The entry date is tied to the date the pay estimate is processed by the Department's comptroller.

B. The entry will be flagged red, indicating failure to make prompt payment, if the entry date is more than 30 Calendar Days after the comptroller processing date.

12.6.3. Payment Delay

Delay payment only for cause and document the reason in the comments area of the UDOT PDBS Subcontractor Payment Screen. This will serve as notification to the Department.

A. Send written notification to the subcontractor.

1. The Design-Builder is considered non-compliant if no payment is made to the subcontractor and there are no comments in PDBS explaining why the subcontractor's payment is being withheld for cause.

2. The Department may withhold the dollar amount of delayed payment, including retention, from future estimates.

B. Provide subcontractor 15 Calendar Days from the date of written notification to correct all deficiencies.

1. Release payment upon receipt of documentation demonstrating correction of deficiencies within 15 Calendar Day.

C. Include language in the subcontract that provides for the use of appropriate alternative dispute resolution mechanisms to resolve payment disputes.

1. The Department may hold disputed funds in escrow until the dispute is resolved.

12.6.4. Failure to Make Prompt Payment

The Department will provide written notification to the Design-Builder upon determination of failure to make prompt payment for Work that was performed according to the Contract's specifications.

A. Make prompt payment within three Working Days of receiving written notification.

B. The Department considers failure to make prompt payment a contract violation for which the Design-Builder is subject to all of the following measures:

1. The Department may withhold money owing to Design-Builder, including overhead and direct costs. The money withheld does not include payment for subcontractor work completed in accordance with the Contract;
2. The Department may withhold issuing a Notice of Substantial Completion; or
3. The Department may withhold recognizing Project Milestones.

The Department may use additional measures up to and including debarment for repeated failure to make prompt payment.

The Department may employ other mechanisms consistent with this Section 12.6.4 and applicable federal, state and local laws so payment is fully and promptly made.

12.7. Final Payment

Final payment will be made in accordance with this Section 12.7.

12.7.1. Application for Final Payment

On or about the date of delivery of its Affidavit of Contract Completion, the Design-Builder shall prepare and submit an Application for Final Payment to the Department showing the proposed total amount due the Design-Builder. In addition to meeting all other requirements for invoices hereunder, the Application for Final Payment shall include (i) the executed release and affidavit described in Section 12.7.2 (Payment); (ii) a list of any outstanding or pending Potential Change Order (PCO) Notices and all existing or threatened Claims, Liens, and stop notices by Subcontractors, laborers, Utility Owners, or other Third-Parties relating to the Project, including any notices filed or to be filed with the Affidavit of Contract Completion, stating the amount at issue associated with each such notice; (iii) the written consent by the Surety to such payment; and (iv) such other documentation as the Department may reasonably require. Prior applications and payments shall be subject to correction in the proposed Application for Final Payment. PCO Notices filed concurrently with the Application for Final Payment must be otherwise timely and meet all requirements under Sections 15 (Change Order Risk Allocation), 16 (Changes in the Work) and 22 (Partnering and Dispute Resolution).

The Department will review the Design-Builder's proposed Application for Final Payment, and changes or corrections will be forwarded to the Design-Builder for correction. If no changes or corrections are required, the Department will Approve the Application for Final Payment.

12.7.2. Payment

As a condition to its obligation to make payment to the Design-Builder based on the Application for Final Payment, the Department shall have received an executed release from the Design-Builder, releasing and waiving any claims against the Indemnified Parties, excluding only those matters identified in any PCO Notices listed as outstanding in the Application for Final Payment, and otherwise satisfactory in form and content to the Department.

The executed release shall be accompanied by an affidavit from the Design-Builder certifying the following:

A. All Work has been performed in strict accordance with the requirements of the Contract Documents.

B. The Design-Builder has resolved any claims made by Subcontractors, Suppliers, Utility Owners, laborers, and others against the Design-Builder, the Department, or the Project, except for those claims identified in the Application for Final Payment pursuant to Section 12.7.1 (Application for Final Payment) (ii) or those claims for which the Subcontractor has executed a release against the Department, the Project, and the Payment Bond.

C. The Design Builder has followed the Department's procedures for Contract Completion, including providing those documents and completed Forms identified in the Construction Manual of Instruction and on the Department's website and has provided complete lien releases from all Subcontractors and Suppliers, except for those with claims listed in (B) above, in a form and with language that will be provided by the Department.

D. The Design-Builder has no reason to believe that any Person has a valid claim against the Design-Builder, the Department, or the Project which has not been communicated in writing by the Design-Builder to the Department as of the date of the certificate.

E. All guarantees, warranties, the Payment Bond and the Performance Bond are in full force and effect.

The executed release and the affidavit shall extend past final payment. The payment amount will be reduced by any amounts deductible under Section 12.5 (Other Deductions).

All prior partial estimates and payments shall be subject to correction in the final payment.

The Design-Builder's acceptance of final payment shall constitute a waiver of affirmative Claims by the Design-Builder except such Claims previously made in writing and identified in writing as outstanding and unsettled at the time of the Application for Final Payment.

13— PROJECT ACCEPTANCE

13.1. Opening of Sections of Project to Traffic

If the Design-Builder determines that (i) any portion of the Project is necessary for the convenience of traffic, such as a structure, interchange, roadway section, intersection, substation, or portion of highway lighting or traffic signal systems, prior to achieving Substantial Completion, and (ii) such portion meets the requirements set forth in Part 4-10 (Maintenance of Traffic), then the following shall be performed

prior to opening such portion to use by the public: (a) the Design-Builder shall establish a Control Point regarding such portion of the Project, (b) the Design-Builder shall provide notice thereof to the Department, per the Control Point notification process, as set forth in Section 3.5.4 (Control Points) and (c) such portion shall be verified for compliance and accepted by the Department in accordance with Part 3 (Quality Program) prior to opening.

The Design-Builder remains responsible for all repair or replacement of that portion of the Work. Maintenance responsibilities remain with the Design-Builder until Substantial Completion is achieved. Designation of safe to open for any portion of the Project shall not start a warranty period for any portion of the Work or void or alter any terms of the Contract.

Opening of portions of the Project prior to Substantial Completion does not constitute acceptance of the Work or a waiver of any provisions of the Contract Documents.

13.1.1.1. Interchange Completion

As a prerequisite to Interchange Completion for each interchange (as described in the definition of Project in Part 1, Appendix A (Acronymns and Definitions) and Part 4-01 (Project Configuration)), the Design-Builder shall provide written notice to the Department when all of the following have occurred:

(1) The Department and the Design-Builder have agreed upon a Punch List and the timing for completing each Punch List item for Interchange Completion and which items, if any, can be deferred until Substantial Completion.
(2) The Design-Builder has completed all Work for an interchange, except for Punch List items, final cleanup and other items specifically identified as required for Interchange Completion.
(3) The Design-Builder has ensured that the Work in connection with Interchange Completion has been performed in accordance with the requirements of the Contract Documents.
(4) The Design-Builder has ensured that the interchange may be operated safely without injury to any Person or damage to the interchange or any other property on or off the Site.
(5) The Design-Builder has ensured that the interchange is open for traffic and that no further work is required except for seeding and landscaping and Punch List items and such work will not involve any lane or shoulder closure or impact traffic.
(6) The Design-Builder has received all applicable Governmental Approvals required for the interchange.
(7) The Design-Builder has furnished to the Department certifications from the Design Manager, in form and substance satisfactory to the Department, certifying that the Design Documents meet the requirements of the Contract Documents for the interchange.
(8) The Design-Builder has furnished to the Department certifications from the Design-Builder's Project Manager, in form and substance satisfactory to the Department, certifying that the construction meets the requirements of the Contract Documents.
(9) There is no outstanding Nonconforming Work, or incomplete Work (except for agreed to Punch List items), identified by the Design-Builder or the Department for the interchange.
(10) The Design-Builder has obtained all applicable Third-Party approvals relating to the Work for the interchange (including Utility Owners as required under any applicable MUAs, Part 4-19 (Utilities), and Part 6 (Third-Party Agreements)), and all Third-Parties have completed all work that involves obligations by the Design-Builder (including Utility Owners under any applicable MUAs, Part 4-19 (Utilities), and Part 6 (Third-Party Agreements)).
(11) All of the Design-Builder's and Subcontractors' personnel, supplies, equipment, waste materials, rubbish, and temporary facilities have been removed from the applicable portion of the Site, the Design-Builder has restored and repaired all damage or injury arising from such removal to the satisfaction of the Department and the applicable portion of the Site and adjacent affected areas for which the Design-Builder is responsible are in good working order and condition.

13.1.1.2. Notice of Interchange Completion

If the Department determines that any Work does not meet the requirements of the Contract Documents or the Department does not agree that all Work remaining will be performed without lane closures or further delays, disruption, or impediment to the public, the Department will advise the Design-Builder as to Nonconforming Work or incomplete Work. Upon correction of the Nonconforming Work or completion of incomplete Work, the Design-Builder shall provide an updated written notification under Section 13.1.1.1 (Interchange Completion) to the Department. This process will continue until there are no identified items of Nonconforming Work or incomplete Work that are prerequisites to Interchange Completion, at which time the Department will issue a Notice of Interchange Completion.

Interchange Completion is reached upon the date identified by the Department in the Notice of Interchange Completion. The Design-Builder hereby acknowledges and agrees that the Department's verification of the Notice of Interchange Completion may require substantial time and will be dependent upon the number and severity of outstanding items requiring verification, as identified in Section 13.1.1.1 (Interchange Completion). The Department agrees that it shall make reasonable efforts and act diligently in such verification and, if appropriate, issuance of the Notice of Interchange Completion. If a Notice of Interchange Completion is issued after the contractual deadline for Interchange Completion, disincentives will apply.

13.2. Substantial Completion

As a prerequisite to Substantial Completion for the Project, the Design-Builder shall provide written notice to the Department when all of the following have occurred:

(1) The Department and the Design-Builder have agreed upon a Punch List and the timing for completing each Punch List item for Substantial Completion and which items, if any, can be deferred until Physical Completion.
(2) The Design-Builder has completed all Work, except for Punch List items, final cleanup and other items specifically identified as required for Physical Completion.
(3) The Design-Builder has ensured that the Work in connection with Substantial Completion has been performed in accordance with the requirements of the Contract Documents.
(4) The Design-Builder has ensured that the Project may be operated safely without injury to any Person or damage to the Project or any other property on or off the Site.
(5) The Design-Builder has ensured that the Project is open for traffic and that no further work is required except for seeding and landscaping and Punch List items and such work will not involve any lane or shoulder closure or impact traffic.
(6) The Design-Builder has received all applicable Governmental Approvals required for the Project.
(7) The Design-Builder has furnished to the Department certifications from the Design Manager, in form and substance satisfactory to the Department, certifying that the Design Documents meet the requirements of the Contract Documents.
(8) The Design-Builder has furnished to the Department certifications from the Design-Builder's Project Manager, in form and substance satisfactory to the Department, certifying that the construction meets the requirements of the Contract Documents.
(9) There is no outstanding Nonconforming Work, or incomplete Work (except for agreed to Punch List items), identified by the Design-Builder or the Department.
(10) The Design-Builder has obtained all applicable Third-Party approvals relating to the Work (including Utility Owners as required under any applicable MUAs, Part 4-19 (Utilities), and Part 6 (Third-Party Agreements)), and all Third-Parties have completed all work that involves obligations by the Design-Builder (including Utility Owners under any applicable MUAs, Part 4-19 (Utilities), and Part 6 (Third-Party Agreements)).

(11) All of the Design-Builder's and Subcontractors' personnel, supplies, equipment, waste materials, rubbish, and temporary facilities have been removed from the applicable portion of the Site, the Design-Builder has restored and repaired all damage or injury arising from such removal to the satisfaction of the Department and the applicable portion of the Site and adjacent affected areas for which the Design-Builder is responsible are in good working order and condition.

13.3. Notice of Substantial Completion

If the Department determines that any Work does not meet the requirements of the Contract Documents or the Department does not agree that all Work remaining will be performed without lane closures or further delays, disruption, or impediment to the public, the Department will advise the Design-Builder as to Nonconforming Work or incomplete Work. Upon correction of the Nonconforming Work or completion of incomplete Work, the Design-Builder shall provide an updated written notification under Section 13.2 (Substantial Completion) to the Department. This process will continue until there are no identified items of Nonconforming Work or incomplete Work that are prerequisites to Substantial Completion, at which time the Department will issue a Notice of Substantial Completion.

Substantial Completion is reached upon the date identified by the Department in the Notice of Substantial Completion. The Design-Builder hereby acknowledges and agrees that the Department's verification of the Notice of Substantial Completion may require substantial time and will be dependent upon the number and severity of outstanding items requiring verification, as identified in Section 13.2 (Substantial Completion). The Design-Builder shall allow for such time in its Project Schedule. The Department agrees that it shall make reasonable efforts and act diligently in such verification and, if appropriate, issuance of the Notice of Substantial Completion. If a Notice of Substantial Completion is issued after the contractual deadline for Substantial Completion, Liquidated Damages or additional Liquidated Damages will apply.

13.4. Physical Completion

As a prerequisite to Physical Completion, the Design-Builder shall provide written notice to the Department when all of the following have occurred:

(1) The Design-Builder has completed all Work, including final cleanup and all Punch List items that were deferred to Physical Completion from Substantial Completion final cleanup and other items specifically identified as required for Physical Completion.
(2) The Design-Builder has ensured that the Work in connection with Physical Completion has been performed in accordance with the requirements of the Contract Documents.
(3) The Design-Builder has ensured that the Project may be operated safely without injury to any Person or damage to the Project or any other property on or off the Site.
(4) The Design-Builder has ensured that the Project is open for traffic and that no further work is required.
(5) The Design-Builder has received all applicable Governmental Approvals required for the Project.
(6) The Design-Builder has furnished to the Department certifications from the Design Manager, in form and substance satisfactory to the Department, certifying that the Design Documents meet the requirements of the Contract Documents.
(7) The Design-Builder has furnished to the Department certifications from the Design-Builder's Project Manager, in form and substance satisfactory to the Department, certifying that the construction meets the requirements of the Contract Documents.
(8) There is no outstanding Nonconforming Work or incomplete Work identified by the Design-Builder or the Department.
(9) All of the Design-Builder's and Subcontractors' personnel, supplies, equipment, waste materials, rubbish, and temporary facilities have been removed from the applicable portion of the Site, the

Design-Builder has restored and repaired all damage or injury arising from such removal to the satisfaction of the Department and the applicable portion of the Site and adjacent affected areas for which the Design-Builder is responsible are in good working order and condition.

13.5. Notice of Physical Completion

If the Department determines that any Work does not meet the requirements of the Contract Documents, the Department will advise the Design-Builder as to Nonconforming Work or incomplete Work. Upon correction of the Nonconforming Work or completion of incomplete Work, the Design-Builder shall provide an updated written notification under Section 13.4 (Physical Completion) to the Department. This process will continue until there are no identified items of Nonconforming Work or incomplete Work that are prerequisites to Physical Completion, at which time the Department will issue a Notice of Physical Completion.

Physical Completion is reached upon the date identified by the Department in the Notice of Physical Completion. The Design-Builder hereby acknowledges and agrees that the Department's verification of the Notice of Physical Completion may require substantial time and will be dependent upon the number and severity of outstanding items requiring verification, as identified in Section 13.4 (Physical Completion). The Design-Builder shall allow for such time in its Project Schedule. The Department agrees that it shall make reasonable efforts and act diligently in such verification and, if appropriate, issuance of the Notice of Physical Completion. If a Notice of Physical Completion is issued after the contractual deadline for Physical Completion, Liquidated Damages or additional disincentives will apply.

13.6. Request for Contract Completion

As a prerequisite to Contract Completion, the Design-Builder shall provide to the Department an executed sworn Affidavit requesting Contract Completion in accordance with this Section 13.6 when all of the following have occurred:

(1) The Design-Builder has completed all Work.
(2) The Department has received all Released for Construction Documents, Final Design Documents, As-Built Documents, O&M Manuals, materials certifications of compliance, surveys, test data, and other deliverables required under the Contract Documents for the Project. The Design-Builder has furnished to the Department alignment points as part of the As-Built Documents.
(3) All special tools, equipment, furnishings, and supplies purchased by and/or used by the Design-Builder, as provided in the Contract Documents, have been delivered to the Department free and clear of Liens.
(4) The Design-Builder has delivered to the Department a notice of completion for the Project in recordable form and meeting all statutory requirements.
(5) All of the Design-Builder's other obligations under the Contract Documents (other than obligations which by their nature are required to be performed after Contract Completion as determined by the Department), have been satisfied in full or waived in writing by the Department.
(6) The Design-Builder has satisfied all requirements of Section 12.7 (Final Payment).
(7) All required warranties and/ or guarantees have been provided.
(8) All requisite training has been provided.

The Affidavit shall include the following statement:

> *To the best of the Design-Builder's knowledge and belief, the Work under the Contract has been completed in strict accordance with the Contract Documents, no lawful debts for labor or materials are outstanding and no federal excise tax has been included in the Contract Amount; all requests for funds for undisputed work under the Contract, including changes in the Work, and under all billings of whatsoever nature are accurate,*

complete and final and no additional compensation over and above the final payment will be requested or is due under the Contract or under any adjustment issued thereunder for said undisputed work; there are no outstanding claims, Liens or stop notices relating to the Project, including claims by Utility Owners; there is no existing default by the Design-Builder under any Utility Agreement, and no event has occurred which, with the passing of time or giving of notice or both, would lead to a claim relating to the Work or event of default under any Utility Agreement; and upon receipt of final payment, the Design-Builder and Subcontractors acknowledge that the Department, its employees, the State of Utah and its authorized representatives are released, discharged and acquitted from any and all claims or liability for any additional sums on account of undisputed work performed under the Contract.

If the Design-Builder is unable to provide the affidavit in the above form, the affidavit shall certify that all such outstanding matters are set forth in an attached list which shall describe the outstanding matters in such detail as may be requested by the Department. The affidavit shall include a representation of the Design-Builder that it is diligently and in good faith contesting all such matters by appropriate legal proceedings and shall provide a status report regarding the same including an estimate of the maximum payable with respect to each such matter.

13.7. Notice of Contract Completion

If the Department determines that any Work does not meet the requirements of the Contract Documents or Work has not been completed, the Department will advise the Design-Builder as to Nonconforming Work or incomplete Work. Upon correction of the Nonconforming Work or completion of incomplete Work, the Design-Builder shall provide an updated written notification under Section 13.6 (Request for Contract Completion) to the Department. This process will continue until there are no identified items of Nonconforming Work or incomplete Work that are prerequisites to Contract Completion, at which time the Department will issue a Notice of Contract Completion.

Contract Completion is reached upon the date identified by the Department in the Notice of Contract Completion. The Design-Builder hereby acknowledges and agrees that the Department's verification of the Notice of Contract Completion may require substantial time and will be dependent upon the number and severity of outstanding items requiring verification, as identified in Section 13.6 (Request for Contract Completion). The Design-Builder shall allow for such time in its Project Schedule. The Department agrees that it shall make reasonable efforts and act diligently in such verification and, if appropriate, issuance of the Notice of Contract Completion if the Design-Builder has satisfied all requirement for such a Notice of Contract Completion.

13.8. Overpayments; No Relief from Continuing Obligations

Contract Completion will not prevent the Department from correcting any measurement, estimate or certificate made before or after completion of the Work, or from recovering from the Design-Builder, the Surety(ies) or both, the amount of any overpayment sustained due to failure of the Design-Builder to fulfill the obligations under the Contract. A waiver on the part of the Department of any breach by the Design-Builder shall not be held to be a waiver of any other or subsequent breach. Contract Completion shall not relieve the Design-Builder from any of its continuing obligations hereunder, or constitute any assumption of liability by the Department.

13.9. Assignment of Causes of Action

The Design-Builder hereby offers and agrees to assign to the Department all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15), arising

from purchases of goods, services or materials pursuant to the Contract or any Subcontract. This assignment shall be made and become effective at the time the Department tenders final payment to the Design-Builder, without further acknowledgment by the parties.

14— COMPLIANCE WITH THE LAW

The Design-Builder shall comply with, and ensure that all Subcontractors comply with, all applicable Laws.

14.1. Observing Laws, Rules, And Regulations

A. Observe and comply with all of the following that affect the conduct of Work on the Project, have jurisdiction or authority over the Work, or that affect individuals engaged or employed on the Project:

1. Federal, State and local Laws;
2. Health officials; and
3. UDOT Construction Safety and Health Manual.

B. Protect, defend, hold harmless and indemnify the Department, its employees, the State of Utah and its representatives against claim or liability arising out of or resulting from violations of any of the above-listed items, whether violated by employees, agents, or contractors of the following:

1. The Design-Builder;
2. Subcontractors at any tier;
3. Suppliers of materials or services;
4. Design Professional or Design Professional engaged by the Design-Builder:
    a. Design Professionals are required to indemnify the Department from liability claims which result from negligent act, wrongful act, error or omission, or other liability imposed by law;
    b. for a person for whom the Design Professional has direct or indirect control or responsibility; and
5. Any others engaged by the Design-Builder or Subcontractor.

C. Do not require employees of the Design-Builder or Subcontractor to work in surroundings or under conditions that are unsanitary, hazardous, or dangerous to health or safety:

1. Immediately correct any conditions that do not comply with the foregoing provisions:
    a. The Department issues a Stop Work order when either Work site conditions or Work practices present an imminent danger that may result in serious injury, death, or extensive property damage until those conditions or practices are corrected; and
    b. A Stop Work order does not provide relief from completing the Project within the specified Contract Completion time(s).

D. Allow access to all areas of Work Site by and admit without delay any OSHA inspector or other legally responsible agency involved in safety and health administration, upon presentation of proper credentials but without presentation of an inspection warrant.

E. Comply with Federal, State, and local Laws, rules, and regulations that enumerate unlawful employment practices including:

1. Discrimination because of race, religion, color, sex, age, disability, or national origin, and that define actions required for Affirmative Action and Minority/Disadvantaged Business programs.
2. Employment and verification of employment eligibility of all persons employed by any Contractor or Sub-Contractor performing work. Compliance must be in accordance with provisions of U.S.C. 1273 and Utah Administrative Code 63-99a-103 and 63G-12-302.

F. The Design-Builder and each of its contrctors and subcontractors must certify as to its own organization, under penalty of perjury, that to the best of their knowledge and belief that the named contractor or subcontractor has registered with and uses the Department's "Status Verification System" to determine the work eligibility status of an employee hired after July 1, 2009, pursuant to Utah Administrative Code 63-99a-103. The Department will not award and execute the Contract nor approve the request to sublet the Work with firms not in compliance with this Section. Immediately notify the Department in writing upon discovering any discrepancy or inconsistency between the Contract and any Law, except as otherwise directed or noted.

G. Immediately correct any conditions that do not comply with the foregoing provisions.

1. A statement made by the Contracting (or consulting) entity, on the entity's letterhead, stating the entity will "maintain an offer of Qualified Health Insurance coverage, as required by Utah Code 72-6-107.5, for the duration of the prime contract between the Design-Builder and the Department."
2. A statement signed by an accredited Actuary, on actuary letterhead, stating:
    a. the identified entity "has chosen to offer health insurance coverage for its employees through a certain date" and
    b. the undersigned accredited actuary has "compared said entity's benefit plan to the minimum qualified health insurance coverage requirements listed in Utah Administrative Code 72-6-107.5, Health Insurance Coverage in State Contracts, and has determined the coverage exceeds or is actuarially equivalent to the minimum health insurance coverage requirements."

H. Observe legal load restrictions when hauling equipment or materials on public roads beyond Project limits:

1. A special permit does not relieve the Design-Builder of liability for damage; and
2. Refer to the Utah Regulations for Legal and Permitted Vehicles.

I. Do not exceed legal gross weight limits on any public roads, structures, or on any component of the pavement structure, excluding granular borrow within the Project limits.

J. If a load restriction violation is observed, suspend construction operations until the Department approves acceptable corrective measures.

15— CHANGE ORDER RISK ALLOCATION

15.1. Items Included in Contract Amount

Refer to Part 1-5.1.1 (Items Included in Contract Amount) for items included in the Contract Amount.

15.2. Items Eligible for Time and Money Changes

The Design-Builder may request a Change Order to increase the Contract Amount, subject to the limitations set forth in Sections 16.6.1(Limitations on Contract Amount Increases) and 16.6.2 (Limitations on Acceleration Costs and Delay Damages), and for time extensions, subject to the limitations set forth in Section 16.6.3 (Limitations on Time Extensions), only for the following increased costs or delays and for no other costs or delays (subject to Section 15.3 (Items Eligible for Time Only Changes)):

(1) Additional costs or time directly attributable to additional Work resulting from Department-Directed Changes, as agreed to or as directed under Sections 15 (Change Order Risk Allocation) and 16 (Changes in Work).
(2) Additional costs or time directly attributable to unavoidable delays arising from a suspension order pursuant to Section 17.1 (Suspension for Convenience).
(3) Additional costs or time directly attributable to the failure or inability of the Department to provide the Design-Builder with access to the real property identified on the ROW Drawings on or before the deadline for such access set forth in the ROW Schedule, in accordance with Section 7.2.2 (Delay in Providing Access).
(4) Certain additional costs or time relating to material errors in the ROW limits indicated in the ROW Drawings, to the extent provided in Section 7 (Right-of-Way and Access).
(5) Certain additional costs or time directly attributable to Differing Site Conditions, to the extent provided in Section 4 (Differing Site Conditions).
(6) Certain additional costs or time directly attributable to the Department's delay in excess of three Working Days in viewing a location for which the Design-Builder provided notification pursuant to Section 3.3.1 (Notification to the Department), to the extent provided in Section 3.3.1.
(7) Certain additional costs or time relating to Remediation Work, to the extent provided in Section 5 (Environmental Compliance).
(8) Certain additional costs or time relating to Utility Work or Third-Party Work (including any Betterments under Section 6.1.4.2 (Additional Utility Betterments), but not including Utility Delays under Section 6.1.5 (Utility Company/Third-Party Delays), to the extent provided in Section 6 (Utility Work and Third-Party Agreements).
(9) Certain additional costs or time directly attributable to uncovering, removing, and restoring Work, to the extent provided in Section 3.5.3 (Obligation to Uncover Finished Work).
(10) Certain additional costs or time directly attributable to the discovery of Items of Archeological, Geological or Biological Significance, discovered within the ROW, provided that the existence of such resources was not disclosed in the RFP, to the extent provided in Section 5.6 (Environmental Resources of Special Significance).
(11) Additional costs or time directly attributable to the suspension, termination, interruption, denial, failure to obtain or nonrenewal of any Environmental Document or Governmental Approval or New Environmental Document required to be obtained by the Department, except as otherwise provided in Sections 5.2 (Mitigation Requirements) and 5.4 (New Environmental Documents to be Obtained by Design-Builder).
(12) Certain additional costs or time directly attributable to any change in a Law, change in the judicial interpretation of a Law, or adoption of any new Law, excluding changes in tax laws, that is materially inconsistent with Laws in effect on the Proposal Due Date (excluding any such change or new Law

which was passed or adopted as of the Proposal Due Date but had a defined future effective date), and which: (i) requires a material modification in the Project Work; (ii) requires the Design-Builder to obtain a major State or federal Environmental Document or Governmental Approval not previously required for the Project; or (iii) specifically targets the Project or the Design-Builder. Compensation shall be limited to actual costs incurred by the Design-Builder, excluding overhead or profit, and additional time, as proven in accordance with Sections 15 (Change Order Risk Allocation) and 16 (Changes in Work). Damages for delay shall not be allowed.

(13) Certain additional costs or time directly attributable to any lawsuit seeking to restrain, enjoin, challenge, or delay construction of the Project, except to the extent that the risk of such lawsuit has been assumed by Design-Builder under Section 5 (Environmental Compliance); or the lawsuit otherwise arises out of any act, omission or breach of obligation of any Design-Builder-Related Entity. Compensation shall be limited to actual costs incurred by the Design-Builder, excluding overhead or profit, and additional time, as proven in accordance with Sections 15 (Change Order Risk Allocation) and 16 (Changes in Work).

(14) Additional costs, only in excess of the Builder's Risk limit, and time directly attributable to an earthquake.

(15) Certain additional costs and time directly attributable to a Necessary Project Configuration Change, in accordance with Section 15.6 (Changes in Project Configuration), to the extent provided in Section 15.6.

(16) Additional costs and time directly attributed to delay for failure or inability of the Department to provide responses to proposed schedules, design submittals or other submittals and matters for which response by the Department is required within the time periods indicated in the Contract Documents.

(17) Additional costs and time directly attributable to any improper failure to act by the Department as required under Section 1.3.5 (Governmental Approvals) within a reasonable time after delivery of notice by the Design-Builder to the Department requesting such action.

15.3. Items Eligible for Time Only Changes

The Design-Builder may request a Change Order for time extensions, subject to the limitations set forth in Section 16.6.3 (Limitations on Time Extension), only for the following excusable delays and for no other delays (subject to Section 15.2 (Items Eligible for Time and Money Changes)):

(1) Force Majeure events, subject to Section 15.5 (Force Majeure Events).
(2) Force majeure events under a MUA.
(3) Utility and Third-Party Delays under Section 6.1.5 (Utility/Third-Party Delays), to the extent provided in Section 6.1.5.

15.4. Items Not Eligible for Change Orders

The Design-Builder acknowledges and agrees that no increase in the Contract Amount or extension of time for any Completion Deadline is available except in circumstances expressly provided for in the Contract, that such price increases shall be available only as provided in Sections 15 (Change Order Risk Allocation) and 16 (Changes in Work), and that the Design-Builder shall bear full responsibility for the costs of all other changes. Matters which are the Design-Builder's exclusive responsibility include the following:

(1) Errors, omissions, inconsistencies, inaccuracies, deficiencies or other defects in the Design Documents (including errors, omissions, inconsistencies, inaccuracies, deficiencies or other defects traceable to errors, omissions, inconsistencies, inaccuracies, deficiencies or other defects in the Reference Documents), except to the extent that the Department fails to act reasonably to approve corrections thereto proposed by the Design-Builder;

(2) Any design changes required by the Department as part of the process of making the Design Documents consistent with the Contract Documents;
(3) Defective or incorrect schedules of Work or changes in the planned sequence of performance of the Work (except to the extent that changes in the planned sequence of performance of the Work arise from causes which otherwise give rise to a right to a Change Order);
(4) Action or inaction of a Subcontractor (unless arising from causes which otherwise give rise to a right to a Change Order);
(5) The action or inaction of an adjoining property owner or of another contractor (including failure to organize and integrate their work with the Design-Builder's Work);
(6) Any variations in soil moisture content, groundwater levels or subsurface moisture content, including changes therein (unless arising from causes which otherwise give rise to a right to a Change Order);
(7) Untimely delivery of equipment or material, or unavailability, defectiveness, or increases in costs of material, equipment or products specified by the Contract Documents;
(8) Any delay not on a Critical Path;
(9) Costs covered by insurance proceeds received by or on behalf of the Design-Builder;
(10) Correction of Nonconforming Work and review and acceptance thereof by the Department;
(11) Failure by the Design-Builder to comply with Contract requirements;
(12) Obtaining all Governmental Approvals except as specified in Section 1.2(3) (General Obligations of the Design-Builder);
(13) Escalation in labor, equipment, or materials prices;
(14) Any impacts whatsoever due to weather, except to the extent provided as a Force Majeure event;
(15) Obtaining or failure to obtain any Governmental Approval or Third-Party approvals required to implement any Approved ATCs incorporated into the Contract Documents;
(16) All events beyond the control of the Department for which the Department has not agreed to assume liability hereunder; and
(17) Any situations which, while not within one of the categories delineated above, were or should have been anticipated because such situations are referred to elsewhere in the Contract or arise out of the nature of the Work (unless arising from causes which otherwise give rise to a right to a Change Order).

The Design-Builder hereby assumes responsibility for all such matters, and acknowledges and agrees that assumption by the Design-Builder of responsibility for such costs and delays, and the consequences and costs resulting therefrom, is reasonable under the circumstances of the Contract and that whatever contingencies the Design-Builder included in the Contract Amount constitute sufficient consideration for its acceptance and assumption of said risks and responsibilities as set forth in this Section 15 and the Contract Documents.

15.5. Force Majeure Events

15.5.1. Definition of Force Majeure

For purposes of the Design-Builder's entitlement to a time extension hereunder, the term "Force Majeure" shall mean any of the following events:

A. Fire or 50-year or greater floods.
B. Lightning, hurricane, or tornado.
C. Any epidemic or quarantine restrictions occurring within the vicinity of the Project.
D. A blockade or freight embargos.
E. War, whether foreign or domestic.
F. Acts of the public enemy.

G. Work stoppages, work slowdowns, or other labor disruptions, unless caused by or otherwise under the control or influence of the Design-Builder occurring within the vicinity of the Project.

15.5.2. Change Orders for Force Majeure Events

Subject to the restriction and limitations in Section 15.5 (Force Majeure Event), the Department agrees to issue Change Orders to extend the affected Completion Deadlines as the result of any delay in the Critical Path caused by a Force Majeure event.

15.5.3. Notification

If the Design-Builder becomes aware that a Force Majeure event is likely to or has impacted the Work, as a condition precedent to the Design-Builder's right to a Change Order, the Design-Builder shall notify the Department by written notification as soon as practicable but no later than five Working days from the time the Design-Builder knew or should have known of the Force Majeure event.

15.5.4. Limitations on Change Orders for Force Majeure Events

The Design-Builder shall bear the burden of proving that a Force Majeure event exists, that it could not reasonably have worked around the Force Majeure event so as to avoid impacts, and that it has mitigated the impacts of any Force Majeure event. Each request for a Change Order relating to a Force Majeure event shall be accompanied by a statement signed by a qualified professional stating the efforts undertaken by the Design-Builder to find alternative design or construction solutions to eliminate or minimize the problem and the associated costs.

15.6. Changes in Project Configuration

15.6.1. Increase in Contract Amount and/or Extension of Contract Deadlines

Upon the Design-Builder's fulfillment of all applicable requirements of Sections 15 (Change Order Risk Allocation) and 16 (Changes in Work), and subject to the limitations contained therein, the Department shall be responsible for, and agrees to issue Change Orders: (i) to compensate the Design-Builder for additional costs directly attributable to a Necessary Project Configuration Change; and (ii) to extend the Completion Deadlines as the result of any delay in the Critical Path affecting a Completion Deadline caused by a Necessary Project Configuration Change, excluding any costs and/or time that could have been avoided by the Design-Builder; provided, however, the Design-Builder shall not be entitled to an increase in the Contract Amount or an extension of the Completion Deadlines in connection with errors, omissions, inconsistencies, inaccuracies, deficiencies or other defects resulting from Approved ATCs incorporated in the Contract Documents. To the extent applicable, the Department, in the Department's sole discretion, shall have the right to mitigate any increase in the Contract Amount by acquiring additional real property.

15.6.2. Decrease in Contract Amount and/or Reduction of Contract Deadlines

If a Necessary Project Configuration Change decreases the cost and/or time to perform the Work, the Contract Amount and/or Completion Deadlines shall be decreased accordingly.

15.6.3. Non-Material Change in Project Configuration

The Design-Builder shall be responsible for any cost increases and/or delays resulting from changes in requirements and obligations of the Design-Builder relating to the Project due to inaccuracies in the Project Configuration which do not necessitate a material change in the Project Configuration. In such event, no change in the Work shall be deemed to have occurred and no Change Order shall be issued for any such cost increases and/or delays.

15.7. Insurance Claims

Prior to filing any request for a Change Order, the Design-Builder shall determine whether builder's risk or other insurance proceeds should be available to cover costs in connection with such item. If the Design-Builder determines that reasonable grounds for filing an insurance claim exist, then the Design-Builder shall so notify the Department. The Department shall not be in default for failure to pay any amounts which the Design-Builder or the Department determines should be covered by insurance, unless and until the claim is denied by the insurance company. The Design-Builder shall maintain contemporaneous records of all costs incurred by it with respect to the Differing Site Condition pending the insurance company's determination regarding the claim. Upon denial of any such claim by the insurance company and receipt of a Change Order request, the Department will process the Change Order request. The Department shall have the right to contest the denial of any insurance claim, and the Design-Builder shall cooperate with the Department in that regard. Notwithstanding anything to the contrary contained in Section 16.3.4 (Procedures for Design-Builder-Initiated Lump Sum Change Orders), the Design-Builder shall not be obligated to include amounts that may be covered by insurance in any Change Order request until 20 days after the insurance company has denied the claim. However, all other Change Order requirements, including the notice requirements of Section 16.3.4 (Procedures for Design-Builder-Initiated Lump Sum Change Orders), shall remain in effect.

16— CHANGES IN THE WORK

This Section 16 (Changes in the Work) sets forth the requirements for obtaining all Change Orders under the Contract. The Design-Builder hereby acknowledges and agrees that the Contract Amount constitutes full compensation for performance of all of the Work, subject only to those exceptions specified in Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work), and that the Department is subject to constraints which limit its ability to increase the Contract Amount or extend the Completion Deadlines. The Design-Builder hereby waives the right to make any claim for a time extension or for any monetary compensation in addition to the Contract Amount and other compensation specified in the Contract, except as set forth in Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work).

16.1. Circumstances Under Which Change Orders may be Issued

16.1.1. Change Orders

The term “Change Order” shall mean a written amendment to the terms and conditions of the Contract Documents issued in accordance with Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work). A Change Order shall not be effective for any purpose unless executed by the Department. Execution of a Change Order by the Department shall mean that the Change Order has been fully executed by the Department and any other necessary parties of the State. Change Orders may be requested by the Design-Builder only pursuant to Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work). Change Orders may be issued for the following purposes (or combination thereof):

A. To modify the Work.

B. To revise a Completion Deadline.

C. To revise the Contract Amount.

D. To revise other terms and conditions of the Contract Documents.

Upon the Department’s Approval of the Change Order form and after signature of the Design-Builder, the Department will execute the Change Order form indicating Approval thereof.

16.1.2. Issuance of Directive Letter

The Department may at any time issue a Directive Letter to the Design-Builder for any desired change in the Work or other purpose or in the event of any Dispute regarding the Work. The Directive Letter will state that it is issued under this Section 16.1.2, will describe the Work in question, and will state the basis for determining compensation, if any. The Design-Builder shall proceed immediately with the Work as directed in the letter, pending the execution of a formal Change Order (or, if the letter states that the Work is within the original scope of the Work, the Design-Builder shall proceed with the Work as directed but shall have the right pursuant to Sections 15 (Change Order Risk Allocation) and 16(Changes in the Work) to request that the Department issue a Change Order with respect thereto).

Receipt of a Directive Letter from the Department is a condition precedent to the Design-Builder's right to claim that a Department-Directed Change has occurred, provided that no Directive Letter shall be required for a Department-Directed Change described in Section 6.3 (Amendments to Third-Party Agreements) or for alleged Department-Directed Changes directly attributable to delays caused by bad faith actions, active interference, gross negligence or comparable tortious conduct by the Department. The fact that a Directive Letter was issued by the Department shall not be considered evidence that in fact a Department-Directed Change occurred. The determination whether a Department-Directed Change in fact occurred shall be based on an analysis of the original Contract Documents requirements and a determination whether the Directive Letter in fact constituted a change in those requirements.

16.1.3. Performance of Changed or Extra Work

As a condition precedent to the Design-Builder's right to receive additional payment for changed or extra work, the Design-Builder shall have received a Directive Letter from the Department stating that it is issued pursuant to Section 16.1.2 (Issuance of Directive Letter), a Change Order for such work executed by the Department for such work executed by the Department. As a condition precedent to the Design-Builder's right to receive an extension of a Completion Deadline for changed or extra work, the Design-Builder shall have received either a Directive Letter from the Department stating that it is issued pursuant to Section 16.1.2 (Issuance of Directive Letter) or a Change Order for such work executed by the Department. To the extent that the Design-Builder undertakes any such work without receiving a Directive Letter, Change Order or Exception Agreement Memorandum executed by the Department, the Design-Builder shall be deemed to have performed such work voluntarily and shall not be entitled to a Change Order in connection therewith. In addition, the Design-Builder may be required to remove or otherwise undo any such work at its sole cost.

16.2. Equal or Better Change Orders

The Design-Builder may request the Department's Approval of a Change Order that is equal or better than the Contract Document requirements. An Equal or Better Change Order is an Approved proposal developed and documented by the Design-Builder, which would modify or require a change in any of the Contract Document requirements in order to be implemented that is "equal to or better than" the underlying requirement. An Equal or Better Change Order cannot be based solely upon a change in quantities, performance or reliability.

If Approved as provided in this Section 16.2, equal or better changes may be implemented without any sharing of the Design-Builder's cost savings (and without any additional cost to the Department). Equal or Better Change Orders cannot change a Completion Deadline.

16.2.1. Required Information

At a minimum, the following information shall be submitted by the Design-Builder with each Equal or Better Change Order proposal in the form set forth in Appendix K (Equal or Better Change Proposal Form):

A. Redline of the changes proposed to the Contract requirements, which are involved in the proposed change.

B. Description of why the proposed change is equal or better than the existing Contract requirements.

C. A description of any previous use or tests of the proposal and the conditions and results if requested by the Department.

D. The Design-Builder shall provide any additional information requested by the Department in a timely manner.

16.2.2. Department Review and Approval or Rejection

Upon receipt of an Equal or Better Change Order proposal, the Department will process it, but shall not be liable for any delay in acting upon any proposal submitted pursuant to this Section 16.2 The Design-Builder may withdraw all or part of any Equal or Better Change Order proposal at any time prior to Approval by the Department. The Department may Approve, in its sole discretion, in whole or in part, any Equal or Better Change Order proposal submitted. Until an Equal or Better Change Order proposal is Approved by the Department, the Design-Builder shall remain obligated to perform in accordance with the Contract Documents. The decision of the Department as to rejection or Approval of any Equal or Better Change Order proposal shall be at the sole discretion of the Department, and shall be final and not subject to partnering, dispute resolution or appeal. Equal or Better Change Order proposals that require excessive time or costs for review, evaluation or investigations, or that are not consistent with the Department's design policies and basic design criteria may be rejected. The Design-Builder shall have no claim for any additional costs or delays resulting from the rejection of an Equal or Better Change Order proposal, including development costs, loss of anticipated profit, or increased material or labor costs. The Department will consider only proven features that have been employed under similar conditions or projects acceptable to the Department.

16.3. Lump Sum Change Orders

The preferred approach by both parties is that Change Orders will be reimbursed on a lump sum payment basis, if the parties can agree on a lump sum amount. If the parties cannot agree on a lump sum amount for Change Orders, the Change Orders will be paid as Force Account Change Orders described in Section 16.4 (Force Account Change Orders).

16.3.1. Issuance of Request for Change Proposal by Department

If the Department desires to evaluate whether to initiate a change to the Work, the Department may, at its discretion, issue a Request for Change Proposal (RCP).

Within seven Calendar Days after the Design-Builder's receipt of a RCP or as otherwise directed by the Department, the Design-Builder and the Department shall consult to define the proposed scope of the change. Within seven Calendar Days after the initial consultation or as otherwise directed by the Department, the Department and the Design-Builder shall consult concerning an estimated rough order of magnitude (ROM) cost and time impacts, if any. The Design-Builder shall prepare the ROM at its cost. The Design-Builder shall provide data regarding such matters as requested by the Department.

Within seven days after the ROM consultation meeting and provision of any data requested by the Department, the Department shall notify the Design-Builder whether the Department:

A. Requests the Design-Builder to prepare a Change Order form as discussed at the meeting.

B. Will not issue a Change Order.

The Department may at any time, in its sole discretion, require the Design-Builder to provide two alternative Change Order forms, one of which shall provide for a time extension if applicable and any additional costs permitted hereunder, and the other of which shall show all Acceleration Costs associated with meeting the original Completion Deadlines, as well as any additional costs permitted hereunder. If it is not feasible to recover to the original Completion Deadline or if the Design-Builder believes that the costs associated with such a recovery are prohibitive, then the Design-Builder shall recommend a date to be shown in the alternative Change Order form.

If and as requested by the Department, the Design-Builder shall prepare and submit to the Department for Approval a Change Order form for the requested change, complying with all applicable requirements of Section 16.3 (Lump Sum Change Orders) and incorporating all requests made by the Department. The Design-Builder shall bear the cost of developing the Change Order form, including any modifications thereto requested by the Department, except that costs of design and engineering Work required for preparation of plans or exhibits necessary to the Change Order form and pre-authorized by the Department shall be included in the Change Order as reimbursable items. If the Change Order is Approved, the design and engineering costs will be included within the Change Order. If the Change Order is not Approved, the Design-Builder shall be separately reimbursed for the design and engineering costs through a separate Change Order.

If the Department and the Design-Builder agree that a change in the requirements relating to the Work has occurred but disagree as to whether the change justifies additional compensation or time or disagree as to the amount of any change to be made to the Contract Amount or a Completion Deadline, the Department may, in its sole discretion, order the Design-Builder to proceed with the performance of the Work in question notwithstanding such disagreement. Such order may, at the Department's option, be in the form of a:

A. Force Account Change Order; or

B. Directive Letter

16.3.2. Unilateral Change Orders

The Department may issue a unilateral Change Order at any time, regardless of whether it has issued a Request for Change Proposal. Any such Change Order shall state that the Design-Builder shall be entitled to compensation in accordance with Section 16.4 (Force Account Change Order) for the additional Work required thereby. For deductive unilateral Change Orders, the Change Order may contain a price deduction deemed appropriate by the Department (if applicable), and the Design-Builder shall have the right to submit the amount of such price deduction to dispute resolution in accordance with Section 22 (Partnering and Dispute Resolution).

16.3.3. Changes in Law

The Department shall be entitled to a decrease in the Contract Amount for any change in Laws that reduces the cost of the Work, if and to the extent that the change (i) allows a material modification in the design of the Project resulting in a net cost savings or (ii) reduces the requirements of complying with the Environmental Approvals.

16.3.4. Procedures for Design-Builder-Initiated Lump Sum Change Orders

(1) The requirements set forth in this Section 16.3.4 constitute conditions precedent to the Design-Builder's entitlement to request and receive a Change Order in all circumstances. The Design-Builder agrees that the filing of a Potential Change Order (PCO) Notice and subsequent filing of a Request for Change Order (RCO) with the Department pursuant to this Section are necessary in order to begin the administrative process for Design-Builder-requested Change Orders. The Design-Builder understands that it shall be forever barred from recovering against the Department under

Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work) if it fails to give notice of any act, or failure to act, by the Department or any of its representatives or the happening of any event, thing or occurrence pursuant to a proper PCO Notice, and thereafter complies with the remaining requirements of this Section.

(2) The Design-Builder shall deliver to the Department a PCO Notice stating that an event or situation has occurred and shall state whether it is entitled to additional time or money. The first notice shall be labeled "PCO No. 1" and subsequent notices shall be numbered sequentially.

(3) Each PCO Notice shall be delivered as promptly as possible after the occurrence of such event or situation. If any PCO Notice is delivered later than ten days after the Design-Builder first discovered (or should have discovered in the exercise of reasonable prudence) the occurrence which is described therein, the Design-Builder shall be deemed to have waived the right to collect any and all costs incurred prior to the date of delivery of the PCO Notice, and shall be deemed to have waived the right to see an extension of any Completion Deadline with respect to any delay in the Critical Path that accrued prior to the date of delivery of the written notice. Furthermore, if any PCO Notice concerns any condition or material described in Section 3.3 (Process to be Followed for Discovery of Certain Site Conditions), the Design-Builder shall be deemed to have waived the right to collect any and all costs incurred in connection therewith to the extent that the Department is not afforded the opportunity to inspect such material or condition before it is disturbed. The Design-Builder's failure to provide a PCO Notice within 14 Calendar Days after the Design-Builder first discovered (or should have discovered in the exercise of reasonable prudence) the occurrence of a given event or situation shall preclude the Design-Builder from any relief whatsoever, unless the Design-Builder can show, based on a preponderance of the evidence that: (i) the Department was not materially prejudiced by the lack of notice; or (ii) the Department's designated representative specified in accordance with Part 1 (Agreement), Section-3.1 (Delivery of Notices) had actual knowledge, prior to the expiration of the notification, of the event or situation and that the Design-Builder believed it was entitled to a Change Order with respect thereto. A PCO Notice shall be deemed delivered only if it fully conforms to the requirements of Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work).

(4) The PCO Notice shall (i) state in detail the facts underlying the potential Change Order, the reasons why the Design-Builder believes additional compensation or time will or may be due and the date of occurrence; (ii) state in detail the basis that the work is not required by the Contract, if applicable; (iii) identify particular elements of Contract performance for which additional compensation may be sought under Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work); (iv) identify any potential impact to the Critical Path affecting a Completion Deadline; and (v) provide an estimate of the time within which a response to the notice is required to minimize cost or delay of performance.

(5) The written notification under Section 3.3 (Process to be Followed for Discovery of Certain Site Conditions) may also serve as a PCO Notice provided it meets the requirements for PCO Notices. Any adjustments made to the Contract shall not include increased costs or time extensions for delay resulting from the Design-Builder's failure to provide requested additional information under this Section 16 (Changes in the Work).

(6) The Design-Builder shall deliver all RCOs under this Section 16 (Changes in the Work) to the Department within 30 Calendar Days after delivery of the PCO Notice. The Department may require design and construction costs to be covered by separate Change Order requests. If the Design-Builder requests a time extension, then the Department, in its sole discretion, may require the Design-Builder to provide two alternative Change Order requests, one of which shall provide for a time extension and any additional costs permitted hereunder, and the other of which shall show all Acceleration Costs associated with meeting the original Completion Deadlines, as well as any additional costs permitted hereunder. If it is not feasible to recover to the original Completion Deadline or if the Design-Builder believes that the costs associated with such a recovery are

prohibitive, then the Design-Builder shall recommend a date to be shown in the alternative Change Order form.

(7) The Design-Builder acknowledges and agrees that, due to the limited availability of funds for the Project, timely delivery of notification of such events and situations and requests for Change Orders and updates thereto are of vital importance to the Department. The Department is relying on the Design-Builder to evaluate, promptly upon the occurrence of any event or situation, whether the event or situation will affect schedule or costs and, if so, whether the Design-Builder believes a time extension and/or price increase is required hereunder. If an event or situation occurs that may affect the Contract Amount or a Completion Deadline, the Department will evaluate the situation and determine whether it wishes to make any changes to the definition of the Project so as to bring it within the Department's funding and time restraints.

(8) The following matters (among others) shall be considered in determining whether the Department has been prejudiced by the Design-Builder's failure to provide timely notice: (i) The effect of the delay on alternatives available to the Department (that is, a comparison of alternatives which are available at the time notice was actually given and alternatives which would have been available had notice been given within ten days after occurrence of the event or when such occurrence should have been discovered in the exercise of reasonable prudence); and (ii) The impact of the delay on the Department's ability to obtain and review objective information contemporaneously with the event.

(9) The Design-Builder's delivery of any RCO shall be accompanied by the certification described in Section 16.5.2 (Design-Builder Representation) (with respect to the RCO).

(10) Prior to submission by the Design-Builder of an RCO to the Department which is based in whole or in part on a request by a Subcontractor to the Design-Builder for a price increase or time extension under its Subcontract, the Design-Builder shall have reviewed all claims by the Subcontractor which constitute the basis for the RCO and determined in good faith that each such claim is justified hereunder and that the Design-Builder is justified in requesting an increase in the Contract Amount and/or change in Completion Deadlines in the amounts specified in the RCO. Each RCO involving Subcontractor Work shall include a sworn certification in form acceptable to the Department signed by the Project Manager stating that the Design-Builder has investigated the basis for the Subcontractor's claims and has determined that all such claims are justified as to entitlement and amount of money and/or time requested and has no reason to believe and does not believe that the factual basis for the Subcontractor's claim is falsely represented. Any RCO involving Subcontractor Work shall be considered incomplete if it is not accompanied by such certification.

(11) If the Department refuses to issue a Change Order based on the Design-Builder's request, the Design-Builder shall nevertheless perform all work as specified in an appropriate Directive Letter, with the right to submit the issue of entitlement to a Change Order to dispute resolution in accordance with Section 22 (Partnering and Dispute Resolution). The Design-Builder shall maintain and deliver to the Department, upon request, contemporaneous records, meeting the requirements of Section 16.4.1 (Force Account Records), for all work performed which the Design-Builder believes constitutes extra work, until all Disputes regarding entitlement or cost of such work are resolved.

16.4. Force Account Change Orders

The Department may at its discretion issue a unilateral Force Account Change Order whenever the parties cannot agree to a Lump Sum Change Order or the Department determines that a Force Account Change Order is advisable. The Force Account Change Order shall instruct the Design-Builder to perform the Work, indicating expressly the intention to treat the items as changes in the Work, and setting forth the kind, character, and limits of the Work as far as they can be ascertained, the terms under which changes to the Contract Amount will be determined and the estimated total change in the Contract Amount anticipated thereunder. Upon final determination of the allowable costs, the Department shall issue a modified Change Order setting forth the final adjustment to the Contract Amount. The costs and

additional amounts allowed in Section 16.7 (Pricing of Change Orders) (and no others) shall be used for calculating the change in the Contract Amount. No direct compensation will be allowed for other miscellaneous costs for which no specific allowance is provided in Section 16.7 (Pricing of Change Orders).

The Department and the Design-Builder may agree to negotiate unit prices for a Force Account Change Order. Measurement of any unit-priced quantities will be as specified in the Change Order. Unit prices shall be deemed to include all costs for labor, material, overhead and profit, and shall not be subject to change regardless of any change in the estimated quantities. Upon final determination of the quantities, the Department will issue a modified Change Order setting forth the final adjustment to the Contract Amount.

16.4.1. Force Account Records

The Design-Builder shall maintain its records in such a manner as to provide a clear distinction between: (i) the direct cost of Work for which it is entitled (or for which it believes it is entitled) to an increase in the Contract Amount; and (ii) the costs of other operations. The Design-Builder shall contemporaneously collect, record in writing, segregate, and preserve: (A) all data necessary to determine the costs described in this Section 16.4 with respect to all Work which is the subject of a Change Order or a requested Change Order, specifically including costs associated with design Work as well as Utility Relocations, but specifically excluding all negotiated Change Orders (except for Supplemental Agreements that are also Change Orders as described in Section 16.1.1 (Change Orders)); and (B) all data necessary to show the actual impact (if any) of the change on the Critical Path affecting a Completion Deadline with respect to all Work which is the subject of a Change Order or a proposed Change Order, if the impact on the Critical Path affecting a Completion Deadline is in dispute. Such data shall be provided pursuant to Section 16 (Changes in the Work), on forms Approved by the Department. The cost of furnishing such reports is included in the Design-Builder's predetermined overhead and profit. Refer to Section 16.7 (Pricing of Change Orders).

The Design-Builder shall furnish daily, on forms Approved by the Department, reports of Force Account Change Order Work. The cost of furnishing such reports shall be included in the Design-Builder's overhead and profit percentages. The reports shall include:

A. Name, classification, date, daily hours, total hours, rate, and extension for each worker (including both construction and non-construction personnel) and foreman.

B. Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.

C. Quantities of materials, prices and extensions.

D. Transportation costs of materials, machinery, and equipment.

E. Invoices for materials used and for transportation charges.

F. The total costs to date for the Force Account Change Order Work.

If materials used on the Force Account Change Order Work are not specifically purchased for the Work but are taken from the Design-Builder's stock, the Design-Builder shall furnish an affidavit certifying that such materials were taken from the Design-Builder's stock, that the quantity claimed was actually used, and that the price and transportation costs claimed represent actual costs to the Design-Builder.

All Force Account Change Order reports shall be signed by the Project Manager. The Department will compare its records with the Design-Builder's reports, make the necessary adjustments and compile the costs of Force Account Change Order Work. When such reports are agreed upon and signed by both parties, they will become the basis of payment, but shall not preclude subsequent adjustment based on a

later audit. The Design-Builder's (and each Subcontractor's) cost records pertaining to Work paid for on a Force Account basis shall be open, during all regular business hours, to inspection or audit by representatives of the Department during the life of the Contract and for a period of not less than seven years after Contract Completion, and the Design-Builder (and each Subcontractor) shall retain such records for that period. If an audit is to be commenced more than 60 days after Contract Completion, the Design-Builder will be given a 14-day notice of the time when such audit is to begin.

16.5. Contents of Change Orders (excluding Equal or Better Change Orders)

Each lump sum, force account Change Order form and RCO shall meet all applicable requirements of Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work). The completed and/or modified Supplemental Agreement described in Section 6.1.3 (Change in Allocation of Responsibility Decreasing the Work) and Part 4-19 (Utilities) shall be considered an appropriate form, where applicable.

The Design-Builder shall prepare a scope of work, cost estimate, time impact analysis, if any and other information as required by this Section for each Change Order form and RCO.

Scope of Work: The scope of work shall describe in detail satisfactory to the Department all activities associated with the Change Order, including a description of additions, deletions and modifications to the existing Contract requirements.

Cost Estimate: Unless the Department agrees otherwise, the cost estimate shall set out the estimated costs in such a way that a fair evaluation can be made. It shall be in the form of Appendix J (Cost Analysis for Request for Change Order) or such other form as required by the Department and shall include as separate items: labor, materials, equipment, overhead (which includes all indirect costs) and profit, as allowed under Section 15 (Change Order Risk Allocation) and this Section 16 (Changes in the Work), if any. If the work is to be performed by Subcontractors and if the work is sufficiently defined to obtain Subcontractor quotes, the Design-Builder shall obtain quotes (with breakdowns showing cost of labor, materials, equipment, overhead and profit) on the Subcontractor's stationery and shall include such quotes as back-up for the Design-Builder's estimate. No additional payment shall be allowed in excess of the provisions under Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work).

Time Impact Analysis:

If the Design-Builder claims that an event, situation or change impacts the Critical Path affecting a Completion Deadline, it shall provide a time impact analysis (TIA). The TIA shall illustrate the impacts of each change or delay to the Project Completion Deadline or Project milestone (defined in Part 1 (Agreement)), as appropriate. The TIA shall use the accepted Project schedule update that has the closest data date prior to the event and compare it to the proposed TIA schedule which incorporates the impact event. If the Department determines that the most recently accepted Project schedule update does not appropriately represent the conditions prior to the event, then the Design-Builder shall provide a schedule updated to one day before the impact event and provide this schedule for acceptance to use in the TIA. Alternatively, if an event or change affects activities that were already in-progress at the time of the impact, then, with the approval of the Department, it may be appropriate to provide analysis using actual dates and durations from the Project schedule update at the time of the event to quantify the impact.

The TIA shall include schedule layouts and a narrative report representing specific activities affected by the event or change; including activity numbers, durations, dates, predecessor and successor activities, resource and cost, and all supporting documentation needed to evaluate the change in a form satisfactory to the Department.Other Supporting Documentation: The Design-Builder shall provide such other supporting documentation as may be required by the Department.

16.5.1. Justification

All requests for Change Orders shall include a narrative justification detailing all causes of the proposed change, making specific reference to the applicable provisions of Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work) that permit a Change Order to be issued, and describing the data and documents that establish the necessity of such proposed change.

16.5.2. Design-Builder Representation

Each Change Order shall contain a sworn certification, in the form of Appendix L, Change Order Certification, by the Design-Builder (and Subcontractor(s), for any Subcontractor involved in the Work or event contemplated by the Change Order).

16.5.3. Incomplete Change Orders

Each RCO provided under Section 16 (Changes in the Work) shall meet all requirements set forth in this Section 16.5, provided that if any such requirements cannot be met due to the nature of the occurrence, the Design-Builder shall provide an incomplete RCO, which shall:

A. Comply with all requirements capable of being met.

B. Include a list of requirements, which are not fulfilled together with an explanation reasonably satisfactory to the Department stating why such requirements cannot be met.

C. Provide such information regarding projected impact on the Critical Path affecting a Completion Deadline as is requested by the Department.

D. In all events include sufficient detail to ascertain the basis for the proposed Change Order and for any price increase associated therewith, to the extent such amount is then ascertainable.

The Design-Builder shall furnish, when requested by the Department, such further information and details as may be required to determine the facts or contentions involved. The Design-Builder agrees that it shall give the Department access to any and all of the Design-Builder's books, records, and other materials relating to the Work, and shall require its Subcontractors to do the same, so that the Department can investigate the basis for such proposed Change Order. The Design-Builder shall provide the Department with a monthly update to all outstanding incomplete requests for Change Order, describing the status of all previously unfulfilled requirements and stating any changes in projections previously delivered to the Department, time expenditures to date and time anticipated for completion of the activities for which the time extension is claimed. Failure to provide the above monthly information as required shall prevent the Design-Builder from being compensated for that month for any RCO amounts that otherwise may be owed or become owed.

The Department may reject the Design-Builder's claim at any point in the process. Once a complete RCO is provided, the Department's failure to respond thereto within 14 days of delivery of the request shall be deemed a rejection of such request. Although the Department intends to review incomplete Change Orders for the purposes of determining whether delivery was timely as described in Section 16.3.4 (Procedures for Design-Builder-Initiated Lump Sum Change Orders), the Department shall have no obligation to review the supporting information associated with any RCO until a complete RCO is provided.

16.5.4. Phased Change Orders

The Department and Design-Builder may mutually agree to use a multiple-step process involving issuance of a Change Order which includes an estimated design cost and which provides for a revised

Change Order to be issued after a certain design level has been reached, thus allowing a refinement and definition of the estimated construction cost.

16.5.5. Not Applicable to Equal or Better Change Orders

This Section 16.5 (Contents of Change Orders) shall not apply to Equal or Better Change Orders.

16.6. Certain Limitations for all Change Orders (excluding Equal or Better Change Orders)

16.6.1. Limitation on Contract Amount Increases

Any increase in the Contract Amount allowed hereunder shall exclude:

A. Costs caused by the breach of contract or fault or negligence, or act or failure to act of any Design-Builder-Related Entity.

B. Costs, which could reasonably have been avoided by the Design-Builder, including by resequencing, reallocating, or redeploying its forces to other portions of the Work or to other activities unrelated to the Work (including any additional costs reasonably incurred in connection with such reallocation or redeployment).

C. Costs for any rejected Work that failed to meet the requirements of the Contract Documents and any necessary remedial Work.

16.6.2. Limitation on Acceleration Costs and Delay Damages

Acceleration Costs: Acceleration Costs are those fully documented increased costs reasonably incurred by the Design-Builder (i.e., costs over and above what the Design-Builder would otherwise have incurred) which are directly attributable to increasing the performance level of the Work in an attempt to complete necessary activities of the Work earlier than otherwise anticipated, such as for additional equipment, additional crews, overtime and shift premiums, increased supervision, and any unexpected movement of materials, equipment, or crews necessary for resequencing in connection with acceleration efforts. Acceleration Costs do not include any costs for Disruption Damages as described below.

Acceleration Costs shall be compensable hereunder only with respect to Change Orders issued by the Department as an alternative to allowing an extension of a Completion Deadline as contemplated by Section 16.3 (Lump Sum Change Orders). Delay Damages shall be compensable hereunder only in the case of a delay to the extent that it entitles the Design-Builder to an extension of a Completion Deadline under Section 15.2(1) (Department-Directed Change), 15.2(2) (suspension order pursuant to Section 17.1 (Suspension for Convenience)), 15.2(3) (failure or inability of the Department to provide the Design-Builder with access to identified ROW), 15.2(4) (material errors in the ROW Drawings), 15.2(6) (the Department's delay in excess of three Working Day in viewing a location), 15.2(9) (uncovering, removing and restoring Work), or 15.2(16) (failure or inability of the Department to provide responses).

Other Limitations: Disruption Damages, whether from a single event or continual, multiple or repetitive events, are not allowed or recoverable under the Contract. Disruption Damages include costs of (i) rearranging the Design-Builder's Work plan not associated with an extension of a Completion Deadline, and (ii) loss of efficiency, momentum or productivity.

Delay Damages: Delay Damages are limited to additional field office and jobsite overhead costs incurred by the Design-Builder directly attributable to the delay of a Completion Deadline. Home office overhead is excluded from Delay Damages and not compensable under the Contract unless specifically agreed to in writing by the Department. Before the Design-Builder may obtain any increase in the Contract Amount

to compensate for any Delay Damages or Acceleration Costs, the Design-Builder shall have demonstrated to the Department's satisfaction that:

A. The Project Schedule in fact sets forth a reasonable method for completion of the Work.

B. The change in the Work or other event or situation that is the subject of the requested Change Order has caused or will result in an identifiable and measurable delay of the Work and impact the Critical Path affecting a Completion Deadline.

C. The Delay Damage was not due to any breach of contract or fault or negligence, or act or failure to act of any Design-Builder-Related Entity, and could not reasonably have been avoided by the Design-Builder, including by resequencing, reallocating or redeploying its forces to other portions of the Work or other activities unrelated to the Work (subject to reimbursement for additional costs reasonably incurred in connection with such reallocation or redeployment).

D. The delay for which compensation is sought is not concurrent with any other delay for which the Design-Builder is not entitled to Delay Damages.

E. The Design-Builder has suffered or will suffer actual costs due to such delay, each of which costs shall be documented in a manner satisfactory to the Department.

16.6.3. Limitation on Time Extensions

Any extension of a Completion Deadline allowed hereunder shall exclude any delay to the extent that it:

A. Did not impact the Critical Path affecting a Completion Deadline.

B. Was due to the fault or negligence, or act or failure to act of any Design-Builder-Related Entity.

C. Could reasonably have been avoided by the Design-Builder, including by resequencing, reallocating or redeploying its forces to other portions of the Work (provided that if the request for extension involves a Department caused delay, the Department shall have agreed, if requested to do so, to reimburse the Design-Builder for its costs incurred, if any, in resequencing, reallocating, or redeploying its forces).

D. Was a concurrent delay with any other delay for which the Design-Builder is not entitled to an extension.

The Design-Builder shall be required to demonstrate to the Department's satisfaction that the change in the Work or other event or situation which is the subject of the RCO seeking a change in a Completion Deadline has caused or will result in an identifiable and measurable delay of the Work which has impacted the Critical Path Activity affecting a Completion Deadline.

16.6.4. Not Applicable to Equal or Better Change Orders

Section 16.6 (Certain Limitations for all Change Orders) shall not apply to Equal or Better Change Orders.

16.7. Pricing of Change Orders (excluding Equal or Better Change Orders)

The Department and the Design-Builder (on its own behalf and on behalf of its Subcontractors) shall endeavor to negotiate, in good faith, a reasonable cost for each Change Order. Subject to the foregoing exceptions, in general the price of a Change Order shall be negotiated in accordance with this Section 16.7 or shall be based on Force Account records pursuant to Section 16.4 (Force Account Change Orders).

16.7.1. Labor Costs

The cost of labor shall be separated into construction-related Work and non-construction-related Work as described below. The use of a labor classification that would increase the extra work cost will not be permitted unless the Design-Builder establishes the necessity for such additional costs. The cost of labor shall be calculated based on straight time for all hours worked, unless the Design-Builder obtains the Department's prior Approval for overtime.

Construction Labor: The cost of labor for workers used in the actual and direct performance of construction-related Work, and the field management required up to but not including the Superintendent, according to the Design-Builder's standard work practices, whether provided by the Design-Builder or a Subcontractor, will equal the sum of the following: (a) actual unburdened wages (i.e. the base wage paid to the employee, verified from certified payrolls, exclusive of any fringe benefits); plus (b) a labor surcharge of 31 percent which constitutes compensation for health, welfare and other benefits required by the collective bargaining agreements or other employment contract generally applicable to the classes of labor employed on the work; plus (c) 15 percent (10 percent overhead and 5 percent profit) of the sum of the above items.

Non-Construction Labor: The cost of labor for non-construction-related Work, whether provided by the Design-Builder or a Subcontractor, will equal the sum of the following: (i) actual wages (i.e. the base wage paid to the employee exclusive of any fringe benefits); plus (ii) labor surcharge using the Department approved audited overhead rate in effect on the date the Design-Builder has achieved NTP, which shall constitute full compensation for all state and federal payroll, unemployment, and other taxes, insurance, fringe benefits (including health insurance, retirement plans, vacation, sick leave, and bonuses), and all other payments made to, or on behalf of, the workers in excess of actual wages, as well as for overhead. The Design-Builder will also be paid for profit on non-construction labor of 5 percent of labor costs plus 10 percent overhead.

16.7.2. Material Costs

Material costs shall be the cost of all materials to be used in the performance of construction Work including normal wastage allowance as per industry standards, subject to the requirements set forth in Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work). The material prices shall be supported by valid quotes and invoices from the Suppliers. The cost shall include applicable sales taxes, freight and delivery charges and any allowable discounts (exclusive of machinery rentals). The Department reserves the right to Approve materials and sources of supply of materials to be furnished by the Design-Builder or Subcontractors, and shall have the right to furnish such materials as it deems advisable. The price allowed for materials shall be adjusted as follows:

If the materials are obtained from a supply or source owned in whole or in part by the Design-Builder or a Subcontractor, the cost of such materials shall not exceed the lesser of the lowest price charged by the Design-Builder or such Subcontractor (as applicable) for similar materials furnished to other jobs or the current wholesale price for such materials delivered to the Site.

If the cost of such materials is, in the opinion of the Department, excessive, then the cost of such materials shall be deemed to be the lowest current wholesale price at which such materials were available, in the quantities needed and delivered to the Site.

If the Design-Builder does not furnish satisfactory evidence of the cost of such materials from the actual supplier thereof within 30 Calendar Days after the date of delivery of the material, the Department reserves the right to establish the cost of such materials at the lowest current wholesale prices at which such materials were available, in the quantities needed and delivered to the Site.

The Design-Builder will be paid an additional 10 percent on material costs, which is for overhead and profit (5 percent overhead and 5 percent profit).

16.7.3. Equipment

Design-Builder will be paid for the use of equipment owned or rented by Design-Builder or any Subcontractor for actual use in construction of the Project at an hourly rate derived from the most recently published *Rental Rate Blue Book for Construction Equipment* by Dataquest, Inc., San Jose, California which is in effect at the time of commencement of the changed Work (the "Blue Book").

The total hourly rates derived from the above publication are computed from equipment costs currently in effect. The rates derived do not include costs for operating personnel. The rates require adjustment by a Regional Factor and a Depreciation Factor found in the front of each chapter in the Blue Book.

Equipment use rates fall in the following two categories:

1. Operating Rate: This rate applies to those hours the equipment is actually in use, includes ownership and operating costs, and shall equal the Blue Book monthly rate adjusted for year of manufacture divided by 176 times the Regional Factor of 1.06 plus the estimated hourly operating costs from the Blue Book.
2. Standby Rate: This rate applies to equipment required to be at the Site but not operating, includes ownership costs only, and shall equal the Blue Book monthly rate adjusted for year of manufacture divided by 176 times the Regional Factor of 1.06 times 0.5. The duration of allowable standby time is to be Approved in writing by the Department with a maximum of eight hours per day or 40 hours in a normal week.

When the "manufacturer's rated capacity" falls between those shown in the Blue Book, the closest rated capacity will be used, without interpolation. All rates shall be agreed upon in writing before work is begun. Payment will not be made for pickup trucks used solely for transportation.

In cases where the equipment to be used is specialized in nature and is not available in Design-Builder's inventory and is rented or leased from an outside agency a 10 percent allowance will be added on the first $5,000 plus 5 percent of the balance in excess of $5,000 for overhead for all rented or leased equipment paid for by invoices. Where the rate charged by the agency exceeds the rate determined by the Blue Book, the rental or lease agreement shall be submitted to the Department for Approval. The equipment operating costs from the Blue Book will be paid for rented or leased equipment for each hour the equipment was actually used.

In those cases where the required equipment is in Design-Builder's or Subcontractor's available inventory but not on the Site, the equipment may be rented from a local source. The Department may Approve rental rates for equipment obtained from local sources when such rates are within 10 percent of rates in the Blue Book. When the equipment use is of short duration (less than a week) "move-in" and "move-out" costs for equipment owned by Design-Builder or Subcontractors may be considered when comparing rental costs of equipment obtained from local sources. This option will only be allowed when the cost of locally rented equipment would be less than using owned equipment, including "move-in" and "move-out" charges. Such rentals must be supported by a cost analysis indicating the method used was the least expensive. Should equipment be rented even though it is of a type that is in Design-Builder's or Subcontractor's inventory and the rental costs exceed that allowed by this paragraph, Design-Builder will be reimbursed for such equipment based on the rates in the Blue Book.

The rates paid as above provided shall be deemed to include compensation for the cost of fuel, oil, lubricants, supplies, small tools, necessary attachments, repairs and maintenance of all kinds, depreciation, storage, insurance and all incidentals. Individual pieces of equipment or tools not listed in the Blue Book and having an individual replacement value of $1,000 or less, whether or not consumed by use, shall be considered to be small tools. Equipment rental rates not provided by the Blue Book must be Approved by the Department before the start of any Change Order Work.

Design-Builders will be paid an additional 10 percent on the equipment costs, which is for overhead and profit.

Equipment operators will be paid for as stipulated in Section 16.7.2 (Labor Costs).

All equipment shall be in good working condition and suitable for the purpose for which the equipment is to be used.

Unless otherwise specified, manufacturer's ratings and manufacturer-approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment, which has no direct power unit, shall be powered by a unit of at least the minimum rating recommended by the manufacturer of that equipment.

The time to be paid for use of equipment on the Site shall be the time the equipment is in operation on the Change Order Work being performed. The time shall include the reasonable time required to move the equipment to the location of the Change Order Work and return it to the original location or to another location requiring no more time than that required to return it to its original location. Moving time will not be paid for if the equipment is also used at the Site other than for Change Order Work. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power. No payment for loading and transporting will be made if the equipment is also used at the Site other than for Change Order Work. Time will be computed in half and full hours. In computing the time for use of equipment, less than 30 minutes shall be considered one-half hour.

16.7.4. Permit Fees

The Design-Builder will be reimbursed for the cost of any additional permit fees payable as the result of a change in the Work requiring additional permit fees. Back-up documentation supporting each cost item for this category shall be provided by the Design-Builder and Approved by the Department prior to any payment authorization being granted.

In addition to the permit fees, the Design-Builder will be paid 5 percent of the permit fee, which is for overhead.

16.7.5. Subcontracted Work

For administration and all overhead costs in connection with Subcontract Work, the Design-Builder will receive an amount equal to 7.5 percent of the compensation allowed for the Subcontractor, provided that only one such markup shall be allowed, notwithstanding the actual number of intervening Subcontractors. This shall fully compensate the Design-Builder (and all Subcontractors) for administration, general superintendence, overhead, profit and expenses not otherwise recoverable with respect to subcontracted Work. This shall not apply to: (i) Subcontracts with Affiliates; or (ii) Subcontracts with Suppliers.

16.7.6. Overhead and Profit

Items included in Overhead and Profit: Unless otherwise indicated in this Section 16 (Changes in the Work), the overhead and profit and labor surcharges under this Section 16 (Changes in the Work) are full and complete compensation for all indirect costs of the added or changed Work, as well as for profit thereon. The Design-Builder's overhead and profit percentages and labor surcharges under this Section 16 (Changes in the Work) shall be considered to include, among other costs, salary and expenses of executive officers, supervising officers or supervising employees (excluding only direct labor costs permitted under Section 16.7.2 (Labor Costs)), clerical employees, charges for minor equipment, such as small tools, and other miscellaneous supplies and services, incidental job burdens, bonuses not otherwise covered, field, jobsite and general home office expenses of all types (including timekeepers, bookkeepers, and other general office help), supervisory expenses of all types (excluding only direct labor costs permitted under Section 16.7.2 (Labor Costs)) and all other overhead, general condition and indirect costs

and expenses and profit. With respect to non-construction related labor costs, overhead is included as part of the labor surcharge calculated in accordance with Section 16 (Changes in the Work) and includes accessories such as Computer-Assisted Drafting and Design (CADD) systems, computers, facsimile transmission machines, scanners, plotters, etc.

Payment of Overhead and Profit: The foregoing overhead and profit and labor surcharges will be paid to the Design-Builder only for Work it performs; in the case of Work that is subcontracted, the additional payment for Subcontract administration will be allowed to the Design-Builder as described in Section 16 (Changes in the Work) and all other overhead and profit and labor surcharges will be allowed to the Subcontractor who actually performs the Work.

Materials and Equipment: No overhead, profit or other surcharges will be paid to the Design-Builder for any materials or equipment furnished by the Department.

Deductive Changes: Where the Design-Builder's or any Subcontractor's portion of a change involves a deductive change, the Design-Builder shall include all Design-Builder's and Subcontractor's overhead and profit in computing the value of the credit.

Bond and Insurance Premiums: If a change requires additional bond and/or insurance premiums, they will be paid for as a direct payment with no additional amount for overhead or profit.

16.7.7. Compliance with Cost Principles Regulations

All costs claimed by the Design-Builder under Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work) shall, at a minimum, be allowable, allocable, and reasonable in accordance with the cost principles and procedures of Part 31 of the Federal Acquisition Regulation and Office of Management and Budget (OMB) Circular A-87, Cost Principles for State and Local Governments.

16.7.8. Not Applicable to Equal or Better Change Orders

This Section 16.7 (Pricing of Change Orders) shall not apply to Equal or Better Change Orders.

16.8. Waiver

The Design-Builder hereby expressly waives all rights to assert any and all claims based on any change in the work, delay or acceleration (including any change, delay, suspension or acceleration which, but for the express terms of the contract documents, could be inferred or implied at law) for which the Design-Builder failed to provide proper and timely notice or failed to provide a timely RCO, and agrees that the Design-Builder shall not be entitled to any compensation or damages whatsoever in connection with the work except to the extent that the contract documents expressly specify that the design-builder is entitled to a change order or other compensation or damages.

16.9. Disputes

If the Department and the Design-Builder agree that a request to increase the Contract Amount and/or extend any Completion Deadline by the Design-Builder has merit, but are unable to agree as to the amount of such price increase and/or time extension, the Department agrees to mark up the Change Order request or Change Order form, as applicable, provided by the Design-Builder to reduce the amount of the price increase and/or time extension as deemed appropriate by the Department. In such event, the Department will execute and deliver the marked-up Change Order to the Design-Builder within a reasonable period, and thereafter will make payment and/or grant a time extension based on such marked-up Change Order. The failure of the Department and the Design-Builder to agree to any Change Order under Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work) (including agreement as to the amount of compensation allowed under a Force Account Change Order and the disputed amount of the increase in the Contract Amount and/or extension of a Completion Deadline in connection with a

Change Order as described above) shall be a Dispute to be resolved pursuant to Section 22 (Partnering and Dispute Resolution). Except as otherwise specified in the Change Order, execution of a Change Order by both parties shall be deemed accord and satisfaction of all claims by the Design-Builder of any nature arising from or relating to the Work covered by the Change Order. The Design-Builder's Claim and any award by the resolver of the dispute shall be limited to the incremental costs incurred by the Design-Builder with respect to the disputed matter (crediting the Department for any corresponding reduction in the Design-Builder's other costs) and shall in no event exceed the amounts allowed by this Section 16 (Changes in the Work) with respect thereto.

16.10. No Release or Waiver

16.10.1. Extension of Time for Performance

No extension of time granted hereunder shall release the Design-Builder's Surety from its obligations. The Department shall not be deemed to have waived any rights under the Contract (including its right to abrogate the Contract for abandonment or for failure to complete within the time specified, or to impose and deduct damages as may be provided herein) as the result of any grant of an extension of time beyond the date fixed for the completion of any part of the Work, any acceptance of performance of any part of the Work after a Completion Deadline, or the making of any payments to the Design-Builder after such date.

16.10.2. No Change Order Based on Course of Conduct or Order by Unauthorized Person

No course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work, and no claim that the Department has been unjustly enriched shall be the basis for any claim, request for additional compensation or extension of a Completion Deadline. Further, the Design-Builder shall undertake, at its risk, work included in any request, order or other authorization issued by a person in excess of that person's authority as provided herein, or included in any oral request. The Design-Builder shall be deemed to have performed such work as a volunteer and at its sole cost. In addition, the Department may require the Design-Builder to remove or otherwise undo any such work, at the Design-Builder's sole cost.

17— SUSPENSION OF WORK

17.1. Suspension for Convenience

The Department may, at any time and for any reason, by written notice, order the Design-Builder to suspend all or any part of the Work required under the Contract Documents for the period of time that the Department deems appropriate for the convenience of the Department. An increase in the Contract Amount or extension of Completion Deadlines shall be determined in accordance with Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work).

17.2. Suspension for Cause

The Department has the authority by written order to suspend the Work without liability to the Department wholly or in part for the Design-Builder's failure to:

A. Correct conditions unsafe for the Project personnel or general public.

B. Comply with any Governmental Approval, Law, or otherwise carry out the requirements of the Contract.

C. Carry out orders of the Department.

D. Comply with environmental requirements or requirements for developing and implementing the Quality Management Plan.

E. Meet the requirements of Section 1.3.7 (Design and Engineering Personnel).

17.3. Design-Builder Responsibilities during Suspension

The Design-Builder shall promptly comply with any written suspension order under this Section 17. The Design-Builder shall promptly recommence the Work upon receipt of written notice from the Department directing the Design-Builder to resume Work. During periods that Work is suspended, the Design-Builder shall continue to be responsible for the Work and shall prevent damage or injury to the Project and other facilities in the Project vicinity, provide for drainage, obtain and maintain compliance with all Governmental Approvals, maintain all Design-Builder-provided insurance and bonds and erect necessary temporary structures, signs or other facilities required to maintain the Project and other facilities in the Project vicinity. During any suspension period, unless otherwise directed by the Department, the Design-Builder shall continue to be responsible for maintenance of traffic in accordance with the Maintenance of Traffic Plan and Part 4-10 (Maintenance of Traffic), and for maintenance during construction in accordance with Part 4-09 (Maintenance During Construction). If only part of the Work is suspended, for the Work not suspended the Design-Builder shall be entitled to payment for the costs allocated thereto as set forth in the Schedule of Values.

18— TERMINATION FOR CONVENIENCE

18.1. Notice of Termination

The Department may terminate the Contract and the performance of the Work by the Design-Builder for its own convenience if the Department determines, in its sole discretion, that a termination is in the best public, State, or national interest. The Department shall notify the Design-Builder of its decision to terminate by delivering to the Design-Builder a written Notice of Termination specifying the extent of termination, its effective date and any remaining Work necessary to place the Project in an acceptable condition, as determined by the Department in its sole discretion. Termination of the Contract shall not relieve any Surety of its obligation for any claims arising out of the Work performed. Termination may occur before or after Work has begun.

18.2. Design-Builder Responsibilities Upon Termination

After receipt of a Notice of Termination, and except as otherwise directed by the Department, the Design-Builder shall immediately proceed as follows, regardless of any delay in determining or adjusting any amounts due under this Section 18 (Termination for Convenience):

A. Stop Work as specified in the notice.

B. Communicate to all affected Subcontractors such notice of termination and that their Subcontracts are not to be further performed unless otherwise authorized in writing by the Department.

C. Place no further Subcontracts or orders for materials, services, or facilities, except as necessary to complete the continued portion of the Work, if any, or for mitigation of damages.

D. Terminate all Subcontracts to the extent that they relate to the Work terminated.

E. Assign to the Department, in the manner, at the times, and as and to the extent directed by the Department, all of the right, title, and interest of the Design-Builder under the Subcontracts so terminated, in which case the Department will have the right, in its sole discretion, to accept performance, settle, or pay any or all claims arising out of the termination of such Subcontracts.

F. Settle all outstanding liabilities and claims arising out of such termination of Subcontracts, with the Approval or ratification of the Department, to the extent it may be required, which Approval or ratification shall be final.

G. Provide the Department with an inventory list of all materials previously produced, purchased, or ordered from Suppliers for use in the Work and not yet used in the Work, including storage locations, as well as any documentation or other property required to be delivered hereunder, which is either in the process of development or previously completed but not yet delivered to the Department, and such other information as the Department may request; and transfer title and deliver to the Department, in the manner, at the times, and as and to the extent, if any, directed by the Department of (i) fabricated or unfabricated parts, the Work in process, completed Work, supplies, and other material produced or acquired for the Work terminated; and (ii) the Design Documents and all other completed or partially completed drawings (including plans, elevations, sections, details, and diagrams), specifications, records, samples, information, and other property that would have been required to be furnished to the Department if the Work had been completed.

H. Complete performance, in accordance with the Contract Documents, of all Work not terminated.

I. Take all action that may be reasonably necessary, or that the Department may direct, for the safety, protection, and preservation of (i) the public, including public and private vehicular movement; (ii) the Work; and (iii) the equipment, machinery, materials, and property related to the Contract Documents that are in the possession of the Design-Builder and in which the Department has or may acquire an interest.

J. As authorized by the Department in writing, use its best efforts to sell, in a manner, at the times, to the extent, and at the price or prices directed or authorized by the Department, any property of the types referred to in Section 18.2(G); provided, however, that the Design-Builder (i) is not required to extend credit to any purchaser; and (ii) may acquire the property under the conditions prescribed and at prices Approved by the Department. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the Department under the Contract Documents or paid in any other manner directed by the Department.

K. If requested by the Department, withdraw from the portions of the Site designated by the Department and remove such materials, equipment, tools and instruments used by, and any debris or waste materials generated by, the Design-Builder and any Subcontractor in the performance of the Work as the Department may direct.

L. Assign and transfer to the Department all of the Design-Builder's right, title and interest in and to the following: (a) all Design Documents, completed or partially completed drawings (including plans, elevations, sections, details and diagrams), specifications, designs, design documents, surveys, and other documents and information pertaining to the design or construction of the terminated Work; (b) all samples, borings, boring logs, geotechnical data and similar data and information relating to the terminated Work; (c) all books, records, reports, test reports, studies and other documents of a similar nature

relating to the terminated Work; and (d) all other work product used or owned by the Design-Builder or any Design-Builder-Related Entity relating to the terminated Work.

M. Take other actions directed by the Department.

18.3. Responsibility After Notice of Termination

The Design-Builder shall continue to be responsible for damage to materials after issuance of the Notice of Termination, except as follows:

A. The Design-Builder's responsibility for damage to materials for which partial payment has been made as provided in Section 12.2.6 (Partial Payment for Material Delivered to the Site of Work) shall end when the Department certifies that those materials have been stored in the manner and at the locations directed by the Department.

B. The Design-Builder's responsibility for damage to materials purchased by the Department subsequent to the Notice of Termination shall end when title and delivery of those materials has been taken by the Department.

Immediately after the Department determines that the Design-Builder has completed the Work directed to be completed in accordance with the Notice of Termination and such other work as may have been ordered to secure the Project for termination, the Design-Builder will not be required to provide for continuing safety, security, and maintenance at the Site. Subsequent to the determination that all materials have been stored in the manner and at the locations directed by the Department, further handling of such materials shall be the responsibility of the Department.

18.4. Negotiated Termination Settlement

18.4.1. Settlement Proposal

After receipt of a Notice of Termination, the Design-Builder shall submit a final termination settlement proposal to the Department in the form and with the certification prescribed by the Department. The Design-Builder shall submit the proposal promptly, but no later than 90 days from the effective date of termination, unless the Design-Builder has requested a time extension in writing within such 90-day period and the Department has agreed in writing to allow such an extension. The Department will then review the Design-Builder's termination settlement proposal and will act upon it, return it with comments or reject it. If the Design-Builder fails to submit the proposal within the time allowed, the Department may determine, on the basis of information available to it, the amount, if any, due to the Design-Builder because of the termination, and shall pay the Design-Builder the amount so determined.

18.4.2. Negotiated Settlement Amount

The Design-Builder and the Department may agree, as provided in Section 18.4.1 (Settlement Proposal), upon the whole or any part of the amount or amounts to be paid to the Design-Builder by reason of Termination of Work pursuant to this Section 18 (Termination For Convenience). Such negotiated settlement may include a reasonable allowance for profit solely on Work that has been completed as of the termination date and subsequently accepted by the Department but not an amount for lost, anticipated or unearned profit or other costs disallowed in Section 18.5.2 (Maximum Compensation). Such agreed amount(s), exclusive of settlement costs, shall not exceed the total Contract Amount as reduced by the amount of payments otherwise made and as further reduced by the cost of the Work not terminated, as determined by the costs allocated to such Work in the Schedule of Values. Upon determination of the settlement amount, the Contract will be amended accordingly, and the Design-Builder will be paid the agreed amount. If parties are unable to reach a settlement on all termination costs, compensation for those costs not agreed upon will be determined in accordance with Section 18.5 (Determination of Termination Amount if Negotiation Fails). Unless otherwise agreed to by the parties as a part of a negotiated

settlement, the Department's execution and delivery of any settlement agreement shall not affect any of its rights under the Contract Documents with respect to completed Work, relieve the Design-Builder from its obligations with respect thereto, including Warranties, or affect the Department's rights under the Contract Bond and payment as to such completed or non-terminated Work.

18.5. Determination of Termination Amount if Negotiations Fail

If the Design-Builder and the Department fail to agree, as provided in Section 18.4.2 (Negotiated Settlement Amount), upon the whole amount to be paid to the Design-Builder in whole or in part by reason of the termination of Work pursuant to this Section 18 (Termination For Convenience), the amount payable (exclusive of interest charges) shall be determined by the Department in accordance with the following, but without duplication of any amounts agreed upon in accordance with Section 18.4 (Negotiated Termination Settlement):

18.5.1. Payment Amount

Subject to the limitations in Section 18.5.2 (Maximum Compensation), the Department will pay the Design-Builder the sum of the following amounts for Work performed prior to the effective date of the Notice of Termination, as such amounts are determined by the Department:

A. The Design-Builder's actual reasonable out-of-pocket cost (without profit, and including equipment costs only to the extent permitted by Section 16 (Changes in the Work)) for all Work performed, including mobilization, demobilization, and work done to secure the Project for termination, including reasonable overhead and accounting for any refunds payable with respect to insurance premiums, deposits, or similar items, as established to the Department's satisfaction. In determining the reasonable cost, deductions will be made for the cost of materials to be retained by the Design-Builder, amounts realized by the sale of materials and for other appropriate credits. Deductions will also be made for the cost of damaged materials. When, in the opinion of the Department, the cost of an item of Work is excessively high due to costs incurred to remedy or replace defective or rejected Work, the reasonable cost to be allowed will be the estimated reasonable cost of performing that Work in compliance with the requirements of the Contract Documents, and the excessive actual cost will be disallowed.

B. As profit on the actual out-of-pocket cost permitted in clause 1 above, a sum determined by the Department to be fair and reasonable; provided, however, that if it appears that the Design-Builder would have sustained a loss on the entire Contract had it been completed, no profit shall be included or allowed under this Section 18.5.1 (Payment Amount), and an appropriate adjustment shall be made by reducing the amount of the settlement to reflect the indicated rate of loss.

C. The cost of settling and paying claims arising out of the termination of Work under Subcontracts as provided in Section 18.2(F), exclusive of the amounts paid or payable on account of supplies or materials delivered or services furnished by the Subcontractor prior to the effective date of the Notice of Termination under the Contract, which amounts shall be included in the cost on account of which payment is made under clause A above.

D. The reasonable out-of-pocket cost (including reasonable overhead) of the preservation and protection of property incurred pursuant to Section 18.2(I) and any other reasonable out-of-pocket cost (including overhead) incidental to termination of Work under the Contract, including the reasonable cost to the Design-Builder of handling material returned to the vendor, delivered to the Department or otherwise disposed of as directed by the Department, and including a reasonable allowance for the Design-Builder's

administrative costs in determining the amount due to the Design-Builder as the result of the termination of Work under the Contract.

18.5.2. Maximum Compensation

The Design-Builder acknowledges and agrees that it shall not be entitled to any compensation in excess of the value of the Work performed (determined as provided in Section 18.5.1 (Payment Amount)) plus its settlement costs, and that items such as lost, anticipated or unearned profit, unabsorbed overhead, opportunity costs or consequential or other damages shall not be recoverable by the Design-Builder for itself or for its Subcontractors on account of the termination of the Contract. However, the total amount to be paid to the Design-Builder, exclusive of costs described in Sections 18.5.1(C) and (D), may not exceed the total Contract Amount less the amount of payments previously made and less the cost of the Work not terminated, as determined by the costs allocated to such Work in the Schedule of Values. Furthermore, if any refund is payable with respect to Project-specific insurance or bond premiums, deposits, or similar items which were previously passed through to the Department by the Design-Builder, such refund shall be paid directly to the Department or otherwise credited to the Department.

18.5.3. Excluded Items

Except for normal spoilage, and except to the extent that the Department will have otherwise expressly assumed the risk of loss, there will be excluded from the amounts payable to the Design-Builder under Section 18.5.1 (Payment Amount), the fair value, as determined by the Department, of equipment, machinery, materials and property which is destroyed, lost, stolen or damaged so as to become undeliverable to the Department, or to a buyer pursuant to Section 18.2(J). The amount set forth in the Proposal by the Design-Builder for the Work terminated shall be a factor to be analyzed in determining the value of the Work terminated.

18.5.4. Payment of Termination Amount

Upon determination of the amount of the termination payment, the Contract shall be amended to reflect the agreed termination payment, and the Design-Builder shall be paid the agreed amount.

18.6. Partial Termination

If a termination hereunder is partial, the Contract Amount for the remainder of the Work shall be adjusted as appropriate to account for the change in the overall scope of the Project.

18.7. Reduction in Amount of Claim

The amount otherwise due the Design-Builder under this Section 18 (Termination For Convenience) shall be reduced by (i) all unliquidated payments for Work or materials not yet performed on or supplied to the Project at the time of the payment, excluding Work or materials paid for under Section 12.2 (Progress, Invoicing, and Payment) or other payments made to or on behalf of the Design-Builder applicable to the terminated portion of the Contract; (ii) the amount of any claim which the Department may have against any Design-Builder-Related Entity in connection with the Contract; (iii) the agreed price for, or the proceeds of the sale of, any property, materials, supplies, or other things acquired by the Design-Builder or sold, pursuant to the provisions of this Section 18 (Termination For Convenience), and not otherwise recovered by or credited to the Department; (iv) amounts that the Department reasonably deems advisable to retain to cover any existing or threatened claims, Liens, and stop notices relating to the Project, including claims by Utility Owners; (v) the cost of repairing, replacing or otherwise correcting any Nonconforming Work; and (vi) any amounts due or payable by the Design-Builder to the Department.

18.8. Partial Payments

The Department may, from time to time, under such terms and conditions as it may prescribe and in its sole discretion, make partial payments on account against costs incurred by the Design-Builder in connection with the terminated portion of the Contract, whenever, in the opinion of the Department, the aggregate of such payments shall be within the amount to which the Design-Builder will be entitled under this Section 18 (Termination For Convenience). If the total of such payments is in excess of the amount finally agreed or determined to be due under this Section 18 (Termination For Convenience), such excess shall be payable by the Design-Builder to the Department upon demand, together with interest at a rate equal to the average rate at the time being received from the investment of state funds, as determined by the State Treasurer, for the period from the date such excess payment is received by Design-Builder to the date on which such excess is repaid to the Department.

18.9. Inclusion in Subcontracts

The Design-Builder shall insert in all Subcontracts a requirement that the Subcontractor shall stop Work on the date and to the extent specified in a Notice of Termination from the Department in accordance with this Section 18 (Termination For Convenience), and shall require Subcontractors to insert the same provision in each Subcontract at all tiers.

18.10. Limitation on Payments to Subcontractor

For the purposes of Sections 18.4.2 (Negotiated Settlement Amount) and 18.5 (Determination of Termination Amount if Negotiations Fail), upon termination under Section 18.2(D) of Work under any Subcontract, the Design-Builder will not be entitled to reimbursement for that portion of the termination settlement with any such Subcontractor which constitutes lost, anticipated or unearned profit, unabsorbed overhead, opportunity costs or consequential or other damages on account of the termination.

18.11. No Unearned Profit or Consequential Damages

Under no circumstances shall the Design-Builder be entitled to lost, anticipated or unearned profit, unabsorbed overhead, opportunity costs or consequential or other damages as a result of a termination under this Section 18 (Termination For Convenience). The payment to the Design-Builder determined in accordance with this Section 18 (Termination For Convenience) constitutes the Design-Builder's sole and exclusive remedy for a termination under this Section 18 (Termination For Convenience).

18.12. No Waiver

Anything contained in the Contract to the contrary notwithstanding, a termination under this Section 18 (Termination For Convenience) shall not waive any right or claim to damages, which the Department may have, and the Department may pursue any cause of action, which it may have at law or in equity or under the Contract.

18.13. Dispute Resolution

The failure of the parties to agree on amounts due under this Section 18 shall be a Dispute to be resolved in accordance with Section 22 (Partnering and Dispute Resolution).

18.14. Allowability of Costs

All costs claimed by the Design-Builder under this Section 18 (Termination For Convenience) shall, at a minimum, be allowable, allocable and reasonable in accordance with the cost principles and procedures of 48 CFR Part 31.

18.15. Suspension of Work

(i) In the event of any suspension of all or part of the Work by the Department, after issuance of NTP, for more than 180 consecutive days, , the Design-Builder shall have the right to consider the Contract to have been terminated or partially terminated for convenience under this Section 18 (Termination For Convenience). The Design-Builder shall notify the Department of such election by delivering to the Department a written notice of termination (or partial termination) due to such suspension specifying its effective date. Upon delivery by the Design-Builder to the Department of a notice of termination due to suspension, the provisions of this Section 18 (Termination For Convenience) shall apply.

19— DEFAULT

19.1. Default by Design-Builder

19.1.1. Events of Default

The Design-Builder shall be in breach under the Contract upon the occurrence of any one or more of the following events or conditions:

A. The Design-Builder fails to promptly begin the Work under the Contract Documents following issuance of NTP.

B. The Design-Builder fails to perform the Work with sufficient resources to ensure the prompt completion thereof or, if a Recovery Schedule is required, the Design-Builder fails to provide a Recovery Schedule and otherwise satisfy the requirements of Section 11.1.3 (Recovery Schedule).

C. The Design-Builder fails to execute remedial action in accordance with the Quality Management Plan and Part 3 (Quality Program).

D. The Design-Builder fails to perform the Work in accordance with the Contract Documents, refuses to remove and replace rejected materials or Nonconforming or unacceptable Work, or fails to remove and replace workers as directed by the Department under Section 8.9 (Character of Workers).

E. The Design-Builder discontinues or suspends the prosecution of the Work (exclusive of Work stoppage due to: (i) termination by the Department; (ii) an excusable delay as a result of a Force Majeure event or suspension for convenience by the Department; or (iii) nonpayment by the Department not related to a breach by the Design-Builder).

F. The Design-Builder fails to resume performance of Work, which has been suspended or stopped, within a reasonable time after receipt of notice from the Department to do so or (if applicable) after cessation of the event preventing performance.

G. The Design-Builder breaches any other agreement, representation or warranty contained in the Contract Documents, or the Design-Builder fails to perform any other obligation under the Contract Documents.

H. The Design-Builder fails to provide and maintain the required insurance and Payment and Performance Bond or other required securities.

I. The Design-Builder assigns or transfers the Contract Documents or any right or interest therein, except as expressly permitted under Section 29.3.2 (Subcontractors and Assignment by Design-Builder).

J. The Design-Builder fails, absent a valid dispute, to make payment when due for labor, equipment or materials in accordance with its agreements with Subcontractors and applicable law, fails to comply with any Law or Governmental Approval; or fails reasonably to comply with the instructions of the Department consistent with the Contract Documents.

K. The Design-Builder fails to discharge or obtain a stay within ten days of any final judgment(s) or order for the payment of money against it in excess of $100,000 in the aggregate arising out of the prosecution of the Work (provided that, for purposes hereof, posting of a bond in the amount of 125 percent of such judgment or order shall be deemed an effective stay).

L. The Design-Builder shall have become insolvent, generally does not pay its debts as they become due, admits in writing its inability to pay its debts, or makes an assignment for the benefit of creditors.

M. Insolvency, receivership, reorganization or bankruptcy proceedings shall have been commenced by or against the Design-Builder and not dismissed within 60 days.

N. Any representation or warranty made by the Design-Builder in the Contract Documents or in any certificate, schedule, instrument or other document delivered pursuant to the Contract Documents shall have been false or materially misleading when made.

O. The Design-Builder is a party to fraud.

P. The Design-Builder fails to pay Liquidated Damages, Disincentives, or both, due and owing to the Department.

19.1.2. Right to Cure

The Department agrees to provide the Design-Builder and Surety 15 day notice and opportunity to cure any breach before declaring an Event of Default, provided that no such notice and opportunity to cure is required for any breach which by its nature cannot be cured. If a breach is curable but by its nature cannot be cured within 15 days, as reasonably determined by the Department, the Department agrees not to declare an Event of Default provided that the Design-Builder commences such cure within such 15-day period and thereafter diligently prosecutes such cure to completion; provided, however, that in no event will such cure period exceed 60 days in total. The Design-Builder hereby acknowledges and agrees that the events described in Section 19.1.1(M) and 19.1.1(N) are not curable. Notwithstanding the foregoing, if the Department believes a condition affecting the Project poses an immediate and imminent danger to public health or safety, the Department may, without notice and without awaiting lapse of any cure period, rectify the condition at the Design-Builder's cost (excluding costs that would otherwise have been the Department's responsibility under the express terms of the Contract, if any), and so long as the Department undertakes such action in good faith, even if under a mistaken belief in the occurrence of such default, such action shall not expose the Department to liability to the Design-Builder and shall not entitle the Design-Builder to any other remedy, it being acknowledged that the Department has a paramount public interest in providing and maintaining safe public use of and access to the Project. The Department's good faith determination of the existence of such danger shall be deemed conclusive in the absence of clear and convincing evidence to the contrary.

19.2. Remedies

19.2.1. Rights of the Department

If an Event of Default occurs, then, in addition to all other rights and remedies provided by law or equity or available under the Contract or otherwise, including the rights to recover Liquidated Damages and

Disincentives and to seek recourse against the Performance Bond or other performance security required hereby, the Department shall have the following rights and remedies, without further notice, and without prejudice to any of its other rights or remedies and without waiving or releasing the Design-Builder from any obligations, and the Design-Builder shall have the following obligations (as applicable):

A. The Department may order the Design-Builder to suspend or discontinue the Work or any portion of the Work.

B. The Department may terminate the Contract or a portion thereof, in which case, the provisions of Sections 18.2 (Design-Builder Responsibilities Upon Termination) and 18.3 (Responsibility After Notice of Termination) shall apply.

C. If directed by the Department, the Design-Builder shall withdraw from the Site and remove such materials, equipment, tools and instruments used by, and any debris or waste materials generated by, any Design-Builder-Related Entity in the performance of the Work.

D. The Design-Builder shall deliver to the Department possession of any or all facilities of the Design-Builder located on the Site as well as any or all Design Documents and all other completed or partially completed drawings (including plans, elevations, details and diagrams), specifications, records, information, schedules, samples, Shop Drawings and other documents, that the Department deems necessary for completion of the Work.

E. The Design-Builder shall confirm the assignment to the Department of the Subcontracts requested by the Department, and the Design-Builder shall terminate, at its cost, all other Subcontracts.

F. The Department may deduct from any amounts payable by the Department to the Design-Builder such amounts payable by the Design-Builder to the Department, including Liquidated Damages, Disincentives, or other damages payable to the Department under the Contract Documents.

G. The Department, without incurring any liability to the Design-Builder, shall have the rights to: (i) take the performance of all or a portion of the Work from the Design-Builder (either with or without the use of the Design-Builder's materials, equipment, tools and instruments) and enter into an agreement with another Person for the completion of such Work; or (ii) use such other methods, as in the opinion of the Department, will be required for the completion of the Project.

H. If the Department exercises any right to perform any obligations of the Design-Builder, in the exercise of such right the Department may, but is not obligated to, among other things: (i) perform or attempt to perform, or cause to be performed, such work; (ii) spend such sums as the Department deems necessary and reasonable to employ and pay such architects, engineers, consultants and contractors and obtain materials and equipment as may be required for the purpose of completing such work; (iii) execute all applications, certificates and other documents as may be required for completing the work; (iv) modify or terminate any contractual arrangements; (v) take any and all other actions which it may in its sole discretion consider necessary to complete the Work; and (vi) prosecute and defend any action or proceeding incident to the Work.

19.2.2. Liability of Design-Builder

If an Event of Default has occurred, the Design-Builder and Surety shall be jointly and severally liable to the Department (in addition to any other damages under the Contract Documents other than those costs intended to be covered by Liquidated Damages and Disincentives payable hereunder) for all costs

reasonably incurred by the Department or any party acting on the Department's behalf in completing the Work or having the Work completed by another Person (including any re-procurement costs, throw away costs for unused portions of the completed Work and increased financing costs). Upon the occurrence of an Event of Default, the Department shall be entitled to withhold all or any portion of further payments to the Design-Builder until such time as the Department is able to determine how much (if any) remains owing to the Design-Builder. Promptly upon such determination, the Department shall notify the Design-Builder in writing of the amount, if any, that the Design-Builder shall pay the Department or that the Department shall pay the Design-Builder with respect thereto. All costs and charges incurred by the Department, including attorneys', accountants' and expert witness fees and costs, together with the cost of completing the Work under the Contract Documents, will be deducted from any moneys due or which may become due to the Design-Builder. If such expense exceeds the sum which would have been payable under the Contract, then the Design-Builder and its Surety(ies) shall be liable and shall pay to the Department the amount of such excess.

It is recognized that if a default under Section 19.1.1(K) or (L) occurs, such event could impair or frustrate the Design-Builder's performance of the Work. Accordingly, it is agreed that upon the occurrence of any such event, the Department shall be entitled to request of the Design-Builder, or its successor in interest, adequate assurance of future performance in accordance with the terms and conditions hereof. Failure to comply with such request within ten days of delivery of the request shall entitle the Department to terminate the Contract and to the accompanying rights set forth above. Pending receipt of adequate assurance of performance and actual performance in accordance therewith, the Department shall be entitled to proceed with the Work with its own forces or with other contractors on a time and material or other appropriate basis, the cost of which will be credited against and deducted from the Department's payment obligations hereunder. The foregoing shall be in addition to all other rights and remedies provided by law or equity and such rights and remedies as are otherwise available under the Contract and Payment and Performance Bonds.

In lieu of the provisions of this Section 19.2 (Remedies) for terminating the Contract and completing the Work, the Department may pay the Design-Builder for the parts already done according to the provisions of the Contract Documents and may treat the parts remaining undone as if they had never been included or contemplated by the Contract. No claim under this provision will be allowed the Design-Builder for prospective profit on, or any other compensation relating to, Work uncompleted by the Design-Builder.

If the Contract is terminated for grounds that are later determined not to justify a termination for default, such termination shall be deemed to constitute a termination for convenience pursuant to Section 18 (Termination for Convenience).

If the Department suffers damages as a result of the Design-Builder's breach or failure to perform an obligation under the Contract Documents, then the Department shall be entitled to recovery of such damages from the Design-Builder regardless of whether the breach or failure that gives rise to the damages ripens into an Event of Default.

The exercise or beginning of the exercise by the Department of any one or more rights or remedies under this Section 19.2 (Remedies) shall not preclude the simultaneous or later exercise by the Department of any or all other rights or remedies, each of which shall be cumulative.

The Design-Builder and Surety shall not be relieved of liability for continuing Liquidated Damages or Disincentives on account of a default by the Design-Builder hereunder or by the Department's declaration of an Event of Default, or by actions taken by the Department under this Section 19.2 (Remedies).

19.3. Right to Stop Work if Undisputed Payment is Not Made

The Design-Builder shall have the right to stop Work if the Department fails to make an undisputed payment due hereunder within fourteen days after receipt of notice of nonpayment. Any such Work

stoppage shall be considered a suspension under Section 17.1 (Suspension for Convenience). The Design-Builder shall not have the right to terminate the Contract for default as the result of any failure by the Department to make an undisputed payment due hereunder, but the Design-Builder shall have the right to declare a termination for convenience under Section 18 (Termination For Convenience) upon meeting the requirements of Section 18.15 (Suspension of Work).

20— INCENTIVES, DISINCENTIVES, AND DAMAGES

20.1. Citizen Coordination Team Incentives

20.1.1. Community Coordination Team

The Department's Communication Team (CT) will organize and manage a Community Coordination Team (CCT) and act as the facilitator at CCT meetings. The CCt will meet in accordance with Part 4-12 (Public Information Services) to provide feedback to the Design-Builder on the effectiveness of the coordination efforts with the public.

20.1.2. Evaluation

The Design-Builder will be evaluated at the end of determined incentive award periods, displayed in the Table 20-1 Incentive Award Periods below. During the monthly CCT meeting at the end of each incentive award period, the voting members will rate the Design-Builder's performance for the period and determine a score (maximum of 100 percent of the incentive award period percentage) to be used in determining the period's incentive amount. The evaluation criteria to be used at each voting meeting will be developed and agreed upon no later than the second CCT meeting through a collaborative process involving both voting and non-voting CCT members. The evaluation criteria may be based on exceeding the requirements of the Public Involvement tasks as outlined in Part 4-12 (Public Information Services) and MOT as it relates to lessening the impact to the public. The portion of the overall Incentive Award allocated to the Public Involvement / CCT is $300,000. This is the total value that can be earned from all CCT incentive award periods combined. The Incentive Award will be divided equally between the seven award periods.

20.1.3. Evaluation and Award of Public Involvement/CRB Incentive

The Public Involvement / CCT criteria will be measured at the conclusion of each incentive period as work progresses. The incentive amount awarded will be based on the following formula:

A = T x IAP% x CCT% where:

A is Actual dollar amount to be awarded each period.
T is Maximum amount of CCT incentive for project ($300,000).
IAP% is Percent of total allowed for each award period (Table Incentive Award Period).
CCT% is CCT score (in percent) for each award period.

The incentive award will be paid the month following the award period shown in Table Incentive Award Period.

TABLE 20-1
INCENTIVE AWARD PERIODS

Incentive Award Period	Maximum Percent of Total Available Award (IAP%)
Period 1: NTP – August 2017	10

Period 2 : August – October 2017	15
Period 3: November – December 2017	20
Period 4: January – March 2018	10
Period 5: April – June 2018	15
Period 6: July – September 2018	15
Period 7 – October – 30 days after Substantial Completion of the Project	15

20.2. Incentives/Disincentives Related to "Time"

Contract time related charges for the Project Work is determined by multiplying the number of Calendar Days by its corresponding time related cost rate. Document time charges for the duration of the project. Finish milestones eligible for incentive or disincentive are identified in Table 20-2 (Time Incentives/Disincentives) Payments or deductions to the Design-Builder will be based on the difference between the time related bid amounts and the actual time charges assessed for a finish milestone (as defined in Part 1 (Agreement)). Payment for the incentive will be made in the Project accounting system after Substantial Completion. Deduction for the disincentive will be made on the first progress payment after the total number of Calendar Days bid (in Form PA) for the finish milestone has passed without completion as defined in Part 1 (Agreement).

TABLE 20-2
TIME INCENTIVES/DISINCENTIVES

Finish Milestone	Time Related Cost Rate (Dollars per Calendar Day)
Substantial Completion	$5,000
5400 South Interchange Completion	$5,000
7000 South Interchange Completion	$10,000
9000 South Interchange Completion	$5,000
11400 South Interchange Completion	$7,500

A. Incentive: The Design-Builder is eligible for incentive when a finish milestone is achieved before the number of Calendar Days bid (in Form PA) as determined by the Department. Payment is made for each finish milestone in Table 20-2 (Time Incentives/Disincentives) at the respective rate identified in Table 20-2 for the difference between the number of Calendar Days bid (in Form PA) and the actual number of Calendar Days used to achieve the finish milestone up to a maximum incentive of 10 Calendar Days per finish milestone. The maximum dollar amount eligible for incentive payment for the milestone is $325,000.

B. Disincentive: The Design Builder is assessed a Disincentive when the finish milestone is not achieved within the number of Calendar Days bid (in Form PA) as determined by the Department. Disincentive is assessed for each finish milestone in Table 20-2 (Time Incentives/Disincentives) at the respective rate identified in Table 20-2 for the difference between the number of Calendar Days bid (in Form PA) and the actual number of

Calendar Days used to achieve the finish milestone. There is no maximum dollar amount for disincentive charges.

20.3. Liquidated Damages and Closure Disincentives

20.3.1. Failure to Meet Contract Requirements

The Design-Builder understands and agrees that if the Design-Builder fails to complete the Work in accordance with the Contract Documents or in the event of a Closure not permitted under the Contract Documents, the Department will suffer substantial losses and damages. If the Design-Builder fails to achieve the Completion Deadline in accordance with Part 1 (Agreement), 4.4 (Completion Deadlines), the Design-Builder shall pay the Department the applicable Liquidated Damages as set forth in Appendix I (Liquidated Damages). In the event of a Closure not permitted under the Contract Documents, the Design-Builder will be assessed Disincentives as set forth in Part 4-10 (Maintenance of Traffic).

The Design-Builder acknowledges and agrees that because of the unique nature of the Project, the fact that it is an essential part of the state highway system, and the fact that inconvenience to the traveling public will be one of the significant impacts of any completion delay, certain Closure duration delays or failure to obtain access, it is impracticable and extremely difficult to ascertain and determine the actual damages that would accrue to the Department and the public in the event of the Design-Builder's failure to achieve completion by a Completion Deadline or in the event of any Closure not permitted under the Contract Documents. In addition, the Department would incur additional costs of administering the Contract (including engineering, legal, accounting, and administrative costs) during any such period of delay, which amount is not possible to ascertain as of the date hereof. Therefore, the Design-Builder and the Department agree to liquidate the amount payable by the Design-Builder in the event of its failure to meet a Completion Deadline or in the event of any Closure not permitted under the Contract Documents. The Design-Builder acknowledges and agrees that such Liquidated Damages and/or Disincentives are intended to compensate the Department solely for the Design-Builder's failure to meet these Contract Document requirements, and shall not excuse the Design-Builder from liability from any other breach of Contract requirements, including any failure of the Work to conform to applicable requirements. The fact that the Department has agreed to accept Liquidated Damages and/or Disincentives as compensation for its damages associated with any delay in meeting a Completion Deadline or any Closure not permitted under the Contract Documents shall not preclude the Department from exercising its other rights and remedies respecting the delay set forth in Section 19.2 (Remedies) for a Default, or elsewhere in the Contract.

20.3.2. Assessments of Liquidated Damages and Disincentives

Disincentives will not be assessed after the Notice of Substantial Completion.

20.3.3. Reasonableness of Liquidated Damage and Disincentive Assessment Amounts

The Design-Builder acknowledges and agrees that the foregoing damages have been set based on an evaluation by the Department of damages that it will incur in each of the above events, including additional engineering costs, administration costs, supervision cost, inspection costs and additional interest expense. The Design-Builder and the Department agree that the damages also include Disincentives intended to recover some of the public's user costs, environmental impacts, or other public expenditures that are unique to the Project or incurred as a result of the Project. The Design-Builder and the Department agree that the amount of such Liquidated Damages and/or Disincentives are impossible to ascertain as of the date of execution hereof, and the parties have agreed to such Liquidated Damages and/or Disincentives in order to fix the Design-Builder's costs and to avoid later disputes over which items are properly chargeable to the Design-Builder. The Design-Builder understands and agrees that any Liquidated Damages and/or Disincentives payable in accordance with this Section 20 are in the nature of

liquidated damages and/or disincentive assessments and not a penalty, and such sums are reasonable under the circumstances existing as of the date of execution and delivery of the Contract. The Design-Builder further acknowledges and agrees that Liquidated Damages and/or Disincentives may be owing even though no event of Default has occurred.

20.4. Utility Relocation Incentive/Disincentive

The utility relocation incentive/disincentive applies to those utility companies listed as being responsible for the relocation design/construction of their facilities.

A. Payments/deductions to the Design-Builder will be based on the difference between the Department's cost share responsibility for Utility Work performed by Third Parties in Form PA, Form UC, and Form BA and the actual utility relocation charges assessed. Payment for the incentive, or a credit for the disincentive, will be made administratively in the project accounting system by an administrative incentive/disincentive detail.

1. Incentive: Payments to the Design-Builder, if applicable, will be lump sum. If the actual utility relocation charges accrued after completion of the project are less than the Department's cost share responsibility for Utility Work performed by Third-Parties in Form PA, Form UC, and Form BA UDOT will pay the Design-Builder 60% of the difference.

2. Disincentive: Payments deducted from the Design-Builder, if applicable, will be lump sum. If the accrued utility relocation charges exceed the amount of the Department's cost share responsibility for Utility Work performed by Third Parties in Form PA, Form UC, and Form BA, the Department will deduct 40% of the difference from moneys due the Design-Builder. These deductions will begin on the first progress payment when the accrued Utility Relocation charges exceed the Department's cost share responsibility for Utility Work performed by Third Parties in Form PA, Form UC, and Form BA.

20.5. Offset; Waiver

20.5.1. Offset

The Department shall have the right to deduct any amount owed by the Design-Builder to the Department hereunder from any amounts owed by the Department to the Design-Builder under the Contract.

20.5.2. No Waiver

Permitting or requiring the Design-Builder to continue and finish the Work or any part thereof after a Completion Deadline shall not act as a waiver of the Department's right to receive Liquidated Damages hereunder or any rights or remedies otherwise available to the Department. Assessment of Liquidated Damages and/or Disincentives shall not relieve the Design-Builder from any other responsibilities under the Contract Documents.

20.6. Payment of Liquidated Damages and Disincentives

To the extent Liquidated Damages and/or Disincentives are not deducted from any amount owed to the Department by the Design-Builder, the Department may send Design-Builder an invoice, and the Liquidated Damages and/or Disincentives shall be payable by the Design-Builder to the Department within 10 days after the Design-Builder's receipt of the invoice therefor. If the Department is unable to collect Liquidated Damages and/or Disincentives from the Design-Builder, it may collect the amount owed from the Surety after declaring a breach of Contract pursuant to Section 19 (Default).

21— INDEMNIFICATION

21.1. Indemnifications by Design-Builder

21.1.1. General Indemnities

Subject to Section 21.1.3 (Losses Due to Negligence of Indemnified Parties), the Design-Builder shall release, defend, indemnify, and hold harmless the Department, the State of Utah and its agents and consultants, and their respective successors and assigns, and their respective officers, directors, agents, and employees (collectively referred to as the "Indemnified Parties") from and against any and all claims, causes of action, suits, judgments, investigations, legal or administrative proceedings, penalties, fines, damages, losses, liabilities, costs and expenses, including any injury to or death of persons or damage to or loss of property (including damage to utility facilities), and including attorneys', accountants' and expert witness fees and costs, arising out of, relating to or resulting from:

A. The breach or alleged breach of the Contract by any Design-Builder-Related Entity.

B. The failure or alleged failure by any Design-Builder-Related Entity to comply with any applicable Environmental Laws or other Laws (including Laws regarding handling, generation, treatment, storage, transportation and disposal of Hazardous Substances) or Governmental Approvals in performing the Work.

C. Any alleged patent or copyright infringement or other allegedly improper appropriation or use of trade secrets, patents, proprietary information, know-how, copyright rights or inventions in performance of the Work, or arising out of any use in connection with the Project of methods, processes, designs, information or other items furnished or communicated to the Department or another Indemnified Party pursuant to the Contract; provided that this indemnity shall not apply to any infringement resulting from the Department's failure to comply with specific written instructions regarding use provided to the Department by the Design-Builder.

D. The alleged negligent act or omission or willful misconduct of any Design-Builder-Related Entity.

E. Any and all claims by any governmental or taxing authority claiming taxes based on gross receipts, purchases or sales, or the use of any property or income of the Design-Builder or any of its Subcontractors or any of their respective agents, officers or employees with respect to any payment for the Work made to or earned by any Design-Builder-Related Entity.

F. Any and all stop notices and/or Liens filed in connection with the Work, including all expenses and attorneys', accountants' and expert witness fees and costs incurred in discharging any stop notice or Lien, provided that the Department is not in default in payments owing to the Design-Builder with respect to such Work.

G. Any spill or release or threatened spill or release of Hazardous Substances: (i) attributable to the negligence, willful misconduct or breach of contract by any Design-Builder-Related Entity; or (ii) that was brought onto the Project site by any Design-Builder-Related Entity.

H. The claim or assertion by any contractor of inconvenience, disruption, delay or loss caused by interference by any Design-Builder-Related Entity with or hindering the progress or completion of work being performed by other contractors as described in Section 24.1 (Cooperation with Other Contractors) or failure of any Design-Builder-

Related Entity to cooperate reasonably with other contractors in accordance therewith.

21.1.2. Design Defects

Subject to Section 21.1.3 (Losses Due to Negligence of Indemnified Parties), the Design-Builder shall release, defend, indemnify and hold harmless the Indemnified Parties from and against any and all claims, causes of action, suits, judgments, investigations, legal or administrative proceedings, penalties, fines, damages, losses, liabilities, costs and expenses, including any injury to or death of persons or damage to or loss of property (including damage to utility facilities), and including attorneys', accountants' and expert witness fees and costs, arising out of, relating to or resulting from errors, omissions, inconsistencies, inaccuracies, deficiencies or other defects in the Design Documents, regardless of whether such errors, omissions, inconsistencies, inaccuracies, deficiencies or other defects were also included in the Project Configuration or Reference Documents. The Design-Builder agrees that, because the Project Configuration and Reference Documents are subject to review and modification by the Design-Builder, it is appropriate for the Design-Builder to assume liability for errors, omissions, inconsistencies, inaccuracies, deficiencies or other defects in the completed Project even though they may be related to errors, omissions, inconsistencies, inaccuracies, deficiencies or other defects in the Project Configuration or Reference Documents.

21.1.3. Losses Due to Negligence of Indemnified Parties

The Design-Builder's indemnity obligations under Sections 21.1.1 (General Indemnities) and 21.1.2 (Design Defects) shall not extend to any loss, damage or cost to the extent that such loss, damage or cost was caused by the sole-negligence or willful misconduct of such Indemnified Party or its employees, agents, or servants who are directly responsible to such Indemnified Party.

21.1.4. Claims by Employees

In claims by an employee of the Design-Builder, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Section 21.1 (Indemnifications by Design-Builder) shall not be limited by any limitation on the amount or type of damages, compensation or benefits payable by or for the Design-Builder or a Subcontractor under workers' compensation, disability benefit or other employee benefits laws.

21.1.5. Reliance on Design-Builder's Performance

The Design-Builder hereby acknowledges and agrees that it is the Design-Builder's obligation to cause the Project to be designed and to construct the Project in accordance with the Contract Documents and that the Indemnified Parties are fully entitled to rely on the Design-Builder's performance of such obligation. The Design-Builder further agrees that any review, acceptance and/or approval by the Department and/or others hereunder shall not relieve the Design-Builder of any of its obligations under the Contract Documents or in any way diminish its liability for performance of such obligations or its obligations to provide indemnities hereunder.

21.1.6. Indemnities in Connection with Utilities and other Third Parties

The Design-Builder is advised that each MUA contains provisions for the Design-Builder to indemnify, save and hold harmless the Utility Owner, its employees and agents with respect to certain matters. The Design-Builder hereby agrees to and shall perform and comply with such provisions of the MUAs for the benefit of the Utility Owners, their employees and agents.

The Design-Builder is also advised that the Utility Agreements and other Third Party Agreements may include certain agreements by the Department to indemnify, defend and hold harmless the Utility Owners and other Third Parties with respect to certain matters. The Design-Builder's obligation under this Section 21.1 (Indemnification by Design-Builder) shall automatically apply to require it to release,

indemnify, defend and hold harmless the Utility Owners and other Third Parties, in addition to the Indemnified Parties, with respect to all such matters.

21.2. Responsibility of the Department for Certain Hazardous Substances

21.2.1. Pre-Existing Site Contamination

The Department may assert that certain Third-Persons or Parties may rightfully bear the ultimate legal responsibility for any and all Hazardous Substances, which may currently be present on the Project site. It is further recognized that certain State and federal statutes provide that individuals and firms may be held liable for damages and claims related to Hazardous Substances under such doctrines as joint and several liability and/or strict liability. It is not the intention of the parties that the Design-Builder be exposed to any such liability arising solely out of: (i) pre-existing site contamination, whether known or unknown, except as otherwise provided in Section 5.1.2 (Limitations on Change Order Remediation Work) or 21.1.1(G); (ii) the performance not attributable to the negligence, willful misconduct or breach of contract by any Design-Builder-Related Entity in the handling of such Hazardous Substances; and/or (iii) the activities of any Persons not described in clause (ii) above, including the Department.

Accordingly, for the purposes of the Contract only, the Department shall reimburse the Design-Builder for Remediation Work (through payment of the Contract Amount, as it may be increased by Change Order pursuant to Sections 15 (Change Order Risk Allocation) and 16 (Changes in the Work)), and will be responsible for any and all claims, damages, losses, liabilities, costs and expenses, including the Design-Builder's attorneys' fees, arising out of, or in connection with, bodily injury (including death) to persons, damage to property or environmental removal or response costs arising out of the presence, release or threatened release of Hazardous Substances on or from the Project site, if such substances were generated or introduced on the site before the execution of the Contract and irrespective of whether the Department was aware of, or directly involved in, the generation or introduction of such materials, but specifically excluding from any obligation of responsibility for those conditions for which the Design-Builder has agreed to be responsible as described in Section 21.1.1(G) and any negligence by the Design-Builder in handling the Hazardous Substances.

21.2.2. Generator Number for Hazardous Waste Remediation

Except for Hazardous Substances for which the Design-Builder is responsible as described in Section 21.1.1(G), without contradiction of any assertion by the Department of Third-Party liability, and for purposes of the Contract only:

A. The Design-Builder shall not be required to execute any hazardous waste manifests if the Design-Builder or Design-Builder-Related Entity did not release the Hazardous Substances.

B. Hazardous Substances encountered in the performance of the Work shall be disposed of, if at all, to a destination facility Approved by the Department utilizing an EPA Identification Number or other appropriate legal device obtained by and carried in the name of the Department or another Person designated by the Department, but only under the express written direction and permission of the Department.

21.3. No Effect on Other Rights

The foregoing obligations shall not be construed to negate, abridge or reduce other rights or obligations, which would otherwise exist in favor of a party hereunder.

21.4. Comprehensive Environmental Response, Compensation, and Liability Act Agreement

Without limiting their generality, the indemnities set forth in Section 21.1.1(G) are intended to operate as agreements pursuant to Section 107(e) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. Section 9607(e), to insure, defend, hold harmless and indemnify the parties indemnified in said Section 21.1.1(G).

22— PARTNERING AND DISPUTE RESOLUTION

22.1. Partnering Program

A. The Design-Builder shall implement a facilitated partnering program, and execute it in conjunction with the Subcontractors, design consultants, design subconsultants, and the Department. This approach uses the strengths of each organization to identify and achieve mutual goals. Partnering does not change the legal relationship of the parties or modify the Contract, and does not relieve either party from any of the terms of the Contract. Partnering does not create a legal partnership between the parties. Rather, it is intended to denote a cooperative collaboration between the parties to efficiently accomplish the Work and complete the Contract.

B. The Design-Builder shall implement partnering in accordance with the UDOT and Utah AGC Partnering Field Guide. Refer to http://www.udot.utah.gov/go/standardsreferences:

1. Design-Builder shall contact the Department within 30 days of Notice of Award and before the pre-Work conference to implement a Third-Party facilitated partnering initiative;
2. The Design-Builder and the Department shall select a facilitator for the meeting and mutually develop the attendees list, agenda, duration, and location of a partnering workshop;
3. The Design-Builder shall ensure that partnering will be held for both design and construction throughout the Project, and shall review survey responses and results monthly with the Department; and
4. The Design-Builder shall perform a design lessons-learned session within two weeks of the final drawings being released-for-construction.

C. Any cost associated with effectuating partnering will be agreed to by both the Design-Builder and the Department. The Design-Builder and the Department shall share any costs equally to accomplish partnering, except that each shall pay full costs associated with its staff attending partnering sessions.

D. Follow-up workshops may be held as agreed by the Design-Builder and the Department.

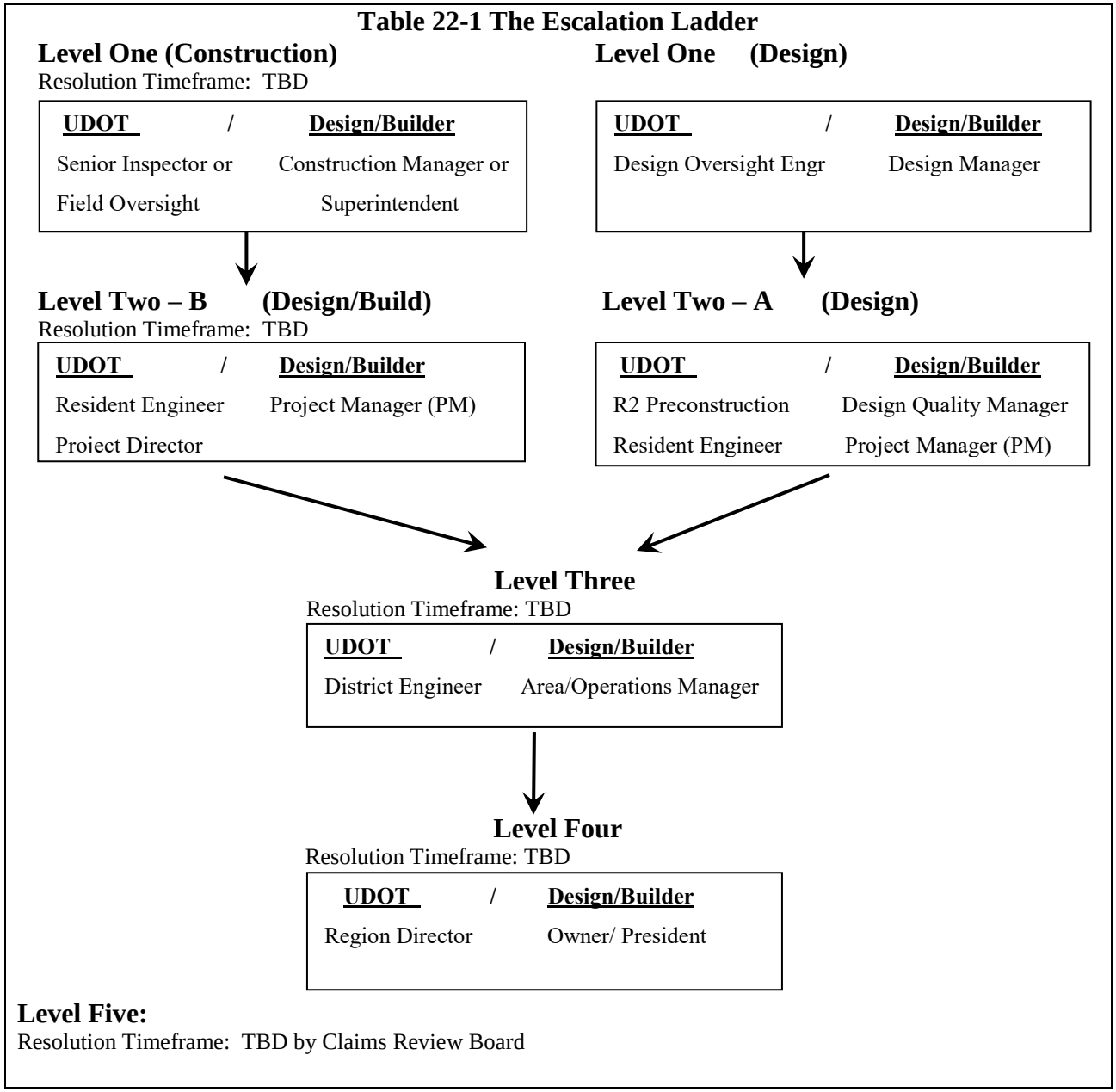
E. Design-Builder shall hold a bi-weekly Executive Partnering meeting with the Department's Project Director and Deputy Project Director. This bi-weekly meeting will begin at NTP and end at Contract Completion.

F. The Design-Builder and Department shall hold a partnering meeting as soon as possible and in no case later than 15 Calendar Days after NTP. Both parties will complete the escalation ladder by assigning the individuals to each level. The Design-Builder shall submit this information to the Department prior to the partnering meeting.

G. The parties shall in good faith attempt to resolve all issues and Disputes at the lowest possible administrative level.

H. Escalation Ladder – See Table 22-1 below. Establish resolution timeframes during Partnering Meeting in coordination with the Department.

Table 22-1 The Escalation Ladder



22.2. Written Notice and Appeals

The dispute resolution provisions contained in Section 22 (Partnering and Dispute Resolution) shall apply only in the event that the Department-Design-Builder issue resolution efforts through partnering are not successful. The provisions of this Section 22 (Partnering and Dispute Resolution) shall apply to all Disputes arising out of the Work that are not resolved by the parties through the partnering process, except as expressly provided to the contrary in the Contract Documents.

The parties shall diligently cooperate with each other during the dispute resolution process and the Claims Review Board.

A. Written Notice and Appeals – The Design-Builder shall file a proper initial written notice of dispute with the Department within seven Calendar Days after becoming aware of any Dispute, using the Dispute Resolution Form provided as Appendix C. The Design-Builder shall provide the following information and documentation as part of the notice:

1. Executive Summary. The executive summary will include a detailed, factual statement of the dispute with necessary dates and locations of Work involved in the Dispute, the dates when the Dispute was discovered, and when the initial written notice of dispute was given to the Engineer;

   a. Describe the acts or omissions of the Department or its representative(s) that allegedly caused or may cause damage to the Design-Builder, citing specific facts, persons, dates and Work involved.

2. The specific Contract provision(s) that support the Dispute;

3. The estimated dollar cost, if any, of the protested Work, and furnish a list of estimated Materials, Equipment and labor for which the Design-Builder might request additional compensation;

4. Theory of entitlement supporting the appeal. Include a narrative of how or why the specific Contract Documents support the appeal and a statement of the reasons why such Contract Documents support the appeal;

5. Itemized list of dispute amounts. Provide claim amounts with a narrative of the theories and documents used to arrive at the amounts provided;

6. Time extension requests. If the Dispute relates to a combination of additional compensation and time extensions, submit a copy of the schedule that was in effect when the Dispute arose and a detailed narrative which explains how the disputed issue impacted a Completion Deadlines, specific to impacts on the Critical Path; and

7. Supporting documents. Include copies of, or excerpts from any documents that support the appeal, such as manuals standard to the industry and used by the Design-Builder or any other information the Design-Builder chooses to provide.

B. Appeals are to be provided within the timeframes specified and according to the procedures described in Section 22.4(Appeals).

22.3. Dispute Resolution Procedure

A. If a Dispute arises the Design-Builder shall do all of the following in order to pursue a Dispute and preserve its claim:

1. Keep all records of entire costs and time incurred throughout the disputed Work, and allow the Department access to those and other supporting records upon request. Provide daily records of disputed work, on a weekly basis, on a schedule to be determined in agreement with the Department.
2. In spite of any Dispute, proceed promptly and diligently with the Work, unless otherwise directed by the Department.
3. Follow the Escalation Ladder in Table 22-1

B. The process starts at the lowest level possible for each party and proceeds up through each party's hierarchy until the issue is resolved.

1. All Disputes are elevated to the next higher level only after a decision has been rendered by the UDOT Dispute Administrator at the current level in the ladder, and only if the Design-Builder has appealed the decision in writing.
2. Once the issue is elevated, the next level meets after receiving any appeal from the previous level, to negotiate and discuss a resolution. All individuals involved in the Dispute, from the previous level, shall sit down with the individuals at the next level of the Escalation Ladder and discuss the Dispute.
    a. Keep the previous escalation levels informed of the progress of the resolution and the reasoning behind any decisions made.
    b. Communicate any resolutions down to the originating level.
3. Meetings must be held each time a Dispute is elevated to the next level and continue through the process until the issue is resolved.
4. Decisions to be made by the UDOT Dispute Administrator at the current level in the ladder within the timeframes shown in Table 22-1, or as extended by the Department.
5. If a resolution of the Dispute has not been successfully achieved by the time the Dispute reaches level V on the Escalation Ladder, the Claims Review Board will be utilized and followed according to Section 22.5 (Claims Review Board).

22.4. Appeals

A. Written appeals apply to all Disputes. If a written appeal is submitted to the Department, both parties shall pursue the matter further in an attempt to settle the Dispute according to the Escalation Ladder shown in Table 22-1. Appeals must be received within 5 Calendar Days from the date the most recent decision was issued by the Department, or as extended by the Department. From the date that an appeal is filed to the Department, if the Department fails to issue a new decision within the timeframe shown for the next level in Table 22-1 the existing Department decision shall stand. If no notice of appeal or complaint is filed within 5 Calendar Days following the date upon which the Department made its most recent decision, the decision shall be final and conclusive.

B. All appeals must be in writing and contain complete and necessary updates to all information as outlined in Section 22.2 (Written Notice and Appeals) in order to be considered.

C. The Department reserves the right at any time to request additional information related to the Dispute, appeal, or to the Contract. Responses from the Design-Builder to requests for more information must be received within seven Calendar Days of the initial request, unless otherwise determined by the Department.

D. Non-written and/or non-supported appeals will be rejected.

22.5. Claims Review Board

A. A Claims Review Board is established to hear unresolved claims and make recommendations for settlement to the Deputy Director of the Department of Transportation pursuant to Utah State Code §63G-10-402. The Claims Review Board will be used for Disputes elevated to level V on the Escalation Ladder as shown in Table 22-1.

1. The Claims Review Board will be composed of the following:

a. The Project Development Director (or designee) as chairman.

b. The Director for Construction and Materials (or designee).

c. Member selected by the Utah Chapter of Associated General Contractors (AGC).

C. The Director for Construction and Materials (or designee) will schedule a claim hearing before the Claims Review Board when a Dispute is elevated to Level V of the Escalation Ladder.

D. The Board may retain or contact technical experts and evaluators as needed to provide additional information/clarification.

E. The claim may be presented informally, with or without legal counsel.

F. The Board will make its recommendations and provide its reasoning to the Deputy Director within 30 Calendar Days after the completion of the claim hearing.

G. The Deputy Director, as the official designee of the Executive Director of the Department, shall consider the recommendations of the Claims Review Board. Any decision shall provide the facts and conclusions for the written decision.

H. The Deputy Director shall issue a written decision within a reasonable time.

I. The Deputy Director's written decision and the recommendation of the Claims Review Board shall not be admissible in any judicial proceeding and is subject to Rule 408 of the Utah Rules of Evidence.

23— RECORDS

23.1. Escrowed Proposal Documents

EPD must be securely stored at the offices of the escrow holder (as defined and in accordance with Form EPD Escrow Agreement). One copy of all documentary information used in preparation of any quotation related to a Contract amendment or Change Order shall be added to the EPD. The EPD will be held and maintained subject to Section 23.1.1 (Review of Escrowed Proposal Documents) until the following have occurred: (i) all Disputes regarding the Contract have been settled; and (ii) final payment on the Contract has been made by the Department and accepted by the Design-Builder.

23.1.1. Review of Escrowed Proposal Documents

The EPD shall be available during regular business hours for joint review by the Design-Builder and the Department in connection with the resolution of Disputes, an audit under Section 23.3.5 (Claims Audit) (if the EPD are the subject of an audit) or as described in Section 23.1.6 (Review by the Department). The Department shall be entitled to review all or any part of the EPD in order to satisfy itself regarding the applicability of the individual documents to the matter at issue. If accompanied by the Design-

Builder, the Department may direct, and the Design-Builder agrees to comply, the Design-Builder to step outside of the immediate room where the review is taking place, provided, however, the Design-Builder is allowed a direct line of site to the Department.

23.1.2. Confidentiality

All records related to EPD, provided to the Department, will be maintained in accordance with the Government Records Access and Management Act (GRAMA), Utah Code Ann., §63G-2-305. Confidentiality will be protected pursuant to §63G-2-309.

To protect information under a Claim of Business Confidentiality, the Proposer must, at the time the information is provided to the Department, include a Claim of Business Confidentiality on Form BC. It is the responsibility of the Design-Builder to complete Form BC in accordance with Subsection §63G-2-309.

23.1.3. Representation and Warranty

The Design-Builder represents and warrants that the EPD provided in accordance with Section 23.1 (Escrowed Proposal Documents) constitute all of the information used in the preparation of its Proposal and agrees that no other Proposal preparation cost information will be considered in resolving Disputes or Claims. The Design-Builder also agrees that the EPD are not part of the Contract and that nothing in the EPD shall change or modify the Contract.

23.1.4. Contents of Escrowed Proposal Documents

The EPD shall, at a minimum, clearly detail how the components of the Contract Amount were determined and shall be adequate to enable a complete understanding and interpretation of how the Design-Builder arrived at the Contract Amount. The EPD provided in connection with quotations and Change Orders shall, inter alia, clearly detail how the total price and individual components of that price were determined and shall be adequate to enable a complete understanding and interpretation of how the Design-Builder determined its scope of Work included in its Proposal, or arrived at its quotation and/or Change Order price. All Work shall be separated into sub-items and separate notebooks as required to present a complete and detailed estimate of all costs. Mobilization costs, crews, plant, equipment, quantities, rates of production, and indirect costs shall be detailed. Estimates of costs shall be further divided into the following cost categories: direct labor, repair labor, equipment ownership and operation, expendable materials, permanent materials, and subcontract costs, as appropriate. The Design-Builder's allocation of plant and equipment, indirect costs, contingencies, overhead and profit, and other items to each direct cost item shall be clearly identified. The EPD shall itemize the estimated costs of the Payment and Performance Bonds; and the insurance premiums for each coverage required to be provided by the Design-Builder under Section 25 (Insurance). The EPD shall include all assumptions, quantity takeoffs, rates of production, the Design-Builder's internal equipment rental rates and progress calculations, quotes from Subcontractors (including Suppliers), memoranda, narratives, notes, and all other information used by the Design-Builder to arrive at the Contract Amount. For each item of Work, the EPD shall itemize any related amounts not included in the stated price for such item such as any amount allocated for contingency.

23.1.5. Format of Escrowed Proposal Documents

The Design-Builder shall submit the EPD in the format used by the Design-Builder in preparing its Proposal. It is not intended that the Design-Builder perform any significant extra work in the preparation of these documents. However, the Design-Builder represents and warrants that the EPD related to the Proposal have been personally examined prior to delivery to the Department by an authorized officer of the Design-Builder and that they meet the requirements of Section 23.1.4 (Contents of Escrowed Proposal

Documents) and are adequate to enable a complete understanding and interpretation of how the Design-Builder arrived at the Contract Amount. The Design-Builder further represents, warrants, and covenants that the EPD related to a Change Order, if applicable, will be personally examined prior to delivery to escrow by an authorized officer of the Design-Builder and that they meet the requirements of Section 23.1.4 (Contents of Escrowed Proposal Documents) and may be adequate to enable a complete understanding and interpretation of how the Design-Builder arrived at its Change Order price.

23.1.6. Review by the Department

The Department may, at any time, conduct a review of the EPD to determine whether it is complete. The Design-Builder shall provide sufficient information to link the EPD information directly to the Schedule of Values. If the Department determines that the EPD are incomplete, the Department may request the Design-Builder supply data to make the EPD complete. The Design-Builder shall provide all such data within three Working Days of the request, and at that time it will be date stamped, labeled to identify it as supplementary EPD information, and added to the EPD. The Design-Builder shall have no right to add documents to the EPD except upon the Department's request. At the Department's option, which may be exercised at any time, any EPD associated with any Change Order or contract amendment shall be reviewed, organized, and indexed as described in Section 23 (Records).

23.2. Subcontractor Pricing Documents

The Design-Builder shall require each first tier Subcontractor, any Subcontractor responsible for performing more than $1,000,000 of the Work, and any Supplier providing more than $5,000,000 in materials, to submit to the Design-Builder a copy of all documentary information used in determining its Subcontract price, immediately prior to executing the Subcontract or any Change Orders or amendments thereto, to be held in the same manner as the EPD and which shall be accessible by the Design-Builder, the Department, the DRB, and other dispute resolvers, on terms substantially similar to those contained herein. Each such Subcontract shall include a representation and warranty from the Subcontractor stating that its documentation constitutes all the documentary information used in establishing its Subcontract price. Each Subcontract that is not subject to the foregoing requirement shall include a provision that requires the Subcontractor to preserve all documentary information used in establishing its Subcontract price and to provide such documentation to the Design-Builder and/or the Department in connection with any disputed change order made by such Subcontractor.

23.3. Project Records

23.3.1. Maintenance of Records

The Design-Builder shall maintain at the Project Manager's office in the State a complete set of As-Built Documents and a complete set of all books, records and documents prepared or employed by the Design-Builder with respect to the Project.

23.3.2. Audit and Inspection Rights

The Design-Builder and its Subcontractors at all tiers shall grant to the Department, FHWA, and the U.S. Comptroller General and their respective authorized representatives, audit and inspection rights and shall allow such Persons access and the right to copy any books and records of the Design-Builder (including all tax returns and supporting documentation filed with any Governmental Persons) as such Persons may reasonably request from time to time in connection with the issuance of Change Orders, the resolution of disputes and other matters as such Persons reasonably deem necessary for purposes of complying or verifying compliance with the Contract and Laws, including responding to requests pursuant to Utah Code 63G, Chapter 2 GRAMA. The Design-Builder shall grant to Utility Owners and their respective

authorized representatives such audit and inspection rights, access and the right to copy such books and records as such Persons may request in connection with the resolution of disputes or other matters, as such Persons reasonably deem necessary for purposes of complying or verifying compliance with the Utility-related Contractual or MUA requirements.

The Design-Builder shall insert in all Subcontracts a requirement that the Subcontractor shall permit audits in accordance with this Section 23.3.2, and shall require Subcontractors to insert the same provision in each Subcontract at all tiers.

23.3.3. Audit of Force Account Work

Where the payment method for any Work is on a Force Account basis, such examination and audit rights shall include all books, records, documents and other evidence and accounting principles and practices sufficient to reflect properly all direct and indirect costs of whatever nature claimed to have been incurred and anticipated to be incurred for the performance of such Work. If an audit indicates the Design-Builder has been over-credited under a previous progress report or progress payment, that over-credit will be credited against current progress reports or payments.

23.3.4. Change Order Pricing Data

For cost and pricing data submitted in connection with pricing Change Orders, unless such pricing is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the public, or prices set by law or regulation, the Department and its representatives have the right to examine all books, records, documents, and other data of the Design-Builder related to the negotiation of or performance of Work under such Change Orders for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data submitted. The right of examination shall extend to all documents deemed necessary by such Persons to permit adequate evaluation of the cost or pricing data submitted, along with the computations and projections used therein.

23.3.5. Claims Audits

All Claims filed against the Department shall be subject to audit at any time following the filing of the Claim. The audit may be performed by employees of the Department or by an auditor under contract with the Department. No notice is required before commencing any audit before 60 days after Contract Completion. Thereafter, the Department shall provide 20 days notice to the Design-Builder, any Subcontractors or their respective agents before commencing an audit. The Design-Builder, Subcontractors or their agents shall provide adequate facilities, acceptable to the Department, for the audit during normal business hours. The Design-Builder, Subcontractors, and their agents shall cooperate with the auditors. Failure of the Design-Builder, Subcontractors, or their agents to maintain and retain sufficient records to allow the auditors to verify all or a portion of the Claim or to permit the auditors access to the books and records of the Design-Builder, Subcontractors, or their agents shall constitute a waiver of the Claim and shall bar any recovery there under. At a minimum, the auditors shall have available to them the following documents:

A. Daily time sheets and supervisor's daily reports
B. Insurance, welfare, and benefits records
C. Payroll registers
D. Earnings records
E. Payroll tax forms
F. Material invoices and requisitions
G. Material cost distribution worksheet
H. Equipment records (list of company equipment, rates, etc.)

I. Subcontractors' (including Suppliers) and agents' invoices
J. Subcontractors' and agents' payment certificates
K. Canceled checks (payroll and Suppliers)
L. Job cost report
M. Job payroll ledger
N. General ledger
O. Cash disbursements journal
P. E-mail, letters, and correspondence
Q. Network servers, data storage devices, backup media
R. All documents that relate to each and every Claim together with all documents that support the amount of damages as to each Claim
S. Work sheets used to prepare the Claim establishing the cost components for items of the Claim including labor, benefits and insurance, materials, equipment, Subcontractors, all documents that establish the time periods, individuals involved, the hours for the individuals and the rates for the individuals

Full compliance by the Design-Builder with the provisions of this Section 23.3.5 is a contractual condition precedent to the Design-Builder's right to seek relief under Section 22 (Partnering and Dispute Resolution). The Design-Builder represents and warrants the completeness and accuracy of all information it or its agents provides in connection with this Section 23.3.5.

23.4. Retention of Records

The Design-Builder shall maintain all records and documents relating to the Contract (including copies of all original documents delivered to the Department) at the Project Manager's office in the State, or as otherwise agreed by the Department in writing, until seven years after the earlier to occur of: (i) the date Contract Completion is achieved; or (ii) the termination date. If Approved by the Department, photographs, microphotographs, or other authentic reproductions may be maintained instead of original records and documents. The Design-Builder shall notify the Department where such records and documents are kept.

Notwithstanding the foregoing, all records which relate to Claims being processed or actions brought under the dispute resolution provisions hereof shall be retained and made available until such actions and Claims have been finally resolved. Records to be retained include all books and other evidence bearing on the Design-Builder's costs and expenses under the Contract Documents. The Design-Builder shall make these records and documents available for audit and inspection to the Department, at the Design-Builder's office, at all reasonable times, without charge, and shall allow such Persons to make copies of such documents (at no expense to the Design-Builder).

23.5. Utah Government Records Access and Management Act (GRAMA)

23.5.1. Applicability of Act

The Design-Builder acknowledges and agrees that all records, documents, drawings, plans, specifications, and other materials in the Department's possession, including materials submitted to the Department by the Design-Builder, are subject to the provisions of the Utah Government Records Access and Management Act (Utah Code Sections 63G-2-101 et seq.). Proposers are responsible for determining which information, if any, they wish to protect under a Claim of Business Confidentiality, and are responsible for taking appropriate action to do so. An entire proposal may not be protected under a Claim of Business Confidentiality.

To protect information under a Claim of Business Confidentiality, the Proposer must, at the time the information is provided to the Department, include a Claim of Business Confidentiality on Form BC. It is the responsibility of the Design-Builder to complete Form BC in accordance with Subsection §63G-2-309.

23.5.2. Design-Builder to Defend Against Disclosure Request

In the event of litigation concerning the disclosure of any material submitted by the Design-Builder to the Department, the Department's sole involvement will be as a stakeholder retaining the material until otherwise ordered by a court, and the Design-Builder shall be fully responsible for otherwise prosecuting or defending any action concerning the materials at its sole expense and risk.

23.5.3. Cooperation with the Department Regarding GRAMA Requests

In the event the Department receives a GRAMA request for covered documents that are in the custody and control of the Design-Builder, the Design-Builder shall cooperate with the Department in responding to the request in a timely manner under GRAMA.

24— COOPERATION AND COORDINATION WITH OTHERS

24.1. Cooperation with Other Contractors

The Department reserves the right to perform and to contract with others to perform other or additional work on or near the Project site. The Design-Builder shall cooperate with the Department and such other contractors to the extent reasonably necessary for the performance by the Department and such other contractors of their work, and shall cause its employees, agents, officers, and Subcontractors and other Persons for whom the Design-Builder may be contractually or legally responsible to so cooperate. If other separate contracts are awarded by the Department that affect the Work, the Design-Builder shall, to the extent reasonably possible, conduct its Work without interfering with or hindering the progress or completion of the work being performed by other contractors. The Department will reasonably cooperate with and support the Design-Builder in resolving any conflicts with other contractors.

24.2. Interference by Other Contractors

If the Design-Builder asserts that any of the Department's other contractors have hindered or interfered with the progress or completion of the Work, then the Design-Builder's sole remedy shall be to seek recourse against such other contractors. The Design-Builder shall have the right to ask the Department to resolve such dispute through the Dispute resolution process, provided the other contractor and its sureties have agreed to submit the dispute to the Department, and provided that such proceeding shall be conducted at no cost to the Department.

25— INSURANCE

25.1. Owner-Controlled Insurance Program (OCIP)

The Department, through an Owner Controlled Insurance Program (OCIP), will provide, at its expense, certain insurance coverages for the Design-Builder and certain Subcontractors. The Design-Builder and Subcontractors are responsible for providing certain insurance as well. Terms and conditions of such insurance coverages are set forth in Appendix B.

Regardless of the Design-Builder insurance requirements required in this section, insolvency, bankruptcy, or failure of any insurance company to pay all claims accrued does not relieve Design-Builder of any obligations.

Provide the following for all required liability insurance policies:

A. Where and when applicable, name as additional insured, only in respect to Work to be performed under this Contract, the State of Utah and the Department;

25.2. Insurance Claims

Unless otherwise directed by the Department in writing, the Design-Builder shall be responsible for reporting and processing all potential claims by the Department or the Design-Builder against the insurance required to be provided hereunder. The Design-Builder agrees to report timely to the insurer(s) any and all matters which may give rise to an insurance claim and to pursue promptly and diligently any and all insurance claims on behalf of the Department, whether for defense or indemnity or both. The Department's responsibility in the event of denial of any claim shall be limited to amounts (if any) payable under Sections 15 and 16.

25.3. Insurance Proceeds

The Design-Builder agrees, and shall obtain a similar agreement from all Subcontractors, that any insurance recoveries for property loss covered under the OCIP, less any deductible or assessments payable by the Design-Builder or Subcontractors, shall be for the account of the Department and payable to the Department, subject to the Design-Builder's rights under this Section 25.3. If insurance proceeds with respect to any loss or damage are paid to the Department, then the Department shall arrange for such proceeds to be paid to the Design-Builder as repair or replacement work is performed by the Design-Builder, to the extent that the Department has not previously paid for such repair or replacement work; provided however, that release of such proceeds to the Design-Builder shall not be a condition precedent to its performing such work.

25.4. Coverage of Third Party Work

All work which the Design-Builder is required to perform hereunder with regard to improvements to be owned by Utility Owners and local agencies (including Betterments) shall be covered by the OCIP. Any liability insurance required by a Third-Party for work performed hereunder by the Design-Builder may be provided by naming such Third Party as an additional insured on the OCIP, and by naming such Third Party as an additional insured on the insurance provided by the Design-Builder and any Subcontractor as required by Appendix B.

26— LIABILITY

26.1. Third-Party Beneficiary Clause

This Contract does not authorize anyone who is not a party to this Contract the right to maintain an action for damages under its provisions or to any of the rights of a third-party beneficiary. However, this Contract does not prohibit the parties from agreeing to provide third-party beneficiary rights to another party so long as those rights are set forth in a separate agreement and signed by all the parties to this Contract and the intended third-party beneficiary**.**

26.2. Department Employees' Personal Liability

A. The Department's authorized representatives act solely as agents and representatives of the Department when carrying out the provisions of or exercising the power or authority granted to them under the Contract.

B. They are not liable either personally or as employees of the Department for actions in their ordinary course of employment.

26.3. No Waiver of Legal Rights Upon Completion

A. Contract Completion will not preclude or prevent the Department from correcting any measurement, estimate, certificate, or price reduction made before or after completion of the Work, nor will the Department be precluded or prevented from recovering from the Design-Builder, its Surety, or both such overpayment as it may sustain. A waiver on the part of the Department of a breach of the Contract will not be held to be a waiver of any other or subsequent breach.

B. The Design-Builder, without prejudice to the terms of the Contract, shall be liable to the Department for latent defects, fraud, or such gross mistakes as may amount to fraud.

26.4. Responsibility for Damage Claims

A. Protect, defend, indemnify, and hold the State, the Department, and their officers, agents, and employees harmless from and against all claims, demands, damages, and causes of action of every kind or character on account of bodily injuries, death, or damage to property arising out of, resulting from, or in any way connected with the performance of the Contract to the extent allowed by law.

B. Defend the Department against all Third-Party or other lawsuits arising out of or resulting from the Contract Work. The Department may require that the Design-Builder represent its interests or may choose to have separate counsel. If the Department has its own counsel, the Department pays for its own attorneys' fees, costs, and expenses, provided, however, that upon determination by the court of the proportionate liability for the claim, the Design-Builder shall reimburse the Department for the attorneys' fees (including fees of in-house counsel), costs and expenses the Department incurred in an amount equal to the proportionate share of the Design-Builder's liability.

C. The Design-Builder and the Department agree to provide each other with a copy of the summons and complaint within a reasonable time if served with a lawsuit or Notice of Claim. Do not file a responsive pleading on behalf of the Department until receiving written notice that the Department chooses to have the Design-Builder handle the defense. The Department will provide the Design-Builder such written notice in a timely manner allowing the Design-Builder adequate time to respond to the summons.

D. All parties agree to cooperate to the fullest extent possible, subject to privileges and ethical rules if the parties have separate counsel.

E. Provide insurance as defined in Section 25 (Insurance) from reliable insurance companies authorized to do business in Utah, rated "A" or better and with a financial size category of Class VII or larger by A.M. Best Company, at the time of Contract execution.

F. Comply with the following insurance claims notification and processing procedures:

1. Notify the Department of all claims within seven Calendar Days of receiving notification;

2. Provide written notification for all pending claims to the Department before Contract Completion.

a. Notify claimants of denied or partially denied claims of $5,000 or less of their right to request re-examination by the:

UDOT Claims Re-Examination Board
4501 South 2700 West
West Valley City, UT 84114-8430
Phone: (801) 965-4116

b. The information provided to the claimant includes:

1) A time deadline for requesting re-examination equal to seven Calendar Days after notification of denial or partial denial;

2) Address and name of the person to whom it should be directed;

3) General information helpful in making a determination; and

4) The Board's prerogative to waive the time deadline.

G. Cooperate with the UDOT Claims Re-Examination Board in resolving disputes regarding denials or partial denials from an insurance carrier:

1. Design-Builder shall provide any information possessed by the carrier that the Board believes is pertinent to the determination;

2. The Board may refer to an insurance carrier's decision and the reason for it;

3. The determination is based on general applicable standards of insurance adjusting;

4. The Board does not grant in-person hearings, but relies on documentation prepared by the Design-Builder, the insurance carrier, the claimant, and the Department;

5. Neither the insurance carrier nor the Design-Builder has the right to intervene in a re-examination before the Board;

6. The Board decides the claim as expeditiously as possible; and

7. The decision by the Claims Re-Examinations Board is administratively final.

H. The Department deducts from any amounts due and payable to the Design-Builder, claims that the Design-Builder's liability insurance carrier denied but are directed to be paid by the Claims Re-Examination Board.

27— SURETY BONDS

The Design-Builder shall provide to the Department, and maintain at all times during the term of the Contract, Payment and Performance Bonds as described below, or other assurance satisfactory to the

Department in its sole discretion. Each bond required hereunder shall be provided by a Surety or Sureties licensed as surety and qualified to do business in the State. The Surety(ies) shall be listed in the current United States Department of the Treasury, Fiscal Service, Department Circular 570, *Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies.* The bonds shall be issued by a Surety(ies) with an A.M. Best and Company rating level of A- or better and Class A-X or better. The Payment and Performance Bonds may not be in excess of the cumulative underwriting limitation listed in the circular of the underwriting capacities of the Design-Builder's surety companies.

27.1. Performance Bond

The Design-Builder shall provide a Performance Bond, in the form included as Appendix G, in the amount of 100 percent of the Contract Amount.

27.2. Payment Bond

The Design-Builder shall provide a Payment Bond, in the form included as Appendix H, in the amount of 100 percent of the Contract Amount. The Design-Builder shall maintain the Payment Bond in full force and effect until the earlier of: (i) the Department's receipt of satisfactory evidence that all Persons performing Work on the Project who may claim a right of action under Utah Code Section 63G-6-505 have been fully paid or (ii) two year after the Department's issuance of Contract Completion.

27.3. Bond Terms and Conditions

A. The Department-furnished Payment and Performance Bond Forms are contained in Appendix G and H to this Part 2 (General Provisions).

B. Return executed forms to the Department as required by the Utah Procurement Code:

1. **Contract Payment Bond/Security** secures the payment of the claims of laborers, mechanics, or materialmen employed on the Work under the Contract.

2. **Contract Performance Bond/Security** guarantees the full performance of the Contract requirements and specifications.

3. **Warranty Bond/Security** guarantees due and punctual performance of all obligations of the Design-Builder under the Contract which survive Contract Completion. Provided that all conditions to Contract Completion of the Project have occurred, the Design-Builder shall have the right to replace the Contract Performance Bond/Security with a Warranty Bond in the amount and in a form satisfactory to the Department in its sole discretion or with such other security as is Approved by the Department at its sole discretion.

   At Contract Completion, if the Contract Performance Bond/Security is reduced or replaced with a Warranty Bond, the Warranty Bond shall be an amount approved by the Department, not to exceed 10 percent of the Contract Amount, covering the obligations of the Design-Builder during the warranty period. Said Warranty Bond shall continue in full force and effect for the duration of the Warranty periods.

C. The Department may make alterations, grant extensions of time, request extra and additional work, and make other changes that do not exceed 20 percent of the Contract Amount without securing the additional certified checks or consent of the Surety or sureties on the Contract Bonds, and such certified checks and bonds shall be deemed amended to cover all such Contract modifications upon their occurrence.

D. If a Design-Builder's Surety is unable to provide payment, the Department shall have the right to cancel all Work on the Contract, unless the Department determines it is in the public interest to continue the Work.

E. As an alternative to the Contract Bonds, furnish a certified check or cash bond of two cashier's checks, each in the amount of the Contract Amount subject to the following conditions:

1. The Department holds the certified check or cash bond and uses it when needed for correction of any nonperformance or nonpayment;

2. The Department returns to the Design-Builder one-half of the cash bond minus any cost against the bond upon release by the Department for satisfactory completion of the work;

3. The Department releases the certified check or remaining cash bond if no payment claims have arisen within 90 Calendar Days after release by the Department;

4. The Department holds the certified check or cash bond until the nonperformance and nonpayment issues are resolved; Design-Builder accrues no liability during this time; and

5. The Department decides the need in its sole discretion for withholding the certified check or cash bond.

F. If the Design-Builder's Surety fails to act promptly, then the Department will give 10 Calendar Days notice of such failure, both to the Design-Builder and Surety, and after the expiration of the 10 Calendar Days the Department may cause the Work to be completed, and the Surety and the Design-Builder shall be jointly and severally liable for the amount of excess cost of completing the Contract Work beyond the amounts remaining for this Contract adjusted for the Work actually performed. When the cost of the excess Work is estimated, the Design-Builder and Surety shall pay, free from all liens and encumbrances, the Department-determined estimated completion costs above the funds remaining for this Contract to the Utah Department of Transportation within 30 Calendar Days of receipt of the estimate. Adjustment of the Department's estimated completion cost will be made upon Contract Completion and appropriate refunds, if any, will be promptly made to the Surety. Any Actual Costs in excess of the estimated completion cost shall be paid to the Department promptly on demand. Additionally, Design-Builder and Surety shall be liable for any applicable Liquidated Damages.

27.4. Utility Work

The Utility Work furnished or performed by the Design-Builder hereunder shall be covered by the Payment and Performance Bonds and any replacement performance bond or other security to be provided by the Design-Builder pursuant to Section 27.3 (B.3) (warranty bond/security). If a Utility Owner whose Utilities are being Relocated by the Design-Builder and which Work is included in the Contract Amount requires the Design-Builder to provide payment and performance bonds, (i) the Utility Owner shall be added as an additional obligee to the Payment and Performance Bonds (up to a maximum cost of the Utility Owner's Relocation(s)), as well as to any replacement performance bond or other security, through the use of a standard Additional Obligee rider to be Approved by the Department, or (ii) the Design-Builder shall provide separate payment and performance bonds to the Utility Owner. The Design-Builder shall provide all information necessary for such coverage to the surety(ies) providing such bonds. All

cost estimates required to be provided under the Contract Documents with respect to Utility Work furnished or performed by the Design-Builder shall include the cost of bond premiums.

27.5. No Relief of Liability

Notwithstanding any other requirements of the Contract Documents, performance by a Surety of any of the obligations of the Design-Builder shall not relieve the Design-Builder of any of its obligations hereunder.

28— WARRANTIES

28.1. Warranties by Design-Builder

28.1.1. Project Warranties

The Design-Builder warrants that

(1) all design and technical services for the Work furnished pursuant to the Contract Documents shall conform to all professional standards identified in the Contract Documents and all professional principles generally accepted as standards of the industry (to the extent such principles are not more restrictive than the professional standards specifically identified in the Contract Documents) and shall be free of errors, omissions, ambiguities, inconsistencies, inaccuracies, deficiencies, inadequacies or other defects.
(2) the construction Work furnished pursuant to the Contract Documents shall be performed in a workmanlike manner and shall conform to the standards of care and diligence normally practiced by recognized construction firms performing construction of a similar nature in the State.
(3) goods, materials and equipment furnished under the Contract Documents shall be of the quality specified or, if not specified, of good quality and, except if otherwise expressly set forth in the Standard Specifications, when installed, shall be new.
(4) the Work shall meet all of the requirements of the Contract Documents.
(5) the specifications and/or drawings selected or prepared for use during construction are suitable for their intended use.
(6) the Project shall be free of defects (including design defects, errors and omissions).

Any Work that does not meet the standards referenced in (1) through (6) above is Nonconforming Work.

28.1.2. Project Warranty Term

The Warranty term for the Work shall extend for the durations specified in Part 9 (Warranty Provisions) The Warranty term begins from the Department's issuance of the Notice of Physical Completion. If, after the issuance of the Notice of Physical Completion, Nonconforming Work is repaired, replaced, or otherwise corrected, the applicable Warranty term shall be extended to one year after completion and acceptance of such repair, replacement, or correction; in no case shall the extended Warranty term be shorter than the original expiration date of the Warranty term for such Work.

28.1.3. Corrective Work

Within seven days of receipt by the Design-Builder of notice from the Department specifying a failure of any of the Work to satisfy the Design-Builder's Warranties, or of any Subcontractor representation, warranty, guarantee, or obligation which the Design-Builder is responsible to enforce, the Design-Builder and the Department shall mutually agree when and how the Design-Builder shall remedy such violation; provided, however, that in case of an emergency as indicated by the Department in its notice requiring immediate curative action, the Design-Builder and the Department shall agree on a remedy immediately upon notice by the Department of such emergency. If the Design-Builder does not use its best efforts to

proceed to effectuate such remedy within the agreed time, or if the Design-Builder and the Department fail to reach such an agreement within such seven Day period (or immediately, in the case of emergency conditions), then the Department, after notice to the Design-Builder, shall have the right to perform or have performed by third parties the necessary remedy, and the costs thereof shall be borne by the Design-Builder. The Design-Builder shall reimburse the Department for such costs within 30 days after the Design-Builder's receipt of invoice therefor. The Department may agree to accept Nonconforming Work in accordance with Section 3.7.2 (Nonconforming Work Pay Adjustment).

The Department and the Design-Builder shall conduct a walkthrough of the Project site annually and prior to expiration of the Warranty period and shall produce a Punch List of those items requiring Warranty Work.

28.1.4. Design-Builder's Costs of Correction of Work

All costs of correcting such rejected Work, including additional testing and inspections, shall be deemed included in the Contract Amount. The Design-Builder shall reimburse the Department and pay the Department's expenses made necessary thereby within 30 days after the Design-Builder's receipt of invoice therefor. The Design-Builder shall be responsible for obtaining any required Governmental Approvals or other consents from any other Person in connection with the Warranty Work.

28.2. Subcontractor Warranties

28.2.1. Assignment

Without in any way derogating the Design-Builder's own representations and warranties (including the Warranties) and other obligations with respect to all of the Work, the Design-Builder shall obtain from all Subcontractors and cause to be extended to the Department, appropriate representations, warranties, guarantees and obligations with respect to the design, materials, workmanship, equipment, tools and supplies furnished by such Subcontractors, including all such representations, warranties, guarantees, and obligations required to be furnished by Subcontractors pursuant to the Contract Documents. All representations, warranties, guarantees, and obligations of Subcontractors shall: (a) be written so as to survive all the Department and the Design-Builder inspections, tests, and approvals; and (b) run directly to and be enforceable by the Design-Builder and/or the Department and their respective successors and assigns. The Design-Builder hereby assigns to the Department all of the Design-Builder's rights and interest in all extended warranties for periods exceeding the applicable Warranty period which are received by the Design-Builder from any of its Subcontractors.

28.2.2. Enforcement

Upon receipt from the Department of notice of a failure of any of the Work to satisfy any Subcontractor warranty, representation, guarantee, or obligation, the Design-Builder shall enforce or perform any such representation, warranty, guarantee, or obligation, in addition to the Design-Builder's other obligations hereunder. The Department's rights under this Section 28.2.2 shall commence at the time such representation, warranty, guarantee, or obligation is furnished, and shall continue until the expiration of the Design-Builder's relevant Warranty. Until such expiration, the Design-Builder shall be responsible for the cost of any equipment, material, labor (including re-engineering) or shipping, and the Design-Builder shall be required to replace or repair defective equipment, material or workmanship furnished by any Subcontractor.

28.3. No Limitation of Liability

The foregoing Warranties are in addition to all rights and remedies available under the Contract Documents or applicable law, and shall not limit the Design-Builder's liability or responsibility imposed by the Contract Documents or applicable law with respect to the Work, including liability for design defects, latent construction defects, strict liability, negligence or fraud; provided, however, that, upon

expiration of the Warranties, the Design-Builder shall have no further liability to the Department hereunder for patent construction defects.

28.4. Warranty Beneficiaries

In addition to benefiting the Department and its successors and assigns, the Warranties and Subcontractor warranties provided under this Section 28 (Warranties) shall inure to the benefit of, and shall be directly enforceable by, any local agencies and Utility Owners with respect to those portions of the Work owned or controlled by each such Person.

28.5. Remedies for Breach of Warranty

In addition to the Department's other rights and remedies hereunder, at law or in equity, the Design-Builder shall be liable for actual damages resulting from its failure to provide corrective Work in accordance with Section 23.1.3 (Representation and Warranty) and any breach of an express warranty or any defect in the Work, including design defects, latent construction defects, strict liability, negligence or fraud.

28.6. Disputes

Any disagreement between the Department and the Design-Builder relating to this Section 28 (Warranties) shall be subject to the dispute resolution provisions contained in Section 22 (Partnering and Dispute Resolution), provided that the Design-Builder shall proceed as directed by the Department pending resolution of the dispute.

29— MISCELLANEOUS PROVISIONS

29.1. Waiver

29.1.1. No Waiver of Subsequent Rights

Either party's waiver of any breach or failure to enforce any of the terms, covenants, conditions, or other provisions of the Contract Documents at any time shall not in any way limit or waive that party's right thereafter to enforce or compel strict compliance with every term, covenant, condition or other provision, any course of dealing or custom of the trade notwithstanding. Furthermore, if the parties make and implement any interpretation of the Contract Documents without documenting such interpretation by an instrument in writing signed by both parties, such interpretation and implementation thereof will not be binding in the event of any future Disputes. The consent by one party to any act by the other party requiring such consent shall not be deemed to render unnecessary the obtaining of consent to any subsequent act for which consent is required, regardless of whether similar to the act for which consent is given.

29.1.2. Custom Does not Constitute Waiver

No act, delay, or omission done, suffered or permitted by one party or its agents shall be deemed to waive, exhaust, or impair any right, remedy, or power of such party under any Contract Document, or to relieve the other party from the full performance of its obligations under the Contract Documents. No custom or practice between the parties in the administration of the terms of the Contract Documents shall be construed to waive or lessen the right of a party to insist upon performance by the other party in strict compliance with the terms of the Contract Documents.

29.1.3. Waivers Must be in Writing

No waiver of any term, covenant or condition of the Contract Documents shall be valid unless in writing and signed by the party providing the waiver.

29.2. Independent Contractor

The relationship of the Design-Builder to the Department is that of an independent contractor, and said Design-Builder, in accordance with its status as an independent contractor, covenants and agrees that it will conduct itself consistently with such status, that it will neither hold itself out as nor claim to be an officer or employee of the Department or the State by reason hereof, and that it will not, by reason hereof, make any claim, demand, or application to or for any right or privilege applicable to an officer or employee of the Department or State, including workers' compensation coverage, unemployment insurance benefits, social security coverage, or retirement membership, or credit.

29.3. Successors and Assigns

The Contract Documents shall be binding upon and inure to the benefit of the Department and the Design-Builder and their permitted successors, assigns and legal representatives.

29.3.1. Assignment by the Department

The Department may assign all or part of its right, title and interest in and to the Contract, including rights with respect to the Payment and Performance Bonds or any other performance security allowed under Section 6 (Utility Work and Third-Party Agreements), to any Person with the prior written approval of the Design-Builder.

29.3.2. Subcontracts and Assignment by Design-Builder

The Design-Builder may subcontract Work in compliance with the requirements of the Contract Documents with the Department's prior written Approval. The Design-Builder shall not otherwise sublet, transfer, assign or dispose of any portion of the Contract, including the right to receive payment, or delegate any of its duties hereunder, except with the Department's prior written Approval. The Design-Builder's assignment of any of its Work under the Contract Documents shall be ineffective to relieve the Design-Builder of its responsibility for the Work assigned, unless the Department, in its sole discretion, has Approved the assignment as well as relief from responsibility due to the assignment.

29.4. Gratuities and Conflicts of Interest

Neither the Design-Builder nor any of its employees, agents and representatives shall offer or give to an officer, official, or employee of the Department or the State gifts, entertainment, payments, loans, or gratuities. The Design-Builder represents and warrants that it has not previously offered or given any gifts, entertainment, payments, loans, or gratuities in violation of such prohibitions.

29.5. Survival

The dispute resolution provisions contained in Section 22 (Partnering and Dispute Resolution), the warranties in Section 28 (Warranties), all of the indemnification provisions, and all other provisions, which by their inherent character should survive Contract Completion or termination of the Contract, shall survive Contract Completion or the termination of the Contract.

29.6. Limitation on Third-Party Beneficiaries

The only Third-Party beneficiaries intended by the Contract Documents are those expressly identified as having Third-Party beneficiary status in other provisions of the Contract. Otherwise, the duties,

obligations, and responsibilities of the parties to the Contract Documents with respect to such Third-Parties shall remain as imposed by law. The Contract Documents shall not be construed to create a contractual relationship of any kind between the Department and a Subcontractor. Except for the Third-Party Agreements included in Part 6 (Third-Party Agreements), the Contract Documents shall not be construed to create a contractual relationship of any kind between the Department and any other Person except the Design-Builder.

29.7. No Personal Liability

The Department's authorized representatives are acting solely as agents and representatives of the Department when carrying out the provisions of or exercising the power or authority granted to them under the Contract Documents. They shall not be liable either personally or as employees of the Department for actions in their ordinary course of employment. The authorized representatives of the Third Parties assume no personal or other liability in exercising their authority granted to them under the Contract Documents. They act only as the Third Party's employees or agents.

29.8. Further Assurances

The Design-Builder shall promptly execute and deliver to the Department all such instruments and other documents and assurances as are reasonably requested by the Department to further evidence the obligations of the Design-Builder hereunder, including assurances regarding assignments of Subcontractors contained herein.

29.9. Sufficient Funding

This Contract and the obligations hereunder are only valid, effective and binding on the Department and the State to the extent sufficient authorizations and appropriations of funds are made by the Utah State Legislature and the Congress of the United States, as applicable, for performance of the Contract.

This Contract may be funded by monies from other governmental or nongovernmental entities that may include municipalities, counties, towns, villages, or authorities.

29.10. Set-Off Rights

The Department will have all of its common law, equitable, and statutory rights of set-off. These rights will include the Department's option to withhold, for the purposes of set-off, any moneys due to the Design-Builder under this Contract up to any amounts due and owing to the Department with regard to this Contract, any other contract with any State department or agency, including any contract for a term commencing prior to the term of this Contract, plus any amounts due and owing to the Department or the State for any other reason including, without limitation, tax delinquencies, fee delinquencies, or monetary penalties relative thereto.

29.11. Severability

If any clause, provision, Section or part of the Contract is ruled invalid by a court of competent jurisdiction, then the parties shall (i) promptly meet and negotiate a substitute for such clause, provision, Section or part, which shall, to the greatest extent legally permissible, effect the original intent of the parties, including an equitable adjustment to the Contract Amount to account for any change in the Work resulting from such invalidated portion; and (ii) if necessary or desirable, apply to the court or other decision maker (as applicable) which declared such invalidity for an interpretation of the invalidated portion to guide the negotiations. The invalidity or unenforceability of any such clause, provision, Section or part shall not affect the validity or enforceability of the balance of the Contract, which shall be

construed and enforced as if the Contract did not contain such invalid or unenforceable clause, provision, Section or part.

29.12. Governing Law

The Contract Documents shall be governed by and construed in accordance with the laws of the State. Venue for any legal action in connection with the Contract shall lie in Salt Lake City, Utah in the Third Judicial District Court for the State of Utah.

29.13. Patented Devices, Materials, and Processes

A. Provide proof of legal agreement with the patentee or owner, if necessary, for use of a design, device, material, or process covered by letters, patents, trademarks or copyrights.

C. Indemnify and hold harmless the Department and any affected Third-Party or political subdivision from claims of infringement of patents, copyrights, or trademarks.

D. Indemnify the Department for costs, expenses, and damages which it may be obligated to pay as a result of an infringement during the conduct of the Work or after the Project is completed.

29.14. Ownership of Documents

Subject to limitations for use of proprietary software, all data, sketches, charts, calculations, plans, specifications, electronic files, correspondence and other documents created or collected under the terms of the Contract Documents shall be considered "works made for hire" for which the Department owns the copyright. Design Documents shall become the Department's property upon preparation; construction documents shall become Department's property upon delivery to the Department; and other documents prepared or obtained by the Design-Builder in connection with the performance of its obligations under the Contract Documents, including studies, manuals, technical and other reports and the like, shall become the property of the Department upon the Design-Builder's preparation or receipt thereof. Copies of all Design Documents and construction documents shall be furnished to the Department upon preparation or receipt thereof by the Design-Builder. The Design-Builder shall maintain all other documents described in this Section 29.14 in accordance with the requirements of Section 23 (Records) and shall deliver copies to the Department as required by the Contract Documents or upon request if not otherwise required to be delivered, with all such documents delivered to the Department as a condition to Contract Completion.

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

PART 2, APPENDIX A – STATE AND FEDERAL REQUIREMENTS

Final Issued September 15, 2016

Not Used

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

PART 2, APPENDIX B – OCIP INSURANCE

Final Issued September 15, 2016

OWNER CONTROLLED INSURANCE PROGRAM (OCIP)

1. GENERAL

The Department will implement an Owner-Controlled Insurance Program (OCIP) on this Project. The Design-Builder shall enroll in and comply with all OCIP requirements. The OCIP requirements are not intended to create any contract between Subcontractors and the Department. The Design-Builder shall ensure that all eligible Subcontractors enroll in and comply with all OCIP requirements, and shall be responsible for enforcing any OCIP provisions that relate to Subcontractors based on the contract let by the Design-Builder.

The OCIP shall minimally provide the following types of insurance coverage for the Design-Builder and all eligible Subcontractors of every tier enrolled in the OCIP and performing Work at the Project site. As used in this Appendix B, the term “eligible Subcontractor” shall mean Subcontractors of every tier enrolled in the OCIP that have employees working on the Work Site. The term “eligible Subcontractor” specifically excludes suppliers, materialmen, vendors, haulers, truckers and "owner/operators" whose employee(s) perform no work on the Work Site or are engaged solely in loading, unloading, stocking, testing, or hauling equipment, supplies or materials.

For purposes of this Appendix B, the term “Work Site” shall not include any locations outside of the Project Right-of-Way that have not been specifically identified by the Design-Builder and Approved in writing by the Department and the insurer(s) for addition to the OCIP.

The OCIP shall minimally provide the following types of insurance coverage: workers’ compensation, employer’s liability, general liability, contractor’s pollution liability, railroad protective (as required), excess liability, and builder’s risk. The Department agrees to pay all premiums associated with the OCIP, including deductibles or self-insured retentions, except as otherwise stated in the Contract Documents.

A. The Design-Builder and eligible Subcontractors will not be allowed to commence performance of Work without enrolling in the OCIP.

B. The current OCIP carriers are as follows:

   1. Workers’ Compensation and Employer’s Liability: To be determined;
   2. General Liability: To be determined;
   3. Contractor’s Pollution Liability: To be determined;
   4. Excess Liability Coverage: To be determined;
   5. Railroad Protective Liability: To be determined; and
   6. Builder’s Risk: To be determined.

C. Ineligible and eligible contractors, at their own expense, shall be required to maintain their own insurance of the types and with the limits as set forth in Section 13 (Design-Builder/Subcontractor-Provided Coverage), with such coverage acknowledging the Work Site, and shall promptly furnish to Department certificates of insurance giving evidence that all required insurance is in force.

D. The Design-Builder shall enroll in the OCIP by completing the attached OCIP Enrollment Form and submitting it to the Department Project Director along with the required certificate(s) per Section 14 (Certificates of Insurance) at the time it returns the executed Contract to the Department or prior to commencement of any Work, whichever occurs first. The Design-Builder shall require that each of its eligible Subcontractors of every tier enroll in the OCIP by submitting the OCIP Enrollment Form to the Department Project Director

prior to the Subcontractor entering the Work Site. By submitting the OCIP Enrollment Form and required certificate(s) to the Department Project Director, the Design-Builder and each Subcontractor warrants that all insurance information is correct. (See Section 14 (Certificates of Insurance)).

E. It is understood and agreed that the Department is providing designated insurance coverages as identified in this Appendix B, to the Design-Builder and Subcontractors, following enrollment. All costs associated with said coverage will be paid for by the Department except for the assessed amounts payable by the Design-Builder and/or Subcontractors. If the Design-Builder or any Subcontractor that begins Work without completing the enrollment process, its Work will be stopped and/or it will be removed from the Work Site until the enrollment requirement is satisfied. The Design-Builder will be held solely responsible for the timely enrollment of all eligible Subcontractors. Failure to do so will result in the Design-Builder being issued a notice of noncompliance, and Work may be stopped, at the expense of the Design-Builder, until compliance with this requirement is met.

F. The Design-Builder's represents and warrants that the Contract Amount excludes conventional insurance costs for the OCIP coverages identified in Paragraphs B through G and that Change Orders will NOT include such costs. Further, Design-Builder shall ensure that its conventional insurance carriers exclude the OCIP Project from its policies, in accordance with Section 13 (B).

G. An auditor or auditors from the insurance companies providing OCIP coverage will audit the payroll and contract revenue of the Design-Builder and each enrolled Subcontractor after the Department Project Director submits notice to the Department's appointed OCIP Administrator (Wells Fargo Insurance) of each such entity's completion of Work.

The purpose of this Appendix B is solely to provide a general understanding of the coverage provided by the OCIP. The Design-Builder acknowledges and agrees that it reviewed the terms of the OCIP policies prior to delivery of its Proposal. The Design-Builder agrees that the specific terms thereof are incorporated by reference herein and deemed part of the Contract Documents and that the specific terms thereof shall govern in the event of any conflict with the general description of the OCIP contained herein, except that the terms of this Appendix B shall control with respect to deductibles and assessments to be made by the Design-Builder and/or Subcontractors in connection with OCIP claims.

1.1. Subcontractors

The Design-Builder shall include all of the provisions of this Appendix B in every subcontract with an eligible Subcontractor, and shall ensure that Subcontractors include such provisions for lower tier subcontracts, so that such provisions will be binding upon each eligible Subcontractor.

1.2. Audit of Design-Builder's Payroll

For purposes of the OCIP, the Design-Builder agrees, and will require all tiers of enrolled Subcontractors to agree, to keep and maintain accurate records of its payroll for operations at the Work Site. The Design-Builder further agrees, and will require all enrolled Subcontractors to further agree, to furnish to the State, it's appointed OCIP Administrator (Wells Fargo Insurance), and the insurance carrier(s) full and accurate payroll data and information in accordance with the requirements of the OCIP; this is accomplished by entering the information in the OCIP web-portal. The Design-Builder and enrolled Subcontractors shall permit the Department, its OCIP Administrator, and its insurance carrier(s) to examine and/or audit their books and records. The Design-Builder and enrolled Subcontractors shall also provide any additional information to the Department or its OCIP Administrator as may be required.

1.3. Coverage provided in OCIP

A. The OCIP will provide coverage to the Design-Builder and eligible Subcontractors, following enrollment, that have employees on the Work Site. Such coverage applies only to Work performed under this Contract at the Work Site. The Design-Builder and Subcontractors must provide their own insurance for activities outside of the Work Site. However, areas that are 100% dedicated to the Project may be added to the OCIP in accordance with UDOT OCIP Manual.

B. The OCIP policies are available for review by the Design-Builder during business hours, upon advance written request to the Department. The terms of such policies or programs, as such policies or programs may be from time to time amended, will be incorporated by reference herein. The Design-Builder hereby agrees to be bound by the terms and conditions of coverage as contained in such insurance policies and/or self-insurance programs.

C. While the OCIP is intended to provide broad coverages and high limits, the OCIP is not intended to meet all the insurance needs of the Design-Builder or Subcontractors. The Design-Builder and each Subcontractor shall ensure that other proper coverages are maintained. See Section 13 (Design-Builder/Subcontractor-Provided Coverage).

1.4. Withholding from Contract amount

With respect to each claim under the OCIP policies caused by the Design-Builder or one or more enrolled Subcontractors, as determined by the insurance carrier, the Department shall have the right to withhold from the Design-Builder the applicable assessed amount set forth herein, but not to exceed the amount of the covered loss. The assessed amount shall be deducted from payments owing to the Design-Builder, and shall become the property of Department. The Design-Builder may pass the assessment through to the responsible Subcontractor.

2. WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE

Workers' Compensation and Employer's Liability insurance provides coverage for injury to employees arising out of and in the course of their employment.

2.1. Scope of Coverage

A. Covers: Injury to employees of insured entities performing Work at the Work Site.

B. Insured: Design-Builder and eligible Subcontractors, following enrollment (the Design-Builder and each Subcontractor will be issued a policy).

C. Limits:

1. Workers' Compensation—Statutory;
2. Employer's Liability:
    a. $1,000,000, each Accident—Bodily Injury by Accident;
    b. $1,000,000, each Employee—Bodily Injury by Disease; and
    c. $1,000,000—Policy Limit - Bodily Injury by Disease;

D. Design-Builder Assessment: $200 per claim, or the actual cost of the claim, whichever is less.

2.2. Effect on Future Experience Modifications

All premiums and losses experienced by each enrolled Design-Builder and Subcontractor will be reported to the National Council on Compensation Insurance (NCCI) or other appropriate authority. The Department anticipates that loss experience for the Project will be used in the normal manner for calculating individual future experience modifiers by NCCI.

3. COMMERCIAL GENERAL LIABILITY

Commercial General Liability insurance provides coverage for Bodily Injury, Property Damage, Personal Injury, and Products and Completed Operations. (Completed Operations has a 5-year extension.)

3.1. Scope of Coverage

A. Operations: Work of any insured entities performed at the Work Site.

B. Insureds: The Department, State of Utah, the Design-Builder and eligible Subcontractors following enrollment.

C. Limits:

1. $2,000,000, Each Occurrence, Bodily Injury and Property Damage;
2. $10,000,000, Per Project General Aggregate; and
3. $6,000,000, Per Project Products and Completed Operations, aggregate.

D. Design-Builder Assessment: $5,000 per claim or the actual cost of the claim, whichever is less.

4. RAILROAD PROTECTIVE LIABILITY (AS REQUIRED)

Railroad Protective Liability insurance provides liability coverage for railroad companies.

4.1. Scope of Coverage

A. Operations: Work of the Design-Builder or Subcontractor performed on the Work Site.

B. Insured: All railroads affected.

C. Limits:

1. $5,000,000, each occurrence; and
2. $10,000,000, aggregate.

D. Assessment: None.

5. EXCESS GENERAL LIABILITY INSURANCE

This insurance covers liability in excess of Primary Commercial General Liability, Employer's Liability, and Railroad Protective Liability.

5.1. Scope of Coverage

A. Operations: Work of insured entities performed at the Work Site.

B. Insured: For the general liability and employer's liability policies, the Department, State of Utah, and Design-Builders and eligible Subcontractors following enrollment. For the railroad protective liability, all railroad affected.

C. Limits:

1. $25,000,000, each occurrence for all Insureds;
2. $25,000,000, aggregate for all Insureds; and

D. Design-Builder Assessment: $200 per claim or the actual cost of the claim, whichever is less .

6. PROFESSIONAL ERRORS AND OMISSIONS LIABILITY

This insurance is Liability coverage for Negligent Acts, Errors, or Omissions of the Insureds. The Design-Builder is expected to carry this insurance; it is not part of the OCIP.

6.1. Scope of Coverage

A. Not Applicable.

7. DESIGN-BUILDERS POLLUTION LIABILITY

This coverage is for liability arising from pollution releases during construction or remediation Work.

7.1. Scope of Coverage

A. Operations: Work of the Design-Builder and eligible Subcontractors performed at the Work Site, following enrollment.

B. Insureds: The Department, the State of Utah (as defined in the policy), the Design-Builder and eligible Subcontractors following enrollment.

C. Limits:

1. $10,000,000, each occurrence; and
2. $10,000,000, aggregate.

D. Design-Builder Assessment: $5,000 per claim or the actual cost of the claim, whichever is less.

8. BUILDERS' RISK

This insurance provides "All Risk" coverage to protect against physical loss or damage to real and personal property or any part thereof, including during transit.

8.1. Scope of Coverage

A. Operations: Property insurance for the Project, including

1. The interest of the insured in roads, bridges, and rest stops (including buildings) included in the Project, including ancillary property that will become a permanent part of the roads, bridges, and rest stops.
2. Certain property of others in the care, custody or control of an insured.
3. Temporary structures meaning scaffolding, construction forms, cribbing, falsework, construction trailers and similar items used in construction of the Project.

B. Insured: The Department, State of Utah, the Design-Builder and eligible Subcontractors, following enrollment.

C. Limits:

1. $20,000,000, each occurrence; and
2. $20,000,000, each flood or earthquake occurrence.

D. Design-Builder Assessment: $25,000 per occurrence.

9. CERTIFICATES AND POLICIES

All OCIP insurance coverage shall be either written by insurance companies approved by the Department or self-insured. The Department or its OCIP Administrator (Wells Fargo Insurance) shall provide the enrolled Design-Builder and Subcontractors with appropriate certificates of insurance or self-insurance evidencing the coverage outlined above.

10. TERMINATION AND MODIFICATION OF THE OCIP

The Department reserves the right to terminate or to modify the OCIP or any portion thereof. To exercise this right, Department shall provide 90 Calendar Days advance written notice to the Design-Builder. The Design-Builder and enrolled Subcontractors shall immediately be required to obtain appropriate replacement insurance coverage acceptable to the Department. The reasonable cost of such replacement insurance will be reimbursed by the Department. The Design-Builder shall provide written evidence of such insurance to the Department prior to the effective date of the termination or modification of the OCIP.

11. DESIGN-BUILDER RESPONSIBILITIES

A. The Design-Builder is required to cooperate with the Department and its OCIP Administrator (Wells Fargo Insurance) regarding the administration and operation of the OCIP. The Design-Builder's responsibilities shall include, but are not limited to:

1. Complying with the terms and conditions of Construction Safety Program(s); UDOT *OCIP Manual*, and UDOT *Construction Safety and Health Manual*, as outlined in the respective manuals setting forth the administrative procedures required of contractors;
2. Providing necessary contract, operations, and insurance information;
3. Immediately notifying the Department of all eligible Subcontractors of upon award, and notifying the Department upon satisfactory completion of Work by each eligible Subcontractor;
4. Maintaining and providing payroll records and other records as necessary for NCCI reporting;
5. Cooperating with any insurance company and OCIP Administrator with respect to requests for claims, payroll, and other information required under the OCIP;
6. Immediately notifying the Department that any Design-Builder-provided or Subcontractor-provided coverage has been canceled, materially changed, or not been renewed; and
7. Completing and submitting, and ensuring that Subcontractors complete and submit, the following administrative form within the time frames specified:
    a. Design-Builder: OCIP Enrollment Form upon execution of the Contract (include certificates of insurance as per Section 14 (Certificates of Insurance); and

b. Subcontractor: OCIP Enrollment Form and required certificate (these will be sent to Subcontractors).

c. Subcontractor: Form 4 (Contract Completion Form), upon completion of Work by the Subcontractor.

B. Failure of the Design-Builder or any eligible Subcontractor to follow the procedures outlined in the UDOT *OCIP Manual* and UDOT *Construction Safety and Health Manual* may result in forfeiture of coverage, fines, and/or penalties assessed against the Design-Builder. The Department shall deduct from monies due or to become due under the Contract any applicable fines or penalties that are assessed, and will exercise any other legal remedies available to the Department which remedies may be cumulative.

12. ASSIGNMENT OF RETURN PREMIUMS

The Department will be responsible for the payment of all premiums associated solely with the OCIP and will be the sole recipient of any dividend(s) and/or return premium(s) generated by the OCIP. In consideration of the Department providing said coverage:

A. The enrolled Design-Builder agrees to irrevocably assign to the Department, all return premiums, premium refunds, premium discounts, dividends, retentions, credits, and any other monies due the Department in connection with the insurance which the Department herein agrees to provide, and to evidence same by a formal instrument of assignment, if requested, to be promptly executed in the form prepared by the Department.

B. Design-Builder shall require each eligible Subcontractor to execute similar assignments for the benefit of Department.

13. DESIGN-BUILDER/SUBCONTRACTOR-PROVIDED COVERAGE (EVEN IF OCIP PROVIDES COVERAGE)

The Design-Builder agrees, and shall require Subcontractors to agree as applicable, to provide certain insurance coverages, even if the OCIP provides coverage.

A. For any Work under this Contract, and until Final Acceptance, the Design-Builder, at its own expense, must promptly furnish to the Department certificates of insurance giving evidence that the certain coverages identified below are in force. The Design-Builder is also responsible for ensuring Subcontractor compliance with this Section 13 and provision of appropriate certificates for Subcontractor policies.

B. The Design-Builder and all enrolled Subcontractors shall cause their Workers' Compensation and Employer's Liability policy to be endorsed with a Designated Workplace Exclusion Endorsement (see Exhibit A) and its Commercial General Liability Polices to be endorsed with an Exclusion-Designated Work Endorsement (see Exhibit B) to exclude operations on the Work Site from its coverage.

C. Prior to entry on Work Site, the Design-Builder agrees to obtain the insurance set out below, at no expense to the Department, from a company or companies acceptable to the Department, as follows:

1. Workers' Compensation Insurance: Workers' compensation insurance covering full liability under the workers' compensation laws of the State, at the statutory limits;

a. The Design-Builder shall require all parties, including subcontractors, to obtain Workers Compensation Insurance as described in this section prior to their entry on the Work Site.

2. Employer's Liability Insurance: Employer's liability insurance with the following minimum limits of liability:

   a. $100,000, each Accident;

   b. $500,000, Disease, policy limit; and

   c. $100,000, Disease, each Employee;

3. Commercial General Liability Insurance: Commercial general liability insurance, on an "occurrence basis", including insurance for operations, independent contractors, products and completed operations. Such insurance must be endorsed with a Broad Form Property Damage Endorsement (including Completed Operations) and afford coverage for explosion, collapse, and underground hazards. The insurance required by this subparagraph (C)(3) shall have limits not less than the following:

   a. **$3,000,000**, General Aggregate;

   b. $1,000,000, Products—Completed Operations Aggregate;

   c. $1,000,000, Personal and Advertising Injury;

   d. $1,000,000, each occurrence;

   e. $50,000 , Fire Damage (any one fire); and

   f. $5,000, Medical Expense (any one person).

   The certificate of insurance shall state that the policy required by this subparagraph 13.C.3 has been endorsed to name the Department and the State as additional insureds. See item 13.B above and 16 (Subcontractor Participation) for waiver of subrogation requirements;

4. Automobile Liability (insurance coverage not provided in OCIP): Automobile liability insurance for claims arising from the ownership, maintenance, or use of a motor vehicle in connection with the Work at, upon, or away from the Work Site. The following minimum limits of liability apply:

   a. $1,000,000, Combined Single Limit Bodily Injury and Property Damage, each occurrence.

   The certificate of insurance shall state that the policy required by this subparagraph 13.C.4 has been endorsed to name the Department and the State as additional insureds;

5. Aircraft Liability (insurance coverage not provided in OCIP): For each entity using its own aircraft or employing aircraft in connection with the Work, aircraft liability insurance with a combined single limit of not less than $1,000,000 per occurrence.

   The certificate of insurance shall state that the policy required by this subparagraph 13.C.5 has been endorsed to name the Department and the State as additional insureds; and

6. Valuable Papers and Records and/or Electronic Data Processing (Data and Media) Coverage (insurance coverage not provided in OCIP): Coverage for the physical loss of or destruction of their work product, including drawings, specifications, and electronic data and media, as necessary.

D. The Design-Builder or (Designer) shall provide professional liability coverage with a minimum limit of $10 million per claim and $10 million aggregate. The policy must

provide coverage from the date on which the Request for Proposals (RFP) was issued to a date not less than 6 years beyond the date of Final Acceptance. The policy must protect against any negligent act, error, or omission arising out of the professional services the Design-Builder provides. The policy (ies) shall apply to the activities of all design, engineering, and professional services provided by or on behalf of the Design-Builder or the Designer.

E. Any and all deductibles and self-insured retentions in the above described insurance policy(ies) shall be assumed by and be at the sole risk of the insured parties.

14. CERTIFICATES OF INSURANCE

Prior to entry on the Work Site, the Design-Builder agrees, and shall cause all Subcontractors to agree, to provide to the Department Project Director a certificates of insurance setting out the coverages described in Section 13 (Design-Builder/Subcontractor-Provided Coverage) and the applicable policy limits, and shall also provide to the Department Project Director any amendments to the certificates necessitated by changes to the Work to be performed under the Contract, until the date of Final Acceptance.

A. Said certificate shall state that the policies required have been endorsed to provide that the insurers issuing said policies shall give the Department and the State not less than 30 Calendar Days prior written notice of cancellation, nonrenewal or material change in coverage thereunder.

B. All policies required shall be endorsed to include a waiver of subrogation in favor of the Department and the State of Utah.

C. All insurance required shall be maintained, without interruption, from the date of commencement of the Work throughout the warranty periods set forth in Part 9 (Warranty Provisions).

D. All insurance policies shall be excess of insurance provided under the OCIP and shall not contribute with such insurance.

E. The Department will forward such certificates to the OCIP Administrator at the following address:

Wells Fargo
Attn: OCIP Administrator
601 Union Street, Suite 1300
Seattle, WA 98101

F. The Design-Builder and Subcontractors shall provide copies of any policies and/or endorsements that Department may request.

15. OTHER INSURANCE

A. Any type of insurance or any increase of limits of liability not described above which the Design-Builder or any Subcontractor requires for its own protection or on account of any statute shall be its own responsibility and at its own expense.

B. The OCIP is not an attempt to provide the Design-Builder and enrolled Subcontractors with complete insurance programs. The Department shall not be responsible for providing any insurance coverage not specified above. The Design-Builder and Subcontractors are responsible for making sure their insurance programs fit their particular needs, and for arranging for and securing any insurance coverage which they deem advisable, whether or not specified above.

C. Any fees, costs, or charges related to requirements of this Appendix B, e.g., additional insured endorsement and waiver of subrogation, are to be borne by the Design-Builder and the Subcontractors.

16. SUBCONTRACTOR PARTICIPATION

The Design-Builder shall cause Subcontractors to cooperate fully with the Department and its insurance companies with respect to the administration of the OCIP. The Design-Builder agrees, and shall cause all Subcontractors to agree, to cooperate in the safety and accident prevention program and claim handling procedures as established for the Project by Department. In accordance with this Section 16, the Design-Builder shall not permit any eligible Subcontractor of any tier to enter the Work Site prior to enrolling in the OCIP.

17. WAIVER OF SUBROGATION

The Design-Builder waives all rights of subrogation and recovery against the Department and the State, including its designees(s), construction managers, other general contractors, and all Subcontractors to the extent of any loss or damage that is insured under the OCIP. The Design-Builder waives its rights of subrogation and recovery for damage to any property or equipment against the Department and State of Utah, its designees(s), construction managers, other general contractors, and Subcontractors. The Design-Builder shall require all Subcontractors to similarly waive their rights of subrogation and recovery in each of their respective construction contracts with respect to their Work.

18. NO RELEASE

The carrying of the above-described insurance shall in no way be interpreted as relieving the Design-Builder of any other responsibility or liability under the Contract Documents or any applicable Law.

19. APPROVAL OF FORMS AND COMPANIES

All Design-Builder-provided insurance described in this Appendix B shall be written by an insurance company or companies satisfactory to the Department and licensed to do business in the State, and shall have a form and content that are satisfactory to the Department. Insurance must be placed with carriers having a Best's Guide Rating of A-VII or better. No party subject to the provisions of this Contract shall violate, or knowingly permit to be violated, any of the provisions of the policies of insurance described herein.

20. OCIP MANUAL, CONSTRUCTION SAFETY AND HEALTH MANUAL, AND CLAIMS PROCEDURES

The Design-Builder and eligible Subcontractors shall adhere to and perform all reporting and administrative requirements as detailed in the UDOT *OCIP Manual* and UDOT *Construction Safety and Health Manual*.

If any construction requires pile driving, the Design-Builder and eligible Subcontractors will perform baseline seismic/vibration monitoring. They will also perform periodic monitoring as well as surveying of surrounding buildings which could be affected.

The Design-Builder will mandate 100% fall protection for all trades at elevations of six feet and greater.

Failure to follow the procedures outlined in the OCIP Manual and OCIP Safety and Health Manual may result in assessment of fines by the Utah Labor Commission or other Governmental Persons and/or a judgments against Department, the Design-Builder and/or Subcontractor. The Design-Builder is responsible for paying any fines or judgments arising out of failure to follow these procedures. In such event, if the fine is not promptly paid and evidence of payment provided to the Department, the Department

may deduct the amount of any such fine from monies due or to become due under this Contract. The foregoing remedy is in addition to and cumulative of any other remedies which may be available to the Department.

The Department will establish an OCIP Management Team consisting of members from the Department Project Team, Risk Management, the Design-Builder, the insurance providers, and the OCIP Administrator. The team will partner and meet regularly to review general liability claims, workers' compensation issues, safety matters, property damage matters, and customer concerns potentially resulting in legal liability. Trends reported and concerns addressed will be shared by all members in order to control and manage the OCIP.

The following is an overview of the required Design-Builder OCIP Safety and Health Program.

21. SAFETY PERSONNEL

The Design-Builder shall employ a full time, project dedicated safety professional. Its subcontractors shall designate an on the job safety administrator that may include a supervisor / foreman with safety knowledge. These will be the UDOT / OCIP team's contacts for safety concerns.

OCIP SAFETY OVERVIEW

Following is a brief overview of the UDOT *Construction Safety and Health Manual*.

Conflicts. In the event of a conflict between the provisions of this overview, the OCIP Manual, applicable Laws concerning safety and health, the other Contract Documents, or the Design-Builder's Safety Plan, the most stringent requirement shall apply.

Responsibility. The effectiveness of Design-Builder's OCIP Safety and Health Program will depend upon the active participation and personal cooperation of all individuals working on the Project. Project cooperation and coordination of efforts toward carrying out the overall safety responsibilities are needed for an effective program. The Design-Builder shall be held responsible for its own and it's Subcontractors' compliance with the Project safety requirements.

Administration. The Design-Builder and its Subcontractors shall designate an on-the-job Safety Administrator who will be the Department's contact for safety concerns. This may be a supervisor or foreman with safety knowledge. The Design-Builder and its Subcontractors shall ensure that a qualified Competent Person, as defined in _____, is provided at Work locations where required by the U.S. Occupational Safety and Health Administration (OSHA). The Design-Builder and its Subcontractors shall ensure that all applicable forms (confined space permit, hot work permit, lockout/tagout, critical lift checklist, Job Safety Advisory (JSA), excavation permit, etc.) are provided at Work locations where required by OSHA. The Design-Builder and its Subcontractors shall establish and enforce effective disciplinary measures to enforce the OCIP Safety and Health Program.

Training and Orientation. All Design-Builder and Subcontractor supervisory personnel must attend supervisor safety training produced by the insurance carrier(s), an approximately three-hour course. All employees (of the Design-Builder, Subcontractors, engineers, etc.) working on the Project must attend a construction safety orientation produced by the insurance carrier(s) that includes a video presentation and a three-page written statement of Project rules and questions. This orientation must be completed before an individual may begin Work at the Work Site. The Design-Builder and its Subcontractors shall conduct (at a minimum, weekly) safety meetings with all employees. All employees (of the Design-Builder, Subcontractors, engineers, etc.) shall have the proper training for the job task they are performing, such as confined-space entry and work, fall protection, use of powder-actuated tools, traffic control, and equipment operation.

Personal Protective Equipment. All employees (of the Design-Builder, Subcontractors, engineers, etc.) working on the Project shall have the proper Personal Protective Equipment (PPE) for the job task they are performing. At a minimum, an individual's PPE shall include a hard hat, safety glasses, safety vest, long pants, a shirt with minimal 4-inch sleeve, and work boots.

Drug-Free Work Zone. The Design-Builder and Subcontractor shall adhere to a 100% drug- and alcohol-free work zone. At a minimum, pre-employment and post-accident testing are required. The Design-Builder shall bear the cost and expenses of pre-employment testing. The insurance carrier(s) will bear the cost of the post-accident testing.

OCIP EXHIBIT A:
DESIGNATED WORKPLACES EXCLUSION ENDORSEMENT

Original Printing, Effective April 1, 1984; WC 00 03 02 Standard

The policy does not cover Work conducted at or from_____.

Source: Designated Workplaces Exclusion Endorsement, WC 00 03 02, National Council on Compensation Insurance, effective April 1, 1984.

This endorsement excludes from coverage injuries incurred at Workplaces described in the endorsement. It is often used when the insured is a Design-Builder who is Working on a large construction project subject to a wrap-up plan, a single consolidated insurance plan covering all parties to a construction contract. It may also be used when the employer has more than one Workers' Compensation policy to exclude Workplaces covered under the other policy; in such cases, the endorsement is filled out with a notation such as "any Workplace covered by policy #_____ issued by _____Insurance Company."

OCIP EXHIBIT B:
EXCLUSION–DESIGNATED OPERATIONS COVERED BY A CONSOLIDATED (WRAP-UP) INSURANCE PROGRAM

Commercial General Liability Cg 21 54 01 96

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Description and Location of Operation(s): _____
(List the OCIP project you are working on.)

_____

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

The following exclusion is added to Appendix B, Section 1(D), Exclusions of COVERAGE A–BODILY INJURY AND PROPERTY DAMAGE LIABILITY (Section I–Coverages):

> This insurance does not apply to "bodily injury" or "property damage" arising out of either your ongoing operations or operations included within the "products-completed operations hazard" at the location described in the Schedule of this endorsement, as a consolidated (wrap-up) insurance program has been provided by the Design-Builder/Project Manager or owner of the construction project in which you are involved.
>
> This exclusion applies whether or not the consolidated (wrap-up) insurance program:
>
> (1) Provides coverage identical to that provided by this Coverage Part;
>
> (2) Has limits adequate to cover all claims; or
>
> (3) Remains in effect.

Wells Fargo Insurance

WELLS FARGO INSURANCE

OCIP Web-Portal Access Form
Utah Department of Transportation

USER INFORMATION	
Awarding Contractor:	
Subcontractor:	
Contract Number:	
Trade:	
Scope of Work:	

Contact person for OCIP Administration: Policy information, OCIP Forms, COI, etc.

First Name: _____ Last Name: _____

Phone Number: _____ Email: _____

Physical Address

Street Address: _____

City: _____ State: _____ Zip: _____

Mailing Address

Same as Physical address _____

Street Address: _____

City: _____ State: _____ Zip: _____

Wells Fargo Contact:
Brittany Chambers P: 206-892-9533
brittany.n.chambers@wellsfargo.com

DEPARTMENT OCIP ENROLLMENT FORM

PROJECT INFORMATION:

Project Name _____

Awarding Contractor _____

Design-Builder _____

Type of Work To Be Done _____

Start Date _____ End Date _____

CONTRACTOR INFORMATION:

Your Company's Name _____

Individual? _____ Partnership? _____

Corporation? _____ Joint Venture? _____

Your Company's Federal Employer Identification Number _____

Does your company fall under MBE? _____ WBE? _____ DBE? _____

Your Address _____

_____

Office Contacts *Tel. No.* _____ *Fax No.* _____

E-Mail Address(es) _____

Site Contact _____

Tel. No. _____ *Fax No.* _____

E-Mail Address(es) _____

Safety Contact _____

Tel. No. _____ *Fax No.* _____

E-Mail Address(es) _____

Payroll Contact _____

Tel. No. _____ *Fax No.* _____

E-Mail Address(es) _____

CONTRACT INFORMATION:

Contract Value ($) _____ Dept. Project No. _____

Estimated Project Payroll _____ Job Class Codes _____

% Self Performed Work _____ % Subcontracted Work _____

Estimated Number of Subcontractors _____

CURRENT INSURANCE INFORMATION:

Design-Builder's Worker's Compensation and General Liability Insurance Broker or Agent:

Company _____

Address _____

_____

Contacts *Tel. No.* _____ *Fax No.* _____

Certificate of Insurance, including wording as required by Contract, must accompany this form.
This form must be submitted to the Department Project Director.
This Enrollment Form must be received prior to starting Work on the Project.

APPENDIX C: DISPUTE RESOLUTION FORMS

Project Name:		Date Submitted by DB:	
PIN:		Date of Initial Written Notice:	
Project No.:		Date of Last Resolution:	
Brief Dispute Description:		Date Appealed by DB:	

Escalation Ladder Level	I	II	III	IV	V
Check as applicable					

DESIGN-BUILDER

1. Executive Summary. In the executive summary include a detailed, factual statement of the dispute with necessary dates and locations of Work involved in the dispute, the dates when the dispute was discovered, and when the initial written notice of dispute was given to the Engineer (attach information as necessary or provide below).

2. Cite the specific Contract provision(s) that support the dispute (attach information as necessary or provide below).

3. Include the estimated dollar cost, if any, of the protested Work, and furnish a list of estimated Materials, Equipment and labor for which the Design-Builder might request additional compensation (attach information as necessary or provide below).

4. Theory of entitlement supporting the appeal. Include a narrative of how or why the specific Contract Specifications support the appeal and a statement of the reasons why such Specifications support the appeal (attach information as necessary or provide below).

5. Itemized list of dispute amounts. Provide claim amounts with a narrative of the theories and documents used to arrive at the amounts provided (attach information as necessary or provide below).

6. Additional Contract Time requests. If the dispute relates to a combination of additional compensation and Contract Time, submit a copy of the schedule that was in effect when the dispute arose and a detailed narrative which explains how the disputed issue impacted Contract Time, specific to impacts on the Critical Path (attach information as necessary or provide below).

7. Supporting documents. Include copies of, or excerpts from any documents that support the appeal, such as manuals standard to the industry and used by the Design-Builder or any other information the Design-Builder chooses to provide (attach information as necessary or provide below).

APPENDIX C: DISPUTE RESOLUTION FORMS

DEPARTMENT
Department Decision, including additional clarifications, supporting documents, etc. (attach information as necessary or provide below).

JOINT RESOLUTION
Document any changes made to the Department's Decision, if any (attach information as necessary or provide below).

☐ Dispute Resolved ☐ Dispute Escalated	Position for Escalation Ladder Level	I	II	III	IV	V
	Check as applicable					

Approved: Date:

UDOT Dispute Administrator

Acknowledged: Date:

Design-Builder Dispute Administrator

APPENDIX D (FORM 01282A):

REQUEST FOR PAYMENT OF MATERIALS

SECTION A (COMPLETED BY DESIGN-BUILDER)
Date:
Description:
Design-Builder:
Schedule of Value Item:
Materials Description:
Value of Payment Requested:
Materials Stored at:
Scheduled Installation on Project:
Submitted by:

SECTION B (COMPLETED BY DEPARTMENT)		
Verify Submissions	***Date***	***Checked by***
Bill of Sale or Voucher		
Certification of Title (to Design-Builder)		
Warranty of Title (to Department)		
Evidence of Acceptability		
Verify Storage		
Waiver and Release (if stored on private property)		
Verify Scheduled Installation:	Yes	No
Payment Recommended by:		
Payment Approved by:	_____ ***Department Project Director***	

APPENDIX E: (FORM 01282B)

CERTIFICATE OF TITLE TO STORED MATERIALS

(Page 1 of 2)

(Title TO MATERIALS STORED OR TO BE STORED, FOR INCORPORATION INTO DEPARTMENT OF TRANSPORTATION PROJECT)

WHEREAS, _____ hereafter referred to as the "Design-Builder," is engaged in the performance of the Design-Build Contract, hereafter referred to the "Contract," with the Utah Department of Transportation, hereafter referred to as the "Department," and

WHEREAS, in accord with the Design Plans and Project Specifications, the Design-Builder has purchased certain materials for incorporation into the Contract Work from _____, hereafter referred to as the "Vendor," and

WHEREAS, these materials referred to are as follows: *[Enter description of materials and quantities]*

and, WHEREAS, to comply with the provisions of the Contract Documents regarding partial payments (Part 2, Section 12.2.6) requiring certification of the Design-Builder's absolute legal title to the materials described above and warrant of title to the same materials to the Department, the Design-Builder and the Vendor have entered into the following agreement.

NOW, THEREFORE, and in consideration of the forgoing premises, the Design-Builder and the Vendor agree, with the intention of being bound hereby, as follows:

A. The Vendor has executed this document for the purpose of acknowledging that: the Vendor has made an outright sale and transfer of title for the above materials to the Design-Builder free of all restrictions, filings, or liens; the Vendor is the lawful owner of the above materials and has the right make such transfer of title; and the Vendor will not in the future make any claims whatsoever to such title.

B. The Design-Builder certifies and represents that he is the lawful holder of the absolute legal title to the above materials, and has full legal right, power, and authority to sell and transfer such title without restrictions, filings, or liens of any kind on the part of the Vendor and/or any Subcontractor.

C. The Design-Builder, Vendor, and/or any Subcontractor and their successors and assigns, will and do by these presents warrant title to the above described materials to the Utah Department of Transportation.

D. If the Vendor has sold the above-described materials to a Subcontractor of the Design-Builder, this Certification of Title is hereby amended at all applicable points to reflect this fact. By the execution of this Certification, any such Subcontractor is acknowledging that: such Subcontractor has made an outright sale and transfer of title for the above materials to the Design-Builder free of all restrictions, filings, or liens; such Subcontractor is the lawful owner of the above materials and has the right to make such transfer of title; and such Subcontractor will not in the future make any claims whatsoever to such title.

FORM 01282B: CERTIFICATE OF TITLE TO STORED MATERIALS

(Page 2 of 2)

IN WITNESS WHEREOF, the parties hereto have caused this Certificate of Title to be executed on this _____day of _____, 201__.

ATTEST: DESIGN-BUILDER

By _____

Title _____

ATTEST: SUBCONTRACTOR

By _____

Title _____

ATTEST: VENDOR

By _____

Title _____

APPENDIX F: (FORM 01282C)

REQUEST FOR PROGRESS PAYMENT

(1) Payment Request No. :			(4) Date Received:	
(2) Period of:			(5) Current Contract Amount:	
(3) Date Request Submitted:				
(6) *Item Description from Price Allocation Form*	(7) *Lump Sum Amount from Price Allocation Form*	(8) *Cumulative Amount Earned at End of Previous Period*	(9) *Payment Request Amount for Current Period*	(10) *Actual Cumulative Amount Earned End of This Period*
[To be filled in based on Design-Builder's Price Allocation Form]				
Compensable Project Overhead				
Design				
Construction				
Utility Work performed by the Design-Builder				
Mobilization at NTP 1				
(11) Total Amount Earned to Date				
(12) Total Amount Earned as of Last Period				
(13) Total Amount Earned This Period				
(14) Less Retention (3%)				
(15) Net Due This Period				

PROGRESS AND QUALITY CERTIFICATION: We hereby certify that all amounts being requested are true and correct, the required level of testing and inspection is complete, there are no outstanding NCRs, all certifications of compliance are submitted, and the Work is completed per the Contract Requirements.

FOR THE DESIGN-BUILDER:

Signed	Signed
Printed or Typed Name	Printed or Typed Name
Design-Builder's Project Manager or Deputy Title	Quality Manager Title
Date	Date

DEPARTMENT ENDORSEMENT:

I hereby confirm the achievement of the cumulative amount earned to date indicated herein and concur with this request and certificate except as noted below or attached.

FOR THE DEPARTMENT:

_____
Signature

_____
Printed or Typed name

Department Project Director
Title

_____
Date

INSTRUCTIONS FOR FORM 01282C

A. All amounts shall be in U.S. dollars.

B. Request for Progress Payment Sheet:

(1) Enter Payment Request Number (numbered sequentially starting with "1").

(2) Enter month and year covered by this payment request.

(3) Enter date this payment request submitted to Department.

(4) Enter date received by Department.

(5) Enter Current Contract Amount.

(6) Enter the Item Description from Price Allocation Form.

(7) Enter Lump Sum Amount from the Price Allocation Form.

(8) Enter Cumulative Amount Earned at End of Previous Period.

(9) Enter Payment Request Amount for Current Period.

(10) Add (8) to (9) for each Item.

(11) Total the Item amounts shown in Column (10).

(12) Enter total of Column (8).

(13) Subtract (12) from (11).

(14) Multiply (13) by 0.03.

(15) Subtract (14) from (13).

C. Progress Payment Certifications:

Design-Builder's Project Manager and Quality Manager shall sign and date the Certifications.

D. Department's Endorsement:

Department Project Director will sign and date the Department endorsement for the Periodic Completion Certificate.

F. Add additional worksheets for additional Project sections as required.

APPENDIX G: PERFORMANCE BOND FORM

Bond No. _____

WHEREAS, the State of Utah, by and through the Utah Department of Transportation (Obligee), has awarded to _____, a _____ (Principal), a contract for Project No. S-0154(12)11/PIN 12566, dated _____, 20____ (the Contract), on the terms and conditions set forth therein; and

WHEREAS, Principal is required to furnish this bond as a condition to execution of the Agreement (Part 1 of the Contract) by Obligee;

NOW, THEREFORE, Principal and _____, a _____, and _____, a _____ (collectively, Co-Sureties), each an admitted surety insurer in the State of Utah, are held and firmly bound unto Obligee in the amount of $_____ (the Bonded Sum), for payment of which sum Principal and Co-Sureties jointly and severally firmly bind themselves and their successors and assigns.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if Principal shall promptly and faithfully perform all of Principal's obligations under the Contract Documents (as defined in the Contract), including any and all amendments and supplements thereto, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The following terms and conditions shall apply with respect to this bond:

1. This bond specifically guarantees the performance of each and every obligation of Principal under the Contract Documents, as they may be amended and supplemented, including its liability for Liquidated Damages and Warranties as specified in the Contract. Conditioned upon the Co-Sureties faithful performance of its obligations, the liability of the Co-Sureties for the Principal's default shall not exceed the Bonded Sum. The Contract Documents are hereby incorporated by reference herein.
2. The guarantees contained herein shall survive the final completion of the design and construction called for in the Contract Documents with respect to those obligations of Principal which survive such final completion.
3. Whenever Principal shall be, and is declared to be, in default under the Contract by Obligee, provided that Obligee is not then in material default thereunder, Co-Sureties shall promptly:
    a. Remedy such default;
    b. Complete Project No. S-0154(12)11/PIN 8314 (the Project) in accordance with the terms and conditions of the Contract Documents then in effect; or
    c. Obtain a bid or bids for completing the Project in accordance with the terms and conditions of the Contract Documents then in effect, and upon determination by Co-Sureties of the lowest responsible bidder (or, if Obligee elects, upon determination by Obligee and Co-Sureties jointly of the lowest responsible bidder), arrange for a contract between such bidder and Obligee, and make available as work progresses (even though there should be a default or a succession of defaults under such contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the unpaid balance of the Contract Amount; but not exceeding, including other costs and damages for which Co-Sureties are liable hereunder, the Bonded Sum.

d. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

i. After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or

ii. Deny liability in whole or in part and promptly notify the Owner citing reasons for the denial.

4. No alteration, modification or supplement to the Contract Documents or the nature of the work to be performed thereunder, including without limitation any extension of time for performance, shall in any way affect the obligations of Co-Sureties under this bond. Co-Sureties waive notice of any alteration, modification, supplement, or extension of time.

5. No right of action shall accrue on this bond to or for the use of any entity other than Obligee or its successors and assigns.

6. The Co-Sureties agree to empower a single representative with responsibility for coordinating among all of the Co-Sureties with respect to this bond, so that Obligee will have no obligation to deal with multiple sureties hereunder. All correspondence from Obligee to the Co-Sureties and all claims under this bond shall be sent to such designated representative. The designated representative may be changed only by delivery of written notice (by personal delivery or by certified mail with return receipt requested) to Obligee designating a single new representative signed by all of the Co-Sureties. The initial representative shall be _____.

IN WITNESS WHEREOF, Principal and Co-Sureties have caused this bond to be executed and delivered as of _____, 20____.

Principal: _____

By: _____

Its: _____

(Seal)

Co-Surety: _____

By: _____

Its: _____

(Seal)

Co-Surety: _____

By: _____

Its: _____

(Seal)

[ADD APPROPRIATE ACKNOWLEDGMENTS]

APPENDIX H: PAYMENT BOND FORM

Bond No. _____

WHEREAS, the State of Utah, by and through the Utah Department of Transportation (Obligee), has awarded to _____, a _____ (Principal), a contract for Project No. S-0154(12)11/PIN 12566, dated _____, 20____ (the Contract), on the terms and conditions set forth therein; and

WHEREAS, Principal is required to furnish this bond as a condition to execution of the Agreement (Part 1 of the Contract) by Obligee;

NOW, THEREFORE, Principal and _____, a _____, and _____, a _____ (collectively, Co-Sureties), each an admitted surety insurer in the State of Utah, are held and firmly bound unto Obligee in the amount of $_____ (the Bonded Sum), for payment of which sum Principal and Co-Sureties jointly and severally firmly bind themselves and their successors and assigns.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if Principal shall fail to pay any of the persons named in Utah Code §63G-6a-1103, with respect to construction work under the Contract, then Co-Sureties shall pay for the same in an amount not to exceed the Bonded Sum; otherwise this obligation shall be null and void.

The following terms and conditions shall apply with respect to this bond:

1. No alteration, modification, or supplement to the Contract Documents (as defined in the Contract) or the nature of the work to be performed thereunder, including without limitation any extension of time for performance, shall in any way affect the obligations of Co-Sureties under this bond. Co-Sureties waive notice of any alteration, modification, supplement or extension of time.

2. This bond shall inure to the benefit of the persons named in Utah Code §63G-6a-1103 with respect to construction work under the Contract so as to give a right of action to such persons and their assigns in any suit brought upon this bond.

3. Liabilities on this bond to all such claimants shall be determined in accordance with Title 63G, Chapter 6a, Part 11, Utah Code, to the same extent as if it were copied at length herein.

4. The Co-Sureties agree to empower a single representative with responsibility to coordinate with all of the Co-Sureties with respect to this bond, so that Obligee will have no obligation to deal with multiple sureties hereunder. All correspondence form Obligee to the Co-Sureties and all claims under this bond shall be sent to such designated representative. The designated representative and agent for service of process may be changed only by delivery of written notice (by personal delivery or by certified mail with return receipt requested) to Obligee designating a single new representative and/or agent, signed by all of the Co-Sureties. The initial representative shall be _____.

IN WITNESS WHEREOF, Principal and Co-Sureties have caused this bond to be executed and delivered as of _____, 20____.

Principal: _____

By: _____

Its: _____

(Seal)

Co-Surety: _____

By: _____

Its: _____

(Seal)

Co-Surety: _____

By: _____

Its: _____

(Seal)

[ADD APPROPRIATE ACKNOWLEDGMENTS]

Appendix I – Liquidated Damages

Completion Deadlines

Liquidated Damages in the amounts set forth in the second column below (LIQUIDATED DAMAGE AMOUNT) shall be assessed for failure to achieve Substantial Completion or Physical Completion by the applicable Completion Deadline.

COMPLETION DEADLINE	LIQUIDATED DAMAGE AMOUNT[1]
Substantial Completion Deadline	$4,870 per Day
Physical Completion Deadline	$1,120 per Day
Contract Completion Deadline	$200 per Day

[1]If the Design-Builder is subject to Liquidated Damages for failure to achieve more than one Completion Deadline, the greater of the applicable Liquidated Damages amounts will apply.

APPENDIX L – CHANGE ORDER CERTIFICATION

"*Under the penalty of law for perjury or falsification, the undersigned,*

*(Name)*_____, *(Title)*_____, *of*

*(Company)*_____,

Hereby certifies that the request for extra compensation and time, if any, made herein for Work on this Contract is a true statement of the actual costs and time sought, and includes all known and anticipated impacts and amounts whatsoever that may be incurred, and is fully documented and supported under the Contract between the parties.

*Dated:*_____ *Signature*_____

Subscribed and sworn before me this _____ day of _____, 20_____.

Notary Public _____

My Commission Expires _____*."*

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS
PART 3—QUALITY PROGRAM

Final Issued September 15, 2016

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1—GENERAL

Conduct all work necessary to meet the requirements of this Part 3 (Quality Program) and to provide documentation that evidences requirements (processes and procedures) are met prior to Department reviews, testing, and inspections.

2—ADMINISTRATIVE

2.1 Quality Management Plan (QMP)

Document the Design-Builder's Quality Program in a Quality Management Plan (QMP). The QMP will define the Design-Builder's processes and procedures to ensure Contract requirements are met. The QMP may be submitted in two parts, one for management and design and one for construction. The management and design portion of the QMP must be Approved prior to the submittal of any design submittal. The construction portion of the QMP must be Approved prior to any permanent construction Work.

Submit three hard-copies and one electronic copy of the QMP. Allow 14 Calendar Days following the Department's initial receipt of the QMP for the Department to provide a response with either Approval, or conditions for Approval. Revise the QMP according to the conditions provided and resubmit for Approval. Allow five Calendar Days following the Department's receipt of the revised QMP for the Department to respond with either Approval, or conditions for Approval. Follow this resubmittal process until Approval is received.

The Department may require the Design-Builder to modify the QMP at any time throughout the Project based on results of Department reviews, testing, and inspections. Such changes initiated by the Department are made under the Department's Approval authority and may result in the Design-Builder expending additional resources and/or time to comply with the revised QMP, such changes are not eligible for additional compensation or a time extension. Any revision to the QMP requires prior Department Approval and will follow the Approval resubmittal process defined in this Section. The Design-Builder's Project Manager and Construction Manager shall endorse and approve the QMP.

Upon Approval, the QMP remains in effect until Final Acceptance.

2.2 Documentation

Utilize the Department's ProjectWise to facilitate electronic submission of documentation to the Department. Describe the submittal process in the QMP.

Specify procedures in the QMP for meeting documentation requirements for the filing of design criteria, reports and notes, calculations, plans, specifications, schematics, project administration, supporting materials, etc. and for the specific responsibilities of personnel to satisfy these requirements. Maintain Project documents for the duration of the Contract; organize and index in the Department's ProjectWise.

In the QMP, identify the folder where each document will be filed in the Department's ProjectWise. Include documentation filing procedures for all phases of the work (e.g. closeout, working drawings, material certs, change orders). Name and attribute all documents; where Department naming conventions exist, follow the Department's naming convention. Develop file naming conventions and other attributes with the intent of allowing for and contributing to easy access and retrieval of any and all documents related to any item(s) of the Work including the ability to allow for cross discipline

queries within ProjectWise. Provide documentation in formats acceptable to the Department and in accordance with the Project Files/Records section of the UDOT *Construction Manual of Instruction.*

Specify measures to control the receipt and issuance of documents in the QMP (such as instructions, procedures, drawings, and any changes thereto) that prescribe activities affecting conformance to Contract requirements. Maintain a log of changes and revisions to documents.

2.2.1 Request for Information

Track, document, and distribute discussions between design and construction to the Department as it is outlined in Appendix A.

2.2.2 Project Documentation

Identify processes in the QMP to ensure accurate, complete, and timely documentation for all submittals. Receipt of submittals by the Department follows Part 1 (Agreement), Section 3.2 (Receipt of Notices).

3—DESIGN

Describe specific procedures in the QMP to be followed to ensure the design conforms to the requirements of the Contract.

3.1 Design Checks

See Part 4-17 (Structures) for general information, definitions and terminology associated with the SDDM.

3.2 Design Adequacy Review

Specify the level, frequency, and methods of reviewing the design adequacy of the Project in the QMP, including the methods by which all design documents, approach, methodology, calculations, Special Provisions, and reports will be reviewed, verified for adequacy of design, and back-checked by licensed engineers from the Design-Builder's staff. Follow the UDOT Structures Quality Control/Quality Assurance (QC/QA) Procedures, which is included as part of the SDDM, for all structural elements. See Part 4-17 (Structures) for general information, definitions and terminology associated with the SDDM.

3.3 Design Coordination

Specify detailed procedures in the QMP for coordinating design performed by different persons, firms, or disciplines on related tasks, in the same geographic area, or in adjacent geographic areas to ensure that no conflicts, omissions, or misalignments occur, and to ensure contract compliance.

3.4 Design Milestone Reviews

Establish a process for design milestone reviews in the QMP.

Conduct a minimum of two separate design milestone reviews.

A. Initial Design Milestone Review - Conduct an initial design milestone review for each design package prior to 60 percent design progress. For structural design packages conduct the initial design milestone review at 30 percent design progress in conformance with a Stage 3 review

as defined in the SDDM. Structure Type selection reports and Plan-in-hand Review forms are not required for Design Build projects.

B. Final Design Milestone Review – Conduct a final design milestone review at 100 percent design progress prior to the issuance of Released for Construction documents. For structural design packages conduct the final design milestone review in conformance with a Stage 4 review as defined in the SDDM.

Follow the requirements in Part 4-04 (Drainage) for an intermediate design milestone review. For all other disciplines, if intermediate reviews are needed, establish a process for additional intermediate design milestone reviews that occur between the initial and final design milestone review.

Follow the requirements in Part 4-06 (Geotechnical) for the review of MSE walls.

Follow the requirements in Part 4-10 (Maintenance of Traffic) for the Traffic Management Plans review.

Include the Department in these reviews and provide the submittals to the Department in advance of the review meeting to allow for review periods required per Table 3D-1. Submit two hard copies and one electronic copy in computer-aided design and drafting (CADD) format and PDF format, of all relevant design memoranda, reports, data, review plans and specifications for each submittal package. No more than five design packages may be in to the Department for review at any one time. The schedule impacts of revisions arising from the Department's review and caused by nonconformance with Contract requirements, including the Department's time for reviewing revisions, is borne by the Design-Builder.

3.5 Early Released for Construction

Early Release for Construction (ERFC) is only allowed for girders, Maintenance of Traffic Plans, clearing and grubbing and the 7000 South pedestrian bridge superstructure. Identify the procedure in the QMP for which design drawings are ERFC. Describe the process to resolve all comments prior to issuing ERFC drawings. Submit two hard copies of ERFC documents and one electronic copy in PDF format. ERFC drawings may be submitted in electronic format.

3.6 Released for Construction

Identify the procedure in the QMP for which design drawings are Released for Construction (RFC). Include a procedure for how ERFC drawings will be included in a RFC submittal. Describe the process to resolve all comments prior to issuing RFC drawings. Submit two hard copies of RFC documents, one electronic copy in PDF format and all associated CADD files. Identify a process and/or feature to allow near real time distribution of RFC plans, or updates to previous RFC plans to all parties.

3.7 Design Changes After Plans have been Released for Construction

Follow the Field Design-Change (FDC) or Notice of Design-Change (NDC) process outlined in Appendix A for changes to documents that are Released for Construction (RFC). Identify the procedure in the QMP for ensuring the most current version of the design is available for use in the field, including Department personnel. Submit two hard copies and one electronic copy in PDF format with every NDC package.

3.8 Working Shop and Falsework Drawings

Outline the process in the QMP for how shop drawings and falsework are prepared, submitted, reviewed, corrected, and accepted. Include the following in the process:

A. Personnel assigned to perform construction submittal reviews including submittals that involve multiple disciplines (e.g. retaining walls).

B. Procedures for documenting reviews and approvals and for obtaining corrective action.

3.9 As-Built Drawings

Specify procedures in the QMP to be used in preparation of the final As-Built drawings to ensure accurate and timely documentation of the constructed Project. Provide electronic copies of the As-Built drawings, including a scanned PDF in ProjectWise, on a monthly basis showing the current status of the drawings. At Final Acceptance, submit three hard-copies and one electronic copy of the As-Built Plans, stamped by the DQM.

4—CONSTRUCTION

Notify the Department in writing each week of planned construction activities (including fabrication) for each Work segment to be undertaken in the following week to allow the Department to schedule its resources.

4.1 Control Point Inspection

A Control Point is a point in time when construction has proceeded to a defined stage and at which representatives of the Design-Builder's production, Design-Builder's QC, the Department, and Utility Company (for Utility Work) verify the conformance of the Work to that point. Provide at least 24 hours of notice to the Department for each Control Point. This notice will be re-established if items of non-conformance are discovered. With the exception of corrective work items, work may not proceed on the Work associated with the Control Point until a conforming Control Point is documented.

The Department and/or the Design-Builder may identify additional Control Points to be included at any time throughout the Project. Revise the QMP to include any additional Control Points identified and necessitated by the Design-Builder's specific design and construction approaches. Establish the following minimum Control Points:

4.1.1 Concrete

A. Prior to any placement of concrete

4.1.2 Environmental Mitigation Measures

A. Before any construction occurs, and after implementation of Best Management Practices (BMPs) and environmental controls per the Permitting requirements

B. Prior to disturbing any stream, dewatering, diverting watercourses, or building cofferdams

4.1.3 Embankments

A. After completion of drainage and utility installations, and before backfill

B. After all clearing, grubbing, and excavation

C. After each lift in accordance with specifications for lift requirements (applicable to all embankments, including walls)

D. After backfill of demolished homes

E. At completion of embankment placement

F. At completion of surcharge placement

G. Prior to removal of surcharge per the Geotechnical Manual of Instruction (MOI)

4.1.4 Structures

A. Before start of bridge foundation pile-driving

B. At Design-Builder's approval of pile driving submittals (including design prior to cutting pile tops to elevation, before and after girder and diaphragm placement)

C. At completion of bridge embankment settlement and prior to placing abutment concrete and sleeper slab

D. After rebar placement but before final form placement for CIP retaining walls and box culverts taller than 6 feet

4.1.5 Drilled Shafts

A. Prior to concrete placement, verify diameter, location, depth, plumbness, and demonstrate the drilled shaft excavation is clean; and the steel reinforcement cage is clean and of correct dimensions and placed in proper location with proper clearances.

B. Prior to construction of column or cap atop drilled shafts, verify location and that concrete strengths are met.

4.1.6 Driven Piles

A. Prior to moving the driving equipment from the driving location, cutting off pile tops, placing reinforcing steel around the piles and/or backfilling around the piles, verify complete pile driving records and tolerance measurements for all piles in each pile group, along with the applicable dynamic pile test results and signal-matching analyses.

4.1.7 Micropiles

A. Prior to building structures on micropiles, submit to the Department the completed inspection records for all micropiles, along with the applicable load test results and analyses.

4.1.8 Retaining Walls and Reinforced Soil Slopes

A. Prior to placing leveling pad or footing, verify the subgrade conditions meet specifications and drawings.

B. Upon placement of first level of soil reinforcements, verify proper placement of leveling pad, correct orientation of reinforcement, conformance of select backfill to material and compaction requirements, and proper alignment of first level of facing elements.

C. Every 10 vertical feet of wall construction, verify reinforcements have been placed in proper locations and orientations, including around obstructions, that wall facing tolerances conform to specifications, and that each lift of select backfill meets material and compaction requirements.

4.1.9 Pavement Base

A. Before placement of each course above subgrade on permanent roadway components (granular borrow, lean base, etc.)

4.1.10 Asphalt

A. Before placement of each lift of asphalt

4.1.11 Noise Walls

A. After completion of every 500 feet of noise wall posts or panels

4.1.12 Traffic Devices and Switches

A. Before opening to traffic

4.1.13 ATMS

A. Before backfilling trenches containing conduit

B. Before placing flowable fill around junction boxes

4.1.14 Utility Work

A. Before backfilling or concealing any portion of work

B. Before tying in Utility Work to existing utilities, new Utility Work, and retirement of existing utilities

C. During each testing event

D. At final field inspection for acceptance of the completed Utility Work

4.2 Deep Foundations (Driven Piles, Micropiles, and Drilled Shafts)

Detail in the QMP the Design-Builder's process for monitoring and inspecting all elements of the Work required by the Contract related to drilled shafts, driven piles, and micropiles.

4.3 Material Identification

Specify procedures in the QMP to ensure material documentation can be traced to a specific location on the project.

4.4 Testing Equipment

Describe a process in the QMP for correlating testing equipment with the Department; the frequency of the correlation will be at least quarterly.

4.5 Final Inspection

Include a process in the QMP for conducting, with the Department, a final inspection of the Work after all elements of physical Work are complete. Include scheduling, conducting, and tracking the inspection process. Include the development of a mutually agreed-to punch-list including date of correction.

4.6 Pre-Activity Meetings

Pre-activity Meetings are meetings conducted by the Design-Builder with the Department and the Design-Builder's production, construction, design, and quality personnel to review the Design-Builder's approach to conforming to requirements for certain elements of Work. Describe the approach to conducting these meetings in the QMP. Conduct all meetings at least 7 Calendar Days prior to the start of the activity. Conduct at a minimum the following Pre-Activity Meetings:

A. Bridge deck placement – At a minimum the following items must be discussed for each bridge deck (may require multiple meetings):

1. Sequence and limits of placement (for example including pouring sequence, direction of pour
2. Location of finishing machine rail supports and construction joints (for example including grade control)
3. Concrete conveyance, placement methods and rate (including length and time of haul from batch plant to construction site, placing method, rate of placement anticipated, vibration of concrete)
4. Finishing method
5. Special equipment
6. Curing plan and equipment
7. Construction details (for example including skew of abutment or bents versus skew of finishing machine, superelevation and transitions)
8. Contingency plans (including precautionary measures for back-up equipment and materials).

B. PCCP – At a minimum provide the Design-Builder's approach to:

1. Reinforcing steel placement – The approach to verifying proper placement of tie bars and dowel bars in PCCP through destructive and/or non-destructive methods.
2. Concrete batching and delivery
3. Concrete placement
4. Curing

C. HMA – At a minimum provide the Design-Builder's approach to:

1. QC testing
2. Equipment
3. Subgrade control
4. Profile and thickness control
5. Density control

D. Pile driving – At a minimum provide the Design-Builder's approach to:

1. QC Testing
2. Equipment

E. Drilled shafts – At a minimum provide the Design-Builder's approach to:

1. QC and specialty Testing
2. Equipment

F. Drainage – At a minimum provide the Design-Builder's approach to:

1. QC Testing
2. Density control
3. Survey control
4. As-built requirements

G. Barrier – At a minimum provide the Design-Builder's approach to:

1. QC testing
2. Rebar placement
3. Concrete requirements/limitations
4. Equipment

5—MANAGEMENT

The Design-Builder's Project Manager will conduct a monthly quality management review with the Department Project Manager to ensure its continuing suitability and effectiveness in satisfying Contract requirements. As part of the monthly progress report and requests for payment, provide a written certification signed by the Design-Builder's Project Manager indicating that the QMP and all of the measures and procedures provided therein are functioning properly and are in full compliance.

The management reviews will assess, at a minimum, the results of Design-Builder quality actions, results of Department reviews, testing, and inspections, status of corrective actions, trends in non-conformance, and time to resolution of problems. Use the results of these meetings as actions for improvement of the Design-Builder's quality management system.

6—ENVIRONMENTAL MONITORING AND COMPLIANCE

Describe the methods, processes, and procedures in the QMP to provide for the effective implementation and documentation of the environmental protection, training, compliance, and monitoring program.

7—NONCONFORMING WORK

Follow the Nonconforming Work process given in Appendix A when Nonconforming Work is detected.

8—SUBMITTALS

Provide submittals to the Department in accordance with Table 8-1.

TABLE 8-1
DESIGN-BUILDER SUBMITTALS FOR QUALITY PROGRAM

Submittal	*For Approval*	*Schedule*
Quality Management Plan (QMP)	Yes	Initial submittal within 10 Calendar Days after receiving NTP. Management and design portion prior to any design submittal, construction portion prior to permanent Work
Initial and Intermediate Design Milestone Review documents	No	14 Calendar Days in advance of review meeting
Responses to Design Review Comments	No	Resolve at or prior to subsequent design milestone review submittal
Early Released for Construction (ERFC) documents	No	7 Calendar Days in advance of review meeting.
Final Design Milestone Review documents	No	14 Calendar Days in advance of review meeting
Released For Construction (RFC) Documents	No	After all review comments are resolved
Responses to notices of Nonconforming Work and Corrective Actions	Yes	Ongoing

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS

PART 3:
APPENDIX A

Final Issued September 15, 2016

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A—NON CONFORMING WORK

A-1 PURPOSE

The purpose of this procedure is to describe how Nonconforming Work is identified, described, and controlled to prevent its unintended use, delivery, or continued practice.

A-2 SCOPE

A-2.1 Definitions

Requirement Deficiency (RD) –When the Work is incomplete and is still under process control, any observation of the Work found by the Design-Builder or the Department to be non-conforming will be segregated from other conforming work and the issue documented through an RD.

Non-Conformance (NC) – When the Work is complete and the plans have been Released for Construction (RFC) or construction Work has had a Control Point.

A-2.2 Applicability

This procedure is applicable to all people involved in performing reviews, verification, inspection or testing of materials, workmanship, management, design, or construction of Work processes.

A-3 METHOD

Nonconforming Work products will be identified as either:

1. **Requirement Deficiency (RD)**
2. **Product Non-Conformance (NC)**
3. **Process Non-Conformance**

All RD's must be appropriately closed prior to the Work becoming Permanent or they will be considered a NC.

A-3.1 Requirement Deficiencies

The Department shall track each RD in a spreadsheet form and assign each RD a unique identifier. If a deficient product can be corrected in the shift it was detected, then an RD need not be issued, but shall be tracked during that shift for closure. If any deficient product cannot be corrected in the shift it was detected, or a deficiency is not corrected in the shift it was detected, then an RD shall be issued and tracked to closure.

A-3.2 Product Non-Conformance (NC)

When Work is deemed NC the Design-Builder shall investigate and rectify the process failure. The nonconforming Work shall be segregated from conforming work and prevented from use.

Once an NC is detected, the Department will verbally notify the Design-Builder of the deficiency and issue a written NCR, using Form 002 NCR Tracking Log. The Design-Builder shall distribute the NCR to the involved parties and determine the proposed resolution. The Design-Builder shall obtain all required signatures.

If the NC resolution is to remove and replace, the Design-Builder shall notify the Department and issue a Control Point. The NCR will remain open until conforming Work is verified.

The Design-Builder shall obtain Approval for any resolution other than remove and replace, prior to proceeding with the segregated Work.

If the Approved resolution is to leave as-is, the Department may, in its sole discretion, apply a deductive amount in accordance to Part 5, Table 5-1 (Unit Prices for Determining Pay Adjustments for Nonconforming Work). These NCRs will remain open until a Change Order, detailing the concession is executed.

In the event that the NC modifies the design, an FDC or NDC shall be issued by the Design-Builder.

A-3.3 Process Non-conformance

If the Nonconformance is a procedure or QMP requirement, the Design-Builder shall investigate and rectify the process failure. NCRs will not be issued for these types of NCs, but will be tracked by the Department for consideration of Corrective Action.

A-3.4 Design Non-conformance

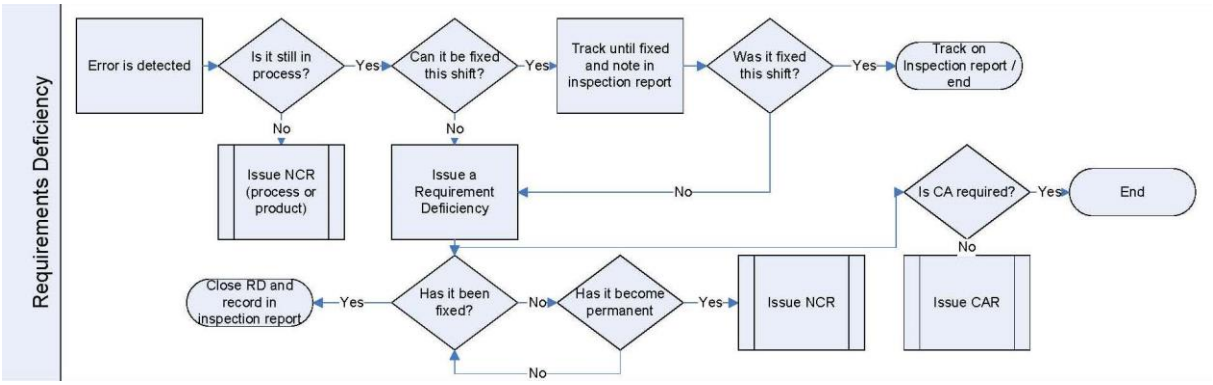
When the design is found to be non-conforming to a Contract requirement it is the responsibility of Design-Builder to investigate and rectify the process breakdown. Any non-conformance of the design or comments that are not addressed prior to RFC will result in an NCR being issued.

A-3.5 Corrective Action Report

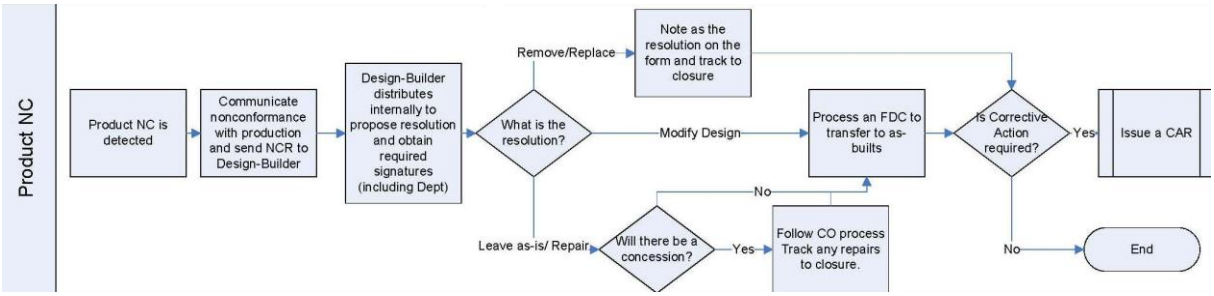
The Department may require Corrective Action if, in its sole discretion, it is determined that a systemic failure of the Design-Builder quality system has occurred; based on the severity of an individual NC, or frequency/repetition of NCs and RD's. Corrective Action will be issued through Form 002 NCR Report. The Design-Builder shall determine and perform a root cause analysis of the Nonconforming Work; modify or develop a process to prevent recurrence; obtain Department Approval of the solution; and verify the new/revised process is successful in preventing recurrence.

A-4 NON CONFORMANCE FLOW CHARTS

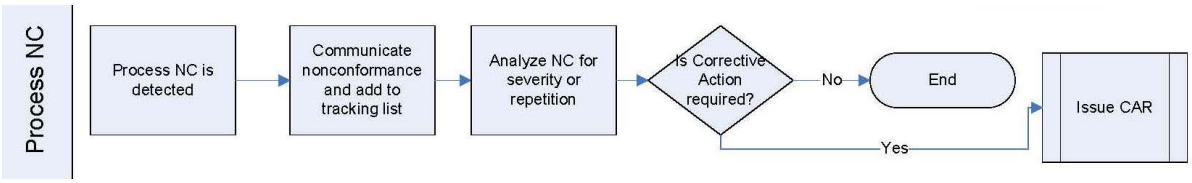
A-1: Requirement Deficiency Flow Chart



A-2: Product Nonconformance Flow Chart



A-3: Process Nonconformance Flow Chart



A-5 FORMS / LOGS

Electronic form/log will be provided.

A-4: Form 002 NCR

BANGERTER **Form NCR - Nonconformance Report**

Nonconformance Report No. (NDC):

Date Sent:

ORIGINATOR:		NOTIFICATION SENT TO:	
LOCATION:		CAP REQ. (Y/N/#)	
SPECIFICATION:			

DESCRIPTION OF NONCONFORMANCE:

CORRECTIVE ACTION / RESPONSE:

☐ Remove & Replace ☐ Repair ☐ Leave-As-Is ☐ N/A

			Yes	No
Date:	Signature: Design-Builder		☐	☐
	Print: Design-Builder			
Date:	Signature: UDOT		☐	☐
	Print: UDOT			

Status:

A-5: Form 002 NCR Tracking Log

BANGERTER

Form NCR - NCR Tracking Log

Project No.: S-0154(12)11 Page of

No.	Date	Originator	Contract / Specification Reference	Description of Nonconformance	Location	CAP Req. (Y/N)	QA Rep	Approved (Y/N)
001								
002								
003								
004								
005								
006								
007								
008								
009								
010								
011								
012								
013								
014								
015								
016								
017								
018								
019								
020								
021								
022								
023								
024								
025								
026								
027								
028								
029								

B—REQUEST FOR INFORMATION

B-1 PURPOSE

To provide a uniform and documented process for Requests for Information (RFI) or clarifications to the RFP to ensure uniform understanding of the design documents by both the Department and Design-Builder.

B-2 SCOPE

This procedure includes the interface between the Design-Builder and the Department.

B-3 DESIGN MANAGER AND CONSTRUCTION MANAGER RESPONSIBILITIES

Design & Construction Manager (DM/CM): Maintain full documentation on design and all field inquiries and process them through the requirements for the Project. Maintain and track all RFIs using RFI log.

B-4 METHOD

The Manager shall document all communication generated by field inquiries. The Manager shall track all RFIs using an RFI log.

Telephone calls where the field inquiry is immediately resolved do not require an RFI form to be generated, but shall be logged and communicated to the Department. All other inquiries and subsequent communication regarding the inquiries shall be documented using Form 001 RFI, logged, and be copied to the Manager and Department.

B-5 FORMS / LOGS

Electronic form/log will be provided.

B-1: Form 001 RFI Form

BANGERTER **Form RFI - Request For Information**

REQUEST FOR INFORMATION No. (RFI):

Date Sent:

CONTRACTOR:		OWNER:	Utah Dept. of Transportation (UDOT)
PROJECT NO.	S-0154(12)11	ORIGINATOR:	
ENGINEER:		SENT TO:	

Subject:		Drawing/Detail Reference:	
Spec. Reference:		Date Reply Required:	
Reference:			

INFORMATION REQUIRED (BE SPECIFIC):

SUGGESTION:

RESPONSE:

RESPONSE BY (SIGN AND PRINT NAME):	DATE:
Status:	

B-2: Form 001 RFI Tracking Log

Form RFI - Request for Information Tracking Log

Project No.: S-0154(12)11 Page of

Discipline	RFI Number	Construction Work Area	Segment	RFI Description	Received by Design	Response Date	Returned to Document Control	Received by CQCM	Require Design Change? (Y/N)	NDC Reference	RFI Status	Remarks

C—FIELD DESIGN CHANGES

C-1 PURPOSE

To establish the mechanism for identifying, processing, and tracking design changes that are initiated to address field conditions after the design package has been Released for Construction.

C-2 SCOPE

Design changes that are initiated by the Design-Builder to address field conditions shall be processed as a FDC. This procedure applies to any situation where design changes are initiated in the field which necessitates a change to one or more plan sheets and/or specifications of a package that has been Released for Construction.

C-3 RESPONSIBILITIES

Project Manager: Initiates a FDC and coordinates processing through to resolution.

Construction Manager (CQM): Coordinates with the Project Manager and the Department to determine the FDC Level and signs off on FDC resolution and tracks and logs FDCs.

Design Manager (DM): Coordinates the design and quality control processes for those FDC's that require design input, and signs off on resolution of FDC's that require design input.

C-4 GENERAL

The procedures outlined below are used to process all modifications to Released for Construction documents that are initiated by the Design-Builder to address field conditions. Field changes shall be classified according to the following:

1. **Level 1 (Minor)** – These are minor changes in the Work that do not materially affect design. These are documented and a copy sent to the responsible design engineer (e.g. shifting a catch basin 1 foot laterally to avoid a utility).
2. **Level 2 (Medium)** – These changes may or may not materially affect design, but require confirmation as to the impact on design (e.g. shifting a catch basin vertically).
3. **Level 3 (Major)** – These changes may or may not materially affect design, but require modification to the plans and/or special provisions and implementation of a NDC (e.g. eliminating a catch basin).

C-5 METHOD

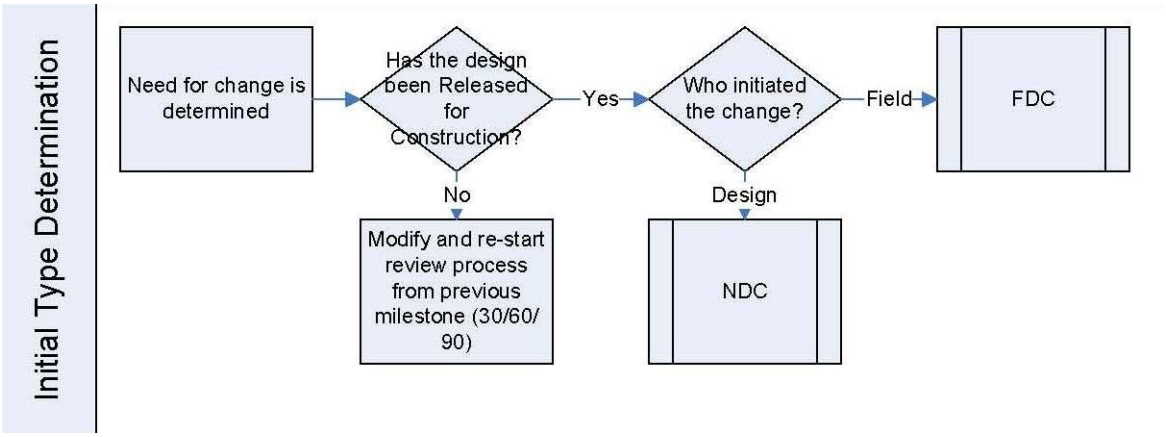
Once a change is determined necessary, the Project Manager shall contact the CQM to jointly determine the level of the field design change. Upon determination of the level of field design change and receiving Department concurrence, the Project Manager shall complete the appropriate portion of Form 003 FDC. The Project Manager and CQM shall acknowledge the information provided in the form by providing their initials in the space provided on the form. If the FDC involves a Third Party, a copy will be sent to the Third Party Design and Construction Manager or Designee, who will be responsible for obtaining an authorized initial on the Form 003 FDC.

If the level is agreed as a Level 1, the Project Manager shall provide enough information on the FDC to be able to communicate the change to the person creating As-Builts. The Project Manager shall complete Form 003 FDC and forward to the CQM for signature. After signature, the completed form shall be submitted to the Department.

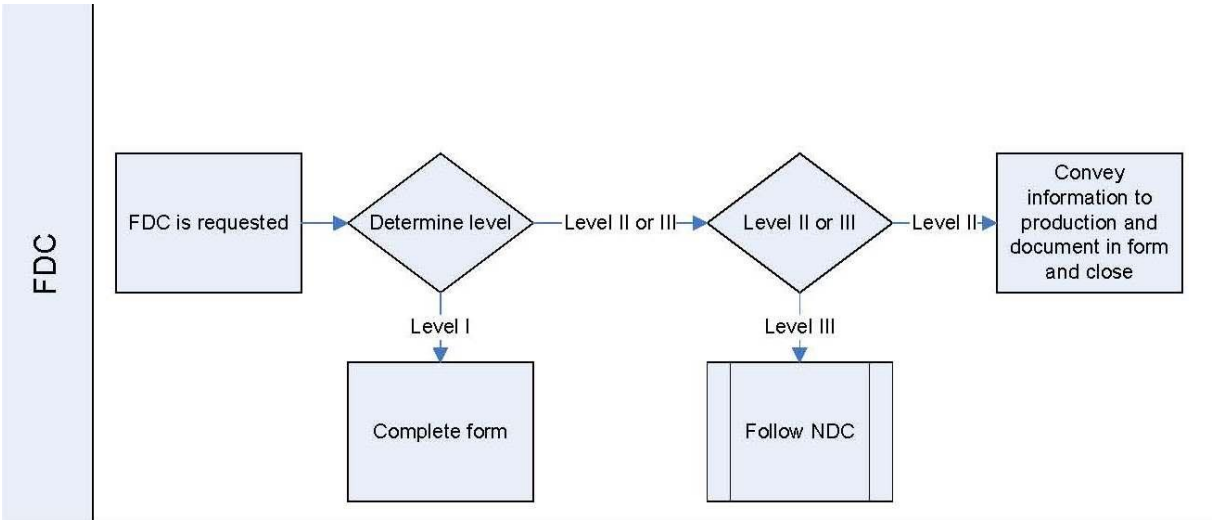
If the change requires involvement of the design team it shall be deemed a Level 2 or Level 3, and the Project Manager, CQM, Design Manager, and the Designer shall agree on the resolution. If the Design Manager determines that the resolution requires re-design, modification of design, or additional design, such that revision of RFC drawings is necessary for construction it is deemed a Level 3 and an NDC shall be processed in accordance with that procedure. If an NDC is determined not necessary, the resolution is described on Form 003 FDC (attachments may be included to clarify). The Design Manager or designee shall complete and approve Form 003 and forward to the Project Manager and CQM for approval. After signature, the completed form shall be submitted to the Department.

C-6 FLOW CHARTS

C-1: Initial Type Determination



C-2: FDC Flow Chart



C-7 FORMS / LOGS

Electronic form will be provided.

C-3: 003 FDC Form

BANGERTER

Form FDC - Field Design Change

FIELD DESIGN CHANGE No. (FDC):

Date Sent:

REQUESTED BY:		**REQUEST DATE:**		**REQUIRED DATE:**	
DESIGN ELEMENT:		**DESIGN DISCIPLINE:**			
LOCATION:					
SPECIFICATION AFFECTED:					
DRAWINGS AFFECTED:					

ISSUE:

IMPACT OF CHANGE:	**CONCURRENCE BY:**	
☐ LEVEL 1 (copysent to design)		
☐ LEVEL 2 (e-mail from design)	UDOT SIGNATURE	DATE:
☐ LEVEL 3 (requires an NDC)	CQM SIGNATURE	DATE:

RESOLUTION:

ATTACHMENTS:	

APPROVAL OF CHANGE: ☐ ADD TO AS-BUILTS

APPROVED BY:		
	DESIGN MANAGER (LEVEL 3 ONLY) (SIGN AND PRINTE NAME)	DATE:
APPROVED BY:		
	CONSTRUCTION QUALITY MANAGER (SIGN AND PRINT NAME)	DATE:
APPROVED BY:		
	DESIGN-BUILD PROJECT MANAGER (SIGN AND PRINT NAME)	DATE:

As the Design Quality Manager, I certify this Field Design Change meets the following:
- The change has followed all applicable processes described in the QMP.
- The change is consistent with other elements of the existing design.
- The change is Released for Construction.

DESIGN QUALITY MANAGER DATE

Status:

D—NOTICE OF DESIGN CHANGE (NDC)

D-1 PURPOSE

To establish the method to identify and provide design changes deemed necessary to address situations discovered after the design package has been Released for Construction.

D-2 SCOPE

This procedure applies to any situation where design changes are initiated by the design team which necessitates a change to one or more plan sheets and/or specifications of a package that has been Released for Construction or deemed a Level 3 Field Design Change (FDC).

D-3 RESPONSIBILITES

Design Manager (DM) – Reviews and approves all NDC's. Establishes the timeline in which the NDC must be completed and issued and maintains a log of all NDC's.

Design Quality Manager (DQM) – Determines level of quality control required for revisions to design and drawings as a result of an NDC. Reviews the NDC to ensure the design change has completed quality control reviews as appropriate to the level of the NDC.

D-4 METHOD

D-4.1 Classifications of the NDCs

A. A minor NDC is a change that impacts only one discipline and has little impact to the surrounding design.

B. A major NDC impacts multiple disciplines and has a larger impact to the surrounding designs.

D-4.2 Issuance of Notices of Design Change (NDCs)

When an NDC is required, an NDC form shall be completed by the Design Manager. A set of affected drawings or specifications indicating the potential changes will be included with the NDC form. These can be hand-marked corrections or comments that explain or show the potential change.

After an NDC has been issued, the design documents will be updated to incorporate the design change and drawings will be revised. Once drawings are revised by the design team, they will undergo quality control as required by this procedure. The drawings will then be signed, sealed, and Released for Construction.

The NDC form will be the means of describing the details of the revisions to the design and drawings. For any drawings that are revised as a result of an NDC, the NDC shall be referenced in the revision block of those sheets and all changes shall be clouded with a revision triangle next to it.

D-4.3 Quality Control of NDC Design and Drawing Revisions

For Work related to a design change resulting from a Notice of Design Change form, the checking process shall be implemented as required by Design-Builder's QMP. The Design Manager shall be responsible for

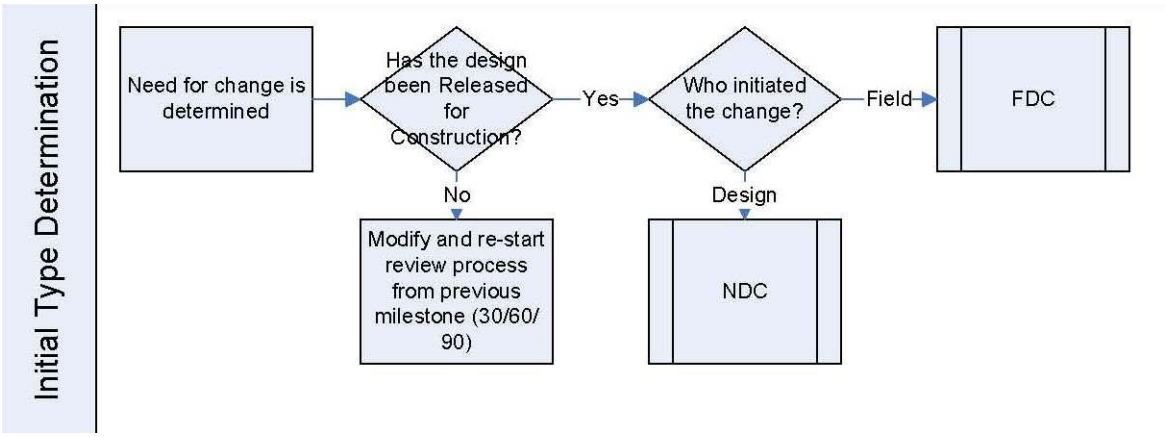
determining the magnitude of the design change and the appropriate quality control activities that will be implemented as a result of the design change.

D-4.4 Identifying Design Changes on Revised Drawings

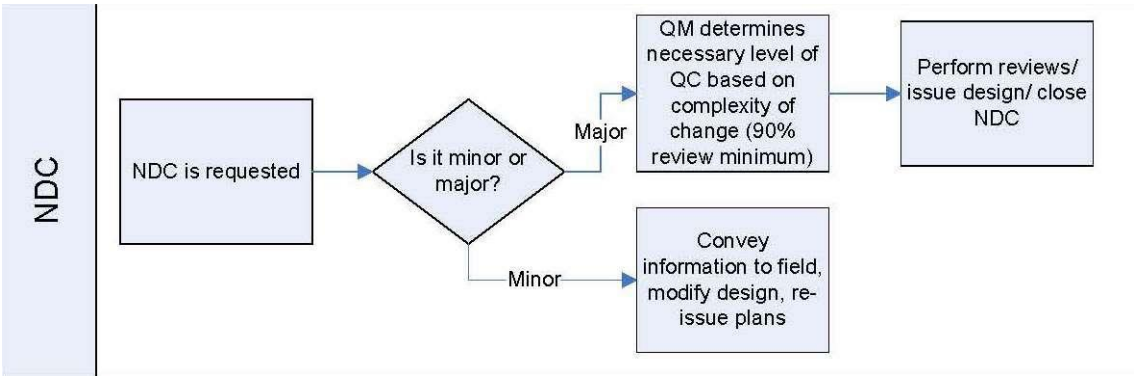
Revisions on drawings will tracked in accordance with the Design-Builder's QMP.

D-5 FLOW CHARTS

D-1: Initial Type Determination



D-2: NDC Flow Chart



REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS
PART 4:
PROJECT DESIGN AND CONSTRUCTION REQUIREMENTS

Final Issued September 15, 2016

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1—PROJECT CONFIGURATION

1A GENERAL

This Part 4-01 (Project Configuration) provides a summarized description of the physical infrastructure elements and limits of the Project that the Design-Builder shall design, construct, and/or install in accordance with the requirements of the Contract.

The Project Base Build and Build Alternative will be used for Project administrative and payment purposes and are not meant to constrain the Design-Builder's design or construction schedule or approach, except as other wise specified in the Contract.

1B INFRASTRUCTURE

1-B.1 Base Build

The following are major components that shall be provided as part of the Project.

1. Design and construction of four SPUI's along Bangerter Highway, structures, ramps and cross streets in accordance with Typical Sections shown in Part 7 (Contract Drawings) at the following locations:
    a. 5400 South
    b. 7000 South
    c. 9000 South
    d. 11400 South
2. Reconstruct mainline Bangerter pavement at each interchange with new PCCP in accordance with Part 4-15 (Roadways).
3. Construct a storm drain system at each interchange, replace or rehabilitate all existing storm drain pipes in accordance with Part 4-04 (Drainage).
4. Design for and accommodate future ramp metering in accordance with Part 4-15 (Roadways) at each on-ramp.
5. Construct new interchange lighting, signage, traffic signals, and ATMS in accordance with Part 4 (Project Design and Construction Requirements).
6. Provide safe facilities for pedestrian and bicycle traffic in accordance with Typical Sections shown in Part 7 (Contract Drawings).
7. Construct noise walls at each interchange as shown in Part 7 (Contract Drawings).
8. Protect the USBOR Aqueduct at 5400 South, 7000 South and 9000 South.
9. Coordinate, relocate and protect-in-place existing utilities as necessary.
10. Obliterate and/or remove all existing and temporary improvements that are not required for a fully functional Project. Unless otherwise specified in the Contract, salvageable material is the property of the Design-Builder.
11. In addition, the following are specific components for each interchanges.

5400 South

- See Build Alternative in this section below.

7000 South

- Reconstruct the pedestrian bridge at the location described in Part 4-17 (Structures) and as shown in Part 7 (Contract Drawings).
- Construct a southbound auxiliary lane between the new 7000 South southbound on ramp and the existing 7800 South southbound off ramp as described in Part 4-15 (Roadways) and shown in the Part 7 (Contract Drawings).
- Construct the JVWCD access vault as shown in Part 7 (Contract Drawings).

9000 South

- Construct the Bingham Creek Culvert.
- Relocate the West Jordan PRV Vault as described in Part 4-17 (Structures) and Part 6 (Third-Party Agreements).

11400 South

- Reconstruct 11400 South from 4000 West to 3600 West including removal of the existing "Oval-about".

1-B.2 Build Alternative

The Build Alternative consists of removal of the existing "Thru-Turn" intersection at 5400 South and 4015 West and replacing it with a standard signalized intersection as described in Part 4-15 (Roadways).

The Department may elect to include the Build Alternative in the Design-Builder's Proposal. The determination to include the Build Alternative may be made at any point during the Project.

2—GENERAL DESIGN REQUIREMENTS

2A. GENERAL

This Part 4-02 (General Design Requirements) establishes basic design and performance requirements to be used in the design and construction of the Project. Furnish the design of the Project in accordance with all professional engineering principles and generally accepted standards of the industry (but at least meeting the terms, conditions, and requirements of the Contract Documents), and in accordance with the terms and conditions set forth in the Contract Documents.

Technical design requirements, which govern the design of individual Project elements, are included within other sections of Part 4. Each section also contains requirements for additional submittals not identified in this Part 4-02 (General Design Requirements). If a Project element or component is not covered within Part 4, the design shall be governed by the Department's most current accepted version of other applicable engineering codes and standards, including those of the various federal, State, and local jurisdictions. If there are any conflicts in standards adhere to the standard with the highest priority or with the most stringent requirements.

See Part 3 (Quality Program) for additional requirements for design and construction.

See Part 1.6 (Agreement) for referenced standards, codes and criteria.

2B. STANDARDS

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

TABLE 2B-1
STANDARDS FOR GENERAL DESIGN REQUIREMENTS

PRIORITY	*AUTHOR OR AGENCY*	*TITLE*
1	UDOT	Special Provisions included in Part 5
2	UDOT	*2012 Standard and Supplemental Specifications for Road and Bridge Construction*
3	UDOT	*2012 Standard and Supplemental Drawings*
4	UDOT	*2015 Plan Sheet Development Standards*
5	UDOT	*Structures Design and Detailing Manual (SDDM)*
6	UDOT	*CADD Standards Manual*
7	UDOT	*Specification Writer's Guide*

2C. REQUIREMENTS

Prepare Design Documents, Plans, and Project Specifications for the Project to the Department's standards for general content and format in accordance with the Contract. Digitally sign all plan sheets.

2C-1 Design Submittals

All submittals shall meet the following requirements:

A. Upload all submittals to the Department's Projectwise.

B. Keep calculations readily accessible, clear, understandable, concise, complete, and accurate.

C. Provide any special provisions developed for the performance of the Work.

D. Organize all design calculations by discipline using a logical folder structure.

E. Include a table of contents, and number all pages with a numbering scheme that covers the entire set of calculations.

F. Include any relevant design memoranda, reports, and data.

G. Identify the code or standard, and the specific section within the code or standard, utilized for design. Indicate the design requirements, the assumptions made, the methods used, the source of information, and the cross-reference for the applicable design drawings.

H. Confirm calculations.

I. For calculations performed using software, reference the computer program name, vendor, version, and release date.

J. Document the coordination with Third-Parties.

2C-2 Released for Construction Documents

Released for Construction (RFC) Documents shall constitute all documents issued for the purposes of construction and shall include plans, reports, specifications, special provisions, Shop Drawings, and other items necessary to construct the Work.

The Design-Builder shall ensure the following:

A. All Work, including modifications to the Work, is designed under the authority of a Professional Engineer licensed in the State of Utah.

B. Work is constructed in accordance with the RFC Documents.

C. There are no outstanding Nonconformances as defined in Part 3 Appendix A.

All RFC Documents shall meet the following requirements:

D. Upload all RFC documents to the Department's Projectwise.

E. Prepare plans in general conformance with the UDOT 2015 *Plan Sheet Development Standards* and *Structures Design and Detailing* –Manual (SDDM). Obtain the Department's Approval of any variations.

F. Provide all plan sheet submittals containing CADD data in MicroStation format and in PDF, compatible for 11-by-17 inch sheets.

G. Provide estimated quantities for the purpose of materials testing.

H. Provide estimated quantities for the purpose of planning and scheduling construction activities, and facilitating payment activities.

I. Sign and seal RFC documents by a responsible Professional Engineer licensed in the State of Utah.

2C-3 Final Design Documents

Final design shall meet the requirements of the Contract and the following additional requirements:

A. Include fully completed RFC Documents and include any associated Notice of Design Changes and Field Design Changes.

B. Include design information from the most current RFC Documents and all design back-up information, including design plans, Shop Drawings, calculations, reports, specifications, memoranda, data, and electronic MicroStation data.

C. Sign and seal Final design documents by a responsible Professional Engineer licensed in the State of Utah.

D. For all post-RFC design changes, follow the same quality procedures for design checks, adequacy, and coordination as were performed on the original design, and conform to all requirements of the Contract in accordance with the Part 3 (Quality Program). Ensure that all design changes (including changes to plans, sketches, memoranda, specifications, calculations, and reports) are signed, stamped, and dated by a Professional Engineer licensed in the State of Utah.

E. Upload all final design documents to the Department's Projectwise.

2C-4 As-Built Documents

Changes to the design shall be incorporated into the As-Built Documents.

As-Built Documents shall meet the requirements of the Contract and shall reflect the actual condition of the final constructed Work.

Prior to Contract Completion, submit one copy of the As-Built Documents in MicroStation format (for CADD data) and in PDF on a CD or DVD, compatible for 11-by-17 inch sheets. Provide other As-Built documents as indicated in Part 4 (Project Design and Construction Requirements).

For all structural elements, provide final design and As-Built Documents to the Department on a CD or DVD, organized by structure number and including: calculations, load ratings, deviations, special provisions, Shop Drawings, and QC/QA forms. Include final geotechnical and hydraulic reports.

2C-5 Software

The following software programs are Approved for use on Project Work. If proposing to use any software other than that listed, submit the proposed software along with verification data for Department review and Approval.

Software used shall be the current version in effect as of the date of the Final RFP, unless otherwise specified. Update software programs throughout the Contract if mutually agreed upon by the Department.

2C-5.1 Office

A. Microsoft (MS) Office Suite 2013 edition (PowerPoint, Publisher, Word, Excel)

B. Primavera Engineering and Construction P6 (for Critical Path Method scheduling)

2C-5.2 Public Involvement

A. Adobe (Photoshop, Illustrator, Acrobat, InDesign)

B. Department-provided database

2C-5.3 Roadway

A. MicroStation (SS3) and Power InRoads (Select Series 4) (by Bentley) – Required

B. MicroStation Power Scope–for viewing CADD files

C. AutoTURN 9.0 (by Transoft Solutions)

D. SignCAD Millenium Version 8.51 (by SignCAD Systems, Inc.)

E. ProjectWise (by Bentley)

2C-5.4 Drainage

A. USACE HEC-HMS
B. USACE HEC-RAS
C. FHWA HY-8
D. Bentley InRoads Storm & Sanitary – Storm Drain Analysis
E. Bentley StormCAD – Storm Drain Analysis
F. Aquaveo Watershed Modeling System, (WMS) - Hydrologic Modeling
G. Bentley PondPak
H. NRCS WinTR-55
I. Bentley FlowMaster
J. FHWA Hydraulic Toolbox
K. EPA Storm Water Management Model (SWMM)

2C-5.5 Geotechnical

A. Deep Foundation Design: COM624, DFSAP, Driven, FLPIER, L-Pile, GROUP, GRLWEAP, Unipile, Allpile
B. Embankment and Slope Design Analysis: EMBANK, PCSTABL, GSTABL, MSEW, RESSA, Settle3D, SLOPE/W, SIGMA/W, STABL5M, STABL6, UTEXAS, UniSettle, XSTABL, SLIDE
C. Geomechanical Modeling: FLAC
D. Rockfall and Rock Slope Stability: CRSP, Rocfall, RockPack, RocPlane, Stereonet Programs, Swedge
E. Soil Nail Design: GoldNail, SNAILZ (Caltrans)
F. Geotechnical Seismic Analysis: DEEPSOIL, LiquefyPro, QUAKE/W, SHAKE, CLig/CPeT
G. Pile Dynamic Testing and Signal-Matching Analysis: PDA and CAPWAP or other Department-approved high-strain dynamic testing wave equation analysis programs with signal matching, including a full computer graphics package.

2C-5.6 Structural Design

A. See SDDM.

2C-5.7 Lighting

A. AGI32, version 2.17 – Lighting Design Software (by Lighting Analyst)

2C-5.8 Traffic

A. VISSIM—Complex signal coordination, roadway design features including but not limited to: weaving, queuing, and intersection turn bay storage (95th percentile).

2C-5.9 Advanced Traffic Management System and Maintenance of Traffic

A. ArcGIS (by ESRI)

2D. SUBMITTALS

Provide submittals to the Department in accordance with Table 2D-1.

TABLE 2D-1
DESIGN-BUILDER SUBMITTALS FOR GENERAL DESIGN

Submittal	***For Approval***	***Schedule***
Design Milestone Review Submittal Packages	No	As determined in QMP
Released for Construction Documents	No	Prior to construction of the Work element
Notice of Design Changes	No	Prior to construction of the Work element
Final Design Milestone Review Packages	No	Prior to Contract Completion
As-Built Documents	No	Prior to Contract Completion

3—ADVANCED TRAFFIC MANAGEMENT SYSTEM (ATMS)

3A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 3 (Advanced Traffic Management System) and satisfy all functional needs and characteristics of the Project, including providing a complete and functional new ATMS system as detailed in the Project scope. This includes providing power services, a complete fiber-optic communications system that includes interconnecting, integrating all required traffic signals and ATMS devices to the communications system and installing Department-furnished material.

The ATMS shall include but is not limited to a fiber optic communications system, and closed circuit camera (CCTV) system, traffic monitoring stations (TMSs), and ramp meters, and variable message signs (VMSs). Note that existing UDOT ATMS conduit within the Project limits may contain private utilities in addition to UDOT ATMS fiber. Said private telecommunication utilities are to be accommodated in accordance with their individual current UDOT lease agreements, Part 4-09 (Maintenance During Construction), Part 4-19 (Utilities), and Part 6 (Third-Party Agreements). It is the Design-Builder's responsibility to coordinate with said private telecommunication utilities, in protecting or relocating their facilities.

Existing UDOT Fiber optic communication system shall remain operational during the entire Project. Damage and relocation cut over down time shall be less than four hours in duration.

3B. STANDARDS

Complete Work for the ATMS in accordance with requirements of the standards listed by priority in Table 3B-1 (Standards for ATMS).

If there is any conflict in Standards, adhere to the Standard with the highest priority.

TABLE 3B-1
STANDARDS FOR ATMS

Priority	*Author or Agency*	*Title*
1	UDOT	Special Provisions included in Part 5
2	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
3	UDOT	*2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
4	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
5	UDOT	*2012 Standard Drawings for Road and Bridge Construction*
6	AASHTO	*A Policy on Geometric Design Of Highways and Streets*
7	AASHTO	*Roadside Design Guide*
8	UDOT	*Utah Manual on Uniform Traffic Control Devices (*Utah MUTCD*)*
9	NEMA	*National Electrical Manufacturers Association Standards*
10	NFPA	*National Electric Code*

3C. REQUIREMENTS

Do not reuse any existing equipment and material for final device installation. Existing equipment may be used for temporary use. Identify the coordinates of all ATMS devices (poles, cabinets, and junction boxes) on the design plans.

3C-1 Closed Circuit Television (CCTV)

Design, construct, and integrate a CCTV camera system and determine locations for the CCTVs.

A. Provide CCTV surveillance coverage at each interchange within the Project limits, including Bangerter mainline lanes, cross-street lane approaches (both sides), ramp terminals, and under bridges. Provide CCTV coverage at ramp meter locations, and on the front side of all CMS within the project limits (for message verification).

B. Maintain existing CCTV surveillance at each interchange to provide a clear view of approach lanes, ramp meter lanes, and a minimum of 0.25 miles of the crossing arterial in both directions. Provide a second CCTV at the interchange if the bridge obstructs the view of the crossing arterial and the interchange signal.

C. Submit the proposed CCTV coverage by either a plot illustrating view cones (sight triangles) and profile analysis for final roadway configuration or hand-held camera view from bucket trucks from each proposed CCTV location.

D. CCTV Poles shall be State Furnished 45 Foot poles. At signalized intersections, CCTV's are to be installed on the traffic signal pole luminaire extension. The Department is to Approve final locations.

3C-2 Traffic Monitoring Station (TMS)

Design, construct, and integrate a non-intrusive detection data collection system utilizing Department-furnished radar detection devices. Design and install the system to accurately record Bangerter Highway traffic volumes, occupancy, and speeds, and collect such data at intervals at all on-ramp and off-ramp locations for each highway mainline lane and at each ramp lane. Determine the location of and construct all traffic monitoring stations.

A. Use ramp meter loops as a TMS for on-ramps.

B. For on-ramp locations the TMS shall be downstream of the ramp meter stop bar, but prior to the mainline painted gore.

C. For off-ramp locations the TMS shall be downstream of the mainline gore, but within 100 feet of the painted gore point.

D. Submit the proposed TMS coverage by a plot illustrating monitoring zones of each proposed TMS site showing that the zones meet the manufactures specifications for device placement and operation.

E. Devices may be co-located on CCTV poles if they are planned in locations that can satisfy placement and operational requirements of both CCTV and TMS devices.

F. Install TMS devices in accordance with manufacturers' installation requirements.

3C-3 Ramp Meters

Design, construct, and integrate the underground portion and partial above ground portion of a ramp meter system for all Bangerter Highway on-ramps. The underground portion consists of lane detection loops, conduits, junction boxes, cabling, power circuitry, pole foundations, and an ATMS cabinet. The above ground portion is the signal poles. Detection devices in new pavement areas shall be pre-formed loops placed under new pavement. Use preformed loops with continuous 14-gauge wire without splices in the loop and on UDOT's list of accepted materials. Saw cut loops are not allowed in new pavement areas. Ramp meter storage on the Interchange On-Ramps shall be provided in accordance with the Part 4-15 (Roadways).

Design, construct, and integrate the system to allow the Department to collect ramp lane volumes from the lane detectors.

3C-4 Changeable Message Sign (CMS)

Design a complete CMS system for future installation by the Department. Install two 2 inch conduits (power and communication) terminating at two Type II Junction Boxes between the future CMS pole and ATMS cabinet. Provide the ATMS power source.

Construct the ATMS maintenance pullout areas for the future CMS.

Locate the VMS boards on Bangerter Highway between the off ramp gores and the structure at 7000 South, centered over the traveled lanes (sign bridge) at the approximate locations listed below:

A. Northbound Bangerter Highway, prior to 7000 South

B. Southbound Bangerter Highway, prior to 7000 South

Coordinate future CMS locations with the Department during the design process. Include CMS locations in the Signing Plan submittal required in Section 16 (Signs). Provide overhead access catwalks on each CMS that extend from the outside edge of the shoulder to the CMS. CMS messages must be visible and legible by at least one CCTV camera.

3C-5 ATMS Cabinets

Determine location of and construct ATMS cabinets, including the cabinet foundations, electrical power, junction boxes, vaults, conduit, grading, cables, and conductors, for each ATMS device location.

A. Locate cabinets for CCTV installations within 100 feet of the camera pole base. CCTV Cabinets may be pedestal or pole mounted.

B. Locate cabinets for TMS installations within 100 feet of the TMS subsystem. TMS Cabinets may be pedestal or pole mounted.

C. Mount the CMS Cabinets between 250 Feet and 500 Feet upstream of the CMS structure. Cabinets for CMS may be pedestal or pole mounted.

D. Cabinet hardware for multiple ATMS devices may be combined into one cabinet, provided they otherwise satisfy the requirements of the type of device it is servicing.

E. Construct the cabinet in accordance with the AASHTO Roadside Design Guide.

F. Place the following in a table on the plan sheet for the ATMS Cabinet:

1. Northing-Easting
2. Project Stationing
3. Latitude-Longitude
4. Local street addressing

3C-6 Department-Furnished Material

3C-6.1 *Department-Furnished Material List*

The Design-Builder is responsible for installing Department-furnished material. The Department will furnish the following material:

A. CCTV Cameras:

1. 45-foot camera poles and anchor bolts
2. Traffic signal pole luminaire extensions at signalized intersections.
3. Data port & Power Supply
4. Positioner CCTV camera assembly and CCTV cable
5. Digital video encoder
6. ATMS cabinet (Model 334) and/or 3R pole-mounted enclosure fully populated and facility tested with required electronics and Ethernet switch and patch cables.

B. Traffic Monitoring Stations:

1. Non-intrusive detector (NID) and NID cabling, and electronic components
2. Lighting luminaire poles and anchor bolts
3. Mounting brackets
4. Surge suppressor
5. ATMS cabinet (Model 334) and/or 3R pole-mounted enclosure fully populated and facility tested with required electronics and Ethernet switch and patch cables.

C. Ramp Meters:

1. Signal poles and anchor bolts
2. Luminaire extensions
3. 2070 controller
4. ATMS cabinet (Model 334) fully populated and facility tested with required electronics and Ethernet switch and patch cables.

3C-6.2 *Department-Furnished Material Notification Process*

To receive Department-furnished material, the subsequent notification process must be followed:

A. Submit the State Furnished ATMS Materials Form and State Furnished Signal Materials Form to the Department for each interchange separately to request Department-furnished material. An itemized inventory schedule of each ATMS site location for the requested material shall accompany each form. These forms shall be submitted in the following time frames:

1. No more than 150 Calendar Days and no less than 110 Calendar Days prior to needing materials: ATMS cabinets, ATMS steel poles for TMS, mast arms, PED poles, VMS, camera poles, Multi-Mode Fiber-optic cable, and CCTV's not at a traffic signal.

2. No more than 90 Calendar Days and no less than 60 Calendar Days prior to needing all other material.

   (a) Submit a notification to the Department requesting pick-up of materials 10 Calendar Days prior to the needed date. This may not be submitted until 10 Days prior to the completion period of the first notification time frames unless the Department has already received the material. The notification will include each site location and associated equipment requested for pick-up.

B. The Department-furnished materials to be picked-up must be coordinated through the Department. Materials will be picked up at the locations below depending on the specific item requested.

Utah Department of Transportation Traffic Operations Center (TOC) 2060 South 2760 West Salt Lake City, UT 84104	or	Utah Department of Transportation Central Warehouse 4501 South Constitution Blvd West Valley City, UT 84119

C. The Design-Builder is responsible for all site installation, insurance, interim storage, labor, and transportation associated with equipment pickup and transportation between storage and field sites.

3C-7 Location and Protection of ATMS Elements

Install all ATMS elements within the Project and in accordance with the AASHTO Roadside Design Guide, and such that routine maintenance will not require a lane closure. Do not locate any ATMS elements in the median, except the center support of highway CMS signs.

3C-8 Electrical Power Service

Comply with Part 4, Section 19 (Utilities) for power service provider coordination and cost requirements.

A. Provide metered service to all ATMS cabinets and devices within the Project limits. Meter may be combined with traffic signals, but must be separate from meter for lighting. The rate schedule for this meter is found on Rocky Mountain Power's schedule 15.2 at http://www.rockymountainpower.net/about/rar/uri.html.

B. Existing Department ATMS power services may be used to provide power to new or relocated devices, if the service can accept, or be modified to accept, additional load, and if the voltage drop to all facilities energized from the service does not exceed NEC requirements. Where electrical power service exists, provide the electrical power feeder and branch circuit from the point of service to the ATMS equipment. Existing power services for other agencies or private interests are not permitted to power Department ATMS elements.

C. Where electrical power service does not exist, coordinate with the Utility for the building of an electrical service point to a location at the edge of the ROW. The Design-Builder shall pay for the cost of the Utility construction. Coordinate with Utility companies and cover the cost. Provide the electrical power feeder and branch circuit from the edge of the ROW to the ATMS equipment

D. It is the Design-Builders responsibility to supply all electrical calculations for ATMS facilities for full functionality.

E. Energize controller/cabinet assemblies. Provide a step-down transformer where service higher than 120 volts is used. Include with every cabinet an additional load allowance of 12 amperes (A) for powering cabinet convenience outlets. Label the cabinet destinations on each power service with a plated label.

F. Electrical power costs for new permanent services shall be paid by the Department.

3C-9 Cabling and Conductors

Design, furnish, and install all conductors, connectors, and cables.

CCTV cables, NID/TMS Cables, and CMS Multi-Mode Fiber Optic Cables are Department Furnished and the Design-Builder is to design, install, and integrate into the fiber optic system.

Remove and dispose of all abandoned ATMS features.

3C-10 Vaults and Junction Boxes

Furnish and construct all at grade junction boxes and pull boxes.

A. Protect-in-place all existing vault locations within the backbone system. If existing vaults are inside the travel lanes of the roadway, sweep conduits to the shoulder and install two new Type III junction boxes. Terminate each half of the conduit bundle into the junction boxes installed side-by-side, or end-to-end.

B. Install two new Type III junction boxes on the shoulder of the roadway, and sweep existing vacant conduits to terminate inside of new junction boxes if existing vault locations are not in locations where access to the duct system is necessary. Do not sweep existing cabling or conduits filled with existing cables into new junction boxes if the cabling does need access by the Department.

C. Junction boxes shall be no smaller than a type II when the box contains future use conduit for fiber-optic cable.

D. Junction boxes shall be no smaller than type III when containing a splice enclosure or designed for a future splice location.

E. Do not place junction boxes or vaults in a flood-prone area, irrigation area, drainage ditch, or paved shoulders.

F. Locate junction boxes for splice enclosures within 25 feet of a vehicle access point. Locate the junction box with a splice enclosure such that there are no obstructions to prevent a vehicle and splice trailer from accessing the junction box. Provide a clear area 50 feet long and 14 wide parallel to the access road with the grading no steeper than 6:1.

G. If junction boxes are placed within maintenance pullout areas, locate boxes centered in the width of the maintenance area. Provide boxes that are concrete vaults with cast iron lids.

H. Only power conductors are to be placed in Type I Junction Boxes.

I. Locate conduit system between vaults and junction boxes.

1. Establish a junction box/vault naming system that corresponds with the predominant relative route number and milepost to the nearest tenth of a mile and a letter designation of 'A-Z' for multiple boxes within the same respective tenth of a mile.

J. Place the following in a table on the plan sheet for the ATMS junction box/vault location:

1. Northing-Easting
2. Project Stationing
3. Latitude-Longitude
4. Local street addressing

Place ground rods in a corner of the junction box leaving the interior 50% clear of any ground rod. Do not place the ground rod in the pass-through space of any entering conduit.

3C-11 Conduits

A. Verify at least one conduit in the existing duct system has a viable pathway by proofing existing conduits with a Department approved mandrel. Replace any crushed conduit in 10 feet increments. Provide documentation to the Department Fiber Manager of all conduit repairs, and verification that at least once conduit is free from obstructions. Document condition or blockages of remaining conduits.

B. Design, construct, and integrate a 144-strand, single-mode fiber-optic (SMFO) cable inside the existing conduit path on Bangerter Highway. Design, construct, and integrate a 1D HDPE conduit system along each of the cross-street interchanges within the Project limits for the 72-strand SMF for the fiber-optic communication system. Splice fiber optic systems together on project cross street interchanges to any Department owned fiber optic cable within ½ mile of the Project limits.

C. Design and construct new conduit for all new conduit pathways for cabling and conductors.

D. Utilize separate conduit systems for communications and power systems. Do not utilize existing backbone conduit along Bangerter Highway for any power system without Department approval.

E. Do not place backbone conduit in bridge parapets, hanging under the structure, nor crossing the interchange ramps, to satisfy mainline conduit or cross street conduit system requirements. Place the conduit as close to the ROW fence away from the roadway as possible at bridges.

F. Use boring to install conduit under existing pavement that will not be replaced.

G. Install all conduit within the Project. If Work performed by the Design-Builder results in existing conduit not meeting depth requirements, it is the Design-Builder's responsibility to replace or relocate the conduit to the required depths.

H. One conduit of the system shall contain a detectable pull tape tied to the ground rod in each junction box.

3C-12 Communications

A. Provide a fiber-optic communication system consisting of all new components and meeting the following requirements:

1. Capable of transporting data and video signals between ATMS field devices and hubs and the Department Traffic Operations Center (TOC).
2. Connect traffic signals as required in Part 4, Section 18 (Traffic Signals) to the fiber-optic communication system.
3. Install a standard, loose-tube 144 Strand Single Mode Fiber Optic cable for the backbone of the fiber-optic communications system.
4. Connect and integrate all ATMS devices to the fiber-optic communication system.
5. Connect new fiber system to the existing Bangerter Highway locate system. Bond the armored fiber cable so it will locate through each junction box without signal interruption.

B. Design and construct a 3-inch (TAL-3) conduit and pre-terminated 6 Strand SMFO drop cable, and #14 locate wire, between the backbone or distribution line of the fiber-optic communication system and the traffic signal cabinets, and ATMS cabinets. Terminate all conduit into a cabinet base, Type II, or Type III junction box.

C. Submit a fiber-optic schematic design, including fiber optic attenuation budgets to the Department Fiber Optics Group.

D. Contact and coordinate with the owning agencies prior to designing, and then prior to performing any work that may impact a hub or communication line.

E. Provide Internet Protocol (IP) Ethernet communication for all devices.

F. Extend backbone fiber beyond the Project limits to the nearest existing full splice point. Roll-end splices shall be more than 10,000 feet from all hubs. Mid-span splices are not allowed. Notify the Department of the date to perform the full splice seven days prior to the proposed splice date.

G. Coil any excess fiber slack in the junction boxes.

H. 60 Days prior to splicing, request fiber splice details from the Department Fiber Optics Group. The request shall include the final ATMS cabinet and splice locations, and the ATMS devices within each cabinet. Modifications to a cabinet or splice location after submitting the request will extend the time period to deliver the fiber splice details an additional 30 days. Splice details will be delivered from the Department to the Design-Builder no more than 5 days prior to the Design-Builder's published splicing schedule.

I. 60 days prior to integration, request from the Department the channel diagrams. The request shall include existing IP addresses, existing channel diagram, the devices needing new addresses for each cabinet.

J. Identify all third-party communication service providers (i.e. Utopia, etc.) lines, within the Project limits on the design drawings.

K. Any disruption of service to the communications in the UDOT fiber shall be coordinated with Lynne Yocom (801-887-3780; lyocom@utah.gov) or Leon Hadley (801-887-3765; lhadley@utah.gov), and shall be in accordance with time requirements as designated in the RFP.

3C-13 Integration and Testing

A. Conduct integration and Local Field Operations Test (LFOT) for all ATMS components and fiber that meet the following criteria:

1. A new device and/or cabinet supporting device has been installed or relocated.

2. A communications path between the device and the local cabinet has been disturbed and/or relocated.

3. A communications path between the local cabinet and its communication hub has been disturbed and/or relocated.

4. New and Re-constructed traffic signals shall have signal controller cabinet, fiber and switch devices tested, configured and passed inspection prior to erecting any traffic signal poles.

B. Integrate ATMS components into the new fiber optic communications system and the TOC.

C. Perform field integration of Department-furnished ATMS field equipment, including site preparation, conduit system, pads, power drop, pick-up of Department-furnished equipment, placement of equipment, power and communications hook-up, site testing, turn-up and burn-in of the site devices, and turn-up of the entire system and its field testing, burn-in and acceptance procedures. Follow the UDOT ATMS Device Acceptance Process.

D. The Design-Builder shall only use consultants listed on the current Department pool list of prequalified consultants for the integration of ATMS field equipment for the placement, integration, and testing of field subsystems and systems.

E. Conduct a TMS detector accuracy test after traffic is in final lane locations. Verify the accuracy of detectors by conducting two separate 10-minute speed and volume counts, and comparing them with speed radar gun and hand (video-recorded) counts. 10-minute counts shall be made under typical traffic conditions, on weekdays between 7 a.m. and 10 a.m. and/or between 3 p.m. and 6 p.m. Take corrective action, as necessary, if detector accuracy is not within specified accuracies. If the inaccuracies are due to the State Furnished item, new State Furnished equipment will be provided. As recorded by the detector, the relative occupancy shall be accurate to ±20 percent, and the vehicle speed shall be accurate to ±5 miles per hour (mph). Notify the Department at least seven calendar days prior to beginning testing.

F. Submit ATMS device integration sheets to the Department five days before burn-in date.

G. Submit 30 Day ATMS Burn-in Test Reports prior to Substantial Completion.

H. Notify Department 10 days prior to fiber testing and conduit mandreling to allow witness by the Department. Submit a digital copy (on a disk or thumb drive) of the fiber test sheets to Leon Hadley five days after testing is complete.

3C-14 ATMS Maintenance Access

Design and construct ATMS device and cabinet locations to provide safe and routine maintenance access to accommodate a space of 14 feet wide and 50 feet long.

A. Provide bucket truck access to NID poles, CMS catwalk, and CCTV camera poles to re-aim or replace requiring a shoulder closure only. Maintenance access area must be 50-foot long (parallel to the roadway) by 14-foot wide and may include the concrete shoulder adjacent to the travel lanes, but not any portion of the travel lane. The point of reference for measurements on the maintenance access area is located at 10 feet from the closet edge of the maintenance access area that is perpendicular to the traffic flow and a minimum of 7 feet from the edge of the travel lane. The distance measured from the ATMS/VMS/TMS pole to the point of reference of the maintenance access must not exceed 30 feet and both must be in-line and perpendicular to the roadway. The Maintenance Access Pullout must be situated relative to the ATMS pole so the 50 foot section is split by 40 feet downstream to traffic and 10 feet upstream to traffic.

B. Provide a 32 inch tall barrier in the maintenance access (pull out) area for maintenance personnel to access ATMS cabinets behind barrier. The grades on both sides of the barrier must be the same to ease access to the ATMS cabinets behind the barrier. ATMS cabinets not behind barrier shall not have slopes steeper than 1 to 4 in the path to access the cabinet and be no more than 100 feet from a safe parking location.

C. Avoid placement of devices or poles in snow storage areas between barriers and sound walls.

D. Locate junction boxes with splice enclosures within 25 feet of the shoulder.

E. See Part 7 (Contract Drawings) for ATMS maintenance access details.

3C-15 Remove and Salvage Material

Remove and salvage to the Department existing ATMS elements and electronics, including ramp meter controllers, ATMS cabinets, ATMS cabinet electronics, NID devices, CCTV cameras and cabling, CMS board, CMS controller, and ETC devices. Remove existing backbone fiber optic cable and junction boxes. Contact the Department to coordinate the salvage work. The Design-Builder is responsible for salvaging and delivering the ATMS devices to the determined location.

3D. SUBMITTALS

Provide submittals to the Department in accordance with Table 3D-1.

TABLE 3D-1
DESIGN-BUILDER SUBMITTALS FOR ATMS

Submittal	***For Approval***	***Schedule***
State Furnished Signal Materials Form	No	As noted in this Section
Notice requesting pick-up of Department-furnished materials	No	As noted in this Section
Proposed CCTV Pole location	Yes	As noted in this Section
Proposed CCTV and TMS coverage roll plot or video	No	Consistent with Part 3 (Quality Program)
Fiber-optic schematic design, including fiber-optic attenuation budgets	No	Consistent with Part 3 (Quality Program)
End-to-end splice dates	No	7 days prior to proposed splice date
Request for fiber splice details	No	30 Days prior to splicing
Request for channel diagrams	No	30 days prior to integration
TMS detector accuracy test notification	No	Minimum 7 Days prior to testing
Device integration sheets	No	5 Days before burn-in date
30 Day ATMS Burn-in Test Reports	No	Prior to Substantial Completion
Fiber optic system as-built plans with GIS lat. and long and fiber optic light test sheets.	No	Prior to Substantial Completion

4—DRAINAGE

4A. GENERAL

Provide a complete drainage system for collecting, detaining, treating, and discharging stormwater runoff from within the Construction Limits and its contributing drainage areas and for conveying offsite surface waters across the Department Right-of-Way (ROW).

Design and construct drainage systems in accordance with requirements of this specification, including performance requirements, standards and references, warranties, design and construction criteria, maintenance during construction, and required submittals.

4B. STANDARDS AND REFERENCES

4B-1 Standards

Design and construct the drainage systems in accordance with the requirements of the standards listed by priority in Table 4B-1 (Standards for Drainage Systems).

If there is any conflict in standards, adhere to the standard with the highest priority. However, if the Design-Builder's Proposal has a higher standard than any of the listed standards, adhere to the Proposal standard.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

TABLE 4B-1
STANDARDS FOR DRAINAGE SYSTEMS

Priority	*Author or Agency*	*Title*
1	*UDOT*	*Request for Proposals, for the Project (including Performance Specifications and Project Special Provisions)*
2	*UDOT*	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction, as modified by Part 5*
3	*UDOT*	*2012 Standard Specifications for Road and Bridge Construction as modified by Part 5*
4	*UDOT*	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
5	*UDOT*	*2012 Standard Drawings for Road and Bridge Construction*
6	*UDOT*	*Manual of Instruction, "Roadway Drainage"*

4B-2 References

Use the current version of each listed reference in Table 4B-2 (References for Drainage Systems) as supplementary guidelines for the design and construction of the drainage system. These references have no established order of precedence.

TABLE 4B-2
REFERENCES FOR DRAINAGE SYSTEMS

Author or Agency	*Title*
AASHTO	*Roadside Design Guide*
FEMA	*Flood Insurance Rate Maps*
FHWA	*Highway Hydrology, HDS-2*
FHWA	*Hydraulic Design of Highway Culverts, HDS-5*
FHWA	*Drainage of Highway Pavements, HEC-12*
FHWA	*Hydraulic Design of Energy Dissipaters for Culverts and Channels, HEC-14*
FHWA	*Design of Roadside Channels with Flexible Linings, HEC-15*
FHWA	*Evaluating Scour At Bridges, HEC-18*
FHWA	*Stream Stability At Highway Structures, HEC-20*
FHWA	*Design of Bridge Deck Drainage, HEC-21*
FHWA	*Urban Drainage Design Manual, HEC-22*
FHWA	*Bridge Scour And Stream Instability Countermeasures, HEC-23*
NASSCO	*Pipeline Assessment and Certification Program Reference Manual*
NCHRP	*Report 568, Riprap Design Criteria, Recommended Specifications, and Quality Control*
NCHRP	*Report 1-29, Improved Surface Drainage of Pavements.*
UDEQ/DWQ	*Utah Pollutant Discharge Elimination System (UPDES) General Permit for Storm Water Discharges from Construction Activities. UPDES Permit No. UTRC00000*
UDEQ/DWQ	*UPDES Municipal Separate Storm Sewer System (MS4) Permit. UPDES Permit No. UTS000003*
UDOT	*Erosion and Sediment Control Field Guide*

4C. GENERAL PROJECT REQUIREMENTS

A. The Design-Builder is responsible for the verification and use of existing drainage and irrigation facility data required for analysis and design. Obtain the following information for any existing drainage and irrigation facilities within the Project Limits that are not included in the information provided by the Department: ownership, size, material, end treatment, functionality, and condition.

B. Drainage facilities are to be compatible with current local stormwater management plans. Coordinate Project drainage plans with local city and county jurisdictions where applicable within the Project.

C. Provide drainage facilities that minimize post-Project maintenance required to keep the systems functional. Provide drainage features that can easily be accessed, and that have adequate operating space. Use drainage system parts, components, accessories, and sizes that conform to the Department's standard drawings. Do not use custom sized catch basin grates.

D. Do not allow any drainage to discharge from the Department ROW onto private property. Drainage that sheet flows (not concentrated) off the Department ROW is to be reviewed and approved on a case by case basis.

E. Maintain the post-construction peak discharge rates at or below the pre-Project peak discharge rates for the 2, 10, 50, and 100 year recurrence intervals. The post-Project release rates combined with other existing flows are not to exceed the capacity of a downstream drainage system.

F. Do not connect to or impact non-Department facilities unless provided for in agreements included in Part 6 (Third-Party Agreements) or without the express,

written consent from the owner of the non-Department facility. Provide a copy of the approval to the Department.

G. Maintain existing drainage patterns or outfall locations outside of the Construction Limits unless changes are specifically required in Part 4-04 (Drainage).

H. Evaluate the integrity and conveyance ability for all existing drainage pipes that will remain and function as part of the drainage system within the Project limits. Assess each drainage pipe condition using the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Program (PACP). The inspector is to have a current NASSCO Certification. Document the condition of each drainage pipe inspected. Note that PACP standards require cleaning of the drainage pipe prior to inspection.

1. *Department Owned Existing Pipes:* Line all existing Department owned pipes that remain in use within the Construction Limits with a pipe rehabilitation liner regardless of condition with the exception of pipes at and near the intersection of Bangerter Highway and 7000 South that have already been rehabilitated. Line from manhole to manhole.

2. *Third-Party Owned Existing Pipes:* Line all Third-Party pipes, including irrigation pipes that remain in use within Construction Limits and Department ROW with a pipe rehabilitation liner. After NTP, coordinate with the Department for proposed rehabilitation methods (based on the inspections) as part of the Project. Line from manhole to manhole.

3. Maintain at least the same hydraulic capacity as that of the existing pipe or culvert, for existing pipes or culverts that are lined or replaced. Use 0.011 as the lower limit for the Manning's "n" coefficient value for pipe liner. Rehabilitate all drainage pipes that remain in place.

4. Structurally evaluate any existing drainage pipe that will remain to verify that any additional fill or loading placed on the drainage pipe does not exceed fill height limits per standard drawings. Do not reuse or allow any drainage pipe to remain that does not meet this criterion.

5. Document all assessment findings in a technical memorandum and include as an appendix to the final design Drainage Report.

I. Evaluate the integrity and conveyance ability for all existing drainage structures (inlets, catch basins, end sections and manholes) that will remain and function as part of the drainage system within the Project limits. Assess each drainage structure condition using the NASSCO Manhole Assessment Certification Program (MACP). The inspector is to have a current NASSCO Certification. Document the condition of each drainage structure inspected.

1. If grade 3, 4 or 5 defects are encountered the structure is to be evaluated by the Department to determine if it is to be rehabilitated or replaced.

2. Document all assessment findings in a technical memorandum and include as an appendix to the final design Drainage Report.

J. Inspect and clean all existing drainage structures (including, but not limited to, detention outlet structures, oil/water separators, catch basins, and manholes) proposed to remain.

1. Ease of maintenance: Provide access to all new drainage facilities, and that provide adequate operating space to allow for post-construction maintenance activities.

2. Safety: Provide safe access to all drainage facilities for post-construction maintenance activities.

K. Completely remove all drainage structures and appurtenances that are abandoned by the Project. Abandon or remove drainage pipes in accordance with Department Standard Specifications.

L. Do not use permanent pump stations for stormwater or groundwater.

M. Do not use openings in walls or barriers to convey stormwater.

N. In addition to analysis and design for the Project, analyze and design storm drain facilities within 100 feet of the Project limits of each interchange and analyze storm drain facilities within contributing drainage areas of existing and proposed detention facilities affected by the Project. . Adhere to all requirements of Section 4-04 Drainage.

4D. DESIGN AND CONSTRUCTION CRITERIA

4D-1 Hydrology

A. Perform hydrologic analyses for all on-site drainage areas and for all off-site drainage areas (or basins that contribute runoff to the Project site. On-site drainage areas are defined as contributing drainage areas within Department ROW; off-site drainage areas are those outside of Department ROW. Identify all impacts to any existing storm drainage system based on the hydrologic analyses.

B. Use the design frequencies in accordance with Table 4D-1 (Design Frequency Requirements) when designing Department owned drainage facilities. The design frequencies for all other drainage facilities are to conform to the local municipality's criteria.

TABLE 4D-1
DESIGN FREQUENCY REQUIREMENTS (YEAR)

FACILITY TYPE	ROAD CHARACTERISTICS		
	BANGERTER HWY.	OTHER THAN BANGERTER HWY. (OVER 1000 AADT*)	LOW VOLUME (UNDER 1000 AADT*)
BRIDGE	50	50	25
CROSS DRAINAGE	50	50	25
STORM DRAINAGE	10	10	10
STORM DRAINAGE CHECK EVENT (SAG LOCATION)	50	25	10

*BASED ON A 20 YEAR TRAFFIC PROJECTION

C. Design all natural rivers and streams that have a floodplain designation by the Federal Emergency Management Administration (FEMA) to accommodate the 100-yr storm event in accordance with State and Federal requirements.

D. Use the 2-year, 1-hour storm event for designing water quality systems.

E. Design canals and irrigation facilities based on existing capacity and functionality as determined by coordination with the owner unless modified by written agreement in Part 6 (Third Party Agreements) and approved by the Department.

F. Use the Rational Method for the design of all on-site storm drain systems and for

erosion protection calculations.

G. Use the precipitation data in Table 4D-2 (Depth/Intensity-Duration Frequency Data) based on NOAA Atlas 14 point precipitation frequency estimates for the design of on-site drainage systems. Use five minutes as the minimum time of concentration.

TABLE 4D-2A
DEPTH/INTENSITY-DURATION-FREQUENCY DATA
BANGERTER HWY. AT 5400 SOUTH

Duration	2-Year		5-Year		10-Year		25-Year		50-Year		100-Year	
	inches	in/hr	inches	in/hr	inches	in/hr	inches	in/hr	inches	in/hr	inches	in/hr
5-min	0.15	1.86	0.21	2.56	0.27	3.19	0.35	4.24	0.44	5.23	0.53	6.38
10-min	0.24	1.42	0.32	1.94	0.41	2.43	0.54	3.23	0.66	3.98	0.81	4.85
15-min	0.29	1.17	0.40	1.60	0.50	2.01	0.67	2.66	0.82	3.29	1.00	4.01
30-min	0.39	0.79	0.54	1.08	0.68	1.35	0.90	1.79	1.11	2.21	1.35	2.70
1-hr	0.49	0.49	0.67	0.67	0.84	0.84	1.11	1.11	1.37	1.37	1.67	1.67
2-hr	0.61	0.30	0.79	0.40	0.97	0.48	1.25	0.63	1.52	0.76	1.83	0.91
3-hr	0.70	0.23	0.88	0.29	1.05	0.35	1.32	0.44	1.56	0.52	1.86	0.62
6-hr	0.90	0.15	1.09	0.18	1.26	0.21	1.52	0.25	1.74	0.29	1.99	0.33
12-hr	1.11	0.09	1.34	0.11	1.54	0.13	1.83	0.15	2.07	0.17	2.33	0.19
24-hr	1.32	0.05	1.57	0.07	1.79	0.07	2.07	0.09	2.30	0.10	2.53	0.11

TABLE 4D-2B
DEPTH/INTENSITY-DURATION-FREQUENCY DATA
BANGERTER HWY. AT 7000 SOUTH

Duration	2-Year		5-Year		10-Year		25-Year		50-Year		100-Year	
	inches	in/hr	inches	in/hr	inches	in/hr	inches	in/hr	inches	in/hr	inches	in/hr
5-min	0.16	1.88	0.22	2.59	0.27	3.24	0.36	4.30	0.44	5.29	0.54	6.46
10-min	0.24	1.44	0.33	1.97	0.41	2.47	0.55	3.27	0.67	4.03	0.82	4.91
15-min	0.30	1.19	0.41	1.63	0.51	2.04	0.68	2.70	0.83	3.33	1.01	4.06
30-min	0.40	0.80	0.55	1.10	0.69	1.37	0.91	1.82	1.12	2.24	1.37	2.73
1-hr	0.49	0.49	0.68	0.68	0.85	0.85	1.13	1.13	1.39	1.39	1.69	1.69
2-hr	0.61	0.31	0.80	0.40	0.98	0.49	1.26	0.63	1.53	0.76	1.84	0.92
3-hr	0.70	0.23	0.89	0.30	1.05	0.35	1.32	0.44	1.57	0.52	1.87	0.62
6-hr	0.91	0.15	1.10	0.18	1.27	0.21	1.54	0.26	1.75	0.29	2.01	0.34
12-hr	1.12	0.09	1.36	0.11	1.56	0.13	1.85	0.15	2.10	0.17	2.36	0.20
24-hr	1.32	0.05	1.57	0.07	1.79	0.07	2.07	0.09	2.30	0.10	2.53	0.11

TABLE 4D-2C

DEPTH/INTENSITY-DURATION-FREQUENCY DATA
BANGERTER HWY. AT 9000 SOUTH

Duration	2-Year		5-Year		10-Year		25-Year		50-Year		100-Year	
	inches	in/hr	inches	in/hr	inches	in/hr	inches	in/hr	inches	in/hr	inches	in/hr
5-min	0.16	1.90	0.22	2.60	0.27	3.26	0.36	4.32	0.44	5.32	0.54	6.48
10-min	0.24	1.45	0.33	1.99	0.41	2.48	0.55	3.28	0.67	4.04	0.82	4.93
15-min	0.30	1.20	0.41	1.64	0.51	2.05	0.68	2.72	0.83	3.34	1.02	4.07
30-min	0.40	0.80	0.55	1.10	0.69	1.38	0.91	1.83	1.12	2.25	1.37	2.74
1-hr	0.50	0.50	0.68	0.68	0.85	0.85	1.13	1.13	1.39	1.39	1.70	1.70
2-hr	0.62	0.31	0.80	0.40	0.98	0.49	1.27	0.63	1.53	0.77	1.85	0.92
3-hr	0.71	0.24	0.89	0.30	1.06	0.35	1.33	0.44	1.58	0.53	1.88	0.63
6-hr	0.91	0.15	1.10	0.18	1.28	0.21	1.54	0.26	1.76	0.29	2.02	0.34
12-hr	1.13	0.09	1.36	0.11	1.56	0.13	1.86	0.15	2.10	0.17	2.37	0.20
24-hr	1.30	0.05	1.56	0.06	1.77	0.07	2.05	0.09	2.27	0.09	2.50	0.10

TABLE 4D-2D
DEPTH/INTENSITY-DURATION-FREQUENCY DATA
BANGERTER HWY. AT 11400 SOUTH

Duration	2-Year		5-Year		10-Year		25-Year		50-Year		100-Year	
	inches	in/hr	inches	in/hr	inches	in/hr	inches	in/hr	inches	in/hr	inches	in/hr
5-min	0.16	1.88	0.22	2.59	0.27	3.24	0.36	4.28	0.44	5.27	0.54	6.42
10-min	0.24	1.43	0.33	1.97	0.41	2.46	0.54	3.26	0.67	4.01	0.81	4.88
15-min	0.30	1.18	0.41	1.63	0.51	2.04	0.67	2.70	0.83	3.31	1.01	4.04
30-min	0.40	0.80	0.55	1.10	0.69	1.37	0.91	1.81	1.11	2.23	1.36	2.72
1-hr	0.49	0.49	0.68	0.68	0.85	0.85	1.12	1.12	1.38	1.38	1.68	1.68
2-hr	0.61	0.30	0.80	0.40	0.97	0.48	1.25	0.63	1.51	0.76	1.82	0.91
3-hr	0.69	0.23	0.88	0.29	1.04	0.35	1.31	0.44	1.55	0.52	1.85	0.62
6-hr	0.89	0.15	1.08	0.18	1.26	0.21	1.51	0.25	1.73	0.29	1.98	0.33
12-hr	1.09	0.09	1.32	0.11	1.52	0.13	1.81	0.15	2.04	0.17	2.29	0.19
24-hr	1.27	0.05	1.52	0.06	1.72	0.07	1.99	0.08	2.20	0.09	2.42	0.10

H. Develop a runoff hydrograph based on a 24-hour duration frequency storm distribution for drainage systems involving detention storage and/or large or complex storm systems.

4D-2 Pavement Drainage

A. Maintain a positive grade toward a storm drain system on all pavements. Do not allow stormwater to pond.

B. In areas where there is no curb and gutter, design and construct the Project to minimize concentrated stormwater runoff in accordance with the provisions of Section 4D-14

C. To minimize hydroplaning, optimize roadway geometric component configurations to comply with the following hydroplaning criteria. In tangents, confirm compliance at all locations between the crown point and the outer edge of the pavement. Except in the immediate vicinity of a superelevation transition, confirm compliance through superelevations. Provide an inlet where the pavement superelevation cross slope

reaches 1% prior to rollover and limit the bypass flow to 0.1 cfs.

Empirical Hydroplaning Equation

$$WD = 0.00338(TXD^{0.11}L^{0.43}I^{0.59}S_3^{-0.42}) - TXD$$

where:

- *WD* = average depth above top of texture (in inches) at distance *L* from the location where water commences to flow
  - Maximum Allowable *WD* = 0.0815 inches
- *TXD* = average texture depth (in inches)
  - For asphalt pavement:
    - *TXD* = 0.0394 inches
  - For PCCP pavement:
    - *TXD* = 0.0394 inches
- *L* = length of flow path (in feet) (see below for calculation of *L*)
- *I* = rainfall intensity (in inches/hour) (use the 2-year event, 5-minute time of concentration value)
- S_3 = slope for flow path (in ft/ft)
  - The value of S_3 is obtained from the following equation:

$$S_3 = (S_1^2 + S_2^2)^{1/2}$$

where:

- S_3 = slope of flow path (in ft/ft)
- S_1 = cross-slope (in ft/ft)
- S_2 = longitudinal grade (in ft/ft); do not account for instantaneous longitudinal grades within vertical curves that are less than 0.3 percent

  - The value of *L* is then computed as follows:

$$L = W\,(S_3/S_1)$$

where:

- *W* = the drained pavement width (in feet), measured perpendicular from the crown line to the outside edge of the outer lane whether general purpose lane or auxiliary lane as applicable

4D-3 Drainage Pipe

A drainage pipe is considered to be any pipe that conveys water regardless of shape and material type such as culverts, irrigation pipes, and storm drains.

A. Provide a 50-year design service life for all proposed drainage pipes or culverts in roadway facilities classified as Interstate or Arterials. Provide a 50-year design service life for all proposed drainage pipes or culverts in roadway facilities classified as Collectors or Local Roads. Regardless of road classification, provide a 75-year service life for drainage pipes or culverts under permanent structures such as retaining walls, MSE walls, buildings, etc. The service life is dependent upon the in place soil characteristics, such as resistivity and pH.

B. Do not use multiple-barrel or multiple-cell drainage pipes or structures.

C. Do not decrease the diameter of a drainage pipe in the downstream direction.

D. Locate cross drainage culverts and storm drain outfalls so that the outlet elevation is as close to the receiving channel flow line as possible.

E. Provide flared end sections or head walls on drainage pipe ends. Use headwalls on all drainage pipes with a diameter of 48 inches and greater; use end sections on drainage pipes less than 48 inches in diameter. Do not place end sections on irrigation pipes.

F. Do not allow new storm drain pipes to cross under the USBOR Aqueduct.

4D-4 Storm Drain Systems

Storm drain systems consist of ditches, swales, culverts, gutters, inlets, pipes, ponds, and other appropriate features designed to collect, convey, treat, and discharge stormwater to the receiving systems.

A. Place inlets based upon spread requirements in Table 4D-3 (Storm Drainage Maximum Spread), while meeting the maximum access spacing in Table 4D-4 (Access Spacing).

TABLE 4D-3
STORM DRAINAGE MAXIMUM SPREAD

ROAD FUNCTIONAL CLASS	DESIGN SPEED	MAXIMUM SPREAD
INTERSTATE AND ARTERIAL	< 45 mph	SHOULDER + 3 ft
	≥ 45 mph	SHOULDER
	Sag	SHOULDER + 3 ft
COLLECTOR AND LOCAL ROADS	< 45 mph	1/2 DRIVING LANE
	≥ 45 mph	SHOULDER
	Sag	1/2 DRIVING LANE

B. Design and locate inlets to limit stormwater to 0.25 cfs or less during the design storm event at intersection features including entrances, driveways, and pedestrian ramps. Exclude residential and detention facility maintenance access driveways.

C. At sag locations where stormwater has no outlet except through the inlet and storm drain system and failure of the drainage system could result in flooding or inundation of the roadway, use the sag location check event for both the inlet and the downstream conveyance system. Low points where water can overtop the curb and escape do not warrant being designed for the sag location design event.

1. Provide flanking inlets on either side of the sag point inlet. Flanking inlets are not to be considered as intercepting flow to reduce the bypass flow to the sag point.
2. Use combination curb and grate inlets for all sag and low points located within the curb and gutter.

D. Determine inlet efficiency using Department standard grates, refer to UDOT Standard Drawings. Design inlets located in roadside ditches, interstate mainline, Bangerter Highway, and ramps with standard grates; design inlets located elsewhere with bicycle-safe grates. Use grates with grating bars oriented to match the orientation of the flow.

E. Storm drain computations are to account for inlet bypass flows.

F. Use a clogging factor of 30 % for inlets on grade and 50% for inlets in sag locations.

G. Inlets or cleanouts are required at the following locations:

1. Where three or more pipes converge,
2. At intermediate points along pipe sections such that the maximum access spacing is not exceeded,
3. Where pipe size or shape changes,
4. Where pipe material changes,
5. Where change in horizontal or vertical pipe alignment occurs.

H. Space inlets or cleanouts in accordance with Table 4D-4 (Access Spacing).

TABLE 4D-4
ACCESS SPACING

Size of Pipe (inches)	Maximum Spacing Distance (feet)
18-24	300
27-36	400
≥ 42	500

I. Do not locate inlets or cleanouts in or between travel lanes and/or shoulders. Place inlets or cleanouts on the outer edge of the shoulder.

J. Design storm drains to flow un-pressurized at the controlling design flow rate. Design storm drains so that the hydraulic grade lines (HGLs) are at least one foot below the finished grade at all times for the controlling check event (see Table 4D-1).

K. Account for energy losses in the design of the storm drainage system. Plot the design event HGL on the design plan storm drain profiles.

L. Design storm drains for a minimum full flow velocity of 2.5 feet per second (fps) and a maximum design velocity of 12 fps for the controlling design flow rates. The velocity will not be less than 2.0 fps at design flow.

M. Provide an 18 inch minimum diameter storm drainage pipes.

N. Design culverts that only convey stormwater based on Storm Drain System requirements.

O. Discharge sumps, or open bottom infiltration, are not permitted in catch basins.

P. Do not use valley gutters or waterways to convey water across streets. Intercept stormwater runoff upstream for subsurface conveyance.

Q. Do not allow water to flow over the top of or down the face of any retaining wall. Ditches adjacent to tops of retaining walls are required to be concrete-lined.

4D-5 Drainage Outfalls

Meet requirements for stormwater discharges as shown in Table 4D-5 (Stormwater Discharges). Include both Project flows and co-mingled flows.

TABLE 4D-5

STORMWATER DISCHARGES

A. **I** **n**	**Facility or Location**	**Receiving Facility**[1]	**Allowable Discharge**[2]
5400 South	Discharge Location 54-1	5400 South Storm Drain System (Department and Taylorsville City)	Demonstrate no increase in peak discharge for the 10-year, 50-year, and 100-year, 24-hour events.
5400 South	Discharge Location 54-2	Bangerter Highway Storm Drain System (to Kearns-Chesterfield Drain, Salt Lake County)	Demonstrate no increase in peak discharge for the 10-year, 50-year, and 100-year, 24-hour events.
5400 South	Detention Basin 54-A	Bangerter Highway Storm Drain Systems (to 5400 South Storm Drain System, Department and Taylorsville City)	See Discharge Location 54-1
5400 South	Detention Basin 54-B	Bangerter Highway Storm Drain Systems (to 5400 South Storm Drain System, Department and Taylorsville City)	See Discharge Location 54-1
5400 South	Detention Basin 54-C	5400 South Storm Drain System (Department and Taylorsville City)	See Discharge Location 54-1
5400 South	Storage Facility 54-D	Bangerter Highway Storm Drain System (to Kearns-Chesterfield Drain, Salt Lake County)	See Discharge Location 54-2
Build Alternative	Discharge Location 40-1	4015 West Storm Drain System (Salt Lake County)	Demonstrate no increase in peak discharge for the 10-year, 50-year, and 100-year events.
7000 South	Detention Basin 70-A	Gold Medal Drive Storm Drain System (West Jordan City)	1.6 cfs for 100-year, 24-hour event
9000 South	Discharge Location 90-1	Bingham Creek (West of Bangerter Highway) (Salt Lake County)	6.3 cfs for 100-year event[3]
9000 South	Discharge Location 90-2	Bingham Creek Culvert (Salt Lake County)	Demonstrate no increase in peak discharge for the 10-year, 50-year, and 100-year events.[4]
9000 South	Discharge Location 90-3	9000 South Storm Drain System	Demonstrate no increase in peak discharge for the 10-year, 50-year, and 100-year events.
9000 South	Detention Basin 90-A	3400 West Storm Drain System (South Jordan City)	Demonstrate no increase in peak discharge for the 10-year, 50-year, and 100-year, 24-hour events.
11400 South	Discharge Location 114-1	3600 West Storm Drain System (South Jordan City)	Demonstrate no increase in peak discharge for the 10-year, 50-year, and 100-year events.
11400 South	Detention Basin 114-A	Midas Creek (Salt Lake County)	Demonstrate no increase in peak discharge for the 10-year, 50-year, and 100-year, 24-hour events.
11400 South	Detention Basin 114-B	11800 South Storm Drain System (South Jordan City)	See Section 4D-9 for requirements.
11400 South	Detention Basin 114-C	Tippecanoe Way Storm Drain System (South Jordan City)	0.1 cfs per acre for 100-year, 24-hour event

1. Jurisdiction of receiving facility noted in parentheses except for Department-only storm drain systems.
2. See Section 4D-9 for additional requirements for to detention facilities. See Part 4-05 (Environmental Compliance) for permitting requirements.
3. Water quality treatment structure required.
4. Multiple storm drain pipes drain directly to the Bingham Creek Culvert. Utilize the sum of peak discharges to demonstrate no increase.

4D-6 Bridge Deck and Approach Slab Drainage

A. Design and construct deck drainage systems so that drainage does not encroach upon travel lanes during the design storm. Collect and convey stormwater to a nearby roadway storm drain system. Design deck drainage systems in accordance with Part 4-17 (Structures). Do not allow runoff from bridge decks to drain onto travel lanes, shoulders, sidewalk, or other features below the bridge.

B. Design the bridge deck drainage system to be compatible with the structural reinforcement, components, and aesthetics of the bridge.

C. Provide a minimum profile grade across bridge decks in accordance with Part 4-17 (Structures).

D. Position the deck drainage outfalls to avoid corrosion, runoff from falling or blowing onto bridge structural elements or, erosion of embankments, and splashing of moving traffic and sidewalk areas below the bridge deck. Daylight outlets above ground for maintenance access.

E. Design and construct downspouts with a minimum diameter of eight inches. Provide cleanouts for downspout systems at all bends and turns in the downspout system. Do not run the drain pipe inside of structural elements.

F. Where the pipe is located behind a retaining wall or slope protection, the pipe is to have seamless joints. Allow for movement at bridge joints (provide an acceptable joint) to maintain integrity and function when accommodating thermal bridge movements.

G. Intercept pavement drainage at both ends of roadway crossing structures to prevent runoff from crossing the bridge expansion joints. Use 0.1 cfs as the maximum allowable bypass flow across bridge expansion joints for the 10-year event.

4D-7 Drainage Ditches

A. The bottom of the roadside ditch is to be one foot minimum below the bottom of the granular borrow layer of the roadway pavement section or provide other measures to drain the pavement section.

B. Ditch side slopes are not to be steeper than 2:1.

C. Provide one foot or two velocity heads minimum freeboard for roadside ditches, whichever is larger.

D. Provide an appropriate channel liner when the velocity within the ditch exceeds the permissible shear stress; adhere to the requirements of 4D-13 (Erosion Control).

4D-8 Stormwater Quality

Treat all stormwater runoff generated from areas of pavement in accordance with the requirements of all applicable Project documents and permits, including the Department's UPDES Municipal Separate Storm Sewer System (MS4) Permit, the Project Environmental Documents, the Project 401 Water Quality Certification (if applicable)), and/or approved TMDLs (if applicable), and Third-Party agreements.

A. Post construction controls that will prevent or minimize water quality impacts are required. Water quality controls may include a combination of structural and/or non-structural controls. Document the effectiveness of the water quality controls selected.
   a. Structural controls: storm water detention, inlet and/or outlet protection, energy dissipaters and storm event flow attenuation.

b. Non-structural controls: maintaining pre-development flows, preserving natural drainage patterns, providing natural dispersion, grassed or vegetated swales and vegetated side-slopes.

4D-9 Detention Facilities

Design detention facilities to reduce peak flow discharge and to capture and retain sediments, oils, trash, and debris within the detention facility. Obtain approval on the location and layout for each detention facility. Detention basins in median or gore areas are not allowed. Adhere to the following minimum design requirements, unless specified otherwise in Table 4D-6.

A. Route stormwater flows along the bottom of the detention facilities and provide a pervious low-flow channel, four feet wide by six inches deep, except at Detention Basins 70-A, 90-A, 114-A, 114-B, and 114-C where flows are conveyed via pipe systems under and/or around the detention facilities. Provide a sloped pond bottom no flatter than 0.5% such that it drains toward the channel and/or outlet and maximizes potential to completely drain the pond.

B. Include a principal outlet and an emergency spillway.

C. Pond discharge via designed infiltration featured or systems is not allowed. Subsurface outlet systems are not allowed except at outlet structures to drain water below orifice invert elevations or at detention basins noted in the paragraph above.

D. Design the principal outlet to convey the 10-year and 100-year design storms without allowing flow to enter the emergency spillway. Design detention facilities to be self-draining within 48 hours after the end of the 10-year design storm.

E. Design the emergency spillway(s) according to the following:

1. The 100-year event is the minimum event to be used to size the detention basin and establish the elevation of the emergency spillway.
2. Assume detention facilities are empty prior to the 100-year event.
3. Consider the orifice(s) non-functional when designing the outlet structure except at Detention Basins 70-A, 90-A, 114-A, 114-B, and 114-C.
4. Provide a minimum of 1.0 foot of freeboard between the 100-year event water level and the lowest point in the facility's berm (excluding the emergency spillway).
5. Address the impact of emergency discharges to adjacent and downstream properties and structures.

F. Provide maintenance access into the detention facilities in accordance with Table 4D-6 (Storage Facilities).

1. Construct access using six inch thick compacted untreated base course. Prepare subgrade in accordance with Department standards.
2. Access grades are not to exceed 15% at any location.
3. Ensure that the location and design of each access does not impair or reduce the functionality of the overall drainage system.

G. Provide 6-ft Type 3 chain link fencing around detention facilities when 10-year design depths exceed three feet unless the area is within a fenced, limited access facility. Provide a maintenance access gate for those facilities that require fencing.

1. For unfenced facilities provide trash racks for pipes greater than 24-inch.

H. Retention and subsurface storage facilities are not permitted with the exception of Storage Facility 54-D.

I. Provide detention facility improvements as specified in Table 4D-6 (Storage Facilities).

TABLE 4D-6
STORAGE FACILITIES

Interchange	Detention Basin/Storage Facility ID and Location	Status	Improvements	Approval Required for Location Change[1]
5400 South	54-A (3687 West Whitewood Court)	Proposed Facility	Provide 12-foot access driveway along noise wall; full perimeter access not required. Provide compacted riprap on pond bottom.	No
5400 South	54-B (3695 West Alveron Drive)	Proposed Facility	Provide 12-foot access driveway along noise wall; full perimeter access not required. Provide compacted riprap on pond bottom.	No
5400 South	54-C (3765 West 5400 South)	Proposed Facility	Provide 12-foot access driveway along noise wall and curb; full perimeter access not required road. Provide compacted riprap on pond bottom.	No
5400 South	54-D	Proposed Storage Facility	Provide storage to meet allowable discharge requirements; see Table 4D-5, Discharge Location 54-2. Underground storage allowed outside pavement limits.	No
7000 South	70-A (Approx. 6700 South & Bangerter Hwy.)	Existing UDOT Facility	Re-grade facility to meet requirements specified in Section 4D-5. Reconstruct emergency spillway. Provide 12-foot perimeter access road on south, east, and north sides of facility. Provide access driveway to pond bottom.	Yes
9000 South	90-A (Approx. 9600 South & 3400 West)	Existing UDOT Facility	Re-grade facility to meet requirements specified in Section 4D-5. Provide emergency spillway. Provide 12-foot access road on east, north, and west sides. Provide turn-around on west side. Provide access driveway to pond bottom. Provide separate farmer access outside of perimeter fence.	Yes
11400 South	114-A (Approx. 12000 South, East of Bangerter Hwy.)	Existing UDOT Facility	No proposed improvements; direct stormwater runoff from Bangerter Highway sag to Detention Basin 114-B to reduce runoff directed to Detention Basin 114-A.	Yes
11400 South	114-B (South Jordan City 23-DET08 at 11800 South & 3600 West)	Existing South Jordan City Facility	Re-grade facility to provide 4.3 AF of additional storage volume with a minimum pond bottom slope of 0.7% and a minimum pond bottom elevation of 4579.5 feet. Grade to facilitate recreational use and replace landscaping in kind. Modify inlet and outlet structures and low flow piping system as required to restore system functionality. Obtain South Jordan City approval for proposed improvements in accordance with Part 4-07 (Landscaping and Aesthetics). No detention basin fencing required; protect existing east wall in place.	Yes
11400 South	114-C (Tippecanoe Way)	Proposed South Jordan City Facility	Provide new detention facility to detain stormwater runoff from Jordan Heights Phase 3. Obtain South Jordan City and Jordan Heights HOA approval in accordance with Part 4-07 (Landscaping and Aesthetics) for proposed improvements. Provide low flow channel or other as approved by City and Jordan Heights HOA. Replace detention basin landscaping in kind. Locate facility outside PUE. No detention basin fencing required.	Yes

[1]Changes to storage facility or detention basin locations require Department approval as indicated in the table.

4D-10 Cross Drainage

Cross drainage consists of pipe culverts or structures designed to convey off-site flows from one side of the roadway embankment to the other.

A. The maximum headwater elevation is to meet to following criteria:
   1. Below the bottom of the pavement section.
   2. No greater than 4 feet above the crown of the culvert.
   3. Below the elevation where flows diverts around the culvert.
   4. No flooding beyond the Department ROW, easement, or prescriptive right.
   5. No change in elevations established to delineate National Flood Insurance Program (NFIP) or other floodplain mapping.

B. The minimum pipe diameter is 24 inches.

C. All changes in horizontal and/or vertical alignment require junction boxes.

D. Provide a concrete apron on the upstream and downstream ends for culverts larger than 48 inches.

E. Increase the diameter of proposed cross drainage pipes by six inches when the embankment over the top of the pipe exceeds eight feet.

F. Analyze and design Bingham Creek cross drainage structure improvements using a 100-year peak discharge of 603 cfs. Replace culvert and provide a 75-year design service life; see Section 4D-3. Coordinate with the local floodplain administrator (West Jordan City) and Salt Lake County Flood Control. Provide a minimum culvert rise of 6 feet for maintenance purposes, and provide maintenance access. Prepare and obtain floodplain and flood control permits and comply with all floodplain requirements; see this Section 4D and Part 4-05 (Environmental Compliance). The Department will be the applicant for Salt Lake County flood control permits.

4D-11 Irrigation

A. Extend irrigation facilities from one side of the Department ROW to the other. Headwalls, wingwalls, and aprons are to be located within Department ROW or permanent easements. Install no access fencing to allow for third party maintenance access to irrigation facilities.

B. Coordinate any impacts to irrigation facilities with the owner of the facility. Maintain full functionality of irrigation systems from April 1 through October 31 each calendar year, unless otherwise approved by the facility owner in writing.

C. Relocate irrigation system downstream of Welby Canal Turnout 200, located near 4000 West, to maintain existing capacity and functionality for associated downstream water users. Obtain Welby Canal Company approval for turnout location and improvements. Obtain water user approval for downstream system improvements.

4D-12 Floodplains

A. Coordinate all impacts to FEMA-regulated floodplains and changes to bridges and culverts located in FEMA-regulated floodplains with the Department, FEMA, the local floodplain administrator, and Salt Lake County. Obtain all required stream alteration and floodplain-related permits and comply with the requirements of these permits and all applicable National Flood Insurance Program requirements.

B. As required by FEMA and/or local floodplain administrators, develop hydraulic models of the waterways and crossing structures to demonstrate hydraulic performance of new and existing structures.

C. Obtain approved Conditional Letters of Map Revision (CLOMR) and Letters of Map Revision (LOMR) as required by City and FEMA regulations. The Design-Builder bears all responsibility for the cost and time associated with obtaining new or revised CLOMRs and LOMRs, including submittal fees. The Design-Builder is responsible for preparation of all applicable permit applications, map revisions, and supporting documentation. The Department will be the applicant for all CLOMRs and LOMRs. Provide one hardcopy and one electronic copy of applications for CLOMRs and LOMRs to the Department, the appropriate floodplain administrator, and Salt Lake County.

4D-13 Groundwater

A. Provide an underdrain system to remove water from the pavement section when a free draining pavement section is not obtained or alternatively provide a modified pavement design.

1. Minimum pipe diameter is 12 inches.
2. Select geotextiles according to AASHTO M 288 and based on in-situ soil conditions.

B. Protect the flow quantity and quality of the wells and/or springs during and after construction.

C. Adhere to the standards of the Utah Division of Water Rights when abandoning a well is required.

4D-14 Erosion Control

Provide temporary and permanent erosion control measures that reduce sediment from being discharged from Department ROW in accordance with the requirements of all applicable Project documents and permits.

A. Size each erosion control measure using the same design storm event that was used for the discharging facility.

4D-15 Drainage Report

Prepare a Drainage Report following the outline shown in Table 4D-6 (Drainage Report Outline). Retain the existing section and subsection headings. If a section or subsection is not used, or is pending a future design submittal, indicate under the given section heading the reason why it is not included or not applicable to the Project. Provide new sections as necessary. Provide line numbering in all draft reports to facilitate review. Provide a page number for each report page including appendices.

TABLE 4D-7
DRAINAGE REPORT OUTLINE

1 INTRODUCTION
- 1.1 Project Location
- 1.2 Description of Existing Drainage Conditions
- 1.3 Description of Improvements
- 1.4 Concept Design
- 1.5 Discussion Of Drainage Investigation

2 OFF-SITE AREA DRAINAGE
- 2.1 Location And General Discussion
- 2.2 Hydrology And Design Flow Development
  - 2.2.1 Information Sources
- 2.3 Agency Coordination
- 2.4 Description of Structural Design
- 2.5 Hydraulic Design
- 2.6 Sediment and Erosion Control

3 ON-SITE AREA DRAINAGE
- 3.1 General Discussion
- 3.2 Design Coordination
  - 3.2.1 Department Coordination
  - 3.2.2 Local Agencies
  - 3.2.3 Irrigation Companies
- 3.3 Hydrology
  - 3.3.1 Drainage Basin Delineations & Characterization
  - 3.3.2 Existing Basins
  - 3.3.3 Proposed Basins
  - 3.3.4 Analysis and Results
- 3.4 Pavement, Median and Roadside Drainage
  - 3.4.1 Inlet/Catch Basin Spacing Design
  - 3.4.2 Storm Drainage Design
  - 3.4.3 Channel Design
  - 3.4.4 Erosion Control Design

4 DETENTION FACILITY DESIGN
- 4.1 Assumptions and Methodologies
  - 4.1.1 Allowable Release Rate Development
- 4.2 Hydrology and Hydraulics
  - 4.2.1 Storage and Outlet Design Documentation

5 WATER QUALITY FACILITY DESIGN
- 5.1 Assumptions and Methodologies
- 5.2 Hydrology and Hydraulics

APPENDICES

The organization of appendices is not prescribed, but is subject to Department review. Appendices shall include or address the following as applicable.

A – Precipitation Data

TABLE 4D-7 **DRAINAGE REPORT OUTLINE**
B – Off-site Drainage Basin Maps
C – Pre-Project On-site Shed Maps
D – Proposed On-site Shed Maps
E – Drainage Plans
F – On-site Drainage Conveyance Hydraulic Calculations and Information
G – Off-site Drainage Conveyance Hydraulic Calculations and Information
H – Detention Facility Calculations and Information
I – Water Quality Calculations and Information
J – Erosion Control Calculations and Information
K – Pipe and Structure Inspection and Assessment Documentation
L – Correspondence and Agency Coordination
M – Design Exceptions
N – Miscellaneous Design Information
O – Operations and Maintenance

Submit the Drainage Report according to the schedule in Table 4D-8 (Drainage Report Submittal Schedule). Each Drainage Report submittal will build on the previous Report submittal.

TABLE 4D-8
DRAINAGE REPORT SUBMITTAL SCHEDULE

Submittal	Report Status	Minimum Content
Initial Milestone Design Review	Draft	As described in Initial milestone design review in this Section
Intermediate Milestone Design Review	Draft	As described in Intermediate milestone design review in this Section
Released for Construction	Final	As described in this Section
As-Built	As-built condition	As described in this Section

4D-16 Design Milestone Reviews

Initial design milestone review. The purpose of this review is to provide the Department an opportunity to identify any significant issues with the Design-Builder's approach to drainage for the Project. At a minimum, provide the following in the initial milestone review:

A. Drainage Plan:

1. Show the ownership, location, size, type, and material of all existing Utilities (including all storm drain and irrigation facilities) located within Project Limits.
2. Provide a plan for drainage from the on-site and off-site areas that demonstrates the Design-Builder's understanding of the existing flow patterns and existing flow rates.
3. Provide a drainage plan that demonstrates how the Design-Builder intends to meet the drainage performance requirements of this Part 4-04 (Drainage). Include the following minimum plan content:

    a. Locations and approximate sizes of proposed pipes, culverts, and end sections
    b. Locations of proposed inlets and catch basins
    c. Locations and approximate sizes of proposed ditches

d. Locations and approximate volumes and surface areas of proposed detention facilities
e. Locations of other proposed drainage elements such as curb and gutter, and end sections
f. Provide an ID for each proposed drainage element for ease of reference.

B. Drainage Report:

1. Document the software utilized for drainage design and analysis.
2. Generally describe existing and proposed drainage patterns and discharge points.
3. Provide watershed delineation figures for drainage from both the on-site and the off-site areas.
4. Demonstrate that hydroplaning requirements are met.
5. Outline the proposed methods, approaches, assumptions, and criteria used in the drainage design, and discuss how the proposed drainage system will meet the performance criteria outlined herein.
6. Show preliminary detention facility locations.
7. Present a general discussion on how roadway drainage spread requirements are met by the design.
8. Provide preliminary discussion regarding water quality. Discuss the proposed approach to water quality measures while identifying proposed BMPs to be implemented in the drainage design.
9. Discuss the proposed approach to erosion control. Describe the methods to be used for evaluating the effectiveness of the proposed erosion controls.
10. Provide preliminary calculations, including hand calculations, spreadsheets, and models for the drainage features outlined above. Where software models are utilized for analysis, provide model input data and assumptions with the corresponding model output. Provide the software models in their native format.
11. Include drainage sheets from design plans as an appendix.

Intermediate design milestone review. The purpose of this review is to provide sufficient drainage design detail and calculations for the Department to verify that the Contract performance specifications and requirements are achievable prior to finalization of the drainage design. At a minimum, provide the following in the intermediate milestone review:

C. Drainage Plans:

1. Update all the information required for the initial milestone design review submission based on refinement of the drainage design and/or changes to the general approach to drainage.
2. Provide preliminary plan and profile sheets for storm drain systems and culverts that show at a minimum:
   a. Stations and offsets.
   b. Approximate finished grades.
   c. Rim elevations, invert elevations, pipe diameters, pipe material, pipe lengths, pipe slopes, existing or proposed utility crossings, and HGLs.
   d. Structure size and material.
3. Show the locations and sizes of proposed water quality BMPs.
4. Identify standard drawings required for each applicable drainage item.
5. Identify all detention basin outlets, discharge locations, and the associated design events and discharges. Identify receiving facilities.
6. Provide preliminary construction details for special items such as:

a. Detention basins
b. Water quality BMPs
c. Drainage structures
d. Riprap or other outfall protection
e. Erosion control treatments
f. Utility conflicts resolution (relocations, removals, etc.)

D. Drainage Report

1. Update all the information required for the initial milestone design review submission based on refinement of the drainage design and/or changes to the general approach to drainage.
2. Provide documentation and discussion of the assessment of existing drainage facilities. Describe the approach for rehabilitation and replacement of facilities and document that the approach will meet all contract requirements.
3. Discuss the basis for the selection of material for pipes, culverts, and other drainage appurtenances.
4. Hydraulic data tables for each pipe, culvert, structure, etc.
5. Provide calculations and narrative to demonstrate that the proposed erosion control treatments satisfy the requirements herein.
6. Provide detailed calculations for all drainage features. Include hand calculations, spreadsheets, and models. Where software models are utilized for analysis, provide model input data and assumptions with the corresponding model output in both hard copy and PDF formats. Provide the software models in their native format.
7. Document and discuss all drainage coordination efforts with all applicable agencies. Include documentation of applicable correspondence, meeting minutes, emails, etc.
8. Include drainage sheets from design plans as an appendix.

4D-17 Final Design Milestone Review

4D-17.1 Final Design Milestone Review Drainage Plans

Include the following in the Final Design Milestone Review drainage plans:

A. The location, material type, and size of pipes, culverts, catch basins, inlets, manholes and cleanout boxes, riprap, and all other drainage and water quality facilities.

B. Profiles of all culverts, pipes, laterals, trunk lines, and other elements, showing all invert elevations, pipe slopes, pipe sizes, proposed finished grade elevations above top of pipe, and the calculated HGL for the design event.

C. Hydraulic data information for large culverts and bridges.

D. Drainage details, grading information, and construction and installation requirements.

E. Existing Utilities and any Utility conflicts with drainage elements, along with relocations, removals, etc.

F. Show how proposed drainage design interacts physically and hydraulically with existing drainage facilities.

4D-17.2 Drainage Report – Final Design

A. The final design Drainage Report submitted with the Final Design Milestone Review Documents are to contain basic design data, design assumptions, hydrologic and hydraulic methodologies, assumptions, model inputs and outputs, detailed calculations, computations, and computer printouts, as well as the rationale for sizing

and selecting all drainage elements, including catch basins, storm drain systems, culverts, ditches, swales, detention facilities, and BMPs. Include materials selection documentation. Provide hydraulic data sheets with a summary of hydraulic design information for each pipe and culvert.

B. Provide in the report a delineation of the contributing pre- and post-Project drainage basins, existing drainage patterns for both highway and cross-drainage flows, design parameters, inflow hydrographs (graphical and tabular format) for detention basins, detention basin sizing, discharge characteristics, discharge hydrographs (graphical and tabular format) for detention basins, detention times, and other information necessary for the design of the drainage systems.

C. Demonstrate that the general drainage plan and each individual element will control and treat the proposed stormwater runoff in accordance with the drainage design, the performance requirements herein, and all applicable permits. Demonstrate an understanding of existing drainage discharge rates and outfall locations, and document the development of detention basin release rates. Document how proposed drainage designs will interact with existing drainage facilities. Include drainage sheets from the Final Design Milestone Review design plans as an appendix.

D. A Professional Engineer licensed in the State of Utah is to prepare, stamp, and sign the final design drainage report. Submit five hard copies of the drainage report and one electronic copy in PDF format. Include with each report electronic copies of all analysis including hand calculations, spreadsheets and models. For models, provide input and output files in their native file format.

4D-18 As-Built Documents

A. Provide tables on the As-Built Document plan sheets that summarize the following for each drainage pipe and culvert: pipe/culvert ID, size, slope, roughness coefficient, capacity, velocity, contributing drainage area, and design flow.

B. Plot final hydraulic grade lines and surveyed elevations on pipe profile sheets.

C. Update the final design drainage report to reflect as-built conditions, and submit an as-built drainage report.

4D-19 Operation and Maintenance Manual

Before system startup, provide detailed operations and maintenance information in an appendix of the final as-built drainage report. In the appendix, address (at a minimum) maintenance of drainage facilities, detention facilities, and erosion control, and include Plans of the basins and piping systems.

4E. SUBMITTALS

Provide submittals to the Department in accordance with Table 4E-1 (Design-Builder Submittals for Drainage Systems).

TABLE 4E-1
DESIGN-BUILDER SUBMITTALS FOR DRAINAGE SYSTEMS

Submittal	***For Approval***	***Schedule***
Storm Water Pollution Prevention Plan (SWPPP)	No	Prior to construction
Drainage Reports	No	As described in Table 4D-7 (Drainage Report Submittal Schedule)
Detention Facility Fencing Plan	No	Prior to construction
Water Quality Treatment Design	No	Prior to construction

5—ENVIRONMENTAL COMPLIANCE

5A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 5 (Environmental Compliance) and satisfy all functional needs of the Project, including environmental mitigation, monitoring and reporting, and protection, while complying with all applicable Environmental Laws and Governmental Approvals.

5B. STANDARDS

Complete Work for Environmental Compliance in accordance with the requirements of the standards listed by priority in Table 5B-1 (Standards for Environmental Compliance).

If there is any conflict in standards, adhere to the standard with the most stringent requirements.

TABLE 5B-1
STANDARDS FOR ENVIRONMENTAL COMPLIANCE

Priority	***Author or Agency***	***Title***
1	UDOT	Environmental Documentation for the Project State Environmental Studies; 5400 South, 7000 South, 9000 South, 11400 South
2	Various	Various permits and agreements (including the Utah Pollutant Discharge Elimination System (UPDES) Construction Permit, Municipal Separate Storm Sewer System (MS4) Permit, and all other permits issued by State and federal agencies)
3	UDOT	Special Provisions included in Part 5
4	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction*, as modified by Part 5
5	UDOT	*2012 Standard Specifications for Road and Bridge Construction*, as modified by Part 5
6	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
7	UDOT	*2012 Standard Drawings for Road and Bridge Construction*
8	UDOT	*Environmental Manual of Instruction*
9	UDOT	*Manual of Instruction – Roadway Drainage*
10	AASHTO	*Construction and Stormwater Field Guide*
11	UDOT	*Geotechnical Manual of Instruction*

5C. REQUIREMENTS

Comply with environmental commitments associated with Environmental Laws; the Project Environmental Document(s); and all Governmental Approvals and new Environmental Documents applicable to and required for the Project. Incorporate all environmental commitments into the Environmental Protection Program (EPP). A summary of known environmental mitigation commitments is contained in the Environmental Document(s) identified in Table 5B-1(Standards for Environmental Compliance) and summarized in the Design-Builder's Environmental Compliance Commitment Summary Table found in Attachment 5-A.

5C-1 Environmental Protection Program (EPP)

Develop, implement, and maintain an Environmental Protection Program (EPP) that incorporates all the provisions identified by this Section 4-05 (Environmental Compliance) to establish the environmental requirements, approach, and procedures to be employed to protect the environment from Project impacts. Structure and develop the EPP to satisfy applicable Environmental Laws; UDOT Standard Specifications and design standards; requirements of Governmental Approvals; and commitments included in the Environmental Documents completed for the Project.

The EPP shall:

A. Establish and implement environmental compliance measures that are consistent with the Environmental Documents and Governmental Approvals (as applicable) and with the environmental commitments for the Project in accordance with Attachment 5-A (Environmental Commitments Table).

B. Implement and document an Environmental Protection Training Plan (EPTP) as described later in Section 5C-2 (Environmental Protection Training Plan) to provide awareness and training for all personnel who will be working on the Project.

C. Demonstrate how the Design-Builder will implement a "zero environmental violation" tolerance on all Project activities.

D. Develop and include the Design-Builder's Environmental Compliance Monitoring and Reporting Plan (ECMP) as described in 5C-4.

E. Designate two Environmental Control Supervisors (ECSs), one for 5400 South and 7000 South and one for 9000 South and 11400 South. The ECSs shall be committed to the Project throughout its duration; be responsible for implementing the EPP; be the Design-Builder's single contact point for all environmental issues; and be ECS-certified by the Department. ECS Certification is available online through the Department's website. The ECSs shall also have a minimum of two years of experience serving as an ECS on a highway project similar in size and scope as the Project, including managing environmental monitoring for highway construction projects with similar complexities, permitting requirements, and clearances as the Project. Submit the qualifications of the proposed ECSs to the Department for Approval.

F. Include a reporting contact tree which lists Design-Builder personnel and contact information, and indicates the level and order in which to contact personnel regarding Environmental Compliance on the Project.

Discuss sensitive environmental areas prior to the start of construction at the pre-construction meeting.

Cooperate with the Department, and provide documentation to verify compliance with Environmental Laws, Governmental Approvals, and Environmental Documents.

5C-2 Environmental Protection Training Plan

Develop and implement a Project-specific Environmental Protection Training Plan (EPTP) that meets the requirements of all Environmental Laws, Governmental Approvals, and Environmental Documents and complies with the provisions of this Section 4-05 (Environmental Compliance). The EPTP objective is to provide a program of Design-Builder employee training adequate to fully comply with applicable Environmental Laws, Governmental Approvals, and Environmental Documents. Include all non-administrative Project workers in the EPTP training sessions. Provide documentation that all Project workers have completed the sessions. Repeat training as often as necessary to stay current with the Project. Document any changes implemented by the Design-Builder. Include activities for the implementation of the EPTP in the Project Schedule.

Structure the detail, length, and frequency of training sessions to achieve the EPTP objective of full environmental compliance on the Project.

Design the EPTP training to communicate, at a minimum, the following:

A. The importance of environmental issues to constructing, operating, and maintaining a successful Project.
B. The Department's and the Design-Builder's commitment to the Project's environmental quality.
C. The Environmental Laws that affect and/or govern the Project, the Governmental Bodies with the authority to administer those Environmental Laws, and construction activities for which Governmental Approvals must be obtained.
D. Environmental commitments at the Project level.
E. Worker responsibilities.
F. BMPs for compliance with Environmental Laws, Governmental Approvals, and/or Environmental Documents.
G. Identification of BMPs and protection measures installed throughout the Project, their meaning, and requirements to avoid water resources.
H. Required mitigation measures for environmental impacts.
I. Procedures and precautions in the event of spills, or the discovery, of Hazardous Substances or unknown chemicals or contamination that are potentially Hazardous Substances.
J. Procedures and precautions in the event that human skeletal remains or other historical, archaeological, or paleontological resources are discovered.
K. Penalties and/or fines for violations of and noncompliance with Governmental Approvals and Environmental Laws.

5C-3 Additional Permits

5C-3.1 Governmental Permits

Obtain all Governmental permits required in addition to the Department-provided permits. Coordinate preparation of all Governmental permits with the Department. All communications with applicable regulatory agencies will be coordinated directly with the Department. E-mail the Department Environmental Coordinator a minimum of five Working Days in advance of any meeting with regulatory or governmental entities. Meetings shall not be held when Department personnel are not present.

Table 5C-1 (Summary of Governmental Permits for Environmental Concerns) identifies the known Governmental Permits for environmental concerns that are needed for the Project. The Design-Builder is responsible for researching and obtaining any other Governmental Permits not included in this list and responsible to implement any required mitigation identified in Governmental Permits.

TABLE 5C-1
SUMMARY OF GOVERNMENTAL PERMITS FOR ENVIRONMENTAL CONCERNS

Permit	*Agency or Governmental Entity with Jurisdiction*	*Status*
UPDES Construction General Permit for Construction Activities	UDEQ/DWQ	Design-Builder to obtain
UPDES Construction Dewatering and Hydrostatic Testing	UDEQ/DWQ	Design-Builder to obtain
Fugitive Dust Emission Control Plan	UDEQ/DAQ	Design-Builder to obtain
Stream Alteration Permit at Bingham Creek	UDNR/DWR	Design-Builder to obtain
Clean Water Act Nationwide Permit at Bingham Creek	USACE	Department to obtain
Flood Control Permits	Salt Lake County	Design-Builder to obtain
Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR)	City of West Jordan (Local Floodplain Administrator) and FEMA	Design-Builder to obtain[2]
Phase I and Phase II Environmental Assessment at Bingham Creek Approval	UDEQ/DERR	Department to obtain
Noise Permit	Salt Lake County	Design-Builder to obtain

1. The Department is to be listed as the applicant for Department discharges to County facilities and for the Bingham Creek culvert. The applicable city is to be listed as the applicant for flood control permits associated with municipal discharges to County facilities.
2. See Section 4-04 (Drainage).

5C-3.2 Department Approval

Submit each Governmental permit application with supporting documentation to the Department for review. The Department will review the application and respond within 14 Calendar Days with either approval or disapproval. If the application is not approved, revise it in accordance with the Department's comments and resubmit. After the Department has approved and (if required) signed an application and returned it to the Design-Builder, submit the completed application to the appropriate Governmental Body.

5C-3.3 Documentation

Provide the Department with copies of all environmental submittals, correspondence, and secured Governmental Permits within seven Calendar Days of occurrence, and maintain records of said materials.

5C-3.4 Design-Builder Initiated Changes

If previously issued Environmental Documents or Governmental Permits become invalid because of Project changes initiated by the Design-Builder, undertake all necessary actions (such as applications, revisions, supplements, reassessments, reevaluations, and coordination with the appropriate Governmental Bodies) to secure and/or amend the Environmental Documents and/or Governmental Permits. E-mail the Department Environmental Coordinator a minimum of seven Calendar Days in advance of any meeting with Governmental Bodies. Meetings shall not be held when Department personnel are not present. Any proposed changes must be approved by the Department prior to any contact with Governmental Bodies.

In all cases, it shall be assumed that Environmental Documents and/or Governmental Permits are invalidated if there is any change in the Project.

Obtain and provide to the Department all necessary Governmental Permits when adding or selecting any ground- or resource-disturbing features (including materials such as gravel, borrow, or waste sites, equipment staging sites, office sites, water lines, and holding ponds).

5C-3.5 Coordination by Department

In cases that require the Department personnel to coordinate directly with Governmental Bodies, provide necessary support regarding Project design and potential environmental impacts in the form of personnel and/or data to assist in securing Governmental Permits.

5C-4 Environmental Compliance Monitoring and Reporting

Develop, implement, and maintain an Environmental Compliance Monitoring and Reporting Plan (ECMP) that details the strategies and procedures to be employed to fully comply with applicable Environmental Laws, Government Permits, and Environmental Documents. Include strategies and procedures for complying with provisions of UDOT Standards and the requirements of the AASHTO Construction and Stormwater Field Guide.

Document the Project's environmental requirements and mitigation commitments, and establish the schedules, protocols, approaches, and methodologies to achieve compliance. The ECMP shall include a plan for monitoring commitments made in the Environmental Documents, monitoring as required to comply with Governmental Permits, and monitoring the effectiveness of the BMP implementation.

5C-4.1 Environmental Monitoring Report

Provide an Environmental Monitoring Report (EMR) on a monthly basis that documents Environmental Compliance. EMRs shall be organized into a single document for each reporting period, organized by resource type. This report may discuss general erosion and sediment controls, but is separate from the required SWPPP inspection reports.

For each resource, include the following information:

A. Location of the area monitored (map, with stationing, addresses, or other reference)
B. Name of inspector or monitor
C. Date(s) monitoring occurred
D. Weather conditions
E. Observations/conditions (typical details are listed below)
F. Resolution of any and all violations or other problems encountered

Conditions to be reported shall include, at a minimum, the following:

G. Air and water quality standards compliance
H. Any and all violations of applicable Governmental Approvals, Environmental Laws, or commitments in the Environmental Documents
I. Status of all Work in streams
J. Any and all spills, either by third-parties or Design-Builder
K. Discharge of groundwater
L. Discovery of migratory bird nest or raptor nest, whether active or not
M. Discovery of any sick, dead, or injured migratory or raptor bird
N. Discovery of potentially historic artifacts, human bones or remains, or non-human bones
O. Agency field oversight, inspection, and coordination
P. Status of impacts to cultural resources
Q. Detection of Hazardous Substances and status of any Remediation Work

5C-4.2 Incident Reporting

Document and notify the Department of every violation of Environmental Law and/or Governmental Permit either electronically or verbally within 12 hours of occurrence. If a violation poses imminent danger to human health or the environment, immediately report to the Department and any other responsible Governmental Agency, and direct the Remediation Work to begin. The actual violation report need not be included in said notification, but should be readily available to the Department and any Governmental Body with jurisdiction. A violation of Environmental Law and/or Governmental Permit is considered a breach of an environmental requirement, regardless of whether a notice of violation has been delivered to the Design-Builder.

Stop work as required to eliminate, prevent, or mitigate violations or noncompliance with Environmental Laws and/or Governmental Permits. This work stoppage shall be limited to the immediate vicinity or area affected by the event. Notify the Department immediately of the event.

5C-4.3 Stormwater

Complete and maintain an individual Storm Water Pollution Prevention Plan (SWPPP) for each of the four interchanges using the Department's SWPPP template. Conduct SWPPP inspections in accordance to Standard Specification 01571. Provide inspection documentation using the Department's SWPPP Inspection Form and keep on site within each SWPPP.

5C-5 Hazardous Substances

5C-5.1 Construction Requirements

For construction activities at and around Bingham Creek, follow all conditions and procedures described in the Phase I and Phase II Environmental Site Assessment/Utah DERR remediation plan provided in Part 8 (Engineering Data).

Fuels, lubricants, cleaners, solvents, or other Hazardous Substances shall not contact the ground, be exposed to stormwater, or be released to any surface water body or to groundwater, except in *de minimus* quantities consistent with good construction business practices. Perform maintenance of vehicles and equipment in designated areas designed to contain incidental spills of hydraulic or other fluids.

Provide secondary containment for all bulk storage tanks or drums. Secondary containment shall be of adequate size to contain the entire contents of the tank plus sufficient freeboard to allow for precipitation. All secondary containments shall be constructed of impermeable materials to prevent infiltration of spilled or leaked tank contents into the ground.

In the event of the discovery and subsequent disturbance of any materials containing lead-based paint, lead, asbestos, and/or polychlorinated biphenyls, dispose of all such materials appropriately. Prepare a remediation report documenting all remedial activities and regulatory approvals. Obtain a site-specific No Further Action Letter, as required by Utah Department of Environmental Quality (UDEQ), within three weeks of completion of any site remediation report.

5C-5.2 Spills

A leak, spill, or other release meeting any of the following measures is a hazardous spill and requires an Emergency Spill Notification:

A. 2.2 pounds or more of "acutely hazardous waste" (see products Material Safety Data Sheet (MSDS)), or
B. 220 pounds or more of other hazardous waste, or
C. 25 gallons or more of fuel or oil are spilled or cause oil sheen to form on a water surface.

5C-5.3 Emergency Spill Notification Procedures

Perform the following actions if the spill presents a potential for harm to personnel, public, or the environment, or the Design-Builder is not able to immediately control and clean-up the spill, and/or the spill exceeds the reportable quantity (see Section 5C-5.2):

A. Notify the Department and the Region 2 Safety Risk Manager (Dottie Weese) to determine if the quantity or severity of the spill warrants outside assistance by emergency services (this is to ascertain the toxicity, size of spill, and if the spill could discharge to a surface water or a sewer/storm drain line).
B. If the spill is clearly an emergency hazardous spill condition, the Department or the Department Region Safety Risk Manager will notify the UDEQ and the National Response Center.
C. Submit an incident report within 24 hours to the Department and include in the next EMR. The Department Region Safety Risk Manager will review the report, and if necessary, hold a post incident meeting with the Design-Builder.
D. Use a State Certified Hazardous Materials Lab when necessary to identify an unknown spill material.

The Design-Builder is responsible for all required hazardous waste management, which includes, but is not limited to, the transportation, storage, and disposal at a hazardous waste disposal facility.

5C-5.4 Waste Disposal and Minor Spills

A minor spill is a condition that:

i) Does not present potential harm to personnel and/or the environment,

ii) Design-Builder has the ability to immediately control and clean-up the spill, and

iii) The spill does not meet the spill parameters in Section 5C-5.2. Perform the following actions to control non-emergency spills:

A. Immediately notify the Department for verification that condition is a non-reportable minor spill.
B. Begin spill clean-up immediately and use trained personnel to respond to critical events involving spills.
C. Use contingency clean up products and equipment to handle non-emergency spills (absorbent materials, personal protection equipment, compatible empty container to store spilled material, fire extinguisher, etc.)
D. Contain spilled liquids or solids in a compatible container and store on-site until proper disposal action is taken as required by state and federal requirements. Fill out a hazardous waste label and establish an accumulation date where a spill occurs or when hazardous wastes are generated.
E. Submit a spill report to the Department explaining the spill quantity and method of disposal, including a Hazardous Waste Disposal Manifest if applicable.

In the event that a Hazardous Substance spill is caused by the Design-Builder's equipment, operations, or Work, the Design-Builder shall be responsible for Remediation Work, mitigation of the hazard, and costs incurred by the Department, the UDEQ, and other Governmental Bodies in connection with said activities.

5C-6 Air Quality

5C-6.1 Air Quality Permits

Obtain any Governmental Permits regarding air quality for the Project.

Contact the Utah Division of Air Quality (DAQ) and obtain the appropriate Air Quality Permit for the Project. Permit application forms can be obtained from DAQ's web site (http://www.deq.utah.gov/Permits/air/index.htm). Refer to:

Utah Division of Air Quality
150 North 1950 West
PO Box 144820
Salt Lake City, UT 84114-4810
Phone: (801) 536-4000; Fax: (801) 536-4099

Do not proceed with Work affecting air quality without an Air Quality Approval Order, a Notice of Intent To Approve letter, or a Temporary Approval Order for the Project, process, or equipment to be used.

5C-6.2 Air Protection Control Plan

Develop, implement, and maintain a Fugitive Dust Emission Control Plan in accordance with the Permit requirements set forth by DAQ.

5C-7 Wetlands, Water Resources and Stormwater

5C-7.1 Wetlands, Waters of the US, and Floodplains

The Department has identified that the Project may impact potentially jurisdictional wetlands and the 100-year floodplain associated with Bingham Creek at the 9000 South interchange. The Department will obtain the Nationwide 3 Permit. Obtain other applicable permits including the Stream Alteration Permit and Flood Control Permit. Obtain approved Conditional Letters of Map Revision (CLOMR) and Letters of Map Revision (LOMR) as required by City and FEMA regulations; see Section 4-04 (Drainage). Comply with all conditions of the permits during construction and ensure the permits have been obtained prior to any construction activities.

5C- 7.2 Stormwater and Ground water

Following the Department's approval of each interchange's individual SWPPP, and prior to any construction activities, submit an individual Notice of Intent (NOI) for each interchange and comply with the UPDES Construction General Permit.

Prior to discharge of groundwater, obtain a UPDES Construction Dewatering Permit.

5C-7.3 USBOR Aqueduct

Follow all conditions specified in the Project Agreements in Part 6 (Third-Party Agreements) with the Bureau of Reclamation and Jordan Valley Water Conservancy District.

5C-8 Noise

Control construction noise and vibration in accordance with Standard Specification 01355. Comply with applicable state and local municipal ordinances and obtain local municipality approvals. Obtain a noise permit and a variance to the Noise Ordinance for night work. There is no guarantee that a variance will be issued. Contact James Bennett Salt Lake County Health Department 385-468-3793 for allowable times for operations.

Modifications to the noise walls shown in Part 7 (Contract Drawings) require approval to ensure abatement measures meet the requirements found in Department's current Noise Abetment Policy 08A2-01.

5D. SUBMITTALS

Provide submittals to the Department in accordance with Table 5D-1 (Design-Builder Submittals for Environmental Compliance).

TABLE 5D-1
DESIGN-BUILDER SUBMITTALS FOR ENVIRONMENTAL COMPLIANCE

Submittal	***For Approval***	***Schedule***
Environmental Protection Plan (EPP)	Yes	14 Calendar Day review
Environmental Protection Training Plan (EPTP), (as part of the EPP)	Yes	Prior to start of construction
Four individual Storm Water Pollution Prevention Plans (SWPPPs)	Yes	Prior to start of construction
Environmental Compliance Monitoring and Reporting Plan (ECMP) (as part of the EPP)	Yes	Prior to start of construction
ECS Key Personnel (as part of the EPP)	Yes	Prior to start of construction
Reporting Contact Tree (as part of the EPP)	Yes	Prior to start of construction
Fugitive Dust Emission Control Plan	No	Prior to start of construction
Environmental Monitoring Report (EMR)	No	Monthly
Copies of all permits and environmental approvals	No	Prior to the start of construction

Attachment 5-A: Environmental Commitments Table

DESIGN-BUILDER ENVIRONMENTAL COMPLIANCE COMMITMENT SUMMARY TABLE

Subject	*Source*	*Commitment*	*Implementation Period(s)*
5400 South			
Air Quality	5400 South SES – Page 16	Follow requirements listed in UDOT Standard Specification 01572, Dust Control and Watering and UDOT Standard Specification 01355, Section 3.5, Fugitive Dust.	Construction
Cultural	5400 South SES – Page 16	Follow UDOT Standard Specification 01355, Parts 3.7 and 3.8.	Construction
Hazardous Waste	5400 South SES – Page 16	Follow UDOT Standard Specification 01355, Parts 3.1 and 3.2.	Construction
Invasive Species	5400 South SES – Page 16	Follow UDOT Supplemental Specification 02924S, Invasive Weed Control	Construction
Water Quality	5400 South SES – Page 16	Prepare, implement, and maintain a Stormwater Pollution Prevention Plan (SWPPP) in accordance with UPDES Permit No. UTRC0000 throughout construction of the Project.	Prior to and during Construction
USBOR Aqueduct	USBOR/JVWCD Project Agreement	Follow all processes and conditions described in Project Agreement between UDOT, Bureau of Reclamation, and Jordan Valley Water Conservancy District.	Construction
Noise	5400 South SES – Page 16 UDOT Noise Abatement Policy 08A2-01 (Feb 2014)	Follow requirements listed in UDOT Standard Specification 01355, Section 3.6, Noise Control. The Design-Builder will install or replace noise abatement measures, as specified by the Department. The location and height of noise abatement measures described in the Final State Environmental Study and Noise Evaluation could change based on any changes to the final design and receptors. Changes to the final design and receptors will be evaluated by the Department prior to making a final determination on the location and height of the noise abatement measures. The final determination on noise wall height and location will also depend on the approval by a sufficient number of affected residents/property owners as defined in the UDOT Noise Abatement Policy (08A2-01, Feb. 2014).	Construction
Demolitions		In accordance with Department Standard Specifications and local jurisdictions.	Construction
7000 South			
Air Quality	7000 South SES – Page 13	Follow requirements listed in UDOT Standard Specification 01572, Dust Control and Watering and UDOT Standard Specification 01355, Section 3.5, Fugitive Dust.	Construction
Cultural	7000 South SES – Page 13	Follow UDOT Standard Specification 01355, Parts 3.7 and 3.8	Construction
Hazardous Waste	7000 South SES – Page 13	Follow UDOT Standard Specification 01355, Parts 3.1	Construction
Invasive Species	7000 South SES – Page 13	Follow UDOT Supplemental Specification 02924S, Invasive Weed Control	Construction
Water Quality	7000 South SES – Page 13	Prepare, implement, and maintain a Stormwater Pollution Prevention Plan (SWPPP) in accordance with UPDES Permit No. UTRC0000 throughout construction of the Project.	Prior to and during Construction
Noise	UDOT Standard Specification 01355	Follow requirements listed in UDOT Standard Specification 01355, Section 3.6, Noise Control. The Design-Builder will install or replace noise abatement measures,	Construction

Subject	*Source*	*Commitment*	*Implementation Period(s)*
	UDOT Noise Abatement Policy 08A2-01 (Feb 2014)	as specified by the Department. The location and height of noise abatement measures described in the Final State Environmental Study and Noise Evaluation could change based on any changes to the final design and receptors. Changes to the final design and receptors will be evaluated by the Department prior to making a final determination on the location and height of the noise abatement measures. The final determination on noise wall height and location will also depend on the approval by a sufficient number of affected residents/property owners as defined in the UDOT Noise Abatement Policy (08A2-01, Feb. 2014).	
USBOR Aqueduct	USBOR/JVWCD Project Agreement	Follow all processes and conditions described in Project Agreement between UDOT, Bureau of Reclamation, and Jordan Valley Water Conservancy District.	Construction
Pedestrians	7000 South SES – page 13	In accordance with Part 4.	Construction
Demolitions		In accordance with Department Standard Specifications and local jurisdictions.	Construction
9000 South			
Air Quality	9000 South SES – Page 14	Follow requirements listed in UDOT Standard Specification 01572, Dust Control and Watering and UDOT Standard Specification 01355, Section 3.5, Fugitive Dust.	Construction
Cultural	9000 South SES – Page 14	Follow UDOT Standard Specification 01355, Parts 3.7 and 3.8	Construction
Hazardous Waste	9000 South SES – Page 14	Follow UDOT Standard Specification 01355, Parts 3.1 In accordance with the Phase I and Phase II in Part 8 (Engineering Data)	Construction
Invasive Species	9000 South SES – Page 14	Follow UDOT Supplemental Specification 02924S, Invasive Weed Control	Construction
Water Quality	9000 South SES – Page 14	Prepare, implement, and maintain a Stormwater Pollution Prevention Plan (SWPPP) in accordance with UPDES Permit No. UTRC0000 throughout construction of the Project.	Prior to and during Construction
Noise	UDOT Standard Specification 01355 UDOT Noise Abatement Policy 08A2-01 (Feb 2014)	Follow requirements listed in UDOT Standard Specification 01355, Section 3.6, Noise Control. The Design-Builder will install or replace noise abatement measures, as specified by the Department. The location and height of noise abatement measures described in the Final State Environmental Study and Noise Evaluation could change based on any changes to the final design and receptors. Changes to the final design and receptors will be evaluated by the Department prior to making a final determination on the location and height of the noise abatement measures. The final determination on noise wall height and location will also depend on the approval by a sufficient number of affected residents/property owners as defined in the UDOT Noise Abatement Policy (08A2-01, Feb. 2014).	Construction
USBOR Aqueduct	USBOR/JVWCD Project Agreement	Follow all processes and conditions described in Project Agreement between UDOT, Bureau of Reclamation, and Jordan Valley Water Conservancy District.	Construction
Wetlands and Waters of the U.S.	Permit	Conform to all general and special conditions of the nationwide permit for impacts to Bingham Creek. Obtain stream alteration permit and follow all conditions.	Construction
Floodplains		Obtain approved Conditional Letter of Map Revision (CLOMR) as	Prior to

Subject	*Source*	*Commitment*	*Implementation Period(s)*
		required by City and FEMA regulations for modifications to Bingham Creek floodplain.	Construction (of Bingham Creek Culvert)
Floodplains	Permit	Obtain flood control permits and follow all terms and conditions.	Construction
Floodplains		Obtain approved Letter of Map Revision for modifications to Bingham Creek floodplain.	Post-Construction (submit within 6 months)
Demolitions		In accordance with Department Standard Specifications and local jurisdictions.	Construction
114000 South			
Air Quality	11400 South SES – Page 13	Follow requirements listed in UDOT Standard Specification 01572, Dust Control and Watering and UDOT Standard Specification 01355, Section 3.5, Fugitive Dust.	Construction
Cultural	11400 South SES – Page 13	Follow UDOT Standard Specification 01355, Parts 3.7 and 3.8	Construction
Hazardous Waste	11400 South SES – Page 13	Follow UDOT Standard Specification 01355, Parts 3.1	Construction
Invasive Species	11400 South SES – Page 13	Follow UDOT Supplemental Specification 02924S, Invasive Weed Control	Construction
Water Quality	11400 South SES – Page 13	Prepare, implement, and maintain a Stormwater Pollution Prevention Plan (SWPPP) in accordance with UPDES Permit No. UTRC0000 throughout construction of the Project.	Prior to and during Construction
Noise	11400 South SES – Page 13 UDOT Noise Abatement Policy 08A2-01 (Feb 2014)	Follow requirements listed in UDOT Standard Specification 01355, Section 3.6, Noise Control. The Design-Builder will install or replace noise abatement measures, as specified by the Department. The location and height of noise abatement measures described in the Final State Environmental Study and Noise Evaluation could change based on any changes to the final design and receptors. Changes to the final design and receptors will be evaluated by the Department prior to making a final determination on the location and height of the noise abatement measures. The final determination on noise wall height and location will also depend on the approval by a sufficient number of affected residents/property owners as defined in the UDOT Noise Abatement Policy (08A2-01, Feb. 2014).	Construction
Demolitions		In accordance with Department Standard Specifications and local jurisdictions.	Construction

6—GEOTECHNICAL

6A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 6 (Geotechnical) and to satisfy all function needs of the Project, including providing foundations, retaining walls, and embankments, and conducting geotechnical investigations.

6B. STANDARDS

Complete Work for geotechnical elements in accordance with the requirements of the standards listed by priority in Table 6B-1 (Standards for Geotechnical).

If there is any conflict in standards, adhere to the standard with the most stringent requirements.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

TABLE 6B-1
GEOTECHNICAL STANDARDS

Priority	*Author or Agency*	*Title*
1	UDOT	Special Provisions included in Part 5
2	UDOT	2012 Supplemental and Standard Specifications for Road and Bridge Construction
3	UDOT	2012 Supplemental and Standard Drawings for Road and Bridge Construction

6C. REQUIREMENTS

6C-1 Geotechnical Investigations and Reports

6C-1.1 Previous Investigations

The results of a Preliminary Subsurface Investigation commissioned for the Project by the Department are provided in Part 8 (Engineering Data: Geotechnical Data). The investigation includes logs and test results for geotechnical test holes performed at or near the proposed locations of selected Project structures and roadway alignments.

6C-1.2 Geotechnical Investigations

Conduct geotechnical investigations to supplement the data provided by the Department in Part 8 (Engineering Data: Geotechnical Data) such that the location, frequency, and scope of the investigations meet applicable standards and characterize the Project sites for design and construction. At a minimum, complete one geotechnical exploratory boring at each bridge location, to a depth appropriate for foundation design.

Prepare a Geotechnical Investigation Plan showing the locations, types, and anticipated depths of proposed subsurface investigations with respect to planned elements of the Project. Obtain the Department's Approval of the Plan before commencing investigations.

Perform a geotechnical test hole located within 100 feet of the foundation extending down at least two foundation diameters below the foundation bottom elevation for each overhead sign foundation that is designed for site specific soil parameters, see Part 4-17 (Structures) for additional requirements.

6C-1.3 Geotechnical Reports

Prepare and submit geotechnical reports bearing the seal and signature of a Professional Engineer licensed in the State of Utah. Include descriptions and results of geotechnical subsurface investigations, laboratory testing, site conditions, geologic setting, engineering analyses, and design recommendations. Include or reference all geotechnical investigations used in the analyses and in development of the recommendations. Include supporting calculations with each geotechnical report.

6C-2 Settlements and Displacements

Design and construct settlement mitigation in accordance with the Geotechnical MOI provided as an appendix to this Section. Include in the geotechnical reports analyses and calculations demonstrating that the design and any planned settlement mitigation conform to the Geotechnical MOI.

Monitor the progress of settlement and settlement mitigation using geotechnical instrumentation during construction. At a minimum and regardless of anticipated settlement magnitudes and durations, use instrumentation to monitor embankment settlements in all bridge approach slab areas. Prior to performing subsequent Work in mitigated areas, submit to the Department the data collected and a technical analysis demonstrating that the mitigation meets the Project requirements.

At any locations where the total calculated (10 year) settlement exceeds 3 inches, and settlements will not be mitigated using surcharge, provide a proof load of at least 360 psf above the pavement subgrade level. Use geotechnical instrumentation to monitor settlements under the proof load for a period of at least 30 days. Prior to releasing the proof load and embankment for pavement and approach slab construction, submit to the Department a technical analysis comparing the recorded settlements with the design calculations and demonstrating that projected long-term settlements meet all Project requirements. A proof load will not be considered a surcharge with respect to the Geotechnical MOI requirements.

Establish a baseline to monitor distress (e.g., settlements and lateral movements) of structures and properties. Install instrumentation, survey points, targets, or similar means at each bridge, retaining wall, and embankment area supporting pavement to allow for long-term monitoring by the Department for at least 10 years following Substantial Completion of the Project. Conduct an as-built survey of each long-term monitoring device, point, and target within 21 Calendar Days following construction of each element, and a second survey of all points within 30 Calendar Days prior to Substantial Completion.

6C-3 Foundations

6C-3.1 Foundation Types and Materials

Use one or more of the following foundation types for support of all structures:

A. Driven concrete-filled steel pipe piles

B. Drilled shafts

C. Driven steel H- piles

D. Pre-stressed concrete piles

E. Micropiles

F. Spread footings

6C-3.2 Drilled Shafts

Drilled shaft inspection will be provided by the Department. Before proceeding with any field

modifications of the drilled shaft criteria specified on the plans, submit to the Department a technical analysis by the Design-Builder's geotechnical and structural designers demonstrating that the modified criteria will not detrimentally impact the foundation performance.

Obtain Approval for alternate methods of shaft construction and before constructing any drilled shaft without using full-depth temporary or permanent casing to maintain the stability of the excavation.

If a Special Provision is used for drilled shaft construction, furnish all shaft base cleanliness inspection and non-destructive testing equipment and services. Coordinate the inspections and tests with the Department drilled shaft inspectors.

6C-3.2 Driven Piles

Pile driving inspection will be provided by the Department. The Design-Builder's geotechnical pile designer determines final driving criteria for driven piles using the results of dynamic testing with signal matching analysis. Furnish the all required PDA testing and analysis (e.g., CAPWAP) services and submit the results to the Department. Provide each of the Department's pile driving inspector with safe and reliable means of estimating and recording the pile blow count and the hammer energy or stroke (e.g., hydraulic hammer energy readout and/or saximeter) at all times.

Ensure that the driven pile geotechnical designer or an authorized representative is present at the bridge site during driving of the first pile at each substructure (monitored with a Pile Driving Analyzer), and remains at the site until sufficient data have been gathered to establish appropriate driving criteria for each support. Notify the geotechnical and structural designers immediately if any unusual or otherwise unanticipated pile driving condition is encountered (including if the piles are driven substantially out of the specified tolerances).

Before proceeding with field modifications of the pile driving criteria specified on the plans, submit to the Department a geotechnical analysis demonstrating that the modified criteria will not detrimentally impact the foundation performance.

If using pre-cast concrete piling, prepare a Special Provision for installing and testing the piles.

6C-3.3 Micropiles

If using micropiles, prepare a Special Provision for installing and testing the micropiles. Micropile inspection will be provided by the Department.

Use solid steel bars for micropile reinforcement. Use epoxy-coated or galvanized bars for all micropiles subject to tension loads.

Place grout and concrete to the bottom of the drilled hole using tremie methods. Do not place micropile grout or concrete in the hole through the stem of an auger.

Conduct the number and type of static load tests appropriate for the site conditions, but in all cases conduct at least one successful verification test at each bridge abutment and bent/pier, and conduct successful proof testing on at least 5 percent of production micropiles. Conduct verification testing before final design occurs and incorporate the results of the verification tests into the RFC design. Furnish all equipment, personnel, materials, and engineering for load testing of micropiles.

Ensure that the micropile designer or an authorized representative is actively involved in the construction process, including on-site construction observation and oversight of load testing. The micropile designer analyzes the load test results and revises the design as necessary based on the results. Before proceeding with revised designs, submit to the Department the applicable test results and design analyses.

6C-3.4 Lateral Load Response of Deep Foundation Groups

In place of the P-multipliers listed in the AASHTO *LRFD Bridge Design Specifications*, use the *P*-multipliers listed in the table below. Alternatively, use *P*-multipliers applicable to specific soil types based on published load test results.

TABLE 6C-1

PILE *P*-MULTIPLIERS, P_M FOR MULTIPLE ROW SHADING

Pile CTC spacing (in the direction of loading)	*P*-Multipliers, P_m		
	Row 1	*Row 2*	*Row 3 and higher*
2.0*B*	0.60	0.35	0.25
3.0*B*	0.75	0.55	0.40
5.0*B*	1.0	0.85	0.70
7.0*B*	1.0	1.0	0.90
8.0*B*	1.0	1.0	1.0

6C-4 Embankments, Slopes, and Retaining Walls

Evaluate the external stability (global stability and bearing resistance) of all wall systems using a limit equilibrium program that estimates the minimum factor of safety along the critical failure surface(s).

Inspection for permanent retaining walls will be provided by the Department.

6C-4.1 Temporary Excavations

Use temporary cut slopes for excavations as permitted by the U.S. Occupational Safety and Health Administration (OSHA) standards for excavation (29 CFR Part 1926, Subpart P) and as indicated by geotechnical analyses, but in no case steeper than 1:1 (H:V) for slopes higher than 6.0 feet that are adjacent to active lanes of traffic.

6C-4.2 MSE and PMGW Wall Systems

For mechanically-stabilized earth (MSE) walls and prefabricated modular gravity walls (PMGW), use only those systems pre-approved by the Department, as listed in Special Provision 02831S.

Use reinforced concrete for all MSE wall panels. Design and construct panel joints and internal reinforcement to accommodate anticipated total and differential settlements. In designing the connection between MSE facing elements and soil reinforcements, account for both the design pullout load and the additional load due to the maximum anticipated settlement of the wall.

Do not locate drainage pipes perpendicular to MSE soil reinforcement within the reinforced soil mass without prior site-specific Department Approval. With any request for Approval, include documentation demonstrating the Design-Builder has exhausted reasonable alternative design options and has addressed applicable technical issues including maintenance, leakage, soil reinforcement conflicts, future accessibility of the pipe for repairs, and settlement. Approval will only be considered for jointless pipes no greater than 24 inches in diameter.

For design drawings and calculations specific to the wall system (typically developed by the wall supplier), comply with the following supplemental requirements.

A. Provide design reviews by the Design-Builder's geotechnical and structural engineers.

B. Complete all applicable interdisciplinary design reviews and constructability reviews to identify and resolve conflicts with other Project features.

C. Submit to the Department a draft version of each design, and a final version that incorporates all agreed-upon review comments.

6C-4.3 Soil Nail Walls

Meet the requirements of Special Provisions 02871S and 02342S for soil nail walls and shotcrete. Do not use soil nail walls below the existing ground water table.

6C-4.4 Temporary Earth Retaining Structures

Construct temporary excavation support such as sheet pile, soldier piles and lagging, soil nailing, and bracing in accordance with site-specific designs that have been prepared, signed, and sealed by a Professional Engineer licensed in the State of Utah.

Where temporary retaining structures or materials will be incorporated into permanent embankments or retaining structures, the design, construction, and testing must meet the requirements for permanent construction.

6C-5 Seismic Design

6C-5.1 Design Seismic Event Magnitudes

For the design seismic event having a 7 percent probability of exceedance in 75 years, use an earthquake moment magnitude of 7.0. For the design seismic event having a 3 percent probability of exceedance in 75 years, use an earthquake moment magnitude of 7.2.

6C-5.2 Design Seismic Acceleration Coeffecients

Determine the Site Class for each interchange. Calculate the site design acceleration coefficients using interpolated AASHTO site coefficients and the Site Class B acceleration coefficients in Table 1 (obtained from the USGS 2008 Hazard Curve Application at http://geohazards.usgs.gov/hazardtool/).

TABLE 6C-2
Seismic Acceleration Coefficients for Site Class B

Probability of Exceedance:	3% in 75 years			7% in 75 years		
Approximate Return Period:	2462 years			1033 years		
Parameter:	PGA	S_s	S_1	PGA	S_s	S_1
11400 South	0.456	1.216	0.344	0.298	0.767	0.213
9000 South	0.462	1.235	0.346	0.305	0.786	0.218
7000 South	0.514	1.374	0.380	0.331	0.853	0.235
5400 South	0.561	1.494	0.413	0.356	0.920	0.252

6C-5.3 Site-Specific Hazard and Response Analyses

Obtain Approval of any site-specific seismic hazard and/or response analysis methodologies and their results prior to their use in design. For this Project, the Department will not Approve use of design spectral response accelerations less than those determined using the General Procedure defined in the AASHTO *Guide Specifications for LRFD Seismic Bridge Design*.

6C-5.4 Design for Seismic Hazards

Account for the effects of seismic ground motions, liquefaction, and soil strength reductions associated with earthquake loading in design of foundations and retaining walls, and in the design of embankments where the seismic performance of the embankment may impact bridges, retaining walls, or other facilities.

Where necessary to meet seismic performance requirements, design and construct ground improvement to mitigate the effects of soft and/or loose foundation soils, liquefaction and dynamic soil strength loss, including global instability, loss of bearing resistance, lateral spread, and excessive deformations. Develop Special Provisions for the ground improvement work, including requirements for in-situ testing of the improved ground to verify the required improvement.

Prior to proceeding with construction in mitigated areas, submit a technical analysis and supporting construction and test data demonstrating that the completed ground improvement meets the applicable requirements and the intent of the geotechnical design.

6C-6 Utilities

Identify all new and existing Utilities crossing embankments, evaluate settlement and vibration impacts on these Utilities, and evaluate impacts of abandoned Utility lines on settlements. Design new and relocated Utilities to accommodate the anticipated settlements and to operate effectively during and after construction. Refer to Part 4-19 (Utilities) for requirements applicable to specific Utilities.

6C-7 Impacts to Adjacent Properties

6C-7.1 Vibrations and Settlements

Where vibration-inducing activities are to be performed, and/or where embankments or walls are to be constructed in the vicinity of properties, schools, structures, water tanks, Utilities, or other facilities, evaluate potential impacts. See Part 4-19 (Utilities) for additional requirements. Develop and implement a program to conduct preconstruction surveys and to monitor and mitigate vibrations and settlement impacts as follows:

A. Use published attenuation relationships to estimate the zones within which vibrations caused by the Project may impact existing properties and facilities.

B. Estimate settlement influence zones from embankment loads and other significant loads that could possibly extend beyond the ROW.

C. Determine the horizontal extent of settlement evaluation and monitoring based on the settlement tolerance of adjacent facilities. At a minimum, evaluate all facilities located within the zones defined in Section 6.7 of the Geotechnical MOI.

D. Within zones of potential impacts, conduct site investigations of properties to determine sensitivity of facilities to vibrations and/or settlement.

E. Identify properties and facilities that may be adversely affected.

F. Conduct a preconstruction survey of each susceptible structure/property.

G. Develop and implement appropriate measures to prevent and/or mitigate adverse vibration and settlement impacts, meeting the Project requirements including all Third-Party Agreements.

H. Monitor vibrations and settlements to ensure they do not cause damage or exceed specified limits. Implement additional mitigation measures where needed.

6C-7.2 Other Potential Impacts

Evaluate the potential for other geotechnical impacts to adjacent properties and structures, including modifications and disruptions to groundwater levels and flows. Develop and implement plans to monitor and mitigate these impacts.

6C-8 Fill Materials

Provide suitable materials for construction of earth fills. Document the source, quality, pertinent physical and chemical properties, and applicable test results for all materials before using them. Do not use steel slag or other potentially-corrosive materials where they may be detrimental to structures or other components, such as MSE wall reinforcements, drainage pipes, or foundations.

6C-8.1 Use of Broken Concrete in Fills

If broken concrete is used in earth fill, meet the following requirements:

A. Limit the maximum size of concrete pieces to 12 inches in the maximum dimension.

B. Arrange and distribute concrete pieces to prevent nesting and voids, and to allow placement and compaction of soil fill between adjacent pieces.

C. Do not use broken concrete as backfill for retaining walls or for reinforced soil fills.

6C-8.2 Lightweight Fill Materials

For lightweight fill materials, use only the following materials:

A. Expanded polystyrene (EPS Geofoam fill), per Special Provision 02334S.

B. Lightweight aggregate consisting of scoria, pumice, expanded shale, and/or steel slag aggregate, per Special Provision 02332S.

C. Lightweight cellular concrete (requires preparation of a Special Provision by Design-Builder's geotechnical engineer).

Use only materials that can withstand exposure to the elements without a loss of integrity over a minimum period of 75 years. Protect all lightweight fill material from conditions which may cause degradation or otherwise impact its properties and performance, including UV degradation of synthetic materials and excessive moisture absorption of lightweight aggregates.

6C-9 Minimum Limits of Granular Backfill Borrow

Place Granular Backfill Borrow to the following minimum limits:

A. 3.0 feet behind abutments

B. 3.0 feet around footings

C. 2.0 feet behind wingwalls

6C-10 Excavation and Backfill for Existing Basements

Remove basements of existing structures as outlined in Section 02221 of the UDOT Standard Specifications. Slope existing structure excavations at no steeper than 2 horizontal to 1 vertical. Backfill basement and other existing structure excavations with Borrow, meeting the placement and compaction requirements of Section 02056.

6D. SUBMITTALS

Provide all applicable submittals to the Department in accordance with Table 6D-1.

TABLE 6D-1
DESIGN-BUILDER SUBMITTALS FOR GEOTECHNICAL

Submittal	***For Approval***	***Schedule***
Geotechnical Investigation Plan(s)	Yes	5 Calendar Days before starting investigations at the applicable location(s)
Geotechnical reports and supporting calculations	No	No later than the final design milestone review
Settlement monitoring data and technical analysis of completed settlement mitigation (other than surcharge)	No	Prior to releasing area for further construction
Requests for release of surcharge, with supporting data and technical analysis	Yes	5 Calendar Days prior to releasing area for further construction
Data and technical analysis for release of proof loads.	No	Prior to releasing area for further construction
Special Provisions for foundation construction (where required)	No	No later than the final design milestone review
Pile drivability analysis demonstrating adequacy of proposed driving equipment.	No	Prior to mobilizing pile driving hammer to the site
Deep foundation inspection records and test results	No	2 Calendar Days prior to steel and concrete placement in driven piles. 2 Calendar Days prior to building structures on shafts and micropiles
Requests for Approval of drainage pipes perpendicular to MSE soil reinforcement.	Yes	No later than initial design milestone review
Supplier Wall Drawings and Calculations	No	Per requirements in Special Provisions 02831S and 02871S
Site-specific seismic hazard and/or response methodologies and analyses.	Yes	No later than initial design milestone review
Special Provisions for ground improvement	No	No later than final design milestone review
Construction/test data and analysis for completed ground improvement	No	Prior to releasing area for further construction
Geotechnical Instrumentation Plan(s)	Yes	No later than initial design milestone review
Geotechnical instrumentation reports	No	Weekly during active installation and/or monitoring

Appendix A: Geotechnical MOI

GEOTECHNICAL MANUAL OF INSTRUCTION

Utah Department of Transportation

November 2015

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CHAPTER 1: INTRODUCTION

1.1 GENERAL

The purposes of this Manual include the following:

- Outline the roles and interaction of the UDOT Geotechnical Division and of Consultant Geotechnical Engineers within the Project team for work on UDOT projects.
- Identify Standard procedures, practices, manuals, specifications, etc. for use in UDOT geotechnical work, including investigations, testing, design, and construction.
- Establish standards for presentation of geotechnical information, including reports, test hole logs, and laboratory test results.
- Define UDOT requirements and expectations for geotechnical work; particularly where UDOT's expectations may differ from or are not clearly addressed by the requirements of the referenced Standards.

Imperative statements in this Manual indicate requirements for geotechnical work on UDOT projects, and the subject of imperative statements is the Project Geotechnical Engineer, unless otherwise noted.

It is not the intent of this Manual to be all-inclusive. Where this manual uses the terms "include" or "including," the implied meaning is "including but not limited to." Address all geotechnical issues that are pertinent to the Project, regardless of whether or not a given issue is specifically addressed by this Manual. Consult with the UDOT Geotechnical Division in developing an approach to geotechnical topics not specifically addressed by this Manual or its Standards.

Wherever a publication is referenced in this Manual, the reference refers to the current edition and all current interims, unless explicitly stated otherwise in the reference. Consult with the UDOT Geotechnical Division for clarification as needed.

This Manual requires that various items be submitted to the UDOT Geotechnical Consultant Manager. The UDOT Geotechnical Division will provide comments on submittals at its discretion. Allow adequate time (generally 5 to 10 business days) for the UDOT Geotechnical Division to provide comments on submittals.

The UDOT Geotechnical Division recognizes the importance of engineering judgment, schedule, and economy in geotechnical work for UDOT projects, and may accept project-specific exceptions to the requirements of this Manual at its discretion. Where the Project Geotechnical Engineer concludes that a specific exception is justified and particularly advantageous to the Project, submit written justification of the proposed exception to the UDOT Geotechnical Consultant Manager. Obtain written acceptance of

the proposed exception from the UDOT Geotechnical Consultant Manager prior to proceeding with the related work.

The UDOT Geotechnical Division maintains and updates this Manual to accommodate advances in geotechnical engineering and AASHTO practice, and welcomes comments and suggestions to be considered for implementation in future editions.

1.2 DEFINITIONS OF SELECTED TERMS USED IN THIS MANUAL

Manual: The phrase "this Manual" refers to this document, the current UDOT *Geotechnical Manual of Instruction*.

Project Geotechnical Engineer: The Geotechnical Engineer of Record. A Professional Engineer registered in the State of Utah and responsible for the geotechnical work performed on the Project. The Project Geotechnical Engineer may be a UDOT Geotechnical Engineer or a Geotechnical Consultant (including a consultant working for another entity on the Project).

Subsurface Exploration: Any subsurface exploration as a part of a geotechnical investigation to determine the engineering properties of the subsurface materials. A subsurface exploration may include soil borings, test pits, trenches, rock coring/boring, and in-situ testing such as SPTs, CPTs, field vane shear, field permeability tests, etc.

UDOT Geotechnical Consultant Manager: Representative of the UDOT Geotechnical Division assigned to a project in cases where the Project Geotechnical Engineer is a Geotechnical Consultant.

1.3 SELECTED ACRONYMNS USED IN THIS MANUAL

AASHTO: American Association of State Highway and Transportation Officials

ADSC: Association of Drilled Shaft Contractors

ASTM: ASTM International (American Society for Testing and Materials)

CPT: Cone Penetration Test

DFI: Deep Foundations Institute

FHWA: Federal Highway Administration

LRFD: Load-and-Resistance Factor Design

MSE: Mechanically-Stabilized Earth

NACSN: North American Commission on Stratigraphic Nomenclature

NCHRP: National Cooperative Highway Research Program

NHI: National Highway Institute

OSHA: Occupational Safety and Health Administration

PDA: High-Strain Dynamic Pile Testing (e.g., Pile Driving Analyzer)

PGA: Peak Ground Acceleration

QC/QA: Quality Control / Quality Assurance

QSM: Quality Systems Manual

RFP: Request for Proposals

RQD: Rock Quality Designation

SPT: Standard Penetration Test

TRB: Transportation Research Board

UDOT: Utah Department of Transportation

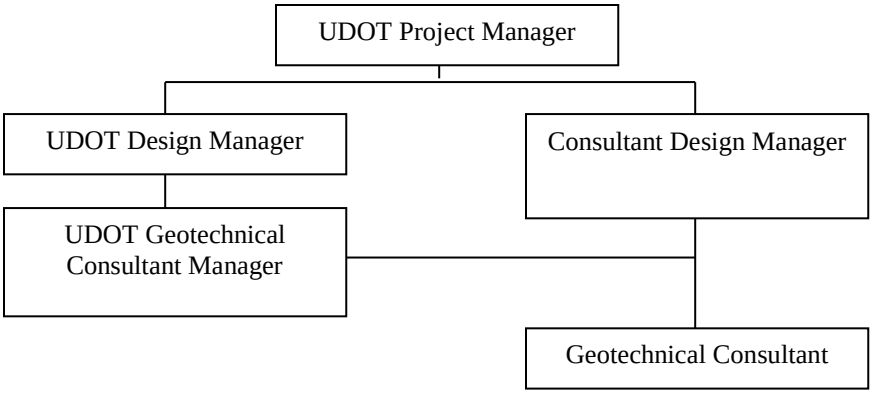
USCS: Unified Soil Classification System

USGS: United States Geological Survey

WEAP: Wave Equation Analysis of Pile Driving

1.4 GEOTECHNICAL PROJECT ORGANIZATION STRUCTURE

For projects employing a Geotechnical Consultant as the Project Geotechnical Engineer, conduct geotechnical work in accordance with the Project team structure illustrated by the diagram below.



Submit all geotechnical reports, calculations, geotechnical plan sheets, special provisions, etc. to the UDOT Geotechnical Consultant Manager, and allow time for comment prior to finalizing reports. The Project Geotechnical Engineer bears the ultimate responsibility for all geotechnical work.

1.5 UDOT PROJECT DELIVERY PROCESS

Conduct work in accordance with the *UDOT Project Delivery Network.* The *Project Delivery Network* describes the project development sequence for the various design disciplines, including the geotechnical design process, identifies the deliverables from each activity and task, and describes the coordination between the geotechnical engineer and other design disciplines.

For additional information on the project development delivery process, refer to the *Project Delivery Network* guidance on the website, the UDOT *Project Manager Guide,* and the UDOT *Local Government Guide.* The UDOT Geotechnical Division does not conduct pavement design. Where geotechnical input is needed for pavement design, refer to the UDOT *Pavement Management and Pavement Design Manual*.

1.6 LOCAL GOVERNMENT PROJECTS

For details on the design process for local government projects, refer to the UDOT *Local Government Design Process Manual*. While oversight authority lies with the local government agency on these projects, the lines of responsibility for geotechnical services and oversight are the same as for State transportation projects. Conduct geotechnical work for local government projects in accordance with this Manual.

1.7 DESIGN-BUILD PROJECTS

Conduct geotechnical work for UDOT Design-Build projects in accordance with this Manual and the other Standards listed by priority in the Project RFP. The UDOT Geotechnical Division will assign a Geotechnical Oversight Engineer to assist the Project management team.

1.8 MAINTENANCE SUPPORT

The UDOT Geotechnical Division will provide support to UDOT's maintenance group regarding issues such as landslides, rockfall, and other geotechnical concerns.

UDOT may occasionally retain consultants to assist the Geotechnical Division in specialized situations. Consultants retained to assist with maintenance issues will provide services in accordance with applicable procedures and standards.

CHAPTER 2: GEOTECHNICAL STANDARDS, REFERENCES, AND SOFTWARE

2.1 GEOTECHNICAL STANDARDS

Conduct all geotechnical work for UDOT projects in accordance with the Standards listed in Table 2-1. In the case of conflicting requirements, the requirements of the highest priority Standard take precedence.

Table 2-1

Standards for UDOT Geotechnical Work		
Priority	**Author or Agency**	**Title**
1	UDOT	Contract Documents for the Project
2	UDOT	*Supplemental Specifications to the Standard Specifications for Road and Bridge Construction*
3	UDOT	*Supplemental Drawings to the Standard Drawings for Road and Bridge Construction*
4	UDOT	*Standard Specifications for Road and Bridge Construction*
5	UDOT	*Standard Drawings for Road and Bridge Construction*
6	UDOT	*Geotechnical Manual of Instruction*
7	AASHTO	*Guide Specifications for LRFD Seismic Bridge Design*
8	AASHTO	*LRFD Bridge Design Specifications* (Customary U.S. Units)
9	AASHTO	*Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*
9	FHWA	*Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, Design and Construction Guidelines* NHI-10-024 (Berg et al, Nov 2009)
9	FHWA	*Soil Nail Walls, Geotechnical Engineering Circular No. 7* FHWA-NHI-14-007Lazarte et al., 2015)

2.2 GEOTECHNICAL REFERENCES

The References section at the end of this Manual (Appendix I) contains complete references for the publications listed in Table 2-1. In addition to the Standards listed in Table 2-1, the UDOT Geotechnical Division commonly uses the other resources referenced in this Manual, and may refer to these references in reviewing geotechnical work, including investigations, testing, reports, design submittals, and proposed methodologies.

2.3 GEOTECHNICAL METHODOLOGIES AND SOFTWARE

Designers are responsible for the accuracy of all methodologies and computer software used for design. Use methodologies specified by the applicable design standards and widely-accepted computer software. Submit documentation demonstrating validity and calculated checks of other methodologies and computer software. Document all

software program names and version numbers.

CHAPTER 3: GEOTECHNICAL INVESTIGATIONS

Consult with the UDOT Geotechnical Consultant Manager in planning and conducting geotechnical investigations.

3.1 LITERATURE REVIEW

Prior to commencing subsurface explorations, conduct a review of available literature and records applicable to the Project. Common sources of geotechnical and geological literature and data useful for UDOT projects include those listed in Table 3-1.

Table 3-1

Common Sources of Geotechnical and Geological Literature and Data	
Source	**Type of Information**
UDOT	previous geotechnical investigation reports; as-constructed drawings from Structures Division records for existing highway facilities (including soil data sheets); construction monitoring and test records; maintenance records; UDOT research reports
USGS	geologic maps, charts, books; probabilistic seismic hazard deaggregations
Utah Geological Survey	geologic maps, charts, books
State, County, and Local Governments	well installation records; geological and geotechnical studies
Utah Department of Natural Resources	well installation records (Division of Water Rights)
Local Colleges and Universities	theses and dissertations on geotechnical and geologic topics of local interest; out-of-print geologic publications
Various Government Agencies	aerial photographs (review with stereoscope may show features/details not obvious to the naked eye); soil surveys (agricultural, engineering, etc.)

3.2 FIELD RECONNAISSANCE

Subsequent to the literature review, provide for site inspection by a geologist and/or a geotechnical engineer. Obtain existing surface and subsurface information prior to performing subsurface explorations, including the following:

- site history and previous land use
- site accessibility, utility conflicts, and potential traffic problems
- topography
- surface water and groundwater
- erosion patterns
- geologic structure and soil/rock profiles
- surface features that may affect design, construction, and performance of proposed facility

Refer to Appendix B of this Manual for an example field reconnaissance report form.

Where applicable, obtain information regarding the soil (nature and thickness of strata) and bedrock (lithology and structure) by observing natural and man-made exposures, including river banks, escarpments, quarries, and highway and railway cuts.

3.3 SUBSURFACE EXPLORATION PLANNING

3.3.1 General

Conduct and finalize site exploration planning in advance of any actual subsurface exploratory work. Ensure that all permits and clearances are obtained and that all necessary precautions (such as evaluations of potential hazards at or near the site) are taken ahead of time.

3.3.2 UDOT Encroachment Permits

Obtain encroachment permits prior to performing any subsurface exploration or testing on UDOT property. Contact the local UDOT region office to apply for permits.

3.3.3 Permission to Access Private Property

Obtain and document permission to access private property directly from the property owner. A sample permit to enter and conduct exploratory drilling is included in Appendix A of this Manual.

3.3.4 Railroad Right of Way

Coordinate all access to Railroad right of way with the UDOT region Engineering Coordinator of Utilities and Railroads.

3.3.5 Environmental Clearances and Permits

Obtain all required environmental clearances and permits prior to initiating investigations. Cease exploration operations and contact UDOT's Risk Management Group if potentially hazardous conditions are identified. Record and immediately report evidence of contamination in any explorations to the Region Environmental Engineer.

3.3.6 Traffic Control Plans

For all exploration sites that require drilling equipment, support vehicles and/or personnel to be located within 30 feet of a traveled way, submit a traffic control plan and obtain acceptance from the Region Traffic and Safety Engineer.

3.3.7 Utility Clearances

Obtain utility clearances through Blue Stakes of Utah (1-800-662-4111 or www.bluestakes.org) and any other entities (e.g., railroads, irrigation companies, etc.) that may own or operate utilities in the area. Provide locations of the proposed

subsurface explorations to utility locating organizations. Obtain clearances as necessary for both overhead and buried utilities
Blue Stakes requires that the address, location, and nature of the work be submitted at least two full working days prior to commencement of subsurface explorations; and requires that all exploration locations be marked in the field in order to perform a locate request. Blue Stakes can schedule an on-site meeting with utility locators in cases where the proposed subsurface exploration locations are difficult to describe. Where the exploration is near an existing utility, the utility company may require that their representative be present at the beginning of the investigation, and may require hand digging or potholing to a depth below the utility.

3.3.8 Impacts to UDOT Property

If UDOT property is damaged or modified in any way due to drilling operations, contact the UDOT region maintenance office and mitigate the impacts as directed.

3.3.9 Health and Safety

Comply with UDOT safety standards and all federal (including OSHA), state, and local laws and ordinances. Conduct drilling using trained and certified personnel equipped with appropriate safety equipment.

3.3.10 Interactions with the Public

Conduct all interactions with the public with respect and courtesy. Cooperate with property owners, public safety officers, and UDOT personnel to minimize and mitigate potential impacts and hazards of field investigations.

Protect the public from falling and tripping hazards posed by test holes. Provide advance notice of lane closures and other potential impacts in heavily-travelled areas. Refer specific questions from the public regarding UDOT projects to the UDOT Project Manager and/or Project public involvement personnel.

3.4 SUBSURFACE EXPLORATION

Submit all subsurface exploration plans to the UDOT Geotechnical Consultant Manager for acceptance prior to beginning field work.

3.4.1 Soil Borings

Soil borings are an essential element of the preliminary engineering investigations for highway bridge foundation design, cut and natural slope stability evaluations, liquefaction/lateral spread evaluation, embankment static and seismic stability and settlement evaluations, and highway location selection. The purposes of soil borings include the following:

- Determine the extent and characteristics of the various natural soil formations.
- Obtain high-quality samples representative of the different soil formations for laboratory testing and subsequent engineering analyses.
- Investigate possible trouble conditions such as springs, swamps, bogs, seepage zones, slide areas, expansive soils or rock, collapsible soils, soft soils, weak soils or rock, compressible soils, liquefiable soils, or other unusual soil or rock, or moisture conditions which could affect construction of highway structures or roadbed stability.

Conduct soil boring drilling, sampling, and in-situ testing in accordance with the specifications and procedures of this Manual and the relevant AASHTO and ASTM standards.

Drilling procedures will vary due to the variety of geologic conditions encountered within Utah. Use drill crews trained and equipped to perform investigations in the anticipated geologic conditions. Ensure that drilling crews conduct work in accordance with the procedures outlined in the NHI-FHWA *Manual on Subsurface Investigations* (2001) and the AASHTO *Manual on Subsurface Investigations* (1988).

3.4.2 Test Hole Frequency and Depth

Exercise engineering judgment in planning and performing subsurface explorations. Consider the following:

- type and criticality of Project elements
- soil and rock formations and characteristics
- subsurface variability at the site
- lengths and widths of Project elements
- loads to be imposed on the foundation materials
- availability and applicability of previous investigations at the site
- groundwater characteristics and conditions

Conduct subsurface explorations meeting the frequency and depth requirements listed in Table 3-2. These frequencies and depths may vary depending on site conditions, existing information, existing cut and fill performance, etc. CPT probes may be used for some of the required test holes where appropriate.

Table 3-2

Frequency and Depth of Geotechnical Subsurface Explorations		
Project Element	**Test Hole Frequency**	**Minimum Test Hole Depth (See discussion following table)**
Roadway Embankments	Every 200 to 600 feet, depending on variation in subsurface conditions	Twice the embankment height.
Cut Slopes	Every 200 to 600 feet, depending on conditions. Minimum of one for every cut exceeding 15 feet in depth.	15 feet below anticipated base of cut, and into competent soils or rock.
Buried Structures	One or more at each buried structure location.	15 feet below anticipated foundation elevation
Structural Foundations	See Section 10 of *AASHTO LRFD Bridge Design Specifications*, except provide at least 2 test holes for substructures more than 70 feet wide.	
Retaining Walls	See Section 11 of *AASHTO LRFD Bridge Design Specifications*	
Roadway Pavement	Refer to UDOT *Pavement Management and Pavement Design Manual*	

In developing the subsurface exploration plan, consider the widths of Project elements such as pavements, embankments, and buried structures. Where the element width exceeds about 70 feet, perform test holes along each side of the Project element at the frequencies listed in Table 3-2.

Project conditions may require more and/or deeper test holes than specified by Table 3-2, at the discretion of the Project Geotechnical Engineer in consultation with the UDOT Geotechnical Division. For example, wide embankments on compressible soils may require test holes to depths much greater than twice the fill height. In all cases, perform sufficient subsurface explorations to provide the information needed for the design and construction of each Project element. Base the extent and number of explorations and possible additional explorations on the variability of subsurface conditions in consultation with the UDOT Geotechnical Division.

It is not the intent of this Manual to require test holes in excessive quantities or depths. In particular, test holes for walls and embankments need not extend excessive depths into competent, incompressible strata. The UDOT Geotechnical Division may accept reduced test hole frequencies and/or depths at the recommendation of the Project Geotechnical Engineer.

3.4.3 Logging of Soil Borings

Log soil borings in the field and record, as a minimum, the information outlined in the NHI-FHWA *Manual on Subsurface Investigations* (2001) and the requirements of article 3.8 of this chapter and Appendix B of this Manual. Prepare final logs in English units as outlined in Appendix B.

3.4.4 Rock Coring/Boring

Obtain and recover rock cores in accordance with the applicable sections of the NHI-FHWA *Manual on Subsurface Investigations* (2001). Log rock cores as outlined in Appendix D.6 of the same manual, and as outlined in the *North American Code of Stratigraphic Nomenclature* (NACSN, 2005). Include on the logs RQD data relevant to Project requirements (see Appendix C of this Manual). Obtain downhole digital images or oriented cores where appropriate.

3.4.5 Test Pits/Trenches

The Project Geotechnical Engineer may use test pits for shallow soil investigations such as pavement subgrade and building (i.e. rest areas, etc.) investigations, and may use exploratory trenches for fault investigations, collapsible soils identification, etc. Log excavations (test pits and trenches) in the field and record the findings as outlined in Appendix D of this Manual.

3.4.6 Groundwater

Record groundwater levels in test holes during drilling/excavation and upon completion. Include the date and time of each groundwater level measurement on the field log. Note pertinent details such as height and/or rate of flow where artesian conditions are encountered.

In many cases, the water level in a test hole will not stabilize to the natural groundwater level until hours or days after drilling is complete. Where necessary, install temporary pipe in test holes to allow subsequent measurements of groundwater levels. If the primary drilling method does not permit reliable measurements of groundwater levels, conduct supplementary test holes to determine the depth to groundwater.

3.5 IN-SITU TESTING

In-situ tests used most frequently for UDOT projects include the Standard Penetration Test (SPT) and the Cone Penetration Test (CPT). Use these and other in-situ testing as appropriate to characterize the subgrade materials. Attempt a given type of in-situ testing only with a prior understanding of the applicability and limitations of the method to be employed. Conduct in-situ testing in accordance with the applicable AASHTO and ASTM standards. For tests not addressed by published standards, use widely-accepted methodologies and carefully document the procedures used.

Do not rely exclusively upon any type of testing that does not acquire a soil sample. Obtain samples of material from all soil strata for visual-manual classification and laboratory testing. Use in-situ testing of strength characteristics only as a supplement to laboratory testing. Consult with the UDOT Geotechnical Division regarding correlations proposed for use in design.

When performing paired explorations with both CPTs and borings, give preference to performing CPT investigations prior to the borings in order to target specific layers for sampling.

Include additional information such as pore pressure dissipation tests to establish estimated water levels; and shear wave velocity information to establish soil Site Class and evaluate liquefaction effects..

Present the results of in-situ tests using English units. On CPT logs, include as a minimum the tip resistance, sleeve resistance, friction ratio, ground surface elevation, latitude, longitude, and soil type interpretation versus depth.

3.6 GEOPHYSICAL METHODS

Use geophysical testing as appropriate for the Project. Refer to ASTM D 6429 for guidance in selecting geophysical methods. Conduct all geophysical testing in accordance with applicable ASTM standards, or in accordance with widely-accepted guidelines in cases where standards do not exist.

3.7 ABANDONMENT OF SUBSURFACE EXPLORATIONS

Where subsurface explorations require excavation through existing pavements, sidewalks, bridge decks, etc., properly patch the pavement upon completion of the exploration.

3.7.1 Borings

Backfill or grout borings as directed by the UDOT Geotechnical Consultant Manager and in accordance with NCHRP Report 378 (Lutenegger et al., 1995). Certify that each of the borings has been abandoned in accordance with all applicable rules and guidelines.

3.7.2 Test Pits/Trenches

Upon completion of the exploration, backfill excavations with the excavated material or other suitable soil material. In cases where any structure, wall, embankment, pavement, or other flatwork could be located over the excavation, backfill the excavation with suitable material, compacted in lifts with appropriate equipment as specified in Section 02056 of the UDOT Standard Specifications. When excavations are outside the footprint of any proposed Project element, tamp the backfill material in lifts no thicker than 12 inches to at least 90 percent of the maximum laboratory density as determined by AASHTO T 99 (Standard Proctor).

Where excavations are located in agricultural areas or other areas used to support plant growth, cover the backfilled excavation with topsoil so that the impacted area will support vegetation as well as or better than the original condition.

3.8 SOIL SAMPLING AND CLASSIFICATION

3.8.1 Sampling

Perform soil sampling to obtain samples that are as representative of subsurface materials as feasibly possible. Conduct sampling in general accordance with the *FHWA-NHI Subsurface Investigations Manual* (2001) and the AASHTO *Manual on Subsurface Investigations* (1988). In soft to very soft cohesive soils, use a piston sampler to obtain relatively undisturbed samples for consolidation testing. Do not attempt to use a driven California sampler to obtain undisturbed samples without prior acceptance by the Geotechnical Division.

Seal soil samples in air-tight containers as soon as they have been exposed and logged. Take particular care to seal samples promptly in extreme weather conditions. Seal thin-walled tube samples with rubber stoppers, o-ring caps, or paraffin wax. Make every effort to obtain, transport, and store samples in a manner that ensures and maintains sample integrity and quality. Avoid exposing samples to bumps, jolts, vibrations, or freezing temperatures.

Conduct SPT sampling using sampling hammers that have been calibrated in accordance with ASTM D 4633 within one year of the sampling date.

For sites in areas of moderate or high seismicity (sites having mapped *PGA* greater than about 0.20g), perform soil sampling and laboratory testing for both global seismic stability analysis and for liquefaction analysis. Where either global seismic stability or liquefaction is a concern for a particular site, perform CPT probes to more specifically assess either global seismic stability or liquefaction potential and to evaluate their effects. Conduct continuous SPT testing and sampling where soil layers may be susceptible to either global seismic instability or to liquefaction.

3.8.2 Field Classification

Classify soils in accordance with the approach and format detailed in ASTM D 2488. Record the basic soil profile elements in the field, including changes in strata, relative properties of soil types in layered/bedded deposits, and presence of cobbles or boulders. Make corrections and additions to the field classification, where necessary, by laboratory testing of the soil samples. See the NHI-FHWA *Manual on Subsurface Investigations* (2001) and Appendix B requirements for field logs and final logs.

Provide on the exploration logs soil descriptions that are precise and comprehensive, without being verbose. Include details without distorting the overall impression of the soil by excessive emphasis on less significant details.

Record descriptions in the Soil Description column of the boring log for every soil sample collected. The preferred order for soil descriptions is as follows:

- Soil name (ASTM D 2488 Group Name) with appropriate modifiers
- Group symbol
- Relative density or consistency
- Moisture condition
- Grain size, soil structure, mineralogy, or other descriptors
- Color

Include the gradation of coarse-grained soil (more than 50 percent retained on No. 200 sieve) in the specific soil name in accordance with ASTM D 2488. Record the maximum size and angularity or roundness of gravel and sand-sized particles. For fine grained soil (50 percent or more passing the No. 200 sieve), modify the name with the appropriate plasticity term in accordance with ASTM D 2488.

Describe interlayered soil zones beginning with an introductory name, followed by the soil types in order of predominance (e.g., “Interlayered Sand and Silt). Indicate the relative proportion of each type of soil observed in interlayered samples.

Where helpful, justify evaluations of soil plasticity with brief descriptions of visual-manual procedures, such as reaction to shaking, toughness of a soil thread, smear test, or dry strength, as outlined in ASTM D 2488.

3.8.3 Group Symbol

List the appropriate group symbol from ASTM D 2488 after each soil name. Dual symbols (e.g., GP-GM, SW-SC, CL-ML) may be used in accordance with ASTM D 2488. Borderline symbols (e.g., GM/SM, SM/SC) may be used occasionally on field logs to indicate that a soil sample has properties that do not distinctly place the soil in a specific group. In general, use the group name assigned to a soil as the group name for the first symbol. Avoid indiscriminate use of borderline symbols. Classify the soil in a single group wherever possible.

3.8.4 Relative Density and Consistency

Indicate the relative density of coarse-grained soils based on SPT N-values (ASTM D 1586). Show on the logs the raw blow counts for each 6-inch increment (or refusal) and the corrected $(N_1)_{60}$ values. Include applicable corrections for hammer energy ratio, sampler size (and liners), rod length, and overburden pressure.

Use miniature vane shear (torvane) to characterize stiffness and strength of cohesive soils. Do not rely on blow counts to characterize stiffness and strength of cohesive soils.

Where sample disturbance or large gravel prevents a reliable estimate of in-situ relative density or consistency, omit this item from the description, and note the reason for the omission on the boring log.

Use the results of vane shear, miniature vane shear (torvane), or pocket penetrometer testing as the primary field methods for evaluating consistency of fine-grained (cohesive) soil.

Correlations between field test results and relative density for coarse-grained soils are listed in Table 3-4, and correlations for consistency of cohesive soils are listed in Table 3-5.

Table 3-4

Relative Density of Cohesionless Soils			
$(N_1)_{60}$ (blows/ft)		**Relative Density**	**Field Test with ½-inch steel rod**
≤35% Gravel	**>35% Gravel**		
<5	<18	very loose	Very easily penetrated when pushed by hand
5-10	18-26	loose	Easily penetrated when pushed by hand
11-30	27-49	medium	Easily penetrated when driven with 5-lb hammer
31-50	50-75	dense	Penetrated 1 foot with difficulty when driven with 5-lb hammer
>50	>75	very dense	Penetrated less than 3 inches when driven with 5-lb hammer

Table 3-5

Consistency of Cohesive Soils				
N_{60} (blows/ft)	**Consistency**	**Shear Strength (tsf)[1]**	**Unconfined Compressive Strength (tsf)[2]**	**Field Test**
<2	very soft	<0.12	<0.25	Easily penetrated several inches by fist
2-4	soft	0.12-0.25	0.25-0.50	Easily penetrated several inches by thumb
5-8	firm	0.25-0.50	0.50-0.10	Penetrated several inches by thumb with moderate effort
9-15	stiff	0.5-1.0	1.0-2.0	Readily indented by thumb but penetrated only with great effort
16-30	very stiff	1.0-2.0	2.0-4.0	Readily indented with thumbnail
>30	hard	>2.0	>4.0	Indented with difficulty by thumbnail

[1]Torvane test is an indicator of shear strength.

[2] Pocket penetrometer is a proximate indicator of unconfined compressive strength.

3.8.5 Moisture Content

Define the degree of moisture present in the soil sample in accordance with Table 3-6.

Table 3-6

Criteria for Describing Moisture Condition	
Description	**Criteria**
Dry	Absence of moisture, dusty, dry to the touch
Slightly Moist	Apparent moisture but well below optimum moisture content
Moist	Damp, but no visible water; at or near optimum moisture content
Very Moist	Above optimum moisture content
Wet	Visible free water; substantially above optimum moisture content; at or above liquid limit

3.8.6 Soil Structure, Mineralogy, and Other Descriptors

Describe discontinuities, inclusions and other features, including joints or fissures, slickensides, bedding or laminations, veins, root holes, and wood or other debris.

Note significant mineralogical information, such as cementation, abundant mica, or unusual mineralogy such as pinhole structure, and other information such as oxidation, ferrous minerals, calcium, organic debris, odor, etc.

Include other descriptors as applicable for describing the sample, including particle size, range and percentages, particle angularity, particle shape, maximum particle size, hardness of large particles, plasticity of fines, dry strength, dilatancy, toughness, reaction to HCL, etc.

If possible, identify the parent rock and rock structure for residual soils having characteristics of both rock and soil.

3.8.7 Color

Record the basic color of a soil. Use an appropriate color code system such as the Munsell color charts. Use modifiers such as “light” and “dark” if necessary. Especially note staining or mottling, as this information may indicate water table fluctuations or contamination.

3.8.8 USCS Laboratory Classification

Modify field descriptions of soils using USCS laboratory classifications as appropriate.

3.8.9 AASHTO Laboratory Classification

Classify soils according to the AASHTO classification system based on available laboratory data in accordance with AASHTO M-145. Show the AASHTO classification symbol next to the USCS symbol on the boring logs.

3.9 ROCK CLASSIFICATION

Classify rock samples with the aid of the appropriate section of the *FHWA-NHI Manual on Subsurface Investigations* (2001), and as outlined in Appendix C of this Manual.

CHAPTER 4: GEOTECHNICAL TESTING

4.1 INTRODUCTION

Conduct the geotechnical testing program at the discretion of the Project Geotechnical Engineer and meeting the requirements of the Project and of this Manual. Exercise engineering judgment in developing the testing program. Use a testing laboratory accredited by AASHTO and ASTM. Maintain current certifications through the duration of the Project for all testing personnel.

The UDOT Geotechnical Laboratory is located in the Materials Testing Facility directly east of the Calvin Rampton building, and its primary function is to provide testing services for UDOT's in-house geotechnical design engineers, and for Geotechnical Consultants doing UDOT work on a project-by-project basis.

4.2 LABORATORY TESTING REQUIREMENTS

Conduct laboratory soil testing in accordance with the following requirements:

- Visually classify in the laboratory all soil samples extracted from the borings.
- Conduct moisture content and density tests on undisturbed cohesive samples, and perform Atterberg limits tests on selected samples to provide data for correlation and identification.
- Perform gradation/hydrometer testing to characterize grain size for any loose to medium-dense sand deposits for liquefaction effects.
- Where consolidation settlement is a concern, perform an adequate number of consolidation tests to determine variation of preconsolidation pressure with depth and variations of compressibility in different strata. Test consolidation samples at loads sufficiently large to accurately determine consolidation parameters. Record consolidation measurements versus time over a time period sufficient to determine rates of both primary and secondary consolidation under loads representative of the in-situ soil stresses anticipated during and after the Project.
- Conduct proper testing for determination of secondary settlement characteristics, amount of surcharge to use, and the percent consolidation to achieve long-term settlement requirements of the project.
- Conduct appropriate shear strength tests on samples from each definable soil deposit, depending on the soil type and the nature, purpose, loading conditions, and importance of the Project element.
- Perform pH, resistivity, chloride, soluble salts (for determining pipe class), and sulfates (for determining cement type), to evaluate potential for corrosion and deterioration of concrete and metal.
- Where sensitive soils are encountered, conduct index and appropriate shear strength tests to evaluate soil sensitivity.

- Test to evaluate potential for collapse, expansion, and other problematic behavior.
- In selecting tests for specific Project features, comply with the requirements and guidelines of applicable AASHTO and UDOT design specifications and manuals, including the *AASHTO LRFD Bridge Design Specifications* and the UDOT *Pavement Management and Pavement Design Manual*.

Perform geomechanical (rock core) testing in accordance with the guidelines set forth in the FHWA-NHI Subsurface Investigations Manual (2001).

4.3 LABORATORY TESTING PROCEDURES

Follow the applicable testing procedures outlined in the current AASHTO and ASTM Standards listed below:

- AASHTO *Standard Specifications for Transportation Materials and Methods of Sampling and Testing*
- *ASTM Volume 04.08: Construction: Soil and Rock (I)*

4.4 SOIL STRENGTH TESTING

Do not rely entirely on field methods such as miniature vane shear or pocket penetrometer tests to estimate shear strength properties of the subsurface materials. Conduct appropriate laboratory shear strength tests to supplement the results of field tests.

4.5 FORMAT OF LABORATORY DATA AND RESULTS

The exact format of laboratory data and results is not critical. Present the required information for each test in a neat and concise manner.

4.6 QUALITY ASSURANCE AND QUALITY CONTROL

Conduct laboratory testing in accordance with the Laboratory's QC/QA plan and QSM. Where samples are disturbed, contaminated, or otherwise compromised, make special note of the condition and its potential impacts on the test results. Make every effort to test only high-quality samples.

4.7 SAMPLE RETENTION

Retain and preserve samples in their original state until final acceptance of the Project following construction. Save laboratory worksheets and records in ProjectWise.

4.8 LABORATORY SUBCONTRACTING

The Project Geotechnical Engineer is ultimately responsible to UDOT for the laboratory testing for the Project, but may subcontract portions of the work to an accredited laboratory with the concurrence of the UDOT Geotechnical Consultant Manager. The same contract requirements apply to the subcontracted laboratory.

CHAPTER 5: GEOTECHNICAL DESIGN

5.1 GENERAL

This Chapter provides an overview of accepted UDOT analysis and design practices. It is not the intent of this Chapter to provide step-by-step procedures for analysis and design. Use expertise and engineering judgment in carrying out the analysis and design necessary to comply with all requirements. Include all assumptions, design properties, final calculations, and computer inputs and outputs in all reports, designs, analyses, etc. Do not hesitate to contact the UDOT Geotechnical Consultant Manager to review assumptions and approaches to analysis and design procedures.

To properly accommodate the guidelines presented herein and to incorporate any other project-specific requirements for design and construction, it may be necessary to modify some UDOT standard specifications or drawing details, or to develop special provisions for the Project. Submit all such items to the UDOT Geotechnical Consultant Manager prior to proper incorporation in the Project specifications and drawings.

5.2 SEISMIC POLICY AND PROCEDURES

5.2.1 General

Bridges built under the Department's oversight are designed in accordance with the policies and procedures specified by the UDOT Structures Division. Design bridge foundations to meet the seismic performance objectives of the bridge in accordance with the Structures Design and Detailing Manual. Design retaining walls, embankments, and other related elements in accordance with the policies and procedures presented in this Manual. For the purposes of seismic design, use the definitions and seismic design criteria shown in Table 5-1 for retaining walls and slopes.

Table 5-1

Seismic Design – Retaining Walls and Slopes		
Category	**Definition**	**Seismic Design Criteria**
Retaining walls and slopes adjacent to bridges	Located within 50 feet of bridge foundations, or within a greater distance where failure or excessive deformation would impact the seismic performance of the bridge	The geotechnical design earthquake for liquefaction, lateral spread, and slope stability for adjacent embankments and retaining walls is based on an earthquake hazard corresponding to 3% probability of exceedance in 75 years for essential and critical bridges, or to 7% probability of exceedance in 75 years for bridges classified as normal.
Retaining walls and slopes adjacent to other critical facilities	Located where failure or excessive deformation will impact adjacent critical utilities and other facilities including buildings in the Risk Categories III or IV of Table 1604.5 of the 2012 International Building Code, within or outside the Right-of-Way.	Design displacements and deformations to protect the adjacent facility in the characteristic earthquake (i.e. 3 percent probability of exceedance in 75 years).
Other retaining walls	All other retaining walls.	Design for the seismic event having a 7 percent probability of exceedance in 75 years, in accordance with the *AASHTO LRFD Bridge Design Specifications.*

5.2.2 Site-Specific Seismic Analyses

Meet the requirements and comply with the guidelines of the *AASHTO Guide Specifications for LRFD Seismic Bridge Design* and the *AASHTO LRFD Bridge Design Specifications* in selecting sites for and performing site-specific seismic analyses. Where AASHTO recommends site-specific procedures be used, consult with the UDOT Geotechnical Division to determine the best approach prior to undertaking the analyses. Before designing bridges or other Project elements using the results of site-specific seismic analyses, submit the analyses to the UDOT Geotechnical Consultant Manager.

5.2.3 Mapped Probabilistic Ground Motions

For the 1,033-year seismic event (7 percent probability of exceedance in 75 years, approximate 1,000-year event) evaluated using the General Procedure (as detailed in the *AASHTO LRFD Bridge Design Specifications* and the *AASHTO Guide Specifications for LRFD Seismic Bridge Design*), determine the mapped ground motion parameters *PGA*, S_a, and S_1 for the site latitude and longitude in accordance with the AASHTO Guide Specifications for LRFD Seismic Bridge Design and the *AASHTO LRFD Bridge Design Specifications.*

Where using the General Procedure for other seismic events (e.g., the approximate 2,500-year event), determine the mapped ground motion parameters for the site latitude

and longitude using the current USGS tools found online at http://earthquake.usgs.gov/ Because mapped ground motion parameters vary significantly over relatively small distances in many parts of Utah, do not use paper maps or zip code lookup tools to determine ground motion parameters for UDOT projects.

5.2.4 Design Event Magnitudes

Where seismic analyses require an estimate of the earthquake magnitude, use the USGS tool referenced in Section 5.2.3 to estimate the event magnitude. Guidelines for selecting design event magnitudes are provided in Article C6.8 of the *AASHTO Guide Specifications for LRFD Seismic Bridge Design*.

5.2.5 Liquefaction

Evaluate the potential for liquefaction and design for its impacts in accordance with Articles 6.8 and C6.8 of the *AASHTO Guide Specifications for LRFD Seismic Bridge Design*. Liquefaction-related impacts pertinent to UDOT projects include the following:

- Reduced soil strength impacting stability of walls and slopes
- Flow failures on steep slopes (greater than 6%)
- Lateral spread down gentle slopes (less than about 6%)
- Ground settlement
- Settlement, downdrag, reduced resistance, and shear for deep foundations
- Settlement and reduced bearing resistance for shallow foundations
-

Where the potential for liquefaction exists for bridge foundations and adjacent walls and slopes, address the potential for either global seismic stability or lateral spreading, or both, including the following considerations:

- Depth and continuity of soil layer(s) susceptible to liquefaction and/or strength loss
- Topography of the site, embankment, and vicinity
- Site geology and evidence of past liquefaction and lateral spreading

5.2.6 Seismic Soil Strength Reductions

For soils that are prone to liquefaction or severe strength loss as a result of ground shaking (e.g., sensitive soils), determine dynamic and post-earthquake strength parameters using cyclic triaxial tests where the loading is based on the design earthquake. Correlations with residual shear strength may be used in the absence of cyclic triaxial testing.

For cohesive soils that are not susceptible to appreciable dynamic/cyclic softening, account for a 10 to 20 percent increase in pore pressures or decrease in soil strength in post-earthquake analyses.

Refer to Section C6.8 of the *AASHTO Guide Specifications for LRFD Seismic Bridge Design* for guidance in addressing the timing of seismic soil strength loss relative to peak ground shaking.

5.2.7 Global Seismic Stability of Walls and Slopes

Evaluate both global seismic stability and lateral spread, and design to mitigate both, in accordance with Tables 5-1 and 5-2.

Evaluate global seismic stability of retaining walls and slopes for the following conditions:

- Dynamic condition during earthquake ground motions
- Post-earthquake condition after ground motions cease and dynamic strength losses (determined as indicated in Section 5.2.6) are fully developed

For the dynamic condition, conduct global seismic stability analyses using a horizontal pseudo-static coefficient equal to $0.5A_S$, with A_S determined in accordance with the *AASHTO LRFD Bridge Design Specifications*. If the pseudo-static limit equilibrium analysis indicates the wall or slope is stable (meeting the criteria in Table 5-2), and the value A_S for the site is less than 0.3, the permanent deformation associated with the dynamic condition can be assumed to be insignificant. For all other cases, supplement the results of the pseudo-static analyses by estimating the likely permanent deformations resulting from the dynamic condition.

Acceptable methods for estimating dynamic deformations of walls and slopes include the following:

- Newmark Sliding Block Analysis: Determine yield acceleration from pseudo-static analysis, then double-integrate acceleration time histories to estimate permanent deformations where the ground acceleration exceeds the yield acceleration. Use a minimum of three time histories that are appropriate for the site.
- Newmark-Based Displacement Charts and Equations: If a site-specific Newmark Analysis is not performed, compute and compare deformations estimated using at least two of the methods defined in Appendix A11 of the AASHTO LRFD Bridge Design Specifications.

Obtain the acceptance of the UDOT Geotechnical Division prior to using more complex methods of dynamic deformation analysis, such as dynamic stress-deformation models. Submit to the UDOT Geotechnical Consultant Manager the qualifications of the engineer(s) responsible for the modeling work, and documentation validating the proposed modeling method.

5.2.8 Lateral Spread

For the purposes of UDOT geotechnical work, “lateral spread” refers to lateral displacements of the ground surface caused by liquefaction of a laterally-continuous subsurface soil layer, and is not to be confused with localized limit-equilibrium slope instability, including flow failure or rotational slump. Lateral spread displacement occurs either in a down-slope direction on gently-sloping topography, or in the direction of a free face topographic feature where gentle or negligible slopes are interrupted by a relatively abrupt downward slope. Slopes and free-face ratios conducive to lateral spreading are outlined by Bartlett and Youd (1992) and Youd et al. (2002).

Use the revised empirical equations of Youd et al. (2002) to estimate lateral spread displacements for UDOT projects where conditions are conducive to lateral spreading. With prior acceptance of the UDOT Geotechnical Division, the Project Geotechnical Engineer may also use other methods to further evaluate potential lateral spread displacements.

5.2.9 Seismic Mitigation

Consult with the Geotechnical Division where seismic stability and/or lateral spread is an issue and ground improvement may be necessary. Where ground improvement is warranted to mitigate the effects of global seismic instability or lateral spread, design a ground improvement program to mitigate both of these conditions. Article C6.8 of the *AASHTO Guide Specifications for LRFD Seismic Bridge Design* briefly discusses potential ground improvement techniques for liquefaction effects and/or global seismic instability mitigation. Structural mitigation methods may be considered for small ground displacements and/or deformations.

The UDOT Geotechnical Division prefers the use of over-excavation and replacement or vibro-replacement (stone columns) for mitigation of liquefaction/lateral spread and global seismic instability. Obtain the prior acceptance of the UDOT Geotechnical Division for any other proposed mitigation methods (including foundation or structural mitigation methods where deemed appropriate). Develop special provisions requiring in-situ post-mitigation testing to verify that the soils left in place within the mitigated zone will not liquefy and/or become unstable in the design event. Always consider and design for the lateral spread depth and flow direction characteristics, including any slope stability failure directions, when designing treatment areas and protection of the structure.

5.3 BRIDGE FOUNDATIONS

5.3.1 General

Comply with the *AASHTO LRFD Bridge Design Specifications* for all aspects of bridge design, with any exceptions as directed by the UDOT Structures Design Manager or the Geotechnical Consultant Manager.

Bridge foundations for UDOT projects typically consist of deep foundations (piles or drilled shafts) or spread footings. Spread footings are generally not considered acceptable to the Structures or Hydraulics Divisions at stream crossings. Conduct an economic analysis to determine the optimal foundation system of those technically feasible. Do not use auger-cast piles, timber piles, rammed aggregate piers, screw-in anchors, or stone columns as a substitute for deep foundations to support UDOT bridges.

The foundation types applicable to a given project depend on anticipated loads and scour depths (where applicable), along with proper consideration of settlements, downdrag, bearing resistance, lateral load resistance, seismic hazards, constructability, and other applicable factors. Communicate with the Project Bridge and Hydraulics Engineers early in the Project and follow up regularly to develop a cost-effective foundation design.

5.3.2 Driven Piles

Driven piles should consist of steel H-pile or steel pipe pile (typically concrete-filled), or pre-stressed concrete pile. Yield strength values used in design should not exceed the values prescribed in the following specifications:

- Pipe pile: ASTM A-252 Grade 2 (35 ksi) or Grade 3 (45 ksi) steel
- H-pile: ASTM A-36 or A-50 steel

Design for corrosion and deterioration of driven piles in accordance with the *AASHTO LRFD Bridge Design Specifications.* Unless site soil conditions indicate the need for a different corrosion rate to meet the design life of the project, use a minimum corrosion rate of 1.3 mils/yr for steel piles.

Where driven piles are used, include as a minimum the following items for each abutment and bent on the pile details drawing:

- Required Driving Resistance
- Estimated Pile Toe Elevation
- Elevation of Minimum Acceptable Pile Penetration
- Pile Axial Compression Resistance at the Strength Limit State
- Pile Axial Compression Resistance at the Extreme Limit State
- Pile Uplift Resistance at the Strength Limit State
- Pile Uplift Resistance at the Extreme Limit State

UDOT Standard Specification 02455 lists installation requirements for driven piles, including required dynamic pile testing (PDA testing) with accompanying signal matching analyses. The required frequency of testing is shown in Section 6.4.1. Require end-of-initial drive PDA testing if cobbles, boulders, dense layers, or other obstructions may result in the pile being over stressed during driving. Where pile relaxation is a concern, require PDA testing during initial drive as well as restrike PDA testing at a minimum specified time following initial drive.

Evaluate pile drivability using WEAP for a range of driving systems that are likely to be proposed for use on the Project, and present the result of the analyses in the geotechnical report. Locally-available pile driving hammers typically used for UDOT projects include the following:

- Delmag/APE D 30-32
- Delmag/APE D 36-32
- ICE I-30
- ICE I-36

Unless the UDOT Geotechnical Division accepts a different approach in writing, design piles to meet all of the following drivability criteria:

- Ensure that the anticipated pile driving blow counts are not excessive (greater than about 120 blows per foot) for driving to the estimated pile toe elevation during initial drive conditions.
- Verify through a driveability analysis that the hammer(s) will deliver energy sufficient to demonstrate the required driving resistance at the estimated toe elevation during restrike conditions. State the minimum required hammer energy on the pile detail drawings.
- State the minimum pile section and yield strength on the pile details drawing to minimize the potential for excessive driving stresses. If these requirements vary depending upon hammer type (e.g., diesel hammers versus hydraulic hammers), state the minimum requirements for each hammer type.

5.3.3 Drilled Shafts

UDOT Standard Specification 02466 is intended for use with drilled shafts of relatively small diameter and depth. Where necessary, submit a special provision for drilled shaft construction that addresses construction issues relevant to the Project, including the following:

- Use of casing (temporary and/or permanent) to advance shaft excavations
- Detailed requirements related to the use of drilling slurry, including slurry type, preparation, testing, maintenance, and disposal.
- Concrete placement beneath groundwater and/or drilling fluid

- Maximum permissible time between beginning of drilling and beginning of concrete placement (to minimize degradation or expansion of exposed shaft sidewalls)
- Required inspection of cleanliness at bottom of shaft
- Time constraints for drilling near recently-completed shafts
- Non-destructive testing (e.g., cross-hole sonic logging, gamma-gamma logging, thermal integrity profiling) to verify integrity of completed shafts. Require non-destructive shaft-integrity testing when shafts are installed using drilling fluid, for all non-redundant shafts, or when determined by the Project Geotechnical Engineer.
- Requirements for post-grouting of drilled shaft toes for large diameter shafts relying on toe resistance
- Requirements that the drilled shaft geotechnical designer be actively involved in oversight of drilled shaft construction, and in the establishment of final required tip elevations in the field (if the elevations change from those shown on the plans)
- Requirements for submittal of completed shaft construction and non-destructive testing records and tolerance measurements for all shafts to the Project Geotechnical Engineer prior to building structures on top of the drilled shafts
- Qualification requirements for drilled shaft construction (i.e., 4 years demonstrated experience with the construction methods to be used in soil conditions similar to those at the site) and a quality control plan for shaft construction, to be submitted at least one month prior to mobilizing shaft construction equipment or materials to the site

For drilled shafts in gravelly soils, follow the design procedures for shaft friction outlined by Rollins, et al, 2005.

5.3.4 Load Testing of Deep Foundations

The Project Geotechnical Engineer may use static load tests to justify larger resistance factors for deep foundations in accordance with the *AASHTO LRFD Bridge Design Specifications*. Evaluate site variability and determine the required number of load tests for each site in accordance with the *AASHTO LRFD Bridge Design Specifications*. In determining the minimum number of load tests for UDOT projects, limit the radius of each site to no more than 300 feet.

UDOT owns a pile load test frame that may be available for use on a given project. The UDOT Geotechnical Division can provide information regarding the availability of the load test frame and the conditions governing its use.

5.3.5 Downdrag

Account for downdrag effects of settling soils on deep foundations, including that caused by liquefaction and by secondary consolidation settlement, in accordance with

the *AASHTO LRFD Bridge Design Specifications*. The UDOT Geotechnical Division prefers the use of the neutral plane approach recommended by Fellenius (2004) or Briaud and Tucker (1997) for analysis of pile settlement and drag load.

Do not use friction-reducing rings, or bituminous or other coatings, in an attempt to reduce downdrag.

5.4 FOUNDATIONS FOR SIGNS, LIGHTING, AND SIGNALS

When not using standard drawings, or when soil and groundwater conditions dictate, conduct appropriate subsurface explorations and testing for foundations of signs, lighting, and signals. Use the design procedure of *Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals*, and appropriate computer programs (as applicable), to design foundations for these structures.

5.5 EMBANKMENTS AND RETAINING WALLS

Design unreinforced and/or unprotected embankments no steeper than 2H:1V (Horizontal: Vertical).

Evaluate all new embankment fills, retaining walls and modifications of existing fills for settlement, global stability, and other applicable geotechnical considerations.

5.5.1 Settlement

Estimate both magnitudes and time rates of anticipated settlements associated with the Project. Address the potential for immediate settlements and both primary and secondary consolidation.

Design mitigation of settlements and displacements so as to not be detrimental to the performance of facilities, within or outside the Project, during construction and over the course of its design life.

Settlement mitigation approaches applicable to UDOT projects include the following:

- Lightweight fills (including EPS-Geofoam) used to reduce settlement magnitudes
- Prefabricated vertical (PV) drains used to accelerate primary consolidation
- Surcharge (which is defined to include preloads) used to reduce post-construction settlements
- Ground modification used to reduce settlement magnitudes and/or accelerate primary consolidation
- Isolating, underpinning, shoring, etc.

Design surcharge as a pressure rather than as a fill height or to a certain elevation. A minimum surcharge pressure should be approximately 360 psf to account for the final pavement section and traffic loads.

Submit the proposed settlement mitigation methods to the UDOT Geotechnical Consultant Manager. At bridge approaches design all settlements within 150 feet of bridge abutment centerlines to achieve at least 98 percent of the projected total primary settlement before embankments are released for construction. At all other locations, design the settlement to complete at least 95 percent of the total primary settlement

before releasing embankments for construction. At a minimum, use analyses of existing field settlement data, field and laboratory geotechnical investigations, monitoring of settlements during construction, and embankment release timing to demonstrate that long-term settlements will not exceed the following magnitudes over a period of 10 years following construction:

- 1.5 inches per 25 feet.
- Transverse differential settlement (perpendicular to roadway control line): 0.25 inch per 12-foot lane width.
- Bridge foundations total settlement: 1.5 inches (while maintaining required minimum clearances beneath structures.)

Obtain written concurrence from the UDOT Geotechnical Division prior to removal of any surcharge fill. Any surcharge fill which is removed without received this concurrence, may need to be replaced at the discretion of the UDOT Geotechnical Division.

5.5.1.1 Utilities

Evaluate settlement impacts on new and existing utilities, and evaluate the impacts of abandoned utility lines on settlements.

Design settlement mitigation as necessary to allow for effective operation through the design life of utilities.

If any utility line is to be abandoned, coordinate with applicable design disciplines and abandon it in such a way that the utility will not detrimentally impact the performance of the completed facility.

5.5.2 Global Stability

Evaluate global stability of embankments and retaining walls using widely-accepted methodologies and applicable computer software. Available slope stability programs produce a single minimum factor of safety. Table 5-2 lists the minimum acceptable factors of safety for global stability of embankments and retaining walls on UDOT projects.

Table 5-2

Minimum Acceptable Factors of Safety – Global Stability			
Category	**Feature**	**Condition**	**Minimum Factor of Safety**
Slopes and walls located where failure or excessive deformation will impact adjacent bridges or critical facilities	Retaining Walls	Construction	1.3
		Static Long-Term	1.5
		Pseudo-static Seismic	1.0*
		Post-Earthquake	1.1
	Embankments and Cut Slopes	Construction	1.3
		Static Long-Term	1.3
		Pseudo-static Seismic	1.0*
		Post-Earthquake	1.1
All other slopes and walls	Retaining Walls	Construction	1.1
		Static Long-Term	1.3
		Pseudo-static Seismic	1.0*
		Post-Earthquake	1.1
	Embankments and Cut Slopes	Construction	1.1
		Static Long-Term	1.2
		Pseudo-static Seismic	Not required
		Post-Earthquake	Not required

*Estimate deformations where required by subsection 5.2.7 in this Manual.

Evaluate and recommend appropriate means of meeting the factors of safety listed above. Acceptable means of improving factors of safety include modifying embankment slopes, dimensions, and materials, reinforcing embankment, and ground improvement. For short-term construction-phase stability deficiencies, evaluate the potential benefits of staged fill placement, using instrumentation to closely monitor stability conditions.

For medium-stiff to very soft fine-grained foundation soils, evaluate the potential for lateral squeeze.

5.5.3 Retaining Walls

Select and design MSE and cast-in-place retaining walls in accordance with the *AASHTO LRFD Bridge Design Specifications*.

- The UDOT Geotechnical Division maintains special provisions applicable to MSE and PMGW retaining walls, and will provide the current version of each to the Project Geotechnical Engineer upon request.02831S: Retaining Walls – Alternate Systems (insert project-specific soil parameters and seismic criteria)
- 02832S: Select Backfill for MSE Walls
- 02833S: MSE Walls Using Concrete Facing Panels and Metal Reinforcing Elements
- 02834S: MSE Walls Using Concrete Facing Panels and Geogrid Reinforcing Elements
- 02835S: MSE Walls Using Modular Block Units and Metal Reinforcing Elements
- 02836S: MSE Walls Using Modular Block Units and Geogrid Reinforcing Elements
- 02837S: Two-stage MSE Walls Using Concrete Facing Panels and Metal Reinforcing Elements
- 02838S: Two-stage MSE Walls Using Concrete Facing Panels and Geogrid Reinforcing Elements
- 02839S: Prefabricated Modular Gravity Wall (PMGW) Systems Using Large Modular Block Units
- 02840S: MSE Walls Using Wire Face and Metal Reinforcing Elements
-

Special Provision 02831S lists the MSE and PMGW retaining wall systems approved for use on UDOT projects, and includes design and construction requirements for the approved wall systems.

Conform to the current FHWA-NHI publication on MSE Walls and Reinforced Soil Slopes (FHWA-NHI-10-024 and -025, Berg et al., 2009) in the design of two-stage walls, and submit analyses and designs for such walls to the UDOT Geotechnical Consultant Manager.

Provide a minimum four-foot wide horizontal bench in front of retaining walls.

Avoid the use of acute corner MSE walls whenever possible, particularly those having an interior angle less than 70 degrees. For any wall having an angle less than 70 degrees, design the system as an internally tied bin structure with full at-rest lateral earth pressures. In any event, do not use any acute corner MSE wall having an interior angle less than 45 degrees.

Design soil nail walls in accordance with the provisions of Geotechnical Engineering Circular (GEC) No. 7 (FHWA, 2015). Design a drainage system for the soil nail walls including the use of geocomposite vertical strip drains spaced between every column of soil nails, and a base drainage system (protected from freezing) to convey any water seepage away from the toe of the wall.

5.6 FILL AND OTHER GEOTECHNICAL MATERIALS

UDOT Standard Specification 02056 describes the use of excavated materials in embankments, without specified exclusions. However, placement of moderately to highly plastic clays and silts (liquid limit > 50), problematic shale, certain volcanics, and other deleterious excavated materials can adversely affect long-term performance of embankments. Exclude the use of such materials in embankments by modified specification or special provision for the Project where necessary.

Other geotechnical materials acceptable for use on UDOT projects include geotextiles, prefabricated vertical drains (wick drains), composite drains, horizontal drains, sand drains, and certain lightweight fill materials. Acceptable lightweight fill materials include expanded polystyrene (e.g., Geofoam), expanded shale/ceramic aggregate, foamed concrete, pumice, inert steel slag products, and scoria. The UDOT Geotechnical Division maintains special provisions for Geofoam and wick drains and for acceptable lightweight aggregates.

Do not use shredded tires, fly ash, bottom ash, wood fibers, or broken concrete containing exposed rebar in fills.

5.7 CUT SLOPES

Evaluate cut slopes for static and dynamic conditions using methods outlined in one or more of the following publications:

- TRB Special Report 247 (1996)– Landslides: Investigation and Mitigation
- Abramson, et al. (1995)
- Huang (1983)

For cut slopes, meet the minimum factors of safety listed in Table 5-2.

Evaluate rockfall hazards using the Oregon DOT Rockfall Catchment Area Design Guide, acceptable simulation programs (e.g., CRSP), and the Ritchie Ditch criteria (Figure 18-15 in TRB Special Report 247). Conduct stereonet evaluations where applicable. Design rockfall catchment/retention (whether or not barriers or other protective measures are used) according to the following:

	At WL*
Interstate routes	98%
Other roadways	95%

* Minimum retention, at the outside edge of travel lane (typically the white line)

The minimum catchment width with barriers is 12 feet for maintenance access.

5.8 GEOTECHNICAL REPORTS

Prepare geotechnical reports in accordance with Appendix E of this Manual. Submit final reports bearing the seal and signature of a Professional Engineer licensed in the State of Utah. Include all assumptions, design properties, final calculations, and computer inputs and outputs in all reports.

5.9 GEOLOGIC REPORTS

Provide geologic reports as outlined in Appendix F, and prepared by a Professional Geologist licensed in the State of Utah with a minimum of five years experience in similar type of work and report preparation.

5.10 SOIL DATA SHEETS

Prepare signed and sealed UDOT-standard soil data sheets for inclusion in the plans for each structure. Include applicable logs of explorations provided by the Department on sheets marked “For Information Only.”

CHAPTER 6: CONSTRUCTION-PHASE WORK

6.1 GENERAL

The Project may require construction-phase services of the Project Geotechnical Engineer, including the following:

- Maintain compliance with geotechnical designs and recommendations
- Review of Contractor design submittals (drawings and calculations)
- Develop and implement an instrumentation program, with appropriate related construction recommendations
- Movement monitoring of facilities affected by the project
- Perform static pile load testing
- Review existing conditions and revise recommendations where appropriate
- Evaluate pile resistance using PDA with signal matching
- Provide clarification related to recommendations and specifications
- Vibration monitoring

Provide construction-phase services (where requested) in accordance with applicable standards. In some cases these services are provided by geotechnical engineers retained by the Contractor.

On Design-Build projects, the Design-Builder is responsible for construction as designed. The Design-Builder's Geotechnical Engineer provides construction-phase services to ensure compliance with geotechnical designs and recommendations.

6.2 RECORD KEEPING

Maintain a thorough log of all field visits and record all observations and recommendations. Document and substantiate all changes to the original design made in the field. Before changes are made, submit all proposed changes to the UDOT Resident Engineer and the UDOT Geotechnical Consultant Manager for concurrence.

6.3 TEMPORARY EXCAVATIONS AND RETAINING STRUCTURES

Evaluate and mitigate potential impacts of temporary excavations and retaining structures on existing and proposed structures, walls, embankments, utilities, railroads, and other facilities. A Utah licensed professional engineer must design, sign, and seal all plans and calculations for all temporary excavations and retaining structures. Do not incorporate temporary retaining structures or materials into permanent embankments or retaining structures unless the incorporated structures and materials have been designed, constructed, and tested in accordance with the requirements for the permanent construction.

6.4 INSPECTION OF DRIVEN PILE FOUNDATIONS

Where requested, provide pile driving inspection in accordance with the DFI *Inspector's Manual for Driven Pile Foundations* (1997). Use the pile driving forms found in Appendix G of this Manual. Note any observed or reported anomalies on the pile driving log.

6.4.1 Dynamic Pile Testing with Signal Matching Analysis

UDOT Standard Specification 02455 specifies procedures for driven pile installation and PDA testing with signal matching on UDOT projects.

The UDOT Resident Engineer will arrange for PDA testing with signal matching analyses to be conducted by either the UDOT Geotechnical Division or a qualified PDA testing firm. The PDA testing firm is responsible for QC/QA of its work. The UDOT Resident Engineer will coordinate with the Geotechnical Consultant Manager and the Project Geotechnical Engineer to resolve deficiencies in driving resistance determined from PDA testing.

On Design-Build Projects, unless otherwise specified by the Project RFP, the Design Builder is responsible for PDA testing and signal matching analyses, under the direction of the Design-Builder's Geotechnical Engineer.

Test at least one pile at each abutment and bent. Where more than 50 piles are used in an abutment or bent, or where the total foundation length is over 100 feet, test at least two piles, evenly distributed across the pile group(s). In no case test fewer piles than required by *AASHTO LRFD Bridge Design Specifications*.

Establish pile driving criteria based on a pile for which the required driving resistance has been verified by PDA testing and signal matching analysis. In the pile driving criteria for remaining piles, specify the minimum blow count and either the hammer energy or the hammer stroke corresponding to the minimum blow count, and an elevation of minimum acceptable pile penetration.

Acceptance of piles based on projected setup is not allowed on UDOT projects. Where additional setup is anticipated and is necessary to meet the required driving resistance, conduct PDA testing and signal matching analysis after the required setup has occurred.

6.5 INSPECTION OF DRILLED SHAFT FOUNDATIONS

The following manuals provide guidance for drilled shaft inspection.

- *Drilled Shaft Inspector's Manual* (DFI/ADSC, 2004)
- *Drilled Shafts: Construction Procedures and LRFD Design Methods* FHWA-NHI-10-016 (Brown, Turner, and Castelli, 2010)

6.6 STATIC LOAD TESTS OF DEEP FOUNDATIONS

Conduct or provide oversight of static load tests where required. Use the procedures specified in the *AASHTO LRFD Bridge Design Specifications*. Submit load test results, analyses, and conclusions to the UDOT Geotechnical Consultant Manager.

6.7 VIBRATION AND SETTLEMENT MONITORING

Use vibration attenuation relationships published by governmental agencies, applicable equipment manufacturers, and other entities to estimate the zones within which vibrations caused by the Project may impact properties and facilities.

At a minimum, monitor settlements of all structures, utilities, and other facilities:

- Where the estimated total settlement exceeds 0.5 inch.
- Within a horizontal distance *H* from the toe of the embankment, where *H* is the height of the embankment plus any surcharge.
- Where embankments are retained by walls, within 2*H* from the toe of walls.

Specify preconstruction surveys, and the monitoring of vibrations and settlements, at all structures, utilities, properties, and facilities potentially impacted by vibrations from compaction and other construction equipment, pile driving, settlements, roadway blasting, etc. Design and implement additional mitigation measures where needed. For vibration monitoring, the UDOT Geotechnical Division maintains Special Provision 02498S - Vibration Control During Construction Related Activities.

6.8 INSTRUMENTATION

Develop a detailed instrumentation plan to monitor parameters including settlements, slope/wall stability and movements, movements and vibrations of nearby structures, buildings, utilities, railroad tracks, and other facilities, groundwater levels, pore pressures (as applicable), and other geotechnical impacts during construction. Develop and implement plans to mitigate these impacts, both within and outside the planned Right-of-Way. Where long-term settlement of embankments or facilities may occur, provide long-term settlement instrumentation arrays in secure locations.

Develop and implement a Geotechnical Instrumentation Plan, and submit to the UDOT Geotechnical Consultant Manager including the following:

- A description of the proposed instrumentation, including parameters to be monitored, types of instruments to be used, their specific purposes, and typical duration and frequency of monitoring.

- Specific criteria for identifying locations requiring each type of instrument..
- Identification of the anticipated construction limits and the locations of adjacent properties, structures, Utilities, and other features that may be affected by the proposed construction.
- Typical construction drawings showing details for each type of instrument to be used.
- A Special Provision for Geotechnical Instrumentation detailing applicable requirements, the required materials, installation process, maintenance, protection, survey requirements, monitoring procedures for each type of instrument, and abandonment procedures.
- Details of the outside survey control and procedures that will be used to monitor and account for displacements of instrumentation reference/readout points, such as settlement platform readout boxes.
- Generalized details and location information for long-term instruments, points, targets, and/or similar devices that will allow long-term monitoring of displacements after project completion.
- Where instruments are used to monitor stability during construction, the acceptable magnitudes and rates of change in the parameters measured by the instruments, and details of an action plan to be implemented in the event the acceptable levels and/or rates are exceeded.
- Construction-phase and long-term instrumentation in sufficient quantity and type to demonstrate compliance with all requirements of the project.
- Construction plan sheets showing the locations, types, and other applicable parameters (e.g., depths) of all instrumentation to be installed.
- Redundancy in instrumentation of features critical to public safety.

During periods of active instrumentation installation and/or monitoring, submit to the UDOT Geotechnical Consultant Manager a weekly report presenting the data collected to date, accompanied by as-built details and surveyed coordinates of the instruments installed during the previous week.

Consult the paper entitled “Instrumentation and Construction Performance Monitoring for I-15 Reconstruction Project in Salt Lake City, Utah” (Bartlett et al., 2001) in developing construction monitoring programs and stability thresholds for embankments and retaining structures on soft sediments.

Include in the Project drawings and specifications requirements for sturdy, lockable instrumentation covers. Provide redundancy in instrumentation as appropriate to ensure compliance with designs and recommendations. Develop an action plan to be implemented in the event that a given instrument is damaged or fails to operate properly. Ensure that the Project special provisions make the Contractor responsible for immediately replacing all instrumentation damaged during construction, including long-term instrumentation arrays.

Make all instrumentation information available to the UDOT Geotechnical Consultant Manager prior to any construction potentially affected by the parameters being

monitored. Obtain UDOT Geotechnical Consultant Manager approval before abandoning any instrument.

Prior to release of any surcharge, submit documentation demonstrating required degree of primary consolidation settlement has been attained.

Obtain written concurrence from the UDOT Geotechnical Division prior to removal of any surcharge fill. Any surcharge fill which is removed without received this concurrence, may need to be replaced at the discretion of the UDOT Geotechnical Division.

APPENDIX A: SAMPLE FIELD WORK FORMS

See the following three pages.

EXAMPLE FIELD RECONNAISSANCE REPORT FORM

BRIDGE FOUNDATION OR OTHER DRILLING SITE
GEOTECHNICAL DIVISION
UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NO.:_____ COUNTY: _____ STA. NO.: _____
REPORTED BY:_____ DATE _____

1. STAKING OF LINE
____Well Staked
____Poorly Staked, Can we still use? ____
____Request Division to Restake

2. BENCH MARKS
In Place: Yes _____ No _____
Distance from Bridge __ (ft/m)

3. PROPERTY OWNERS
Granted Permission: Yes _____ No _____
Remarks On Back _____

4. UTILITIES
Will Drillers Encounter Underground or Overhead
Utilities: Yes ____ No _____ Maybe ____
At Which Holes? _____
What Type? _____
Who to See for Definite Location _____
_____

5. GEOLOGIC FORMATION _____
_____

6. SURFACE SOILS
Sand ___ Clay ___ Sandy Clay/Clayey Sand
Rock _____ Silt _____ Other _____

7. GENERAL SITE DESCRIPTION
Topography
Level _____ Rolling _____ Hillside _____
Valley _____ Swamp _____ Guillied _____
Groundcover:
Cleared _____ Farmed _____ Buildings ____
Heavy Woods _____ Light Woods _____

8. BRIDGE SITE
Replacing _____
Widening _____
Relocation _____
Check Appropriate Equipment
(describe any potential problems with access)
_____ Truck Mounted Drill Rig
_____ Track Mounted Drill Rig
_____ Failing 1500
_____ Truck Mounted Skid Rig
_____ Skid Rig
_____ Rock Coring Rig

8. BRIDGE SITE - Cont'd
____ Wash Boring Equipment
____ Water Wagon
____ Pump
____ Hose (ft/m)
Cut Section _____ (ft/m)
Fill Section _____ (ft/m)
If Stream Crossing:
Will Pontoons Be Necessary? _____
Can Pontoons Be Placed In Water Easily?
_____
Can Cable Be Stretched Across Stream?
____ How Long? _____ (ft/m)
Is Outboard Motorboat Necessary? _____
Current:
Swift: ___ Moderate: ___ Slow: ____
Describe Streambanks Scour:
If Present Bridge Nearby:
Type of Foundation_____
_____
Any Problems Evident in Old Bridge?
(Incl scour):_____
if nec, describe on back
Is Water Nearby for Wet Drilling? Dis: __ (ft/m)

9. GROUNDWATER TABLE
Close to Surface _____ (ft/m)
Nearby Wells _____ (ft/m)
Intermediate Depth _____(ft/m)

10. ROCK
Boulders Over Area? Yes _____ No _____
Definite Outcrop? Yes _____ No _____
(show sketch on back)

11. SPECIAL EQUIPMENT NECESSARY
_____
_____

12. REMARKS ON ACCESS
_____
_____

13. DEBRIS AND SANITARY DUMPS
Stations _____
Remarks _____

Reference: 1978 AASHTO Foundation Investigation Manual

SAMPLE PERMIT TO ENTER AND CONDUCT EXPLORATORY DRILLING

Job. No.: _____ Address (attach map): _____

Incident to the “Project description”, _____ hereinafter referred to as “ _____”, and the owner of the property at the above indicated address, hereinafter referred to as “OWNER”, do agree as follows:

The OWNER hereby authorizes _____ or its agent or Contractor, to enter and conduct exploratory drilling on the property; install inclinometer casing and/or water observation wells; and to occasionally enter the property on an as-needed basis to conduct downhole monitoring.

The OWNER hereby certifies that he/she is the OWNER of the property at the address indicated above.

This permit shall expire at the completion of the Project or two years from the date of signing of this permit, or by revocation by OWNER in writing.

The foregoing covenants in each and every particular are and shall be construed as real covenants and shall run with the land, and the same hereby made binding upon the heirs, administrators, executors, devisees, assigns and successors in interest of the parties hereto.

Geotechnical Consultant: _____

By: _____ _____
Project Manager Date Owner Date

APPENDIX B: EXPLORATION LOG REQUIREMENTS

Provide the following information on both field and final exploration logs (borings and test pits), unless otherwise specified:

- Project name
- Project location
- UDOT Project number
- Location of borehole or test pit. Describe the position of the exploration with respect to its latitude and longitude. Where useful, provide a sketch of the exploration position on the field boring log.
- Start date of exploration.
- Completion date of exploration.
- Weather: Record the approximate ambient conditions, i.e. temperature, wind and amount/type of precipitation at the time of exploration.
- Exploration number. Number test holes using a consistent, organized, and intuitive numbering system, and briefly explain the numbering system in the Geotechnical Report.
- Borehole inclination
- Sheet ___ of ___ numbers
- Name of geotechnical firm
- Name of field engineer/geologist
- Name of drilling/excavation contractor(s).
- Names of all equipment operators and crew members.
- Method of drilling
- Drilling fluid: mineral slurry, polymer, water, or none
- Make of drilling equipment
- Drill model number
- Surface elevation. Measure the ground surface elevation of the exploration to an accuracy of 0.1 foot or better.
- Borehole diameter.
- Drill bit type and size
- Inside diameter of casing
- Casing wall thickness
- Cased depth
- Excavation method and equipment: Identify the mode and make (John Deere, Case, etc.) of backhoe or other excavator, together with the bucket width.
- Depth scale
- Methods of sampling (pushing, hammering, drilling, coring)
- Sampler type and size.
- Blow counts
- Sample depth
- Depth of changed ground/drilling conditions
- Soil information (description, ASTM classification, USCS symbol, color, density or

consistency/hardness, moisture, plasticity, minor constituents, etc.)
Depth of exploration termination
Length of sample recovered
Date and time of each groundwater level measurement on the field log
Backfilling information
Abandonment procedures
Abandonment certification
Field testing (pocket penetrometer, field vane shear, torvane, falling head permeability)
Depth of wells/piezometers, with material and installation details
Piezometer screen interval
Groundwater levels: during exploration, subsequent to completion, and after installation of well (see notes that follow this list)
Descriptions of any contamination encountered
Comments: Include all pertinent observations (changes in drilling fluid color or loss, rod drops, drilling chatter, rod bounce as in driving on cobble, easy advancement of hollow stem augers, damaged samplers, equipment malfunctions, etc.) in the field log. Also note if rock coring was used at any point to advance the boring through cobbles, boulders, etc. Instruct the driller to report any significant changes during drilling (changes in material, changes in drilling rates, pressures, advancement, occurrence of boulders, and loss of drilling fluid).

Meet the following additional requirements for final test hole logs:

- Use a depth scale on the log that is suitable to the depth of the test hole and the level of detail shown on the log.
- Clearly indicate the top and bottom depth of the range of sampler penetration. Also indicate whether the sample is disturbed or relatively undisturbed. Enter the depth range of the sample interval and the amount of recovery.
- Show the length to the nearest inch of soil sample recovered from the sampler. Do not include slough in the sample.
- List the raw number of blows required for each 6 inches of sampler penetration and the corrected $(N_1)_{60}$ value. Clearly identify where driving is terminated due to practical refusal, defined as a blow count of 50 for an interval less than 6 inches. Record partial penetration, for example of 50 blows for 1 inch, as 50/1”. Also enter the size, type, and section length of the sampling rods. Indicate the hammer weight, type, drop interval, and sampler dimensions in cases where these parameters vary from AASHTO T 206.
- Soil Description: Follow the USCS format. Where appropriate laboratory tests have been performed, assign the equivalent AASHTO soil designations and present them in parentheses on the final logs. Include the soil moisture content, unit weight, strength properties, and other properties where these properties have been tested in the laboratory.

- Groundwater: Enter the depth below ground surface to the static groundwater level in the exploration if encountered, and the date and time of the measurement. When groundwater is encountered, leave borings open for however long possible to monitor groundwater elevations. Generally, measure groundwater levels and record the date and time of the measurement at the end of each day of drilling, each morning before resuming drilling, and at the completion of each boring. Note on the log where free groundwater is not encountered during drilling, or cannot be detected because of the drilling method.

APPENDIX C: GEOMECHANICAL LOGGING

Use the Geomechanical Logging form included at the end of Appendix C to log rock cores. The following sections describe application of the entries of this form and accepted practice for rock core logging.

Drill Interval (From-To column)

The drill interval is the depth of where a drill run begins and ends, corresponding to the Driller's wooden blocks, which are typically placed at the beginning and end of each run. Record this interval record in the "From-To" column.

Recovery (recovered length)

Recovery is the actual length of core retrieved from a drill run. In some cases, recovery will be less than 100 percent of the drilled interval, due to washing of fines, compaction of soft units, or the inability of the core spring (catcher) to break the stub flush with the bottom of the run. Conversely, recovery sometimes exceeds 100 percent due to some caving of the hole (re-drills), expanding clays, or removal of the entire stub at the bottom of the hole during core barrel retrieval. Avoid inadequate and improper drilling methods which decrease the amount of core recovered. Triple-tube core barrels, which add another separate, non-rotating liner, may increase recovery in poor quality, semi-cemented soils, or in zones of highly variable hardness and consistency.

RQD Length (+2X core diameter)

Disregarding mechanical breaks, RQD (Rock Quality Designation) length is the sum of the lengths of the whole core pieces that are equal to or greater than twice the core diameter. Mechanical breaks are not true natural fractures, and for that reason, they are disregarded when considering RQD length, number of whole pieces, and longest-piece measurements. Mechanical breaks frequently form perpendicular to the core axis and are the result of breakage during handling or drilling.

Fracturing often occurs parallel or oblique to the axis of the core, resulting in wedge to rectangular shaped core halves. Determine RQD length for these conditions in the following manner: Project an imaginary line through the center of the core. The RQD length of an individual piece of core is defined as the distance between where this imaginary line intersects the midpoint of the structural plane bounding one end of the piece of core to a point where the line intersects the midpoint of the structural plane bounding the other end of the piece of core.

Whole Piece

Classify as a whole piece any core specimen meeting one of the following criteria:

- Some component of the core specimen has a full core diameter
- If core is fractured down the middle (parallel to the core axis) classify individual pieces with lengths equal to or greater than the core diameter as whole pieces.

Number of Whole Pieces

Disregarding mechanical breaks, the number of whole pieces are the number of pieces that fit the criteria discussed above. Do not count whole pieces in “broken” or “rubbly” zones, as defined in this Appendix.

Mark the location of mechanical breaks induced during extraction from the core barrel and/or transferring the material to core boxes, particularly where core lengths are broken with a hammer to fit into the box. Minimize the practice of breaking core to fit a core box

Length Longest Piece

Disregarding mechanical breaks, measure and record the longest whole piece of core for each drill run. If there are no whole pieces in the drill run, the recovered portion is considered to be broken material, and the length of the longest piece is zero.

Length of Whole Core

This is the sum of all whole core pieces present in the drill interval.

Length Broken Zone

A broken zone consists of a core interval composed of pieces with length of less than one core diameter in which more than 50% of the material is made up of fragments with a diameter of greater than ½ inch.

Length Rubbly Zone

A rubbly zone consists of a core interval composed of pieces with length of less than one core diameter in which more than 50% of the material is made up of fragments with a diameter of less than ½ inch.

Hardness (H)

Use Table C-1 in this Appendix for hardness field testing of each drill run.

Bedding Angle

Record the bedding angle (the surface parallel to the surface of deposition) if the bedding plane is apparent. Adjust the bedding angle for the inclination of the drill hole if the drill hole is not vertical.

Fractures and Fracture Angle

Measure and record the total number of fractures for each angle classification for each drill run. Measure the angle relative to the core axis, with 90° being parallel to the axis of the core and 0° perpendicular to the core axis.

Fracture Filling

Note any fracture filling material and include secondary mineralization and clay gouge along the fractures.

Compressive Strength Testing

Test representative samples of each rock type and variation in the laboratory in accordance with ASTM D 7012.

Notes

The combined lengths of “whole core”, “broken zone” and “rubbly zone” should equal the “recovered” core length.

Make every effort to maximize recovery during rock coring. Box, label, and store all recovered core in accordance with the current AASHTO *Manual on Subsurface Investigations*.

See the following two pages for Table C-1 and Geomechanical Logging form.

Table C-1
Relationship Between Hardness or Consistency and Unconfined Compressive Strength

Hardness	Consistency	Field Identification	Approximate Range of Unconfined Compressive Strength (psi)
		Soils and Fault Gouges	
S1	Very Soft Soil	Easily penetrated several inches by fist	< 3.5
S2	Soft Soil	Easily penetrated several inches by thumb	3.5 – 7
S3	Firm Soil	Can be penetrated several inches by thumb with moderate effort	7 - 14
S4	Stiff Soil	Readily indented by thumb but penetrated only with great effort	14 – 28
S5	Very Stiff Soil	Readily indented by thumbnail	28 – 56
S6	Hard Soil	Indented with difficulty by thumbnail	> 56
		Rock	
R0	Extremely Soft Rock	Indented by thumbnail	28 – 100
R1	Very Soft Rock	Crumbles under firm blows with point of geological pick, can be peeled by a pocket knife	100 – 1000
R2	Soft Rock	Can be peeled by a pocket knife with difficulty, specimen can be fractured with single firm blow of hammer end of geological pick	1000 – 4000
R3	Average Rock	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of hammer end of geological pick	4000 – 8000
R4	Hard Rock	Specimen requires many blows of hammer end of geological pick to fracture it	8000 – 16,000
R5	Very Hard Rock	Specimen requires many blows of hammer end of geological pick to fracture it	16,000 – 32,000
R6	Extremely Hard Rock	Specimen can only be chipped with geological pick	> 32,000

Table based on work by Deere (1968), Terzaghi and Peck (1967), Jennings and Robertson (1969), and Piteau (1970).

Project: _____ Core Size: _____ Dip: _____ Water Depth: _____ Date: _____

DDH No: _____ Total Depth: _____ Azimuth: _____ Logged By: _____ Page _____ of _____

Depth	Graphic	Geologic Description Rock Type, Alteration, Texture, etc.	Drill Run/Core Rec.			RQD		Pieces / Run	Long-Piece	Hard-ness	Bedd. Angle	Fract. Angle				Fracture Filling	Whole Core	Broken Zone	Rubbly Zone	Is (psi)
			From To	Len.	%	Len.	%					0-30	30-45	45-60	60-90					

APPENDIX D: TEST PIT/TRENCH SAMPLING AND LOGGING

Collect sufficient amounts of representative material from the test pit for the intended laboratory observation and testing.

If samples are required from a specific part of the test pits, do not accept a sample that has been raked up through the overburden and topsoil.

Seal samples to prevent moisture loss. Label samples clearly with the test pit/trench number, sample number and sample depth, and identify sample locations on the test pit log.

Obtain intact soil samples from test pits/trenches by cutting ring samples or block samples from the sides or bottom of the hole. The UDOT Geotechnical Division often obtains samples using U type rings having an outside diameter of 2.50 inches and an inside diameter of 2.42 inches, in heights of 1.0 inch and 3.0 inches, and has found the 3.0-inch ring height to be particularly useful for obtaining samples for collapse tests. Carefully handle and transport all samples to the laboratory to preserve their integrity. Ensure that samples are not contaminated by foreign or dissimilar materials.

Prepare logs of exploratory test pits/trenches including the following information:

Depth Below Surface: Use a depth scale on the test pit log that is suitable to the depth of the test pit and the details shown on the log.

Sample Type and Depth: Enter the sample type (i.e., U-type, bag, bulk, etc.), location, and depth. Clearly indicate the top and bottom depth of the range of the collected sample.

Soil Description: Follow the USCS format described in ASTM 2488. Where laboratory classification testing has been performed, show the AASHTO letter/number designation next to the USCS description.

Include also the following information on the logs:

- Lenses or layers of gravel, pea gravel, sand, silt or clay (either in the form of clay balls or clay lenses). This would also include isolated pockets of sand, silt, or clay.
- Record any measurable amount of soft sedimentary rock, clay, silt balls, elongated or flat particles, and list estimated percentages of these features on the logs.
- If groundwater is encountered, indicate the depth below ground level and whether water flows or seeps into the test hole.
- Measure and sketch on the log any observed variations.

Where large rock is encountered, record the following:

-
- Average size rock encountered by percentage
- Type of rock (granite, quartz, sandstone, limestone, etc.)
- Whether the material is well graded or poorly graded

While digging the area make a sketch of the trench/pit location, boundaries, and topographic features. Map man-made features including pipelines, telephone, etc.

APPENDIX E: GEOTECHNICAL REPORT REQUIREMENTS

TABLE OF CONTENTS

Show page numbers for main headings. Include lists of figures, appendices, and attachments

1 GENERAL

Explain the purposes of the study and scope of work.

1.1 PROJECT DESCRIPTION

State the background information which may be necessary to understand or interpret the materials and foundation report. Discussion of the suggested items may be very brief where they may have been adequately covered in a project report.

1.1.1 General

Describe existing site conditions with emphasis on site locations, existing structures and embankments, etc. The size of the Project and the length of corridor segments may require that the site description be broken down into stations or individual structure areas.

1.1.2 Proposed Improvements

Outline proposed improvements and contiguous road system. Describe new structures, embankments, and MSE walls, etc. in this section.

2 PREVIOUS REPORTS AND INVESTIGATIONS

Reference all pertinent reports and correspondence. Provide a brief description of the nature of the paper if the title is not self-explanatory. It is not necessary to append material which could be normally found in UDOT headquarters files such as foundation reports by UDOT and project reports. Do append such items as materials investigations by outside consultants, etc. (i.e., materials are not available in UDOT headquarters.)

Provide a brief description of previous investigations including number of borings, depths, dates of explorations, and drilling. Include relevant subsurface conditions.

3 EXISTING FACILITIES

If portions of the existing highway are to be included, describe the type, age, and condition (including deflection data when available) of the structural section. If pertinent, describe cracking of pavement on embankments and pumping/failing of PCC pavement and their probable causes. Where cross streets are to be replaced in kind, describe the structural section.

Append pictures of existing facilities and the new alignment to aid the presentation.

4 FINDINGS

4.1 SITE CONDITIONS

Provide a brief discussion of topography, terrains, land use, and other surface conditions affecting the highway and proposed widening. Identify sensitive surface and subsurface substructures, existing and abandoned utilities, presence of hazardous and toxic substances which could affect the overall construction of the Project.

Use the UDOT alignment stations for locations.

4.2 SURFACE DRAINAGE

Discuss briefly surface drainage of the site with particular emphasis on springs and signs of groundwater flow. Identify any potential surface drainage problems that may exist within the site, e.g., low areas subject to ponding and flooding, locations of nearby creeks, ponds, and rivers.

4.3 GEOLOGY

Outline the general geological formations at the Project site. Mention the presence of old slides, unstable areas, areas of cracking and subsidence, etc. Append any necessary topographic or geological maps, etc. and reference them in this section.

4.4 FAULTING AND SEISMICITY

Mention the presence of active faults and the seismicity of the area. Append any seismic maps, seismic surveys, etc. and reference them in this section. Discuss estimated mean peak ground accelerations within the study area due to previous or future MCE events. Describe types of faults and ages if applicable.

4.5 SOIL MATERIALS

Describe previous site explorations made in the Project site. Outline general types of soil materials encountered in or inferred from the previous site explorations.

4.6 GEOHYDROLOGIC CONDITIONS

Describe regional geohydrologic conditions based upon previous subsurface investigations and desk studies. Include unusual groundwater conditions, springs, artesian water flow, local ponding, etc.

4.7 CLIMATIC CONDITIONS

Discuss the climatic conditions relevant to the project, including freeze-thaw conditions and the use of deicing salt during winters. Include frost depth of the project area.

5 FIELD AND LABORATORY TESTING

Provide a concise summary of laboratory and field testing, and the physical relationship to the plan and profile of the planned improvement. Discuss the numbering system used to identify test holes and the methods and equipment used in the investigation. List the types of laboratory tests performed. Direct the reader to the locations of test hole logs and laboratory test results in the appendices of the report.

6 STRUCTURES

6.1 DESCRIPTION

6.1.1 General

Describe the proposed structures to be constructed and adjoining bridges in detail. These include the dimensions, types of structures, number of bents, bent spacings, pier heights, types of bridge deck, etc. Include design foundation loads and pile cap elevations, if available for the new structures, types of foundation, footing or pile cap elevations of the adjoining bridges, etc. which could be referenced from as-built foundation plans.

6.1.2 Subsurface Conditions

Describe subsurface conditions underlying the structures on the basis of the new and old site investigation data. Emphasize problem soils that would cause undue total and differential settlements of the structures and instability of embankments.

Provide a general description of the stratigraphy (using USCS classifications). If there are significant differences between borings, describe the strata encountered in each boring. Briefly summarize the results of laboratory testing for the various types of soils

and rock encountered. Geologic cross-sections or fence diagrams may be useful in describing subsurface relationship.

6.1.3 Groundwater

Report groundwater measured during current drilling and past subsurface investigations. Also report the range of water levels in creeks and river channels. Estimate maximum rise of groundwater level. Make note of any evidence of perched groundwater.

6.1.4 Earthquake Considerations

6.1.4.1 Seismic Hazards

Provide discussions of seismic hazards such as ground shaking, fault rupture, seismic criteria, liquefaction potential, seismic soil strength reductions, global seismic stability, and lateral spreading at the Project site.

6.1.4.2 Seismic Design Criteria

Identify the seismic site class and provide ground motion parameters for use in AASHTO LRFD design.

6.1.5 Potentially Hazardous Materials

Describe all soil and groundwater contamination encountered during the subsurface investigation. Identify any special procedures or equipment used during drilling and handling of samples. Select Environmental Protection Agency (EPA) standard test method(s) based on site assessment of area, historical use of land, and field observations. Report results of chemical testing in tabular form. Include constituent, units of concentration, reporting limits, and results. Compare concentrations of contaminants to listed values in state and federal regulations to determine severity of contamination.

6.2 RECOMMENDATIONS

6.2.1 Bridge Structures

Discuss appropriate foundation types, including advantages and disadvantages of each type considered.

6.2.1.1 Foundation Design

A. Pile Support (driven or drilled cast-in-place shafts)

1. Method of support (skin friction and/or end bearing) in clays and dense sandy materials.
2. Suitable pile type(s)- reasons for choice and/or exclusion of types.
3. Pile toe elevations and length of piles.
4. Pile axial compression resistance at the applicable AASHTO LRFD limit states.
5. Reduction of pile resistance due to negative skin friction.
6. Scour depth (elevation) if applicable and method of determination.
7. Effects of induced loads on piles due to adjoining new or existing embankments.

B. Footing Support (if applicable)
1. Elevation of bottom of footing
2. LRFD bearing resistance
3. Approximate settlements at loads corresponding to the applicable AASHTO LRFD limit states
4. Brief description of material on which the footing is to be placed and soil improvement, if expected (i.e., subexcavation)
5. Scour depth (elevation)

6.2.1.2 Settlements

Estimate group settlements and time for the settlements to occur. Discuss potential differential settlements of new and/or existing foundations due to varying subsurface conditions.

6.2.1.3 Uplift

Determine uplift resistance of deep foundations at the applicable AASHTO LRFD limit states. Discuss what governs the uplift capacity and whether the weight of pile should be included in calculating resistance to uplift.

6.2.1.4 Lateral Loading

Determine lateral capacity versus deformation of the pile. Discuss how pile layout, length, spacing, head-fixity and loading conditions would affect the lateral capacity of the piles. Present load-deformation analysis result summary.

6.2.1.5 Load Tests

Discuss the need for pile dynamic analyzer (PDA) tests and static load tests to verify design loads. Recommend pile load test programs for piles near abutments, bent locations if deemed appropriate.

6.2.1.6 Construction Considerations

A. Water table-seasonal or long term fluctuations, data for possible control in excavations (i.e. pumping, well points, tremie seals, amount of groundwater, etc.)
B. Adjacent structures-protection against damage from excavations, pile driving, dewatering, etc.
C. Pile driving - difficulties, clearance, overhead or underground utilities, other unusual conditions, etc. Effects on existing structures due to pile driving, and the corresponding mitigation measures. Include preliminary WEAP evaluations and discuss the implications in terms of required hammer energy, pile section, and pile material strengths.
D. Excavation for pile caps and footings - control of earth slopes including shoring, sheet piles, bracing, and safety considerations.
E. Need for dewatering excavations and evaluation of potential effects on surrounding area/structures.
F. Effects of induced load on piles due to adjoining new or existing embankments.
G. Corrosion effects of various soils and waters, and possibility of galvanic reaction from stray currents.

6.2.2 Embankments

Discuss where new embankments or approach fill embankments are located relative to existing structures. Describe the soil materials on which embankments will be founded.

6.2.2.1 Slope Stability

Conduct stability analyses of proposed embankments for construction conditions, long-term static conditions, and seismic conditions (including dynamic condition during earthquake ground motions and post-earthquake condition when ground motions cease and dynamic strength losses are fully developed), and discuss the results. Recommend potential mitigation methods where needed. Embankments without walls and not adjacent to bridges or critical facilities do not require seismic analysis or mitigation.

6.2.2.2 Settlements

Estimate short term (initial) and long term (primary and secondary) settlements of the embankments and discuss the results.

6.2.2.3 Time rate of settlements

Estimate rate of primary and secondary settlements based upon laboratory and field data. Discuss the results.

6.2.2.4 Construction Considerations

As the construction of the embankments is controlled by the soft grounds, recommend such measures as (1) fill height limit on untreated foundation, (2) controlled rate of loading, (3) surcharging the area, (4) waiting periods, (5) use of wick drains to shorten

the required time delay period, (6) slope protection, (7) use of light weight fills to reduce amount of settlement, and (8) any control devices required such as settlement platforms, piezometers, surface hubs, etc. These issues will be discussed in the following subsections on Staged Construction and Instrumentation.

6.2.2.5 Staged Construction

Discuss staged construction as a means to prevent foundation instability and the gain in undrained shear strength as a result of the staged construction. Discuss also the time required for each staged construction, referencing relevant stability analyses.

6.2.2.6 Instrumentation

Discuss where necessary the need for field instrumentation to monitor settlements and slope stability, including types of instrumentation, e.g., settlement platforms, settlement hubs, piezometers, inclinometers, etc.

6.2.2.7 Foundation Treatments

Make specific recommendations for foundation treatments. As may be necessary, recommend wick drains, stone columns, stabilization trenches, stripping, and special treatments of original ground. Provide any additional information as required.

6.2.3 Retaining Walls and Noise Walls

6.2.3.1 Foundation Designs

Carry out global and external stability of the retaining structures, including seismic, (note that a check of internal stability is also needed for MSE walls); specify allowable and ultimate footing pressures. Provide a brief description of material on which the wall footing is to be founded. Recommend scour depth if footing is subject to damage by flood scour.

6.2.3.2 Settlements

Estimate total and differential settlements of the walls based on the anticipated static and seismic loadings. Briefly discuss method of estimating settlements.

6.2.3.3 Earth Pressures and Geotechnical Parameters

Recommend static earth pressures for level and sloping grounds in terms of equivalent fluid pressures, sliding resistance, adhesion mobilized along the wall base, passive earth pressures and zone, unit weight of backfill, etc.

6.2.3.4 Seismic Loading

Develop seismic earth pressures (in terms of equivalent fluid pressures, where appropriate) for level and sloping grounds and recommend resultant seismic forces that develop behind the wall and inertial forces from backfill (if any).

6.2.3.5 Construction Considerations

Make a provision of a drainage system behind all the walls to intercept groundwater. Discuss specific cut or excavation conditions within given limits. Topics which may require discussion include types and conditions of materials, groundwater and springs, existing slopes, underground utilities, faults, temporary support, cut slope design, benching, maintenance, debris interception, temporary slope protection, etc. Make any suggestions considered necessary for excavation procedures. Discuss select material when pertinent. Provide any additional recommendations as needed.

6.2.3.6 Foundation Treatments (if applicable)

Recommend types of stabilization methods to mitigate unacceptable differential settlements of the walls and to enhance wall stability.

7 EARTHWORK

7.1 ROADWAY AND EMBANKMENTS

Evaluate and discuss the existing conditions. Items which may require discussion include relative compaction of existing fills, groundwater, springs, unsuitable soils, expansive soils, dumps, underground utilities, etc. Use concise engineering classification in discussion of soils.

7.2 SITE PREPARATION

Provide a brief discussion of site and subgrade preparation.

7.3 FILL PLACEMENT AND COMPACTION

Recommend methods of fill placement and compaction for embankments and retaining walls in accordance with UDOT standard specifications. These may include recommendations for moisture control, fill placement over frozen soils, erosion control, contouring, temporary drainage and expansive soil. Where applicable, include recommendations for special treatments to mitigate settlement or compression within the approach embankments to structures. This may include use of imported borrow, special compaction, or other methods as may be dictated by the available material.

7.4 EXCAVATION

Briefly discuss anticipated permanent and temporary excavations with particular reference to soil conditions. Discuss and evaluate potential adverse effects of excavations on adjacent structures and buildings.

7.5 EARTHWORK FACTORS

Provide earthwork factors and pertinent information for excavation and backfill.

7.6 RE-USE OF EXCAVATED SOIL MATERIALS

Briefly discuss re-use of excavated materials. It may be appropriate to discuss availability or scarcity of materials, quality, economic factors, or other factors which may affect material selection or embankment design. Where applicable, comment on material disposal, potential disposal sites, stockpiling for other parts of the Project, etc.

7.7 CUT & FILL SLOPES

Provide specific recommendations for cut and fill slopes. These may include proposed cut and fill slope design, surface erosion mitigation, control groundwater flow and springs by means of subdrains or dewatering systems.

7.8 TEMPORARY EXCAVATIONS

Provide specific recommendations for temporary cut and fill slopes and temporary surface erosion mitigation.

7.9 DEWATERING AND SUBDRAINS

Recommend methods of dewatering for excavations and types of sub-drainage systems for the Project.

8 CORROSION INVESTIGATIONS

Obtain soil samples from test holes and confirm the corrosion potential of soils to material types to be used for any subsurface structure. Report test results of laboratory analysis of soil. Typical laboratory testing includes pH, resistivity, sulfates, chlorides, and soluble salts. Use test results to determine corrosion potential of soil, especially in areas of pipes and foundations, and in selecting cement type.

Where applicable, conduct a culvert study from the pH and electrical resistivity values to determine estimated life span for a standard gage steel culvert. Recommend a gage type to increase longevity to 50-year life span.

Provide a recommendation of the appropriate cement type to be used for concrete in contact with soils.

State that the estimated years to detrimental corrosion can vary significantly according to the factual variables of concrete manufacture that are used in construction. If there are existing structures, describe any visible evidence of distress caused by the environment. For example, the evidence of distress could be described by a simple statement such as “Concrete cracking and rust stains in substructure.”

9 RECOMMENDED MATERIAL SPECIFICATIONS

Include suggested specifications for all materials used in the structural section, plus imported borrow, structure backfill, embankment fill, ballast and sub-ballast (if applicable) and drainage materials. Where possible, use UDOT standards and special provisions as references. For MSE backfill, use UDOT special provisions.

10 CLOSURE

Provide a brief closure of the report. List areas or topics that may require further investigation.

11 LIMITATIONS

List statements of limitations and potentials for unknowns.

12 REFERENCES

Provide complete citations for all references in alphabetical order.

TABLES

Present tables referenced in the body of the report, except where such tables are presented within the body.

FIGURES

Present figures referenced in the body of the report. Examples are vicinity map, site plans, geologic maps, fault maps, test hole location plans, subsurface soil profiles, seismic design response spectrum, etc.

APPENDICES

Examples of material include boring logs, CPT logs, soil data sheets, laboratory testing data, field test data (if applicable), instrumentation data (if applicable), copies of reports by outside consultants, seismic surveys, special correspondence or memos, maps, and

cross-sections, as-built foundation drawings, all design assumptions and property values, design calculations, computer program inputs and outputs, etc. Organize and label appendices so that information can be easily accessed.

PHOTOGRAPHS

Append photos of existing facilities and the new alignment.

APPENDIX F: GEOLOGIC REPORT REQUIREMENTS

1 Introduction
- 1.1 Purpose of Project
- 1.2 Location and Limits of Project
- 1.3 Site Description
- 1.4 Main Project Features
- 1.5 Purpose of Report
- 1.6 Related Reports

2 Subsurface Exploration

3 Geologic Setting
- 3.1 Regional Geology
- 3.2 Seismicity
  - Surface Fault Rupture
  - Ground Shaking
- 3.3 Site Geology
  - Fills
  - Talus
  - Colluvium
  - Alluvium
  - Bedrock
- 3.4 Discontinuities in Rock Mass
  - Bedding
  - Folds
  - Faults & Shear Zones
  - Jointing
- 3.5 Geologic Conditions Along Alignment or Area (including possibility of failure along each geologic segment)
  - Failure Types-wedge, sliding, bedding plane, toppling
- 3.6 Geohydrologic Conditions
  - Surface
  - Subsurface
- 3.7 Geotechnical Engineering Properties
  - Description
  - Soil Overburden Design Parameters
  - Bedrock

4 Geologic Features of Engineering & construction Significance
- 4.1 Talus Slopes
- 4.2 Rock Fall Zones
- 4.3 Fault & Shear Zones

5 Man-made Features of Engineering & Construction Significance
- 5.1 Existing Landslides

5.2 Existing Roadway and Culverts
5.3 Adjacent Communities
5.4 Utilities
5.5 Railroads
6 Cuts and Retaining Walls
6.1 Rock Cuts
Local Experience
Design Considerations and Assumptions
Construction Sequence
Behavior During Excavation
Excavation Methods
Blasting Specification
Ground Support
6.2 Soil Overburden Cuts
Design Considerations and Assumptions
Construction Sequence
Behavior During Excavation
Excavation Methods
Ground Support
6.3 Retaining Walls
Design Considerations and Assumptions
Construction Sequence
Behavior During Excavation
7 Geotechnical Instrumentation and Monitoring
References
List of Tables
List of Figures
Appendices
Photographs

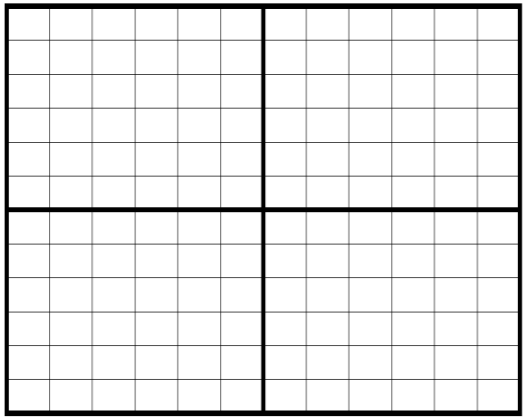
APPENDIX G: PILE DRIVING FORMS

See the following three pages.

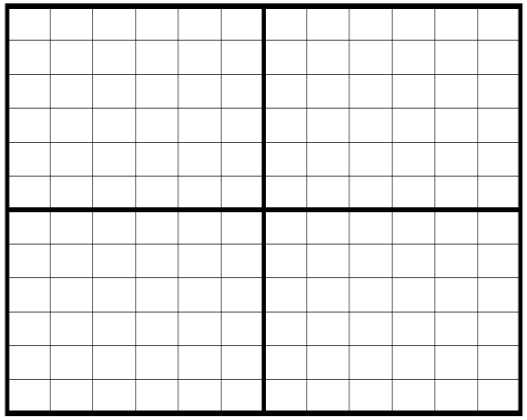
PILE DRIVING RECORD

Project:		Hammer Type:		Date:	
Location:		Hammer Model:		Inspector:	
Resident Engineer:		Pile Location & No.:		Weather:	
General Contractor:		Pile Type & Dia.:		Temp:	
Pile Contractor:		Pile Tip:		Final Length:	

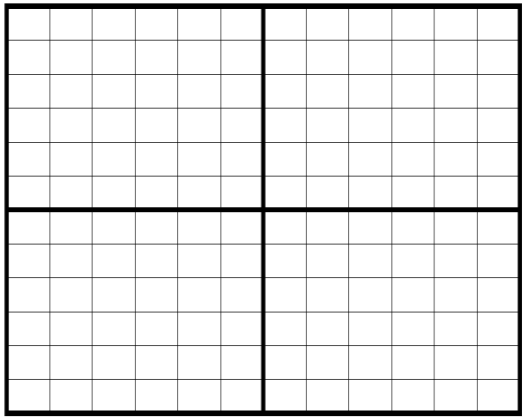
PLUMBNESS



PILE CENTER



PILE CAP LAYOUT



COMMENTS:

PILE DRIVING RECORD

for piles up to 90 feet deep

Depth (ft)	Blows	Remarks	Depth (ft)	Blows	Remarks	Depth (ft)	Blows	Remarks
1			31			61		
2			32			62		
3			33			63		
4			34			64		
5			35			65		
6			36			66		
7			37			67		
8			38			68		
9			39			69		
10			40			70		
11			41			71		
12			42			72		
13			43			73		
14			44			74		
15			45			75		
16			46			76		
17			47			77		
18			48			78		
19			49			79		
20			50			80		
21			51			81		
22			52			82		
23			53			83		
24			54			84		
25			55			85		
26			56			86		
27			57			87		
28			58			88		
29			59			89		
30			60			90		

PILE DRIVING RECORD

for piles 90 to 130 ft. deep with relatively easy driving in upper 50 ft.

Depth (ft)	Blows	Remarks	Depth (ft)	Blows	Remarks	Depth (ft)	Blows	Remarks
0-5			71			101		
5-10			72			102		
10-15			73			103		
15-20			74			104		
20-25			75			105		
25-30			76			106		
30-35			77			107		
35-40			78			108		
40-45			79			109		
45-50			80			110		
51			81			111		
52			82			112		
53			83			113		
54			84			114		
55			85			115		
56			86			116		
57			87			117		
58			88			118		
59			89			119		
60			90			120		
61			91			121		
62			92			122		
63			93			123		
64			94			124		
65			95			125		
66			96			126		
67			97			127		
68			98			128		
69			99			129		
70			100			130		

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7—LANDSCAPING AND AESTHETICS

7A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 7 (Landscaping and Aesthetics) and to satisfy all functional needs of the Project, including soil preparation, planting, irrigation, mulching, seeding, invasive weed control, aesthetic treatment of bridges/structures, walls, sidewalks, lighting, fencing/railing, colors, and incorporation of municipal Betterments.

7B. STANDARDS

Complete work for landscaping and aesthetics elements in accordance with the requirements of the standards listed by priority in Table 7B-1 (Standards for Landscaping and Aesthetics).

If there is any conflict in Standards, adhere to the Standard with the highest priority.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

TABLE 7B - 1
STANDARDS FOR LANDSCAPING AND AESTHETICS

Priority	*Author or Agency*	*Title*
1	UDOT	Special Provisions included in Part 5
2	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
3	UDOT	*2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
4	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
5	UDOT	*2012 Standard Drawings for Road and Bridge Construction*
6	AASHTO	*A Policy on Geometric Design of Highways and Streets*
7	AASHTO	*Roadside Design Guide*
8	Various	*Municipal maintenance agreements*
9	UDOT	*Project Aesthetics and Landscaping Plan Development and Review, Policy 08A-03*
10	UDOT	*Aesthetics Guidelines*
11	UDOT	*Placement of Monument Features and City Logo Panels on State Highways, Policy 08A-02*
12	UDOT	*Monument Feature and City Logo Panel Design Guidelines*
13	Division of Administrative Rules	*Utah Administrative Code R307-361 Architectural Coatings*
14	Local Government	*Irrigation Standards*
15	AASHTO	*Construction Stormwater Field Guide*

7C. REQUIREMENTS

Design and construct all aesthetics and landscaping elements to meet the following requirements:

A. For baseline aesthetic and landscaping treatments for the Base Build:

a. Commit to provide Project aesthetics and landscaping in accordance with this Section and the UDOT Baseline Aesthetics Guidelines. Include an additional $100,000 per interchange in the Contract Amount for Project aesthetic and landscaping enhancements, this does not include design costs. Design costs for Project aesthetic and landscaping enhancements is included in the lump sum design cost in the Contract Amount.

b. Build Alternative 4015 West, provide landscape treatment at specific locations as follows:

1. Northwest corner of Sams Boulevard and 4000 West:

a. Protect in place and maintain the existing trees that are not directly displaced by new sidewalk or other Project related elements.

b. Protect in place and/or relocate the existing irrigation system to maintain irrigation to plant material.

c. In new landscape areas and existing landscape areas that are disturbed:

i. Place weed barrier in accordance with this section and use existing landscape rock in accordance with this section.

ii. If additional landscape rock is required, match existing rock and install in accordance with this section.

2. Southeast corner of Point Lane and 4000 West:

a. Place topsoil and roadside seed in accordance with this section.

3. Southeast corner of 5415 South and 4120 West:

a. Place weed barrier and landscape rock in accordance with this section.

B. If landscaping is incorporated, use plant material that is drought-tolerant, and design irrigation systems that minimize water consumption and minimize maintenance.

7C-1 Aesthetics and Landscape Design Packages

For review and acceptance of Aesthetics and Landscape plans follow the UDOT Project Aesthetic and Landscaping Plan Development and Review Policy (08A-03) and Aesthetics Guidelines. This policy requires coordination with the Department, and UDOT Aesthetic Committee and local municipalities involved in the project.

After NTP coordinate with the Department to develop a Conceptual Aesthetics and Landscape Design Package that incorporates elements set forth in this Section, baseline condition, and possible enhancements. Provide Department personnel with necessary support regarding landscape and irrigation design in the form of personnel and/or design data/drawings to assist when coordinating with local municipalities. Coordination with the local municipalities should take place through the development and approval of the Conceptual Aesthetics and Landscape Design Package. Any communication between the Project and the local municipalities will be coordinated through the Department.

Submit for review a Conceptual Aesthetics and Landscape Design Package that addresses the items on the Conceptual Aesthetics and Landscape Design Checklist found in the Aesthetics Guidelines.

Incorporate any revisions or changes to the plan required by the Department and the UDOT Aesthetics Committee. Submit for Approval a Final Aesthetics and Landscape Design Package that includes all the interchanges and addresses the items on the Final Aesthetics and Landscape Design Checklist found in the Aesthetics Guidelines (Appendix D).

Allow a minimum of 30 Calendar Days for an Approval process involving the UDOT Aesthetics Committee. See Part 3 (Quality Program) for review times.

7C-2 Structures Aesthetics Criteria

Provide aesthetic treatments on bridge components, retaining walls, and noise walls. Provide structural aesthetic treatments as follows:

A. When designing the structures on the Project, the Department will require that the design priorities listed in Table 7C-2 (Design Guidelines for Structures Aesthetics Criteria) be followed when incorporating aesthetics into structural elements.

TABLE 7C - 2
DESIGN GUIDELINES FOR STRUCTURES AESTHETICS CRITERIA

Design Priority	*Structural Design Element or Feature*
1	Horizontal and Vertical Geometry
2	Superstructure Type and Shape
3	Bent Placement and Span Arrangement
4	Abutment Placement and Height
5	Bent, Girder, and Parapet Shape and Construction Material
6	Color and Texture of various Structural Elements
7	Ornamentation and Details

B. MSE Panel and Cast-in-Place Wall Treatments:

1. Use basalt texture form liners with a minimum 2” textural relief.
2. Apply Concrete Coating: FS 36492 tinted concrete sealer to all exposed surfaces. See Standard Specification 09981 (Concrete Coating).

C. Coping, Abutment and Wingwall Treatments:

1. Provide smooth concrete finish.
2. Apply Concrete Coating: FS 36492 tinted concrete sealer to all exposed surfaces. See Standard Specification 09981 (Concrete Coating).

D. Parapet Treatments:

1. Construct recessed windows with paired (top and bottom) concrete architectural dowel holes (maximum three foot on center spacing in recessed window insets). Provide smooth concrete finish on window frames and insets.
2. Apply Concrete Coating: FS 36492 tinted concrete sealer to all exposed surfaces. See Standard Specification 09981 (Concrete Coating).

E. Bridge Column Treatments:

1. If square, form columns with vertical recessed windows (one on each side of the column). Provide paired concrete architectural dowel holes in the recessed windows at a maximum four feet on center). Provide smooth textural finish.
2. If round, no recessed windows are required. Provide smooth concrete finish.
3. Apply Concrete Coating: FS 36492 tinted concrete sealer to all exposed surfaces. See Standard Specification 09981 (Concrete Coating).

F. Girder Color Treatments:

1. Concrete Girders: Apply FS 30109 tinted concrete sealer to exterior side of exterior girders and the bottom flange of all girders.
2. Steel Girders: Apply paint using FS 30109. See Standard Specification 09972 (Painting for Structural Steel).

G. Noise Wall Treatments:

1. Bangerter Highway Facing Side: Provide single panel with exposed aggregate treatment and one-foot wide smooth finish top cap (Refer to UDOT Standard Drawing SW 6).
2. Non-Bangerter Highway Facing Side: Provide single panel with 'Ashlar' texture pattern (one-inch relief) and one-foot wide smooth finish top cap (Refer to UDOT Standard Drawing SW 6). Where tying into existing panels continue exposed aggregate wall to the property boundary. Use a single texture within the limits of a parcel.

H. Pedestrian Bridge Treatments:

1. Steel Truss Girders: Apply paint using FS 30109. See Standard Specification 09972 (Painting for Structural Steel).
2. Concrete Columns:
   a) If square, form columns with vertical recessed windows (one on each side of the column). Provide paired concrete architectural dowel holes in the recessed windows at a maximum 3-foot on center spacing). Provide smooth textural finish.
   b) If round, no recessed windows are required. Provide smooth concrete finish.
   c) Apply Concrete Coating: FS 36492 tinted concrete sealer to all exposed surfaces. See Standard Specification 09981 (Concrete Coating).

7C-3 Monument Features and City Logos

Any proposal or request by local municipalities to incorporate a city monument feature or logo into the Project will be required to follow UDOT Placement of Monument Features and City Logo Panels on State Highways Policy (08A-02) and the Monument Feature and City Logo Panel Design Guidelines.

7C-4 Topsoil

Provide topsoil that is free of petroleum products, construction waste, debris, and particles larger than one inch in any dimension. Use existing topsoil wherever possible. Strip and stockpile topsoil from available open areas to be impacted by the Project.

7C-4.1 Existing Topsoil

Existing topsoil may be stripped and stockpiled from the ROW and other suitable environmentally cleared project areas and re-used on Project disturbed slopes when all of the following criteria are met:

A. The existing topsoil is free of petroleum products, construction waste, and other contaminants.

B. The area being stripped currently supports suitable vegetation.

C. The soils are not currently growing weeds included on the State's noxious weed list.

7C-5 Planting Design Criteria

7C-5.1 Plants

Obtain Approval for all plant selections and sizes. Provide plant material as follows:

A. **Trees:** Along freeways, do not locate any trees within 36 feet of the edge of the traveled way, except in areas shielded by barrier; do not place barrier to provide larger planting areas. Do not locate any trees inside the clear zone or in areas that may obstruct safe view distances from intersections and driveways. If the landscaping plan includes trees planted in the park strip, select trees appropriate for street use that provide adequate vertical clearance for vehicles and pedestrians and minimal overhang of the roadway. Consider mature height and spread of trees in the design. When selecting tree varieties, choose trees that are well adapted to the Project area and that are not susceptible to disease or other problems that will limit successful long-term growth.

1. Protect all existing trees within the Project limits that are not considered weedy species. Provide environmental fence around the canopy or dripline of all existing trees to be protected. Do not park or store equipment and construction material within fenced area of existing trees.

2. Provide tree staking on slopes greater than 4:1 (H:V).

3. For mulching around tree plantings the follow requirements listed under compost and bark mulch in this Section.

B. **Shrubs:** Along freeways, do not locate any shrubs inside the clear zone and all plants must meet height requirements. At intersections and driveways, select shrubs that allow safe viewing of the roadway from vehicles. Locate shrubs only in planting beds.

C. **Groundcovers, Ornamental Grasses and Perennials:** Use groundcovers, ornamental grasses and perennials to add color, texture, and seasonal interest to the landscape design; locate groundcovers and perennials in planting beds in masses at appropriate spacing with like varieties. Position groundcovers, ornamental grasses and perennials as masses only in planting beds.

D. **Turf Sod and Irrigation:** Restore irrigation and turf sod where there is existing turf sod, unless a property owner has been previously compensated by cost-to-cure agreement.

E. **Roadside Seed:** Seed throughout all disturbed areas of the Project that will not be stabilized with landscape treatments (i.e., turf sod and irrigation, planting beds, and landscape rock, etc.) in accordance with the seed schedule in Table 7C-3.

F. **Planting Beds**: Arrange trees, shrubs, groundcovers, ornamental grasses, and perennials into groupings or masses referred to as "planting beds". Area of planting beds should be identified by placement compost and bark mulch. Install a landscape edge along the perimeter to define and distinguish the planting bed from surrounding conditions.

7C-5.2 Plant Classifications

A. Plants are classified by category, size, and whether they are deciduous or evergreen. Comply with the American Association of Nurserymen Standards for Nursery Stock for the minimum tree height associated with the specified caliper of each species type.

B. Use the following classifications and criteria and provide a plant material and size schedule in the Released for Construction landscape plans to define the planting material:

3. **Shade Trees** (deciduous trees taller than 30 feet at mature height): Use 2-inch caliper minimum tree size at time of planting.
4. **Ornamental Trees** (deciduous trees between 15 and 40 feet at mature height, with ornamentals having distinct or showy characteristics in flower, fruit, leaf color, or form): Use 1.75-inch caliper minimum tree size at time of planting.
5. **Evergreen Trees** (evergreen or broadleaf evergreen leaf trees with a minimum mature height of 15 feet): Use 5-foot minimum tree height at time of planting.
6. **Deciduous Shrubs** (any deciduous shrub classified by height, large shrub with mature height greater than 12 feet, medium shrub with a mature height between 6 to 12 feet, small shrub with a mature height less than 6 feet.): Plant a 5-gallon minimum container size.
7. **Evergreen Shrubs** (shrubs having evergreen or broadleaf evergreen leaves): Determine the minimum size at planting by the predominant direction of growth. Use similar shrub size description referenced in deciduous shrub above. Plant a 5-gallon minimum container size.
8. **Groundcover:** (herbaceous perennials planted typically for their spreading growth characteristic): Use a minimum 4-inch pot size at time of planting.
9. **Turf Sod**
10. **Perennials and Ornamental Grasses**: Use a 1-gallon minimum container size at the time of planting.

7C-5.3 Organic Mulch

A. Place compost at a minimum depth of 2 inches throughout entire limits of planting beds.

For individual trees placed outside the limits of planting bed areas, compost shall be applied at a minimum depth of 2 inches and at a minimum 3-foot diameter area centered about the tree collar. Use only compost that meets the following requirements, and submit the source of material to the Department and obtain Approval before ordering. Compost shall:

1. Be weed-free, organic compost derived from a variety of feed stocks including agricultural, biosolids, forestry, food, leaf and yard trimmings,

manure, and tree wood with no substances toxic to plants.

2. Derived from well decomposed organic matter source produced by controlled aerobic (biological) decomposition that has been sanitized through the generation of heat and stabilized to be appropriate for landscape applications.

3. Processed through proper thermophilic composting, meeting the US Environmental Protection Agency's definition for a 'process to further reduce pathogens' (PFRP).

4. Meet the chemical, physical, and biological properties outlined below:

Parameters	Units of Measure	Acceptable Compost
PH	PH Units	5.0-8.0
Soluble Salt Concentration	dS/m	< 5
Stability Dioxide Rate	mg CO_2-C per g OM per day	< 8
Physical Contaminant	% dry weight base	< 1

B. Apply bark mulch over the top of the placed compost to a minimum depth of 3 inches. Designate planting bed areas on the plans, and spread bark mulch over placed compost, throughout the entire planting bed and around root balls. For individual tree plantings located outside of planting beds or tree groupings, extend bark mulch to cover a 3 foot minimum diameter around the tree collar. Use only bark mulch that meets the following requirements, and submit the source of material to the Department for Approval before ordering:

1. Is composed of shredded bark (not ground scrap lumber or pallets)

2. Has been decomposed in a pile for a minimum of 120 Calendar Days

3. Has a pH 6.0 to 7.5

4. Has a maximum size of 1.5 inches thick and 6 inches long for at least 75 percent of the applied mulch

5. Has only natural bark color with no additional stain or color additives

6. Install landscape edge around perimeter of bark mulch to define its limit and boundary from surrounding conditions.

7C-5.4 Landscape Rock

Use landscape rocks in accordance with Part 5 (Special Provisions and Exceptions).

7C-5.5 Landscape Edge

Use a concrete landscape edge to define the perimeter boundaries of planting beds and Landscape Rock areas where other concrete (i.e.-sidewalk, curb, etc) is not present. Place a composite board Landscape Edge inside of planting beds and Landscape Rock areas to separate various materials (rock, bark mulch, and roadside grasses), including types of landscape rock. Landscape Edges are to keep material from moving, rolling, or creeping into adjacent treatment. Adhere to the following criteria when designing and placing landscape edge:

A. Perimeter landscape edge: constructed of concrete.

B. Interior landscape edge: constructed of composite board. Submit three composite board samples depicting color, size, and manufacturer installation instructions to the Engineer for Approval.

C. Placed or installed on compacted soil.

D. Overall height of the landscape edge must be tall enough to keep adjacent materials (rock, gravel and/or mulch) from moving across edge.

7C-6 Roadside Seed

A. Seed all disturbed ground areas. Install seeding by drilling or broadcasting in accordance with UDOT Standard Specification 02922.

B. Apply wood fiber mulch to all seeded areas with slopes less than 2:1.

C. Apply steep-slope erosion control to all seeded areas with slopes 2:1 or steeper.

Use the following seeding schedule:

Table 7C - 3
Seed Schedule

Seed No.	Species Name		Number of Seeds per pound	Drill Seed			Broadcast Seed		
	Botanical	Common		Pounds of pure live seed per acre	Percent of mix	Seeds per sq. ft.	Pounds of pure live seed per acre	Percent of mix	Seeds per sq. ft.
1	Agropyron cristatum 'Roadcrest'	RoadCrest wheatgrass	265,250	3.00	15.51%	18.27	4.50	15.51%	27.40
2	Elymus wawawaiensis	Snake River wheatgrass	120,000	4.00	9.36%	11.02	6.00	9.36%	16.53
3	Festuca ovina 'Covar'	Covar sheep fescue	680,000	2.50	33.14%	39.03	3.75	33.14%	58.54
4	Poa secunda spp. Sandbergii 'High Plains'	High plains sandberg bluegrass	925,000	1.50	27.05%	31.85	2.25	27.05%	47.78
5	Thinopyrum intermedium 'Tegmar'	Tegmar intermediate wheatgrass	88,000	4.50	7.72%	9.09	6.75	7.72%	13.64
6	Linum lewisii 'Maple Grove''	Maple Grove blue flax	170,000	1.00	3.31%	3.90	1.5	3.31%	5.85
7	Penstemon Eatonii 'Richfield'	Richfield firecracker penstemon	400,000	0.50	3.90%	4.59	0.75	3.90%	6.89
Total				17.00	100.00%	117.75	25.50	100.00%	176.63

7C-7 Invasive Weed Control

Control invasive weeds in all disturbed areas in accordance with Part 5 (Special Provisions and

Exceptions) 02924S (Invasive Weed Control). Control invasive weeds for the duration of the Project.

7C-8 Irrigation

Meet the standards for the local municipality for any proposed irrigation. Submit the design of the irrigation to the local municipality and Department for Approval. Irrigation systems should be designed without any overhead spray irrigation (pop-up or rotor) immediately adjacent to the roadway.

7C-9 Park Strip, Median, and Island Treatments

Apply one of the following treatment options to park strips, medians, and islands within the Project limits:

A. Stamped Colored Concrete:

1. Use integral concrete color Fed. Std. 36081 or approved equal.
2. Use ashlar slate pattern or approved equal.
3. Provide construction joints that parallel the ashler slate pattern.

B. Cobble Rock:

1. Use 3 to 6-inch cobble rock placed 6 inches in depth.
2. Place weed barrier fabric under rock..
3. For island areas, use a 4-foot wide band of stamped colored concrete (see above) around the perimeter and cobble rock for the interior portion.

7C-10 Landscape Treatments at Specific Locations

Provide landscape treatment at specific locations as follows:

A. Parcels 536, 562, and 565. Use a combination of landscape rock and stamped colored concrete in accordance with this section. Landscape treatments should be used in a manner compatible with the primary use of the parcel.

B. The Oval-A-Bout on 11400 South between River Heights Drive and Summer Heights Drive and District Drive and Parkway Plaza Drive. Place native borrow 4-inch below sidewalk and/or top back of curb. Native borrow must be free of petroleum products, construction waste, and other contaminants, including large rocks greater than 3-inches in diameter.

C. New Detention Basins. Use landscape rock in accordance with this section.

7D. SUBMITTALS

Provide submittals to the Department in accordance with Table 7D-1.

TABLE 7D – 1
DESIGN-BUILDER SUBMITTALS FOR LANDSCAPING AND AESTHETICS

Submittal	***For Approval***	***Schedule***
Conceptual Aesthetics and Landscape Design Package (Aesthetics committee)	Yes	After NTP
Final Aesthetics and Landscape Design Package	Yes	Obtain Approval prior to Initial Design Milestone Submittal Package for Structures and affected Release for Construction Documents
Sources of material for (i) Landscape Rock, (ii) Compost, and (iii) Bark mulch samples	Yes	Obtain Approval prior to Released for Construction Documents
As-Built Irrigation Plans	No	With As-Built Documents

8—LIGHTING

8A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 8 (Lighting) and satisfy all functional needs of the Project, including lighting for mainlines, ramps, city streets, pedestrian bridge, railroad tracks under overhead structures, roadway underpasses and daytime lighting.

8B. STANDARDS

Complete Work for lighting in accordance with the requirements of the standards listed by priority in Table 8B-1 (Standards for Lighting).

If there is any conflict in Standards, adhere to the Standard with the highest priority.

TABLE 8B-1
STANDARDS FOR LIGHTING

Priority	*Author or Agency*	*Title*
1	UDOT	Special Provisions included in Part 5
2	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction*, as modified by Part 5
3	UDOT	*2012 Standard Specifications for Road and Bridge Construction*, as modified by Part 5
4	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
5	UDOT	*2012 Standard Drawings for Road and Bridge Construction*
6	AASHTO	*A Policy on Geometric Design of Highways and Streets*
7	AASHTO	*Roadside Design Guide*
8	UDOT	*Utah Manual on Uniform Traffic Control Devices* (Utah MUTCD)
9	NFPA	*National Electrical Code*
10	UDOT	*UDOT Design Guidelines for Signalized Intersections*
11	AASHTO	*Roadway Lighting Design Guide*
12	IES	*Roadway Lighting (RP-8)*
13	IES	*Technical Memorandum on Light Trespass: Research, Results, and Recommendations (Reaffirmed 2011) - IESMA TM-11-2000*
14	City	*South Jordan and West Jordan City Street Light Standards*

8C. REQUIREMENTS

Provide lighting systems as follows:

A. Supply a uniform light distribution where lighting is provided.

B. Avoid light pollution and light trespass outside of any highway or Right-of-Way corridor.

C. Avoids disability or discomfort from glare to users.

D. Design the lighting to allow ease of maintenance and servicing without lane closures.

E. Provide partial interchange lighting including all on-ramp areas, off-ramp areas, lane drop areas and ramp terminal intersections as defined in Part 7 (Contract Drawings).

F. Provide pedestrian lighting on the landings/ramps of the pedestrian bridge near 7000 South. Design the lighting to provide light for pedestrians on the bridge, ramps, and landings.

G. Relocate the existing decorative lights along 11400 South within the Project limits in accordance with South Jordan City Standards. Reuse the existing poles and luminaire assemblies. Replace any poles damaged by construction.

H. Relocate the existing lights on 7000 South that are impacted by the project in accordance with West Jordan City Standards. Reuse the existing poles and luminaire assemblies. Replace any poles damaged by construction. .

I. Provide lighting at all signalized intersections, including roadway luminaires at each corner. If overhead utilities prohibit the use of signal pole extensions, provide separate luminaire poles and arms located outside the conflict area.

J. Provide lighting for all pedestrian crosswalks in accordance with Part 7 (Contract Drawings).

K. Provide lighting on Bangerter Highway at 11400 South in accordance with Part 7 (Contract Drawings).

L. Provide understructure lighting for all new structures over public roadways within the Project limits, except for the pedestrian bridge at 7000 South. Provide and locate understructure luminaires to reduce the likelihood of tampering and damage by vandals.

M. Install a 2-inch future-use PVC conduit with tracer wire (single No. 14 AWG copper THHN wire) from each lighting power pedestal to the nearest ATMS junction box or cabinet.

8C-1 Design Criteria

Use the Illuminance Method for all lighting design calculations. See Part 7 (Contract Drawings) for lighting calculation requirements. Submit lighting calculations justifying the basis for the design of the lighting systems.

Provide understructure lighting that is consistent with the illuminance levels and uniformity of the surrounding lighting system; do not provide daytime lighting for understructures.

Provide lighting with a maximum Veiling Luminance Ratio of 0.3.

For all LED fixtures, use a Light Loss Factor (LLF) of 0.90 for lighting design calculations.

Perform and submit illuminance calculations using a vertical grid along the ROW line based on the method outlined in IESMA TM-11-2000 in order to avoid light trespass outside of any roadway or ROW. Extend the vertical grid 20 feet upward with calculation points oriented perpendicular to the roadway. The light trespass limitations are as follows:

A. Maximum vertical illuminance – 0.3 fc in residential areas

B. Maximum vertical illumination – 0.6 fc in commercial areas

8C-2 Construction Criteria

All splices shall be performed by an IMSA-certified and/or Journeyman Electrician. All electrical work shall be overseen by a Journeyman Electrician.

Use Schedule 40 PVC or SDR11 HDPE for conduit trenched in soil, and use SDR11 HDPE for conduit installed by boring methods.

Bury all lighting junction boxes with 2-inches of cover below finished grade. Provide locate devices inside each junction box.

8C-3 Materials

Provide lighting materials that are new at the time of installation. Do not salvage or reuse lighting materials except for the existing poles and luminaire assemblies on local streets or owned by local Cities.

8C-3.1 Lamps and Luminaires

Use Light-Emitting Diode (LED) luminaire fixtures for all luminaires. Provide luminaires with the following lamps to facilitate maintenance:

A. Use Department-furnished LED Type B cobra head roadway luminaires. Use Department-furnished anchor bolts, poles and LED luminaires.

B. Understructure LED luminaire requirements:

1. Understructure luminaires may be surface mounted to the underside of deck or wall mounted.
2. Locate understructure luminaires to provide maintenance access so that a lane closure is not necessary.
3. Provide a vibration resistant mounting for surface mounted luminaires.
4. Provide understructure luminaires that are vandal resistant.
5. Provide single photo control with lighting contactor and circuit breaker for underdeck lighting systems.

C. High mast LED luminaire requirements:

1. Type II or Type V light distribution
2. Bug rating: Max B5-U0-G5
3. UL 8750 and UL 1598 compliant
4. 3G Vibration rated per ANSI C136.31
5. EMA IP66 rated
6. IES L70 lumen maintenance minimum 70,000 hours
7. Apparent color temperature 4,000K – 4,500K
8. White fixture housing color

8C-3.2 Power

Notify the municipality at least seven Calendar Days before disconnecting and/or connecting the power to existing lighting.

If temporary lighting is required, the Design-Builder shall pay the temporary lighting costs until all permanent lighting is in place and operational.

Provide 240-Volt, single-phase power for all cross street, ramp-terminal intersection, and interchange cross-street understructure lighting.

Provide 480-Volt, single-phase power for all lighting circuits on Bangerter Highway, including ramp

lighting.

8C-3.3 Lighting Pedestal and Circuits

Use metered lighting pedestals with central photo control for all lighting circuits.

Provide lighting pedestals with a meter for each municipality or jurisdiction. For example, power for a traffic signal on a State route will be paid by the Department; however, if power for lights at the same intersection will be paid by the local municipality, a dual-metered pedestal will be required at that location. Connect each lighting circuit to the designated meter for the jurisdiction that will pay to provide power to that circuit.

Provide lighting pedestals and circuits that meet the following requirements:

A) Wiring and Conductors

1. Aluminum wire and grounding may be used as an alternative to copper wire and grounding as follows:
    a. Wire and cable – refer to American Wire Gauge
    b. Conductors and ground wires use RHW coated single-conductor aluminum wire

B) Cabinet

1. Provide Rainproof, NEMA 3R.
2. Provide 0.125" anodized aluminum 5052-H32 or 16 gauge #306 stainless steel, continuously welded or overlapped and carriage-bolted exterior and door seams, smooth and free of any voids.
3. Provide provisions for one meter socket complying with local power utility requirements.
4. Design cabinet openings such as ventilation holes to prevent entrance of insects such as wasps, hornets, or bees. Install a permanent, welded insect screen, if ventilation holes are required.
5. Provide adequate clearances inside the cabinet for pulling and connecting to service and distribution (field) wiring with conduits extending into the cabinet 2.0 inch maximum.
6. Provide sealed shatter-resistant and UV-resistant polycarbonate windows for meter reading and photocell operation. Meter shall be visible from the front. Include photocell headlight shield that will not affect normal operation nor will harbor nesting insects.
7. Provide service entrance, meter, and distribution compartments with padlockable, vandal-resistant doors and covers, and corrosion resistant barriers separating each compartment. Design compartments for safety and ease of maintenance with stainless steel piano hinges on access panel or access door. When a person is facing the cabinet, the hinges shall be on that person's left.
8. Fasten cabinet directly to pad-mount base encased in concrete, with option for attachment to anchor bolts. All mounting bolts shall be secured from inside the cabinet.
9. Mechanically fasten permanent labels (etched or engraved) to the cabinet. Adhesives are not acceptable. Exterior front-door label: "LIGHTING

DISCONNECT". Conform to UL508 Industrial Control Panel Labels for service entrance equipment requirements.

10. Provide documentation permanently and conveniently attached to the inside of the distribution section or a permanently attached interior documentation storage pocket or pouch. Include the manufacturer's name, address, phone number, a wiring diagram, date of manufacture, and all necessary information on documentation to order an identical pedestal and replacement parts.

C) Electrical

1. Provide Single-phase, 3-wire, 120V/240V or 240V/480V, 200A.
2. Provide 200A utility landing lugs rated for 250 MCM wire with two self-contained watt-hour meter sockets, main service disconnect, and meter bypass switch, meeting local power utility company requirements. Provide adequate space for a meter puller.
3. Pre-wire all components to NEC and NEMA specifications. Use XHHW-2 or THHN-2 wire for all pre-wiring.
4. Provide a system capable of operating between -30ºF and 130ºF.
5. Meet EUSERC requirements for all mounting hardware and installation details.
6. Provide double pole 70-amp main plug-in circuit breaker (10K AIC) labeled "Lighting Main".
7. Provide double pole 30-amp (240/240 volt) plug-in circuit breaker (10K AIC) labeled "lighting", plus breaker for photo control, both secondary to the Lighting Main breaker.
8. Provide pre-wired 30-amp 240V electrically-held 2-pole contactors, Square D Part # 8903-SM02, or approved equivalent.
9. Provide three-position rotary test switch with "On-Off-Auto" settings, clearly labeled.
10. Provide a minimum of 18 circuit panel board circuit breakers.
11. Provide Circuit terminal bar with lugs rated for wire sizes #6 to #0 AWG, labeled "Lighting Circuit". Provide grounding terminal bar with lugs rated for #6 to #0 AWG wire size, adjacent to circuit terminal bar

8D. SUBMITTALS

Provide submittals to the Department in accordance with Table 8D-1.

TABLE 8D-1
DESIGN-BUILDER SUBMITTALS FOR LIGHTING

Submittal	***For Approval***	***Schedule***
Lighting Design Calculations	No	Prior to Release for Construction Documents

9—MAINTENANCE DURING CONSTRUCTION

9A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 9 (Maintenance During Construction) and to satisfy all functional needs of the Project, including routine maintenance, emergency and operational response, inspections, and repairs required throughout the life of the Contract.

9B. STANDARDS

Not used.

9C. REQUIREMENTS

Operate, maintain, and repair existing facilities and facilities constructed under this Contract, including cross-streets within the Project limits, to provide safe and efficient movement of people and goods throughout the Project area during construction. Perform all maintenance activities beginning at NTP and ending on the day of Contract Completion, at which time the Warranty will govern such work.

9C-1 Department's Role

The only maintenance that will be performed by the Department inside the Project limits is snowplowing of the roadways open to use by the general public.

The Department reserves the right to perform other maintenance work as it deems necessary with its own forces, and/or to enter into special contracts for the maintenance of specific items, and to back-charge the Design-Builder for costs resulting from Design-Builder's failure to comply with the provisions of this Section 4-09 (Maintenance During Construction).

9C-2 Maintenance of Traffic

Maintain all features necessary to support the maintenance of traffic during construction as described in Part 4-10 (Maintenance of Traffic).

Provide a safe travel corridor. If a device or other element of Work cannot be immediately repaired or replaced, install temporary mitigation devices and/or procedures until repair or replacement is completed. Repair or replace within 24 hours unless otherwise noted herein.

Do not use barrier(s) with wire loop pin connectors

9C-3 Maintenance of the ROW

Keep the ROW and Work site clean and free of noxious weeds, rubbish, and debris throughout all phases of construction.

9C-4 Maintenance of Roadways

Maintain all roadways within the Project limits, and adjacent roadways, in a condition such that the roadways safely accommodate traffic. As construction is completed, keep the roadways free of loose dirt, gravel, and debris. Clean and broom-sweep paved surfaces adjoining the Project, and within the Project limits as needed; rake and clean other surfaces of the Project site.

Provide the Department with contact names and 24-hour telephone numbers so that the Department can access the Design-Builder's emergency maintenance service at any time.

9C-4.1 Pavement

Maintain all pavement within the Project, including the highway and cross-streets where pavement is damaged. Damage includes potholes, other serious deterioration or rutting, and other unsafe surface conditions as determined by the Department, and includes damage caused by Design-Builder's haul operations. Begin such repair within 24 hours of observance or notification. For repairs located within a travel lane, implement the repair during the next possible MOT Off-Peak Period as defined in Part 4-10 (Maintenance of Traffic), unless otherwise directed by the Department. Clean all debris from hauling operations within 12 hours of observation or notification.

9C-4.2 Drainage & Irrigation

During the course of construction, maintain all necessary watercourses and drainage systems to collect and convey stormwater flows. Do not allow standing water on the roadway surface.

Maintain full functionality of landscaping irrigation systems from April 1 through October 31 each calendar year, unless otherwise Approved by the Department and agreed to by the facility owner in writing.

9C-4.3 Lighting

Maintain and operate all existing and new lighting systems within the Project limits, including the following:

A. Replace nonfunctioning lamps.

B. Replace or repair any damaged equipment or underground cable.

C. Address and maintain public safety issues (for example, system outage, exposed wires, and knockdowns) within one hour of notice, and routine maintenance and other maintenance not related to public safety (for example, lamp replacement or repair of minor equipment damage) within 12 hours of notice.

D. Provide temporary lighting and/or maintain lighting throughout construction at all intersections, with the exception of overhead sign lighting once new signs with ASTM D4956 Type XI sheeting have been installed.

E. Provide temporary lighting plans.

F. Prevent glare from Work zone lighting to approaching motorists.

G. Pay for the power costs for all temporary lighting associated with the Project.

9C-4.4 Signing

Maintain all signs, including sign supports and foundations. Replace or repair damaged stop signs within 30 minutes of notice. Replace or repair other signs within 12 hours of notice.

Remove and prevent any obstructions from blocking the view of signing within the Project limits, including construction equipment, parked vehicles, Work zone devices, vegetation, and other

obstructions.

9C-4.5 Pavement Markings

Maintain all pavement markings to safe levels of presence (125 millicandelas or greater) and retroreflectivity within the Project limits. At a minimum, repaint pavement markings every two months between April and October, and once per month between October and April.

Completely remove all unneeded markings by means of water-blasting, sand-blasting or shot-blasting prior to opening the roadway to traffic.

9C-4.6 Traffic Signals

Equipment: Maintain all traffic signal equipment (including new, temporary, and existing) within the Project limits, except as specified in this section, until Substantial Completion at each respective intersection. Replace existing loops to maintain signal detection during construction. Maintenance and operation shall meet requirements of the Utah MUTCD and shall include the following:

A. Replacement of nonfunctioning lamps.

B. Functioning pedestrian detection.

C. Functioning vehicle detection for all intersection approach lanes.

1. The Design-Builder may incorporate permanent radar detection equipment sensors, wire, and electronics as part of any temporary traffic signal detection system. Reimburse the Department for any damage to permanent detection devices used in a temporary condition.

D. Functioning traffic signal communication.

1. In the event the communication network is off-line for more than four hours, provide an alternate communication path. If using high-speed wireless communication, it shall operate in the 3.5/4.9-5.8 GHz bands. Wireless communication shall support bandwidth of 108 MBps. Provide wireless communication at no additional cost to the Department, and integrate into the Department's existing device control software.

E. Signal preemption at signalized intersections.

F. Replacement or repair of any damaged equipment or underground cable.

G. Functioning traffic signal cabinet and associated hardware. The Department will be responsible to maintain the traffic signal controller.

H. The Department will maintain and operate signal timing throughout the Project area.

Operations:

I. Maintain and protect traffic as required by the municipality or county in which Work is being completed along the municipal facilities.

J. When disrupting the normal operation of traffic signals, provide an adequate number of traffic control personnel on-site to facilitate the safe and efficient movement of traffic. At intersections with a functional traffic signal, no flagging operations are allowed; alternatively, the signal may be

1. Shut down and traffic directed by law enforcement personnel; or

2. Operated manually by law enforcement personnel.

K. The Design-Builder shall pay for the power costs for all temporary traffic signals associated with the Project.

L. Notify the Department seven Calendar Days prior to turning on or modifying a traffic signal. The Department will program both controllers and detection for all signals (temporary and permanent).

Shutdowns: When existing controllers and cabinets are being removed and the new cabinets and controllers are being installed, the Design-Builder shall shut down traffic signals. Obtain Approval from the Department, seven days in advance of any signal shutdown, as well as advanced Approval from the agency with jurisdiction over the facility where the equipment is located. Limit signal shutdown to the MOT Off-Peak Periods as defined in Part 4-10 (Maintenance of Traffic).

Repair and maintain traffic signals around the clock (24 hours per day, seven days per week). Respond to notification within 10 minutes and be on-Site to initiate repairs within 30 minutes. Remain onsite and continue Work until signal operation is verified by the Department. Emergency maintenance shall be limited to problems related to public safety, such as a dark intersection, flashing signal lights, twisted signal heads, burned out red lamps, exposed wires, and knockdowns or other as determined by the Department.

Provide the Department with contact names and 24-hour telephone numbers so that the Department can access this emergency maintenance service at any time.

Other routine maintenance not affecting public safety shall be initiated within 24 hours of notice or observation.

The UDOT Signal Turn-On Checklist shall be used for the process of initiating operation of new and existing signals.

Design-Builder staff responsible for maintenance of traffic signals shall demonstrate experience in trouble shooting and maintenance of traffic signal equipment and possess International Municipal Signal Association (IMSA) Level III certification.

9C-4.7 Snow Removal

The Department will be responsible for snow removal on the travel lanes, shoulders, and emergency pullouts in the vicinity of the Project as part of the normal course of plowing. The Department will take no special measures when plowing inside the Project limits, and will not be responsible for delay and/or damage caused by snow removal operations. If any channelization devices are displaced or damaged by plowing operations, the Design-Builder shall restore them within one hour of observance or notification.

The Design-Builder shall be responsible for all other snow removal in the work zone. Coordinate with UDOT Region Maintenance when snow removal from the work zone could result in impacts to traffic and/or UDOT snow removal efforts on mainline.

The Design-Builder shall not stockpile snow such that snow melt will encroach onto travel lanes, shoulders, and emergency pullouts.

9C-5 Maintenance of Structures

Maintain all structures within the Project limits in working order. Repair any potholes on bridge decks.

9C-6 Maintenance of Miscellaneous Equipment/Devices

Provide AASHTO HL-93 load-bearing junction boxes and lids, cable vaults and lids, and drainage grates within two feet of travel lanes. Weld drainage grates within two feet of travel lanes on Bangerter Highway to prevent them from dislodging and causing a hazard.

9C-7 Maintenance of Access to Facilities

Maintain uninterrupted access to all public and private facilities affected by the Project. Access shall mean providing a clear and easily understood route into and out of an existing residence, facility, or business, and providing access for all types of vehicles using the access. Provide all necessary signing in accordance with the Utah MUTCD to convey that the route to the residence, facility, or business is open to traffic.

9C-8 Maintenance of Pedestrian Access Routes

Maintain or relocate the pedestrian access routes within the Project limits in on a paved surface and in accordance with the Americans with Disabilities Act (ADA), the Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG), and the Utah MUTCD. Obtain Approval of all pedestrian detour plans needed to accommodate construction.

Maintain the existing pedestrian structure near Bangerter Highway and 7000 South intersection until the new pedestrian structure is open.

9C-9 Maintenance of River and Flood Control Channels

Keep construction material away from drainage structures, flood control channels, rivers, and waterways. Do not allow debris or contaminants of any nature to be deposited in the above-mentioned waterways. If any such item is found floating in a waterway near the site, immediately remove it. Maintain all water courses, drainage ways, drainage systems, and irrigation systems. Collect and convey storm water flows that are less than or equal to the 10-year storm event to avert flooding of active roadways and properties abutting the ROW.

9C-10 Maintenance of Landscape

Existing Landscape: Maintain existing landscape within the Project limits that are to remain after construction until Substantial Completion. Limits of Work include any area within the Project limits that has been disturbed, including staging areas. Maintenance Work includes the following:

A. **Watering**: Keep trees, shrubs, and other plantings watered. Use automatic irrigation, if present.

B. **Weed Control**: Monitor and control invasive weeds as specified in Part 5 (Special Provisions and Exceptions) 02924S (Invasive Weed Control).

C. **Erosion Control**: Follow the Project Storm Water Pollution Prevention Plan (SWPPP). Repair, maintain, and replace erosion and sediment control measures according to Part 4-05 (Environmental Compliance).

D. **Irrigation System**: Perform annual winterization activities to shut down the system, including cleaning out all water in the system with compressed air. Check bubbler heads, valves, and other system components for damage or wear, and repair them prior to restarting the system the next season.

E. **Plant Replacement**: Replace plant materials.

9C-11 Maintenance of Property

Before moving, disturbing, or damaging land monument and property markers, witness or reference their locations, using a registered land surveyor. Notify the County surveyor prior to moving, disturbing, or damaging section corners and other County monuments.

Install temporary fence prior to removing the existing fence and/or wall from the properties. Place temporary fence that meets the needs of the existing fencing. Maintain all temporary fence until the permanent fence and/or wall is installed. Notify property owners affected by the Work in accordance with Part 4-12 (Public Involvement and Information Services).

Restore any damaged or injured property to a condition equal to or better than it existed before the damage or injury occurred.

9C-12 Maintenance of Advanced Traffic Management System (ATMS)

9C-12.1 General

Maintain the functionality and centrally controlled operations of all existing and temporary ATMS devices in the Project area and those outside the Project area that are affected by the Design-Builder's Work in accordance with Part 4-03 (ATMS). Temporary devices may be used to maintain functionality, but must be integrated in the Department's existing control software.

Maintain communication to the TOC for existing and temporary ATMS devices. In the event the existing communication is off-line for more than four hours provide temporary high-speed wireless communication that is compatible and will integrate with the existing ATMS communications system. Supply wireless communication at no additional cost to the Department, and integrate wireless communication into the Department's existing device control software.

Maintain the existing backbone communication functionality throughout the Project limits for the duration of the Project or until cut-over to the new backbone infrastructure. Submit a Communications Maintenance Plan to the Department describing the Design-Builder's plan for maintaining existing backbone communication.

Maintain existing CCTV surveillance functionality covering the entire traveled way in the work zone, including ramp lanes, mainline lanes, and interchanges within the work zone.

Maintain existing Non-Intrusive Detection (NIDs – radar units) functionality within the Project limits including reconfiguring device aiming and central configuration to continue accurate detection when MOT phasing reconfigures lane locations.

The Design-Builder is responsible to notify the Department and repair any damage to the ATMS system.

9C-12.2 Interval Between Installation and Operation

Make all ATMS equipment that is visible to the motoring public (e.g., variable message signing (VMS), ramp meters, and closed-circuit television (CCTV)) operational from the Department TOC within 20 Working Days of installation. An operational piece of equipment is one that satisfies the identified functional requirements and passes all required acceptance testing.

9C-12.3 Response Time

Safety-Related: Respond to a reported nonfunctioning component of Work that is safety-related and any and all issues that pose an imminent threat to the safety of the traveling public and/or Project personnel within the Project limits within 30 minutes and be on-Site to initiate repairs within 30 minutes after notification of the problem and continuously work until the problem is corrected and the

component is working. Take whatever actions are necessary to protect the public from any nonfunctioning component of Work until the corrections are completed. Within 24 hours of any safety-related issue, provide the Department with correspondence detailing the safety issue(s) and the resolution.

Non-Safety-Related: Respond to a reported nonfunctioning component of Work that is not safety-related (for example, signal interconnect outage to an intersection or an inoperable video camera) within 24 hours of notification of the problem. Return the component to working condition within 48 hours of such notification.

When a problem affects an entire subsystem (e.g., all detection, all video, or all devices in a specific area), respond within four hours of problem notification and work continuously until the problem has been corrected.

9C-13 Maintenance of N/A Line

In locations where the existing N/A fence is temporarily removed, maintain a temporary N/A fence at all times. The temporary N/A fence shall be a minimum of six feet in height.

9C-14 Documentation

Maintain an electronic log of all maintenance and repair response activities performed during the Project and include, at a minimum, the following information:

A. Date and time the problem was reported

B. Entity reporting the problem

C. Description of the reported problem

D. Arrival time of maintenance or repair worker(s) at the problem site

E. Technician(s) performing repair or replacement

F. Corrective action(s) taken

G. Model and serial number of component(s) repaired or replaced

H. Date and time problem was rectified

For ATMS, signs, and signals, keep the log on the Department's TOC-supplied work order management system. For maintenance and repair activities at ATMS cabinets, update the maintenance log book at each cabinet.

9D. SUBMITTALS

Provide submittals to the Department in accordance with Table 9D-1.

TABLE 9D-1
DESIGN-BUILDER SUBMITTALS FOR MAINTENANCE DURING CONSTRUCTION

Submittal	***For Approval***	***Schedule***
Traffic Signal Shutdown Notification	Yes	Seven Calendar Days (minimum) prior to shutdown
Communications Maintenance Plan	No	Prior to start of construction
Contact Names and 24 Hour Telephone Numbers	No	Prior to start of construction

10—MAINTENANCE OF TRAFFIC

10A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 10 (Maintenance of Traffic) and to satisfy all functional needs of the Project. Develop and implement Maintenance of Traffic (MOT) Plans that provide for the safe and efficient passage of traffic and optimize mobility. Coordinate, plan, provide, and implement traffic control for all the Work of the Project, including work performed by Third-Parties. The term "MOT plan" applies to, and encompasses the traffic control plan.

Develop a MOT plan with the flexibility to accommodate Project changes that produce benefits or savings to the Department and the Design-Builder without impairing the essential functions and characteristics of the Project, such as safety, traffic operations, durability, application of traffic control standards, maintainability, environmental protection, drainage, and other permitted constraints.

10B. STANDARDS

Complete Work for MOT in accordance with the requirements of the standards listed by priority in Table 10B-1 (Standards for Maintenance of Traffic). Provide MOT plans that are stamped by an engineer licensed to perform work in the State of Utah.

If there is any conflict in standards, adhere to the standard with the most stringent requirements; if the Design-Builder’s Proposal has a higher standard than any of the listed standards, adhere to the Proposal standard.

If there is any unresolved ambiguity in standards, it is the Design-Builder’s responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

Use the current version accepted by the Department of each listed standard as of the initial issue date of this RFP, unless modified by Addendum or Change Order.

TABLE 10B-1
STANDARDS FOR MAINTENANCE OF TRAFFIC

Priority	*Author or Agency*	*Title*
1	UDOT	Special Provisions included in Part 5
2	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
3	UDOT	*2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
4	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
5	UDOT	*2012 Standard Drawings for Road and Bridge Construction*
6	UDOT	*Utah Manual on Uniform Traffic Control Devices (Utah MUTCD)*
7	AASHTO	*A Policy on Geometric Design of Highways and Streets*
8	AASHTO	*Roadside Design Guide*
9	UDOT	*UDOT Sign Manual*
10	UDOT	*Utah Standard Highway Signs Supplement*
11	FHWA	*Standard Highway Signs*
12	TRB	*Highway Capacity Manual*
13	UDOT	*UDOT Design Guidelines for Signalized Intersections*
14	UDOT	*UDOT Flagger Training Handbook*
15	FHWA	National Cooperative Highway Research Program, *Recommended Procedures for the Safety Performance Evaluation of Highway Features* (NCHRP Report 350)
16	ATSSA	*Quality Standards for Work Zone Traffic Control Devices*

10C. REQUIREMENTS

10C-1 Definitions

Cross Streets: Streets with more than one travel lane per direction that cross Bangerter Highway, including but not limited to 5400 South, 7000 South, 9000 South, 11400 South, and public streets that intersect 5400 South, 7000 South, 9000 South and 11400 South.

Existing Configuration: The existing lane configuration on the Proposal Due Date, including existing lanes, lane widths, shoulder widths, and storage lengths.

Full Closure: The closure of all lanes in any one direction of an individual Movement.

Holiday Periods: All Holiday Periods as defined in Table 10C-6 (Holiday Periods Table).

MOT Peak Periods: All peak periods as defined in Tables 10C-1, through 10C-5 where all existing lanes must remain open to traffic.

MOT Off-Peak Periods: All periods outside the MOT Peak Periods as defined in Tables 10C-1 through 10C-5, excluding Holiday Periods.

Movement: A direction of travel; either a left turn, right turn or through travel path of a vehicle on any ramp, Cross Street, or highway.

Partial Closure: The closure of one or more lanes of any individual Movement, compared to the

Existing Configuration, so long as each Movement is accommodated within each intersection. A Storage Length Reduction is also considered a Partial Closure.

Storage Length Reduction: A decrease in storage length of a turning Movement at an intersection compared to the storage lengths outlined in Table 10C-7, Table 10C-8, and Section 10C-12.8.

Rolling Slowdown: The use of a law enforcement vehicle to close a travel lane(s) or impede traffic for less than fifteen minutes between 12:00 AM and 5:00 AM.

Traffic Split: A Traffic Split is the separation of lanes in the same direction of travel of an individual Movement.

Traveled Way: Any public or private street, sidewalk, or Cross Street.

10C-2 General MOT Requirements

Coordinate, plan, provide, and implement traffic control for all Work, including work performed by Third Parties.

A. Provide for the safe and efficient passage of traffic through construction zones. Begin maintenance of traffic activities at the start of construction work (including preparatory MOT work) or when first hauling construction materials and/or equipment, whichever is earliest, and continue MOT activities until Substantial Completion and removal of all construction traffic control.

B. Minimize traffic impacts to the traveling public, residents, schools and businesses. During the MOT Peak Period, maintain all intersection turning Movements, lane configurations (e.g., dual left-turn lanes), and storage lengths consistent with roadway conditions prior to construction, unless otherwise Approved (see Section 10C-12 for additional Closure Restrictions).

C. Design, place, and maintain all required traffic control, MOT elements, and detour routes required during construction.

D. Obtain all necessary permits from all agencies impacted by the Project for temporary construction of roadways and/or haul routes. Identify and obtain required permits for all construction roads to be used for delivery of heavy loads such as fill, asphalt, concrete, and bridge girders required for the Project.

E. Obtain Approval of any temporary work zone speed limit reductions on state highways in accordance with UDOT Policy 06C-61. Obtain Approval of any temporary work zone speed limit reductions on city and Cross Streets from the respective jurisdiction.

F. Notify the Jordan and/or Granite School Districts of MOT changes that impact their schools, coordinate school bus circulation and schedules with the Districts.

10C-3 Traffic Management Plan

Prior to start of any construction activities obtain Approval of a Traffic Management Plan (TMP). Develop, implement, and maintain a TMP that describes how the MOT plans and requirements will be met. The TMP shall describe the procedures that will be implemented and followed on the Project to provide for the safe and efficient passage of traffic, pedestrians and cyclists. The TMP shall comply with the Contract Documents and not be used as a means for waiving requirements. The TMP shall be submitted in accordance with this Section and Part 3 (Quality Program). The TMP shall include the

following:

A. The processes to produce MOT plans, including development, dissemination, implementation, monitoring, refinement, and maintenance of the MOT plans.

B. An emergency services plan to coordinate and cooperate with emergency service providers and the hospital at 9000 South. Ensure that emergency access is provided at all times and regularly communicated to the proper authorities.

C. An Incident Management Plan (IMP) including:

1. Protocols for notifying emergency service providers, the Department's Traffic Operations Center (TOC), and others in the event of an incident

2. Roles and responsibilities in the event of an incident

3. In the event of an incident, identify the processes to be used to modify construction activities or lane closures to allow traffic flow to return to normal conditions.

D. The processes to be used to provide and maintain access to properties and how this will be incorporated into the MOT plans.

E. The process to obtain Approval and notify the Department of every Full Closure Partial Closure, and Storage Length Reduction.

F. The process to obtain Approval from the Department of a detour plan used for each Full Closure.

G. The process of coordinating and notifying the Department's TOC of a Storage Length Reduction Full or Partial Closures. This includes coordinating the usage of technology with the TOC, including ATMS devices, Changeable Message Signs (CMS), traffic signal timing modifications, approval of CMS messages, etc.

H. A description of roles, responsibilities, qualifications, and contact information of MOT personnel identified in Section 10C-16 (MOT Personnel) who will plan, direct, implement, and maintain the Traffic Management Plan.

I. A pedestrian and bicyclist access plan that provides for safe pedestrian and bicyclist routing.

J. A student access plan that provides for safe pedestrian routing to and from all the schools within the Project limits, see section 10C-8.

K. The procedures to adjust the required traffic control devices, including advanced signing, to provide advance warning to motorists of slowed or stopped traffic.

L. The procedure to stage the implementation of traffic control for a closure and detour; including placing all of the signs and channelizing devices needed for the closure or detour on the shoulder of the road, turning signs to facing away from traffic, turning detour signs to face traffic an hour prior to the closure, and turning all other signs at the beginning of the closure.

M. The process of coordination with the Department regarding the availability of ATMS within the Project area.

N. The processes to perform daily MOT inspection reports in accordance with UDOT Standard Specification Section 01554 and submit these reports to the Department on a weekly basis.

O. The process to coordinate plans for traffic signal timing and the procedure for communicating these to the Department. The Department is responsible for signal timing adjustments with input from the Design-Builder.

10C-4 MOT Plans

MOT plans apply to and encompass traffic control plans. Develop and implement MOT plans that meet the following performance requirements:

A. The MOT plans shall identify each work zone and the Traveled Way during all phases of construction.

B. The MOT plans shall identify and account for all elements needed to safely and efficiently maintain traffic during construction including temporary roadway improvements, temporary traffic control devices, temporary drainage improvements, temporary traffic signals, temporary lighting, hazard mitigation strategies, detour plans, pedestrian/bicycle accommodations, business access, flagging operations, construction vehicle access points, etc.

C. All traffic control shall be implemented in accordance with the Release For Construction (RFC) MOT plans.

D. MOT field personnel shall have a copy of the applicable MOT plans on-hand during the implementation of traffic control.

E. Coordinate MOT plans with the UHP, local law enforcement, and other emergency service providers to verify that public safety and emergency response times are not compromised. At the Department's request, provide evidence of coordination with emergency services agencies. Incorporate comments from emergency service providers in the development of the MOT plans and throughout the duration of construction.

10C-5 Temporary Roadway Facilities

Design and construct all geometric aspects of temporary roadways for 10 MPH below the posted speed in effect on the Proposal Due Date. Meet all sight distance requirements for the posted speed limit in effect on the roadway on the Proposal Due Date.

Maintain traffic on a paved surface at all times. Provide smooth transitions between existing and temporary paving. The Design-Builder is responsible to provide smooth transitions if trench plates are used. See Part 4-09 (Maintenance During Construction) and Part 4-11 (Pavement) for additional temporary paving requirements.

Maintain a travel lane width of 11 feet. The minimum width applies to travel lanes, turn lanes and auxiliary lanes.

Maintain a shoulder width of at least two feet where shoulders exist on the Proposal Due Date.

Provide acceleration and deceleration lanes for temporary roadways, including construction access points, accessing Bangerter Highway (SR-154).

Maintain at all times a concrete barrier between opposing mainline Bangerter travel lanes where barrier exists prior to construction. When a work zone is in the median, construction access points (i.e., openings in the median barrier) shall be staggered to prevent any cross-over collisions should a vehicle enter the work zone.

Design and install or modify temporary and existing traffic signals in coordination with MOT and temporary traffic control plans. For lane shifts through an intersection use a taper rate as defined in the Department Standard Drawings and no more than three feet. Align signal heads over the center of the lanes they serve. Obtain approval of all traffic signal phasing and timing changes. Provide radar vehicle detection at all temporary traffic signals.

Replace all junction boxes and lids, cable vaults and lids, and drainage grates within two feet of a temporary travel lane with load bearing infrastructure designed to support AASHTO HL-93 loads. Weld shut all lids located within the temporary travel lane.

10C-6 Temporary Traffic Control

Maintain existing regulatory signs, warning signs, guide signs, airport signs, hospital signs, and logo signs during all phases of construction.

All temporary signing shall meet or exceed retroreflectivity standards for ASTM Type XI sheeting. Use fluorescent orange sheeting when orange sheeting is specified.

Travel lanes shall be defined by painted lines at all times where striping exists prior to construction. Temporary striping shall meet minimum retrorelectivity standards.

Stripe travel lanes or provide temporary traffic markings before removing temporary traffic control devices.

Stage the implementation of each Partial Closure or Full Closure by placing signs and channelizing devices needed for the closure on the shoulder of the road. Prior to the closure, signs shall be turned facing away from traffic, with the exception of detour signs that shall be turned to face traffic an hour prior to the closure. All signage and channelizing devices shall be placed in accordance with the RFC MOT plans when the closure is implemented.

Provide Project Notification Signs (see Utah Standard Highway Signs Supplement) on both sides of each interchange Cross Street approaching Bangerter Highway (SR-154) and on Bangerter Highway (SR-154) approaching the Project Limits (two signs on each 5400 South, 7000 South, 9000 South, 11400 South, and on Bangerter Highway (SR-154)). Prepare and obtain Approval of the Project Notification Sign layout and installation plan prior to ordering the signs.

10C-7 Business and Private Property Access

Maintain and provide access to every property except as otherwise Approved by the Department.

Provide temporary business access signs during construction according to UDOT Standard Drawings.

No two accesses that serve the same business will be permitted to be under construction concurrently. See Part 4-14 (Right of Way) for additional requirements.

10C-8 Accommodations for Bicyclists and Pedestrians

Maintain the current pedestrian accommodations within the Project limits during construction unless otherwise Approved by the Department.

Obtain Approval of all pedestrian and bicycle detour plans. All existing Safe Routes to School must be maintained throughout the duration of construction. Obtain Approval of a Pedestrian Access Plan that provides for safe pedestrian routing and includes a safe route for school children to cross the Project. Coordinate and obtain approval from the school district for any modifications to the Student Neighborhood Access Plan (SNAP).

The existing pedestrian bridge at 7000 South shall remain open until a new pedestrian bridge is opened to pedestrians, unless the Design-Builder pays Jordan School District to bus students to and from the Qquirrh Elementary School during the pedestrian bridge closure. If the pedestrian bridge is closed prior to the new bridge being open, the Design-Builder is required to pay for the cost of busing students on a school day as well as for activities and programs during the summer and normal school year. The cost of Jordan School District to provide busing is $178.12 per bus per school day; four buses are needed on a school day. Busing must be done continuously during the closure. Notify the Department and Jordan School District a minimum of 30 days prior to closing the pedestrian bridge.

10C-9 Detours

Provide convenient and logical rerouting of traffic (by using advance warning systems, directional and informational signing, lighting, and striping) to provide driver-friendly detours and to maximize the safety of the traveling public and construction workers. Coordinate detour routes with the Department to ensure detour traffic signal timing plans are in place to accommodate detoured traffic.

Obtain Approval of all traffic detour plans.

Implement a signed detour in accordance with the MOT plans.

Provide motorist guidance to and along the entire length of every detour route prior to implementing a roadway closure.

Use state routes for the detour of other state routes. If the detour cannot be limited to state facilities, obtain Approval for the detour and written approval from the jurisdiction whose facilities will be utilized.

Identify and coordinate with other construction projects in the vicinity of the Project area, to ensure that both projects detours routes do not conflict with each other.

Detours for multiple closures shall not go through the same intersection.

Detour trailblazing signing shall indicate the route number or street name of the road being closed.

The detour plan shall include the installation and maintenance of static signs and portable CMS at key regional locations, in addition to the point of closure.

10C-10 Flagging

Flagging is not permitted.

Use a law enforcement officer when construction activities are impacting an operating signalized intersection. Signalized intersections shall be in flash mode when law enforcement officers are controlling traffic. Use of flaggers at traffic signals is only permitted when, under the direction of a law enforcement officer, the signals have been turned off or are inoperable.

10C-11 Changeable Message Signs (CMS)

Place a portable CMS at all ends of the Project to notify motorists of upcoming construction and to warn motorists of the pending changes to existing conditions.

Provide 10 portable CMS that the Department can access remotely to change the message. Equip each CMS with GPS tracking capability. Make two additional CMS to be placed at the Department's discretion. Obtain Department approval for all messages for each CMS.

Place CMS in view of oncoming traffic without obstructing traffic flow. Relocate CMS, as necessary,

to match field conditions.

Remove CMS from the site of work when they are not needed for the immediate control of traffic. Provide locked cabinets on all CMS in the field. Verify the security of all CMS during each work shift. The controller on the CMS used to change messages shall be password protected.

Unless directed otherwise by the Department, display advance notification CMS messages for six Calendar Days prior to any traffic impacts, such as lane closures or change in traffic patterns, to cover all impacted roadways of the Project and intermittently at the Department's direction.

When providing six Calendar Days notice for construction activities, state the day of the week (e.g. Monday) on which the construction will occur instead of indicating the date (e.g. June 13).

10C-12 Limitations of Operations

Tables 10C-1 through 10C-5 establish the MOT Peak Periods, and MOT Off-Peak Periods by direction of travel and day of the week on Bangerter Highway and each cross-street respectively.

TABLE 10C-1
BANGERTER HIGHWAY (SR-154) MOT PEAK AND OFF-PEAK TIMES (NUMBER OF THROUGH LANES REQUIRED TO BE OPEN IN EACH DIRECTION)

Hour Starting	Monday-Thursday		Friday		Saturday		Sunday	
	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	1	1	1	1	1	1	1	1
1:00 AM	1	1	1	1	1	1	1	1
2:00 AM	1	1	1	1	1	1	1	1
3:00 AM	1	1	1	1	1	1	1	1
4:00 AM	1	1	1	1	1	1	1	1
5:00 AM	2	2	2	2	1	1	1	1
6:00 AM	All	2	All	2	1	1	1	1
7:00 AM	All	All	All	All	2	2	1	1
8:00 AM	All	All	All	All	2	2	1	1
9:00 AM	All	All	All	All	2	2	1	1
10:00 AM	2	2	2	2	2	2	1	1
11:00 AM	2	2	2	2	2	2	2	2
12:00 PM	2	2	2	2	2	All	2	2
1:00 PM	2	2	All	All	2	All	2	2
2:00 PM	2	All	All	All	2	All	2	2
3:00 PM	All	All	All	All	2	All	2	2
4:00 PM	All	All	All	All	2	All	2	2
5:00 PM	All	All	All	All	2	All	2	2
6:00 PM	All	All	All	All	2	All	2	2
7:00 PM	2	2	2	All	2	2	2	2
8:00 PM	2	2	2	2	2	2	2	2
9:00 PM	2	2	2	2	2	2	2	2
10:00 PM	2	2	2	2	2	2	1	1
11:00 PM	1	1	1	1	1	1	1	1

1 or 2 through lanes open equals MOT Off-Peak Period

All through lanes open equals MOT Peak Period

TABLE 10C-2
5400 SOUTH MOT PEAK AND OFF-PEAK TIMES (NUMBER OF THROUGH LANES REQUIRED TO BE OPEN IN EACH DIRECTION)

Hour Starting	Monday-Thursday		Friday		Saturday		Sunday	
	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	1	1	1	1	1	1	1	1
1:00 AM	1	1	1	1	1	1	1	1
2:00 AM	1	1	1	1	1	1	1	1
3:00 AM	1	1	1	1	1	1	1	1
4:00 AM	1	1	1	1	1	1	1	1
5:00 AM	1	1	1	1	1	1	1	1
6:00 AM	2	1	2	1	1	1	1	1
7:00 AM	All	2	All	2	1	1	1	1
8:00 AM	All	2	All	2	2	1	1	1
9:00 AM	All	2	All	2	2	2	1	1
10:00 AM	2	2	2	2	2	2	2	1
11:00 AM	2	2	2	2	2	2	2	2
12:00 PM	2	2	2	2	All	All	2	2
1:00 PM	2	2	2	2	All	All	2	2
2:00 PM	2	2	2	All	All	All	2	2
3:00 PM	2	All	2	All	2	All	2	2
4:00 PM	2	All	2	All	2	All	2	2
5:00 PM	2	All	2	All	2	All	2	2
6:00 PM	2	All	2	All	2	2	2	2
7:00 PM	2	2	2	All	2	2	2	2
8:00 PM	2	2	2	2	2	2	1	2
9:00 PM	1	2	2	2	2	2	1	1
10:00 PM	1	1	1	1	1	1	1	1
11:00 PM	1	1	1	1	1	1	1	1

1 or 2 through lanes open equals MOT Off-Peak Period

All through lanes open equals MOT Peak Period

TABLE 10C-3
7000 SOUTH MOT PEAK AND OFF-PEAK TIMES (NUMBER OF THROUGH LANES REQUIRED TO BE OPEN IN EACH DIRECTION)

Hour Starting	Monday-Thursday		Friday		Saturday		Sunday	
	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	1	1	1	1	1	1	1	1
1:00 AM	1	1	1	1	1	1	1	1
2:00 AM	1	1	1	1	1	1	1	1
3:00 AM	1	1	1	1	1	1	1	1
4:00 AM	1	1	1	1	1	1	1	1
5:00 AM	1	1	1	1	1	1	1	1
6:00 AM	1	1	1	1	1	1	1	1
7:00 AM	1	1	1	1	1	1	1	1
8:00 AM	1	1	1	1	1	1	1	1
9:00 AM	1	1	1	1	1	1	1	1
10:00 AM	1	1	1	1	1	All	1	1
11:00 AM	1	1	1	1	All	All	1	1
12:00 PM	1	1	1	1	All	All	1	1
1:00 PM	1	1	1	1	All	All	1	1
2:00 PM	1	1	1	1	All	All	1	1
3:00 PM	1	All	1	All	All	All	1	1
4:00 PM	All	All	All	All	All	All	1	1
5:00 PM	All	All	All	All	All	All	1	1
6:00 PM	All	All	All	All	All	All	1	1
7:00 PM	1	1	1	1	1	All	1	1
8:00 PM	1	1	1	1	1	1	1	1
9:00 PM	1	1	1	1	1	1	1	1
10:00 PM	1	1	1	1	1	1	1	1
11:00 PM	1	1	1	1	1	1	1	1

1 through lane open equals MOT Off-Peak Period

All through lanes open equals MOT Peak Period

TABLE 10C-4
9000 SOUTH MOT PEAK AND OFF-PEAK TIMES (NUMBER OF THROUGH LANES REQUIRED TO BE OPEN IN EACH DIRECTION)

Hour Starting	Monday-Thursday		Friday		Saturday		Sunday	
	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	1	1	1	1	1	1	1	1
1:00 AM	1	1	1	1	1	1	1	1
2:00 AM	1	1	1	1	1	1	1	1
3:00 AM	1	1	1	1	1	1	1	1
4:00 AM	1	1	1	1	1	1	1	1
5:00 AM	1	1	1	1	1	1	1	1
6:00 AM	All	1	All	1	1	1	1	1
7:00 AM	All	All	All	All	1	1	1	1
8:00 AM	All	All	All	All	All	1	1	1
9:00 AM	All	All	All	All	All	1	1	1
10:00 AM	All	All	All	All	All	All	1	1
11:00 AM	All	All	All	All	All	All	All	All
12:00 PM	All	All	All	All	All	All	All	All
1:00 PM	All	All	All	All	All	All	All	All
2:00 PM	All	All	All	All	All	All	1	All
3:00 PM	All	All	All	All	All	All	1	All
4:00 PM	All	All	All	All	All	All	1	All
5:00 PM	All	All	All	All	All	All	1	All
6:00 PM	All	All	All	All	All	All	1	1
7:00 PM	All	All	All	All	1	1	1	1
8:00 PM	1	All	1	All	1	1	1	1
9:00 PM	1	1	1	1	1	1	1	1
10:00 PM	1	1	1	1	1	1	1	1
11:00 PM	1	1	1	1	1	1	1	1

1 through lane open equals MOT Off-Peak Period

All through lanes open equals MOT Peak Period

TABLE 10C-5
11400 SOUTH MOT PEAK AND OFF-PEAK TIMES (NUMBER OF THROUGH LANES REQUIRED TO BE OPEN IN EACH DIRECTION)

Hour Starting	Monday-Thursday		Friday		Saturday		Sunday	
	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	1	1	1	1	1	1	1	1
1:00 AM	1	1	1	1	1	1	1	1
2:00 AM	1	1	1	1	1	1	1	1
3:00 AM	1	1	1	1	1	1	1	1
4:00 AM	1	1	1	1	1	1	1	1
5:00 AM	1	1	1	1	1	1	1	1
6:00 AM	1	1	1	1	1	1	1	1
7:00 AM	All	All	All	All	1	1	1	1
8:00 AM	All	All	All	All	1	1	1	1
9:00 AM	All	All	All	All	All	1	1	1
10:00 AM	All	All	All	All	All	All	1	1
11:00 AM	All	All	All	All	All	All	All	1
12:00 PM	All	All	All	All	All	All	All	All
1:00 PM	All	All	All	All	All	All	All	All
2:00 PM	All	All	All	All	All	All	All	All
3:00 PM	All	All	All	All	All	All	All	All
4:00 PM	All	All	All	All	All	All	All	All
5:00 PM	All	All	All	All	All	All	All	All
6:00 PM	All	All	All	All	All	All	All	All
7:00 PM	All	All	All	All	All	All	1	1
8:00 PM	All	All	All	All	All	All	1	1
9:00 PM	1	All	1	All	1	All	1	1
10:00 PM	1	1	1	1	1	1	1	1
11:00 PM	1	1	1	1	1	1	1	1

1 through lane open equals MOT Off-Peak Period

All through lanes open equals MOT Peak Period

No Partial Closure, Full Closure, or Storage Length Reduction will be allowed during Holiday Periods for the dates and times shown Table 10C-6 below. Partial Closures, Full Closures, and Storage Length Reductions that are Approved for periods longer than 48 hours and begin at least seven Calendar Days prior to a Holiday Period are permitted to continue through Holiday Periods, except as identified in Section 10C-12.5 (Bangerter Highway Closures).

TABLE 10C-6 HOLIDAY PERIODS

Holiday/Event	From	Date	To	Date
Memorial Day	3:00 PM	May 25, 2017	12:00 AM	May 30, 2017
Independence Day	3:00 PM	June 29, 2017	1:00 AM	July 5, 2017
Pioneer Day	3:00 PM	July 20, 2017	12:00 AM	July 25, 2017
Labor Day	3:00 PM	August 31, 2017	12:00 AM	September 5, 2017
Thanksgiving Day	12:00 PM	November 21, 2017	12:00 AM	November 27, 2017
Christmas Day	3:00 PM	December 21, 2017	12:00 PM	December 26, 2017
New Year's Day	3:00 PM	December 28, 2017	5:00 AM	January 2, 2018
Memorial Day	3:00 PM	May 24, 2018	12:00 AM	May 29, 2017
Independence Day	3:00 PM	July 3, 2018	1:00 AM	July 5, 2018
Pioneer Day	3:00 PM	July 23, 2018	12:00 AM	July 25, 2018
Labor Day	3:00 PM	August 30, 2018	12:00 AM	September 4, 2018
Thanksgiving Day	3:00 PM	November 20, 2018	12:00 AM	November 26, 2018
Christmas Day	3:00 PM	December 21, 2018	12:00 AM	December 26, 2018
New Year's Day	3:00 PM	December 28, 2018	5:00 AM	January 2, 2019

10C-12.1 Requests for Closure

Obtain Approval for any Full Closure, Partial Closure, or Storage Length Reduction from the Department and the local government that has jurisdiction over the impacted roadway prior to providing the required advanced notification.

The Design-Builder shall submit a request for closure for each Full, Movement, and Partial Closures, and any Storage Length Reduction. In order to provide advanced notification of each closure, obtain Approval a minimum of:

A. 21 Calendar Days prior to implementing a Full Closure
B. 14 Calendar Days prior to implementing a Partial Closure or Storage Length Reduction during MOT Peak Periods
C. 7 Calendar Days prior to implementing a Partial Closure or Storage Length Reduction during MOT Off-Peak Periods.

Provide sufficient time in the schedule to accommodate the Department's review of each Request for Closure, including addressing comments. Allow for 7 Calendar Days for the Department to review each request.

Each request for closure shall include:

A. Plan sheets showing the location and limits of the closure
B. Applicable detour plans
C. Applicable CMS locations and messages to be displayed to the public in advance of

and during the closure

D. A detailed description of the closure including duration, date(s), need for the closure, construction activities to occur, etc.
E. Lane and shoulder widths modifications, if applicable
F. Locations, and limits of varying cross section, if applicable

For each request for a Storage Length Reduction during MOT Peak Periods, submit a traffic analysis to demonstrate the level of impact anticipated during peak hours.

The Department may revoke Approval of any closure due to significant weather events or other unanticipated civic events at the Department's sole discretion.

10C-12.2 Notifications

Provide notification of each closure or modification to the Traveled Way as follows:

A. Once a Request for Closure has been Approved, notify the Department a minimum of:
   1. 21 Calendar Days in advance of implementing a Full Closure,
   2. 14 Calendar Days in advance of implementing a Partial Closure, or Storage Length Reduction during MOT Peak Periods,
   3. 5 Calendar Days in advance of implementing a Partial Closure or Storage Length Reduction during MOT Off-Peak Periods, or
   4. Sooner if otherwise required by permit.
B. Notify the Department 7 Calendar Days prior to implementing lane shifts.
C. Notify ports of entry (Troy Richins at troyrichins@utah.gov; carbon copy the Design-Builder's Public Involvement Manager) of any lane restrictions (including reduced lane widths) for oversized loads and of any closures associated with this Project at least 14 Calendar Days in advance of the closure or lane restrictions.
D. Provide advanced notification to the Department of any upcoming lane closure cancelation at least 24 hours prior to the original start date of the closure.
E. Provide real-time notification of every lane closure and subsequent lane opening on Bangerter Highway (SR-154) to the Department's TOC at 801-887-3700.
   1. Lane Closure: Notify the TOC within 10 minutes before placing the first traffic control device in the travel lane.
   2. Lane Opening: Notify the TOC within 10 minutes after removing the last traffic control device in the lane.
F. Provide five Calendar Days notice before starting night work.
G. Each Closure Notification shall include:
   1. The specific location and limits of the closure (route number, street name, the beginning and ending mile point, inside vs. outside lanes, direction of closure, etc.)
   2. The number of lanes to be closed
   3. The date and time of the beginning of the closure

4. The date and time of the ending of the closure
5. The proposed detour plan, if applicable
6. The purpose of the closure

10C-12.3 Required Storage Lengths

Table 10C-7 and Table 10C-8 outline the required number of lanes and the associated storage lengths for each turning Movement at intersections within the Project configured as a conventional intersection (standard NEMA phasing/ring-barrier structure). Maintain the Existing Configuration during construction on Bangerter Highway at 11400 South and 9000 South in accordance with the minimum number of lanes and storage lengths outlined in Table 10C-7 unless otherwise Approved. Modification to the Existing Configuration during construction on Bangerter Highway at 7000 South and 5400 South and at the oval-about on 11400 South will be allowed in accordance with the minimum number of lanes and storage lengths outlined in Table 10C-8 unless otherwise Approved.

TABLE 10C-7
TURNING MOVEMENT STORAGE REQUIREMENTS ON BANGERTER HIGHWAY AT 9000 SOUTH AND 11400 SOUTH

Turning Movement	Intersection Turn-Lane Storage Requirements[a]		
	11400 South & Bangerter Highway	11400 South & 4000 West	9000 South & Bangerter Highway
Northbound Left-Turn	Two 420 ft Lanes	One 130 ft Lane	Two 460 ft Lanes
Northbound Right-Turn	One 450 ft Lane	Maintain Existing Trap Lane	One 580 ft Lane
Westbound Left-Turn	Two 200 ft Lanes	Two 100 ft Lanes	Two 480 ft Lanes
Westbound Right-Turn	One 200 ft Lane	One 140 ft Lane	One 350 ft Lane – Maintain Free-Right with Merge Condition
Southbound Left-Turn	Two 500 ft Lanes	One 100 ft Lane	Two 500 ft Lanes
Southbound Right-Turn	One 490 ft Lane	One 100 ft Lane	One 380 ft Lane
Eastbound Left-Turn	Two 220 ft Lanes	One 130 ft Lane	Two 300 ft Lanes
Eastbound Right-Turn	One 240 ft Lane	One 100 ft Lane	One 240 ft Lane

[a]Turn-lane storage length is measured from the taper to the stop bar (not including the required taper length).

TABLE 10C-8
TURNING MOVEMENT STORAGE REQUIREMENTS AS CONVENTIONAL INTERSECTIONS ON BANGERTER HIGHWAY AT 5400 SOUTH AND 7000 SOUTH AND AT THE OVAL-ABOUT ON 11400 SOUTH

Turning Movement	Intersection Turn-Lane Storage Requirements[a] as Conventional Intersection			
	5400 South & Bangerter Highway	7000 South & Bangerter Highway	11400 South & River Heights Dr	11400 South & Summer Heights Dr
Northbound Left-Turn	Two 400 ft Lanes	Two 400 ft Lanes	One 100 ft Lane	One 100 ft Lane
Northbound Right-Turn	One 400 ft Lane	One 200 ft Lane	One 100 ft Lane	One 100 ft Lane
Westbound Left-Turn	Two 250 ft Lanes with continuous storage in a Two-way Left-turn Lane	Two 200 ft Lanes	One 100 ft Lane	One 100 ft Lane
Westbound Right-Turn	N/A	One 200 ft Lane	One 100 ft Lane – Maintain Free Right Turn Movement	One 100 ft Lane
Southbound Left-Turn	Two 480 ft Lanes plus an additional 700 ft of single left-turn lane storage (see 5400 South Aqueduct Relocation plans)	Two 200 ft Lanes	One 100 ft Lane	One 100 ft Lane
Southbound Right-Turn	One 200 ft Lane	One 980 ft Lane	One 100 ft Lane	One 100 ft Lane
Eastbound Left-Turn	Two 200 ft Lanes	Two 400 ft Lanes	One 150 ft Lane	One 150 ft Lane
Eastbound Right-Turn	One 200 ft Lane	One 300 ft Lane	One 100 ft Lane – Maintain Free Right Turn Movement	One 100 ft Lane – Maintain Free Right Turn Movement

[a]Turn-lane storage length is measured from the taper to the stop bar (not including the required taper length).

Provide temporary traffic signals at each intersection to modify the existing CFI and oval-about intersections from the Existing Configuration.

10C-12.4 General Closure Restrictions

All closures require Approval, including closures for work performed by Third Parties, unless otherwise specified below.

Full Closures during MOT Off-Peak Periods will only be allowed during the hours identified in Table

10C-9 (Allowable Full Closure Timeframes During MOT Off-Peak Periods).

TABLE 10C-9
ALLOWABLE FULL CLOSURE TIMEFRAMES DURING MOT OFF-PEAK PERIODS

Location	Closure Window
Bangerter Highway	11:00 PM Saturday through 8:00 AM Sunday
Cross Streets	10:00 PM Saturday through 8:00 AM Sunday

No Full or Partial Closures will be allowed with the exception of those identified in Table 10C-10 (Summary of MOT Closure Restrictions).

Maintain the existing left-turn phase at each of the intersections where either a protected phase or protected/permitted phase exists in the Existing Configuration, except when a Full Closure of the left-turn Movement has been Approved.

No Full or Partial Closures will be allowed to occur along an active detour route for any construction project, unless otherwise Approved.

No Traffic Splits will be allowed.

Do not walk construction equipment that is not street legal across any roadway or Traveled Way during MOT Peak Periods. Transport the equipment across the Traveled Way or walk across the roadway or Traveled Way in conjunction with a Rolling Slowdown during MOT Off-Peak Periods. Violation of this requirement will be deemed as Nonconforming Work and is subject to disincentive as identified in Part 5 (Special Provisions and Exceptions), Table 5-1 (Unit Prices for Determining Pay Adjustments for Nonconforming Work).

All traffic signal shut-downs and turn-ons shall occur during between 12:00 AM and 5:00 AM. Violation of this requirement will be deemed as Nonconforming Work and is subject to disincentive as identified in Part 5 (Special Provisions and Exceptions), Table 5-1 (Unit Prices for Determining Pay Adjustments for Nonconforming Work)

Table 10C-10 (Summary of MOT Closure Restrictions) summarizes the general MOT closure restrictions outlined in this section:

TABLE 10C-10
SUMMARY OF MOT CLOSURE RESTRICTION

Type of Closure	Closure Location	Traffic Movement	MOT Peak Periods	MOT Off-Peak Periods
Full Closures	Bangerter Highway	Left-turn	Up to 45 consecutive days – see Section 10C-12.5. At 7000 South, up to 60 days will be allowed in coordination with the Full Closure of the 7000 South through Movements (see details below).	Permitted with Approved detour
		Through	Not allowed	Up to 6 nights per direction at each interchange and for the pedestrian bridge over Bangerter Highway in accordance with the timeframes in Table 10C-9
		Right-turn	Not allowed	Not allowed, except in coordination with the Full Closure of the through Movement outlined above
	Cross Streets	Left-turn	Up to 90 consecutive days at each Cross Street or up to 60 days on 7000 South in conjunction with the Full Closure of the through Movement as outlined below. (also see Section 10C-12.5)	Permitted with Approved Detour
		Through	Not allowed, except at 7000 South for no more than 60 days as long as right-turn Movements to and from Bangerter Highway are maintained.	Up to 6 nights per Cross Street in accordance with the timeframes in Table 10C-9
		Right-turn	Not allowed	Not allowed, except in coordination with Full Closures of Bangerter Highway
	Pedestrian Bridge	All	Not allowed, except as outlined in Section 10C-8.	Not allowed, except as outlined in Section 10C-8.
Partial Closures	Bangerter	Left-turn	Not allowed	Permitted

TABLE 10C-10
SUMMARY OF MOT CLOSURE RESTRICTION

Type of Closure	Closure Location	Traffic Movement	MOT Peak Periods	MOT Off-Peak Periods
	Highway	Through	Not allowed, except for the closure of one lane in each direction for up to 45 consecutive days at the Old Bingham Highway bridge north of 9000 South, if all existing lanes are provided within 500 feet of adjacent traffic signals	Permitted - see Table 10C-1
		Right-turn	Not allowed	Not allowed
	Cross Streets	Left-turn	Not allowed	Permitted
		Through	Not allowed, except for: • The closure of flex lane system for up to 90 consecutive days - see Part 4-18 (Traffic Signals) and Section 10C-12.6	Permitted - see Table 10C-2 through Table 10C-5
		Right-turn	Not allowed	Permitted

10C-12.5 Bangerter Highway Closures

Full Closures of all left-turn Movements at 11400 South and 7000 South are not permitted beginning with the Thanksgiving Holiday Period through the Christmas Holiday Period.

Provide right-turn lanes on Bangerter Highway at all times.

10C-12.6 Cross Street Closures

Do not close 7000 South during the City's waterline project to the east when closures are taking place on 7000 South between 3200 West and 2700 West.

The flex lanes are permitted to operate in a three-one-three (three lanes each direction with a center turn lane) configuration all day for up to 90 consecutive days. Anything beyond 90 days will be considered a Partial Closure and be subject to Disincentives as identified in Table 10C-11 (MOT Closure Summary and Associated Disincentives). Notify Matt Luker at mluker@utah.gov 14 Calendar days prior to any impacts to the flex lane system. Coordinate with Matt Luker for any adjustments or impacts to the system, including the fiber optic network.

10C-12.7 Rolling Slowdowns

Law enforcement officers shall perform all Rolling Slowdowns. Do not use construction vehicles to perform Rolling Slowdowns.

All Rolling Slowdowns shall be Approved unless otherwise specified below.

10C-12.8 4015 West Build Alternative

For Work performed for the 4015 West Build Alternative on 5400 South, follow the requirements outlined above as it relates to closures on 5400 South. On 4015 West, a Partial Closure of the through

Movement in each direction is permitted for up to 60 consecutive days. Full Closures of 4015 West are not permitted. Provide a minimum storage length measured from the taper to the stop bar (not including the required taper length) for the following turn lanes associated with the 5400 South and 4015 West intersection:

A. Southbound right: 150 feet

B. Southbound left (at thru-turn intersection to the south): 300 feet

C. Eastbound right: 180 feet

D. Northbound right: Maintain the continuous auxiliary lane between the thru-turn intersection to the south of 5400 South

E. Northbound left (at thru-turn intersection to the north): 250 feet

F. Westbound right: 180 feet

G. Westbound left (at thru-turn intersection to the west): 250 feet

10C-13 MOT Inspection & Quality

Perform daily MOT inspection reports in accordance with UDOT Standard Specification Section 01554 and submit these reports to the Department on a weekly basis.

Correct all traffic control deficiencies upon notification or observance of the deficiency within 1 hour of notice or observation.

10C-14 MOT Disincentives

Price reductions for nonconformance of traffic control on Bangerter Highway (SR-154) and Cross Streets are assessed according to Part 5 (Special Provisions and Exceptions) Table 5-1 (Unit Prices For Determining Pay Adjustments For Nonconforming Work).

The Design-Builder is responsible for ensuring that the traffic control and the number of lanes provided for the traveling public are returned to the required state in accordance with the timeframes defined in Tables 10C-1 through 10C-5. If not, a disincentive in the amount as shown in Table 10C-11 (MOT Closure Summary and Associated Disincentive) will be assessed for non-compliance with the time periods above. The disincentives will be assessed in the amount of twenty-five percent of the hourly disincentive shown in Table 10C-11 (MOT Closure Summary and Associated Disincentive) for every 15 minute period in which the closure is in place beyond the timeframe that is allowed or Approved. If the closure is in place for any portion of a 15 minute period that has not been allowed or Approved, the disincentive will be assessed in full for that 15 minute period.

For nonconformance regarding flagging or Rolling Slowdowns such nonconformance will be deemed as a Partial Closure of the Movement where the nonconformance occurred and a Disincentive will be assessed in the amount as shown in Table 10C-11 (MOT Closure Summary and Associated Disincentives).

These Disincentives are separate from the non-conformance traffic control pay adjustment in Part 5 (Special Provisions and Exceptions) Table 5-1 (Unit Prices For Determining Pay Adjustments for Nonconforming Work).

TABLE 10C-11
MOT CLOSURE SUMMARY AND ASSOCIATED DISINCENTIVES

Location of Closure	Type of Closure	Disincentive Per Hour of Closure	
Bangerter Highway (SR-154)	Full or Partial Closure	$10,000 per lane closed	
Cross Streets	Full or Partial Closure	$5,000 per lane closed	

10C-15 MOT Personnel

10C-15.1 Traffic Operations Manager

The Traffic Operations Manager's duties include the following:

A. Develop MOT plans for review at milestones specified by the QMP.

B. Develop and implement the TMP.

C. Coordinate MOT activities with the Design-Builder's, the Department's signal timing staff, and the Traffic Operation Center (TOC).

D. Supervise the activities of the Traffic Control Maintainer(s).

E. Interface with the design engineers and participate in the review of the MOT Plans prior to submittal to the Department.

10C-15.2 Traffic Control Maintainer

In the event of a traffic incident, the Traffic Control Maintainer is authorized, under the direction of law enforcement, to direct changes in traffic control, coordinate with the Department to provide traffic signal timing and signal phasing that ensures safe and continuous traffic flow, and to direct traffic operations. A Traffic Control Maintainer shall be available at all times and shall be on site within 30 minutes of notification throughout the duration of the Project.

10D. SUBMITTALS

Provide submittals to the Department in accordance with Table 10D-1.

TABLE 10D-1
DESIGN-BUILDER SUBMITTALS FOR MAINTENANCE OF TRAFFIC

Submittal	***For Approval***	***Schedule***
Request for Closure	Yes	In accordance with Section 10C-12.1
Closure Notification	No	In accordance with Section 10C-12.1
Pedestrian detour plans	Yes	Obtain Approval prior to implementation
Project Notification Sign Layouts & Installation Plans	Yes	Obtain Approval prior to ordering the signs
Traffic Management Plan (TMP) including an emergency services plan, Incident Management Plan & pedestrian/bicyclist access plan, & student access plan	Yes	Obtain Approval prior to start of construction
Request for Traffic Engineering Order (TEO) for temporary speed limit reductions	Yes	Obtain Approval prior to implementation
Traffic detour plans	Yes	Obtain Approval as part of Request for Closure
MOT plans	No	Submit RFC Plans 14 days prior to implementation.
CMS messages	No	Obtain approval of messages through the design process
MOT Status Report	No	Monthly
Verification of each Traffic Control Maintainer's qualifications	No	With the TMP, and again if changes are made
Daily MOT Inspection Reports	No	Weekly

11—PAVEMENT

11A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 11 (Pavement) and satisfy all functional needs of the Project including pavement and associated items.

11B. STANDARDS

Complete Work for pavements in accordance with the requirements of the standards listed by priority in Table 11B-1 (Standards for Pavement).

If there is any conflict in Standards, adhere to the Standard with the highest priority.

TABLE 11B-1
STANDARDS FOR PAVEMENT

Priority	*Author or Agency*	*Title*
1	UDOT	Special Provisions included in Part 5
2	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
3	UDOT	*2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
4	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
5	UDOT	*2012 Standard Drawings for Road and Bridge Construction*
6	UDOT	*DARWin-ME 2012 (Pavement Design) Manual of Instruction*
7	UDOT	*Materials Manual of Instruction*
8	AASHTO	*A Policy on Geometric Design of Highways and Street*

11C. REQUIREMENTS

Construct pavements that meet the following requirements:

A. The term "Pavement Section," is defined as the entire pavement structural section, including all structural layers (e.g., Portland Cement Concrete Pavement (PCCP), hot-mix asphalt (HMA), additional wearing courses, base and sub-base materials) in any combination as defined by the pavement design.

B. Provide Pavement Sections as follows:

(1) Bangerter Highway (SR-154), ramps and 11400 South East of Bangerter

10 inches PCCP

4 inches HMA or Lean Concrete Base

6 inches Untreated Base Course; adjust and regrade to final grade

12 inches Granular Borrow

Separation Fabric

(2) For widening adjacent to existing asphalt for 5400 South, 7000 South, 9000 South, & 11400 South

6 inches HMA

6 inches Untreated Base Course

12 inches Granular Borrow

Separation Fabric

(3) Remove existing concrete pavement and lean base course at 5400 South, 7000 South, & 9000 South and replace with:

10 inches PCCP

4 inches HMA or Lean Concrete Base

(4) Local Streets:

4 inches HMA

6 inches Untreated Base Course

(5) At 5400 South provide a micro surface over asphalt full width including the full reconstruct sections to the limits of new striping.

(6) At 7000 South provide a 1.5 inch rotomill and fill with HMA over existing asphalt to the limits of new striping.

(7) At 9000 South provide a 1.5 inch rotomill and fill with HMA over existing asphalt to the limits of new striping.

(8) At 11400 South West of Bangerter provide a 1.5 inch rotomill and fill with HMA over existing asphalt to the limits of new striping.

(9) At 4015 West provide a micro surface over existing asphalt to the limits of new striping.

C. Overlays of existing flexible pavements are required whenever the existing pavement is widened or when re-striping is required due to lane shifts and/or transitions. The overlays shall be applied to the entire width of the pavement prior to final striping to provide a continuous and homogeneous riding surface.

For the purpose of this Section 11, overlays are defined as follows:

1. Structural HMA overlays: The final full-width overlay shall include the top HMA layer and SMA wearing course.

D. Grind existing pavement and seal joints for Bangerter Highway whenever existing pavement is widened or when re-striping is required.

11C-1 Ride Quality

Evaluate ride quality in accordance with Standard Specification, Section 01452, and Section 8-995 (Procedure for Certifying Profilographs/Profilers and Qualifying Profilograph Technicians).

11C-2 Surface Texture

Provide longitudinal tining as defined in Standard Specification, Section 02742S.

11C-3 Temporary and/or Temporary Use Pavement

The Design-Builder shall be responsible for design, construction, and maintenance of all temporary pavements. Remove temporary pavement prior to Substantial Completion.

If existing shoulders that are to remain are used as temporary travel lanes to facilitate construction, provide in the Pavement Design Report a condition survey of the existing shoulders including photographs. The Pavement Design Report shall also include the anticipated duration for shoulder use, and demonstrate that the existing pavement is adequate to sustain the traffic loads without structural damage to the pavement. Repair or replace any damaged pavement.

11C-4 Repair of Defective Pavement

Replace any cracked, damaged, or otherwise defective pavement placed as part of the Contract or damaged by the Design-Builder. Provide new full panels for any PCCP repairs/replacement.

11C-5 Permanent Pavement Markings and Messages

For all permanent pavement markings, meet the requirements of Part 5 (Special Provisions and Exceptions).

A. Use grooved in contrasting pavement marking paint on concrete for all longitudinal lines.

B. Use pavement marking tape on asphalt surfaces for Department roads.

C. Use pavement marking paint on asphalt surfaces for City streets.

D. Use thermoplastic for all messages. Use grooved in messages on concrete.

11D. SUBMITTALS

Provide submittals to the Department in accordance with Table 11D-1.

TABLE 11D-1
DESIGN-BUILDER SUBMITTALS FOR PAVEMENT

Submittal	***For Approval***	***Schedule***
Electronic record of vibrator operating frequencies	No	At time of paving operations per Section 11C-4

12—PUBLIC INFORMATION SERVICES

12A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 12 (Public Information) and to satisfy all functional needs of the Project, including providing support for the Department-led communication effort.

12B. STANDARDS

Not Used.

12C. REQUIREMENTS

12C-1 Division of Roles

The Department's ongoing objective is to be responsive to stakeholders throughout the Project. It is imperative that the Department and Design-Builder build and maintain public support by working with the public to ensure that questions, concerns, and comments are understood, considered, and addressed and that information related to Project activities and impacts is proactively and effectively distributed.

The Department has designated a consultant Communications Team (CT) to manage external communication. The Department will be responsible for all public communication strategies, including Public Involvement (PI), message development, and information dissemination . The CT will perform the Public Involvement (PI) activities including on-the-ground outreach and grassroots communication efforts.

Provide a Point of Contact (POC) for the CT to provide and verify accurate information on schedule and impacts that the CT will communicate to the public. Provide a POC who has authority to quickly make changes to MOT, access, and other potential impacts to the public on the Project.

Designate an Interchange Point of Contact (IPOC), for each Project interchange location, who is responsible to communicate and coordinate interchange-specific information directly with the CT. The IPOC must be responsible for the day-to-day construction activities at the interchange and can not be the same individual as the POC.

Table 12C-1 Division of Responsibilities		
Communications Team (CT)	Design-Builder	Shared
Set communications strategy, planning, messaging, branding, and oversight	Designate a POC to the CT	
Manage all communication, including advertising,media relations, grassroots outreach, and social media	Designate IPOCs to the CT	Develop and execute crisis communication plan
Develop and execute Communication Plan (CP) and execute all tactics for the Project	Provide schedule, impact, and other pertinent Project information to the CT	Prepare for and participate in CT and Project meetings
Create and maintain stakeholder database	Provide Emergency Responders Contact List	
Track stakeholder interactions in stakeholder database	Notify the CT of all stakeholder or media interactions, or prior to any planned interactions	
Respond to stakeholder issues and complaints	Respond to CT requests to resolve MOT, access, and other construction-related stakeholder concerns	
Provide weekly stakeholder reports	Review weekly project update emails and other construction information notices for accuracy	
Maintain Project hotline, email, web site	Report weekly on actions taken based on reported stakeholder problems	
Attend Design-Builder weekly construction meetings (PI)	Prepare for and present at CCT meetings	
Form and facilitate Community Coordination Team (CCT)		

12C-2 General Requirements

A. Provide a POC to maintain an effective working relationship with the CT.

B. Provide IPOCs to maintain an effective working relationship with the CT.

C. Provide the CT with accurate and timely information. Inform the CT in advance of any construction impacts to traffic, including all Partial and Full Closures. Notice should be provided to the CT in accordance with Part 4-10 (Maintenance of Traffic).

D. Notify the CT of any impacts to Third-Parties anticipated to be affected by the Work,

including access to homes, businesses, schools, property owners, etc., and including impacts due to noise, dust, vibrations, and light. Notify the CT at least seven Calendar Days in advance of Work impacts to Third-Parties and other Work requiring public notice, unless otherwise specified in Part 4-10 (Maintenance of Traffic).

E. Notify the CT two months in advance of any major construction phase changes.

F. Communicate construction activities that correspond and or conflict with public events and holidays to the CT. Identify and plan mitigation measures when possible.

G. Notify the CT within 15 minutes of a major accident or unexpected occurrence in or adjacent to the Project.

12C-3 Definitions and Personnel

Communications Team (CT): The CT consists of a consultant Public Involvement team that includes a Public Information Manager (PIM), Interchange Public Involvement Lead, Media Relations Manager, creative, and interactive staff. The CT will be responsible for setting communications strategies, and messaging, and executing tactics related to that strategy and Communications Plan (CP). The CT reports to the Department Project Manager and Program Manager. The Department Public Information Officer will be the media spokesperson. The CT will also keep the Region Two Region Communications Manager and Department Central Communications informed of PI activities.

Public Information Manager (PIM): The PIM will manage the CT and be responsible for the development of an overall CP for the Project. The PIM will primarily be responsible to oversee broadscale communication, media relations, advertising and outreach planned and executed by the Interchange Public Involvement Lead's.

Interchange Public Involvement Coordinator (IPIC): The IPIC will be a member of the CT and will be responsible for the execution of communication and outreach for a specific interchange for the Project and to support the CT. The IPIC is primarily responsible for on-the-ground PI, including providing current Project information, responding to urgent PI and public relations issues, communicating with stakeholders adjacent to the Project, coordinating with the Design-Builder, gathering information on construction schedule and impacts, and providing information to the CT. The IPIC will attend construction meetings.

Point of Contact (POC): The role of the POC will be filled by a member of the Design-Build team, who has authority to quickly make changes to MOT, access, and other potential impacts to the public on the Project.The POC will assist and be a resource to the CT to quickly resolve issues and provide information. The POC will be available by phone 24 hours per day, seven days per week.

Interchange Point of Contact (IPOC): The role of the IPOC will be filled by a member of the Design-Build team, who is responsible to communicate and coordinate interchange-specific information directly with the CT and has the authority to quickly make changes to MOT, access and other potential impacts to the public on the Project. The IPOC will work closely with the IPIC to provide information about contruction activities and potential impacts to the public.

Stakeholder: A stakeholder is an individual, business, group or municipality whose interests might be affected in a specific manner, whether real or perceived, by the construction and operation of the Project.

12C-3.1 POC and IPOC Responsibilities

A. Respond to and maintain regular communication with the CT.

B. Invite a member of the CT to attend construction meetings to discuss and review

construction plans, schedule, and coordinate PI activities and notifications.

C. Communicate and document construction schedule, MOT plans and changes, access impacts, and Project updates with the following:

1. Communications Team (CT)

D. Review publicly distributed materials (for accuracy) at the request of the CT prior to distribution.

E. Coordinate with emergency responders on any changes to access or traffic impacts that could affect public safety or response time.

F. Participate in crisis communication planning and response.

12C-4 Project Logo and Collateral

Obtain Department Approval for any Design-Builder items featuring the Project logo, such as any clothing or signs.

Do not use corporate logo for Project collateral or Design-Builder promotion. Do not attach permanent or temporary Design-Builder logos or branding identification on any Project physical features within the Project limits. Logos or branding identification other than those permanently attached to vehicles, equipment, and apparel are prohibited.

12C-5 Media and Communication led by the Department

12C-5.1 Project Messaging

The CT will develop key messaging to be used by anyone communicating with a member of the public or media.

12C-5.2 Project Hotline and E-mail

The CT will be responsible for staffing a Project hotline with availability 24 hours per day, seven days per week. The CT will also establish and manage a Project email address and will involve the POC and IPOCs for resolution or response, as appropriate. See Table 12C-2 for required response times.

12C-5.3 Media Relations

The CT and the Department will be responsible for media relations for the Project, and will require assistance from the POC for media events and interviews. Media is defined as any newspaper, television, radio, online, trade publication, other periodical, blog, or social media (e.g., Facebook, Twitter, online forums).

Design-Builder will notify CT and the Department prior to all communications with the media. Forward all media inquiries—written and verbal—to the CT, including requests for Project information and requests for interviews or article submissions.

12C-6 Internal Communication

12C-6.1 Kickoff and Partnering Meetings

The CT, POC, and IPOCs will participate in the Project kickoff and partnering meetings, during which the Project team will clarify goals, expectations, roles, and lines of communication.

12C-6.2 Internal Communication

The POC will coordinate with, be available for, and respond to the CT to ensure timely and accurate

information is communicated to Project stakeholders. The Design-Builder will support the coordination and communication activities of the CT by providing information, reviews, and timely response.

12C-7 Public Involvement and Outreach

12C-7.1 Communication Planning

The CT will provide the Project's CP to the POC for information. The POC will provide schedule and impact changes to the CT that would affect the CP outreach schedule within the timeframes outlined in 12C-2.

12C-7.2 Stakeholder Database and Reports

The CT will provide a stakeholder contact summary report every week. The report will be shared with the POC.

The POC will refer all stakeholder interaction to the CT. The POC will notify the CT of any unavoidable reactive communication (e.g. on-site) with stakeholders with the following information:

A. Name, address, contact information

B. Date of contact

C. Method of contact

D. Issue being addressed

E. Notes on the interaction, including steps toward resolution

F. Action items, if any

G. Attach hotline stickers to all construction hard hats with hotline number. CT will provide stickers.

12C-7.3 Event Participation

The Design-Builder will participate in events including the following:

A. Department-led media interviews and events

B. Public outreach meetings (e.g., city council meetings, private meetings, business meetings, community meetings.)

C. Special Events (e.g., ground breakings, public open houses, Meet the Contractor Open House, neighborhood meetings, ribbon cutting ceremonies, etc.)

Participation will include training, materials review (for accuracy), preparation for events, meetings, and interviews and may include providing maintenance of traffic and secure and safe access to Work areas.

12C-7.4 Emergency Response and Crisis Communication

Develop and maintain a Project emergency responders contact list. Submit the contact list within 30 days of Contract award or prior to construction activities. This list should include a main point of contact for emergency responders and a backup person if the primary contact is not available. Contact emergency responders with the same notification times as the CT when a change to access or traffic impact may alter emergency response times or public safety. Assist the CT in the development, execution, and updating of a Project Crisis Communications Plan.

12C-7.5 Stakeholder Issues and Complaints

Provide responses to the CT for stakeholder issues, complaints, and requests in a timely manner. Address safety issues immediately. Comply with the minimum response requirements in Table 12C-2.

Table 12C-2
Response Requirements

Type	*Response Due*	*Information Required*
Phone calls from the Department	Two hours after origination	Response
Emails from the Department	One Working Day after origination	Response
Stakeholder issues and complaints via email	One Working Day after origination	Response
Stakeholder issues and complaints via phone call	2 hours after origination	Response
Stakeholder issues and complaints via email (IPOC)	One Working Day after origination	Comment and stakeholder contact information provided to the CT
Stakeholder issues and complaints via phone call (IPOC)	One Working Day after origination	Issue, location, and time provided to the CT
Media inquiries	Immediately after inquiry	Media contact information and subject of inquiry provided to CT
Immediate PI-action required activities	One hour after discovery or as listed in the Crisis Communications Plan	Update or resolution provided to the CT
Late lane or road openings	One hour before the scheduled opening, or immediately upon discovery	Location, cause of delay and expected opening time provided to the CT
Safety related issues	One hour after origination or discovery or as listed in the crisis communications plan	Type and location of issue

12C-8 Community Coordination Team (CCT)

The CT will form and facilitate a Community Coordination Team (CCT) to represent West Jordan City, South Jordan City, Taylorsville City, area stakeholders, local residents and schools, area businesses, emergency services, and other local entities. The CCT will administer the monetary incentive as defined in Part 2 (General Provisions).

Committee members will represent the interests of the public and provide input from Project stakeholders to the Project Team, and communicate information about the Project and Project schedule to stakeholders.

In order to focus responsibilities, each CCT meeting will follow items as specified on an agenda, which will be prepared by the CT.

12C-8.1 Community Coordination Team Meetings

The CCT will meet no less than seven times during the Project. The CCT will be attended by the Design-Builder Project Manager, the Design-Builder POC, the Department Project team and CT representatives, and stakeholders at a minimum. The CCT meeting schedule will be determined after NTP. The last meeting will be scheduled within 30 days after Substantial Completion of the Project.

Table 12C-3
Incentive Award Periods

Incentive Award Period	**Maximum Percent of Total Available Award (IAP%)**
Period 2 : August – October 2017	15
Period 3: November – December 2017	20
Period 4: January – March 2018	10
Period 5: April – June 2018	15
Period 6: July – September 2018	15
Period 7 – October – 30 days after Substantial Completion of the Project	15

12C-8.2 CCT Meeting Logistics

The Design-Builder will provide agenda items, presentations, meeting space, and snacks, to support the CCT meetings. The CT will facilitate and lead the meetings.

12D. SUBMITTALS

Provide submittals to the Department in accordance with Table 12D-1.

TABLE 12D - 1
DESIGN-BUILDER SUBMITTALS FOR PUBLIC INFORMATION

Submittal	***For Approval***	***Schedule***
Point of Contact (POC) Designee	No	Prior to NTP
Interchange Point of Contact (IPOC) Designee	No	Prior to NTP
Material with Project ID or Logo for Design-Builder's use	Yes	Prior to material order
Emergency Responders Contact List	No	Within 30 days of Contract award or prior to construction activities
Crisis Communication Plan	Yes	Within 7 days of Contract award
Partnering Plan	No	Within 30 days of Contract award

13—RAILROAD

13A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 13 (Railroads) and to satisfy all functional needs and characteristics of the Project, including providing agreements with the Railroads, and coordinating and obtaining approval of Work on, over, under, or affecting Railroad right-of-way(ROW) and at all existing, new, or future at-grade or grade-separated crossings of Railroad ROW.

13B. STANDARDS

Complete Work for all Railroads in accordance with the requirements of the standards listed by priority in Table 13B-1 (Standards for Railroad).

If there is any conflict in standards, adhere to the standard with the most stringent requirements.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

TABLE 13B-1
STANDARDS FOR RAILROAD

Priority	*Author or Agency*	*Title*
1	UDOT	Utah Transit Authority Partnering Agreement
2	UTA	License Agreement for Bangerter Crossing
3	UDOT	Special Provisions included in Part 5
4	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
5	UDOT	*2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
6	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
7	UDOT	*2012 Standard Drawings for Road and Bridge Construction*
8	UTA	*Utah Transit Authority Light Rail Design Criteria,* HTTP://WWW.RIDEUTA.COM/UPLOADS/UTALRTDESIGNCRITERIAREVISION5.PDF
9	FHWA	*Railroads, 23 Code of Federal Regulations (CFR)*
10	FRA	*Railroad Workplace Safety, 49 CFR*
11	AASHTO	*A Policy on Geometric Design of Highways and Streets*
12	AREMA	*Manual of Railway Engineering*
13	BNSF/UPRR	*Guidelines for Railroad Grade Separation Projects*

13C. REQUIREMENTS

The Project interfaces with railroad corridors owned and/or operated by UTA. The Design-Builder shall coordinate, design, and construct both temporary and permanent Project features in accordance with UTA's criteria for Work items, as necessary to maintain the level of service and to accommodate the Project construction. The Design-Builder is responsible for obtaining and complying with all applicable design and construction specifications and requirements for each location. UTA's

requirements for working in and around UTA's property can be found at the following web site: http://www.rideuta.com/mc/?page=DoingBusiness-PropertyManagement. Obtain all permits and approvals necessary to accommodate any Project work or impacts to/within UTA's right-of-way. Include time in the schedule to obtain said permits/approvals. Any cost incurred for obtaining the agreements(s) shall be borne by the Design-Builder.

Before commencing work on UTA property, obtain and submit executed Contract Right-of-Entry Agreements as described in Section 13C-2.2 (Right of Entry/Insurance Requirements).

13C-1 General Provisions

13C-1.1 Cleaning of Right-of-Way

Upon completion of the Work performed by Design-Builder on UTA's premises, and over or beneath the tracks of UTA, promptly remove from the UTA ROW all of the Design-Builder's tools, implements, and other materials, whether brought onto the ROW by Design-Builder or any Subcontractor, employee, or agent of Design-Builder, and leave the ROW in a clean and presentable condition to the satisfaction of UTA.

13C-1.2 Traffic Control

Submit MOT Plans to UTA for all Work in, above, or affecting the railroad ROW. Design-Builder's operations that control traffic across or around rail facilities shall be coordinated with and approved by UTA's Designated Representative.

13C-1.3 Construction Excavations

Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls, or other facilities that require shoring shall comply, at a minimum, with requirements of OSHA, AREMA, and UTA / UPRR guidelines.

Contact Utah "Call Before You Dig" service (Bluestakes; www.bluestakes.org) at 811 to determine location of Utility Facilities. If Utility Facilities are buried anywhere on or near UTA ROW, coordinate with any of the Utility Facilities to arrange for relocation or other protection of the system prior to beginning any Work on UTA ROW.

For construction or maintenance of any grade-separated crossing, submit to UTA plans setting out the method and manner of handling all Work to be performed under the track and bridge structure, including shoring and cribbing, if any, to protect the operations of UTA and the freight operator. The Design-Builder shall not proceed with any such Work until Design-Builder's proposed methods have been approved by UTA.

13C-2 UTA Company Interests, Insurance, Worker Protection, Flagging, and Plan Submittal

13C-2.1 UTA Contact Persons

Coordinate and cooperate with UTA for all Work on, over, or under the railroad ROW or Work that may impact current or future railroad operations.

The primary UTA point of contact for this Project is:

Mailia Lauto'o
Property Administrator
Utah Transit Authority
669 West 200 South
Salt Lake City, UT 84101

(801) 237-1995 (Work)

13C-2.2 Right of Entry/Insurance Requirements

Apply and obtain Contractor's Right-of-Entry from UTA to allow the Design-Builder to access UTA's ROW as required by the License Agreement. Any cost incurred for processing the agreement shall be borne by the Design-Builder. Comply with the terms of the Right-of-Entry Agreement and provide and maintain insurance as required by UTA's Insurance Requirements.

Do not begin Work on or over UTA's ROW until UTA has received the insurance policies, binders, certificates, and endorsements required by the License Agreement, and until UTA has advised the Department that such insurance is in accordance with the Agreement. The required insurance will be kept in full force and effect during the performance of Work and thereafter until Design-Builder removes all tools, equipment, and material from UTA's property and cleans the premises in a manner satisfactory to UTA.

Obtain a Track Access Permit covering the time and place where there will be activity on the railroad ROW. All personnel employed by the Design-Builder and all subcontractors must complete the UTA training course "Roadway Worker Protection and Rail Safety Training", and be registered prior to working on UTA ROW.

13C-2.3 Flagging and Inspection

UTA flagging representatives, conductors, or watch persons shall be provided by UTA at Design-Builder's expense to protect UTA facilities, property, and operations. The Design-Builder shall include in its costs the number of 12-hour flagger days that required for railroad flagging and inspection. The Department will compensate UTA for flagging and inspection costs and deduct the amount of compensation from the progress and final pay estimates to be paid to the Design-Builder.

Document, in a log book, the actual time periods during which UTA personnel are flagging and inspecting. If Design-Builder disputes any payment to the Department for any charges incurred by the Department for UTA personnel flagging and inspecting, Design-Builder shall submit a copy of the log for each disputed invoicing period.

UTA may not be able to provide railroad flaggers on specific requested dates. The Design-Builder shall not receive additional compensation or be allowed changes to the Project Schedule because of flagging unavailability.

The pay rates of UTA employees shall be the UTA rates in effect at the time of the Work for the various classes of labor.

Coordinate with UTA providing initial notice at least 10 Working Days in advance of proposed Work and adjusting the Work schedule as necessary by coordinating activities with UTA.

UTA will furnish such personnel or other protective services in the following situations, subject to the opinion and interpretation of UTA's Designated Representative:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally from centerline of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25-foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if track or other UTA facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation, or grading in proximity to UTA facilities that may endanger UTA facilities or operations.

D. During any Design-Builder operations when UTA facilities, including tracks, buildings, signals, wire lines, or pipelines, may be endangered.

If the Design-Builder does not comply with the flagging requirements, UTA will post flaggers as it deems necessary. The costs of such flagger(s) shall be deducted from payments to the Design-Builder. The Design-Builder shall not be entitled to any additional compensation, and shall comply with all directions given by UTA flaggers.

13D. SUBMITTALS

Provide submittals to the Department and UTA / UPRR in accordance with Table 13D-1.

TABLE 13D-1
DESIGN-BUILDER SUBMITTALS FOR RAILROAD

Submittal*	For Department Approval	For indicated Railroad approval	Schedule	Minimum Railroad Review Time
30% Bridge Structure Plans	No	Yes	Prior to Work within Railroad ROW	12 Weeks
100% Bridge Structure Plans	No	Yes	Prior to Work within Railroad ROW	12 Weeks
Shoring	No	Yes	Prior to Work within Railroad ROW	4 Weeks
Falsework	No	Yes	Prior to Work within Railroad ROW	4 Weeks
Demolition	No	Yes	Prior to Work within Railroad ROW	4 Weeks
Erection	No	Yes	Prior to Work within Railroad ROW	4 Weeks
Erosion Control	No	Yes	Prior to Work within Railroad ROW	4 Weeks
Constrution Phasing Plan	No	Yes	Prior to Work within Railroad ROW	4 Weeks
Contract Right-of-Entry	No	UTA / UPRR - Yes	Prior to Work within Railroad ROW	4 Weeks
DailyLogs	No	No	As requested by Department	
As-built Drawings	No	No	As requested by UTA / UPRR	

* SEE BNSF/UPRR Guidelines for Railroad Grade Separation Projects for submittal requirements.

14—RIGHT-OF-WAY

14A. GENERAL

It is anticipated that Right-of-Way needed for the Project as shown in the Part 7 (Contract Drawings) will be purchased by the Department. However, if any Right-of-Way is modified from Part 7 (Contract Drawings) or additional Right-of-Way needs to be purchased as part of the Design-Builders design, then the Design-Builder shall be solely responsible for the design and purchase or modification of the Right-of-Way. If purchasing Right-of-Way, conduct all Work necessary to meet the requirements of this Section 14 (Right-of-Way) and to satisfy all functional needs and characteristics of the Project, including acquisition of temporary construction easements and additional Right-of-Way as needed.

14B. STANDARDS

Complete Work for Right-of-Way in accordance with the requirements of the standards listed by priority in Table 14B-1 (Standards for Right-of-Way).

If there is any conflict in standards, adhere to the standard with the most stringent requirements.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

TABLE 14B-1
STANDARDS FOR RIGHT-OF-WAY

Priority	***Author or Agency***	***Title***
1	UDOT	Special Provisions included in Part 5
2	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
3	UDOT	*2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
4	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
5	UDOT	*2012 Standard Drawings for Road and Bridge Construction*
6	UDOT	*Manual of Instruction–Right-of-Way-Design*
7	UDOT	*Project Development Process Manual*
8	UDOT	*Right-of-Way Operations Manual (Policies and Procedures) Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended and Implementing Regulations found in Title 49 Code of Federal regulations Part 24 and Code of Federal regulations 23 CFR Part 710.313*
9	UDOT	*ROW ProjectWise Guide*

14C. REQUIREMENTS

The Department has acquired certain Right-of-Way (ROW) specifically for the Project which is shown on the ROW Drawings included in Part 7 (Contract Drawings). The Department will retain possession of each parcel and all improvements, if any, made thereon by the Design-Builder. The Design-Builder's access and use of the ROW arises solely from the permission granted by the Department under the Contract.

The Design-Builder shall not assume that any Department-acquired property, or any other property, outside

the Project shown on the ROW Drawings in Part 7 (Contract Drawings) is acceptable for its use. In certain instances, the Project may not extend to or include the entire ROW. Use of Department property outside of the Project is acceptable only with the Department's prior Approval outlining the conditions for use. Approval is given by the Department's property management section within the ROW Division.

14C-1 Status of Right-of-Way

The Design-Builder shall be allowed access to each parcel identified in Attachment 14-A (Right-of-Way Schedule) as each individual parcel is acquired and as the Department provides the Design-Builder notice. The Department will provide the Design-Builder with status reports, written notice of parcel access, and any applicable restrictions that may apply. The Design-Builder shall not access any parcel on which access has not been provided.

The Design-Builder shall not trespass on private property.

The Department has designed the N/A or L/A line and any changes require Department Approval.

14C-1.1 Right-of-Way Commitments

Perform all obligations indicated as the Design-Builder's responsibility in Attachment 14-B (Right-of-Way Commitment Table). Items identified as paid to the property owner in the Right-of-Way agreement identified in Attachment 14-B (Right-of-Way Commitment Table), are not the responsibility of the Design-Builder.

14C-1.2 Right-of-Way Manager

Should the Design-Builder determine that additional ROW, easement, or modifications to ROW other than what is shown in Part 7 (Contract Drawings), is necessary, the Design-Builder shall submit for Approval a ROW manager who shall be responsible for all ROW coordination and compliance requirements. The ROW manager shall be qualified for both acquisition and relocation services as defined in the UDOT ROW Operations Manual and meet the requirements for the Department ROW Pool. The ROW Manager will be responsible for supervising staff and consultant agents who are specialized in real property acquisition, relocation assistance for non-residential and residential services, appraisal services for residential and complex services, and appraisal review. The ROW manager shall coordinate all acquisition and relocation activities with the Department ROW Oversight Manager or designated representative.

14C-1.3 Request for Project Right-of-Way

Request for Additional Right-of-Way

Should the Design-Builder determine that additional ROW, easement, or modification to ROW other than what is shown in Part 7 (Contract Drawings), is necessary, the Design-Builder shall submit a written request to the Department. Each request shall include an identification of the additional ROW, easement, or modification and a justification for its need related to the Project.

The Department will review each request and determine if the ROW, easement, or modification is needed for the Project (and therefore should have been originally provided or identified by the Department) or if it is for the Design-Builder's convenience.

If it is determined that the ROW is needed for the Project and should have been originally provided by the Department in accordance with Part 2, Section 7.3.2.1 (Due to Department-Directed Change), the Department will Approve the ROW request. The Design-Builder and the Department must agree to the change in the design and acquisition schedule and all related issues. The Design-Builder shall provide information as outlined in this Section 14C-1.3 (Request for Project Right-of-Way – Department Approved

Right-of-Way). The Department will acquire the approved ROW unless otherwise agreed upon with the Design-Builder. If the Design-Builder acquires the ROW on behalf of the Department, follow the procedures outlined in Attachment 14C (ROW Acquisition for the Design-Builders Convenience) unless otherwise directed by the Department.

If the Department does not Approve the ROW request, the Department will notify the Design-Builder that the ROW is for their convenience and acquisition of such ROW will be the responsibility of the Design-Builder in accordance with Part 2, Section 7.3.2.2 (Acquisition Process for ROW for Design-Builder's Convenience). The Design-Builder shall comply with the Section 14C-1.3 (Request for Project Right-of-Way – ROW Acquisition for the Design-Builder's Convenience) for acquisition procedures.

Department Approved Right-of-Way

Upon Department Approval of the request, the Design-Builder shall submit the following information:

Design Package/Electronic Summary:

A. **Right-of-Way Design Sheets:** Provide 11-by-17 inch plan sheets outlining and defining ROW acquisition boundary. ROW acquisition boundary shall be designed using Project ROW alignment. Provide station and offset references/calls to property line, intersections, and points of deflection. Provide all horizontal curve data necessary to adequately describe new property line limits.

B. **Right-of-Way Design Sheets with Aerials:** Provide 11-by-17 inch plan sheets outlining and defining ROW acquisition boundary with the project Aerial Imagery projected on each of the Right-of-Ray Design Sheets. ROW acquisition boundary shall be designed using Project ROW alignment. Provide station and offset references/calls to property line, intersections, and points of deflection. Provide all horizontal curve data necessary to adequately describe new property line limits. In addition, provide Total Tract Sheets.

C. **Ownership Record**: Provide an Ownership Record, verifying all owners and the percentages of ownership dating back five years or until a Warranty Deed is found for each ownership and/or percentages. This shall include the legal description of the full parcel along with the size of the full parcel in acreage or square footage. Provide a copy of the vesting instruments.

D. **Acquisition Package**: Provide documents in accordance with Part 4 Appendix C.

E. **Documentation**: Deliver all summaries in accordance with Part 4 Appendix C, designs, records, reports, correspondence, and documents relating to ROW acquisition to the Department in electronic, MicroStation CADD files (DGN files), and hardcopy formats, or as otherwise requested by the Department. All documents submitted to the Department must be in accordance with the Right-of-Way ProjectWise Guide found at (http://udot.utah.gov/go/rowprojectwiseguide). Complete a final quality check to ensure that all documents have been entered into ProjectWise and/ or UDOT's ePM ROW module.

Access to the additional ROW, easement, or modification shall be granted upon written notification to the Design-Builder.

ROW Acquisition for the Design-Builder's Convenience

Any additional ROW other than what is shown on the ROW Plans in Part 7 (Contract Drawings) and ROW Approved from Section 14C-1.3 (Request for Project Right-of-Way), is designated as ROW for the Design-Builder's Convenience. The Design-Builder shall be solely responsible for the acquisition of these

properties and easements. The Design-Builder shall follow the ROW acquisition procedures as outlined in Attachment 14-C (ROW Acquisition Procedures) for ROW Acquisition for the Design-Builder's Convenience.

Permission to Enter Property

Any additional ROW other than what is shown on the ROW Plans in Part 7 (Contract Drawings) and ROW Approved from Section 14C-1.3 (Request for Project Right-of-Way), is designated as ROW for the Design-Builder's Convenience. The Design-Builder shall secure Permits to Enter and Construct forms prior to entering any property outside the ROW shown on the ROW Plans in Part 7 (Contract Drawings) for survey, environmental, appraisal purposes, and Project-related Work. It shall be the Design-Builder's sole responsibility for any and all damages and claims. The Design-Builder shall submit copies of all executed Permit to Enter and Construct forms to the Department prior to performing any Work on property outside the ROW shown on the ROW Plans in Part 7 (Contract Drawings). A copy of the form is provided in UDOT's ePM ROW module system. Do not request Permits to Enter and Construct with property owners who are currently or will be in negotiations with the Department without Approval.

14C-1.4 Temporary Construction Easements (TCEs)

The Design-Builder shall be responsible for acquiring and obtaining all TCEs not shown in the ROW Drawings in Part 7 (Contract Drawings) that are necessary to meet the requirements of the Contract Documents.

All TCEs shall be appraised and valued in accordance with the UDOT *Right-of-Way Operations Manual.* If a TCE is to be acquired on a property on which the Department has an unsettled condemnation case, obtain Department Approval prior to any communication with the property owners.

After each TCE is acquired, the Design-Builder shall prepare a complete parcel acquisition file, which includes copies of offer letters, fair market valuation, fully executed easement documents and/or agreements, the agent log, and a statement signed by the property owner acknowledging receipt of payment in full. Parcel acquisition files shall be submitted through UDOT's ePM ROW module and in accordance with Sections 1.2.7 and 1.2.8 of the UDOT *Right-of-Way Operations Manual and* this Section 14C-1.3.D.

If the Design-Builder cannot reach an agreement with a property owner for the acquisition, the Design-Builder may request in writing that the Department acquire the easement(s) through condemnation proceedings.

Cost of TCEs and ROW Acquisition for the Design-Builder's Convenience Design-Builder shall pay the cost of, and be responsible for, processing and issuing all payments of agreed purchase prices or awards; relocation assistance payments and all legal, administrative, and incidental expenses of or related to the Design-Builder's temporary construction easements and ROW Acquisition for the Design-Builder's Convenience.

In addition, the Design-Builder shall:

A. Be solely responsible for all costs and be responsible for (the process of) acquiring/obtaining environmental approvals and the cost associated with obtaining the approvals.

B. Be solely responsible for cost and time delays associated with the Department's proceeding with condemnation.

C. Not be entitled to any Change Order for time or money as a result of site condition (e.g., hazardous materials, differing site conditions, geotechnical issues, Utilities) on such additional ROW.

D. Not be entitled to any Change Order for time or money as a result of any delay, inability, or cost associated with the acquisition of such ROW.

14C-1.5 Access

Maintain the same access to all existing properties that are to remain after the completion of construction. Repair or replace in kind all existing driveways and access roads. Impacts to driveways are limited to 10 Calendar Days. No full closure of driveways allowed without written permission from the property owner.

If access is required through the Project No Access lines, complete the Temporary Interstate Access Request Form provided in Part 4-14 (Right-of-Way). Access is subject to Department Approval.

14C-1.6 Construction Clearance

Do not begin construction on any real estate until specifically Approved by the Department after all property rights for the Project have been conveyed in favor of the Department or a Right of Occupancy Agreement (ROO), Court Order to Occupy, or a Right of Entry Agreement has been executed by all applicable parties of interest, and the property has been certified as cleared for construction purposes.

14C-1.7 Protection of Property

Once permission to enter has been acquired for a property in accordance with the requirements herein, the Design-Builder shall manage and minimize losses to the property. This shall include the installation of temporary chain link security fencing sufficient to contain animals, people, etc. The temporary fencing shall be installed prior to removing any ROW or existing fencing or sound barrier in place within the Project limits.

14C-1.8 Business Parking Availability and Access

Once Work begins in the vicinity of a business, the Design-Builder shall avoid losses to the business's parking availability and access to and from the business especially if there is only one access for the business. If there is only one access to a business, construction of the driveways shall be constructed by closing only 1/2 of the driveway at any given time and maintain the remaining 1/2 of the driveway open at all times. Limitations on the use and/or removal of parking and access are identified in Attachment 14-B (Right-of-Way Commitment Table).

14C-1.9 Demolition

The Design-Builder shall demolish, as necessary, all buildings, structures, and other improvements within the ROW in compliance with procedures and requirements identified by the Division of Air Quality (DAQ), the Occupational Safety and Health Administration (OSHA), all Federal, State, and Local Government rules and regulations. The Design-Builder shall conduct asbestos and lead-based paint inspections on all ROW buildings, structures, and other improvements), and prepare reports summarizing the findings of the inspections. The Design-Builder shall leave each property clear of debris, and if there was an excavation, the hole must be filled and compacted per Department specifications and the disturbed area needs to be treated in accordance with the requirements in Part 4-07 (Landscaping and Aesthetics) .The Design-Builder is responsible to demolish the structures in the tables in Attachment 14-A: Right-of-Way Schedule upon notification from the Department.

14C-1.10 Restoration of Property and Landscape

Should the Design-Builder damage, injure, or destroy property or landscaping on any property for which the owner has not been compensated, the Design-Builder shall, at its sole cost and expense, repair and/or

replace or restore the damage to a condition equal to or better than that existing prior to the damage. Restoration may include repair, replacing in kind, rebuilding, or replanting.

14C-2 Final ROW Surveying and Mapping

14C-2.1 Design-Builder's Responsibilities

The Design-Builder shall provide DGN files for ROW and easement acquisitions in the Project coordinate system based on the Project ROW alignment file.

14C-2.2 Department Responsibilities

The Department will provide surveying, mapping and will prepare all documents for ROW or easements acquired as outlined in Section 14C 1.3 (Request for Right of Way) and Section 14C 1.4 (Temporary Construction Easements). The Department will install and set permanent Right-of-Way markers. Notify the Department 14 Calendar Days prior to the installation of the Right-of-Way fence.

A Record of Survey will be prepared by the Department and submitted to the Salt Lake County Surveyor(s) office(s).

Department will prepare final ROW drawings for the Project.

14D. SUBMITTALS

Provide submittals to the Department in accordance with Table 14D-1.

TABLE 14D-1
DESIGN-BUILDER SUBMITTALS FOR RIGHT-OF-WAY

Submittal	*For Approval*	*Schedule*
ROW Instruments	Yes	Prior to acquisition
Request for additional ROW	Yes	Prior to acquisition
Permit to Enter and Construct Form	Yes	Prior to entry
Parcel acquisition file	Yes	Two Days (maximum) following payment to landowner
Asbestos and lead based paint inspection report	No	15 Days prior to demolition

Attachment 14-A: Right-of-Way Schedule

5400 South Interchange

Parcel No.	*Owner Name*	*Property Address*	*Demolition*	*Committed Clearance Date*
716	CHAVEZ, KRIS S	3661 W 5695 S	N/A	April 1, 2017
718	SONG, DOOHYUN K	3676 W 5695 S	N/A	April 16, 2017
720	LUNA, JORGE	3670 W 5695 S	N/A	April 1, 2017
722	LOVEDAY, CLINT & CARYN; JT	3671 W 5650 S	Department	NTP
724	LOVEDAY, KENNETH L & DARLENE N; JT	3677 W 5650 S	Department	NTP
726	FISHER, GARY & MALISSA; JT	3674 W 5650 S	Department	NTP
728	CRANE, DAVID L & KATHY M (JT)	3687 W WHITEWOOD CT	Department	NTP
728B	Schytler		N/A	NTP
730	SAWYER, ROBERT H; TR (RHS TR)	3688 W WHITEWOOD CT	Department	NTP
732	BLANK, CATHY L	3686 W WHITEWOOD CT	Department	NTP
734	MONTOYA, SONDRA C	3695 W ALVERON DR	Department	NTP
736	ALMEIDA, JESSICA A D S	5580 S ALVERON DR	Department	NTP
738	SMITH, STEWART	5568 S ALVERON DR	Department	NTP
740	WILLIS, KILEY	5556 S ALVERON DR	Department	NTP
744	SEARLE, DOUGLAS E & MONA L; JT	5544 S ALVERON DR	Department	NTP
745	STEELE, KENT H & KAREN S (JT)	5532 S ALVERON DR	Department	NTP
746	BEAMON, JAMES E & CHALLI R; JT	5520 S ALVERON DR	Design-Builder	September 8, 2017
747	ROWLEY, RUSSELL J & KATHLEEN L (JT)	5512 S ALVERON DR	Design-Builder	September 5, 2017
748	HEFFRON, HOLLY	5498 S ALVERON DR	Department	NTP
749	HETRICK, MOLLY A	5490 S ALVERON DR	Department	NTP
750	HARRIS, JEREMY T	5480 S ALVERON DR	Department	NTP
751	THIEM, THIEN M &	5472 S ALVERON DR	Department	NTP

	VU, LUAN B; JT			
752	LECHTENBERG, DANNY & ANAST, VALARIE C; JT	5462 S ALVERON DR	Department	NTP
753	GREMAR LLC	3815 W 5400 S	N/A	June 7, 2017
754	SOUKPHOUANGHAM, PATRICIA M	3740 W CHRISTYANN DR	N/A	NTP
754B	PADILLA, LARRY AND JANELLE	3736 W CHRISTYANN DR	Department	NTP
775	FPA WEST POINT LLC	3855-3879 W 5400 S	N/A	June 7, 2017
776	SJ, LLC	3770 W 5400 S	Design-Builder	May 31, 2017
777	M S C INC	3765 W 5400 S	Department	NTP
777B	COUNTY OF SALT LAKE	3738 W CHRISTYANN DR.	Department	NTP
778	21ST STREET PROPERTIES, LLC	3762 W 5400 S	N/A	July1, 2017
779	GUBLER PROPERTIES, LLC	3725 W 5400 S	N/A	April 14, 2017
780	21ST STREET PROPERTIES, LLC	3712 W 5400 S	N/A	July 1, 2017
781	IVERSON FAMILY INVESTMENTS LLC	3705 W 5400 S	N/A	April 14, 2017
783	REDWOOD EQUITY PARTNERS	3685 W 5400 S	N/A	April 14, 2017
784	21ST STREET PROPERTIES LLC	3692 W 5400 S	N/A	July 1, 2017
785	HALLE PROPERTIES LLC	3665 W 5400 S	N/A	April 14, 2017
786	BURT, BRAD L & CARLEEN D; JT	3684 W 5400 S	N/A	April 14, 2017
798	SU CASA MULBERRY, LLC	5287 S DEWBERRY LN	N/A	May 26, 2017
806	MILLER, PAUL	5262 S 3760 W	Department	NTP
808	GRUNDVIG, NICHOLAS C & JUELEE V; JT	5256 S 3760 W	Department	NTP
810	WHITING, ERIC J & VICKIE L; JT	5244 S 3760 W	Department	NTP
812	ROULEAU, WILLIAM F JR & JEAN M; JT	5238 S 3760 W	Department	NTP
814	CHATTERTON PROPERTIES LLC	5228 S 3760 W	Department	NTP

816	HIGBY, LACIE & TROY; JT	5218 S 3760 W	Department	NTP
818	LAM, HOANG M & KIM NGAN S; TC	5208 S 3760 W	Department	NTP
819	WHITTED, DEBORAH L	5198 S 3760 W	Department	NTP
820	PRINSTON PROPERTIES, L.L.C.	5198 S 3760 W	Department	NTP
821	SORENSEN, BEN & JACQUELLE; JT	5178 S 3760 W	Department	NTP
822	HALATOA, KILIFI & BROWN, SALOTE	5168 S 3760 W	Department	NTP
823	BAILEY, KATHLEEN A	5160 S 3760 W	N/A	July 14, 2017
824	CHRISTENSON, BERT	5150 S 3760 W	N/A	July 14, 2017
825	ATTERMANN, SHARON J; TR (SJA REV TR)	5140 S 3760 W	N/A	July 14, 2017
826	GREER, DENNIS J & BLIGHT-GREER,KAREN E;	5128 S 3760 W	N/A	July 14, 2017
828	MALMSTROM, CHARLES & JOHNSON, ERICA H; JT	5116 S 3760 W	N/A	July 14, 2017
829	KOEHLER, DALLAS	5106 S 3760 W	N/A	July 14, 2017
830	STRUM, GREGORY W	5096 S 3760 W	N/A	July 14, 2017
831	JENSEN, MICHAEL R	5086 S 3760 W	N/A	July 14, 2017
832	BRIONES, GABINO H	5074 S 3760 W	N/A	July 14, 2017
833	HUDSON, JOHN G	5064 S 3760 W	N/A	July 14, 2017

7000 South Interchange

Parcel No.	*Owner Name*	*Property Address*	*Demolition*	*Committed Clearance Date*
506	PREECE, MCCOY D & KAREN L G (JT)	3536 W PIERA CIR	N/A	NTP
508	STARKS, TONIA M & DANIEL J; JT	3535 W NEW WORLD DR	N/A	NTP
512	LOW, RICHARD D & TAMARA J; JT	3536 W NEW WORLD DR	Department	NTP
514	MITCHELL, JANICE E; TR (DR&JEMRT)	3541 W FOXTON CIR	N/A	May 19, 2017
515	LOWRY, CALEB AND JENNIFER	3542 W FOXTON CIR	Department	NTP
516	ABBOTT, WADE R & ALICIA A; JT	3540 W FOXTON CIR	N/A	NTP
518	HEGERHORST, WALTER F & ORA M; TRS (W&OHFT)	3541 W WHEATWOOD CIR	N/A	NTP
519	WILSON, DOUGLAS E & DIANE A; TRS (W FAM TR)	3542 W WHEATWOOD CIR	Department	NTP
520	J&P FAMILY INVESTMENTS, LLC	3540 W WHEATWOOD CIR	Department	NTP
521	GUSTAFSON, JOHN A	3541 W MILLERBERG CIR	Department	NTP
522	GARN, NORMA M	3542 W MILLERBERG CIR	Department	NTP
523	PLAZA AT JORDAN LANDING LLC	7111 S PLAZA CENTER DR	N/A	NTP
524	MALDONADO, JOSE G & AMINTA I; TRS	3540 W MILLERBERG CIR	Department	NTP
526	MAYER, YVETTE	3533 W BRANDY CIR	N/A	NTP
527	WELCH, GREGORY L & BARBARA R; JT	3536 W BRANDY CIR	Department	NTP
528	WATKINS, HUBERT L & SHERIE; JT	7026 S ANGELSEA DR	N/A	NTP
536	D & B BYERS, LLC	6989 S DIXIE DR	Department	NTP
536B:E	PLAZA AT JORDAN LANDING LLC	7111 S PLAZA CENTER DR	Department	NTP
537	RUSK, RICHARD D & PATRICIA L; TRS (RD&PLRRT)	6980 S 3535 W	Department	NTP

553	6D HOLDINGS TRUST; ET AL DANA K; TC	6977 S DIXIE DR	N/A	May 19, 2017
554	GOSS, EMILY A; ET AL	6968 S 3535 W	Department	NTP
556	ANDREWS, ROBERT L & TERRIE L; JT	6954 S 3535 W	Department	NTP
558	DUPAIX, JOSEPH H & ALICE S	6944 S 3535 W	N/A	NTP
560	PEARSON, ERIC N & SHALISE L; JT	6932 S 3535 W	N/A	NTP
562	DEARING, RYAN C & KRISTI; JT	6922 S 3535 W	Design-Builder	May 19, 2017
564	ANDREWS, STEVEN D & KATHERINE E; JT	6912 S 3535 W	N/A	May 19, 2017
565	BADER, TERRY	6919 S DIXIE DR	Design-Builder	May 19, 2017
566	PETERSON, MARK W & MEGAN D; JT	6900 S 3535 W	N/A	NTP
568	BLANCO, HEIDDY C	6890 S 3535 W	N/A	NTP
570	MADSEN, JOHN G & SHARILYN; JT	6880 S 3535 W	N/A	NTP
572	DOCKSTADER, MAX L & LISA M; JT	6868 S 3535 W	N/A	NTP
574	FERGUSON, WILLIAM S & SHERRI S	6858 S 3535 W	N/A	NTP
576	BARROWS, STEWART G	6848 S 3535 W	N/A	NTP
578	KLEPACZ, MATTHEW A & NICOLE L; JT	6836 S 3535 W	N/A	NTP
580	GIFFORD, QUINTEN	6826 S 3535 W	N/A	NTP
582	CANNING, DENNIS L & KATHLEEN M	3538 W 6825 S	N/A	NTP
588	CORP OF PB OF CH JC OF LDS	6780 S 3420 W	N/A	NTP
596	CITY OF WEST JORDAN	6778 S 3420 W	N/A	NTP

9000 South Interchange

Parcel No.	*Owner Name*	*Property Address*	*Demolition*	*Committed Clearance Date*
330	AMERICAN HOMES 4 RENT PROPERTIES FIVE, LLC	9379 S NEW HERITAGE DR	N/A	May 1, 2017
331	BRUSCH, DUSTIN	9367 S NEW HERITAGE DR	N/A	May 1, 2017
332	NEWMAN, NATHAN L	9351 S NEW HERITAGE DR	N/A	May 1, 2017
333	ERDMANN, KYLE M & AMANDA JEAN; JT	9339 S NEW HERITAGE DR	Department	NTP
334	LEITER, JASON	9327 S NEW HERITAGE DR	N/A	May 1, 2017
335	BLACKMER, BENN W & JANICE L; TC	9313 S NEW HERITAGE DR	N/A	May 1, 2017
336	SALT LAKE COMMUNITY COLLEGE	9301 S WIGHTS FORT RD	N/A	May 1, 2017
337	CARTER, WILLIS, TR; ET AL	9301 S NEW HERITAGE DR	N/A	May 1, 2017
338	PEREZ, OLEGARIO	9287 S NEW HERITAGE DR	Department	NTP
339	HUYNH, HOA K	9275 S NEW HERITAGE DR	Design-Builder	March 3, 2017
340	LARSEN, JARED R & JAMIE R; JT	9261 S NEW HERITAGE DR	Department	NTP
341	DENNIS, ADRIAN	9249 S NEW HERITAGE DR	Department	NTP
342	JOHNSON, JEROD G & STEPHANIE J; JT	9235 S NEW HERITAGE DR	Department	NTP
343	HILL, BRIDGER W & BRANDI A; JT	9223 S NEW HERITAGE DR	Department	NTP
344	CRAIG, SCOTT M & AUBREY L; JT	9209 S NEW HERITAGE DR	Department	NTP
345	ROSALES, JAMIE L & MERRILL, MAUREEN W; JT	9197 S NEW HERITAGE DR	Department	NTP
347	PEZELY, FRANCO P & SANDI M; JT	9185 S NEW HERITAGE DR	Department	NTP
348	TOSTADO, HUMBERTO F & MARIA A; JT	9173 S NEW HERITAGE DR	Department	NTP
349	SESE, PATRICIA C	9161 S NEW HERITAGE DR	Department	NTP

350	SPENCER, SUSAN	9149 S NEW HERITAGE DR	Department	NTP
351	RUSSELL, DEANNE T & JEFFERY R; JT	9137 S NEW HERITAGE DR	Department	NTP
352	BENKOVSKIY, ALEKSANDR L & YELENA B; JT	9125 S NEW HERITAGE DR	Department	NTP
353	GARRARD, MICHAEL J & ANGELA S; JT	3642 W VISTA WEST DR	Design-Builder	March 24, 2017
355	CITY OF WEST JORDAN	9098 S WINTHROPE DR	N/A	NTP
356	MILLER, TYLER & ANNE; JT	3657 W WINTHROPE CIR	Department	NTP
358	GEDICKS, CHRISTOPHER W & KELLY L; JT	3659 W WINTHROPE CIR	N/A	May 19, 2017
368	Jordan Health Properties		N/A	June 23, 1017
370	Baeza		N/A	June 23, 1017
371	Weenig		N/A	June 23, 1017
373	Baker		N/A	June 23, 1017
375	Deniro		N/A	NTP
376	LARSEN, STEVEN L & LINDA L	3666 W WINTHROPE CIR	Department	June 23, 1017
378	LARSEN, RICHARD J	3655 W WINTHROPE CIR	Department	NTP
380	DENIRO REICHMAN, DAWNDI	3644 W 9000 S	N/A	NTP
381	UNITED STATES OF AMERICA	3596 W 9000 S	N/A	March 17, 2017
386	DEASON, HENRY H & MAYE W; JT	8871 S 3680 W	N/A	March 17, 2017
387	KELLY, JASON P & JESSICA A; JT	3647 W 8850 S	Department	NTP
388	STOLL, CALLIE H	8845 S 3645 W	Department	NTP
389	BESSEY, BARRY M & AUTUMN G; JT	8833 S 3645 W	Department	NTP
390	MARKUS, KURT W & MARILYN J (JT)	8821 S 3645 W	Department	NTP
391	HANSEN, BUDDY & WHITNEY; JT	8809 S 3645 W	Department	NTP
392	RESTORE UTAH PROPERTY I LLC	8795 S 3645 W	Department	NTP

393	BUTTON, TREVA P	8783 S 3645 W	Department	NTP
395	BENTLEY, CLIFFORD & DANA; JT	8769 S 3645 W	Design-Builder	March 31, 2017
396	DANISE, BRETT A & KELLY A; JT	8757 S 3645 W	Design-Builder	March 31, 2017
397	DUARTE, MARCOS	8745 S 3645 W	Department	NTP
398	BEHUNIN, SETH & ANJANETTE; TC	3638 W VALLEYWEST DR	N/A	March 17, 2017
404	UTAH TRANSIT AUTHORITY	8632 S 3320 W	N/A	May 1, 2017

11400 South Interchange

Parcel No.	*Owner Name*	*Property Address*	*Demolition*	*Committed Clearance Date*
121	South Jordan City		N/A	July 7, 2017
121B	SJ Marketplace		N/A	July 7, 2017
123	District		N/A	July 7, 2017
124			N/A	July 7, 2017
128	South Jordan City		N/A	July 7, 2017
138	IREIT SOUTH JORDAN OQUIRRH MOUNTAIN LLC	11501 S 4000 W	N/A	July 7, 2017
140	DISTRICT LC	11422 S DISTRICT DR	N/A	July 7, 2017
141	DISTRICT LC	11426 S DISTRICT DR	N/A	July 7, 2017
142	THE DISTRICT-NORTH LC	11364 S RIVER HEIGHTS DR	N/A	July 7, 2017
143	DISTRICT LC	11428 S DISTRICT DR	N/A	July 7, 2017
144	THE DISTRICT-NORTH LC	11374 S RIVER HEIGHTS DR	N/A	July 7, 2017
145	DISTRICT LC	11432 S DISTRICT DR	N/A	July 7, 2017
147	DISTRICT LC	11426 S PARKWAY PLAZA DR	N/A	July 7, 2017
151	SOUTH JORDAN W, LLC	3754 W 11400 S	N/A	July 7, 2017
152	DISTRICT LC	11453 S PARKWAY PLAZA DR	N/A	July 7, 2017
153	DISTRICT PROPERTIES INVESTMENTS, LLC	3668 W 11400 S	N/A	July 7, 2017
154	JORDAN HEIGHTS HOA, INC	11291 S TIPPECANOE WY	N/A	July 7, 2017
155	DISTRICT-NORTH II LLC, THE	11332 S RIVER HEIGHTS DR	N/A	July 7, 2017
156	WB II LAND INVESTMENT LC; ET AL	11248 S RIVER HEIGHTS DR	N/A	July 7, 2017
157	BARBER, MELISSA K	11281 S TIPPECANOE WY	Department	NTP
158	COBURN, YUNG	11273 S TIPPECANOE WY	N/A	NTP
159	LUCERO, PATRICK JR.	11263 S TIPPECANOE WY	Design-Builder	May 12, 2017

160	BURTON, CHARLES E & KRISTA A; JT	11253 S TIPPECANOE WY	Department	NTP
161	RICHES, BRADLEY M & ASHLEY R; JT	11243 S TIPPECANOE WY	Department	NTP
162	PECK, NICHOLAS	11233 S TIPPECANOE WY	Department	NTP
163	SEENAPPA, CHANDRASHEKAR & VESARAPU, RAMYA; JT	11227 S TIPPECANOE WY	Department	NTP
164	LUNDQUIST, DALLAS & ANGELA; JT	11217 S TIPPECANOE WY	Department	NTP
165	PILLEY, JAMES R & VANESSA L; JT	11209 S TIPPECANOE WY	Department	NTP
166	FOSTER, DENNIS K	11199 S TIPPECANOE WY	Department	NTP
167	DUONG, BAO H & DIEU, QUYNH M; TC	11191 S TIPPECANOE WY	N/A	NTP
168	THATCHER, REED & GLORIA; JT	11181 S TIPPECANOE WY	Department	NTP
169	KROGH, ASHLEY	11173 S TIPPECANOE WY	Department	NTP
170	KFJ PARTNERSHIP	11163 S TIPPECANOE WY		NTP
171	YATES, WALTER G & MICHELLE L; JT	11157 S TIPPECANOE WY	Department	NTP
172	MIRANDA, ELVIS R & MELVA R; JT	11147 S TIPPECANOE WY	Department	NTP
173	ISON, JOHN N & KIMBERLY; JT	11141 S TIPPECANOE WY	Department	NTP
174	CARNESECCA, ZACHARY C & NATALIE M; JT	11137 S TIPPECANOE WY	N/A	NTP
175	BECKER, MERCEDES	11123 S TIPPECANOE WY	N/A	NTP
176	PIZZO, STEPHEN G & SMITH-PIZZO, VICTORIA A; JT	11117 S TIPPECANOE WY	N/A	NTP
177	HANSEN, JACOB & BOBBI	11109 S TIPPECANOE WY	N/A	July 7, 2017
178	CONNELL, CHRIS & AMIEE; JT	11103 S TIPPECANOE WY	N/A	July 7, 2017
179	DUNCAN, JAMES EDWARD; TR (2011 D REV TR)	11093 S TIPPECANOE WY	N/A	July 7, 2017

180	WB II LAND INVESTMENT LC; ET AL	11164 S RIVER HEIGHTS DR	N/A	July 7, 2017
181	HUNTER, JACQUELINE	11087 S TIPPECANOE WY	N/A	July 7, 2017
193			N/A	July 7, 2017

Build Alternative – 4015 West

Parcel No.	***Owner Name***	***Property Address***	***Demolition***	***Committed Clearance Date***
755			N/A	TBD
755B			N/A	TBD
756			N/A	TBD
756B			N/A	TBD
757			N/A	TBD
757B			N/A	TBD
758			N/A	TBD
758B	Parrish		N/A	TBD
760			N/A	TBD
762			N/A	TBD

Attachment 14-B: TEMPORARY INTERSTATE ACCESS REQUEST FORM

Date of Request:		**Attn:**	
Project		**State PIN**	
Project Description			

Temporary Interstate Access Information		
Location of proposed access (see attached map):		
City in UT:	Nearest address or intersection:	
Description:		
Estimated Duration of Temporary Access:		
Est. Calendar Days:	Est. Start Date:	Est. End Date:
Route and ADT (See attached Table 1 for Annual Daily Traffic values):		
Route Number and Description: ADT ():		
Purpose of proposed access:		
Describe:		
Alternatives to the requested access (if any):		
Describe:		
Planned safety precautions:		
Describe:		
Operations plan for ingress/egress (see attached map):		
Describe:		
Method of ensuring no unauthorized use during non-work hours:		

Describe:

Insert Map

Verify Compliance			
Has the requestor:	**YES**	**NO**	**N/A**
Verified that existing network improvements cannot satisfactorily provide the intended access? (Policy Point 1)	☐	☐	☐
Describe:			
Considered all reasonable alternatives? (Policy Point 2)	☐	☐	☐
Describe:			
Verified that there will not be a significant adverse impact on the safety and operations of the interstate mainline? (Policy Point 3)	☐	☐	☐
Describe consideration of operations:			
Describe consideration of safety:			
Verified that access connects to a public road and provides for all movements? (Policy Point 4)	☐	☐	☐
Describe:			
Verified that plan request is consistent with regional land use and transportation plans. (Policy Point 5)	☐	☐	☐
Describe:			

Systematically studied the effects? (Policy Point 6)	☐	☐	☐
Describe:			
Coordinated with related development? (Policy Point 7)	☐	☐	☐
Describe:			
Coordinated with environmental evaluation and approval process? (Policy Point 8)	☐	☐	☐
Describe:			
Verified that request meets MUTCD?	☐	☐	☐
Describe:			
Requestor Agrees to the following statements:	☐	☐	☐
The Access Point is controlled by UDOT, who may allow the Contractor control as well. The Temporary Access will be removed when it is no longer needed, returned to its previous condition. The contractor will be responsible for purchasing the materials and, if required, the time savings that will be achieved by having that access.			

Table 15-A-1
ADT Values for Utah Highways within the Project Limits

ROUTE NAME	BEG. ACCUM. MILEAGE	END ACCUM. MILEAGE	LOCATION DESCRIPTION	ADT

Attachment 14-C: Right-of-Way Acquisition Procedures

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14C. RIGHT-OF-WAY ACQUISITION FOR THE DESIGN-BUILDERS CONVENIENCE

14C-1 GENERAL REQUIREMENTS

General Scope. Design-Builder shall acquire Right-of-Way (ROW) and conduct activities related to ROW acquisition in accordance with the requirements of this Attachment 14-C for those properties designated as ROW for the Design-Builder's Convenience. These ROW activities include, at a minimum, the following:

A. Mapping
B. Documents
C. Appraisal
D. Appraisal review
E. Negotiation
F. Acquisition
G. Title insurance procurement
H. Title clearance
I. Acquisition closings
J. Condemnation support
K. Relocation assistance
L. Property Management
M. Clearance and demolition of improvements;
N. As required, environmental testing and remediation
O. As required, historical documentation.

Legal Role. Function as agent for the Department while acquiring ROW designated ROW for the Design-Builders Convenience.

Department Approval. Obtain the Department's Approval of ROW design documents, appraisals, requests to acquire ROW, acquisition documentation, acquisition settlements, Right-of-Way Contracts, relocation Notices of Eligibility, Relocation claims, and requests to commence condemnation proceedings. Provide the Department with all specific reports and supporting documentation for review and Approval during the acquisition process.

Documentation. Maintain hard copies of all ROW documentation in addition to placing documentation into ProjectWise and UDOT's ePM ROW module. Submit documents into ProjectWise in accordance with the Department's currently approved file structure and attribute each file according to the Department's current processes. Coordinate the placement of all documentation into ProjectWise with UDOT Central Right-of-Way. Notify UDOT Central Right-of-Way when documentation has been submitted into ProjectWise and/or UDOT's ePM ROW module. All documents submitted to the department must be in accordance with the Right of Way ProjectWise Guide found at (http://udot.utah.gov/go/rowprojectwiseguide). Complete a final quality check to ensure that all documents have been entered into ProjectWise and/or UDOT's ePM ROW module.

All offer documentation must be generated out of UDOT's ePM ROW module.

General. Complete all administrative activities and prepare all documentation sufficient to acquire the ROW. Obtain the Department's review and Approval of all appraisals, legal descriptions, acquisition and relocation documentation, purchase prices, and funding and closing procedures.

ROW Costs. Design-Builder is responsible for all costs associated with the acquisition of the ROW. The Design-Builder will pay the costs of all services and documentation preparation for ROW acquisition and related relocation assistance. All documents, process and procedures to acquire ROW by the Design-Builder, will conform to the Department's ROW processes as outlined in both the ROW Design and ROW Operations Manuals. The Department will not be obligated to exercise its power of eminent domain for, nor will it have any responsibility for, the acquisition, maintenance, or disposition of additional properties or of any temporary right or interest therein.

14C-2 Standards

Complete all ROW acquisition activities in accordance with the requirements of the standards in Table 14-C-1 (Standards for Right-of-Way Acquisition). Standards are listed in alphabetical order and have no established order of precedence.

TABLE 14-C-1
STANDARDS FOR RIGHT-OF-WAY ACQUISITION

Author or Agency	*Title*
Appraisal Foundation	*Uniform Standards of Professional Appraisal Practices* (USPAP)
FHWA	Right-of-Way Project Development Guide, *Federal Aid Policy Guide* (FAPG)
FHWA	*Uniform Appraisal Standards for Federal Land Acquisitions and USPAP*
UDOT	*Manual of Instruction–Right-of-Way-Design* and current UDOT Standards and Practices.
UDOT	*Project Development Process Manual*
UDOT	*Right-of-Way Operations Manual (Policies and Procedures)*
UDOT	*Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,* as amended *and Implementing Regulations found in Title 49 Code of Federal regulations Part 24 and Code of Federal regulations 23 CFR Part 710.313.*
UDOT	*ROW ProjectWise Guide*

14C-3 Right-of-Way Schedule

14C-3.1 Department Review and Approval

Submittal. Design-Builder shall meet with the Department and submit a schedule for the acquisition and delivery of ROW to the Department for review and Approval. Include in the schedule the following:

A. The beginning date and anticipated completion date of ROW acquisition;

B. Priorities for parcels whose acquisition will significantly impact the Project Schedule and/or affect its Critical Path; and

Implementation. After the Department's review, implement the additional ROW parcel acquisition time into the ROW schedule and integrate it into the Project Baseline Schedule.

ROW Properties. Notify, in advance, the Department of all Design-Builder properties and temporary rights or interests in real property to be acquired by the Design-Builder. Obtain, Approval from the Department for the acquisition of any additional ROW for the Design-Builder's Convenience. Comply with all requirements in Part 4 (Project Design and Construction Requirements).

Acquisition Files. Submit all complete appraisal or acquisition files to the Department for review, in accordance with Section 14C-4.4 (ROW Appraisal and Acquisition File Approval). For submittals of more than one appraisal or acquisition file at any given time, indicate the priority of required review in order to meet the ROW schedule. Each acquisition file shall contain one copy of the appraisal(s) and appraisal review.

Relocation Files. Submit relocation plans and relocation files in conjunction with the acquisition files (for all parcels identified which will require displacement) to the Department for review in accordance with this section. All acquisitions which will require a relocation must be prioritized to meet the ROW schedule.

Electronic Summary/Design Packages

Each summary package(s) shall consist of a partial summary, or a final summary, or supplemental summaries. Each submitted partial summary will contain no more than 12 ownerships in any given partial summary when delivered to the Region 2 Right-of-Way Engineer for a review. Upon completion of the region review, the summary will be forwarded to Central Right-of-Way for a Conformity Review. Review packages delivered to the Region will consist of one hard copy of each document as well as all of the electronic data being posted to ProjectWise following the Department's guidelines and procedures for ROW submittals. When comments and questions have been sufficiently addressed, the Region will direct the consultant to upload the electronic summary into the ePM system and to forward the electronic design package to UDOT ROW Oversight Manager at Central Right-of-Way. If the quality of the review package is considered to be sub-standard by the Department, it may request additional reviews before authorizing the final submittal. Only one summary review will be allowed at the Department at any given time. The electronic file naming convention for partial summaries, as directed by Central Right-of-Way, must be carefully followed. The Design-Builder or ROW designer shall upload each partial or supplemental summary to ePM and ProjectWise and notify Central Right-of-Way with a carbon copy to the Department upon completion.

The Design-Builder or ROW designer will upload to ePM and forward the electronic design package to Central Right-of-Way. Any submittal not directly uploaded will not be reviewed.

Schedule Delay. The Design-Builder is responsible for any delays to the Project Baseline Schedule that result from submittal of inadequate or incomplete appraisal, acquisition files, relocation files or electronic summary/design packages and/or the inability of the Design-Builder to acquire any ROW in a timely manner.

Deficiencies. A summary/design package, appraisal, relocation file, or acquisition file shall be deficient, as determined by the Department, if any of its components contains any error or omission or if it fails to meet any of the criteria established in this Attachment 14-C. Upon Department notification of a deficiency, correct such deficiency and resubmit the file to the Department.

General. Complete all administrative activities and prepare all documentation sufficient to acquire the ROW. Obtain the Department's review and Approval of all appraisals, legal descriptions, acquisition and relocation documentation, purchase prices, and funding and closing procedures.

Eminent Domain. If the Design-Builder and landowner cannot agree upon a purchase price acceptable to the Department, the Department may, at its sole discretion, Approve an acquisition through condemnation or eminent domain procedures. Do not begin eminent domain procedures without an Approved acquisition memo as part of the acquisition file.

A. **Acquisition File.** For condemnation purposes, the acquisition file must contain an approved memo from the Director of Right-of-Way to the Attorney General's AG) office (as noted above). Attached to the memo and the request for condemnation are several documents which include copies of the following: 40 Year Title Report; Agent's log;

Appraisal; Appraisal Review; map; statement of just compensation; ownership record; and any other documents that would be relevant for the attorney representing the agency. The acquisition file should contain 2 copies of the appraisal, and 2 copies of the appraisal review, along with two copies of the agents log and any other relevant information that the Attorney General's office may need to review to properly prepare for the condemnation.

B. Providing that the Design-Builder has provided the appropriate documents with the request for condemnation (including the title report, an error free legal description, and error free map of the parcels) the Department will submit the completed Condemnation Resolution to the Attorney General's Office after it has Approved the request for condemnation.

Construction Clearance. Do not begin construction on any real estate until specifically Approved by the Department after all property rights for the Project have been conveyed in favor of the Department or a Right of Occupancy Agreement (ROOA), Court Order to Occupy or a Right of Entry Agreement has been validly executed by all applicable parties of interest, and the property has been certified as cleared for construction purposes.

Legal Compliance. Complete and document all ROW activities in compliance with applicable laws (including the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* as amended, the *Utah Relocation Act*, and other applicable rules and regulations). Prevent fraud, waste, and mismanagement.

Communications. In all correspondence with the Department relating to acquisition of real property, include the following information (at a minimum) in a heading:

A. County
B. Region
C. Project Name
D. Project Number
E. Pin Number
F. Highway Designation
G. Project Limits
H. UDOT Parcel Number(s)
I. Assessor's Parcel Number(s)
J. Name-of-record owner(s)

Design Package/Electronic Summary

In each electronic summary or design package prepared and submitted for Department Approval, include the following items:

A. **Electronic Spreadsheet Summary**: An electronic spreadsheet with the following information:

1. Summary Submittal Number;
2. Pin Number;
3. Project Number;
4. Parcel Number;
5. Type of Granting instrument (fee, easement, etc.);
6. Name of owner(s);

7. Address of property owner;
8. Type of vesting deed;
9. County Recorder Entry, Book and Page for vesting deed;
10. County Tax ID#;
11. Section, Township and Range of Parcel;
12. Latitude and Longitude of Parcel;
13. Acreage and / or square footage;
14. Property type;
15. Contact information for licensed Land Surveyor in charge;
16. Document preparer to include the company contact information for the person responsible for creating the ROW documents on the cover sheet of each ROW submittal.

B. **Conveyance Documents**: Include:

1. Grantor Names, Caption, legal description, appropriate clauses, acknowledgement, and prepared by information; and
2. The UDOT approved form of the granting instrument (Deed, easement, etc.) adequate to effect the desired acquisition of the parcel.

C. **Right-of-Way Sheets:** Provide 11x17 Plan Sheets as prepared by the Land Surveyor, and Conveyance Summary Sheets for each summary package submitted. In addition, provide 11x17 plan sheets with aerial photography for each summary package if supplied by the Project and Total Tract Sheets.

D. **Ownership Record**: An Ownership Record, verifying all owners and the percentages of ownership, on a UDOT RW-51 form going back five years or until a Warranty Deed is found. This must include the legal description of the full parcel along with the size of the full parcel in acreage and/or square footage. Provide a copy of the vesting instrument as an addendum to the ownership record.

E. **Prepare Summary of Right-Of-Way (Form RW-53)**

F. **Submittal of Documentation**: Deliver all reports, correspondence and documents relating to ROW acquisition to the Department in both electronic and hard copy formats or as otherwise requested by the Department.

G. **Preliminary Title Reports**

H. **Closure Report** including Graphic representation of deed (Deed Plotter or similar).

14C-4 Project-Specific Services

General. Perform the following Project-specific ROW acquisition services:

A. **Title Acquisition**: As more fully described in the following subsections, provide all services necessary to:

1. Acquire title of the ROW in the name of the Utah Department of Transportation in form and substance acceptable to the Department;
2. Relocate displaces (i.e., displaced businesses and residents); and
3. Clear and/or demolish the improvements from the ROW, or as otherwise specified

by the Department, which may include improvements located on acquired properties but situate outside the final ROW.

B. **Guidelines**: Access and comply with the UDOT *Manual of Instruction Right-of-Way Design*, UDOT *Right-of-Way Operations Manual*, and maintain a current approved ROW map.

C. **Meetings**: Attend ROW meetings as requested by the Department.

D. **Letter to Property Owners**: Provide a letter of introduction to each property owner and/or occupant, as Approved by the Department, on Department letterhead stationery, and signed by the UDOT ROW Oversight Manager or his/her designee.

E. **Submittal of Documentation**: Deliver all reports, correspondence, and documents relating to ROW acquisition to the Department in both electronic format and as hard copy, or as requested by the Department.

14C-4.1 Title Services

Title Company. Select and contract with one or more title companies approved by the Department.

Preliminary Title Reports. Preliminary Title Reports are to be obtained by the consultant and are required for all ownerships as part of the summary packages.

Title Exceptions and Exclusions. All owners of record need to sign the conveying document(s). If new parties of interest are discovered during negotiations or vesting is other than what was indicated on the original documents, the acquisition file shall be revised to include all corrected grantors and all appropriate forms, deeds and other documents will be revised accordingly.

Title Insurance. Obtain title insurance on all fee acquisitions on the Department's behalf.

14C-4.2 Appraisal Services

General. Include the following for each ROW parcel acquired for the Design-Builder's Convenience:

Appraisals: Provide the Department with a fair market-value appraisal prepared by an appraiser which meets the minimum qualifications established herein, unless the parcel can be valued under the waiver valuation provisions of the Uniform Relocation Act or the implemented URA regulations as described in the UDOT *Right-of-Way Operations Manual*. The Department will pre-approve the use of the waiver valuation on a per ownership basis. Waiver valuations are acceptable only for low-value, uncomplicated valuations. The Department's pre-approval of the use of waiver valuations may be requested on a per-ownership basis; no offer may be made to a property owner based on a waiver valuation without Department Approval. Provide the Department with the following items for review and Approval if using waiver valuations:

A. Compensation estimate form printed out of Electronic Project Manager (ePM) (Compensation must be Approved by the Department).

B. A copy of a spreadsheet breaking down the compensation.

C. A copy of the comparables used (MLS sales on properties used to determine sales price). This must show comparable zoning and use, dollar amount per square foot, size of the comparable parcel, location etc.

D. Information regarding the size of the larger parcel of our subject property.

E. Pictures of the take and/or easement area. Provide pictures of any unique items that are directly impacted (i.e. cost to cure items or improvements to be acquired).

F. A copy of the ROW map.

All appraisals of properties to be acquired in full, or which include a structure within the acquisition area that may be occupied, must include an estimate of the market rental rate.

Regulations/Manuals: Prepare the appraisal in conformance with Law (including the Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970, as amended), and in accordance with professional appraisal methods and applicable UDOT standards as described in the current UDOT *Right-of-Way Operations Manual.*

Appraiser Selection. Select qualified, certified appraisers who are licensed by the State of Utah and on the UDOT pre-approved ROW pool list. Obtain Department Approval of each appraiser and each review appraiser that the Design-Builder plans to use for this project prior to engagement of services with same. The Department reserves the right to reject any and all appraisal and/or review reports produced by appraisers or reviewers who have not been previously Approved by the Department for this Project.

Pre-Appraisal Property Inspection. For properties which are improved with residential improvements that will be directly impacted by the project provide a property (house, building, property, etc.) inspection report, prepared by a qualified inspector, to the appraiser. The report must include documentation of all deficiencies (i.e. mechanical systems, electrical systems, etc.) and comments about structural damages observed by the inspector. The inspection report shall be an all inclusive formal Inspection Report. Each appraisal which includes the valuation of improvements, determined by the appraiser to have contributory value (excluding, e.g. landscaping and minimal concrete flatwork), must include an Inspection Report, unless the Department determines, on a case by case basis that a formal Inspection Report is not necessary. The appraisal shall refer to the report, by reference, as part of the scope of the appraisal assignment.

Owner Contacts. Establish personal pre-appraisal contact with each owner of record and each occupant, lessee, or tenant. Contact shall be in person and/or in writing. The written contact may be, but is not limited to, the mailing of an introductory letter. Document all contacts using a form Approved by the Department. Offer each owner of record, party of interest and any occupants, tenants and lessees or their designated representatives, in writing, via certified mail return receipt, the opportunity to accompany the appraiser on the appraiser's inspection of the parcel. The appraiser shall maintain a record of all such contacts. Said report shall be included with the appraisal in the acquisition file.

Appraisal Report. Prepare a complete appraisal report for each parcel that:

A. Complies with and includes all matters required by this Attachment 14-C, and the UDOT ROW-related manuals and other applicable standards included in Table 14-C-1 (STANDARDS FOR RIGHT-OF-WAY ACQUISITION**)**;

B. Includes an ePM summary report;

C. Satisfies the requirements of The Appraisal Foundation's *Uniform Standards of Professional Appraisal Practices* (USPAP) in effect at the time the appraisal is submitted;

D. Is in the form Approved by the Department;

E. Includes all pertinent special analyses, studies, or reports, including but not limited to a Real and Personal Property Report, and/or an Inspection Report;

F. Includes (as an extraordinary assumption if necessary), for residential relocation purposes, the following: Uniform Residential Appraisal Report; an opinion of the land value as a typical residential lot; and listings of comparable available rental properties; and

G. Exclude compensation for any items that are being replaced by the Design-Builder such as material for driveways in the easement areas. (Appraiser to verify what impacted items are

being replaced by the Design-Builder prior to determining cost to cure compensation)

Compensable Interests. For each parcel, provide the Department with copies of all written leases, licenses, and other occupancy agreements to identify lessees, licensees, and other occupants with potential compensable interests in each parcel to determine the value of each such interest. Include any outdoor advertising leases if there is a billboard on the site which will be impacted by the project. The appraiser will be required to evaluate the Leasehold interest and the Leased-fee interest as it pertains to the billboard, as well as a value for the billboard structure.

Environmental Concerns.

A. Documentation: Document the environmental condition of the required parcel(s), based on field investigations and/or historical review and/or the project environmental permit, and make documentation available to the appraiser(s). Develop the following report(s) for the required parcel(s):

1. An Environmental Site Assessment (ESA) Phase I;
2. An ESA Phase II if the ESA Phase I determines that there is a potential environmental risk; and
3. An ESA Phase III if the ESA Phase II report justifies it (including approximate costs to remediate the parcel to achieve its current use and its highest and best use).

B. Department Notification: Submit timely written notification to the Department of any concerns that could require environmental remediation of or other special attention to ROW parcels and/or additional properties.

Appraisal Updates. When required by the Department (e.g., for eminent domain proceedings or to allocate values for ST parcels etc.), update appraisals and appraisal reviews.

Backflow Prevention. Examine local ordinances regarding requirements for meter supply backflow preventors and/or other special conditions. In the appraisal report, consider the installation of any such appurtenances on the parcel remainder as damage and include it as part of the compensation package to the landowner.

Copies of Documents. When requested by the Department, provide copies of appraisal file documents as may be needed to respond to discovery motions or requests for production.

14C-4.3 Appraisal Review

Appraisal Reviewers. Select a qualified appraisal reviewer that is independent from the appraiser and is experienced in appraisal reviews for transportation projects. Select only one appraisal reviewer for the Project to ensure report consistency and fairness unless there is a documented need to employ more than one appraisal reviewer. The use of more than one appraisal reviewer may be allowed with justification at the discretion of the Department.

Advertising Signs. Evaluate all outdoor advertising signs, as required, utilizing the appropriate forms and sign schedule, and/or as instructed by the Department. If applicable, provide location and other information about the signs which will enable the Design-Builder to provide all appropriate relocation assistance, including advisory assistance and prescribed 90/30 Calendar Day notices to the owner of the signs.

Additional Reports. Determine, in consultation with the Department, whether additional appraisal reports or technical expert reports are required. If so, initiate, review, and reconcile each report required.

Review of Appraisals. Review all appraisal reports for each parcel to determine their consistency of

methodology, supporting documentation related to the conclusion reached, and compliance with UDOT standards, as defined herein and by standards and requirements imposed by Uniform Standards of Professional Appraisal Practices (USPAP). Obtain from the appraiser written certification that all these standards have been met.

14C-4.4 ROW Appraisal and Acquisition File Approval

UDOT ROW Oversight Manager. Before beginning ROW appraisal services, meet with the Department ROW Oversight Manager.

14C-4.5 Final Right-of-Way Acquisition and Compliance

Legal Compliance. Conduct all negotiations in accordance with the requirements of the Law and applicable regulations. Acquisition agents employed by the Design-Builder for this project may not be required to be licensed Real Estate Agents in the State of Utah. However, all acquisition agents hired to acquire real property for this project must be qualified agents Approved by the Department prior to commencing acquisition activities on this Project. Provide acquisition assistance strictly in accordance with the Law, including, but not limited to the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,* as amended; the Utah Relocation Act; and UDOT policies and procedures as described in the UDOT *Right-of-Way Operations Manual.*

Acquisition Agents/Negotiators. All agents working as acquisition agents or negotiators shall be qualified and experienced. The Design-Builder and firm must obtain final Approval of each agent who will actually work on the Project. All agents must be fully qualified to perform the duties assigned as described in the 2015-2018 Right of Way Services & Local Government Pool RFQ. (The RFQ is available from the Consultant Services Page of the UDOT Web Site found at http://www.udot.utah.gov/main/uconowner.gf?n=20347703526797897)

Contact Reports. Prepare, in a format acceptable to the Department, a separate negotiator's contact report or agent's log which will document each meeting or conversation with any person (or their appointed representatives) who has a compensable interest in each parcel. All contacts must be noted in the agent's log which shall be available for view by the agency on a daily basis. The log entries are to be entered into the UDOT ROW ePM module as required by UDOT standards, as documented in the UDOT *Right-of-Way Operations Manual*, on a daily basis as applicable.

Brochure(s). Produce informational brochure(s) for distribution to all property owners, tenants, lessees, or other parties of interest and to actual or potential displacees. Prior to creating, coordinate with the Department to determine if a brochure will be used. Prior to distribution, submit brochures to the Department and obtain consent to use brochures.

Presentation of Offer Within 10 Calendar Days of the Department's establishment of just compensation, the agent shall prepare the offer to purchase and other required documents as part of the acquisition file. Once prepared, the agent shall present in person (when practicable) the purchase offer with the appraisal report on the subject property and applicable brochure(s), to, and only to, the property owner(s) or owner's designee. If the offer is presented by mail or e-mail, the agent shall explain in the agent log why the offer was not presented in person. Document the delivery of the appraisal report with a receipt signed by the property owner or designee. Upon acceptance of the purchase offer, maintain follow-up contacts as appropriate to secure any supplemental documentation needed to facilitate the closing.

Negotiating for Compensable Interests. Identify lessees, licensees, occupants, or other parties with potential compensable interests and if appropriate, after consultation with the Department, negotiate with such parties for the acquisition of their compensable interests. Provide timely response to the verbal or written inquiries of any property owner, lessee, licensee, occupant or other holder of a compensable

interest, as applicable, not more than 10 Calendar Days after the inquiry.

Acquisition Files. Maintain a complete acquisition file for each ownership. All original documentation related to the purchase of the real property interests will be maintained either in conjunction with or separate from the relocation files in conformance with UDOT standards, manuals, and procedures and as specified herein. The Design-Builder must maintain all acquisition and relocation agent's logs in the UDOT ePM ROW module. If a separate relocation file is set up and maintained, that file must contain a copy of all pertinent information from the acquisition file, sufficient to satisfy the needs of the relocation agent, the Design-Builder reviewing agent, and the UDOT ROW Oversight Manager or designated Department review person. The acquisition file must also include a reference to any relocation of displaced persons who occupy any parcel within the ownership. The file must include a copy of any relocation studies that are completed prior to the initiation of negotiations for the purchase of the subject property. The agent log must include any information about relocation assistance provided to the occupants including advisory assistance. Forward the signed original documents to the UDOT Project ROW Coordinator. The UDOT Project ROW Coordinator will update the ePM system with receipt dates for all documents and files received from the Design-Builder. The UDOT Project ROW Coordinator will also confirm that all files are complete and ready for Department review. The file and all forms to be Approved must be forwarded to the Department for required review. All contracts, agreements, claims, must be Approved by the UDOT Director of Right-of-Way.

UDOT Project ROW Coordinator. All documents and files including appraisals, appraisal reviews, waiver valuations, acquisition files, relocation files, claims, invoices etc., shall be submitted through ProjectWise to the designated UDOT Project ROW Coordinator as per the Right of Way ProjectWise Guide (http://udot.utah.gov/go/rowprojectwiseguide).

Administrative Settlement. If a settlement cannot be reached without an administrative settlement, advise the property owners, and other holders of compensable interests, or their representatives of the administrative settlement process. In all dealings with property owners and other holders of compensable interests, clearly represent and maintain that the UDOT Director of Right-of-Way or his designee has the ultimate decision authority regarding any settlement requests. All offers are nonbinding on the Department unless or until the contract is approved by the UDOT Director of Right-of-Way or his Deputy. Confer with and deliver to the UDOT ROW Oversight Manager any settlement request from property owners, lessees, licensees, occupants, or other holders of any compensable interest, as applicable, including a detailed recommendation from the Design-Builder in accordance with standards, manuals, and procedures as defined herein. Deliver the administrative settlement request and the Design-Builder's recommendation to the Department within five Working Days of receipt of the request.

Second Appraisals. If a property owner requests a second opinion of value or second appraisal the owner is to seek assistance from Utah's Office of the Property Rights Ombudsman (Ombudsman) before commissioning said appraisal or opinion of value.

Evaluation of Settlement/Mediation or Arbitration Requests. If requested by the Department, participate in the evaluation of administrative settlement requests and attend the settlement, mediation or arbitration meetings. Prior to the meeting, report to the Department any pertinent issues concerning the property including information about any and all leases as identified in a current title report and provide the Department with a copy of identified leases or other encumbrance documents. If the property is subject to a lease, determine the remaining lease term, rents collected and or security deposits held by the grantor. Provide applicable information about any other liens or encumbrances applicable to the subject property including but not limited to property taxes paid. When the Department has made its findings, if requested by the Department, provide a letter of response regarding the administrative settlement findings to the property owner, lessee, licensee, occupant, or other holder of a compensable interest, as applicable. Deliver

all such response(s) within five Calendar Days of receipt of findings. If the findings letter is delivered by mail, it shall be sent certified with return receipt requested.

Final Offer Letter. Subject to the Department's prior written Approval, prepare and deliver the "Four Options Letter" to the property owner, lessee, licensee, occupant, or other holder of any compensable interest, as applicable. This "Four Options Letter" will be the Final Offer Letter submitted by the Department to the property owner, lessee, licensee, occupant, or other holder of any compensable interest, as applicable. The "Four Options Letter" shall be on the UDOT designated ROW letterhead and shall be signed by the UDOT ROW Oversight Manager.

Conveyance Documents. Prepare and deliver documents of conveyance (including bisection clause and access clause, if applicable) to the property owner, lessee, licensee, occupant, or other holder of any compensable interest, as applicable, and obtain their execution of the same. Obtain notarization of all signatures on documents to be recorded, in accordance with Utah law.

Deliver the original recorded conveyance document or documents to the UDOT Project ROW Coordinator Upon receipt, the UDOT Project ROW Coordinator will log in all conveyance documents received from the Design-Builder into the UDOT's ePM ROW module.

Right-of-Occupancy Agreement. As a last resort, prior to submitting the file to the Department requesting a condemnation, secure a "Right of Occupancy Agreement" (ROOA) between the record title owner(s) and the Design-Builder. The ROOA shall grant the Department and the Design-Builder and/or assignees permission to enter and occupy the parcel. If the Design-Builder's best efforts could not result in a negotiated contract agreement or the Design-Builder cannot secure a ROOA, provide documentation acceptable to the Department that specifies the conversations, correspondence, and all other efforts made to secure the agreement.

The Design-Builder must provide an action plan to the Department describing what steps will be taken to secure a contract or ROOA. The action plan and ROOA must be presented and approved by the Department before the Design-Builder enters or commences construction on the subject parcel.

Right of Entry. Secure a Right of Entry, for the purpose of constructing driveway tie in's or other features that benefit the property owner, but which are not required for the project. A Right of Entry is only applicable and approved for use when these construction features can be eliminated from the project if permission to enter and construct is not granted by the property owner or his or her designated representative.

Expediting ROW Acquisition. Remain open to all reasonable settlement requests from property owners that are feasible and help expedite the ROW acquisition process and comply with the regulations as outlined herein. Note that the Department encourages all positive and creative solutions that satisfy the property owner, promote the success of the Project, and are fiscally responsible**.**

Mediation and/or Arbitration. The Department encourages the use of mediation and or arbitration as a means for alternate dispute resolution. We encourage all attempts to mediate or arbitrate value or relocation issues in compliance with the Utah Office of the Property Rights Ombudsman.

14C-4.6 Closing Services

Perform closing services, as discussed below:

Request for Funding. Prepare a request for funding in accordance with the UDOT Right-of-Way Operations Design, or as directed by the Department.

Closings. Attend closings as needed and as requested by the Department. Provide curative documents and exhibits as required and in conjunction with the applicable title company, if the closing is to be closed using

a title company. For partial acquisitions, closings will be completed by the Design-Builder unless the Department determines, on a case by case basis, that the Department will be responsible for the closing. The Design-Builder may need to obtain a partial release of a lien or liens. In those cases, closings will be completed by the title company.

If the property is tenant occupied, the negotiator shall obtain a copy of the lease, security deposits and pro-rated rents. If the tenant has not paid a security deposit, the Department will withhold a 1% key/security deposit from the property owner's proceeds from the sale of the property to the Department. If the property is to remain occupied by an owner-occupant, a key/security deposit is to be withheld. Notify the Department at least five Calendar Days in advance of all closing appointments. Obtain a set of keys to the property prior to or at said closing, and confirm prior to closing that all conditions of closing have been met. The Agent is also required to complete the Property Management Tenant Occupant Form. For Owner Occupied Property the Agent must complete the Property Management Owner Occupant Form. All required forms must be included in the acquisition file when the acquisition file is submitted to the Department for execution of the purchase contract.

14C-4.7 Relocation Assistance

Legal Compliance. Provide relocation assistance strictly in accordance with the Law, including, but not limited to the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended; the Utah Relocation Act; and UDOT policies and procedures as described in the UDOT *Right-of-Way Operations Manual.*

Written Notice. Provide written notice of relocation assistance and a relocation assistance brochure to all potential displaced property owners, lessees, licensees, occupants, other holders of compensable interests and other potential displacees. Base the relocation assistance brochures on the *Relocation Assistance Brochure* on the Utah Office of the Property Rights Ombudsman website at Propertyrights.utah.gov.

Interviews. Conduct relocation interviews with potential displacees, discussing general eligibility requirements, programs, and services, then complete and maintain interview forms; and with potential displacees, maintain a written daily record of all verbal contacts in the agent's log as part of UDOT's ePM ROW module record.

Ineligible Occupants. Give written notice of the pending acquisition to any occupants believed to be ineligible for relocation assistance. Direct potential displacees to submit written eligibility questions to the Design-Builder ROW Coordinator. The Design-Builder ROW Coordinator will forward questions received to the UDOT ROW Oversight Manager or designated review person with a recommended answer to each question.

Relocation Assistance. Contact and provide relocation assistance to those parties affected by the ROW acquisition and complete necessary forms for all displacees, as required. Provide sufficient advisory assistance to those actually displaced as well as to those affected by the Project in compliance with applicable regulations and UDOT *Policies and Procedures*. Utilize the Department standardized Right-of-Way Division ePM forms or forms pre-approved by the Department if those forms are not available from ePM.

Relocation Sites. Locate, evaluate, and maintain files on comparable available housing, commercial, retail, and industrial sites, and make these information files available to displaced persons or persons not displaced but who are adjacent to or affected by the project.

Supplements. Compute and submit requests for relocation payments, including Replacement Housing Payments (RHP), and rental housing RHP's to the Department, using a form with a format approved by the Department. Obtain Department approval of all relocation benefits prior to presenting relocation notices of

eligibility or housing studies to the displaced person.

Relocation Eligibility Notices. Relocation assistance and Notices of Eligibility must be signed and approved by a qualified Relocation Agent as designated by the Design-Builder. Said Agents shall be pre-approved by the Department. The Design-Builder must obtain final Approval from the Department of each Agent who will actually work on the Project. All agents must be fully qualified to perform the duties assigned as described in the 2015-2018 Right of Way Services & Local Government Pool RFQ. (The RFQ is available from the Consultant Services Page of the UDOT Web Site found at http://www.udot.utah.gov/main/uconowner.gf?n=20347703526797897)

Inspection. Verify that all replacement housing as selected by the displacees is decent, safe, and sanitary (DS&S). Perform a DS&S inspection of the selected replacement residence, using a form pre-approved by the Department. No RHPs (including the RHP, Incidental Expenses and MIDP) shall be released to the displaced person unless or until the replacement property has met the DS&S requirements unless expressly and specifically approved by the Department.

Moving Personal Property. For relocation of personal property from a residential property which is owner or tenant occupied; prepare a Scheduled Move cost estimate. If the displaced person elects to claim reimbursement for a commercial move, the displacee shall obtain at least two moving cost estimates from qualified, publically recognized commercial moving companies unless two bids are determined to be unnecessary by the Department. (If needed, the agency reserves the right to have the Design-Builder obtain a third bid.) The Agent shall also prepare a moving plan with appropriate photographs, sketches and, as needed, an inventory of personal property to be moved. Coordinate moves with displacees and moving companies in compliance with UDOT policies and procedures, and the *Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970, as amended.*

For the relocation of personal property from a Non-Residential property the Agent and the displacee are to obtain a minimum of two bids from qualified moving companies, unless otherwise directed by the Department.

Prior to obtaining the bids the agent shall prepare a moving plan with appropriate photographs, sketches and an inventory of all personal property, which is to be moved. This inventory should be prepared by the displacee, however, if needed, the inventory can be prepared by the agent. The agent and the displacee shall review the inventory list to verify that it is accurate. Both the Agent and the displacee must sign the inventory list agreeing to its accuracy. Once prepared, the inventory is to be provided to the moving companies to assure that they will prepare consistent and comparable bids for the move and for all associated mechanical, electrical, plumbing and other reasonable and necessary expenses of the move.

The agent shall monitor the move. All moving expenses must be documented and pre-approved by a qualified Agent and by the Department. The maximum eligible amounts should be stated on the displacee's Notice of Eligibility.

Relocation Contact Logs. Maintain relocation contact logs, also known as the agent's relocation log, in a format approved by the Department and as directed by the Department using the UDOT's ePM ROW module. If the same agent performs the duties of the acquisition agent and relocation agent, the agent's log may contain a daily record of both acquisition and relocation contacts. When the log has been completed the agent shall sign and date the log and verify that the contact report is a complete and accurate record of all contacts with the owner and/or displaced persons of the subject property.

Closings and Payments. Attend all closings on replacement properties, if requested by any party involved, and ensure that supplemental payments, if any, are properly distributed. Make all residential RHP's, except moving expense payments, payable to the title company, to be retained by the displaced person for the benefit of the displaced person. All RHP's must be applied to the purchase of the qualified replacement

residence only. As required, process and compute increased interest payments on the mortgage of owner-occupied dwellings. Note: Relocation payments are reimbursements of actual expenses incurred. As such, they are not to be released without proof of the qualified expenditure(s). Receipts and invoices must be filed once the replacement home has been purchased or rented, and the move has been completed. If funds are advanced based upon estimated expenses, any overpayments must be refunded in full to the agency within 20 Calendar Days of the move from the displacement property and or from the date of closing on a replacement property purchase.

For RHPs a final closing statement or HUD-1 statement shall be submitted to the Department upon the closing of the purchase of the replacement residence.

Notices to Displacees. For Residential property: Deliver to displacees a 90 Calendar Day Notice simultaneous with the delivery of the relocation Notice of Eligibility and the Supplemental Housing Study. The notice and the study must identify the location of the comparable property used to compute the RHP. For non-residential property: Deliver to the displaced person a 90 Calendar Day Notice simultaneously with the written offer to purchase. Note that this notice is advisory only.

A 30 Calendar Day notice to vacate shall subsequently be delivered to the displaced person when the required vacate date is known, unless the person has already vacated the displacement property. This Notice may not be sent any earlier than 60 Calendar Days from the date the initial 90 Calendar Day notice was delivered. For all Notices, the Agent must enter the date that the notices were presented into the appropriate locations in the ePM system, and include this information as part of their agent log. Copies of all written notices must be retained in the applicable acquisition and relocation file.

If a displacee has not moved after the 30 Calendar Day notice expires, immediately notify the Department's ROW Oversight Manager and prepare a written recommendation to facilitate the displacee's move.

For condemnation purposes the 30 Calendar Day Notice should be sent to the displaced person(s) when the condemnation resolution is submitted to the Attorney General's Office provided that at least 60 Calendar Day have elapsed since the 90 Calendar Day Notice was delivered to the displaced person.

Eviction Proceedings. Assist the Attorney General's (AG) office with any eviction proceedings.

Legal Proceedings. Be available for any legal proceedings, such as appeals or hearings.

Securing Vacant Properties. After a property acquisition and relocation has been completed, coordinate the final walkthrough of the vacated property with UDOT Property Management. Secure the dwelling and/or other structures no later than 24 hours after vacancy, and protect the property acquired. The Department will complete their salvage of the property within 20 Calendar Day of the final walkthrough. After the 20 Calendar Day, the property will be turned over to the Design-Builder. The Design-Builder is responsible for maintenance and care of properties acquired by, or turned over to the possession of the Design-Builder for the duration of the Project.

Displacee Files. Maintain a complete file, separate from acquisition files, on each displacee, if appropriate, and as needed. If a separate relocation file is set up and maintained, that file must contain a copy of all pertinent information from the acquisition file, sufficient to satisfy the needs of the relocation agent, the Design-Build reviewing agent, and the UDOT ROW Oversight Manager or the designated Department review person.

Eminent Domain and Relocations. For any parcel referred to the Attorney General's (AG) office for eminent domain proceedings that has a relocation issue, notify the AG that a relocation offer has been made. Include in the documents sent to the AG a copy of all relocation notices including the Notice of Eligibility and the 90 and/or 30 Calendar Day Notices that have been delivered to the displacee. Also include a record of all payments that have been made to the displacee. Advise the UDOT ROW Oversight

Manager and the AG's office if there are any contacts with or from the displacee after the case has been submitted to the AG for condemnation. Forward the complete agent log to the AG's Office immediately after each contact.

The displacee may request the assistance of the Utah Office of the Property Rights Ombudsman for relocation issues.

All correspondence to the displacees or their representative(s) that are prepared and sent by the Design-Builder will be prepared on the Design-Builder's designated letterhead and will be signed by the Design-Builder's Project ROW Relocation Specialist. Copies of all correspondence shall be retained in the acquisition/relocation file. Correspondence prepared and sent to the displacees or their representatives using Department letterhead must be signed by the UDOT ROW Oversight Manager or his/her designee.

Relocation Payments. Prepare relocation payment claim submissions for all displacees and all relocation assistance benefits using prescribed and approved forms with all appropriate funding codes. Deliver to each displacee the relocation assistance payments in compliance with separation of function, conflict of interest, and provisions of the UDOT *Right-Of-Way Operations Manual* and the *Uniform Relocation Act.*

14C-4.8 Administration and Management of Right-of-Way

Property Security, Clearance and Demolition of Right-of-Way. After acquisition or possession of any parcel of ROW, secure and protect all buildings, improvements, and fixtures until they are disposed of or demolished. Mow the grass and board up and winterize the buildings as required by the Department or applicable law.

Salvage Rights. See UDOT ROW Operations Manual.

Personal Property. Coordinate with the owner and occupants to ensure the clearance of personal property from the ROW, as applicable. Provide written notification to the Department of any real and/or personal property remaining on the ROW after being vacated by the occupants that was not acquired under the acquisition. Upon approval by the Department or the Design-Builder, if an item of personal property is allowed to be left onsite after the property has been vacated, the grantor or prior owner of the personal property must provide the Department in care of the Design-Builder, with a bill of sale and if applicable title to the vehicle or other item abandoned and left in place.

Pest Control. Provide for any insect and rodent control and initiate extermination as required to rid the acquired properties, as applicable, from infestations.

Governmental Approvals. Secure governmental approvals required for demolition and environmental surveys or tests, and notify the Department in writing of all such activities.

Documentation. Prepare all necessary documentation for disposal of improvements, fixtures, and buildings in accordance with applicable laws and submit the same to the Department.

Utility Service. Terminate all utility service(s) when appropriate and notify the UDOT Property Management.

Demolition/Removal Requirements. Process all required forms, documents, and permit applications in order to proceed with the timely demolition or removal of any and all improvements, buildings, and fixtures located on the acquired properties, as applicable.

Improvements. Demolish and/or remove all improvements necessary for construction of the Project and/or as directed by the Department.

A. Documentation:
Document the disposal of improvements, fixtures, and buildings in accordance with

applicable Laws and submit documentation to the UDOT Project ROW Coordinator.

Department Notification. Notify the Department upon completion of the demolition and clearance of the ROW, as applicable.

Parcel Files. Maintain parcel records on file of all aspects of the acquisition process in accordance with applicable law. Each parcel file and ownership file or relocation file shall include all documents required by the RFP, FHWA, and/or the Department.

Expense Reports. If needed and requested by the Department, provide monthly summary reports of project right-of-way expenses, including amounts authorized, amounts paid, and budget forecasting on a parcel-by-parcel and overall project basis.

Projected Funding. The Design-Builder ROW Project Coordinator will be required to prepare and submit the R-709 (Right-of-Way Cost Estimate) form to the UDOT ROW Oversight Manager, with the appropriate attachments and update ePM (screen 740 in the UDOT's ROW ePM module) as applicable, with all projected ROW expenses. Posting shall be prior to the commencement of the acquisition processes. Subsequent postings will also be required if there are subsequent changes to the projected ROW budget. Provide budget projections and anticipated funding requirements every 30 Calendar Days, or more frequently, as requested by the Department UDOT ROW Oversight Manager.

Status Reports. Maintain and electronically transmit to the Department, in a format acceptable to the Department, weekly status reports of all parcels and activities related to ROW acquisition as outlined in this Attachment 14-C (ROW Acquisition Procedures)..

Correspondence. Provide copies of all incoming and outgoing correspondence as requested.

Sub consultant Reports. Evaluate and report subcontractor status and performance on an ongoing basis in UDOT's ePM ROW module (Screen 760).

14C-4.9 Department Oversight, Monitoring, and Review

General. The Department or its designee may, at its discretion, review and/or monitor the ROW activities and services performed by the Design-Builder. This will be for oversight as a secondary review. Primary review shall be conducted by the Design-Builder. The Department will notify the Design-Builder in writing of any Project oversight monitor or reviewer under contract with the Department. Provide any information (in addition to that specifically required elsewhere in the RFP) to the Department requested to assist in the Department's review and assessment of the progress, timeliness, adequacy, and sufficiency of the Design-Builder's ROW activities.

14C-4.10 Cost Responsibilities of the Design-Builder

ROW Costs. The Design-Builder shall be responsible for paying all costs associated with all ROW design packages, for processing and issuing all payments of agreed purchase prices or awards; relocation assistance payments; and all legal, administrative, and incidental expenses of, or related to, the Design-Builder's additional properties, temporary construction easements, and other interests in real property acquired for the Project.

If additional ROW will be required to implement a Design-Builder's ATC, the Design-Builder acknowledges and agrees to the following:

A. Design-Builder shall be solely responsible for all costs associated with the acquisition of any such ROW, including the cost(s) thereof, and for obtaining any necessary environmental approvals;

B. Any additional ROW shall be purchased by the Design-Builder for the Project, with final

title reflecting the UDOT as owner;

C. Design-Builder shall not be entitled to any Change Order for time or money as a result of site conditions (e.g., hazardous materials, differing Site conditions, geotechnical issues, Utilities) on such additional ROW; and

D. Design-Builder shall not be entitled to any Change Order for time or money as a result of any delay, inability, or cost associated with the acquisition of such ROW.

15—ROADWAYS

15A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 15 (Roadways) and to satisfy all functional needs of the Project, including providing mainline, ramps, city streets, driveways, entrances, sidewalks, cut and fill slopes, survey, and fencing.

15B.STANDARDS

Complete Work for roadways in accordance with the requirements of the standards listed by priority in Table 15B-1 (Standards for Roadways).

If there is any conflict in standards, adhere to the standard with the most stringent requirements.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

TABLE 15B-1
STANDARDS FOR ROADWAYS

Priority	*Author or Agency*	*Title*
1	UDOT	Special Provisions included in Part 5
2	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
3	UDOT	*2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
4	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
5	UDOT	*2012 Standard Drawings for Road and Bridge Construction*
6	AASHTO	*A Policy on Geometric Design of Highways and Streets*
7	AASHTO	*Roadside Design Guide*
8	AASHTO	*Standard Specifications for Highway Bridges*
9	UDOT	*Utah Manual on Uniform Traffic Control Devices* (Utah MUTCD)
10	AASHTO	*Guide for the Development of Bicycle Facilities*
11	TRB	*Highway Capacity Manual*
12	UDOT	*UDOT Plan Sheet Development Standards*
13	UDOT	*Manual of Instruction, Roadway Design*
14	UDOT	*Manual of Instruction, Surveying*
15	UDOT	*Engineering Technology Systems Manual*
16	UDOT	*Manual for the Accommodation of Utilities and the Control and Protection of State Highway Rights of Way*
17	UDOT	*Manual of Instruction, Roadway Drainage*
18	UDOT	*Construction and Maintenance of Right-of-Way Fence,* Policy 08A-10
19	UDOT	*Guidelines for Crash Cushions and Barrier End Treatments, Approved Products List*
20	UDOT	*Single Point Urban Interchange Design and Operations Analysis*
21	APWA	*2012 American Public Works Association Standards and Specification*
22	Local	*South Jordan City*
23	Local	*West Jordan City*
24	Local	*Taylorsville City*
25	Local	*Salt Lake County*

15C. REQUIREMENTS

Remove all existing pavement, curb and gutter, sidewalk, steps, drainage facilities, soil, rock, and other obstructions within the Project limits necessary to construct the Project. Unless unused pavement is modified to be used as embankment, remove all unused pavements and sidewalks, including temporary facilities, within the Project limits.

15C-1 Non-Interstate Roadways

Design and construct all non-interstate roadway work in accordance with the functional classification and category for the specific AASHTO roadway type.

For roads that are not within the No Access Line and are not owned by the Department, design and construct according to the appropriate standards and criteria of the governing city or county; except, for the following cases comply with the requirements described in this Section 15C-1.:

A. Structures

1. Construct structures according to the Typical Sections in Part 7 (Contract Drawings) and as identified in Part 4-17 (Structures).

B. Bangerter Highway (Mainline)

1. Construct the lanes and shoulders in accordance with the Typical Sections in Part 7 (Contract Drawings). Design the mainline in accordance with the PDC.
2. Reconstruct the existing concrete pavement on Bangerter mainline from vertical tie-in points south and north of each intersection.
3. AASHTO Functional Classification is Other – Principal Arterial

C. On- and Off Ramps

1. Construct ramps in accordance with the Typical Sections in Part 7 (Contract Drawings). Design the ramps in accordance with the PDC.
2. Provide an additional 12 foot of grading for future two-lane off ramp in accordance with the drawing in Part 7 (Contract Drawings) with the following exceptions:
    a. 5400 South southbound and 7800 South southbound auxiliary lane.

15C-2 Crossing Roadways

Design and construct all roadway work in accordance with the functional classification and category for the specific AASHTO roadway type.

For roads that are not within the No Access Line and are not owned by the Department, design and construct according to the appropriate standards and criteria of the governing city or county; except, for the following cases comply with the requirements described below:

A. 5400 South

1. Construct the roadway in accordance with the Typical Sections in Part 7 (Contract Drawings). Reconstruct the existing concrete pavement on 5400 South at the intersection to the existing concrete joint limits located both east and west of Bangerter Highway. See Part 4-11 (Pavement) for additional requirements.
2. Do not impact or relocate the existing Gantries used for the flex lanes.

B. 7000 South

1. Construct the roadway in accordance with the Typical Sections in Part 7 (Contract Drawings). Reconstruct the existing concrete pavement on 7000 South at the intersection from the existing concrete pavement limits. See Part 4-11 (Pavement) for additional requirements.

C. 9000 South

1. Construct the roadway in accordance with the Typical Sections in Part 7 (Contract Drawings). Reconstruct the existing concrete pavement on 9000 South at the intersection from the existing concrete pavement limits. See Part 4-11 (Pavement) for additional requirements.

D. 11400 South

1. Construct the roadway in accordance with the Typical Sections in Part 7 (Contract Drawings). Reconstruct existing pavement on 11400 South from the east curb return

at 4000 West to the west curb return at 3600 West. See Part 4-11 (Pavement) for additional requirements.

2. Construct Bangerter Highway under 11400 South. The elevation of 11400 South cannot be raised more than five feet above existing elevation.

E. 4015 West Build Alterative

1. Construct the roadway in accordance with the Typical Sections in Part 7 (Contract Drawings).
2. At each U-turn intersection (U-turn intersections are 4015 West & Sam's Boulevard, 4015 West & Point Lane, and 5400 South & 4120 West):
   a. Remove all U-turn roadway elements such as (but not limited to) existing curb, gutter, sidewalk, raised island, associated U-turn signs, signals, striping and asphalt pavement in the bulb-out area (bulb-out area is the area of the U-turn outside of the standard travel lane and shoulder of the main street, 4105 West or 5400 South, and side street, Sam's Boulevard, Point Lane or 4120 West). Refer to Part 4, Section 18 (Traffic Signals) for removal and salvage of existing traffic signal.
   b. Reconstruct curb, gutter, drainage structure, parkstrip, sidewalk, and asphalt pavement, signing and striping to eliminate the bulb-out and to reconfigure the intersections as a standard intersection configuration. Relocate any necessary utilities such as fire hydrants in the parkstrip.

F. Local Streets

1. For parcels where buildings are demolished, remove curb and gutter curb cuts, driveway aprons, and driveways.
2. Place full-height curb and gutter matching existing width and shape of the existing curb and gutter.
3. Remove the existing sidewalk from parcel 154 to 173 on east side of Tippecanoe Way.
4. Provide crosswalk and pedestrian ramps from east side to west side of Tippecanoe where sidewalk removal ends south of parcel 174 along east side of Tippecanoe.
5. Reconstruct the knuckle at the corner of New Heritage Drive and 9150 South. Construct a turn-around area for an AASHTO City Bus and obtain Approval from West Jordan City for the design.
6. Remove the existing cul-de-sac at Winthrope Circle; pavement, curb, sidewalk. Construct a turn-around area for an AASHTO City Bus and obtain Approval from West Jordan City for the design.

15C-3 Interchange Criteria

Provide a Single-Point Urban Interchange (SPUI) at each interchange. A concept is provided in Reference Documents. If an alternate configuration is proposed, seek approval through the ATC process.

A. Provide a minimum of 4.0 feet from front face of curb to face, side or corner of bridge abutment or MSE wall unless barrier is provided.

B. Left hand exits or entrances are not allowed.

C. Provide parallel-type entrance ramps. Place the noise wall and grade to accommodate dual-lane off-ramps. Construct all other items of Work associated with the off ramps in a single-lane off-ramp configuration.

D. For on-ramps, provide acceleration lengths from the ramp meter stop bar.

E. For off-ramps, provide the deceleration lengths to the back of the ramp terminal intersection storage lengths in accordance with the PDC.

F. Provide ramp meter storage as shown in Table 15C-1.

G. Provide a minimum separation width of 10 feet between opposing left turning lanes.

H. Stop Bars for all movements will not be staggered.

I. Provide a maximum 2:1 (larger radius: small radius) compound ratio between the radii of the two curves on each ramp. Place the larger radius first in the direction of travel for on-ramps and the smaller radius first in the direction of travel for the off ramps.

J. Provide a southbound auxiliary lane between 7800 South and 7000 South.

15C-4 Horizontal and Superelevation Design

Provide horizontal curves for all horizontal alignment deflection angles greater than 0.5 degrees (30 minutes). Provide a minimum of 800 feet tangent between deflection angles.

15C-5 Vertical Design

Use a minimum vertical curve length in accordance with AASHTO design speed k values. Pavement transitions are subject to vertical design requirements. The minimum vertical curve length is 500 feet for mainlines, 200 feet for ramp bodies and State facilities, and 100 feet for ramp terminals. For all other non-State facilities, the minimum vertical curve length shall be 100 feet.

A vertical curve is required for grade breaks with an algebraic difference greater than 0.2 percent on mainline and ramps, and 0.5 percent for all other facilities. Provide a minimum of 500 feet between grade breaks along mainline and ramps, and minimum of 200 feet between grade breaks on all other facilities.

- Design the maximum final pavement elevation of Bangerter Highway, ramps, and cross streets to not exceed the following elevations within a 100 foot zone, 50 feet north and 50 feet south of the existing Rocky Mountain Power (RMP) overhead power lines that run parallel to 5400 South, 9000 South, and 11400 South, and cross Bangerter Highway within the Project limits.5400 South 4584.00
- 9000 South 4529.00
- 11400 South 4663.50

15C-6 Design Vehicle

For all turning movements along 5400 South, 7000 South, 9000 South, 11400 South, Bangerter Highway (SR-154) and ramps, comply with the following requirements:

A. For all single lane turning movements, an AASHTO WB-67 design vehicle must be able to turn from turning lane to receiving lane with its wheels entirely on lane or

shoulder pavement.

B. For all multiple lane turning movements, an AASHTO WB-67 design vehicle wheels must stay within the outside lane and shoulder pavement without crossing the inside lane line. For the inside lane, AASHTO WB-50 must be used.

For all other turning movements use an AASHTO WB-50 design vehicle for all lanes of all turning movements.

For the design of a cul-de-sac when existing cul-de-sacs are modified or new ones are created on City streets use an AASHTO City Bus design vehicle and the respective City standard requirements for all turning movements.

15C-7 On-Ramps

Provide pavement to accommodate future ramp meters on all on-ramps. Provide a minimum of three lanes on all on-ramps from the ramp terminal to the stop bar without impacting cross-street traffic or pedestrian movements for 5400 South, 7000 South and 9000 South. Provide a minimum of two lanes on all on-ramps from the ramp terminal to the stop bar without impacting cross-street traffic or pedestrian movements at 11400 South.

Use a minimum 300-foot taper for each lane drop on each on-ramp except for approved deviations in the appendix to this Section.

Provide the following ramp storage lengths from the cross street curb return to the ramp meter stop bar and ramp lengths between end of taper to beginning of taper (lengths in Table 15C-1 (On-Ramp Lengths) do not include taper lengths):

TABLE 15C-1
ON-RAMP LENGTHS

Ramp	*Required Ramp Meter Storage Length (Lane-Feet)*	*Desired Ramp Meter Storage Length (Lane-Feet)*	*Length of two lane section between tapers (Feet)*	*Length of one lane section between tapers (Feet)*
	5400 South			
Southbound	3,000	4,100	300	300
Northbound	1,200	1,200	300	300
	7000 South			
Southbound	1,875	1,875	300	300
Northbound	900	900	300	300
	9000 South			
Southbound	2,400	2400	300	300
Northbound	1,900	2,790	300	300
	11400 South			
Southbound	2,520	2,520	300	300

North bound	2715	3,200	300	300

15C-8 Off Ramps

Provide the required deceleration length from the painted gore to the beginning of the required queue length as shown in the PDC.

15C-9 Project Design Criteria (PDC) Changes

The Department has approved the Project Design Criteria (PDC) for the Project as shown in Attachment 15-A to this Section 15. The Department has approved Project Design Criteria for the 4015 West Build Alternative as shown in Attachment 15-A to this Section. Any updates or modifications to the PDC must be Approved by the Department before the subject Work is performed.

15C-10 Design Exceptions/Waivers

The Department has approved Design Exceptions/Waivers for the Project as shown in the appendix to this Section. The Design-Builder shall be responsible for obtaining any other necessary Design Exceptions/Waivers for the Project.

15C-11 Typical Sections

Design roadways in accordance with Part 7 (Contract Drawings).

Provide the structure clear spans illustrated the Structure Clearance Envelope included in Part 7 (Contract Drawings) free of all bridge substructure, retaining walls, and slope paving.

15C-12 Intersections

Provide turn-lane storage lengths and number of turn lanes in accordance with the (PDC) for the Project as shown in Attachment 15-A to this Section 15.

15C-13 Barrier

For all roadside locations where clear zone requirements are not met, provide a 42-inch minimum cast-in-place constant-slope barrier or 42-inch minimum cast-in-place constant-slope half-barrier based on the required length of need for any obstruction within the clear zone.

Provide a 42-inch minimum cast-in-place constant-slope barrier in the median along Bangerter Highway (SR-154) if existing median barrier is impacted or removed. Tie new median barrier to existing barrier using required barrier transition element from 42 inch to 32 inch barrier.

Provide 32-inch pre-cast concrete half barrier along the front face of the MSE walls next to travel lanes.

If existing barrier along structural columns is impacted or removed provide 54-inch minimum cast-in-place barrier around structural columns per Standard Drawing BA 1E. See Part 4-17 (Structures) for additional requirements.

15C-14 Curb, Curb & Gutter, and Median Curb

In locations where barrier is not installed along the edge of Bangerter Highway (SR-154) and the ramps, provide concrete curb and gutter Type M1. Extend M1 curb and gutter until it ties back to existing curb and gutter along Bangerter Highway (SR-154). Extend M1 curb and gutter along ramps up to the curb returns at the ramp terminal. Provide Concrete M1 curb and gutter at the edge of pavement along 5400 South, 7000 South, 9000 South, and 11400 South between ramps unless the street is on the structure.

Provide concrete curb Type M2 at ramp terminals for splitter islands.

Provide concrete curb Type B5 in the median along 5400 South, 7000 South, 9000 South, and 11400 South until it ties back to existing curb.

Provide back-to-back B5 curb along left turn pockets.

Provide concrete curb and gutter Type B1 along 5400 South, 7000 South, 9000 South, and 11400 South from the outside of the ramp curb returns to existing curb and gutter.

Provide concrete curb and gutter that meets the governing City for any local street that needs to be reconstructed as part of this Project.

4105 West Build Alternative: Provide concrete curb Type B5 in the median along 5400 South between 4120 West and 3900 West. Remove raised median curbs on 4015 West from Sam's Boulevard to Point Lane.

15C-15 Sidewalk and Parkstrips

Provide concrete sidewalk and/or parkstrips on any street that is being reconstructed as part of this project that currently has sidewalk and parkstrip that is being removed. Match existing widths for sidewalk and parkstrip. Replace in-kind aesthetic treatment in parkstrip areas.

Provide concrete sidewalk and a pedestrian crossing across the south side of the 7000 South interchange that ties into existing sidewalk on the east and west side. Provide width for a future sidewalk and pedestrian crossing on the north side of the 7000 South interchange between ramp intersections.

15C-16 Pedestrian Ramps

Provide new ADA-compliant pedestrian access ramps where a pedestrian path intersects a roadway being constructed, reconstructed, or repaved. Provide documentation and calculations at design submittal reviews that show the pedestrian ramps will meet ADA requirements.

Coordinate with the Department and each city for guidance on the color of truncated domes for pedestrian access ramps on City-owned streets. A single color shall be used for all ramps at a single intersection.

Complete the UDOT *Pedestrian Access Ramp Evaluation Form (Form C-170)* upon completion of each pedestrian ramp and provide in As-builts.

15C-17 Fencing

Provide new 6-foot chain link fence type III, within the pavement reconstruction limits along Bangerter Highway (SR-154) and at each cross street along the No-Access line. Replace any fence damaged or removed for construction activities with new fence of the same size and type.

For all other roadways, provide new fence along each parcel that currently has fencing with the same type and size. Obtain permission from the property owner(s) for elimination of fencing.

Fencing is not required along the No-Access line where noise walls are required. Install a gate if there is an existing gap for access to the noise wall.

Connect existing fence into the new noise wall locations, match the existing fence type.

15C-18 Maintenance Access Zone

Provide a continuous 10-foot-wide maintenance access zone between the ROW fencing and the face of retaining wall or between the ROW fencing and the toe of any slope greater than 4:1 (H:V). Limit the slope of the maintenance access zone to less than 4:1 (H:V). Deviations from maintenance access requirements are not permitted at the bottom of walls retaining the roadway. During design development, provide a description of areas that deviate from the maintenance access requirement that includes length, width, location, point of access and distance from point of access. Provide 12-foot-wide gates in the ROW fence and a drivable transition between the local street network and each segment of the maintenance access zone. Do not place above-grade appurtenances, including ATMS cabinets, sign structures, lighting supports, trees, shrubs, walls, drainage features or structures, within the maintenance access zone.

9000 South

Provide access from the northbound off ramp to the existing driveways for the USBOR Aqueduct Easement.

15C-19 Snow Storage Area

Provide a minimum 5-foot-wide area that can be used for snow storage between roadway barriers and noise walls. Include drainage of this area in the design and construction of drainage facilities.

15C-20 Walls

Provide noise walls in accordance with Right of Way Drawings in Part 7 (Contract Drawings). Reconstruction of noise walls is limited to the wall that is impacted by the Project.

Provide 1 foot between the face of noise wall, retaining noise wall to the N/A line.

15C-21 Survey

Perform any survey necessary to complete the Work. Survey and confirm the location, accuracy, and datum of all information provided, regardless of the source of the information. Existing horizontal and vertical survey control is provided in Part 7 (Contract Drawings).

Provide a statement before beginning design indicating all Department-provided horizontal and vertical control has been field checked and the control has been determined to be accurate within the tolerances specified in the UDOT Survey & Geomatics Standards which can be found at http://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:1521,. Attach field survey information used to verify control. Notify the Department verbally and in writing if discrepancies are found.

15D. SUBMITTALS

Provide submittals to the Department in accordance with Table 15D-1.

TABLE 15D-1
DESIGN-BUILDER SUBMITTALS FOR ROADWAYS

Submittal	***For Approval***	***Schedule***
Pedestrian Access Ramp Evaluation Form: C-170	No	Prior to Substantial Completion
List of deviations	Yes	Prior to submittal of Released for Construction documents
Statement of verification of survey control	No	Prior to beginning design

Appendix 1: PROJECT DESIGN CRITERIA

PROJECT DESIGN CRITERIA - URBAN ARTERIAL - OTHER

I. PROJECT DESCRIPTION

DATE: 7/7/2016

Project No	**S-0154(12)11**	**Location**	**4 Interchanges on Bangerter Highway**
PIN	**12566**	**Concept**	**4 Interchanges on Existing Freeway**

Describe the scope of the project Construct 4 New Interchanges

II. DESIGN STANDARDS BY ROADWAY

(Complete a separate PDC for each roadway on your project)

Date of OSR: 2/18/2016

Roadway Name: **SR-154 (Bangerter Hwy) - 5400 South**

Roadway Characteristics

Functional Class	Urban Arterial - Other			**Pavement Type**	Rigid		
Current Year	2015	**AADT=**	**56,000**	**Terrain**	Rolling Terrain		
Design Year	2040	**AADT=**	**109,000**	**% Trucks (current)**	6%		
Design Vehicle	WB-67			**Posted / Design Speed**		55	65

Proposed Roadway Characteristics

Total Number of Lanes 6

Shoulder Width (Typ) 12'

Curb & Gutter Type & Width (Typ) Type M1 (2.5')

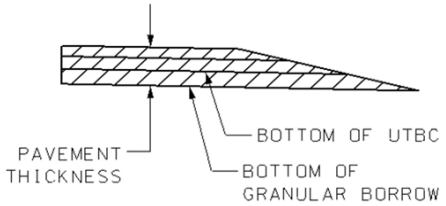
Comments

Ramps A, B, C & D
- Design Speed - 55 mph
  - 300 ft along ramp beyond painted gore in the travel direction
- Design Speed - 45 mph
  - Ramp Body
- Design Speed - 25 mph
  - Within 300 ft of 5400 S

* A design speed of 20 mph will be used for SSD near the 5400 S. Intersection.

Pavement Thickness

See Typical Sections in Part 7



Pavement Thickness consists of Hard Surfacing, UTBC, and Granular Borrow (if used).

Order of Precedence: SD - 2012 Standard Drawings; MOI - Roadway Design Manual of Instruction; GB - AASHTO Green Book 2011 Edition

FHWA 13 Critical Elements	UDOT Standard	RFP Requirement	Design Exception	References	Date of Decision, Comments, Mitigation, etc.
Design Speed	65 mph	65 mph	☑ Not Required ☐ Required ☐ Approved	**MOI** 2-1; **GB** pp. 2-53:58, 8-1:2	Determined by Concept Team
Lane Width	**Mainline** 12' **LT Turn Lane(s)** 12' **RT Turn Lane(s)** 12'	12' 12' 12'	☑ Not Required ☐ Required ☐ Approved	**SD** (DD & ST series); **MOI** 7-1, 43:47, 107; **GB** pp. 8-2:3	
Shoulder Width	**Outside** 12' / **Inside** 12' / **Barrier Offset** 2'	**Outside** *12' / **Inside** 12' / **Barrier Offset** 2'	☐ Not Required ☐ Required ☑ Approved	**SD** (DD & ST series); **MOI** 7-44:46; **GB** pp. 4-8:11, 8-2:3	*Design exception to reduce the outside shoulder for the SB On Ramp only.
Superelevation	**Maximum Superelevation** 6%	**Maximum Superelevation** 6%	☑ Not Required ☐ Required ☐ Approved	**SD** DD 1; **MOI** 7-26:29; **GB** pp. 8-3, 3-45 (T. 3-9)	
Horizontal Alignment	**Minimum Radii Value** 1660'	**Minimum Radii Value** 1660'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-30:33, 50:55; **GB** pp. 8-6, 3-32 (T. 3-7), 3-45 (T. 3-9)	
Vertical Alignment	**Sag Curve Min. K Value** 157 / **Crest Curve Min. K Value** 193	**Sag Curve Min. K Value** 157 / **Crest Curve Min. K Value** 193	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-56:60; **GB** pp. *crest* 3-155: 157 (T. 3-34:35), *sag* 3-161 (T. 3-36)	
Profile Grades	**% Min** 0.30% / **% Max** 5.00%	**% Min** 0.30% / **% Max** 6.00%	☐ Not Required ☐ Required ☑ Approved	**MOI** 7-58:62; **GB** pp. 3-119, 8-3:4 (T. 8-1)	0.50% preferred
Cross Slope	**Standard Value** 2%	**Value Proposed/Used** 2%	☑ Not Required ☐ Required ☐ Approved	**SD** (DD, DD 4); **MOI** 7-47:48; **GB** pp. 4-1:6, 8-2:3	
Stopping-Sight Distance	**Minimum** 645'	**Minimum** 645'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-62; **GB** pp. 3-2:8, 3-106:110, 3-4 (T. 3-1)	
Structural Capacity	**Design Loading** HL-93	**Design Loading** HL-93	☑ Not Required ☐ Required ☐ Approved	**MOI** 11-2:3; **GB** p. 8-4	HS-20 for existing; HL-93 for new construction
Bridge Width	**Minimum** 62'-10"	**Minimum** 62'-10"	☑ Not Required ☐ Required ☐ Approved	**SD** DD 9; **MOI** 11-3; **GB** p. 8-4	Bridge width per direction
Vertical Clearance*	**Minimum** 16.5' over road, 23.5' over rail	**Minimum** 16.5'	☑ Not Required ☐ Required ☐ Approved	**SD** DD 8:0; **MOI** 11-4:5; **GB** p. 8-4	* Notify FHWA on any changes to Vertical Clearance on the National Highway System
Lateral Offset to Obstruction	**Minimum** Urban environments shoulder + 2', other locations clearzone.	**Minimum** Urban environments shoulder + 2', other locations clearzone.	☑ Not Required ☐ Required ☐ Approved	**SD** DD 17; **GB** p. 8-5, 10-19:21	

Design Waivers	UDOT Standard				RFP Requirement		Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Acceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. A part of the ramp proper may also be considered in the acceleration length as a design waiver. Table 10-3 **GB** p. 10-110. See also **GB** pp. 9-124:125, 10-107:110, 116:122; **SD** DD 13A:14B, ST 1; **MOI** 7-106	
	65 mph	50 mph	0	1410	Ramp B 0 to 65 (SB On) Ramp D 0 to 65 (NB On)	1410' 1410'			
			14	1350					
			18	1310					
			22	1220					
			26	1120					
Deceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. Table 10-5 **GB** p. 10-115. See also **GB** pp. 9-124:125, 10-107,112:120, 123:124; **SD** DD 13A:14B, ST 3A:3B; **MOI** 7-106	
	65 mph	55 mph	0	570	Ramp A 65 to 0 (NB Off) Ramp C 65 to 0 (SB Off)	570' 570'			
			14	540					
			18	520					
			22	500					
			26	470					
Guardrail Bridge Connection	UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.				UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.		☑ Not Required ☐ Required ☐ Approved	**SD** BA 4B1:4B2, UDOT Design Exception Form	
Clear Zone	Meet clear zone compliant requirements defined in Standard Drawings.				30'		☑ Not Required ☐ Required ☐ Approved	2006 Roadside Design Guide pg. 3-6 and Figure 3.2 pg. 3-8; **SD** DD 4, 8, 10-12,17	
Intersection Sight Distance	Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.				Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 9-28:54, **MOI** 7-64:67	
Ramp Terminal Sight Distance	Along the Ramp				Along the Ramp		☑ Not Required ☐ Required Approved	SSD (Stopping Sight Distance) should be at least as great as design SSD *SSD is 25% greater than minimum SSD. **DSD is Decision Sight Distance based on avoidance maneuver 'E' and is desired where feasible. Document DSD but do not obtain waiver if DSD is not met. **GB** p. 3-4 (T. 3-1) **GB** p. 3-7 (T. 3-3) **GB** p. 10-92	
	Design Speed	**SSD (ft)**			**Design Speed**	**SSD (ft)**			
	70 mph	730							
	55 mph	495			65 mph	645			
	50 mph	425			55 mph	495			
	45 mph	360			45 mph	360			
	40 mph	305			25 mph	155			
	35 mph	250			20 mph	115			
	30 mph	200							
	25 mph	155							
	Along the Freeway or Street Preceeding Approach Nose of Exit Ramp				Along the Freeway or Street Preceed Approach Nose of Exit Ramp		☐ Approved		
	Design Speed	**SSD (ft)***	**DSD (ft)****		**Location**	**SSD***	**DS**		
	70 mph	915	1445		SR-154 Approaching Ramp A (NB Off)	810'	13		
	55 mph	620	1135						
	50 mph	535	1030						
	45 mph	450	930						
	40 mph	385	825						
	35 mph	315	720		SR-154 Approaching Ramp C (SB Off)	810'	13		
	30 mph	250	620						
	25 mph	200	N/A						
Shoulder/Travel way (gutter pan)	The gutter pan is not considered a part of the traveled way or shoulder.				The gutter pan is not considered part of the traveled way or shoulc			**GB** pp. 4-19, 10-103; **MOI** 7-1, 43:44	

Design Waivers	UDOT Standard	RFP Requirement	Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Gores	Follow the key points from 2011 AASHTO: • Should be uniform along the freeway; • Geometric shape is appropriate for given speeds; • Mitigation required for major obstructions in a gore; and • Unpaved area beyond the gore nose should be graded nearly level with the roadways as practical.	Location: 5400 South Meets all Requirements?: YES	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 10-96:101; **SD** DD 6, ST 3A:3B	
Ramp Terminals	Platform Location: Ramp side of the approach nose or merging end. Length: 200 ft Location: At- grade terminal of ramp. Length: Varies	Platform Location: Ramp side of the approach nose or merging end. Length: 200 ft Location: t- grade terminal of ramp. Length: Varies	☑ Not Required ☐ Required ☐ Approved	Avoid left hand entrances and exits. **GB** pp. 10 103:104. Ramp Terminal means: 1) the exit terminal from the side street onto the freeway entrance ramp; 2) the entrance terminal onto the freeway; 3) the exit terminal from the freeway onto the exit ramp; and 4) the entrance terminal from the freeway exit ramp onto the side street. Refer to **GB** 10-104 for platform lengths. **MOI** 7-105:106	
On Ramp Design	Type: Parallel Curve Radius: 1000 ft Dist. From Physical Nose to Ramp Control Line Terminus: 200 ft Taper: 300 ft min	Ramp Loc.: 5400 South Ramps Type: Parallel Curve Rad.: 1000 ft Dist.: 200 ft Taper: 300'	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 10-107:112; **SD** DD 6, ST 1; **MOI** p. 1-2. UDOTs preferred approach is to utilize parallel entrance ramps. See **GB** pp. 10-89:90; **MOI** 7-105:106.	
Off Ramp Design	Type: Taper Divergence Angle (deg): 2-5 Dist. from outer edge alignment break to ramp control line: 200 ft	Ramp Loc.: 5400 South Ramps Type: Taper Angle: 2-5 Dist.: 200 ft	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 10-112:116; **SD** DD 6, ST 3A:3B; **MOI** p. 1-2. UDOTs preferred approach is to utilize tapered exit ramps for single lane exits. If multi lane exit, one lane must be parallel. See **GB** pp. 10-89:90; **MOI** 7-105:106.	
Curb Configuration	2011 AASHTO p.10-103	Type M1	☑ Not Required ☐ Required ☐ Approved	Determine if the curb is appropriate for the type of facility. **GB** pp. 4-16:19, 10-103; **SD** GW 2	
Traffic Control	Meet Traffic Control Standard Drawings requirements	Meet Traffic Control Standard Drawings requirements	☑ Not Required ☐ Required ☐ Approved	**SD** TC series	
Rumble Strips	Meet Paving Standard Drawings requirements	Meet Paving Standard Drawings requirements	☑ Not Required ☐ Required ☐ Approved	**SD** PV 6A:8B	

Prepared by _____ Date 9/12/2016

Verified Only _____ Date _____
- Local Government Projects Only

Approved by _____ Date: 2016.09.12 08:33:48 -06'00' Date _____

On local government projects that are not on a UDOT road, the Region Preconstruction Engineer signs the "Verified Only" line and the Engineer of Record signs the "Approved by" line. For all other projects, the "Verified Only" line is left blank and the Region Preconstruction Engineer signs the "Approved by" line.

PROJECT DESIGN CRITERIA - URBAN ARTERIAL

I. PROJECT DESCRIPTION

DATE: 7/7/2016

Project No	**S-0154(12)11**	**Location**	**4 Interchanges on Bangerter Highway**
PIN	**12566**	**Concept**	**4 Interchanges on Existing Freeway**

Describe the scope of the project Construct 4 New Interchanges

II. DESIGN STANDARDS BY ROADWAY

(Complete a separate PDC for each roadway on your project)

Date of OSR: 2/18/2016

Roadway Name: **5400 South**

Comments

Roadway Characteristics

Functional Class	Urban Arterial			**Pavement Type**	Rigid	
Current Yea	2015	**AADT=**	38,000	**Terrain**	Flat	
Design Yea	2040	**AADT=**	45,000	**% Trucks (current)**	4%	
Design Vehicle	WB-67			**Posted / Design Speed**	45	50

Proposed Roadway Characteristics

Total Number of Lanes	6	**Park Strip Width (Typ)**	5'
Shoulder Width (Typ)	0	**Sidewalk Width (Typ)**	4' - 6'
Curb & Gutter Type & Width (Typ)	Type B1 (2.5')		

Intersection #1:

Roadway Name	Dir.	# of LT Lanes	Storage Length	# of Thru Lanes	# of RT Lanes	Storage Length
5400 South	**EB**	2	250	3	1	N/A
5400 South	**WB**	2	185	3	0	N/A
NB Off Ramp	**NB**	2	525	0	2	525
SB Off Ramp	**SB**	2	450	0	1	450

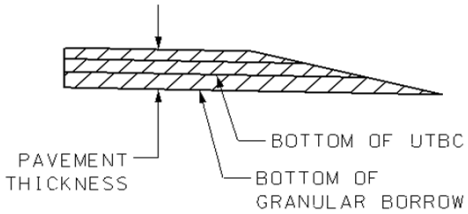
Curb Radius From T.B.C.

NW Curb Radius:	25'
SW Curb Radius:	68.5'
NE Curb Radius:	70.5'
SE Curb Radius:	25'

Pavement Thickness

See Typical Sections in Part 7

Ramp	Required Ramp Meter Storage (Lane-Feet)
SB On Ramp	3000
NB On Ramp	1200

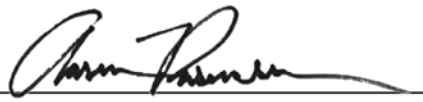


Pavement Thickness consists of Hard Surfacing, UTBC, and Granular Borrow (if used).

Order of Precedence: SD - 2012 Standard Drawings; MOI - Roadway Design Manual of Instruction; GB - AASHTO Green Book 2011 Edition

FHWA 13 Critical Elements	UDOT Standard	RFP Requirement	Design Exception	References	Date of Decision, Comments, Mitigation, etc.
Design Speed	50 MPH	50 MPH	☑ Not Required ☐ Required ☐ Approved	**MOI** 2-1; **GB** pp. 2-53:58, 7-27	Determined by Concept Team
Lane Width	**Mainline** 12' **LT Turn Lane(s)** 12' **RT Turn Lane(s)** 11'	11' 11' 11'	☐ Not Required ☐ Required ☑ Approved	**SD** (DD & ST series); **MOI** 7-1, 43:47, 107; **GB** pp. 7-29:30	11' lanes allowed per existing design exception, PIN 8523
Shoulder Width	**Outside** / **Inside** / **Barrier Offset** 8' / N/A / N/A	**Outside** / **Inside** / **Barrier Offset** 0' / N/A / N/A	☐ Not Required ☐ Required ☑ Approved	**SD** (DD & ST series); **MOI** 7-44:46; **GB** pp. 4-8:11, 7-30	
Superelevation	**Maximum Superelevation** 4%	**Maximum Superelevation** 4%	☑ Not Required ☐ Required ☐ Approved	**SD** DD 1; **MOI** 7-26:29; **GB** pp. 7-29, 3-44 (T. 3-8)	
Horizontal Alignment	**Minimum Radii Value** 926'	**Minimum Radii Value** 926'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-30:33, 50:55; **GB** pp. 7-28, 3-32 (T. 3-7), 3-44 (T. 3-8)	
Vertical Alignment	**Sag Curve Min. K Value** / **Crest Curve Min. K Value** 96 / 84	**Sag Curve Min. K Value** / **Crest Curve Min. K Value** 96 / 84	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-56:60; **GB** pp. *crest* 3-155: 157 (T. 3-34:35), *sag* 3-161 (T. 3-36)	
Profile Grades	**% Min** / **% Max** 0.30% / 6.0%	**% Min** / **% Max** 0.30% / 6.0%	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-58:62; **GB** pp. 3-119, 7-28:29 (T. 7-4)	0.50% preferred
Cross Slope	**Standard Value** 2%	**Value Proposed/Used** 2%	☑ Not Required ☐ Required ☐ Approved	**SD** (DD series); **MOI** 7-47:48; **GB** pp. 4-1:6, 7-29	
Stopping-Sight Distance	**Minimum** 425'	**Minimum** 425'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-62; **GB** pp. 3-2:8, 3-106:110, 7-28, 7-3 (T. 7-1)	
Structural Capacity	**Design Loading** HL-93 for New Construction	**Design Loading** HL-93 for New Construction	☑ Not Required ☐ Required ☐ Approved	**MOI** 11-2:3; **GB** p. 7-38	HS-20 for existing; HL-93 for new construction
Bridge Width	**Minimum** N/A	**Minimum** N/A	☑ Not Required ☐ Required ☐ Approved	**SD** DD 9; **MOI** 11-3; **GB** pp. 7-37:38	
Vertical Clearance*	**Minimum** 16.5' over road, 23.5' over rail	**Minimum** 16.5'	☑ Not Required ☐ Required ☐ Approved	**SD** DD 8:9; **MOI** 11-4:5; **GB** p. 7-38	* Notify FHWA on any changes to Vertical Clearance on the National Highway System
Lateral Offset to Obstruction	**Minimum** 1.5' tangent / 3' radius	**Minimum** 1.5' tangent / 3' radius	☑ Not Required ☐ Required ☐ Approved	**SD** DD 17; **GB** pp. 7-37:38	

Design Waivers	UDOT Standard				RFP Requirement		Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Acceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. A part of the ramp proper may also be considered in the acceleration length as a design waiver. Table 10-3 **GB** p. 10-110. See also **GB** pp. 9-124:125, 10-107:110, 116:122; **SD** DD 13A:14B, ST 1; **MOI** 7-106	
	50 mph	39 mph	0	720	N/A				
			14	660					
			18	610					
			22	550					
			26	450					
Deceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☐ Not Required ☐ Required ☑ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. Table 10-5 **GB** p. 10-115. See also **GB** pp. 9-124:125, 10-107,112:120, 123:124; **SD** DD 13A:14B, ST 3A:3B; **MOI** 7-106	*Design waiver provided
	50 mph	44 mph	0	435	EB Left Turn WB Left Turn WB Left Turn Onto 3900 W	*140' 435' *140'			
			14	405					
			18	385					
			22	355					
			26	315					
Guardrail Bridge Connection	UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.				N/A		☑ Not Required ☐ Required ☐ Approved	**SD** BA 4B1:4B2, UDOT Design Exception Form	
Clear Zone	Meet clear zone compliant requirements defined in Standard Drawings.				20'		☑ Not Required ☐ Required ☐ Approved	2006 Roadside Design Guide pg. 3-6 and Figure 3.2 pg. 3-8; **SD** DD 4, 8, 10:12,17	
Intersection Sight Distance	Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.				Sight triangles cases A-F and skew are met.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 9-28:54, **MOI** 7-64:67	
Shoulder/Travel way (gutter pan)	The gutter pan is not considered a part of the traveled way or shoulder.				The gutter pan is not a part of the shoulder or traveled way.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 4-19, 10-103; **MOI** 7-1, 43:44	
Curb Configuration	2011 AASHTO p. 10-103				Type B1,Type B5, Type M2		☑ Not Required ☐ Required ☐ Approved	Determine if the curb is appropriate for the type of facility. **GB** pp. 4-16:19, 10-103; **SD** GW 2	
Traffic Control	Meet Traffic Control Standard Drawings requirements				Meet Traffic Control Standard Drawings requirements		☑ Not Required ☐ Required ☐ Approved	**SD** TC series	
Rumble Strips	Meet Paving Standard Drawings requirements				N/A		☑ Not Required ☐ Required ☐ Approved	**SD** PV 6A:8B	

Prepared by  Date 9/12/2016

Verified Only
- Local Government Projects Only

Date

Approved by Date: 2016.09.12 08:34:27 -06'00'

Date

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PROJECT DESIGN CRITERIA - URBAN ARTERIAL

I. PROJECT DESCRIPTION

DATE: 7/28/2016

Project No	**S-0154(12)11**	**Location**	**4 Interchanges on Bangerter Highway**
PIN	**12566**	**Concept**	**4 Interchanges on Existing Freeway**

Describe the scope of the project Construct 4 New Interchanges

II. DESIGN STANDARDS BY ROADWAY

(Complete a separate PDC for each roadway on your project)

Date of OSR: 2/18/2016

Roadway Name: 5400 South (at 4015 West)

Comments

This PDC is for 5400 South at 4015 West only. As shown in the additive bidding plans.

*Low speed urban design is assumed through the 45 MPH design speed section of 5400 South. This eastern limit of this section is just east of the reverse curves through the 4015 intersection. The 45 design speed zone then continues to the west. The design speed is classified as 50 MPH east of this zone.

Roadway Characteristics

Functional Class	Urban Arterial			**Pavement Type**	Asphalt	
Current Year	2015	**AADT=**	38,000	**Terrain**	Level	
Design Year	2040	**AADT=**	45,000	**% Trucks (current)**	4%	
Design Vehicle	WB-67			**Posted / Design Speed**	40*	45*

Proposed Roadway Characteristics

Total Number of Lanes	6	**Park Strip Width (Typ)**	0' - 5'
Shoulder Width (Typ)	0	**Sidewalk Width (Typ)**	4' - 6'
Curb & Gutter Type & Width (Typ)	Type B1 (2.5')		

Intersection #1: 4015 West at 5400 South

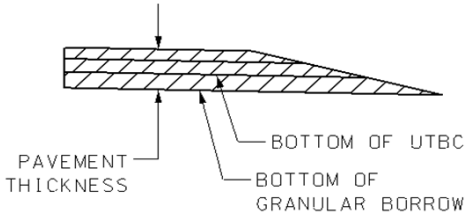
Roadway Name	Dir.	# of LT Lanes	Storage Length	# of Thru Lanes	# of RT Lanes	Storage Length
5400 South	EB	1	375	3	1	250
5400 South	WB	1	450	3	1	100
4015 West	NB	1	250	1	1	250
4015 West	SB	1	250	1	1	250

Curb Radius From T.B.C.

NW Curb Radius:	55'
SW Curb Radius:	60' (existing)
NE Curb Radius:	45'
SE Curb Radius:	60' (existing)

Pavement Thickness

See Typical Sections in Part 7

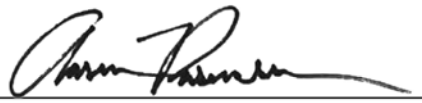


Pavement Thickness consists of Hard Surfacing, UTBC, and Granular Borrow (if used).

Order of Precedence: SD - 2012 Standard Drawings; MOI - Roadway Design Manual of Instruction; GB - AASHTO Green Book 2011 Edition

FHWA 13 Critical Elements	UDOT Standard	RFP Requirement	Design Exception	References	Date of Decision, Comments, Mitigation, etc.
Design Speed	50 MPH	50 MPH	☑ Not Required ☐ Required ☐ Approved	**MOI** 2-1; **GB** pp. 2-53:58, 7-27	
Lane Width	**Mainline** 12' **LT Turn Lane(s)** 12' **RT Turn Lane(s)** 11'	11 11 11	☐ Not Required ☐ Required ☑ Approved	**SD** (DD & ST series); **MOI** 7-1, 43:47, 107; **GB** pp. 7-29:30	Existing design exception for 11' lanes exists in this location from PIN 8523.
Shoulder Width	**Outside** 4' / **Inside** N/A / **Barrier Offset** N/A	**Outside** 0' / **Inside** N/A / **Barrier Offset** N/A	☐ Not Required ☐ Required ☑ Approved	**SD** (DD & ST series); **MOI** 7-44:46; **GB** pp. 4-8:11, 7-30	Existing design exception for 0' shoulders exists in this location from PIN 8523.
Superelevation	**Maximum Superelevation** 4%	**Maximum Superelevation** 4%	☑ Not Required ☐ Required ☐ Approved	**SD** DD 1; **MOI** 7-26:29; **GB** pp. 7-29, 3-44 (T. 3-8)	
Horizontal Alignment	**Minimum Radii Value** 1039'	**Minimum Radii Value** 1039'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-30:33, 50:55; **GB** pp. 7-28, 3-32 (T. 3-7), 3-44 (T. 3-8)	PIN 8523 assumed low speed urban design for the 45 MPH design section. That will be continued.
Vertical Alignment	**Sag Curve Min. K Value** 96 / **Crest Curve Min. K Value** 84	**Sag Curve Min. K Value** 96 / **Crest Curve Min. K Value** 84	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-56:60; **GB** pp. *crest* 3-155: 157 (T. 3-34:35), *sag* 3-161 (T. 3-36)	
Profile Grades	**% Min** 0.30% / **% Max** 6.0%	**% Min** 0.30% / **% Max** 6.0%	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-58:62; **GB** pp. 3-119, 7-28:29 (T. 7-4)	0.50% preferred
Cross Slope	**Standard Value** 2%	**Value Proposed/Used** 2%	☑ Not Required ☐ Required ☐ Approved	**SD** (DD series); **MOI** 7-47:48; **GB** pp. 4-1:6, 7-29	
Stopping-Sight Distance	**Minimum** 425'	**Minimum** 425'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-62; **GB** pp. 3-2:8, 3-106:110, 7-28, 7-3 (T. 7-1)	
Structural Capacity	**Design Loading** HL-93 for New Construction	**Design Loading** HL-93 for New Construction	☑ Not Required ☐ Required ☐ Approved	**MOI** 11-2:3; **GB** p. 7-38	HS-20 for existing; HL-93 for new construction
Bridge Width	**Minimum** N/A	**Minimum** N/A	☑ Not Required ☐ Required ☐ Approved	**SD** DD 9; **MOI** 11-3; **GB** pp. 7-37:38	
Vertical Clearance*	**Minimum** 16.5' over road, 23.5' over rail	**Minimum** 16.5'	☑ Not Required ☐ Required ☐ Approved	**SD** DD 8:9; **MOI** 11-4:5; **GB** p. 7-38	* Notify FHWA on any changes to Vertical Clearance on the National Highway System
Lateral Offset to Obstruction	**Minimum** 1.5' tangent / 3' radius	**Minimum** 1.5' tangent / 3' radius	☑ Not Required ☐ Required ☐ Approved	**SD** DD 17; **GB** pp. 7-37:38	

Design Waivers	UDOT Standard				RFP Requirement		Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Acceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. A part of the ramp proper may also be considered in the acceleration length as a design waiver. Table 10-3 **GB** p. 10-110. See also **GB** pp. 9-124:125, 10-107:110, 116:122; **SD** DD 13A:14B, ST 1; **MOI** 7-106	
	50 mph	39 mph	0	720	N/A				
			14	660					
			18	610					
			22	550					
			26	450					
Deceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. Table 10-5 **GB** p. 10-115. See also **GB** pp. 9-124:125, 10-107,112:120, 123:124; **SD** DD 13A:14B, ST 3A:3B; **MOI** 7-106	
	50 mph	44 mph	0	435	N/A				
			14	405					
			18	385					
			22	355					
			26	315					
Guardrail Bridge Connection	UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.				N/A		☑ Not Required ☐ Required ☐ Approved	**SD** BA 4B1:4B2, UDOT Design Exception Form	
Clear Zone	Meet clear zone compliant requirements defined in Standard Drawings.				20'		☑ Not Required ☐ Required ☐ Approved	2006 Roadside Design Guide pg. 3-6 and Figure 3.2 pg. 3-8; **SD** DD 4, 8, 10:12,17	
Intersection Sight Distance	Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.				Sight triangles cases A-F and skew are met.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 9-28:54, **MOI** 7-64:67	
Shoulder/Travel way (gutter pan)	The gutter pan is not considered a part of the traveled way or shoulder.				The gutter pan is not a part of the shoulder or traveled way.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 4-19, 10-103; **MOI** 7-1, 43:44	
Curb Configuration	2011 AASHTO p. 10-103				Type B1		☑ Not Required ☐ Required ☐ Approved	Determine if the curb is appropriate for the type of facility. **GB** pp. 4-16:19, 10-103; **SD** GW 2	
Traffic Control	Meet Traffic Control Standard Drawings requirements				Meet Traffic Control Standard Drawings requirements		☑ Not Required ☐ Required ☐ Approved	**SD** TC series	
Rumble Strips	Meet Paving Standard Drawings requirements				N/A		☑ Not Required ☐ Required ☐ Approved	**SD** PV 6A:8B	

Prepared by  Date 9/01/16

Verified Only
- Local Government Projects Only

Date

Approved by Date: 2016.09.07 07:50:54 -06'00'

Date

On local government projects that are not on a UDOT road, the Region Preconstruction Engineer signs the "Verified Only" line and the Engineer of Record signs the "Approved by" line. For all other projects, the "Verified Only" line is left blank and the Region Preconstruction Engineer signs the "Approved by" line.

PROJECT DESIGN CRITERIA - URBAN COLLECTOR

I. PROJECT DESCRIPTION

DATE: 7/28/2016

Project No	**S-0154(12)11**	**Location**	**4 Interchanges on Bangerter Highway**
PIN	**12566**	**Concept**	**4 Interchanges on Existing Freeway**

Describe the scope of the project Construct 4 New Interchanges

II. DESIGN STANDARDS BY ROADWAY

(Complete a separate PDC for each roadway on your project)

Date of OSR: 2/18/2016

Roadway Name: **4015 West**

Roadway Characteristics

Functional Class	Urban Collector			**Pavement Type**	Asphalt	
Current Year	2015	**AADT=**	15,500	**Terrain**	Level	
Design Year	2040	**AADT=**	16,900	**% Trucks (current)**	2% (assumed)	
Design Vehicle	WB-67			**Posted / Design Speed**	35	40

Comments

As shown in the additive bidding plans.

Proposed Roadway Characteristics

Total Number of Lanes	2	**Park Strip Width (Typ)**	0' - 5'
Shoulder Width (Typ)	0-10'	**Sidewalk Width (Typ)**	4' - 6'
Curb & Gutter Type & Width (Typ)	Type B1 (2.5')		

Intersection #1: **4015 West at 5400 South**

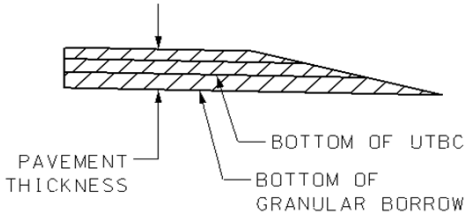
Roadway Name	Dir.	# of LT Lanes	Storage Length	# of Thru Lanes	# of RT Lanes	Storage Length
5400 South	**EB**	1	375	3	1	250
5400 South	**WB**	1	450	3	1	100
4015 West	**NB**	1	250	1	1	250
4015 West	**SB**	1	250	1	1	250

Curb Radius From T.B.C.

NW Curb Radius:	55'
SW Curb Radius:	60' (existing)
NE Curb Radius:	45'
SE Curb Radius:	60' (existing)

Pavement Thickness

See Typical Sections in Part 7



Pavement Thickness consists of Hard Surfacing, UTBC, and Granular Borrow (if used).

Order of Precedence: SD - 2012 Standard Drawings; MOI - Roadway Design Manual of Instruction; GB - AASHTO Green Book 2011 Edition

FHWA 13 Critical Elements	UDOT Standard	RFP Requirement	Design Exception	References	Date of Decision, Comments, Mitigation, etc.
Design Speed	40 MPH	40 MPH	☑ Not Required ☐ Required ☐ Approved	**MOI** 2-1; **GB** pp. 2-53:58, 7-27	
Lane Width	**Mainline** 12' **LT Turn Lane(s)** 12' **RT Turn Lane(s)** 11'	11' 11' 11'	☐ Not Required ☐ Required ☑ Approved	**SD** (DD & ST series); **MOI** 7-1, 43:47, 107; **GB** pp. 7-29:30	Existing design exception for 11' lanes exists in this location from PIN 8523.
Shoulder Width	**Outside** 4' / **Inside** N/A / **Barrier Offset** N/A	**Outside** 0' / **Inside** N/A / **Barrier Offset** N/A	☐ Not Required ☐ Required ☑ Approved	**SD** (DD & ST series); **MOI** 7-44:46; **GB** pp. 4-8:11, 7-30	Existing design exception for 0' shoulders exists in this location from PIN 8523.
Superelevation	**Maximum Superelevation** 4%	**Maximum Superelevation** 4%	☑ Not Required ☐ Required ☐ Approved	**SD** DD 1; **MOI** 7-26:29; **GB** pp. 7-29, 3-44 (T. 3-8)	PIN 8523 assumed low speed urban design
Horizontal Alignment	**Minimum Radii Value** 1039'	**Minimum Radii Value** 1039'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-30:33, 50:55; **GB** pp. 7-28, 3-32 (T. 3-7), 3-44 (T. 3-8)	PIN 8523 assumed low speed urban design
Vertical Alignment	**Sag Curve Min. K Value** 64 / **Crest Curve Min. K Value** 44	**Sag Curve Min. K Value** 64 / **Crest Curve Min. K Value** 44	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-56:60; **GB** pp. *crest* 3-155: 157 (T. 3-34:35), *sag* 3-161 (T. 3-36)	
Profile Grades	**% Min** 0.30% / **% Max** 6.0%	**% Min** 0.30% / **% Max** 6.0%	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-58:62; **GB** pp. 3-119, 7-28:29 (T. 7-4)	0.50% preferred
Cross Slope	**Standard Value** 2%	**Value Proposed/Used** 2%	☑ Not Required ☐ Required ☐ Approved	**SD** (DD series); **MOI** 7-47:48; **GB** pp. 4-1:6, 7-29	
Stopping-Sight Distance	**Minimum** 305'	**Minimum** 305'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-62; **GB** pp. 3-2:8, 3-106:110, 7-28, 7-3 (T. 7-1)	
Structural Capacity	**Design Loading** HL-93 for New Construction	**Design Loading** HL-93 for New Construction	☑ Not Required ☐ Required ☐ Approved	**MOI** 11-2:3; **GB** p. 7-38	HS-20 for existing; HL-93 for new construction
Bridge Width	**Minimum** N/A	**Minimum** N/A	☑ Not Required ☐ Required ☐ Approved	**SD** DD 9; **MOI** 11-3; **GB** pp. 7-37:38	
Vertical Clearance*	**Minimum** 16.5' over road, 23.5' over rail	**Minimum** 16.5'	☑ Not Required ☐ Required ☐ Approved	**SD** DD 8:9; **MOI** 11-4:5; **GB** p. 7-38	* Notify FHWA on any changes to Vertical Clearance on the National Highway System
Lateral Offset to Obstruction	**Minimum** 1.5' tangent / 3' radius	**Minimum** 1.5' tangent / 3' radius	☑ Not Required ☐ Required ☐ Approved	**SD** DD 17; **GB** pp. 7-37:38	

Design Waivers	UDOT Standard				RFP Requirement		Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Acceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. A part of the ramp proper may also be considered in the acceleration length as a design waiver. Table 10-3 **GB** p. 10-110. See also **GB** pp. 9-124:125, 10-107:110, 116:122; **SD** DD 13A:14B, ST 1; **MOI** 7-106	
	40	31	0	360	N/A				
			14	300					
			18	270					
			22	210					
			26	120					
Deceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. Table 10-5 **GB** p. 10-115. See also **GB** pp. 9-124:125, 10-107,112:120, 123:124; **SD** DD 13A:14B, ST 3A:3B; **MOI** 7-106	
	40	31	0	360	N/A				
			14	300					
			18	270					
			22	210					
			26	120					
Guardrail Bridge Connection	UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.				N/A		☑ Not Required ☐ Required ☐ Approved	**SD** BA 4B1:4B2, UDOT Design Exception Form	
Clear Zone	Meet clear zone compliant requirements defined in Standard Drawings.				14'		☑ Not Required ☐ Required ☐ Approved	2006 Roadside Design Guide pg. 3-6 and Figure 3.2 pg. 3-8; **SD** DD 4, 8, 10:12,17	
Intersection Sight Distance	Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.				Sight triangles cases A-F and skew are met.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 9-28:54, **MOI** 7-64:67	
Shoulder/Travel way (gutter pan)	The gutter pan is not considered a part of the traveled way or shoulder.				The gutter pan is not a part of the shoulder or traveled way.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 4-19, 10-103; **MOI** 7-1, 43:44	
Curb Configuration	2011 AASHTO p. 10-103				Type B1		☑ Not Required ☐ Required ☐ Approved	Determine if the curb is appropriate for the type of facility. **GB** pp. 4-16:19, 10-103; **SD** GW 2	
Traffic Control	Meet Traffic Control Standard Drawings requirements				Meet Traffic Control Standard Drawings requirements		☑ Not Required ☐ Required ☐ Approved	**SD** TC series	
Rumble Strips	Meet Paving Standard Drawings requirements				N/A		☑ Not Required ☐ Required ☐ Approved	**SD** PV 6A:8B	

Prepared by _____ Date 9/01/16

Verified Only _____ Date _____
- Local Government Projects Only

Approved by _____ Date: 2016.09.07 07:53:58 -06'00' Date _____

On local government projects that are not on a UDOT road, the Region Preconstruction Engineer signs the "Verified Only" line and the Engineer of Record signs the "Approved by" line. For all other projects, the "Verified Only" line is left blank and the Region Preconstruction Engineer signs the "Approved by" line.

PROJECT DESIGN CRITERIA - URBAN ARTERIAL - OTHER

I. PROJECT DESCRIPTION

DATE: 7/6/2016

Project No	**S-0154(12)11**	**Location**	**4 Interchanges on Bangerter Highway**
PIN	**12566**	**Concept**	**4 Interchanges on Bangerter Highway**

Describe the scope of the project Construct 4 New Interchanges

II. DESIGN STANDARDS BY ROADWAY

(Complete a separate PDC for each roadway on your project)

Date of OSR: 2/18/2016

Roadway Name: **SR-154 (Bangerter Highway) at 7000 S Interchange**

Roadway Characteristics

Functional Class	Urban Arterial - Other			**Pavement Type**	Rigid		
Current Year	2015	**AADT=**	**57,000**	**Terrain**	Rolling Terrain		
Design Year	2040	**AADT=**	**121,000**	**% Trucks (current)**	6%		
Design Vehicle	WB-67			**Posted / Design Speed**		55	65

Proposed Roadway Characteristics

Total Number of Lanes 6

Shoulder Width (Typ) 12'

Curb & Gutter Type & Width (Typ) Type M1 (2.5')

Comments

Ramps A1, B1, C1, & D1:* (Right Turn Lanes Within 300' of 7000 S)

Design Speed - 20 mph

Ramps A2, B2, C2, & D2:*

Design Speed (300 ft along ramp beyond the painted gore in the travel direction) - 55 mph

Design Speed (Ramp Body) - 45 mph

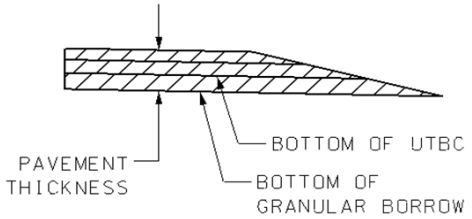
Design Speed (Within 300 ft of 7000 S) - 20 mph

20-mph Design Speed continues through the left turn movement

*Refer to Standard Drawings DD 5 and DD 6 for design of ramp elements, use the design speeds listed above for determining superelevation, minimum radii, vertical curve k values, stopping sight distance, and clear zone.

Pavement Thickness

See Typical Sections in Part 7



Pavement Thickness consists of Hard Surfacing, UTBC, and Granular Borrow (if used).

Order of Precedence: SD - 2012 Standard Drawings; MOI - Roadway Design Manual of Instruction; GB - AASHTO Green Book 2011 Edition

FHWA 13 Critical Elements	UDOT Standard	RFP Requirement	Design Exception	References	Date of Decision, Comments, Mitigation, etc.
Design Speed	65 mph	65 mph	☑ Not Required ☐ Required ☐ Approved	**MOI** 2-1; **GB** pp. 2-53:58, 8-1:2	Determined by Concept Team
Lane Width	**Mainline** 12' **LT Turn Lane(s)** 12' **RT Turn Lane(s)** 11'	12' 12' 12'	☑ Not Required ☐ Required ☐ Approved	**SD** (DD & ST series); **MOI** 7-1, 43:47, 107; **GB** pp. 8-2:3	
Shoulder Width	**Outside** 12' / **Inside** 12' / **Barrier Offset** 2'	**Outside** 12' / **Inside** 12' / **Barrier Offset** 2'	☑ Not Required ☐ Required ☐ Approved	**SD** (DD & ST series); **MOI** 7-44:46; **GB** pp. 4-8:11, 8-2:3	Barrier offset not required for 12' shoulders
Superelevation	**Maximum Superelevation** 6%	**Maximum Superelevation** 6%	☑ Not Required ☐ Required ☐ Approved	**SD** DD 1; **MOI** 7-26:29; **GB** pp. 8-3, 3-45 (T. 3-9)	
Horizontal Alignment	**Minimum Radii Value** 1660'	**Minimum Radii Value** 1660'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-30:33, 50:55; **GB** pp. 8-6, 3-32 (T. 3-7), 3-45 (T. 3-9)	
Vertical Alignment	**Sag Curve Min. K Value** 157 / **Crest Curve Min. K Value** 193	**Sag Curve Min. K Value** 157 / **Crest Curve Min. K Value** 193	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-56:60; **GB** pp. *crest* 3-155: 157 (T. 3-34:35), *sag* 3-161 (T. 3-36)	
Profile Grades	**% Min** 0.30% / **% Max** 5.00%	**% Min** 0.30% / **% Max** 5.00%	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-58:62; **GB** pp. 3-119, 8-3:4 (T. 8-1)	0.50% preferred
Cross Slope	**Standard Value** 2%	**Value Proposed/Used** 2%	☑ Not Required ☐ Required ☐ Approved	**SD** (DD, DD 4); **MOI** 7-47:48; **GB** pp. 4-1:6, 8-2:3	
Stopping-Sight Distance	**Minimum** 645'	**Minimum** 645'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-62; **GB** pp. 3-2:8, 3-106:110, 3-4 (T. 3-1)	
Structural Capacity	**Design Loading** HL-93	**Design Loading** HL-93	☑ Not Required ☐ Required ☐ Approved	**MOI** 11-2:3; **GB** p. 8-4	HS-20 for existing; HL-93 for new construction
Bridge Width	**Minimum** 62'-10"	**Minimum** 62'-10"	☑ Not Required ☐ Required ☐ Approved	**SD** DD 9; **MOI** 11-3; **GB** p. 8-4	
Vertical Clearance*	**Minimum** 16.5' over road, 23.5' over rail	**Minimum** 16.5'	☑ Not Required ☐ Required ☐ Approved	**SD** DD 8:0; **MOI** 11-4:5; **GB** p. 8-4	* Notify FHWA on any changes to Vertical Clearance on the National Highway System
Lateral Offset to Obstruction	**Minimum** Urban environments shoulder + 2', other locations clearzone.	**Minimum** Urban environments shoulder + 2', other locations clearzone.	☑ Not Required ☐ Required ☐ Approved	**SD** DD 17; **GB** p. 8-5, 10-19:21	

Design Waivers	UDOT Standard	RFP Requirement	Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Acceleration Lanes	V: 65 mph; Va: 50 mph V'a: 0 mph – L: 1410' V'a: 14 mph – L: 1350' V'a: 18 mph – L: 1310' V'a: 22 mph – L: 1220' V'a: 26 mph – L: 1120'	Location / L: Ramp B 0 to 65 (SB On) – 1410' Ramp D 0 to 65 (NB On) – 1410'	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. A part of the ramp proper may also be considered in the acceleration length as a design waiver. Table 10-3 **GB** p. 10-110. See also **GB** pp. 9-124:125, 10-107:110, 116:122; **SD** DD 13A:14B, ST 1; **MOI** 7-106	
Deceleration Lanes	V: 65 mph; Va: 55 mph V'a: 0 mph – L: 570' V'a: 14 mph – L: 540' V'a: 18 mph – L: 520' V'a: 22 mph – L: 500' V'a: 26 mph – L: 470'	Location / L: Ramp A 65 to 0 (NB Off) – 570' Ramp C 65 to 0 (SB Off) – 570'	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. Table 10-5 **GB** p. 10-115. See also **GB** pp. 9-124:125, 10-107,112:120, 123:124; **SD** DD 13A:14B, ST 3A:3B; **MOI** 7-106	
Guardrail Bridge Connection	UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.	UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.	☑ Not Required ☐ Required ☐ Approved	**SD** BA 4B1:4B2, UDOT Design Exception Form	
Clear Zone	Meet clear zone compliant requirements defined in Standard Drawings.	30'	☑ Not Required ☐ Required ☐ Approved	2006 Roadside Design Guide pg. 3-6 and Figure 3.2 pg. 3-8; **SD** DD 4, 8, 10-12,17	
Intersection Sight Distance	Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.	Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 9-28:54, **MOI** 7-64:67	
Ramp Terminal Sight Distance	Along the Ramp Design Speed / SSD (ft): 70 mph 730 55 mph 495 50 mph 425 45 mph 360 40 mph 305 35 mph 250 30 mph 200 25 mph 155 Along the Freeway or Street Preceeding Approach Nose of Exit Ramp Design Speed / SSD (ft)* / DSD (ft)**: 65 mph 810 1365 55 mph 620 1135 50 mph 535 1030 45 mph 450 930 40 mph 385 825 35 mph 315 720 30 mph 250 620 25 mph 200 N/A	Along the Ramp Design Speed / SSD (ft): 65 mph 645 55 mph 495 45 mph 360 20 mph 115 Along the Freeway or Street Pr… Approach Nose of Exit Ra… Location / SSD*: SR-154 Approaching Ram – 810' SR-154 Approaching Ram C – 810'	☑ Not Required Required Approved ☐ Required ☐ Approvec …ired ☐ Approved	SSD (Stopping Sight Distance) should be at least as great as design SSD *SSD is 25% greater than minimum SSD. **DSD is Decision Sight Distance based on avoidance maneuver 'E' and is desired where feasible. Document DSD but do not obtain waiver if DSD is not met. **GB** p. 3-4 (T. 3-1) **GB** p. 3-7 (T. 3-3) **GB** p. 10-92	
Shoulder/Travel way (gutter pan)	The gutter pan is not considered a part of the traveled way or shoulder.	The gutter pan is not cons… part of the traveled way or shoulder.		**GB** pp. 4-19, 10-103; **MOI** 7-1, 43:44	

Design Waivers	UDOT Standard	RFP Requirement	Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Gores	Follow the key points from 2011 AASHTO: • Should be uniform along the freeway; • Geometric shape is appropriate for given speeds; • Mitigation required for major obstructions in a gore; and • Unpaved area beyond the gore nose should be graded nearly level with the roadways as practical.	Location: 7000 South Meets all Requirements?: YES	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 10-96:101; **SD** DD 6, ST 3A:3B	
Ramp Terminals	Platform Location: Ramp side of the approach nose or merging end. Length: 200 ft Location: At- grade terminal of ramp. Length: Varies	Platform Location: Ramp side of the approach nose or merging end. Length: 200 ft Location: At- grade terminal of ramp. Length: Varies	☑ Not Required ☐ Required ☐ Approved	Avoid left hand entrances and exits. **GB** pp. 10-103:104. Ramp Terminal means: 1) the exit terminal from the side street onto the freeway entrance ramp; 2) the entrance terminal onto the freeway; 3) the exit terminal from the freeway onto the exit ramp; and 4) the entrance terminal from the freeway exit ramp onto the side street. Refer to **GB** 10-104 for platform lengths. **MOI** 7-105:106	
On Ramp Design	Type: Parallel Curve Radius: 1000 ft Dist. From Physical Nose to Ramp Control Line Terminus: 200 ft Taper: 300 ft min	Ramp Loc.: 7000 South Ramps Type: Parallel Curve Rad.: 1400' Dist.: 327' Taper: 300'	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 10-107:112; **SD** DD 6, ST 1; **MOI** p. 1-2. UDOTs preferred approach is to utilize parallel entrance ramps. See **GB** pp. 10-89:90; **MOI** 7-105:106.	
Off Ramp Design	Type: Taper Divergence Angle (deg): 2-5 Dist. from outer edge alignment break to ramp control line: 200 ft	Ramp Loc.: 7000 South Ramps Type: Taper Angle: 2-5 Dist.: 200'	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 10-112:116; **SD** DD 6, ST 3A:3B; **MOI** p. 1-2. UDOTs preferred approach is to utilize tapered exit ramps for single lane exits. If multi lane exit, one lane must be parallel. See **GB** pp. 10-89:90; **MOI** 7-105:106.	
Curb Configuration	2011 AASHTO p.10-103	Type M1	☑ Not Required ☐ Required ☐ Approved	Determine if the curb is appropriate for the type of facility. **GB** pp. 4-16:19, 10-103; **SD** GW 2	
Traffic Control	Meet Traffic Control Standard Drawings requirements	Meet Traffic Control Standard Drawings requirements	☑ Not Required ☐ Required ☐ Approved	**SD** TC series	
Rumble Strips	Meet Paving Standard Drawings requirements	NA	☑ Not Required ☐ Required ☐ Approved	**SD** PV 6A:8B	

Prepared by David Clawson _____ Date 9/9/16

Verified Only _____ Date _____
- Local Government Projects Only

Approved by _____ Date: 2016.09.12 07:24:41 -06'00' Date _____

On local government projects that are not on a UDOT road, the Region Preconstruction Engineer signs the "Verified Only" line and the Engineer of Record signs the "Approved by" line. For all other projects, the "Verified Only" line is left blank and the Region Preconstruction Engineer signs the "Approved by" line.

PROJECT DESIGN CRITERIA - URBAN ARTERIAL

I. PROJECT DESCRIPTION

DATE: 7/6/2016

Project No	**S-0154(12)11**	Location	**4 Interchanges on Bangerter Highway**
PIN	**12566**	Concept	**4 Interchanges on Bangerter Highway**

Describe the scope of the project Construct 4 New Interchanges

II. DESIGN STANDARDS BY ROADWAY

(Complete a separate PDC for each roadway on your project)

Date of OSR: 2/18/2016

Roadway Name: **7000 South**

Comments

Roadway Characteristics

Functional Class	Urban Arterial			**Pavement Type**	Rigid	
Current Yea	2015	**AADT=**	20,000	**Terrain**	Rolling	
Design Yea	2040	**AADT=**	32,000	**% Trucks (current)**	3%	
Design Vehicle	WB-67			**Posted / Design Speed**	35	40

Proposed Roadway Characteristics

Total Number of Lanes	5	**Park Strip Width (Typ)**	NA
Shoulder Width (Typ)	8'	**Sidewalk Width (Typ)**	6'
Curb & Gutter Type & Width (Typ)	Type B1 (2.5')		

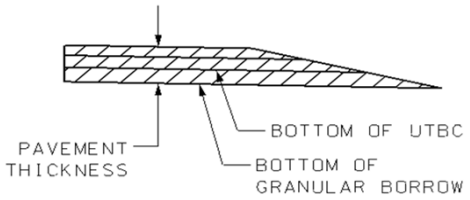
Intersection #1: **SPUI - 7000 South & Bangerter Hwy**

Roadway Name	Dir.	# of LT Lanes	Storage Length	# of Thru Lanes	# of RT Lanes	Storage Length
7000 South	**EB**	2	800	2	1	300
7000 South	**WB**	2	400	2	1	200
SB OFF Ramp	**SB**	2 (Including 1 Shared RT/LT Lane)	450	-	2 (Including 1 Shared RT/LT Lane)	800
NB OFF Ramp	**NB**	2	400	-	1	300

Pavement Thickness

See Typical Sections in Part 7

Ramp	Required Ramp Meter Storage (Lane-Feet)
SB On Ramp	1875
NB On Ramp	900



Pavement Thickness consists of Hard Surfacing, UTBC, and Granular Borrow (if used).

Order of Precedence: SD - 2012 Standard Drawings; MOI - Roadway Design Manual of Instruction; GB - AASHTO Green Book 2011 Edition

FHWA 13 Critical Elements	UDOT Standard	RFP Requirement	Design Exception	References	Date of Decision, Comments, Mitigation, etc.
Design Speed	40 MPH	40 MPH	☑ Not Required ☐ Required ☐ Approved	**MOI** 2-1; **GB** pp. 2-53:58, 7-27	Determined by Concept Team
Lane Width	**Mainline** 12' **LT Turn Lane(s)** 12' **RT Turn Lane(s)** 10'	12' 12' 12'	☑ Not Required ☐ Required ☐ Approved	**SD** (DD & ST series); **MOI** 7-1, 43:47, 107; **GB** pp. 7-29:30	
Shoulder Width	**Outside** / **Inside** / **Barrier Offset** 4'/8' / NA / NA	**Outside** / **Inside** / **Barrier Offset** 8' / NA / NA	☑ Not Required ☐ Required ☐ Approved	**SD** (DD & ST series); **MOI** 7-44:46; **GB** pp. 4-8:11, 7-30	5' Minimum outside shoulder/bike lane.
Superelevation	**Maximum Superelevation** 2%	**Maximum Superelevation** 2%	☑ Not Required ☐ Required ☐ Approved	**SD** DD 1; **MOI** 7-26:29; **GB** pp. 7-29, 3-44 (T. 3-8)	Use low speed urban
Horizontal Alignment	**Minimum Radii Value** 762	**Minimum Radii Value** 762	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-30:33, 50:55; **GB** pp. 7-28, 3-32 (T. 3-7), 3-44 (T. 3-8)	
Vertical Alignment	**Sag Curve Min. K Value** / **Crest Curve Min. K Value** 64 / 44	**Sag Curve Min. K Value** / **Crest Curve Min. K Value** 64 / 44	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-56:60; **GB** pp. *crest* 3-155: 157 (T. 3-34:35), *sag* 3-161 (T. 3-36)	
Profile Grades	**% Min** / **% Max** 0.3% / 6%	**% Min** / **% Max** 0.3% / 6%	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-58:62; **GB** pp. 3-119, 7-28:29 (T. 7-4)	0.50% preferred
Cross Slope	**Standard Value** 2%	**Value Proposed/Used** 2%	☑ Not Required ☐ Required ☐ Approved	**SD** (DD series); **MOI** 7-47:48; **GB** pp. 4-1:6, 7-29	
Stopping-Sight Distance	**Minimum** 305	**Minimum** 305	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-62; **GB** pp. 3-2:8, 3-106:110, 7-28, 7-3 (T. 7-1)	
Structural Capacity	**Design Loading** HL-93 for new construction	**Design Loading** HL-93 for new construction	☑ Not Required ☐ Required ☐ Approved	**MOI** 11-2:3; **GB** p. 7-38	HS-20 for existing; HL-93 for new construction
Bridge Width	**Minimum** 125.833'	**Minimum** 125.833'	☑ Not Required ☐ Required ☐ Approved	**SD** DD 9; **MOI** 11-3; **GB** pp. 7-37:38	
Vertical Clearance*	**Minimum** 16.5' over road, 23.5' over rail	**Minimum** 16.5'	☑ Not Required ☐ Required ☐ Approved	**SD** DD 8:9; **MOI** 11-4:5; **GB** p. 7-38	* Notify FHWA on any changes to Vertical Clearance on the National Highway System
Lateral Offset to Obstruction	**Minimum** 1.5' tangent / 3' radius	**Minimum** 1.5' tangent / 3' radius	☑ Not Required ☐ Required ☐ Approved	**SD** DD 17; **GB** pp. 7-37:38	

Design Waivers	UDOT Standard				RFP Requirement		Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Acceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. A part of the ramp proper may also be considered in the acceleration length as a design waiver. Table 10-3 **GB** p. 10-110. See also **GB** pp. 9-124:125, 10-107:110, 116:122; **SD** DD 13A:14B, ST 1; **MOI** 7-106	
	40 mph	31 mph	0 mph	360'	N/A	N/A			
			14 mph	300'					
			18 mph	270'					
			22 mph	210'					
			26 mph	120'					
Deceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. Table 10-5 **GB** p. 10-115. See also **GB** pp. 9-124:125, 10-107,112:120, 123:124; **SD** DD 13A:14B, ST 3A:3B; **MOI** 7-106	
	40 mph	36 mph	0 mph	320'	N/A	N/A			
			14 mph	295'					
			18 mph	265'					
			22 mph	235'					
			26 mph	185'					
Guardrail Bridge Connection	UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.				UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.		☑ Not Required ☐ Required ☐ Approved	**SD** BA 4B1:4B2, UDOT Design Exception Form	
Clear Zone	Meet clear zone compliant requirements defined in Standard Drawings.				14'		☑ Not Required ☐ Required ☐ Approved	2006 Roadside Design Guide pg. 3-6 and Figure 3.2 pg. 3-8; **SD** DD 4, 8, 10:12,17	
Intersection Sight Distance	Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.				Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 9-28:54, **MOI** 7-64:67	
Shoulder/Travel way (gutter pan)	The gutter pan is not considered a part of the traveled way or shoulder.				The gutter pan is not considered a part of the traveled way or shoulder.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 4-19, 10-103; **MOI** 7-1, 43:44	
Curb Configuration	2011 AASHTO p. 10-103				Type B1/Type B5/ Type M1/Type M2		☑ Not Required ☐ Required ☐ Approved	Determine if the curb is appropriate for the type of facility. **GB** pp. 4-16:19, 10-103; **SD** GW 2	
Traffic Control	Meet Traffic Control Standard Drawings requirements				Meet Traffic Control Standard Drawings requirements		☑ Not Required ☐ Required ☐ Approved	**SD** TC series	
Rumble Strips	Meet Paving Standard Drawings requirements				NA		☑ Not Required ☐ Required ☐ Approved	**SD** PV 6A:8B	

Prepared by David Clawson Date 9/9/16

Verified Only - Local Government Projects Only _____ Date _____

Approved by _____ Date: 2016.09.12 08:35:27 -06'00' Date _____

On local government projects that are not on a UDOT road, the Region Preconstruction Engineer signs the "Verified Only" line and the Engineer of Record signs the "Approved by" line. For all other projects, the "Verified Only" line is left blank and the Region Preconstruction Engineer signs the "Approved by" line.

PROJECT DESIGN CRITERIA - URBAN ARTERIAL - OTHER

I. PROJECT DESCRIPTION

DATE: 8/26/2016

Project No	**S-0154(12)11**	Location	**4 Interchanges on Bangerter Highway**
PIN	**12566**	Concept	**4 New Interchanges on Bangerter Highway**

Describe the scope of the project Construct 4 New Interchanges

II. DESIGN STANDARDS BY ROADWAY

Date of OSR: 2/18/2016

Roadway Name: **SR-154 Bangerter Hwy - 9000 South**

Roadway Characteristics

Functional Class	Urban Arterial - Other			**Pavement Type**	Rigid	
Current Year	2016	**AADT=**	50,000	**Terrain**	Rolling Terrain	
Design Year	2040	**AADT=**	115,000	**% Trucks (current)**	6%	
Design Vehicle	WB-67			**Posted / Design Speed**	60	65

Proposed Roadway Characteristics

Total Number of Lanes 6

Shoulder Width (Typ) 12'

Curb & Gutter Type & Width (Typ) Type M1 (2.5')

Pavement Thickness

See Part 4-11 for Pavement Requirements

Comments

Ramps A, B, C, & D:*

Design Speed (300 ft along ramp beyond the painted gore in the travel direction) - 55 mph

Design Speed (Ramp Body) - 45 mph

Design Speed (Within 300 ft of 9000 S) - 20 mph

20-mph Design Speed continues through the left turn movement

Ramps A2, B2, C2, & D2:* (Right Turn Lanes Within 300 ft of 9000 S)

Design Speed - 20 mph

*Refer to Standard Drawings DD 5 and DD 6 for design of ramp elements, use the design speeds listed above for determining superelevation, minimum radii, vertical curve k values, stopping sight distance, and clear zone. Superelevation method 2 can be used for curves at the ramp terminal.

Order of Precedence: SD - 2012 Standard Drawings; MOI - Roadway Design Manual of Instruction; GB - AASHTO Green Book 2011 Edition

FHWA 13 Critical Elements	UDOT Standard	RFP Requirement	Design Exception	References	Date of Decision, Comments, Mitigation, etc.
Design Speed	65 mph	65 mph	☑ Not Required ☐ Required ☐ Approved	**MOI** 2-1; **GB** pp. 2-53:58, 8-1:2	Determined by Concept Team. See Comments box for Ramp Design Speeds.
Lane Width	**Through Lanes** 12' **LT Turn Lane(s)** 12' **RT Turn Lane(s)** 12'	12' 12' 12'	☑ Not Required ☐ Required ☐ Approved	**SD** (DD & ST series); **MOI** 7-1, 43:47, 107; **GB** pp. 8-2:3	
Shoulder Width	**Outside** 12' / **Inside** 12' / **Barrier Offset** 2'	**Outside** 12' / **Inside** 12'* / **Barrier Offset** 2'	☐ Not Required ☐ Required ☑ Approved	**SD** (DD & ST series); **MOI** 7-44:46; **GB** pp. 4-8:11, 8-2:3	*Inside Shoulder - narrows to 3 feet (shoulder + shy) under canal/ Old Bingham Highway Bridges
Superelevation	**Maximum Superelevation** 6.0%	**Maximum Superelevation** 6.0%	☑ Not Required ☐ Required ☐ Approved	**SD** DD 1; **MOI** 7-26:29; **GB** pp. 8-3, 3-45 (T. 3-9)	
Horizontal Alignment	**Minimum Radii Value** 1660'	**Minimum Radii Value** 1660'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-30:33, 50:55; **GB** pp. 8-6, 3-32 (T. 3-7), 3-45 (T. 3-9)	
Vertical Alignment	**Sag Curve Min. K Value** 157 / **Crest Curve Min. K Value** 193	**Sag Curve Min. K Value** 157 / **Crest Curve Min. K Value** 193	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-56:60; **GB** pp. *crest* 3-155: 157 (T. 3-34:35), *sag* 3-161 (T. 3-36)	
Profile Grades	**% Min** 0.30% / **% Max** 5.0%	**% Min** 0.30% / **% Max** 6.0%	☐ Not Required ☐ Required ☑ Approved	**MOI** 7-58:62; **GB** pp. 3-119, 8-3:4 (T. 8-1)	6% needed to reduce profile impacts
Cross Slope	**Standard Value** 2.0%	**Value Proposed/Used** 2%	☑ Not Required ☐ Required ☐ Approved	**SD** (DD, DD 4); **MOI** 7-47:48; **GB** pp. 4-1:6, 8-2:3	
Stopping-Sight Distance	**Minimum** 645'	**Minimum** 645'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-62; **GB** pp. 3-2:8, 3-106:110, 3-4 (T. 3-1)	
Structural Capacity	**Design Loading** HL-93	**Design Loading** HL-93	☑ Not Required ☐ Required ☐ Approved	**MOI** 11-2:3; **GB** p. 8-4	HS-20 for existing; HL-93 for new construction
Bridge Width	**Minimum** 62'-10"	**Minimum** 62'-10"	☑ Not Required ☐ Required ☐ Approved	**SD** DD 9; **MOI** 11-3; **GB** p. 8-4	
Vertical Clearance*	**Minimum** 16.5' over road, 23.5' over rail	**Minimum** 16.5'	☑ Not Required ☐ Required ☐ Approved	**SD** DD 8:0; **MOI** 11-4:5; **GB** p. 8-4	* Notify FHWA on any changes to Vertical Clearance on the National Highway System
Lateral Offset to Obstruction	**Minimum** Edge of the Travel Lane to the Edge of the Shoulder.	**Minimum** Edge of the Travel Lane to the Edge of the Shoulder.	☑ Not Required ☐ Required ☐ Approved	**SD** DD 17; **GB** p. 8-5, 10-19:21	

Design Waivers	UDOT Standard	RFP Requirement	Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Acceleration Lanes	V: 65 mph; Va: 50 mph V'a: 0 mph, L: 1410' V'a: 14 mph, L: 1350' V'a: 18 mph, L: 1310' V'a: 22 mph, L: 1220' V'a: 26 mph, L: 1120'	Location: Ramp B 0 to 65 (SB On), L: 1410' Location: Ramp D 0 to 65 (NB On), L: 1410'	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. A part of the ramp proper may also be considered in the acceleration length as a design waiver. Table 10-3 **GB** p. 10-110. See also **GB** pp. 9-124:125, 10-107:110, 116:122; **SD** DD 13A:14B, ST 1; **MOI** 7-106	*5-6% Downgrade = 0.5 Adjustment Factor for 0 mph to 50 mph acceleration
Deceleration Lanes	V: 65 mph; Va: 55 mph V'a: 0 mph, L: 570' V'a: 14 mph, L: 540' V'a: 18 mph, L: 520' V'a: 22 mph, L: 500' V'a: 26 mph, L: 470'	Location: Ramp A 65 to 0 (NB Off), L: 570' Location: Ramp C 65 to 0 (SB Off), L: 570'	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. Table 10-5 **GB** p. 10-115. See also **GB** pp. 9-124:125, 10-107,112:120, 123:124; **SD** DD 13A:14B, ST 3A:3B; **MOI** 7-106	*3-4% Upgrade = 0.9 Adjustment Factor for 50 mph to 0 mph deceleration. **5-6% Upgrade = 0.8 Adjustment Factor for 50 mph to 0 mph deceleration.
Guardrail Bridge Connection	UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.	UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.	☑ Not Required ☐ Required ☐ Approved	**SD** BA 4B1:4B2, UDOT Design Exception Form	
Clear Zone	Meet clear zone compliant requirements defined in Standard Drawings.	30'	☑ Not Required ☐ Required ☐ Approved	2006 Roadside Design Guide pg. 3-6 and Figure 3.2 pg. 3-8; **SD** DD 4, 8, 10-12,17	
Intersection Sight Distance	Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.	Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 9-28:54, **MOI** 7-64:67	
Ramp Terminal Sight Distance	Along the Ramp Design Speed / SSD (ft): 65 mph 645; 55 mph 495; 50 mph 425; 45 mph 360; 40 mph 305; 35 mph 250; 30 mph 200; 25 mph 155 Along the Freeway or Street Preceeding Approach Nose of Exit Ramp Design Speed / SSD (ft)* / DSD (ft)**: 65 mph 810 1365; 55 mph 620 1135; 50 mph 535 1030; 45 mph 450 930; 40 mph 385 825; 35 mph 315 720; 30 mph 250 620; 25 mph 195 N/A	Along the Ramp Design Speed / SSD (ft): 65 mph 645'; 55 mph 495'; 45 mph 360'; 25 mph 155' Along the Freeway or Street Pre... Approach Nose of Exit Ra... Location / SSD*: SR-154 Approaching Ram 810'; SR-154 Approaching Ramp C 810'	☑ Not Required ☐ Required Approved	SSD (Stopping Sight Distance) should be at least as great as design SSD *SSD is 25% greater than minimum SSD. **DSD is Decision Sight Distance based on avoidance maneuver 'E' and is desired where feasible. Document DSD but do not obtain waiver if DSD is not met. **GB** p. 3-4 (T. 3-1) **GB** p. 3-7 (T. 3-3) **GB** p. 10-92	
Shoulder/Travel way (gutter pan)	The gutter pan is not considered a part of the traveled way or shoulder.	The gutter pan is not conside... of the traveled way or sho...	...ired	**GB** pp. 4-19, 10-103; **MOI** 7-1, 43:44	

Design Waivers	UDOT Standard	RFP Requirement	Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Gores	Follow the key points from 2011 AASHTO: • Should be uniform along the freeway; • Geometric shape is appropriate for given speeds; • Mitigation required for major obstructions in a gore; and • Unpaved area beyond the gore nose should be graded nearly level with the roadways as practical.	Location: 9000 South Meets all Requirements?: YES	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 10-96:101; **SD** DD 6, ST 3A:3B	
Ramp Terminals	Platform Location: Ramp side of the approach nose or merging end. Length: 200' Location: At- grade terminal of ramp. Length: Varies	Platform Location: Ramp side of the approach nose or merging end. Length: 200' Location: At- grade terminal of ramp. Length: Varies	☑ Not Required ☐ Required ☐ Approved	Avoid left hand entrances and exits. **GB** pp. 10 103:104. Ramp Terminal means: 1) the exit terminal from the side street onto the freeway entrance ramp; 2) the entrance terminal onto the freeway; 3) the exit terminal from the freeway onto the exit ramp; and 4) the entrance terminal from the freeway exit ramp onto the side street. Refer to **GB** 10-104 for platform lengths. **MOI** 7-105:106	
On Ramp Design	Type: Parallel Curve Radius: 1000' min Dist. From Physical Nose to Ramp Control Line Terminus: 200' min Taper: L(300' min)	Ramp Loc. 9000 South Ramps Type: Parallel Curve Rad.: 1000' min Dist.: 200' min Taper: L(300' min)	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 10-107:112; **SD** DD 6, ST 1; **MOI** p. 1-2. UDOTs preferred approach is to utilize parallel entrance ramps. See **GB** pp. 10-89:90; **MOI** 7-105:106.	
Off Ramp Design	Type: Taper Divergence Angle (deg): 2-5 Dist. from outer edge alignment break to ramp control line: 200'	Ramp Loc. 9000 South Ramps Type: Taper Angle: 2-5 Dist.: 200'	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 10-112:116; **SD** DD 6, ST 3A:3B; **MOI** p. 1-2. UDOTs preferred approach is to utilize tapered exit ramps for single lane exits. If multi lane exit, one lane must be parallel. See **GB** pp. 10-89:90; **MOI** 7-105:106.	
Curb Configuration	Low Profile, Sloping Design	Type M1	☑ Not Required ☐ Required ☐ Approved	Determine if the curb is appropriate for the type of facility. **GB** pp. 4-16:19, 10-103; **SD** GW 2	
Traffic Control	Meet Traffic Control Standard Drawings requirements	Meet Traffic Control Standard Drawings requirements	☑ Not Required ☐ Required ☐ Approved	**SD** TC series	
Rumble Strips	Meet Paving Standard Drawings requirements	NA	☑ Not Required ☐ Required ☐ Approved	**SD** PV 6A:8B	

Prepared by Justin Beddoes — Justin Beddoes 2016.08.26 10:37:27 -06'00' — Date _____

Verified Only
- Local Government Projects Only — Date _____

Approved by _____ — Date: 2016.09.07 09:40:12 -06'00' — Date _____

On local government projects that are not on a UDOT road, the Region Preconstruction Engineer signs the "Verified Only" line and the Engineer of Record signs the "Approved by" line. For all other projects, the "Verified Only" line is left blank and the Region Preconstruction Engineer signs the "Approved by" line.

PROJECT DESIGN CRITERIA - URBAN ARTERIAL

I. PROJECT DESCRIPTION

DATE: 8/26/2016

Project No	**S-0154(12)11**	Location	**9000 S/Bangerter Hwy**
PIN	**12566**	Concept	**SPUI Bangerter Over 9000 S**

Describe the scope of the project Construct New Interchange

II. DESIGN STANDARDS BY ROADWAY

Date of OSR: 2/18/2016

Roadway Name: **9000 South**

Roadway Characteristics

Functional Class	Urban Arterial			**Pavement Type**	Both	
Current Yea	2016	**AADT=**	29,000	**Terrain**	Rolling	
Design Yea	2040	**AADT=**	54,000	**% Trucks (current)**	4%	
Design Vehicle	WB-67			**Posted / Design Speed**	40	45

Proposed Roadway Characteristics

Total Number of Lanes	5	**Park Strip Width (Typ)**	NA
Shoulder Width (Typ)	8'	**Sidewalk Width (Typ)**	6'
Curb & Gutter Type & Width (Typ)	Type B1 (2.5')		

Comments

Intersections at 3695 W and Jordan Valley Way are right-in/right-out access only.

Intersection #1: **9000 South & Judd Ln**

Roadway Name	Dir.	# of LT Lanes	Storage Length	# of Thru Lanes	# of RT Lanes	Storage Length
9000 South	**EB**	-	-	2	-	-
9000 South	**WB**	1	100' Lane	2	-	-
Judd Ln	**NB**	1 Shared	-	-	1 Shared	-

Intersection #2: **SPUI - 9000 South & Bangerter Hwy**

Roadway Name	Dir.	# of LT Lanes	Storage Length	# of Thru Lanes	# of RT Lanes	Storage Length
9000 South	**EB**	2	300' Each Lane	2	1	100' Lane
9000 South	**WB**	2	300' Each Lane	2	1	100' Lane
SB OFF Ramp	**SB**	2	500' Each Lane	-	2	800' Each Lane
NB OFF Ramp	**NB**	2	400' Each Lane	-	2	1000' Each Lane

Intersection #3: **9000 South & 3400 West**

Roadway Name	Dir.	# of LT Lanes	Storage Length	# of Thru Lanes	# of RT Lanes	Storage Length
9000 South	**EB**	1	Maintain Existing	2	1	Maintain Existing
9000 South	**WB**	1	Maintain Existing	2	1	Maintain Existing
3400 West	**SB**	1	Maintain Existing	1	1	Maintain Existing
3400 West	**NB**	1	Maintain Existing	1	1	Maintain Existing

Pavement Thickness

See Part 4-11 for Pavement Requirements

Ramp	Ramp Meter Storage (Lane-Feet)
SB On Ramp	2,400
NB On Ramp	1,900

*Inside Shoulder - narrows to 1 foot

Order of Precedence: SD - 2012 Standard Drawings; MOI - Roadway Design Manual of Instruction; GB - AASHTO Green Book 2011 Edition

FHWA 13 Critical Elements	UDOT Standard	RFP Requirement	Design Exception	References	Date of Decision, Comments, Mitigation, etc.
Design Speed	45 MPH	45 MPH	☑ Not Required ☐ Required ☐ Approved	**MOI** 2-1; **GB** pp. 2-53:58, 7-27	Determined by Concept Team
Lane Width	**Mainline** 12' **LT Turn Lane(s)** 12' **RT Turn Lane(s)** 10'	12' 12'/14' 12'	☑ Not Required ☐ Required ☐ Approved	**SD** (DD & ST series); **MOI** 7-1, 43:47, 107; **GB** pp. 7-29:30	
Shoulder Width	**Outside** 4'/8' · **Inside** NA · **Barrier Offset** NA	**Outside** 5' · **Inside** NA · **Barrier Offset** NA	☑ Not Required ☐ Required ☐ Approved	**SD** (DD & ST series); **MOI** 7-44:46; **GB** pp. 4-8:11, 7-30	5' Minimum outside shoulder/bike lane.
Superelevation	**Maximum Superelevation** 2%	**Maximum Superelevation** 2%	☑ Not Required ☐ Required ☐ Approved	**SD** DD 1; **MOI** 7-26:29; **GB** pp. 7-29, 3-44 (T. 3-8)	Use low speed urban
Horizontal Alignment	**Minimum Radii Value** 1039	**Minimum Radii Value** 1039	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-30:33, 50:55; **GB** pp. 7-28, 3-32 (T. 3-7), 3-44 (T. 3-8)	
Vertical Alignment	**Sag Curve Min. K Value** 79 · **Crest Curve Min. K Value** 61	**Sag Curve Min. K Value** 79 · **Crest Curve Min. K Value** 61	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-56:60; **GB** pp. *crest* 3-155: 157 (T. 3-34:35), *sag* 3-161 (T. 3-36)	
Profile Grades	**% Min** 0.3% · **% Max** 6%	**% Min** 0.5% · **% Max** 6%	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-58:62; **GB** pp. 3-119, 7-28:29 (T. 7-4)	0.50% preferred
Cross Slope	**Standard Value** 2%	**Value Proposed/Used** 2%	☑ Not Required ☐ Required ☐ Approved	**SD** (DD series); **MOI** 7-47:48; **GB** pp. 4-1:6, 7-29	
Stopping-Sight Distance	**Minimum** 360	**Minimum** 360	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-62; **GB** pp. 3-2:8, 3-106:110, 7-28, 7-3 (T. 7-1)	
Structural Capacity	**Design Loading** HL-93 for new construction	**Design Loading** HL-93 for new construction	☑ Not Required ☐ Required ☐ Approved	**MOI** 11-2:3; **GB** p. 7-38	HS-20 for existing; HL-93 for new construction
Bridge Width	**Minimum** 125.833"	**Minimum** 125.833"	☑ Not Required ☐ Required ☐ Approved	**SD** DD 9; **MOI** 11-3; **GB** pp. 7-37:38	
Vertical Clearance*	**Minimum** 16.5' over road, 23.5' over rail	**Minimum** 16.5'	☑ Not Required ☐ Required ☐ Approved	**SD** DD 8:9; **MOI** 11-4:5; **GB** p. 7-38	* Notify FHWA on any changes to Vertical Clearance on the National Highway System
Lateral Offset to Obstruction	**Minimum** 1.5' tangent / 3' radius	**Minimum** 1.5' tangent / 3' radius	☑ Not Required ☐ Required ☐ Approved	**SD** DD 17; **GB** pp. 7-37:38	

Design Waivers	UDOT Standard				RFP Requirement		Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Acceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. A part of the ramp proper may also be considered in the acceleration length as a design waiver. Table 10-3 **GB** p. 10-110. See also **GB** pp. 9-124:125, 10-107:110, 116:122; **SD** DD 13A:14B, ST 1; **MOI** 7-106	
	45 mph	35 mph	0 mph	560'	NA	NA			
			14 mph	490'					
			18 mph	440'					
			22 mph	380'					
			26 mph	280'					
Deceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. Table 10-5 **GB** p. 10-115. See also **GB** pp. 9-124:125, 10-107,112:120, 123:124; **SD** DD 13A:14B, ST 3A:3B; **MOI** 7-106	
	45 mph	40 mph	0 mph	385'	Ramp B (45-0 mph)	385'			
			14 mph	350'	Ramp D (45-0 mph)	385'			
			18 mph	325'					
			22 mph	295'					
			26 mph	250'					
Guardrail Bridge Connection	UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.				UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.		☑ Not Required ☐ Required ☐ Approved	**SD** BA 4B1:4B2, UDOT Design Exception Form	
Clear Zone	Meet clear zone compliant requirements defined in Standard Drawings.				20'		☑ Not Required ☐ Required ☐ Approved	2006 Roadside Design Guide pg. 3-6 and Figure 3.2 pg. 3-8; **SD** DD 4, 8, 10:12,17	
Intersection Sight Distance	Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.				Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 9-28:54, **MOI** 7-64:67	
Shoulder/Travel way (gutter pan)	The gutter pan is not considered a part of the traveled way or shoulder.				The gutter pan is not considered a part of the traveled way or shoulder.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 4-19, 10-103; **MOI** 7-1, 43:44	
Curb Configuration	2011 AASHTO p. 10-103				Type B1/Type M2		☑ Not Required ☐ Required ☐ Approved	Determine if the curb is appropriate for the type of facility. **GB** pp. 4-16:19, 10-103; **SD** GW 2	
Traffic Control	Meet Traffic Control Standard Drawings requirements				Meet Traffic Control Standard Drawings requirements		☑ Not Required ☐ Required ☐ Approved	**SD** TC series	
Rumble Strips	Meet Paving Standard Drawings requirements				NA		☑ Not Required ☐ Required ☐ Approved	**SD** PV 6A:8B	

Prepared by Justin Beddoes Justin Beddoes 2016.08.26 10:37:15 -06'00' Date _____

Verified Only _____ Date _____
- Local Government Projects Only

Approved by _____ Date: 2016.09.07 09:42:07 -06'00' Date _____

On local government projects that are not on a UDOT road, the Region Preconstruction Engineer signs the "Verified Only" line and the Engineer of Record signs the "Approved by" line. For all other projects, the "Verified Only" line is left blank and the Region Preconstruction Engineer signs the "Approved by" line.

PROJECT DESIGN CRITERIA - URBAN ARTERIAL - OTHER

I. PROJECT DESCRIPTION

DATE: 5/9/2016

Project No	**S-0154(12)11**	**Location**	11400 S/Bangerter Hwy
PIN	**12566**	**Concept**	4 New Interchanges on Bangerter Highway

Describe the scope of the project Construct 4 New Interchages

II. DESIGN STANDARDS BY ROADWAY

(Complete a separate PDC for each roadway on your project)

Date of OSR: 2/18/2016

Roadway Name: **SR-154 (Bangerter Highway) at 11400 S Interchange**

Roadway Characteristics

Functional Class	Urban Arterial - Other			**Pavement Type**	Rigid		
Current Year	2015	**AADT=**	**43,000**	**Terrain**	Rolling		
Design Year	2040	**AADT=**	**87,000**	**% Trucks (current)**	6		
Design Vehicle	WB-67			**Posted / Design Speed**		60	65

Proposed Roadway Characteristics

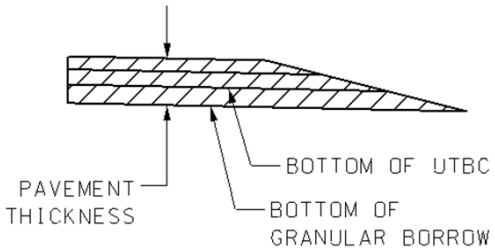
Total Number of Lanes 6

Shoulder Width (Typ) 12'

Curb & Gutter Type & Width (Typ) Type M1 (2.5')

Pavement Thickness

See Typical Sections in Part 7



Pavement Thickness consists of Hard Surfacing, LCBC, UTBC, and Granular Borrow.

Comments

Ramps A2, B2, C2, & D2:* (Right Turn Lanes)
Design Speed - 20 mph

Ramps A1, B1, C1, & D1:*
Design Speed (300 ft along ramp beyond the painted gore in the travel direction) - 55 mph
Design Speed (Ramp Body) - 45 mph
Design Speed (Within 300 ft of 11400 S) - 20 mph
20-mph Design Speed continues through the left turn movement

*Refer to Standard Drawings DD 5 and DD 6 for design of ramp elements, use the design speeds listed above for determining superelevation, minimum radii, vertical curve k values, stopping sight distance, and clear zone. Superelevation method 2 can be used for curves at the ramp terminal.

Order of Precedence: SD - 2012 Standard Drawings; MOI - Roadway Design Manual of Instruction; GB - AASHTO Green Book 2011 Edition

FHWA 13 Critical Elements	UDOT Standard	RFP Requirement	Design Exception	References	Date of Decision, Comments, Mitigation, etc.
Design Speed	65 MPH	65 MPH	☑ Not Required ☐ Required ☐ Approved	**MOI** 2-1; **GB** pp. 2-53:58, 7-27	Determined by Concept Team
Lane Width	**Mainline** 12' **LT Turn Lane(s)** 12' **RT Turn Lane(s)** 12'	12' 12' 12'	☑ Not Required ☐ Required ☐ Approved	**SD** (DD & ST series); **MOI** 7-1, 43:47, 107; **GB** pp. 7-29:30	
Shoulder Width	**Outside** 12' / **Inside** 12' / **Barrier Offset** 2'	**Outside** *12' / **Inside** *12' / **Barrier Offset** 2'	☐ Not Required ☑ Required ☐ Approved	**SD** (DD & ST series); **MOI** 7-44:46; **GB** pp. 4-8:11, 7-30	*Increase shoulder width as necessary to accommodate stopping sight distance. Barrier Offset not required for 12' shoulders. Design Exception is for the outside shoulder for the entrance ramps only. See Design Exception for limits of reduced shoulder
Superelevation	**Maximum Superelevation** 6%	**Maximum Superelevation** 6%	☑ Not Required ☐ Required ☐ Approved	**SD** DD 1; **MOI** 7-26:29; **GB** pp. 7-29, 3-44 (T. 3-8)	
Horizontal Alignment	**Minimum Radii Value** 1660'	**Minimum Radii Value** 1660'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-30:33, 50:55; **GB** pp. 7-28, 3-32 (T. 3-7), 3-44 (T. 3-8)	
Vertical Alignment	**Sag Curve Min. K Value** 157 / **Crest Curve Min. K Value** 193	**Sag Curve Min. K Value** *157 / **Crest Curve Min. K Value** 193	☐ Not Required ☑ Required ☐ Approved	**MOI** 7-56:60; **GB** pp. *crest* 3-155: 157 (T. 3-34:35), *sag* 3-161 (T. 3-36)	*AASHTO Design criteria for a "Comfort" Sag curve will be allowed for the sag curve under 11400 South only, meet min k value of 157 at all other locations on SR-154. Meet AASHTO GB requirements for length of comfort sag. See RFP for Lighting Requirements.
Profile Grades	**% Min** 0.30% / **% Max** 5%	**% Min** 0.30% / **% Max** 5%	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-58:62; **GB** pp. 3-119, 7-28:29 (T. 7-4)	0.50% preferred
Cross Slope	**Standard Value** 2%	**Value Proposed/Used** 2%	☑ Not Required ☐ Required ☐ Approved	**SD** (DD, DD 4); **MOI** 7-47:48; **GB** pp. 4-1:6, 8-2:3	
Stopping-Sight Distance	**Minimum** 645	**Minimum** 645	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-62; **GB** pp. 3-2:8, 3-106:110, 3-4 (T. 3-1)	Adjust stopping sight distance for grades above 3% per AASHTO GB
Structural Capacity	**Design Loading** HL-93	**Design Loading** HL-93	☑ Not Required ☐ Required ☐ Approved	**MOI** 11-2:3; **GB** p. 8-4	HS-20 for existing; HL-93 for new construction
Bridge Width	**Minimum** Traffic Lanes+Shoulders+Barrier Offset+Parapets	**Minimum** Traffic Lanes+Shoulders+Barrier Offset+Parapets	☑ Not Required ☐ Required ☐ Approved	**SD** DD 9; **MOI** 11-3; **GB** p. 8-4	
Vertical Clearance*	**Minimum** 16.5' over road, 23.5' over rail	**Minimum** 16.5'	☑ Not Required ☐ Required ☐ Approved	**SD** DD 8:9; **MOI** 11-4:5; **GB** p. 7-38	* Notify FHWA on any changes to Vertical Clearance on the National Highway System
Lateral Offset to Obstruction	**Minimum** Edge of the Travel Lane to the Edge of the Shoulder.	**Minimum** Edge of the Travel Lane to the Edge of the Shoulder.	☑ Not Required ☐ Required ☐ Approved	**SD** DD 17; **GB** pp. 7-37:38	

<table>
<tr><th>Design Waivers</th><th>UDOT Standard</th><th>RFP Requirement</th><th>Design Waiver</th><th>References</th><th>Date of Decision, Comments, Mitigation, etc.</th></tr>
<tr><td>Acceleration Lanes</td><td>
<table>
<tr><th>V</th><th>Va</th><th>V'a</th><th>L</th></tr>
<tr><td rowspan="5">65 mph</td><td rowspan="5">50 mph</td><td>0</td><td>1410</td></tr>
<tr><td>14</td><td>1350</td></tr>
<tr><td>18</td><td>1310</td></tr>
<tr><td>22</td><td>1220</td></tr>
<tr><td>26</td><td>1120</td></tr>
</table>
</td><td>
<table>
<tr><th>Location</th><th>L</th></tr>
<tr><td>Ramp B 0 to 65 (SB ON)</td><td>1410'</td></tr>
<tr><td>Ramp D 0 to 65 (NB ON)</td><td>1410'</td></tr>
</table>
</td><td>☑ Not Required
☐ Required
☐ Approved</td><td>Refer to Table 10-4 GB pp. 10-111:112 to adjust for grade. A part of the ramp proper may also be considered in the acceleration length as a design waiver. Table 10-3 GB p. 10-110. See also GB pp. 9-124:125, 10-107:110, 116:122; SD DD 13A:14B, ST 1; MOI 7-106</td><td></td></tr>
<tr><td>Deceleration Lanes</td><td>
<table>
<tr><th>V</th><th>Va</th><th>V'a</th><th>L</th></tr>
<tr><td rowspan="5">65 mph</td><td rowspan="5">55 mph</td><td>0</td><td>570</td></tr>
<tr><td>14</td><td>540</td></tr>
<tr><td>18</td><td>520</td></tr>
<tr><td>22</td><td>500</td></tr>
<tr><td>26</td><td>470</td></tr>
</table>
</td><td>
<table>
<tr><th>Location</th><th>L</th></tr>
<tr><td>Ramp A 65 to 0 (NB Off)</td><td>570'</td></tr>
<tr><td>Ramp C 65 to 0 (SB Off)</td><td>570'</td></tr>
</table>
</td><td>☑ Not Required
☐ Required
☐ Approved</td><td>Refer to Table 10-4 GB pp. 10-111:112 to adjust for grade. Table 10-5 GB p. 10-115. See also GB pp. 9-124:125, 10-107,112:120, 123:124; SD DD 13A:14B, ST 3A:3B; MOI 7-106</td><td></td></tr>
<tr><td>Guardrail Bridge Connection</td><td>UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.</td><td>UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.</td><td>☑ Not Required
☐ Required
☐ Approved</td><td>SD BA 4B1:4B2, UDOT Design Exception Form</td><td></td></tr>
<tr><td>Clear Zone</td><td>Meet clear zone compliant requirements defined in Standard Drawings.</td><td>30'</td><td>☑ Not Required
☐ Required
☐ Approved</td><td>2006 Roadside Design Guide pg. 3-6 and Figure 3.2 pg. 3-8; SD DD 4, 8, 10-12,17</td><td></td></tr>
<tr><td>Intersection Sight Distance</td><td>Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.</td><td>Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.</td><td>☑ Not Required
☐ Required
☐ Approved</td><td>GB pp. 9-28:54, MOI 7-64:67</td><td></td></tr>
<tr><td>Ramp Terminal Sight Distance</td><td>
Along the Ramp
<table>
<tr><th>Design Speed</th><th>SSD (ft)</th></tr>
<tr><td>65 mph</td><td>645</td></tr>
<tr><td>55 mph</td><td>495</td></tr>
<tr><td>50 mph</td><td>425</td></tr>
<tr><td>45 mph</td><td>360</td></tr>
<tr><td>40 mph</td><td>305</td></tr>
<tr><td>35 mph</td><td>250</td></tr>
<tr><td>30 mph</td><td>200</td></tr>
<tr><td>25 mph</td><td>155</td></tr>
</table>
Along the Freeway or Street Preceeding Approach Nose of Exit Ramp
<table>
<tr><th>Design Speed</th><th>SSD (ft)*</th><th>DSD (ft)**</th></tr>
<tr><td>65 mph</td><td>810</td><td>1365</td></tr>
<tr><td>55 mph</td><td>620</td><td>1135</td></tr>
<tr><td>50 mph</td><td>535</td><td>1030</td></tr>
<tr><td>45 mph</td><td>450</td><td>930</td></tr>
<tr><td>40 mph</td><td>385</td><td>825</td></tr>
<tr><td>35 mph</td><td>315</td><td>720</td></tr>
<tr><td>30 mph</td><td>250</td><td>620</td></tr>
<tr><td>25 mph</td><td>200</td><td>N/</td></tr>
</table>
</td><td>
Along the Ramp
<table>
<tr><th>Design Speed</th><th>SSD (ft)</th></tr>
<tr><td>65 mph</td><td>645</td></tr>
<tr><td>55 mph</td><td>495</td></tr>
<tr><td>45 mph</td><td>360</td></tr>
<tr><td>20 mph</td><td>115</td></tr>
</table>
Along the Freeway or Street Preceeding Approach Nose of Exit Ramp
<table>
<tr><th>Location</th><th>SSD*</th><th>DSD**</th></tr>
<tr><td>SR-154 Approacing Ramp A & C</td><td>810'</td><td>1365'</td></tr>
</table>
</td><td>☑ Not Required
☐ Required
☐ Approved</td><td>SSD (Stopping Sight Distance) should be at least as great as design SSD
*SSD is 25% greater than minimum SSD.
**DSD is Decision Sight Distance based on avoidance maneuver 'E' and is desired where feasible. Document DSD but do not obtain waiver if DSD is not met.
GB p. 3-4 (T. 3-1)
GB p. 3-7 (T. 3-3)
GB p. 10-92</td><td></td></tr>
<tr><td>Shoulder/Travel way (gutter pan)</td><td>The gutter pan is not considered a part of the traveled way or shoulder.</td><td>The gutter pan is not considered a part of the traveled way or shoulder.</td><td>☑ Not Required
☐ Required
☐ Approved</td><td>GB pp. 4-19, 10-103; MOI 7-1, 43:44</td><td></td></tr>
</table>

Design Waivers	UDOT Standard	RFP Requirement	Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Gores	Follow the key points from 2011 AASHTO: • Should be uniform along the freeway; • Geometric shape is appropriate for given speeds; • Mitigation required for major obstructions in a gore; and • Unpaved area beyond the gore nose should be graded nearly level with the roadways as practical.	Location: All Gores — Meets all Requirements?: Yes	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 10-96:101; **SD** DD 6, ST 3A:3B	
Ramp Terminals	Platform — Location: Ramp side of the approach nose or merging end. — Length: 200 ft At- grade terminal of ramp. — Varies	Platform — Location: Ramp side of the approach nose or merging end. — Length: 200 ft At- grade terminal of ramp. — Varies	☑ Not Required ☐ Required ☐ Approved	Avoid left hand entrances and exits. **GB** pp. 10-103:104. Ramp Terminal means: 1) the exit terminal from the side street onto the freeway entrance ramp; 2) the entrance terminal onto the freeway; 3) the exit terminal from the freeway onto the exit ramp; and 4) the entrance terminal from the freeway exit ramp onto the side street. Refer to **GB** 10-104 for platform lengths. **MOI** 7-105:106	
On Ramp Design	Type: Parallel Curve Radius: 1000 ft Dist. From Physical Nose to Ramp Control Line Terminus: 200 ft Taper: 300 ft min	Ramp Loc. — All On Ramps Type: Parallel Curve Rad.: 1000 ft Dist.: 200 ft Taper: 300 ft	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 10-107:112; **SD** DD 6, ST 1; **MOI** p. 1-2. UDOTs preferred approach is to utilize parallel entrance ramps. See **GB** pp. 10-89:90; **MOI** 7-105:106.	
Off Ramp Design	Type: Taper Divergence Angle (deg): 2-5 Dist. from outer edge alignment break to ramp control line: 200 ft	Ramp Loc. — All Off Ramps Type: Taper Angle: 2-5 Dist.: 200 ft	☑ Not Required ☐ Required ☐ Approved	**GB** pp. 10-112:116; **SD** DD 6, ST 3A:3B; **MOI** p. 1-2. UDOTs preferred approach is to utilize tapered exit ramps for single lane exits. If multi lane exit, one lane must be parallel. See **GB** pp. 10-89:90; **MOI** 7-105:106.	
Curb Configuration	2011 AASHTO p.10-103	Type M1	☑ Not Required ☐ Required ☐ Approved	Determine if the curb is appropriate for the type of facility. **GB** pp. 4-16:19, 10-103; **SD** GW 2	
Traffic Control	Meet Traffic Control Standard Drawings requirements	Meet Traffic Control Standard Drawings requirements	☑ Not Required ☐ Required ☐ Approved	**SD** TC series	
Rumble Strips	Meet Paving Standard Drawings requirements	N/A	☑ Not Required ☐ Required ☐ Approved	**SD** PV 6A:8B	

Prepared by Mark Bedke Date 8/23/2016

Verified Only
- Local Government Projects Only
Date

Approved by Date: 2016.09.07 09:43:37 -06'00' Date

On local government projects that are not on a UDOT road, the Region Preconstruction Engineer signs the "Verified Only" line and the Engineer of Record signs the "Approved by" line. For all other projects, the "Verified Only" line is left blank and the Region Preconstruction Engineer signs the "Approved by" line.

PROJECT DESIGN CRITERIA - URBAN ARTERIAL

I. PROJECT DESCRIPTION

DATE: 5/9/2016

Project No	**S-0154(12)11**	**Location**	11400 S/Bangerter Hwy
PIN	**12566**	**Concept**	SPUI Bangerter Under 11400 S

Describe the scope of the project Construct 4 New Interchages

II. DESIGN STANDARDS BY ROADWAY

(Complete a separate PDC for each roadway on your project)

Date of OSR: 2/18/2016

Roadway Name: **11400 South**

Comments

Roadway Characteristics

Functional Class	Urban Arterial			**Pavement Type**	Rigid		
Current Year	2015	**AADT=**	**26,000**	**Terrain**	Level		
Design Year	2040	**AADT=**	**47,000**	**% Trucks (current)**	3		
Design Vehicle	WB-67			**Posted / Design Speed**	40	45	

Proposed Roadway Characteristics

Total Number of Lanes	5	**Park Strip Width (Typ)**	4
Shoulder Width (Typ)	8	**Sidewalk Width (Typ)**	5
Curb & Gutter Type & Width (Typ)	B1, 2.5'		

Intersection #1:

Roadway Name	Dir.	# of LT Lanes	Storage Length	# of Thru Lanes	# of RT Lanes	Storage Length
11400 S	EB	-	-	-	-	-
11400 S	WB	2	85	2	1	115
4000 West	NB	-	-	-	-	-
4000 West	SB	-	-	-	-	-

Curb Radius From T.B.C.

NW Curb Radius:	-
SW Curb Radius:	-
NE Curb Radius:	35
SE Curb Radius:	35

Intersection #2:

Roadway Name	Dir.	# of LT Lanes	Storage Length	# of Thru Lanes	# of RT Lanes	Storage Length
11400 S	EB	2	250	2	1	-
11400 S	WB	2	250	2	1	-
NB Off Ramp	NB	2	300	-	1	300
SB Off Ramp	SB	2	500	-	2	500

NW Curb Radius:	31.5
SW Curb Radius:	64.5
NE Curb Radius:	64.5
SE Curb Radius:	39.5

Intersection #3:

Roadway Name	Dir.	# of LT Lanes	Storage Length	# of Thru Lanes	# of RT Lanes	Storage Length
11400 S	EB	1	200	2	1	200
11400 S	WB	1	200	2	1	-
River Heights	NB	1	250	1	1	100
River Heights	SB	1	150	1	1	300

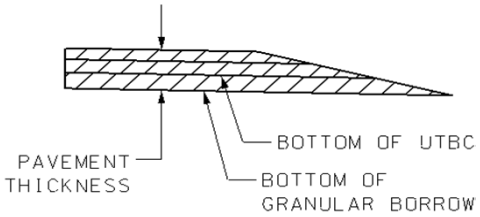
NW Curb Radius:	35
SW Curb Radius:	35
NE Curb Radius:	35
SE Curb Radius:	35

Intersection #4:

Roadway Name	Dir.	# of LT Lanes	Storage Length	# of Thru Lanes	# of RT Lanes	Storage Length
11400 S	EB	1	100	2	1	-
11400 S	WB	1	125	2	1	150
Summer Heights	NB	1	150	1	1	100
Summer Heights	SB	1	100	1	1	125

NW Curb Radius:	35
SW Curb Radius:	35
NE Curb Radius:	35
SE Curb Radius:	35

Pavement Thickness
See Typical Sections in Part 7



Pavement Thickness consists of Hard Surfacing, UTBC, and Granular Borrow (if used).

Order of Precedence: SD - 2012 Standard Drawings; MOI - Roadway Design Manual of Instruction; GB - AASHTO Green Book 2011 Edition

FHWA 13 Critical Elements	UDOT Standard	RFP Requirement	Design Exception	References	Date of Decision, Comments, Mitigation, etc.
Design Speed	45	45	☑ Not Required ☐ Required ☐ Approved	**MOI** 2-1; **GB** pp. 2-53:58, 7-27	Determined by Concept Team
Lane Width	**Mainline** 12' **LT Turn Lane(s)** 12' **RT Turn Lane(s)** 12'	12' 12' 12'	☑ Not Required ☐ Required ☐ Approved	**SD** (DD & ST series); **MOI** 7-1, 43:47, 107; **GB** pp. 7-29:30	
Shoulder Width	**Outside** 8; **Inside** N/A; **Barrier Offset** 2	**Outside** 8; **Inside** N/A; **Barrier Offset** 2	☑ Not Required ☐ Required ☐ Approved	**SD** (DD & ST series); **MOI** 7-44:46; **GB** pp. 4-8:11, 7-30	
Superelevation	**Maximum Superelevation** 6%	**Maximum Superelevation** 6%	☑ Not Required ☐ Required ☐ Approved	**SD** DD 1; **MOI** 7-26:29; **GB** pp. 7-29, 3-44 (T. 3-8)	
Horizontal Alignment	**Minimum Radii Value** 643	**Minimum Radii Value** 643	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-30:33, 50:55; **GB** pp. 7-28, 3-32 (T. 3-7), 3-44 (T. 3-8)	
Vertical Alignment	**Sag Curve Min. K Value** 79; **Crest Curve Min. K Value** 61	**Sag Curve Min. K Value** 79; **Crest Curve Min. K Value** 61	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-56:60; **GB** pp. *crest* 3-155: 157 (T. 3-34:35), *sag* 3-161 (T. 3-36)	
Profile Grades	**% Min** 0.30%; **% Max** 6%	**% Min** 0.30%; **% Max** 6%	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-58:62; **GB** pp. 3-119, 7-28:29 (T. 7-4)	0.50% preferred
Cross Slope	**Standard Value** 2%	**Value Proposed/Used** 2%	☑ Not Required ☐ Required ☐ Approved	**SD** (DD series); **MOI** 7-47:48; **GB** pp. 4-1:6, 7-29	
Stopping-Sight Distance	**Minimum** 360'	**Minimum** 360'	☑ Not Required ☐ Required ☐ Approved	**MOI** 7-62; **GB** pp. 3-2:8, 3-106:110, 7-28, 7-3 (T. 7-1)	
Structural Capacity	**Design Loading** HL-93 for New Construction	**Design Loading** HL-93 for New Construction	☑ Not Required ☐ Required ☐ Approved	**MOI** 11-2:3; **GB** p. 7-38	HS-20 for existing; HL-93 for new construction
Bridge Width	**Minimum** N/A	**Minimum** N/A	☑ Not Required ☐ Required ☐ Approved	**SD** DD 9; **MOI** 11-3; **GB** pp. 7-37:38	
Vertical Clearance*	**Minimum** 16.5' over road, 23.5' over rail	**Minimum** 16.5'	☑ Not Required ☐ Required ☐ Approved	**SD** DD 8:9; **MOI** 11-4:5; **GB** p. 7-38	* Notify FHWA on any changes to Vertical Clearance on the National Hi hwa S stem
Lateral Offset to Obstruction	**Minimum** 1.5' tangent / 3' radius	**Minimum** 1.5' tangent / 3' radius	☑ Not Required ☐ Required ☐ Approved	**SD** DD 17; **GB** pp. 7-37:38	

Design Waivers	UDOT Standard				RFP Requirement		Design Waiver	References	Date of Decision, Comments, Mitigation, etc.
Acceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. A part of the ramp proper may also be considered in the acceleration length as a design waiver. Table 10-3 **GB** p. 10-110. See also **GB** pp. 9-124:125, 10-107:110, 116:122; **SD** DD 13A:14B, ST 1; **MOI** 7-106	
	70 mph	53 mph	22	1420	N/A				
			26	1350					
			36	1000					
			40	820					
			44	580					
Deceleration Lanes	**V**	**Va**	**V'a**	**L**	**Location**	**L**	☑ Not Required ☐ Required ☐ Approved	Refer to Table 10-4 **GB** pp. 10-111:112 to adjust for grade. Table 10-5 **GB** p. 10-115. See also **GB** pp. 9-124:125, 10-107,112:120, 123:124; **SD** DD 13A:14B, ST 3A:3B; **MOI** 7-106	
	70 mph	58 mph	22	550	N/A				
			26	520					
			36	440					
			40	390					
			44	340					
Guardrail Bridge Connection	UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception Form.				UDOT Std Dwg BA 4B1:4B2 & Bridge Rail or Parapet section of UDOT Design Exception		☑ Not Required ☐ Required ☐ Approved	**SD** BA 4B1:4B2, UDOT Design Exception Form	
Clear Zone	Meet clear zone compliant requirements defined in Standard Drawings.				20'		☑ Not Required ☐ Required ☐ Approved	2006 Roadside Design Guide pg. 3-6 and Figure 3.2 pg. 3-8; **SD** DD 4, 8, 10:12,17	
Intersection Sight Distance	Meet 2011 AASHTO requirements for sight triangles cases A-F and skew.				Sight triangles cases A-F and skew are met.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 9-28:54, **MOI** 7-64:67	
Shoulder/Travel way (gutter pan)	The gutter pan is not considered a part of the traveled way or shoulder.				The gutter pan is not considered a part of the traveled way or shoulder.		☑ Not Required ☐ Required ☐ Approved	**GB** pp. 4-19, 10-103; **MOI** 7-1, 43:44	
Curb Configuration	2011 AASHTO p. 10-103				Type B1		☑ Not Required ☐ Required ☐ Approved	Determine if the curb is appropriate for the type of facility. **GB** pp. 4-16:19, 10-103; **SD** GW 2	
Traffic Control	Meet Traffic Control Standard Drawings requirements				Meet Traffic Control Standard Drawings requirements		☑ Not Required ☐ Required ☐ Approved	**SD** TC series	
Rumble Strips	Meet Paving Standard Drawings requirements				Meet Paving Standard Drawings requirements		☑ Not Required ☐ Required ☐ Approved	**SD** PV 6A:8B	

Prepared by Mark Bedke Date 8/23/2016

Verified Only
- Local Government Projects Only

Date

Approved by Date: 2016.09.07 09:44:21 -06'00' Date

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Appendix 2: PROJECT DESIGN EXCEPTIONS & DEVIATIONS

Utah Department of Transportation - Deviation from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

Project Information:

Project No:	S-R299(210)	PIN:	12566
Location:	Bangerter Hwy; 4 Locations; 5400 South		
Description:	New Interchange on Existing Freeway		

All Deviations are approved at the Region Level

Deviations are any change that does one of the following:

1) Entirely or partially modifies or deletes a Standard or Supplemental Specification.

2) Modifies or deletes a Standard Drawing.

3) Modifies or deletes an internal design process.

4) Adds a project scope related special provision, adds a new section, or a new drawing.

Deviations that DO NOT need to be listed on this page include:

- Special Provisions obtained from UDOT's website.
- Modifications to Section 00555M or 00555S, Limitation of Operations.
- Any specification modified for the purposes of updating contact information.

Proposed Deviations:

Spec/Dwg Number:	SW 2	Spec/Dwg Name:	Noise Wall Placement	UDOT Standard:	5'-0" Minimum
Proposed Deviation:	0'-0"				
Explanation of Deviation and Mitigation Measures:	The northbound off ramp of SR-154 (Bangerter Highway) encroaches into an adjacent neighborhood. A 5' minimum distance between the noise wall and concrete barrier for a section adjacent to roadway is required. Providing this minimum distance will place the concrete barrier in the roadway requiring it to be re-aligned which will impact right-of-way of adjacent homes that are not currently being impacted by the project. Snow storage would be removed for approx. 520 feet.				
Safety Impacts:	No safety impacts				
Cost to Attain UDOT Standard:	49,300		Practical Design :		No

Total Project Cost Savings Identified Using Practical Design: 0.00

Utah Department of Transportation
Deviation from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-R299(210) Bangerter Hwy; 4 Locations; 5400 South

Approval / Signatures:

Prepared By

Comments:

Marwan Farah

Digitally signed by Marwan Farah
Date: 2016.09.12 09:18:21 -06'00'

UDOT Project Manager

Comments:

Region Pre-construction Engineer

Comments:

* A completed copy of this form will be provided to the Region Director for informational purposes.

** If the Region Preconstruction Engineer deems a Deviation in need of escalation, it may be submitted to the Statewide Preconstruction Engineer for review and approval.

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

Type of Request: (select one or both) ☒ Design Exception ☐ Design Waiver

Project Information:

Project No: S-R299(210) PIN: 12566

Location: Bangerter Hwy; 4 Locations; 5400 South

Concept: New Interchange on Existing Freeway

Roadway Characteristics and Traffic Data:

Functional Class:	Urban Arterial			Pavement Type:	Rigid
Current Year:	2016	AADT =	56,000	Current % Trucks:	6 %
Projected:	10 Years	AADT =	76,000	Projected % Trucks:	6 %
Projected:	25 Years	AADT =	109,000	Projected % Trucks:	6 %
Terrain:	Level			Posted Speed:	60 mph
Project Design Life:	40 Years			Design Speed:	65 mph
Design Vehicle:	WB-67				

Geometric Data:

Number of Lanes:	6	Clear Zone Distance:	30 ft.
Pavement Width:	122 ft.	ROW Width:	150 ft.
Shoulder Width:	12 ft.	Shoulder Type:	Paved

Accident History as documented in the OSR:

	Actual Rate	Expected Rate
Accident History	N/A	N/A
Severity	N/A	N/A

Accident History Years: 2012-2014

Date of OSR: 2/18/2016

Remarks:

Accident data is not applicable because the at-grade intersection will be converted to a grade separated interchange.

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-R299(210) Bangerter Hwy; 4 Locations; 5400 South

Adjoining Section Geometry Compatibility:

Direction:	North	Pavement Width: 98'	Shoulder Width	In-12; Out-0
Shoulder Type:	Inside - Paved; Outside - None			
Compatibility:	At reconstruction limits the shoulders will be tapered in to match existing.			
Direction:	South	Pavement Width: 98'	Shoulder Width	In-12; Out-0
Shoulder Type:	Inside - Paved; Outside - None			
Compatibility:	At reconstruction limits the shoulders will be tapered in to match existing.			

Programmed Future Improvements:

Cost Data:

Project Cost as Proposed:	$62,927,617.07
Additional Project Cost to Attain FHWA 13 Critical Elements (Design Exceptions):	$7,343,000.00
Additional Project Cost to Attain Other Standards (Design Waivers):	$5,000,000.00
Project Cost Savings Identified Using Practical Design (This amount may be part of or all of the above amounts for Design Exceptions and/or Waivers):	

Attached Detailed Estimate: 12566_54_Exceptions_Costs.pdf

Comments:

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-R299(210) Bangerter Hwy; 4 Locations; 5400 South

Exceptions to FHWA's 13 Critical Elements:

1. Design Speed	2. Lane Width	3. Shoulder Width	4. Horizontal Alignment	5. Vertical Alignment
6. Grades	7. Stopping-Sight Distance	8. Cross Slopes	9. Superelevation	10. Structural Capacity
11.Bridge Width	12. Vertical Clearance (Notify FHWA on any changes on the NHS and STRAHNET routes. See detailed instructions for more information.)		13. Lateral Offset to Obstruction	

Design Exception #1		Additional information in attached file:		
Element:	Shoulder Width	Existing	UDOT Standard	Proposed
Location:	SB On Ramp	N/A	10' (Shoulder + Shy)	4' (Shoulder + Shy)

Mitigation: N/A

Remarks: The SB on ramp for Bangerter Hwy and 5400 South will be a three lane ramp with the ramp metering system located on the inside of the ramp due to the BOR aqueduct on the West side. The 4' (shoulder + shy) occurs for 50' along the ramp, but the shoulder is reduced from the 10' (shoulder + shy) for a total of 482' with the appropriate taper rates for the design speed. Reducing the shoulder will prevent impacts to the adjacent commercial property which has proved to be difficult to work with in the past. The cost for the impact could be more than an assumed square footage cost just due to the difficulty of the property owner.

Design Exception #2		Additional information in attached file:		
Element:	Grades	Existing	UDOT Standard	Proposed
Location:	SR-154 (Bangerter Hwy); North SR-173 (5400 South)	4.16%	5.00%	6.00%

Mitigation:

Remarks: The intersection improvements of Bangerter Hwy and 5400 South will implement a bridge over 5400 South for Bangerter travel. Currently North of the intersection the road slopes downward at 4.16%; with the addition of the bridge a steeper slope is necessary to connect the existing roadway with the design. Using a 6% grade for 434 ft will minimize the impacts to the surrounding urban environment. This grade allows for the design to tie in quicker taking advantage of the current roadway topography, reduces the amount of the retaining wall necessary, reduces the required length of aqueduct reconstruction by 380 linear feet, and prevents the total acquisition of 7 properties and 2 partial acquisitions.

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-R299(210) Bangerter Hwy; 4 Locations; 5400 South

Design Exception #3		Additional information in attached file:		
Element:	Shoulder Width	Existing	UDOT Standard	Proposed
Location:	SR-173 (5400 South)	0'	8'	0'

Mitigation:

Remarks: Currently SR-173 (5400 South) has no shoulders along the traveled way. To implement 8 foot shoulders would have major impacts on the surrounding urban environment. Property acquisitions would occur for each adjacent property and would cause a few businesses to close. Besides the major ROW/community impacts, there would also be major utility conflicts with the flex lane gantries and the power lines that run along SR-173. To avoid the major utility and ROW impacts with widening the road to construct the 8 foot shoulders the design will follow the existing condition of no shoulders.

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-R299(210) Bangerter Hwy; 4 Locations; 5400 South

Waivers of Additional Design Criteria:

1. Acceleration Lanes	2. Deceleration Lanes	3. Clear Zone	4. Intersection Sight Distance	5. Ramp Terminal Sight Distance
6. Shoulder/Travel Way (Gutter Pan)	7. Gores	8. Ramp Terminals	9. On Ramp Design	10. Off Ramp Design
11. Curb Configuration	12. Guardrail Bridge Connection (See next section)	13. Traffic Control	14. Rumble Strips	

Waiver #1		Additional information in attached file:		
Element:	Deceleration Lanes	Existing	UDOT Standard	Proposed
Location:	SR-173 (5400 South)	EB - LT : 200 ft WB - LT : 90 ft	EB - LT : 385 ft WB - LT : 385 ft	EB - LT : 140 ft WB - LT : 140 ft

Mitigation:

Remarks: The required deceleration length will not be provided for the Eastbound left turn from SR-173 (5400 South) onto SR-154 (Bangerter Hwy) and Westbound left turn from SR-173 (5400 South) onto 3900 West. For the EB left, providing the full deceleration length would extend the deceleration lane into the 3900 West intersection making it inoperative. Providing full deceleration for the WB left would have similar repercussions as the deceleration length would push the lane into the middle of the SPUI system. In order to provide the deceleration lengths required the 3900 West signal would need to be moved and redesigned. Both left turns have been designed to provide the required 140 ft gap length for the design speed and allows both intersections to operate

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-R299(210) Bangerter Hwy; 4 Locations; 5400 South

Waivers of Additional Design Criteria – Bridge Rail or Parapet:

Structure Number: _____ Sufficiency Rating: (from Structures Division) _____

Mainline or Overcrossing: _____

Location: _____

Existing Systems:

	Bridge		Approach	
Rail Type*			○ Guardrail	○ Precast Barrier
Height				
Attached			○ Yes	○ No
Meets Standards	○ Yes	○ No	○ Yes	○ No
Total Width				
Lane Width				
Shoulder Width				
Condition				
3 Year Accidents	Actual Rate	Expected Rate	Actual Rate	Expected Rate

*Attach Sketch of Rail Type

Remarks:

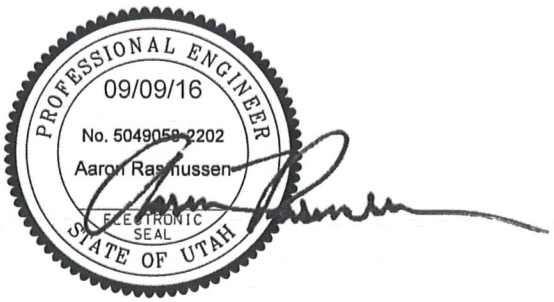
_____

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-R299(210) Bangerter Hwy; 4 Locations; 5400 South

Approval / Signatures:



Prepared and Submitted by: Aaron Rasmussen

Comments:

9/12/2016
UDOT Project Manager

Comments:

Region Pre-construction Engineer

Comments:

Statewide Traffic and Safety Engineer

Comments:

Statewide Pre-construction Engineer

Comments:

FHWA Approval*
(*If required per current Stewardship and Oversight Agreement)

Approval of Design Exceptions for all highway improvement projects on the NHS or Interstate System is considered to be a Federal Administrative Action as specified in 23 CFR 771.107, and as such must comply with the National Environmental Policy Act (NEPA). For Design Exceptions on a Federal-Aid project (or state funded project where a NEPA action was taken), the Design Exception is covered by the previous NEPA action. For Design Exceptions on projects where there has been no previous NEPA action FHWA intends to programmatically classify these actions as Categorical Exclusions (CE) pursuant to 23 CFR 771.117(a), provided there are no unusual circumstances (23 CFR 771.117(b)) or significant environmental impacts. Signature above by the Statewide Pre-construction Engineer confirms that NEPA has been completed for approved Design Exceptions.

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

Type of Request: (select one or both) ☒ Design Exception ☐ Design Waiver

Project Information:

Project No: S-0154(12)11 PIN: 12566

Location: Bangerter Hwy; 4 Locations; 9000 South

Concept: New Interchange on Existing Freeway

Roadway Characteristics and Traffic Data:

Functional Class:	Urban Arterial			Pavement Type:	Rigid
Current Year:	2016	AADT =	50,000	Current % Trucks:	6 %
Projected:	10 Years	AADT =	75,000	Projected % Trucks:	6 %
Projected:	25 Years	AADT =	115,000	Projected % Trucks:	6 %
Terrain:		Rolling		Posted Speed:	60 mph
Project Design Life:	40 Years			Design Speed:	65 mph
Design Vehicle:		WB-67			

Geometric Data:

Number of Lanes:	6	Clear Zone Distance:	30 ft.
Pavement Width:	125 ft.	ROW Width:	150 ft.
Shoulder Width:	12 ft.	Shoulder Type:	Paved

Accident History as documented in the OSR:

	Actual Rate	Expected Rate
Accident History	N/A	N/A
Severity	N/A	N/A

Accident History Years: 2012-2014

Date of OSR: 2/18/2016

Remarks:

Accident data is not applicable due the at-grade intersection will be converted to grade separated interchange.

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-0154(12)11 Bangerter Hwy; 4 Locations; 9000 South

Adjoining Section Geometry Compatibility:

Direction:	North	Pavement Width: 49	Shoulder Width 0
Shoulder Type:	N/A (No Shoulder)		
Compatibility:	Full Shoulder will be added		

Direction:	South	Pavement Width: 49	Shoulder Width 0
Shoulder Type:	N/A (No Shoulder)		
Compatibility:	Full Shoulder will be added		

Programmed Future Improvements:
None

Cost Data:

Project Cost as Proposed:	$67,651,000.00
Additional Project Cost to Attain FHWA 13 Critical Elements (Design Exceptions):	$14,800,000.00
Additional Project Cost to Attain Other Standards (Design Waivers):	
Project Cost Savings Identified Using Practical Design (This amount may be part of or all of the above amounts for Design Exceptions and/or Waivers):	
Attached Detailed Estimate:	

Comments:
Remove 4 Bridges - $80,000
Build 4 bridges - $10,000,000
Remove existing wall - $200,000
Install New Wall - $2,600,000
Relocate JV Aqueduct - $2,000,000
Total $14,800,000

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-0154(12)11 Bangerter Hwy; 4 Locations; 9000 South

Exceptions to FHWA's 13 Critical Elements:

1. Design Speed	2. Lane Width	3. Shoulder Width	4. Horizontal Alignment	5. Vertical Alignment
6. Grades	7. Stopping-Sight Distance	8. Cross Slopes	9. Superelevation	10. Structural Capacity
11.Bridge Width	12. Vertical Clearance (Notify FHWA on any changes on the NHS and STRAHNET routes. See detailed instructions for more information.)		13. Lateral Offset to Obstruction	

Design Exception #1		Additional information in attached file: 12566_9000 South_Profiles 5 and 6		
Element:	Vertical Alignment	Existing	UDOT Standard	Proposed
Location:	SR-154 (Bangerter Hwy) SR-209 (9000 South) Between Old Bingham Hwy and 90th South	5%	5%	6%

Mitigation: 400 feet at 6%; Avoid Bridge Structures, Canal, UTA, Old Bingham Hwy.

Remarks: Currently, there is a 55-foot elevation difference along Bangerter Hwy between 90th South (higher) and Old Bingham Hwy (lower). The current grade of Bangerter Hwy at this location is 5%. There are three bridges that cross over Bangerter Hwy in the vicinity of the Old Bingham Hwy, a canal bridge , two UTA bridges, and a bridge for the Old Bingham Hwy. If the standard 5% grade was used to set a new profile to go over 90th South; it would require to raise the profile of Bangerter Hwy under these structures that would require the full reconstruction of these bridges. If a 6% grade is used the geometry can be tied back in to existing Bangerter Hwy before these structures. Both Grades require 90th South to be lowered 1 to 2 feet. See Profile Figure.

Design Exception #2		Additional information in attached file:		
Element:	Shoulder Width	Existing	UDOT Standard	Proposed
Location:	SR-154 (Bangerter Hwy) under Old Bingham Hwy For Northbound only Inside Shoulder Width Outside Shoulder Width	 8' 0'	 12' 12'	 3' 3'

Mitigation: Object markers will be placed on end columns to enhance visibility of concrete columns.

Remarks: Due to center bents in the median for the Old Bingham Hwy, UTA Tracks, and the Canal structures the existing shoulder at this location is reduced from the standard 12' inside shoulder to 8'. The proposed design adds a fourth-lane in the northbound direction that extends past these bridge columns.

To add the fourth lane, it will require the removal of the slope paving between the outside edge of pavement and the retaining wall and re-striping the travel lanes. The new striping will be offset from the joint lines by about 5 feet.

The proposed inside shoulder will be 3-feet from the face of the barrier at the bridge columns, the 3-foot shoulders will run for 220 feet; then the barrier around the columns transitions back to single median barrier where the inside shoulder becomes 6-feet wide for 360 feet. Then the lanes shift back to the existing striping over a 370-foot taper where the inside shoulder is back to 12 feet wide.

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-0154(12)11 Bangerter Hwy; 4 Locations; 9000 South

Waivers of Additional Design Criteria:

1. Acceleration Lanes	2. Deceleration Lanes	3. Clear Zone	4. Intersection Sight Distance	5. Ramp Terminal Sight Distance
6. Shoulder/Travel Way (Gutter Pan)	7. Gores	8. Ramp Terminals	9. On Ramp Design	10. Off Ramp Design
11. Curb Configuration	12. Guardrail Bridge Connection (See next section)	13. Traffic Control	14. Rumble Strips	

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-0154(12)11 Bangerter Hwy; 4 Locations; 9000 South

Waivers of Additional Design Criteria – Bridge Rail or Parapet:

Structure Number: _____ Sufficiency Rating: (from Structures Division) _____

Mainline or Overcrossing: _____

Location: _____

Existing Systems:

	Bridge		Approach	
Rail Type*			○ Guardrail	○ Precast Barrier
Height				
Attached			○ Yes	○ No
Meets Standards	○ Yes	○ No	○ Yes	○ No
Total Width				
Lane Width				
Shoulder Width				
Condition				
3 Year Accidents	Actual Rate	Expected Rate	Actual Rate	Expected Rate

*Attach Sketch of Rail Type

Remarks:

_____

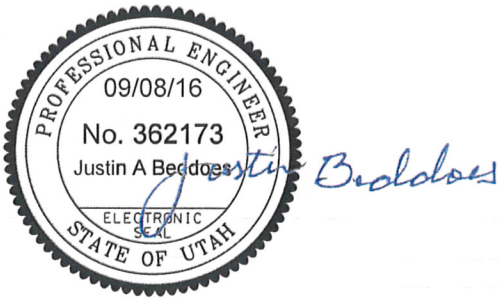
Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-0154(12)11 Bangerter Hwy; 4 Locations; 9000 South

Approval / Signatures:

Prepared and Submitted by: Justin A Beddoes



Comments:

9/12/2016
UDOT Project Manager

Comments:

Region Pre-construction Engineer

Comments:

Statewide Traffic and Safety Engineer

Comments:

Statewide Pre-construction Engineer

Comments:

FHWA Approval*
(*If required per current Stewardship and Oversight Agreement)

Approval of Design Exceptions for all highway improvement projects on the NHS or Interstate System is considered to be a Federal Administrative Action as specified in 23 CFR 771.107, and as such must comply with the National Environmental Policy Act (NEPA). For Design Exceptions on a Federal-Aid project (or state funded project where a NEPA action was taken), the Design Exception is covered by the previous NEPA action. For Design Exceptions on projects where there has been no previous NEPA action FHWA intends to programmatically classify these actions as Categorical Exclusions (CE) pursuant to 23 CFR 771.117(a), provided there are no unusual circumstances (23 CFR 771.117(b)) or significant environmental impacts. Signature above by the Statewide Pre-construction Engineer confirms that NEPA has been completed for approved Design Exceptions.

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

Type of Request: (select one or both) ☒ Design Exception ☐ Design Waiver

Project Information:

Project No:	S-0154(12)11	PIN:	12566
Location:	Bangerter Hwy; 4 Locations; 11400 South		
Concept:	New Interchange on Existing Freeway		

Roadway Characteristics and Traffic Data:

Functional Class:	Urban Arterial			Pavement Type:	Rigid
Current Year:	2015	AADT =	43,000	Current % Trucks:	6 %
Projected:	10 Years	AADT =	56,500	Projected % Trucks:	6 %
Projected:	25 Years	AADT =	87,000	Projected % Trucks:	6 %
Terrain:	Rolling			Posted Speed:	60 mph
Project Design Life:	40 Years			Design Speed:	65 mph
Design Vehicle:	WB-67				

Geometric Data:

Number of Lanes:	6	Clear Zone Distance:	30 ft.
Pavement Width:	113 ft.	ROW Width:	150-250 ft.
Shoulder Width:	12 ft.	Shoulder Type:	Paved

Accident History as documented in the OSR:

	Actual Rate	Expected Rate
Accident History	N/A	N/A
Severity	N/A	N/A

Accident History Years: 2012-2014

Date of OSR: 2/18/2016

Remarks:

Accident data is not applicable due to the at-grade intersection will be converted to grade separated interchange.

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-0154(12)11 Bangerter Hwy; 4 Locations; 11400 South

Adjoining Section Geometry Compatibility:

Direction:	South	Pavement Width: 105'	Shoulder Width	In-12' Out-4'
Shoulder Type:	Paved			
Compatibility:	Shoulders will be tapered to match existing at ends of reconstruction limits			

Direction:	North	Pavement Width: 97'	Shoulder Width	In-12' Out-0'
Shoulder Type:	Inside - Paved, Outside - None			
Compatibility:	Shoulders will be tapered to match existing at ends of reconstruction limits			

Programmed Future Improvements:

Cost Data:

Project Cost as Proposed:	$54,560,000.00
Additional Project Cost to Attain FHWA 13 Critical Elements (Design Exceptions):	$2,790,000.00
Additional Project Cost to Attain Other Standards (Design Waivers):	
Project Cost Savings Identified Using Practical Design (This amount may be part of or all of the above amounts for Design Exceptions and/or Waivers):	$2,790,000.00
Attached Detailed Estimate:	

Comments:

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-0154(12)11 Bangerter Hwy; 4 Locations; 11400 South

Exceptions to FHWA's 13 Critical Elements:

1. Design Speed	2. Lane Width	3. Shoulder Width	4. Horizontal Alignment	5. Vertical Alignment
6. Grades	7. Stopping-Sight Distance	8. Cross Slopes	9. Superelevation	10. Structural Capacity
11.Bridge Width	12. Vertical Clearance (Notify FHWA on any changes on the NHS and STRAHNET routes. See detailed instructions for more information.)		13. Lateral Offset to Obstruction	

	Design Exception #1	Additional information in attached file:		
Element:	Shoulder Width	Existing	UDOT Standard	Proposed
Location:	Outside Shoulder on the entrance ramps through the limits of the ramp meter storage only.	N/A	10' Outside Shoulder (including barrier offset)	7' Outside Shoulder (including barrier offset)

Mitigation: None

Remarks: Design Exception would allow a minimum distance of 9' from back of barrier to all commercial buildings in the area. Without the design exception we will be able to provide approx 6'. Impacts to the parking lot for Buffalo Wild Wings and the parking lot for the new development to the north would be avoided. Full standard shoulders will be provided beyond the proposed ramp meter storage area.
$870,000 cost to attain standard includes approx $400,000 in property acquisition and damage costs, and $320,000 in pavement/earthwork/retaining wall costs, $150,000 in utility and commercial sign costs.

	Design Exception #2	Additional information in attached file:		
Element:	Vertical Alignment	Existing	UDOT Standard	Proposed
Location:	Sag curve on SR-154 under 11400 South	N/A	min K value of 157 for sag curves for a design speed of 65 mph	Design Sag curve for Comfort instead of headlight sight distance

Mitigation: Lighting will be provided through the limits of the comfort sag curve.

Remarks: Project will meet AASHTO design criteria for a comfort sag under 11400 South. All other sag curves will meet minimum k values for headlight sight distance.
$1,920,000 cost to attain standard includes approx $700,000 in residential property acquisitions, $800,000 in retaining wall costs, $230,000 in roadway excavation, $190,000 in other misc roadway/drainage costs

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-0154(12)11 Bangerter Hwy; 4 Locations; 11400 South

Waivers of Additional Design Criteria:

1. Acceleration Lanes	2. Deceleration Lanes	3. Clear Zone	4. Intersection Sight Distance	5. Ramp Terminal Sight Distance
6. Shoulder/Travel Way (Gutter Pan)	7. Gores	8. Ramp Terminals	9. On Ramp Design	10. Off Ramp Design
11. Curb Configuration	12. Guardrail Bridge Connection (See next section)	13. Traffic Control	14. Rumble Strips	

Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-0154(12)11 Bangerter Hwy; 4 Locations; 11400 South

Waivers of Additional Design Criteria – Bridge Rail or Parapet:

Structure Number: _____ Sufficiency Rating: (from Structures Division) _____

Mainline or Overcrossing: _____

Location: _____

Existing Systems:

	Bridge		Approach	
Rail Type*			○ Guardrail	○ Precast Barrier
Height				
Attached			○ Yes	○ No
Meets Standards	○ Yes	○ No	○ Yes	○ No
Total Width				
Lane Width				
Shoulder Width				
Condition				
3 Year Accidents	Actual Rate	Expected Rate	Actual Rate	Expected Rate

*Attach Sketch of Rail Type

Remarks:

_____

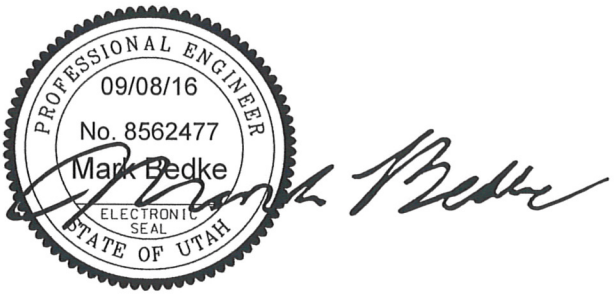
Utah Department of Transportation
Design Exception / Design Waiver from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-0154(12)11 Bangerter Hwy; 4 Locations; 11400 South

Approval / Signatures:

Prepared and Submitted by: Mark Bedke



Comments:

9/12/2016
UDOT Project Manager

Comments:

Region Pre-construction Engineer

Comments:

Statewide Traffic and Safety Engineer

Comments:

Statewide Pre-construction Engineer

Comments:

FHWA Approval*
(*If required per current Stewardship and Oversight Agreement)

Approval of Design Exceptions for all highway improvement projects on the NHS or Interstate System is considered to be a Federal Administrative Action as specified in 23 CFR 771.107, and as such must comply with the National Environmental Policy Act (NEPA). For Design Exceptions on a Federal-Aid project (or state funded project where a NEPA action was taken), the Design Exception is covered by the previous NEPA action. For Design Exceptions on projects where there has been no previous NEPA action FHWA intends to programmatically classify these actions as Categorical Exclusions (CE) pursuant to 23 CFR 771.117(a), provided there are no unusual circumstances (23 CFR 771.117(b)) or significant environmental impacts. Signature above by the Statewide Pre-construction Engineer confirms that NEPA has been completed for approved Design Exceptions.

Utah Department of Transportation - Deviation from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

Project Information:

Project No:	S-0154(12)11	PIN:	12566
Location:	Bangerter Hwy; 4 Locations; 11400 South		
Description:	New Interchange on Existing Freeway		

All Deviations are approved at the Region Level

Deviations are any change that does one of the following:

1) Entirely or partially modifies or deletes a Standard or Supplemental Specification.

2) Modifies or deletes a Standard Drawing.

3) Modifies or deletes an internal design process.

4) Adds a project scope related special provision, adds a new section, or a new drawing.

Deviations that DO NOT need to be listed on this page include:

- Special Provisions obtained from UDOT's website.
- Modifications to Section 00555M or 00555S, Limitation of Operations.
- Any specification modified for the purposes of updating contact information.

Proposed Deviations:

Spec/Dwg Number:	DD 5A	Spec/Dwg Name:	Entrance and Exit Ram	UDOT Standard:	300' Min Transition
Proposed Deviation:	180' Min Transition				
Explanation of Deviation and Mitigation Measures:	This deviation applies to the first transition from 3 lanes to 2 lanes on the SB On Ramp Only. Due to the close proximity of the newly developed commercial buildings there is not sufficient length to safely provide a 300' lane taper. Traffic and Safety wants to avoid a yield condition for the right turn movements, providing a shorter taper rather than a yield condition would be a safer option. The merging point begins within 300 ft of the cross street, traffic will be traveling at slower speeds. Cost to attain standard includes approx $1,500,000 for property acquisition.				
Safety Impacts:	Traffic would have less distance to merge.				
Cost to Attain UDOT Standard:	1,500,000			Practical Design :	Yes

Utah Department of Transportation
Deviation from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-0154(12)11 Bangerter Hwy; 4 Locations; 11400 South

Spec/Dwg Number: SW 2 Spec/Dwg Name: Noise Wall Placement UDOT Standard: 5' min snow storage

Proposed Deviation: 3" min distance between noise wall and concrete barrier

Explanation of Deviation and Mitigation Measures: This deviation applies to the proposed noise wall along SR-154 on the east side between station 1050+00 RT to 1060+00 RT. All other locations where noise walls are located the 5 ft min storage area is required. Providing the snow storage would require a 3 ft Right-of-Way strip acquisition through the entire limits of the adjacent property of approx 1000 ft long. There is an existing retaining wall of about 5 ft high and 300 ft long that would be avoided with design deviation. Currently the proposed retaining/noise wall is retaining a max height of 5 ft, providing snow storage would increase the retaining portion of the wall to approx 7' high. The UDOT Standard shoulders are required through this area.
$540,000 to attain standard includes approx $160,000 in property acquisition and temporary construction easements, $380,000 for reconstruction existing retaining wall and additional Ret/Noise wall

Safety Impacts: Snow would be pushed to the shoulder instead of behind the barrier creating a temporary hazard and reduced shoulder for emergencies.

Cost to Attain UDOT Standard: 540,000

Practical Design : Yes

Total Project Cost Savings Identified Using Practical Design: 2,040,000

Utah Department of Transportation
Deviation from UDOT Standards

www.udot.utah.gov/go/designexceptionprocess

12566 S-0154(12)11 Bangerter Hwy; 4 Locations; 11400 South

Approval / Signatures:

Comments:

Prepared By

Comments:

Marwan Farah

Digitally signed by Marwan Farah
Date: 2016.09.12 09:24:36 -06'00'

UDOT Project Manager

Comments:

Region Pre-construction Engineer

* A completed copy of this form will be provided to the Region Director for informational purposes.

** If the Region Preconstruction Engineer deems a Deviation in need of escalation, it may be submitted to the Statewide Preconstruction Engineer for review and approval.

16—SIGNS

16A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 16 (Signs) and to satisfy all functional needs of the Project, including signing for Bangerter Highway (SR-154), ramps, city streets, interchanges, intersections, frontage roads, accesses, parking lots, bike lanes, and sidewalks.

16B. STANDARDS

Complete Work for signs in accordance with the requirements of the standards listed by priority in Table 16B-1 (Standards for Signs).

If there is any conflict in standards, adhere to the standard with the most stringent requirements.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

TABLE 16B-1
STANDARDS FOR SIGNS

Priority	***Author or Agency***	***Title***
1	UDOT	Special Provisions included in Part 5
2	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
3	UDOT	*2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
4	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
5	UDOT	*2012 Standard Drawings for Road and Bridge Construction*
6	UDOT	*Utah Manual on Uniform Traffic Control Devices (Utah MUTCD)*
7	UDOT	*UDOT Sign Manual*
8	UDOT	*Utah Standard Highway Signs Supplement*
9	FHWA	*2012 Supplemental to the Standard Highway Signs*
10	FHWA	*Standard Highway Signs*
11	AASHTO	*A Policy on Geometric Design of Highways and Streets*
12	AASHTO	*Roadside Design Guide*

16C. REQUIREMENTS

Provide all components of a sign system to meet the following requirements:

A. Provide for the orderly and predictable movement of all traffic, including bicycle and pedestrian traffic.

B. Provide guidance, regulatory, and warning signs needed to ensure the safe and informed operation of individual elements of the traffic stream, including bicycle and pedestrian traffic.

C. Provide new signs on the Project.

D. Provide signing, striping, and pavement messages in accordance the requirements of Part 4 (Project Design and Construction Requirements).

E. All specific service (logo) signing impacted by a Work zone shall be included in the Project. This includes the reconstruction, relocation, and/or upgrade of signs and/or supports for the specific service signs. Provide for and integrate logo signs into the Project signing in the design.

F. When specific service (logo) signs are impacted due to Work, the signs shall be temporarily relocated so that they are displayed for the Project duration. The Design-Builder shall be responsible for any fees that need to be refunded to individual business for the direction(s) of travel when for more than a month the signs cannot be temporarily displayed.

G. Provide Interchange Guide Signing on Bangerter Highway (SR-154) as well as crossroad signing for each of the following interchanges: 5400 South, 7000 South, 9000 South and 11400 South. Advanced Guide Signing shall not be installed prior to adjacent signalized intersections on Bangerter Highway. Where space allows, both a ½ mile and 1 mile advanced guide sign shall be provided in advance of each interchange. See Part 7 (Contract Drawings) for sign details.

H. All off-ramps shall have intersection lane control signing (for multiple lanes, on both sides of the off-ramp) for permanent off-ramp lane configurations at the beginning of the turn lanes.

I. Provide overhead guide signing on Bangerter Highway (SR-154) for any trap lanes and as necessary to avoid design conflicts such as ROW restrictions, utilities, etc. See Part 7 (Contract Drawings) for sign details.

J. Provide ½ mile advanced guide signing for signalized intersections on Bangerter Highway 12600 South (southbound only), 10400 South (northbound only), and 9800 South (southbound only). See Part 7 (Contract Drawings) for sign details. Existing advanced guide signing for the existing CFI intersections at 6200 South and 4700 South shall remain in place unless otherwise impacted by the Project.

K. Provide supplemental guide signing on Bangerter Highway (SR-154) and off-ramps in both direction for Utah Olympic Oval and USANA Amphitheatre at the 5400 South interchange and for the Hospital at the 9000 South interchange. See Part 7 (Contract Drawings) for sign details.

L. Provide oversized one-way (R6-1), do not enter (R5-1), wrong way (R5-1a) signs, four wrong way (R5-1a) signs (two of which include solar powered continuous flashing LED borders), and wrong way arrow pavement markings in accordance with Part 7 (Contract Drawings). Place a 2 inch wide red retroreflective strip on all off ramp sign posts and all delineation on the side facing the wrong way traffic.

M. 4015 West Build Alternative – Remove all existing signs associated with the ThrU Turns, including overhead signs. Obliterate ThrU Turn overhead sign foundations 24 inches below grade.

16C-1 Design

Prepare a Signing Plan and sign details. The sheets shall cover the entire Project area. Design all signs

in accordance with the Utah MUTCD, UDOT Sign Manual and the Utah Standard Highway Signs Supplement, along with the Standard Drawings and Specifications for sign heights and lateral offsets. Design all signing on Bangerter Highway (SR-154) to expressway design standards. For loading requirements refer to Part 4-17 (Structures).

16C-1.1 Signing Plan

A. Include all necessary regulatory, warning, guide signs (including, but not limited to supplemental, specific service (Hospital) for Bangerter Highway (SR-154), ramps, the cross-streets, and any other roadways affected by the Project.

B. Modify any signage outside the limits of the Project that is rendered inaccurate, ineffective, confusing, or unnecessary by the Project due to the Design-Builder's design and construction; such modifications may be in the form of addition, removal, or replacement of signs and appurtenances.

C. Design all off-ramp signing to the design speed of Bangerter Highway (SR-154) until within 250 feet of the ramp terminal.

D. Design all signing on Bangerter Highway (SR-154) to expressway design standards. Refer to Part 7 (Contract Drawings).

E. Design and install signing that meets all Standard and Guidance statements outlined in the Utah MUTCD. Obtain Approval prior to implementing any option statements provided in the Utah MUTCD. See the Utah MUTCD (Section 1A.13) for definitions of Standard, Guidance, and Option.

16C-1.2 Overhead Sign Design

Provide overhead signing that meets the following requirements:

A. Install new signs using retroreflective sheeting meeting or exceeding the minimum requirements of ASTM D-4956 Type XI sheeting in accordance with Section 16C-2, Materials. Sign lights are not required.

B. Refer to Part 4-17 (Structures) for structural design of sign supports.

C. Refer to Part 4-17 (Structures) for minimum overhead sign clearance.

D. Design and construct all overhead sign structures in accordance with Part 7 (Contract Drawings) for sign details and sign details.

16C-1.3 Sign Spacing on Bangerter Highway (SR-154)

Sign spacing shall meet the following requirements:

A. Changeable Message Signs (CMS) – Minimum sign spacing: 1000 feet in advance of the CMS unless otherwise Approved by the Department. Show the location of future CMS on the Signing Plan. See Part 4-03, Section 3C-4 for additional requirements regarding the placement of CMS.

B. Guide Signs – Minimum sign spacing: 800 feet

C. Mile Posts: 14 Calendar Days prior to installation, contact the Department (Peter Bigelow 801-965-4349) to mark locations for mile posts.

16C-1.4 Sign Lateral Offsets

All ground-mounted signs mounted on raised islands shall not overhang into the shoulder or travel lane.

16C-1.5 Other Signage Requirements

Do not attach signs to any bridge structure with the exception of cross-street names on overhead structures over Bangerter Highway (SR-154). Mechanical attachment of signs on structures is not permitted; use adhesive as approved by the Department to attach signs to bridge structures.

16C-2 Materials

Provide signing materials that are new at the time of installation with the exception of Logo Signs as described above.

A. **Sheeting**: Retroreflective sheeting shall meet or exceed the minimum requirements of ASTM D-4956 Type XI.

B. **Substrate**: Aluminum is required for all permanent signing in accordance with the 2012 UDOT Standard Specifications and in accordance with the following categories of signing:

1. For all signs placed on galvanized frames, use 0.125-inch aluminum substrate.
2. For all exit gore signs, use one-piece 0.125-inch aluminum substrate backed with plywood (½ inch HDO plywood backing).
3. For all ground mount signs located on the right hand side of the road, use ½ inch HDO plywood backing behind 0.080-inch aluminum substrate.
4. For all other signs either with or without Z bar, use 0.080-inch aluminum substrate.

C. **Ground-Mounted Sign Supports**: For all sign supports with breakaway slip bases, use no smaller than P5 Steel Posts (UDOT Standard Drawings SN 10A, SN 10B, SN 11A). For all signing 16 square feet or larger, use the freeway signing standards for posts, bases, hardware, etc. (UDOT Standard Drawings SN 14A, SN 14B, SN 14C, SN 14D, SN 14E, SN 16A, SN 16B, SN 16C). Signs placed in paved gores or other paved areas shall be mounted on bases that break away flush with the pavement.

D. **Roadside and Barrier Delineators**: Place roadside delineators a uniform distance from the edge of shoulder pavement in accordance with UDOT Standard Drawing GW 10. Place barrier reflectors on all roadside barriers in accordance with UDOT Standard Drawings. Use Flexible Delineator Posts for roadside delineators.

E. **Raised Island/Median Reflectors:** Install raised island/median reflectors in accordance with Standard Drawing GW1D.

F. **Linear Delineation Panels:** Install linear delineation panels in accordance with UDOT Standard Drawing GW 9B on the barrier on the outside of the following curves and in the place of barrier delineators when the barrier is greater than 42 inches high:

1. Bangerter Highway (SR-154) north of 11400 South
2. Bangerter Highway (SR-154) north of 5400 South

16D. SUBMITTALS

Provide submittals to the Department in accordance with Table 16D-1.

TABLE 16D-1
DESIGN-BUILDER SUBMITTALS FOR SIGNS

Submittal	***For Approval***	***Schedule***
Signing Plan (Provide a scroll plot for each submittal)	Yes	Prior to designing overhead sign structures

17—STRUCTURES

17A. GENERAL

Conduct all Work necessary to meet the requirements of this Section and to satisfy all functional needs of the Project, including temporary and permanent structures, bridges, and miscellaneous structures including walls, barriers, tunnels, moment slabs, sign structures, luminaires, traffic signals, and major drainage structures such as box culverts, structural plate arches, and precast concrete arches.

17A-1 Standards

Complete Work for structures in accordance with the requirements of the standards listed by priority in Table 17B-1(Standards for Structures).

If there is any conflict in standards, adhere to the standard with the most stringent requirements.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

TABLE 17B-1
STANDARDS FOR STRUCTURES

Priority	***Author or Agency***	***Title***
1	UDOT	Special Provisions included in Part 5
2	UDOT	*Supplemental Specifications for 2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
3	UDOT	*2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
4	UDOT	*Structures Design and Detailing Manual(SDDM)*
5	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
6	UDOT	*2012 Standard Drawings for Road and Bridge Construction*
7	UDOT	*Bridge Management Manual*
8	UDOT	*Structures Quality Control / Quality Assurance (QC/QA) Procedures*
9	UDOT	*Aesthetics Guidelines*
10	State of Utah	*Utah Administrative Code, Rule R930-7 Manual of Accommodation of Utility Facilities and the Control and Protection of State Highway Rights-of-Way.*
11	AASHTO	*AASHTO LRFD Bridge Design Specifications* (Customary U.S. Units),
12	AASHTO	*Guide Specifications for LRFD Seismic Bridge Design*
13	AASHTO	*A Policy on Geometric Design of Highways and Streets*
14	AASHTO	*Guide Specifications for Design and Construction of Segmental Concrete Bridges*
15	AASHTO	*LRFD Guide Specifications for the Design of Pedestrian Bridges*
16	AASHTO	*Guide Design Specifications for Bridge Temporary Works*
17	OSHA	*Standards-29 CFR, Part 1926 Safety & Health Regulations for Construction*
18	AASHTO	*Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 6th edition.*
19	AASHTO / AWS	*Bridge Welding Code, D1.5M/D1.5: 2015*
20	AWS	*Structural Welding Code-Steel, D.1/D1.1M:2010*

21	AASHTO	*Manual for Bridge Evaluation*
22	BNSF/UPRR	*Guidelines for Railroad Grade Separation Projects*
23	AREMA	*Manual for Railway Engineering*
24	ANSI/ASSE	*Z359 Fall Protection Code*
25	PTI/ASBI	*M50.3-12: Guide Specification for Grouted Post-Tensioning*
26	PTI	*M55.1-12: Specification for Grouting of Post-Tensioned Structures*
27	FHWA	*Steel Bridge Design Handbook*
28	PCI	*Bridge Design Manual*
29	AASHTO	*Guide Specifications for Seismic Isolation Design*
30	AASHTO	*LRFD Bridge Construction Specifications*
31	FHWA	*Drilled Shafts, FHWA-IF-99-025*
32	FHWA	*Drilled Shafts for Bridge Foundations, FHWA-RD-92-004*
33	FHWA	*Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Design and Construction Guidelines,* Demonstration Project 82, Ground Improvement, FHWA-NHI-10-025
34	FHWA	*Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, FHWA-NHI-09-087*
35	UDOT Engineering Services Division	*Life Cycle Cost Analysis*

17A-2 Structures Design and Detailing Manual

17A-2.1 General SDDM

The SDDM defines the Department's requirements for structure design and detailing. The SDDM consists of manual chapters, drawings, checklists, templates, and design memoranda and is located on the UDOT website. Any deviations from the SDDM require Department approval.

17A-2.2 Definitions and Terminology

A. When the SDDM refers to "Structures Design Manager" such reference means the individual representing the Department who grants formal conditional determination that a particular matter or item is good or satisfactory for the Project.

B. When the SDDM refers to "approval, approves, or approved" such references means the definition in Section 17A-3 (Structures Approval).

C. When the SDDM refers to "temporary" such reference means intended for limited time or use as necessary for the completion of the Project. Temporary items are used by the Design-Builder to assist in the construction of the Project and are removed before Substantial Completion.

D. When the SDDM refers to "permanent" such reference means items are contractually required and are in place at Substantial Completion.

E. When the SDDM refers to nonredundant structural elements such references include integral and/or post-tensioned bent caps.

17A-3 Structures Approval

"Approval" as used in this Section, means any modifications from structural design criteria as defined in the RFP, including Work that differs from the design and/or technical requirements of the Contract

and must be submitted and Approved as an Alternative Technical Concept (ATC). Approval of an ATC does not constitute approval of a design deviation as defined in the SDDM.

When this Section refers to "approval" request acceptance using the Structural Design Criteria Deviation Request template and Structural Design Criteria Deviation Acceptance form found on the UDOT website. The Structural Design Criteria Deviations request cannot be used to request approval for design that does not meet requirements. Structural Design Deviation Requests must include justification for the request. Deviation requests will not be reviewed during the Proposal development. Submit and receive approval for requests for deviations in accordance with Part 3 (Quality Program). Submit deviations and receive approval before incorporation into the design and before each Milestone Review.

17B. REQUIREMENTS

The requirements set forth provide Project specific clarification and supplement the requirements in 17A-1.

17B-1 Materials

17B-1.1 Structural Concrete

See Part 5 (Special Provisions and Exceptions), Section 03310M (Structural Concrete).

17B-1.2 Structural Concrete for Decks and Approach Slabs

See Part 5 (Special Provisions and Exceptions), Section 03312S (Structural Concrete for Decks and Approach Slabs).

17B-1.3 Penetrating Concrete Sealer and Concrete Coating

Seal or coat all columns, bent caps, abutment seats and exposed faces, wing walls and parapets on new and existing bridges. Meet the requirements in Part 4-07 (Landscaping and Aesthetics). Show required limits of sealing or coating on the plans.

17B-1.4 Prestressed Concrete Members

Use low-relaxation strand from plants certified by the Precast/Prestressed Concrete Institute (PCI).

17B-1.5 Post-Tensioning Steel

All personnel grouting post-tensioning ducts must be American Segmental Bridge Institute (ASBI) or PCI -certified as grouting technicians.

17B-1.6 Reinforcing

Stainless steel reinforcing conforming to ASTM A 955 Type XM-28 may be used.

17B-2 Design

17B-2.1 Loads and Forces

Comply with the following minimum design and load requirements as follows:

A. **Uplift:** Proportion the bridge spans to eliminate uplift at supports due to non-seismic loads. Designs resulting in uplift at the supports require approval. Approval is not required when widening existing structures with uplift at supports.

B. **Wind Forces.** Use wind exposure category C for design.

17B-2.2 Weathering Steel Details

Provide girder details as follows that control girder drainage and concrete staining.

A. Paint steel expansion bearings.

B. Ensure the girders can air-dry from any water spray or high-water events.

17B-2.3 Structural Steel Parameters

Provide steel girder details as follows:

A. Minimum thickness of any steel plate or shape to which shear studs are welded: ½ inch.

B. Web depth: Constant depth per bridge. The maximum allowable change in thickness or gross cross-sectional area of any web or flange plate at any splice is a factor of 2.0.

C. On new girders, do not use cover plates, pins, or hangers.

D. For structural steel field splices, use direct-tension indicator washers.

E. Provide steel diaphragms that satisfy strength and stiffness recommendations in the FHWA *Steel Bridge Design Handbook*, Volume 13.

17B-2.4 Prestressed Concrete Members

A. Design prestressed concrete members so that there is no sag (negative camber) in the girder after all dead loads are applied to the bridge (C_D) and to prevent ponding on the bridge under long-term sag conditions. Calculate dead load deflections based on the gross section properties and AASHTO *LRFD Bridge Design Specifications* Article 5.7.3.6.

B. Use of Utah Deck Bulb Tee prestressed concrete members is not allowed.

17B-2.5 Post-Tensioning Steel

A. Unbonded and external tendons may be used for bridge rehabilitation work with Approval.

B. Design the top flange of cast-in-place post-tensioned bridges to satisfy the requirements for severe corrosion conditions.

C. Provide a minimum 6 inches of concrete below bottom of girder flanges for post-tensioned integral bent caps. Use of post-tensioned integral bent caps requires Approval.

D. See Part 5 (Special Provisions and Exceptions), Section 03251 (Post-Tensioning Concrete for Structures).

17B-2.6 Accelerated Bridge Construction (ABC)

See Part 5 (Special Provisions and Exceptions), Section 03374S (Move Bridge) and the Heavy Lift ABC Project, Planning Items, Plan Sheet Requirements, Engineering Checks, Review Guidelines And Shop Drawing Sheet Requirements Checklist. Submit the checklist with both design milestones submittals and construction as defined by the responsibilities on the checklist Align the stages on the checklist with applicable project milestones in both design and construction. In addition, meet the following requirements:

A. **Temporary Support Structures:** Show dimensions, alignments, and elevations of temporary supports relative to those of the permanent supports.

B. **Permanent Superstructure:** Design permanent superstructure for any temporary

support conditions necessitated by the chosen method of moving the bridge. Specify the maximum anticipated and maximum allowable deflections for all stages of construction.

C. **Bridge Movement System:** When transporting the bridge using SPMTs, include a 10 percent contingency factor for loss of support or function of individual axles.

D. **Placement Tolerances:** As shown on the RFC plans.

E. **Utility Agreements and Mitigation Plans:** Obtain and provide written agreements to cross all affected above- and below-ground Utilities. Include in each agreement a plan to mitigate Utility issues via partial shut-down of Utility, complete shut-down of Utility, redistribution of load, etc.

17B-3 Bridges

17B-3.1 Bridge Geometry

A. **Geometric Layout (including Cut-and-Fill Slopes and Retaining Walls):**

1. Modifications from the RFP and the design provided as Reference Documents for the following structure geometrics require Approval:

   a. Horizontal alignment shift greater than five feet;

   b. Increasing structure skew greater than five degrees;

   c. Span configuration (number of spans and/or span length proportions);

   d. Locations of retaining walls relative to the abutments and wingwalls including changes to the abutment type or shape.

   e. Provide a minimum profile grade of 0.5% measured from the high point to the ends of the bridge to accommodate deck drainage. Do not use deck drains to deviate from the minimum profile grade required.

B. **Vertical Clearances:** Provide the following minimum vertical clearances for all new structures whether in a temporary or final location:

1. During Construction: Do not reduce the vertical clearance for a bridge over a road from the minimum existing vertical clearance or 16’-0”, whichever is greater. For vertical clearance less than 16’-6”, provide a mitigation strategy for Approval. The Department approves all submittals to address any impacts to the structure.

2. Bridges over railroads: 23.83 feet.

3. Bridges over water: Meet the requirements of the SDDM 10.6.2.

C. **Horizontal Clearances:** Meet the horizontal clearance requirements of UDOT Standard Drawings, the SDDM, and in accordance with the Typical Sections in Part 7 (Contract Drawings).

D. **Bridges with Median Parapet:** Where a bridge includes a median parapet, provide a 2-inch minimum longitudinal joint in the center of the median parapet and deck to separate the cross-section into two bridges.

E. **Overhang:** Proportion the overhang per the SDDM 10.3.3.

F. **Support locations:** Locate adjacent bridges at the same crossing so that center lines of girder bearings are collinear.

G. **Single Point Urban Interchanges (SPUI):** Bridge abutments must be constant in width with no kinks or chamfered corners. Approach slabs for ramps require a minimum length of 25 feet measured along any edge. See Part 4-15 (Roadways) for additional requirements.

17B-3.2 Bridge Type

A. The bridge types listed in the SDDM 10.9.1 are the Department's common applications for new bridges and can be used without Approval.

B. The bridge types listed in the SDDM 10.9.2 and 10.9.3 are not commonly used by the Department, but may be used when Approved.

C. Buried structures may be used when Approved.

D. The Department will not allow steel box girders or concrete box girders with an inside depth that is less than 5.0 feet.

E. For requests to use uncommon bridge types, supply the Department with information demonstrating the following:

1. The bridge type or element has been successfully used by other transportation authorities, as supported by specific project contact information or validation of the concept by the Design-Builder through a detailed discussion of the proposed structural system, anticipated performance, and benefit to the Project.
2. The bridge type benefits the Department and/or Project.
3. The bridge type and components will perform well under the environmental conditions of the Project, including frequent freeze-thaw cycles and heavy road salt use.
4. A method for replacing bridge deck with minimal impacts to the cross-traffic.
5. The bridge meets all other requirements contained in the SDDM and this Section.

F. The following requirements apply to bridge widenings.

1. Provide a minimum of two girder lines per widened section unless Approved.
2. Match the aesthetics of the existing structure, including column and bent cap shapes and proportions unless approved.
3. Provide a full moment connection across the longitudinal joint between the new and existing deck sections unless approved.

17B-3.3 Seismic Requirements

A. Bridge Classification for a bridge carrying Bangerter Highway is Essential. Bridge Classification for a bridge carrying 5400 South, 7000 South, 9000 South and 11400 South are Normal. Provide adequate gap between barriers and structural elements such as columns and retaining walls to accommodate the design seismic movement.

17B-3.4 Inspection Access

A. When the bridge crosses a river or railroad tracks or cannot be reached by a 25-foot ladder, provide the following clearances for the snooper truck:

1. Total height of the parapet and fencing must be 10 feet or less.
2. The horizontal distances from the front face of the parapet or curb and gutter to the edge of deck must be less than 10 feet.

B. Provide a cable anchorage system to facilitate inspections when elements subject to inspection cannot be accessed using a 25-foot ladder.

C. Provide lighting inside of box girders to aid inspection.

17B-4 Bridge Components

A. **Bridge Parapets:** Provide cast-in-place single-slope parapets on bridges and approach slabs that are consistent with the requirements in the SDDM and Part 4-15 (Roadways). Use of Aesthetic Rail requires Approval. Use a minimum parapet height of 42 inches, or match the roadway barrier height if it exceeds 42 inches, 54 inch parapet may be utilized in median applications only. Transition to roadway barriers on the roadway section, not on the approach slabs.

B. **Bridge Approach Slabs:** Provide for expansion and contraction at the approach slab to pavement interface. For skews at the approach slab to pavement interface greater than 20 degrees, and where the roadway pavement structural section surface is PCCP, provide a stepped joint to prevent lateral movement of the approach slab due to expansion and contraction. When a stepped joint is used, match step widths to those defined by Standard Drawing PV-2. On bridge widenings, use approach slabs with lengths, orientation, and step widths that match the existing approach slab. Use of a precast approach slab requires Approval. For ramp approach slabs, see Section 17B-3.1G (SPUI).

C. **Sleeper Slabs:** Sleeper slabs are not required for bridge widenings where an existing sleeper slab does not exist or for box culvert approach slabs.

D. **Box Culvert Approach Slabs:** Provide approach slabs at box culverts and at three sided boxes where the cover over the top slab is less than the full pavement section as defined in Part 4-11 (Pavement) and the Typical Sections in Part 7 (Contract Drawings).

E. **Deck Systems:**

1. Do not connect temporary barriers to bridge decks by pinning, drilling, bolting or any other means, unless the bridge deck to which the connection is made will be replaced as part of this Project.

2. Use only the deck systems addressed in the SDDM. Deck systems not addressed in the SDDM require Approval.

3. Design post-tensioning systems to prevent inducing tension in the deck.

4. The maximum width of a closure pour is the greater of the reinforcement lap splice length required plus three inches, or three feet.

F. **Inlets/Downspouts/Pipes:** Paint drain pipes to match the color of the adjacent structural members. Where feasible, extend drains down substructure elements to an outlet at ground level into slope protection or rip-rap basin. Provide bicycle safe grates at inlets. See Part 4-04 (Drainage) for additional requirements.

G. **Expansion Joints:**

1. Eliminate deck expansion joints in bridges shorter than 360 feet, unless the bridge is skewed more than 30 degrees. Expansion joints are required at the roadway ends of approach slabs as specified in the SDDM.

2. Tabulate the movement rating for each joint, and the appropriate gap dimensions for anticipated temperatures at the time of installation.

3. In the design and location of joints, provide for maintenance accessibility and future replacement.

4. Use modular expansion joints designed for high-cycle fatigue loading.

H. **Thin-Bonded Polymer:** Use a Thin-Bonded Polymer Type I overlay on all bridges. See Part 5 (Special Provisions and Exceptions), Section 03372S (Thin Bonded Polymer Overlay). Apply the overlay on the concrete deck after grinding and proper surface preparation. Extend overlay to include approach slabs.

1. For bridge decks and approach slabs, the Thin Bonded Polymer overlay may be applied within the same construction season, between April 15 and September 15, as long as required temperatures can be attained.

2. For bridges constructed and moved into place where the operation of moving the bridge either requires the bridge to be supported more than 36 inches from the staged support point, or if tensile stresses may occur during the movement or setting of the bridge, apply the Polymer overlay within 30 Calendar Days after setting the bridge in its final location as temperature and material specifications allow. This is an exception to the dates specified above.

I. **Graffiti Protection:** Provide flange guards on all steel and concrete exterior girders that are accessible without a ladder to prevent pedestrian access along the exterior girders. Install steel plate flange guards on exterior steel plate girders where necessary. Provide steel guard plates or concrete guard blocks to the tops of exterior concrete girder bottom flanges where the top of bottom flanges are flatter than 45 degrees.

J. **Bearing:** At expansion bearings, do not permit the edge of the sole plate to slide past the edge of the elastomeric pad. Provide at least six inches of cover between the edge of the anchor bolts and the edge of the concrete pedestal. Reinforce pedestals taller than three inches.

K. **Bent Caps:** Make the type of bent cap consistent with the bridge system and aesthetic strategy proposed for the Project.

L. **Abutments:** Do not use MSE walls to support abutments.

M. **Wingwalls:** Run wingwalls parallel with the edge of the approach slab at all abutments unless otherwise approved.

N. **Slope Protection:** Provide concrete slope protection for all bridges with spill-through abutments, except where riprap is required for hydraulic reasons. Make slope protection consistent with the aesthetics and landscaping concept submitted by the Design-Builder.

O. **Waterproofing Membrane:** Apply a waterproofing membrane to the top slab and side walls of all buried structures (concrete box culverts and three-sided structures). Place the waterproofing membrane the full length of the structure. Place 12 inches of free draining granular backfill full height of wall, adjacent to each wall, the full length of the structure. Provide a system to drain the backfill, such as a six-inch pipe, away from the structure.

17B-5 Retaining Walls

17B-5.1 Approved Wall Systems

Use only the wall types listed as approved retaining walls in the SDDM section 22.4.3. Obtain approval for other wall types as directed in the same section. Tieback walls may only be used with approval. Obtain approval when using retaining walls of different types adjacent to each other.

17B-5.2 General

A. At retaining wall ends, construct wall five feet past the point where retaining is no longer necessary.

B. Where access is open to the public, provide a pedestrian railing or a six foot fence at the top of walls.

C. Provide a minimum clear distance of six inches between the top of the retaining wall and the top of the material being retained.

17B-5.3 Wall Characteristics

A. Refer to Part 4-06 (Geotechnical).

B. **Moment Slabs:** Use a minimum barrier height of 42 inches, or match the roadway barrier height if it exceeds 42 inches. Transition to roadway barriers on the roadway section (not on the moment slab) over a minimum of 20 feet. Use minimum test level criteria of TL-4 for moment slab barrier design.

17B-6 Sign, Signal, and Lighting Structures

A. If a Project specific design is required, use the SDDM drawings and submit for approval.

B. All overhead sign structures must be one of the seven types of overhead sign structures detailed in the SDDM. A Project specific configuration requires Approval.

C. Do not reduce design dimensions, including drilled shaft embedment depth, for overhead sign structures covered in the SDDM drawings.

D. Provide a separate plan and elevation for each sign structure in the plans.

1. Draw the structure to scale at each unique location; include roadway features.

E. Use Fatigue Importance Category I for overhead sign structures and High Mast Lighting Towers with High Hazard Level. Use Fatigue Importance Category II for all other structures. Consider truck-induced gust loading when designing overhead traffic signal support structures for fatigue.

F. Limit the horizontal displacement at the top of the drilled shaft foundation to 1/2 inch maximum.

G. Use constant diameter drilled shafts to support overhead sign structures; any alternative requires approval. Cast-in-place retaining walls may be used to provide vertical support for sign and lighting foundations. Coordinate and incorporate sign loads transferred through soil with retaining wall designers and fabricators. However, do not count on horizontal structural support from any retaining wall to support sign loads. Under loading conditions the sign foundation cannot apply any horizontal pressure on the wall. Do not mount signs on bridges.

H. Reuse of existing sign structures or any components is not allowed.

I. **Signal Heads and Detection Devices**: Signal heads and detection devices for the SPUI are not considered a utility and may be attached to the exterior girder. If signal heads or detection devices must be placed on a structure, include the connection design, details, and calculations in the appropriate design milestone submittal and final documents.

17B-7 Miscellaneous Structures – Vaults

A. Design all vaults for HS-20 loading.

B. See Part 4-19 (Utilities) for additional information.

17B-8 Hydraulic Structures

A. Provide clearance for storm drains over box culverts following requirements of Part 4-04 (Drainage) and UDOT Standards.

17B-9 Interchange Specific Requirements

17B-9.1 5400 South

A. Meet the requirements for the Flex Lane Gantry Structures in accordance with Part 4-15 (Roadways)

17B-9.2 7000 South Pedestrian Bridge

A. Provide a pedestrian bridge over Bangerter Highway at the 7000 South interchange in accordance with Part 7 (Contract Drawings). Locate the landings/ramps on parcels 562 and 565 in accordance with the Part 7 (Contract Drawings) and tie into the existing sidewalk.

B. Enclose area below ramps to prevent public access with a 6-foot chain link fence type III. Provide access to the Department to allow future inspection of structural ramp elements.

C. Provide a concrete deck (4000 psi, Class AA(AE)). The concrete deck must be composite when supported by girders. The concrete deck must be connected to its supporting components to prevent vertical separation when supported by truss type superstructures. Timber decking is not allowed.

D. Provide a roof/cover that protects the deck from snow.

E. Pedestrian Bridge Roof/Cover Loads

1. Design for a roof snow load of 40 psf.

2. Roof Snow Load Factors:

   a. Use a load factor of 1.0 for roof snow load for all Service Load Cases.

   b. Use a load factor of 0.5 for roof snow load for all Strength Load Cases.

   c. Use a load factor of 0.2 for roof snow load for all Extreme Event Load Cases. The effective snow load will be accounted for as dead load and included as mass in the Extreme Event Load Cases.

F. Salvage the existing pedestrian bridge at 7000 South. Store the bridge in the property

in the northwest corner of Bangerter Highway and 9000 South. Place the structure on temporary supports.

G. Provide a detail sheet in the structure plans incorporating the aesthetics requirements.

17B-9.3 9000 South

A. Existing wall R-261 West along Bangerter Highway

1. Any modification to the existing retaining wall requires Approval.
2. Remove and modify existing wall to meet Project requirements while protecting existing bridge structures north of 9000 South.
    a. Provide cast-in-place coping along the top of the modified wall using the SDDM SD sheets.
    b. Provide 2 inches of cover for existing reinforcing not covered by a coping.

B. Existing wall R-260 East along Bangerter Highway

1. Any modification to the existing retaining wall requires Approval.
2. Protect the existing USBOR Aqueduct in place in accordance with Part 4-19 (Utilities)
3. Removal, replacement or modification to the existing barrier adjacent to structures R-288, F-576, F-764 and C-785 requires Approval.

C. Bingham Creek Culvert Replacement

1. Do not increase load on the existing USBOR Aqueduct structure. See Part 4-04 (Drainage) for additional requirements.

17B-9.4 11400 South

A. 11400 South Structure

1. Signal foundation must be isolated and independent of bridge elements.
2. Detail, design and phase construction of 11400 South structure to address temperature, shrinkage and creep effects in the bridge deck and approach slab. Design to accommodate expansion and contraction in the substructure.

17B-10 Structure Design Calculations

A. Organize the final structure calculations as required by the SDDM with the following exception:

1. SDDM 2.17.6 – Replace the Structure Design Criteria and Design Codes and References bullets with the following:
    - Structure Design Criteria
        - Design codes and references
        - Design loads
        - Materials
        - Design assumptions relevant to the design of each element.

B. Number all pages with a numbering scheme that covers the entire set of calculations.

17B-11 Plan Organization and Content

Provide structure RFC plans that comply with the SDDM project document requirements and the following:

A. Separate the structure plans from all other discipline sheets in the plan set and organize them by UDOT structure drawing number.

B. When corridor standard plans are used to replace details typically included in the structure plan set, include the applicable corridor standard plan sheets with each structure plan set and list them in the Index of Sheets on the Situation and Layout Sheet.

C. Include in the structure plans a soil boring location plan and the soil boring logs used in the geotechnical design of the structure.

D. Include in the final retaining wall structures plans a location plan showing the location of all retaining walls pertaining to the structure drawing number. Include for each individual retaining wall the situation and layout plans and details prepared by the Designer. For MSE walls include the detailed drawings prepared by the wall supplier. Include aesthetic treatment in supplier drawings.

E. Include in the final overhead sign structure plans a location plan showing the location of all overhead sign structures.

F. Place As-Built quantities on the first sheet of the As-Built Structure Situation and Layout.

G. Provide As-Built locations on the Situation and Layout plans for a structure moved into its final location.

17B-12 Submittal Packages

17B-12.1 Initial Design Milestone Submittals (30%)

Provide Situation and Layout plans for all bridges, box culverts, rigid frame drainage structures, retaining walls, and custom designed noise walls.

For a structure moved into its final location, provide placement tolerances along the X, Y, and Z axes on the Situation and Layout plans for the structure placement.

Include the following quantities as appropriate on the Situation and Layout plans prior to releasing them for construction.

A. Granular Backfill Borrow / Free Draining Granular Backfill

B. Drilled shafts / Driven Piles

C. Reinforcing steel

D. Structural concrete

E. Thin Bonded Polymer Overlay (or applicable deck protection)

F. Prestressed Concrete Members

G. Structural Steel

For the initial design milestone review, provide a Situation and Layout submittal package that includes the following:

A. Situation and Layout plans

B. S&L Sheet(s) Guidelines and Checklist (for each structure)
C. Seismic Design Strategy Report (Preliminary) for each bridge
D. Foundation recommendation memos
E. Draft Hydraulics Report

17B-12.2 Intermediate Design Milestone Submittals (60%)

For any design milestone reviews between the initial design and final design milestone reviews, refer to Part 3 (Quality Program) for submittal requirements and review processes.

17B-12.3 Final Design Milestone Submittals (100%)

Provide required quantities on the Situation and Layout plans.

For the final design milestone review, for each structure provide a final design submittal package that includes:

A. Structures Plans
B. Structures Design Calculations
C. Load Rating Package for each bridge.
D. Seismic Design Strategy Report (Final) for each bridge.
E. Final Geotechnical Report
F. Final Hydraulics Report

17C. SUBMITTALS

Provide these submittals in addition to the submittals in Part 4-02 (General Design Requirements) to the Department in accordance with Table 17C-1 (Design-Builder Submittals for Structures) for review. Submittal package requirements are identified in Section 17B-12 (Submittal Packages).

TABLE 17C-1
DESIGN-BUILDER SUBMITTALS FOR STRUCTURES

Submittal	***For Approval***	***Schedule***
Structural Design Criteria Deviation Request	No	Allow a minimum of 7 Calendar Days for initial Review. When comments are provided allow an additional 3 Calendar Days. Allow 3 Calendar Days for review after comments have - been addressed and the Deviation request has been re-submitted.
Initial Design Milestone Review - Situation and Layout Submittal Package	No	A minimum of 7 Calendar Days for review.
Intermediate Design Milestone Design	No	7 Calendar Days for review
Final Design Milestone Review Submittal Package	No	A minimum of 14 Calendar Days for review
Accelerated Bridge Construction Plans (for bridges constructed in a staging area and launched, slide or transported to a final location) RFC documents and all required submittals.	Yes	A minimum of 14 Calendar days before construction.

18—TRAFFIC SIGNALS

18A. GENERAL

Conduct all Work necessary to meet the requirements of this Part 4-18 (Traffic Signals) and to satisfy all functional needs of the Project, including constructing new and temporary traffic signals and maintaining the operation of existing signals, and infrastructure provisions for future signals.

18B. STANDARDS

Complete Work for traffic signals in accordance with the requirements of the standards listed by priority in Table 18B-1 (Standards for Traffic Signals).

If there is any conflict in standards, adhere to the standard with the most stringent requirements.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

TABLE 18B-1
STANDARDS FOR TRAFFIC SIGNALS

Priority	***Author or Agency***	***Title***
1	UDOT	Special Provisions included in Part 5
2	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
3	UDOT	*2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
4	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
5	UDOT	*2012 Standard Drawings for Road and Bridge Construction*
6	UDOT	*Utah Manual on Uniform Traffic Control Devices* (Utah MUTCD)
7	AASHTO	*A Policy on Geometric Design of Highways and Streets*
8	UDOT	*UDOT Signalized Intersections Design Guidelines*
9	AASHTO	*Roadside Design Guide*
10	AASHTO	*Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals Design Guide*.
11	ITE	*Vehicle Traffic Control Signal Heads (VTCSH), Reference 2012 Standard Specification 02892*
12	TRB	*Highway Capacity Manual 2010*
13	Local Jurisdiction	*Design Standards, Details and Specifications*
14	UDOT	*Manual for the Accommodation of Utilities and Control and Protection of State Highway Rights of Way*
15	NEMA	*National Electrical Manufacturers Association Standards*
16	IMSA	*International Municipal Signal Association Standards*
17	NFPA	*National Electrical Code*

18C. REQUIREMENTS

18C-1 General

Coordinate the traffic signal design plans with the Department to ensure signal design can handle the required phasing when implemented. The Department will provide the phasing diagram to include on the signal design plans.

Provide documentation establishing the basis of designs of temporary, new, and replacement traffic signals.

Submit traffic signal plans, including the following:

A. Placement of intersection physical equipment

B. Accommodation of pedestrians and shared use path users

C. Verification that sight distance for signals is met in locations with structures.

D. The Department will be responsible for developing and implementing traffic signal timing plans. Coordinate with the Department on issues regarding the following:

1. Group(s) of signals to be coordinated
2. Coordinated phases at each signal
3. Operation of signals that will not be in coordination
4. Cycle lengths
5. Splits for side streets
6. Coordinated phases
7. Anticipated traffic volumes

E. Compatibility with State supplied signal equipment

Traffic signal mast arm pole foundations and highway luminaire pole foundations are prohibited within the Jordan Valley Water Conservancy District (JVWCD) Aqueduct easement. JVWCD must Approve placement of any other signal equipment within the easement, including pedestrian poles, signal cabinets, etc.

18C-2 Traffic Signal Design

Provide permanent traffic signals for the design year traffic volumes in accordance with Part 7 (Contract Drawings) to minimize delay and accommodate pedestrians at the following interchanges with Bangerter Highway (SR-154):

A. 5400 South
B. 7000 South
C. 9000 South
D. 11400 South

Provide permanent traffic signals at the following intersections:

E. 11400 South and River Heights Drive
F. 11400 South and Parkway Plaza Drive/Summer Heights Drive

Design and reconstruct existing traffic signals at the following intersections;

G. 11400 South and 4000 West

Design and reconstruct existing traffic signals at the following intersections for the 4015 West Build Alternative;

H. 5400 South and 4015 West

Remove existing traffic signals at the following intersection if the 4015 West Build Alternative is exercised:

I. 4015 West and Sam's Boulevard (North Leg U-Turn)
J. 4015 West and Point Lane (South Leg U-Turn)
K. 5400 South and 4120 West (West Leg U-Turn)

Design the traffic signals to accommodate the future widening of 7000 South to five lanes and of 9000 South and 11400 South to seven lanes. Design intersections to accommodate optimal signal coordination. Use queue detection on the highway off-ramps and on the surface streets.

18C-3 Left-Turn Phasing

Provide left-turn phasing in accordance with UDOT's Guidelines for Left-Turn Phases at Signalized Intersections using design year traffic volumes. Use Flashing Yellow Arrow (FYA - Type VI) signal heads for all left-turns that require permissive/protected left-turn phasing. Do not use Type V heads for permissive/protected left-turn phasing.

18C-4 Right-Turns

Signalize all right-turn movements from the off-ramp at each SPUI.

For right-turns from the cross-street on to the on-ramp, yield conditions will not be permitted.

Provide right-turn overlap phasing using a modified Type V signal head at the following locations:

A. Northbound Right-Turn at 11400 South & 4000 West

18C-5 Signal Placement at Single Point Urban Interchanges (SPUI)

Install signal heads overhead over each lane where Bangerter Highway is under the cross street. Use programmable signal heads for all left-turn signal heads installed over each lane that will be visible to other left-turn movements.

Provide both near-side and far-side (pull-through) signal heads for all left-turn movements through the SPUI.

18C-6 Controller Cabinet Foundations

Provide size 6 cabinet foundations at all traffic signals within the Project limits.

18C-7 Power Service for Signals and Lighting at Signalized Intersections

Coordinate with and provide support to the Department and the local municipality for updates to the lighting agreements for the street lighting at all new traffic signals or at existing traffic signals where the street lighting is changing by this Project.

Install a Department-furnished uninterruptible power supply (UPS) at each ramp terminal intersection at all interchanges and at adjacent intersections.

18C-8 Temporary Traffic Signals

Utilize temporary signal configurations at existing signalized intersections until new traffic signals are fully operational, including detection. Integrate communication for signal controller and detection to the ATMS system.

Submit all proposed phasing changes and temporary signal pole and head placement for approval. For temporary signals, signal heads must also be centered in the travel lanes as shown in the MOT or temporary traffic control plan. Use new LEDs in signal heads for temporary signals or provide certification that they meet standards for brightness and luminous intensity.

18C-9 Signal Inspections and Turn-On

Provide a proposed schedule for the following activities at the start of construction. Notify the Department a minimum of eight Calendar Days prior to the following activities:

A. Meter base inspection
B. Traffic signal preliminary inspection
C. Traffic signal turn-on
D. Removal of existing traffic signals
E. Traffic signal final inspection
F. Flex Lane mast arm pole relocation

The Department will turn on all traffic signals belonging to the Department. Coordinate with the local jurisdiction on all other signal turn-ons.

The UDOT Signal Turn-On Checklist shall be used for the process of initiating operation of new and existing signals that were previously turned off.

New and re-constructed traffic signals shall have signal controller cabinet, fiber and switch devices tested, configured and passed inspection prior to erecting any traffic signal poles.

18C-10 Vehicle Detection Devices

Install Department-furnished detection on all approaches to each traffic signal. Install Department-furnished advance detection on approaches with posted speeds of 40mph or greater.

Integration of State Furnished radar devices shall be done by an approved contractor if the electrical subcontractor is not qualified.

18C-11 Preemption

Relocate existing emergency vehicle preemption equipment at all signalized intersections where preemption currently exists. Do not add any new devices unless agreed upon by emergency agency and Department.

18C-12 Communication

Connect traffic signals to the Department fiber-optic communications system and verify system communication with the Region 2 Traffic Signal Engineer (Peter Jager at pjager@utah.gov) prior to signal turn-on. Include communication setup and integration of any other IP addressable devices, including radar detection and uninterruptible power supplies (UPS).

Restore the connectivity of any traffic signals that have lost connectivity because of the Work within 24 hours of notification.

18C-13 Vehicle and Pedestrian Indications

Use State Furnished signal heads and backplates for all permanent traffic signals, which include retroreflective tape.

18C-14 Advanced Warning System (AWS)

Provide an AWS (Prepare to Stop When Flashing Signs, Flashers, & Detection) on Bangerter Highway (SR-154) as follows:

A. Provide a post-mounted AWS "Option A" in accordance with UDOT Supplemental Drawing SL 18 at the following locations:

1. Northbound and southbound Bangerter Highway (SR-154) at 9800 South
2. Northbound and southbound Bangerter Highway (SR-154) at 6200 South

Connect each AWS to the existing traffic signal controller. Coordinate the timing of the AWS with the Department prior to programming and turning on the AWS.

18C-15 Removal and Salvage

Remove and salvage existing traffic signal hardware equipment (power pedestal, meterbase, preemption equipment, signal heads, cabinets, cameras, and hardware, including, hand-hole covers, end caps, and mounting brackets) and detection equipment including radar sensors, pucks, and aerial repeaters and deliver the items to the Department. Contact the Region 2 Signal Supervisor to coordinate the delivery date and location. Remove and dispose of all other traffic signal steel and equipment. Remove and salvage cabinet electronic equipment (controllers and other components) and deliver to the UDOT Region 2 Signals Laboratory. Contact the Region 2 Signal Supervisor to coordinate the delivery date. Remove unused existing foundations or obliterate 24 inches below existing ground.

18C-16 Department-Furnished Material List

The Design-Builder is responsible to install all Department-furnished material. The Department will furnish the following material:

A. Signal steel equipment: Signal poles, mast arms, signal pole luminaire extensions and arms, pedestrian poles and anchor bolts

B. Signal detection equipment: hardware, including the radar sensor, sensor mount, 100 foot cable & connector, splice kits, and cabinet interface

C. Signal cabinet equipment: Controller cabinets (all internal hardware, except fiber-optic gator patches), controllers, and uninterruptible power source (UPS) service pedestals or inverters with batteries.

D. Signal heads, including the mounting bracket, visor, backplate, and LED module.

18C-16.1 Department-Furnished Material Notification Process

For the Design-Builder to receive Department-furnished material, the subsequent notification process must be followed:

A. The Design-Builder shall submit the completed State Furnished ATMS Materials Form and State Furnished Signal Materials Forms. A state furnished materials order form must be submitted for each intersection but all the materials for each intersection should be submitted on the same order form at the same time. Provide an itemized inventory schedule of each signal location for the requested material shall accompany the form. The completed state furnished forms are to be emailed to the Region 2 Traffic Signal Engineer (Peter Jager at pjager@utah.gov) and State Furnished Materials at sfmaterials@utah.gov, along with Department notification. This

notification shall be submitted prior to pick-up in accordance with the following minimum time frames:

1. 110 Calendar Days: Signal poles, mast arms, PED poles, and controller cabinets
2. 90 Calendar Days for Programmable Signal Heads
3. Allow an additional 30 Calendar Days for powder coating
4. 60 Calendar Days: All other material

B. The Design-Builder shall submit a notification requesting pick-up of materials 10 Calendar Days prior to the needed date. This may not be submitted until 10 Days prior to the completion period of the first notification time frames unless the Department has already received the material. The notification will include each site location and associated equipment requested for pick-up.

C. The Department-furnished materials to be picked-up must be coordinated through the Department and a time arranged to pick-up the materials at one of the following locations, depending on the specific equipment ordered:

Utah Department of Transportation Traffic Operations Center (TOC) 2060 South 2760 West Salt Lake City, UT 84104	or	Utah Department of Transportation Central Warehouse 4501 South Constitution Blvd West Valley City, UT 84119

Steel poles and mast arms can be drop-shipped to the Design-Builder's yard within the Project limits with an additional 14 Calendar Day notice.

D. Provide all site installation, insurance, interim storage, labor, and transportation associated with equipment pickup and transportation between storage and field sites.

18C-17 Flex Lanes on 5400 South

Install a new signal pole and mast arm for eastbound traffic east of the 5400 South Interchange to modify the beginning of the Flex Lane System. Install the new signal pole 90 feet east of the existing pole. Relocate the existing mounted signs and blank-out sign and reroute the existing conduit and conductors to the new location.

Do not impact the existing flex lanes gantries and other equipment not listed above. Notify Matt Luker at mluker@utah.gov in the event of any impacts to the flex lane system. See Part 4-10 (Maintenance of Traffic) for additional requirements.

E.

18D. SUBMITTALS

Provide submittals to the Department in accordance with Table 18D-1.

TABLE 18D-1
DESIGN-BUILDER SUBMITTALS FOR TRAFFIC SIGNALS

Submittal	***For Approval***	***Schedule***
Traffic Signal Plans and Calculations	No	Prior to RFC
Proposed Phasing Changes and Temporary Signal Pole and Head Placement	No	Prior to RFC
Phasing changes to traffic signals	No	Prior to implementing phase change
State-Furnished Signal Material Form & State-Furnished ATMS Material Form	No	As described in Section 18C-13
Request to pick up materials	No	As described in Section 18C-13.1

19—UTILITIES

19A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 19 (Utilities) and satisfy all functional needs and characteristics of the Project, including performing and coordinating Utility Work and executing additional agreements as necessary.

19B. STANDARDS

Complete Work for Utilities in accordance with the requirements of the standards listed by priority in Table 19B-1 (Standards for Utilities).

If there is any conflict in standards, adhere to the standard with the most stringent requirements.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

TABLE 19B-1
STANDARDS FOR UTILITIES

Priority	***Author or Agency***	***Title***
1	UDOT	*Statewide, Project MUAs and Supplemental Agreements (including Utility specifications and standards) (in App. 6-1)*
2	UDOT	*Contract Documents for the Project*
3	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction, as modified by Part 5*
4	UDOT	*2012 Standard Specifications for Road and Bridge Construction, as modified by Part 5*
5	UDOT	*Utah Administrative Code R930-7 Utility Accommodation and R930-8 Utility Relocations Required by Highway Projects*
6	UDOT	*Standard Drawing No. DD18; Utility Location Requirements*
7	FHWA	*Utilities, 23 Code of Federal Regulations (CFR)*
8	AASHTO	*A Policy on Geometric Design of Highways and Streets*
9	CI/ASCE 38-02	*Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*
10	APWA	*Manual of Standard Specifications*
11	APWA	*Manual of Standard Plans*
12	NESC	*National Electric Safety Code*

19C. REQUIREMENTS

Coordinate the Utility Work with the Department and with privately, publicly, cooperatively, or municipally owned Utilities (hereinafter referred to as "Utility Company") in accordance with this Section 4-19 (Utilities) and with Section 4-17 (Structures) paragraph 17B-2.6(I).

The Department has developed Master Utility Agreements (hereinafter referred to as "MUA(s)") or Statewide Utility Relocation Agreements with each of the Utility Companies known to own and/or operate facilities affected by the Project which are included in Part 6 (Third-Party Agreements).

Develop Supplemental or Project Agreements on behalf of the Department for signature by the Utility Companies and signature and execution by the Department, for all Utility Work. Perform or coordinate the performance of the Utility Work for design and construction as specified herein. Obtain required permits necessary to perform Utility Work.

Repair any Utility damages caused by the Design-Builder which occur during construction within the Project limits. All repairs associated with such damages are the responsibility of the Design-Builder.

All costs for coordination, design, permits, construction, and coordination of all temporary Utility relocations that are implemented for the convenience of the Design-Builder's construction operation and schedule are the responsibility of the Design-Builder.

The Design-Builder is responsible to contact Blue Stakes at (800) 662-4111 before all Utility Work to have all utilities marked prior to construction.

The existing RMP transmission overhead power lines and poles (and any distribution lines on those transmission poles) located along 11400 South, 9000 South, and 5400 South will be relocated by others within the Project Limits; do not provide a price for these relocates in Form UC. The RMP transmission relocation project is being installed by others, see Part 4-15 (Roadway) for additional requirements. The anticipated completion date of the relocation is December 31, 2017. Coordinate with RMP to assure that the Design-Builder's design does not negatively impact the RMP transmission relocation project. All impacts to the RMP transmission relocation project must be accounted for in the Design-Builder's schedule and Price Proposal. Coordinate the relocation with each Utility Company for utilities located on the existing transmission power poles.

Price all other RMP relocates and the other utility relocates and include in Form UC.

If the Design-Builder's design has additional transmission relocations, it is the Design-Builder's responsibility to price those relocates and include them in Form UC.

19C-1 General Requirements

Coordinate all design and construction activities with the Department and the Utility Company Project Representative identified in each MUA or Statewide Utility Relocation Agreement (regardless of who performs or pays for any proposed Utility Work). Coordinate on finalizing the design, the location of the relocated Utility facility, the potential impacts of Utility Work, costs, and schedule. Design, protect, temporarily relocate, and/or construct the facility as applicable for the Utility type, subject to the requirements of the specific MUA or Statewide Utility Relocation Agreement.

Perform the Utility Work as follows:

A. Comply with all provisions of MUA(s), Statewide Utility Relocation Agreement(s), Supplemental Agreement(s), and other applicable agreements, whether included in Part 6 (Third-Party Agreements) or subsequently provided to the Design-Builder.

B. Minimize the impacts to Utility Companies and Third-Party.

C. Identify the extents of required protect-in-place measures and relocations, if Utility facility conflicts cannot reasonably be avoided. Coordinate with impacted Utility Companies as necessary to accomplish each mutually agreeable proposed protect-in-place measure and relocation solution. Coordinate the proposed Utility Work with other Utility facilities present at the site to ensure that all Utility facilities are accommodated.

D. Prepare Supplemental Agreement(s) as necessary and submit to the Department for review and approval prior to submitting them to the Utility Companies.

E. Perform all obligations indicated as responsibility of the Department, contractors, and subcontractors (if contemplated) set forth in the MUA(s) or Statewide Utility Relocation Agreements and the obligations therein.

F. Provide all coordination, surveying, staking, clearing/grubbing, MOT, and traffic control for all Utility Work, regardless of who is performing the Utility Work. These costs will not be back-charged to the Utility Companies.

G. Provide all Incidental Utility Work.

H. Keep the Department and Utility Companies well informed of Project construction progress and schedules. Notify Utility Companies at least twenty-four (24) hours in advance of any Utility Work in the vicinity of their facilities and forty-eight (48) hours notice of potential impacts on service or as outlined in each specific MUA or Statewide Utility Relocation Agreement, whichever is greater. Invite Utility Companies to Utility-related coordination meetings and keep Utility Companies well informed of Project changes and involved in making the Utility design decisions.

I. Cooperate with the Utility Companies to solve relocation installation issues, allow betterments without causing the Department or Utility Companies to incur any unnecessary expense, and remain consistent with the Design-Builder's scope of Work.

J. Work cooperatively with the Utility Companies identified in this Part 4-19 (Utilities) and in Part 6 (Third-Party Agreements) and establish reasonable schedules to perform Utility Work.

K. Coordinate with those Utility Companies who perform their own Utility Work by scheduling adequate and reasonable time to accomplish their Utility Work.

L. Advise the Utility Company of the approximate time required for Utility relocations performed by the Design-Builder.

M. Develop procedures for addressing Utility facility conflicts discovered during design and/or construction and for notification/coordination/approval from the Department in addressing the Utility conflict.

N. Evaluate and discuss the possible elimination of Utility conflicts with the Utility Companies.

O. Establish the mitigation approach to be implemented at each specific Utility location.

P. Ensure that all relocated Utility facilities are acceptable to the Department and the Utility Company.

Q. Ensure that all relocated Utility facilities shall be functionally equivalent to or better than the existing Utility facilities. All Utility relocations shall meet current Utility Company standards.

R. Coordinate the construction schedule to accommodate all Utility Company Utility Work, including design, Supplemental Agreement review and approval, permitting regulatory approvals, material procurement, and construction.

S. Do not perform any Utility Work on behalf of a Utility Company without prior written approval for said Utility Work. If Design-Builder choses to perform any Utility Work without a written agreement between the Utility Company the and Department, such as excavation in an effort to expedite completion of the Utility Work process, costs for said work shall not be back-charged to the Utility Company or the Department.

T. Provide to the Department a weekly report of events (including all Utility Company coordination meetings, design progress, and construction progress) and the revised schedule as it relates to design and construction progress of Utility Work.

U. Monitor the progress of Utility Company Utility Work and notify the Department if there is cause to believe that the Utility Company will not meet the specified time frame(s) for design review of the Design-Builder's plans, construction, or timely inspection. Provide such notice to the Department within seventy-two (72) hours of discovery.

V. Provide survey-grade (X,Y and Z coordinates) As-Built Utility locations and attributes for Utility Work performed by the Design-Builder and Third Parties in a .csv file weekly and at the completion of each specific Utility facility relocation.

W. Notify the Department's Utility Manager or designee, Communications Team (CT) Manager, and Utility Company Representative seven Calendar Days prior to starting any planned Utility Work. Also, for unforeseen Utility facility interruptions, contact the Resident Engineer, PM, and Utility Company Representative immediately.

X. Maintain the positive working relationships the Department has developed with the Utility Companies in their cooperative participation and support of the Project.

Y. Extend all existing Utility casings to limits defined in Utah Administrative Code R930-7. Design-Builder is responsible to work with Utility Companies to locate and extend existing Utility casings within the Project

Z. Be responsible for installing/obtaining all power service to ATMS, signals lighting, and ATMS/ITS equipment.

AA. Be responsible for the costs and schedule for all temporary Utility relocations.

BB. Ensure that all overhead and underground clearances and depth of bury meet both Department requirements as well as the Utility Company's requirements.

CC. Include the Department in all communications and coordination efforts with the Utility Companies.

DD. Extend all service laterals and meters to the new ROW line. Match existing sizes for laterals and meters.

Do not bury or conceal any portion of the Utility Work that has not been inspected and accepted by the Utility Company. Any Utility Work buried or concealed without being inspected and accepted by the Utility Company shall be exposed by the Design-Builder at no additional cost to the Department or Utility Company.

19C-2 U. S. Bureau of Reclamation/Jordan Valley Water Conservancy District

The Department entered into a Project Agreement with the USBOR and Jordan Valley Water Conservancy District (JVWCD) for the protection of the USBOR Aqueduct Reaches 2 & 3 within the USBOR's Aqueduct Easement. The UDOT/ USBORJVWCD Project Agreement is in Part 6 (Third Party Agreements) and contains restrictions on both temporary and permanent construction activities that are allowed within the USBOR's aqueduct easement. Coordinate all Work within the USBOR's Aqueduct Easement through the single point of contact listed in the Project Agreement and receive approval from the USBOR /JVWCD prior to performing any Work within the USBOR's Aqueduct Easement area. Obtain approvals from the USBOR /JVWCD for any deviation from the terms of the agreement. The 2005 USBOR & UDOT Memorandum of Agreement is included as an exhibit to the Project Agreement in Part 6 (Third Party Agreements) and the USBOR O&M Guidelines are included

in Part 7 (Contract Drawings).

Below is a list of the USBOR's Jordan Aqueduct Reach 2 (JA-2) requirements and shutdown information:

1. Aqueduct 2 runs between the Bluffdale Water Treatment Plant and the Terminal Reservoirs on Bangerter Highway near 6000 S.
2. There are two mainline isolation valves that break JA2 into three segments, located at 12600 South and 9000 South.
3. Do not shut down the segment of the aqueduct on the north side of the 9000 South valve at the same time as the south side for operational reasons.
4. Perform all work on north side of 9000 South during the first shutdown period, followed by a separate shutdown to perform work on the south side.
5. The two aqueduct shutdown periods are allowed to be consecutive.
6. Schedule the north side shutdown first, followed by the south side shutdown.
7. Aqueduct shutdown periods must take place in accordance with the Project Agreement.

19C-3 City of West Jordan

Repair the damaged 12-inch sanitary sewer line at along the west side of the intersection approximately 212 feet east of the SSMH located at 7000 South and Dixie Drive if the West Jordan betterment is not performed. Pipe repair method required West Jordan City approval.

19C-4 Design-Builder Third Party-Manager

Provide a Third-Party Manager to act as the overall Utility coordinator to ensure adequate coordination during Supplemental Agreement development, mobilization activities, and performance reviews of Utility Work. Coordinate, cooperate, and work with the contact person designated in Part 6 (Third-Party Agreements) or as otherwise assigned by the Department. Responsibilities of the Third-Party Manager include coordinating Design-Builder oversight, coordinating and administering the Utility Work within the Project, site administration, standard and specification adherence, and performance reviews of the Design-Builder while working on and off-site, including but not limited to safety, quality, timeliness, and performance.

Coordinate Utility facility relocations until all Utility Work is completed.

Maintain a record of all design and construction activities for all Utility Work that has been performed by the Design-Builder, and all Utility Work that has been designed and Released for Construction after Notice to Proceed.

The Third-Party Manager responsibilities:

A. Act as a liaison between the Department, Utility Company, and Design-Builder workforces as needed.

B. Prepare Supplemental and Project Agreement(s) as necessary and submit to the Department for review and approval prior to submitting them to the Utility Companies.

C. Provide support in Utility Work problem resolution.

D. Communicate Utility Work Project status to various levels of site personnel including management, other company organizations, contractors, and suppliers.

E. Monitor the successful completion of assigned Project deliverables and milestones.

F. Distribute design plans that have been reviewed by the Utility Company and received consultation and written comment by the Department.

G. Provide notification of construction dates to the Department and Utility Company.

H. Keep a record of all meetings with Utility Companies and provide meeting minutes within seven Calendar Days.

I. Obtain a signature from the Utility Company on final design plans indicating that the plans are Released for Construction.

J. Keep a record of Utility Company inspector present at any time.

K. Provide any revisions to the design plans.

L. Provide date(s) that construction was completed.

M. Obtain signature and acceptance of Utility Companies on As-Built Plans and all other As-Built requirements stipulated in the Department's Utility Regulations.

N. Provide a weekly summary and schedule of Utility Work activities.

19C-5 Subsurface Utility Engineering (SUE) Information

Underground Utilities. The Department has performed a Utility investigation with subsequent depictions as per CI/ASCE 38-02 Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data. Subsurface Utility Engineering (SUE), and various Quality Levels have been obtained. Quality Level B/C/D has been achieved at various locations throughout the Project and Quality Level A at selected locations. These data are listed and depicted in the documented information shown in Part 8 (Engineering Data). Only the elevations and depths on Utilities at actual test holes or within manholes shall be considered accurate and reliable vertical data. The vertical component of Utility lines depictions in the three-dimensional SUE representation were interpolated between Quality Level A data points and at measured Utility elevations at points within vaults. All vertical Utility data except at these points should be considered as unverified and uncertain.

Various SUE quality levels of Utility location data have been achieved with "Reasonable Confidence" as follows:

A. Quality Level A is information gathered attest hole locations (a vertical location within +/- 0.5 feet tolerance at the test hole location only).

B. For Quality Level A data, actual pipe size does not differ from the size indicated by more than twenty-five percent (25%).

C. Quality Level B is horizontal location information gathered by application of non-destructive surface geophysical techniques, professional interpretation of the results, and appropriate survey control (horizontal accuracy is certified to within +/- 2-foot tolerance unless indicated otherwise); there are no estimates on vertical elevation). For Quality Level B data, actual pipe size does not differ from the size indicated by more than twenty-five percent (25%)

D. Quality Level C is information gathered from correlating Utility records to surveyed visible above-ground facilities, visible inspections, and all other obtained data.

E. For Quality Level C data, actual pipe size does not differ from the size indicated by more than twenty-five percent (25%)

F. Quality Level D is information gathered and interpreted from existing Utility records, and put into context with all other obtained data.

G. The depiction of this Utility data does not replace the statutory duty of the Design-Builder to utilize the One-Call system before any excavation activities. Nor does it relieve the Design-Builder of the responsibility to confirm the horizontal and vertical locations of all tie-in points.

The cost of any additional SUE information required by the Design-Builder for use during design and construction of the Project in addition to the information provided shall be performed at the Design-Builder's expense.

19C-6 Relocation Agreements

The Department has developed MUAs or Statewide Utility Relocation Agreements with the Utility Companies known to own and/or operate facilities affected by the Project. Copies of these proposed Agreements are in Part 6 (Third-Party Agreements). Each MUA or Statewide Utility Relocation Agreement includes the following:

A. Allocation of roles and responsibility for the design and construction of the Utility Work between the Design-Builder and the Utility Company.

B. Utility Company requirements, including time frames and commitments for Utility facility design, material acquisition, engineering review, supplemental agreement review and approval, and construction activities.

Authority to Execute Agreements. The terms of all MUAs and any amendments will be set by the Department and the Utility Company; the Design-Builder shall have no authority to enter into or execute any Agreements with any Utility Company on the Department's behalf.

If the Design-Builder identifies conflicts with a Utility facility owned by an entity other than as listed in Part 6 (Third-Party Agreements), the Department will execute a MUA or Relocation Reimbursement Agreement with the unlisted Utility Company.

In the case of an inconsistency between an executed MUA or Statewide Utility Relocation Agreement and information provided elsewhere in this document or Contract Documents, the terms and conditions in the executed MUA or Statewide Utility Relocation Agreement shall govern.

19C-7 Supplemental / Project Agreements

Submit Supplemental and Project Agreements for Department approval that provides the Utility Work scope, schedule, and cost to the affected Utility Company and to the Department for review. Develop, negotiate, and provide a schedule as part of the Supplemental or Project Agreement for defined Utility Work. Allow the specified amount of time in the Project Schedule for each Utility Work design, design review, Supplemental Agreement review and execution, and construction, as provided in the MUA(s) or Statewide Utility Relocation Agreements. Allow three Working Days for the Department to execute Supplemental and Project Agreements after it has been signed by the Third Party. Identify critical activities and sequences as they affect the Utility Work and plan to effectively mitigate impacts.

Coordinate the negotiations for and the preparation of all Supplemental and Project Agreements. Use the draft Supplemental and draft Project Agreement form as provided in Part 6 (Third-Party

Agreements) to accommodate the specific Utility Work identified as the design of the Project progresses. Prepare and provide any related documentation such as reports, plans, surveys, and estimates of cost and provide personnel to attend negotiation sessions with Utility Companies.

Include plans, cost, and schedule, as exhibits, for the Utility Work associated with each executed Supplemental or Project Agreement. Upon request, Design-Builder shall provide actual costs for Utility Work performed by Design-Builder which will be included in the Supplemental or Project Agreement.

Do not submit Supplemental and Project Agreements to the Department for approval until the Agreement is complete and includes scope, costs, and schedule. Incomplete Supplemental and Project Agreement submittals will not be reviewed.

The Department and Utility Company will sign each Supplemental Agreement indicating their concurrence with the Utility Work.

Once the draft Supplemental or Project Agreement has been approved by the Department, provide two copies of each proposed Supplemental or Project Agreement, along with the corresponding plans, schedules, and estimates of cost to the Utility Company for signature. Once the Supplemental or Project Agreements have been signed by the Utility Company provide the partially executed agreements to the Department's Utility Manager or designee for signature from the Department and full execution. The Design-Builder shall not perform any Utility Work until the Supplemental Agreement for the Utility Work is signed by the Company and the Department. The Department will issue an authorization to proceed to the Design-Builder for each specific Utility Work location.

19C-8 Cooperative Agreements

Department will prepare and negotiate Cooperative Agreements needed for the Project.

Design-Builder Responsibility - Prepare and provide any related documentation such as reports, plans, surveys, and estimates of cost and provide personnel to attend negotiation sessions with Third-Parties at no additional cost to the Department. Upon request of the Department, provide related documentation within seven Calendar Days

19C-9 Meetings and Correspondence

Keep Utility Companies well informed of Project changes and involved in making Project design decisions so they can provide uninterrupted service to their customers or minimize interruption of services. Notify Utility Companies at least 24 hours in advance of any Work in the vicinity of their facilities and provide 48 hours prior notice of potential impacts on service.

Startup Meeting Topics. Schedule startup meetings with each Utility Company and the Department's Utility Manager to review the following:

A. Inventory of Utility facilities.

B. Terms of the MUAs and Statewide Utility Relocation Agreements, including allocation of responsibilities.

C. All potential items of Work that affect the Project schedule.

D. The schedule for the Project.

E. Potential Utility conflicts and relocations.

F. Time frames to design, procure materials for, and construct Utility relocations.

G. Concurrence on the number and extent of known affected Utility facilities and issues.

H. Possibility of eliminating Utility conflicts.

I. Mitigation approach to be used at each specific location.

J. Procedures for addressing Utility conflicts discovered during design and/or construction.

Progress Meetings. Schedule at least bi-monthly Utility meetings with the Department to discuss Project progress, issues, and planned Work for all phases of Utility Work, including design and construction. Notify the Department at least seven Calendar Days in advance of each meeting. Invite Utility Companies to progress meetings.

Develop the agenda for these meetings jointly with the Department. At these meetings, include the Design-Builder's and the Department's Key Personnel who have responsibilities for Utilities. Take and maintain meeting minutes of all the Utility meetings and distribute copies of the minutes to participants, including representatives of Utility Companies who have facilities in the areas reviewed (even if they did not attend the meeting) within seven Calendar Days after the meeting.

Correspondence. Maintain documentation of contact and discussions with Utility Companies. Provide to the Department copies of all correspondence between the Design-Builder and any Utility Company within one Calendar Day of receiving it or sending it, as applicable.

19C-10 Design and Construction Responsibility

Coordinate all Project design and construction activities with the Department and Utility Companies, including design and construction of Utility facilities as applicable for each Utility type, subject to the requirements of the MUA(s), Statewide Utility Relocation Agreement(s), and Supplemental Agreement(s). Verify that the design plans prepared and the Utility Work performed is consistent and compatible with the executed Agreement(s) and with the Project design and construction.

The following Tables summarize the Utility requirements and responsibilities specified in the respective MUA(s), Statewide Utility Relocation Agreement(s), and Supplemental Agreement(s). In case of a discrepancy or conflict between the information in this section and an executed Agreement, the executed Agreement shall govern.

Table 19C-1 (Design-Builder to Design and Construct) lists the Utility Companies for which the engineering design and construction of Utility Work will be the responsibility of the Design-Builder. Design-Builder may be required to perform the Utility relocation design and/or construction using specific subcontractors and/or vendors in accordance with MUA(s).

TABLE 19C-1
DESIGN-BUILDER TO DESIGN AND CONSTRUCT

Utility Company	***Department Cost Share (Include on Form PA & Form UC)***
Daybreak Secondary Water	100%
Kearns Improvement District	100%
Manuel Bros., Inc	50%
South Jordan City	100%
South Valley Sewer District	100%
Taylorsville City	100%
Taylorsville Bennion Improvement District	100%

Utility Company	***Department Cost Share (Include on Form PA & Form UC)***
US Bureau of Reclamation (using an approved sub-contractor)	100%
City of West Jordan City	100%
Welby Jacobs Canal	100%
Private Irrigation Users	100%

Utility Companies listed in Table 19C-2 (Utility Company for a Portion of the Utility Work) are responsible for completing a portion of the Utility Work as specified in Table 19C-2 (Utility Company for a Portion of the Utility Work). Perform all other Utility Work. Design-Builder may be required to perform the relocation design and/or construction of Utility Work using specific subcontractors and/or vendors in accordance with MUA(s), Telecommunications Facility Exchange Agreement(s) and Statewide Utility Relocation Agreement(s).

TABLE 19C-2
UTILITY COMPANY FOR A PORTION OF THE UTILITY WORK

Utility Company	***Company Utility Work Responsibility***	***Department Cost Share (Include on Form PA & Form UC)***
AT&T Corp.	AT&T Corp to furnishing cables and hand holds and pulling and splicing	50%
First Digital Telcom	First Digital Telecom to furnish cable/pedestal procurement, pulling, and splicing	50%
MCI (Verizon Business)	MCI Communication Services to provide cable and pedestal procurement, pulling, and splicing	50%
Syringa Networks, LLC	Fiber design fiber procurement, pulling, and splicing	100% of UDOT's design and construction boxes and conduit Syringa Networks, LLC responsible for 100% of fiber design, fiber procurement, pulling and splicing
Zayo Group, LLC.	Cable/pedestal procurement, pulling, and splicing	50%

Table 19C-3 (Utility Company for Design and Construction) identifies the Utility Companies that will be responsible for performing engineering design and construction of its own Utility facilities independent from the Design-Builder. Coordinate with the Utility Companies in identifying Utility facility conflicts with the Project to incorporate the design and construction of Utility Work into the Project Schedule and the Work.

TABLE 19C-3
UTILITY COMPANY FOR DESIGN AND CONSTRUCTION

Utility Company	***Department Cost Share (Include on Form PA & Form UC)***
CenturyLink	50%
Comcast	50%
Questar Gas Company	50%
Rocky Mountain Power (11400 South)	100%
Rocky Mountain Power (9000 South)	83%
Rocky Mountain Power (7000 South)	50%
Rocky Mountain Power (5400 South)	60%
Rocky Mountain Power (4015 West & 5400 S)	50%

*Design-Builder to provide trenching, conduit, and bedding material per RMP specification for all RMP underground Utility Work, only if agreed upon and coordinated with RMP.

Utility Companies have requested Utility Betterments to be constructed as part of the Project. Construct the Betterments identified in Table 19C-4 (Betterment Design and Construction Responsibilities of Design-Builder) as part of the Utility Work.

TABLE 19C-4
BETTERMENT DESIGN AND CONSTRUCTION RESPONSIBILITIES OF DESIGN-BUILDER

Utility Company	***Betterment***
South Jordan City	See Part 6 (Third Party Agreements)
Taylorsville City	See Part 6 (Third-Party Agreements)
Taylorsville Bennion Improvement District	See Part 6 (Third-Party Agreements)
City of West Jordan	See Part 6 (Third Party Agreements)

If the Design-Builder changes the Project design after the Utility Company has an executed Supplemental Agreement or the Utility Work has been performed, resulting in a new conflict with the completed Project related Utility Work, the Design-Builder will pay for one-hundred percent (100%) of the costs to redesign and construct the additional Utility Work required to resolve said new conflict. The Design-Builder is responsible to make adjustments for any additional time that may be required for the Utility Company to review modified plans and perform Utility Work on its facilities when required.

Cost share percentages provided as an example or guide. If a Utility Company is within their own Right-of-Way, easement, or in a Public Utility Easement, then the Department is responsible for one-hundred percent (100%) of the Utility relocation costs. Follow Utah Law per Utah Code 72-6-116, unless otherwise specifically noted in the MUA(s) or Statewide Utility Relocation Agreement(s) between the Department and each Utility Company. In-case of discrepancy the executed MUA(s) or Statewide Utility Relocation Agreement(s) shall govern.

19C-11 Utility Work Design Plans

After the Project design has been advanced sufficiently to clearly define Utility Work, prepare Utility Work design plans, or coordinate with Utility Companies to obtain company-prepared Utility Work plans. Utility Work design plans need to identify the extent of the Utility Work required and clearly show the proposed highway improvements. Coordinate as necessary with each Utility Company to accomplish each Utility relocation including providing and clearly indicating a mutually agreeable proposed location for the relocated Utility facility.

For Utility Work Design Plans Prepared by the Design-Builder, prepare Utility Work design plans:

A. Prepare a detail Utility Work design plan for each specific Utility relocation in the Project plan sheet format..

B. Plan set shall include sufficient information to perform survey verification.

C. Include a MOT and traffic control plan in compliance with Part 4-10 (Maintenance of Traffic) for each Utility Work that requires MOT and traffic control.

D. Include submittal information for proper material verification.

E. Include sufficient design detail to allow review and verification of Utility Work and show all proposed Utility Work design. Show all existing Utilities, as identified by the Department and Design-Builder.

F. Deliver electronic and hardcopy to the Department.

G. Identify the extent of the Utility Work and clearly show the proposed highway improvements.

H. If the Design-Builder makes changes to the approved Utility Work design plans, submit the revised plans to the Utility Company for approval. Allow additional time for the Utility Company to review the modifications to plans.

I. Obtain final design approval signatures for Utility Work design plans from authorized Utility Company personnel. The approval signature shall appear on the Released for Construction plan set.

J. Provide Released for Construction Documents signed by both the Utility Company and Design-Builder to the Department.

K. Correlate all Utility Work design plans with the Project design information and submit them to the Department, Design-Builder, and Department Utility Manager for review prior to construction.

For Utility Work Design Plans Prepared by the Utility Company, prepare plan sheets showing

the proposed highway improvements and existing Utility facility locations. Identify all Utility conflicts and required Utility Work on the plans and submit them to the Utility Company and the Department. The Utility Company will use these plans to prepare their Utility Work design plans. Correlate all Utility Company relocation plans with the Project design information and submit them to the Department for review prior to construction.

Review Utility Company-prepared relocation plans for consistency and compatibility with the Project design and obtain Utility Company Supplemental Agreement approval before construction on the utility for which the plans are prepared, whether construction is to be performed by the Design-Builder or the Utility Company.

19C-12 Notification

Notify the Department and each Utility Company in writing as required in the MUA(s) and Statewide Utility Relocation Agreement(s), prior to beginning any Utility Work that may affect any Utility facility, including shutdowns and diversions. Provide proper notification to each Utility Company of all temporary Utility Work implemented for the convenience of the Design-Builder's construction operation.

19C-13 Inspection

Utility Companies have the right to inspect and test the Utility Work performed by the Design-Builder on their facilities. The Utility Company and Design-Builder shall keep daily records of the Utility Work performed. The Utility Company and Design-Builder shall retain a copy of said daily records and upon request, supply a copy of each record to the Department. Utility Companies will communicate any concerns or irregularities with the progression of Utility Work to the Department, which will forward the concerns to the Design-Builder in accordance with the MUA(s) and Statewide Utility Relocation Agreement(s). Inspection and acceptance of the Utility Work by the Utility Company shall not relieve the Design-Builder from the obligation to perform all Utility Work in compliance with specifications and any other obligations in the MUA(s) or Statewide Utility Relocation Agreement(s).

19C-14 Utility Work Limits

The limits of Utility Work extend as far as is necessary to accommodate the Utility Work and the Utility Company's relocation requirements, whether inside or outside the ROW or Construction limits. Obtain all necessary permits as needed to complete the Utility Work.

The relocation of all existing Utility facilities that may have resided outside the existing ROW and will be located within the new ROW are the responsibility of the Design-Builder.

19C-15 Excavation

Give such notices of excavation as are required under Utah Code Title 54 Chapter 8a-2 (known as the Blue Stakes Law). Contact Blue Stakes at (800) 662-4111 before all Utility Work.

19C-16 Overhead Lines

Before working adjacent to overhead lines, give appropriate notice to the Utility Company. Obtain the minimum clearances requirements (between the Utility lines and the Project's construction equipment, permanent finished grade and appurtenances, and/or temporary grade) directly from the Utility Companies.

Inventory and determine existing vertical clearance of overhead lines over existing roadways and

appurtenances. Provide clearance between overhead electric wires and under-build communication systems and between top of finished ground and appurtenances (at the lowest sag).

19C-17 Fees and Construction Permits

Where performing Utility Work, obtain, pay the cost of, and comply with all relocation permits and application fees for Utility locations, both within and outside the ROW. Obtain a construction permit from the Department for construction of any new facility within the ROW. (No construction permit is required from the Department for the relocation, betterment, abandonment, or removal of an existing Utility within the ROW). Pay any fees associated with installation of new Utility services or maintenance of existing Utility services. Obtain other non-UDOT permits before beginning Utility Work.

19C-18 Abandonment and Protection-in-Place

Unless specifically noted otherwise in the Contract Documents or directed otherwise in writing by the Utility Company, removal of abandoned underground Utility or pipes within the planned ROW limits is not required of the Design-Builder. For underground Utilities, casings, and pipes that are to be left in place and are larger than six (6) inches in equivalent diameter, abandon them by placing or pumping in concrete slurry, sand slurry, or other material approved by the Department and then capping all open ends with concrete; for pipes eight (8) inches or greater in diameter, the cap must be at least twenty-four inches (24") thick. All abandoned pipelines shall be shown and identified on the As-built drawings

The following are exceptions to the abandonment process, listed above:

A. Remove the existing abandoned USBOR/JVWCD water main located starting on the north side of the 5400 South interchange and moving north.
B. Remove all manholes, vaults, and other underground structures to a depth of 2' below subgrade. Completely remove any underground structure that will be located under any structural element of the project.

Protect existing Utilities not requiring relocation, removal, or abandonment in accordance with the Utility Company's requirements. It is the Design-Builder's responsibility to fully understand the Utility Company's protect-in-place requirements prior to submitting their bid. Actively protect all Utilities to be left in place and communicate its status to the Subcontractors and other Utility Companies. Repair or replace any existing Utility facility that is damaged by the Design-Builder at no cost to the Department or Utility Company. All costs including costs of the facility being out of service as a result of the damage shall be borne by the Design-Builder.

Design-Builder shall submit an abandonment and/or protection-in-place plan to the Department as part of a Supplemental Agreement for Department approval. All protect-in-place measures must be approved by the Utility Company prior to the start of Utility Work. The Design-Builder must provide written acceptance of the Utility Company (or signed protect-in-place plans) to the Department. Survey the abandoned pipes and show them on the as-built drawings and provide the Department the locations in a .cvs file.

19C-19 Utility Company As-Built Plans

For all Utility Work designed and/or constructed by the Design-Builder, provide Utility As-built plans to each Utility Company in the electronic file format specified by the Utility Company. Show the locations of existing Utilities, structures, trees, streets, and highway ROW limits on the plans.

19C-20 Project-Wide Utility Plans

Transfer As-built information to a separate set of Project-wide Utility plans, prepared using the Project plan sheet format. The purpose of this set is to show a comprehensive picture of all As-built Utilities (both existing and adjusted as a part of the Project) for the Project on a single set of plans in the same format, as is required for all other Project As-built Plans.

Include on the plans Project survey control information and sheets. Show survey-grade points along the relocated Utility facilities via stations, offsets to the dominant control line at the following intervals along with northing coordinates, easting coordinates, Project elevation of natural ground, and facility elevation (invert or bottom of facility), as follows:

A. Every 100 feet and/or at angle points.

B. At ROW boundaries.

C. At roadway control points.

19C-21 Completion of Work

Obtain written approval by the respective Utility Company of all As-built Utility Work plans for which the Design-Builder has been responsible.

19D. SUBMITTALS

Provide submittals to the Department in accordance with Table 19D-1.

TABLE 19D-1
DESIGN-BUILDER SUBMITTALS FOR UTILITIES

Submittal	***Department Approval***	***Utility approval***	***Schedule***
Utility Work weekly work plan	No	No	Weekly
Supplemental Agreements	No	Yes	Prior to submission to Utility Company
Abandonment and Protection-in-Place Plan	Yes	Yes	Prior to Construction
Construction Permits	No	Yes	Prior to Construction
Utility Work design plans	No	Yes	Prior to Construction
Daily Records	No	No	As requested by Department
Utility As-Built plans	No	Yes	With As-Built Documents
Project-wide Utility plans	No	No	Upon completion of Utility Work

20—PHOTOGRAPHS

20A. GENERAL

Conduct all Work necessary to meet the requirements of this Section 20 (Photographs) and satisfy all functional needs and characteristics of the Project, including providing aerial imagery of the Project at each stage of construction and at all critical elements, and as the Design-Buider and Department deem necessary.

20B. STANDARDS

Complete Work related to Project photographs in accordance with the requirements of the standards listed by priority in Table 20B-1 (Standards for Photographs).

If there is any conflict in standards, adhere to the standard with the most stringent requirements.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification and Approval from the Department before proceeding with design and/or construction.

TABLE 20B-1
STANDARDS FOR PHOTOGRAPHS

Priority	*Author or Agency*	*Title*
1	UDOT	*Supplemental Specifications to 2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
2	UDOT	*2012 Standard Specifications for Road and Bridge Construction,* as modified by Part 5
3	UDOT	*Supplemental Drawings to 2012 Standard Drawings for Road and Bridge Construction*
4	UDOT	*2012 Standard Drawings for Road and Bridge Construction*

20C. REQUIREMENTS

20C-1 Progress Photographs

Take monthly aerial photographs of the Project Work and site to serve as Progress Photographs. Each time photos are taken, aerial photographs shall include all areas within the Project, whether temporary or permanent, and all other areas impacted. Prior to each photo event, obtain the Department's acceptance of the views to be taken and captured in the photos, and the approximate time of day when the photos will be taken.

Provide monthly a DVD or USB Drive containing a complete set of the aerial Progress Photographs. Provide the Department with one copy of the DVD or USB Drive. Aerial photographs shall be at least 16-by-24-inches at a resolution of 200 dots-per-inch taken with a digital single lens reflex (DSLR) camera having a minimum image sensor size of 15.4 megapixels. Provide all photographs in high-quality .jpeg format and label the file names with the approximate view and location (intersection) and the date the photos were taken.

20C-2 Pre-Construction Photographs and Video

Immediately after NTP, take a sufficient number of pre-construction photographs and a high-quality video of the Project site, including roadways, structures, drainage, adjacent buildings to the site, businesses, and all areas anticipated to be impacted by the Work, in high-definition format so as to resolve any disputes that may arise regarding the conditions prior to and subsequent to construction. Work with the CT (Communication Team) to obtain access to properties adjacent to areas impacted by th Work. Such preconstruction survey shall be completed prior to the start of construction in addition to the requirements of Part 4-06 (Geotechnical) and Part 5 (Special Provisions and Exceptions) Section 01727S – Preconstruction Survey.

If a dispute arises whether or not sufficient photographic or video evidence of the existing condition is available, the disputed area shall be restored to the extent directed by the Department at no additional cost to the Department.

20D. SUBMITTALS

Provide submittals to the Department in accordance with Table 20D-1.

TABLE 20D-1
DESIGN-BUILDER SUBMITTALS FOR ROADWAYS

Submittal	***For Approval***	***Schedule***
Progress photographs (Aerials)	No	With monthly Progress Report
Pre-construction photography	No	Prior to the start of construction

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS

PART 5:

SPECIAL PROVISIONS AND EXCEPTIONS

Final Issued September 15, 2016

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1. PRICE REDUCTIONS FOR NONCONFORMING WORK
2. DESIGN-BUILD SPECIAL PROVISIONS
3. ERRATA

1—PRICE REDUCTIONS FOR NONCONFORMING WORK

Unit prices for materials are not utilized in the payment structure of this Contract. However, unit prices are required to utilize the pay factors and/or daily pay adjustments identified in the Standard Specifications and Special Provisions of this Contract. Unit prices listed in Table 5-1 (Unit Prices for Determining Pay Adjustments for Nonconforming Work) shall be applied and used in the calculation of Pay adjustments per specification requirements. Other prices for price reductions not listed below shall be established.

TABLE 5-1:
UNIT PRICES FOR DETERMINING PAY ADJUSTMENTS FOR NONCONFORMING WORK

Material or Activity	*Standard Specification Section*	*Unit*	*Unit Price*	*Pay Adjustment Type*
1. Traffic Control	01554	Day per interchange	$2,500	Daily Deduction
2. Driven Piles	02455	Cubic Yard, of concrete in place	$400	Unit Price for Pay Factor
2a. Driven Piles	02455	Linear Foot, in place	$65	Unit Price for Pay Factor
3. Drilled Shafts	02466	Cubic Yard, of concrete in place	$400	Unit Price for Pay Factor
4. Portland Cement Concrete Pavement	02752	Square Yard, in place	$42	Unit Price for Pay Factor
5. Lean Concrete Base	02712	Square Yard, in place	$25	Unit Price for Pay Factor
6. Structural Concrete (Structurally designed elements – bridges, box culverts, etc.)	03310	Cubic Yard, of concrete in place	$500	Unit Price for Pay Factor
7. Structural Concrete (all other structural elements)	03310	Cubic Yard, of concrete in place	$400	Unit Price for Pay Factor
8. Portland Cement Concrete (un-reinforced concrete items)	03055	Cubic Yard, of concrete in place	$200	Unit Price for Pay Factor
9. Hot-Mix Asphalt (HMA)	02741	Tons, in place	$65	Unit Price for Pay Factor
10. Asphalt Material (Binder)	02745	Ton of HMA, in place	$75	Unit Price for Pay Factor
11. Prestressed Concrete	03412	Cubic Yard, of concrete in place	$750	Unit Price for Pay Factor
12. MSE Walls – Single Stage	02831S	Square Feet, in place. Includes backfill material	$60	Unit Price for Pay Factor
13. MSE Walls – Two Stage	02837S	Square Feet, in place. Includes backfill material	$70	Unit Price for Pay Factor
14. Pavement Marking Paint	02765	Gallons, in place	$25	Unit Price for Pay Factor
15. Untreated Base Course	02721S	Tons, in place	$18	Unit Price for Pay Factor

* Based on current specifications, pay adjustments for these materials are “hard dollar” calculations and are not based on a pay factor (i.e., some percentage of a unit cost). These items are eligible for incentives as well as disincentives/reductions.

2—DESIGN-BUILD SPECIAL PROVISIONS

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MOVE BRIDGE ..... to be issued at a later date

August 1, 2016

SECTION 01452S

PAVEMENT SMOOTHNESS

(International Roughness Index Specification)

Delete section 01452 and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Process and procedures for acceptance testing and determination of a minimum International Roughness Index (IRI) and Incentive/Disincentive for smoothness of Hot Mix Asphalt (HMA), Open Graded Surface Course (OGSC), Bonded Wearing Course (BWC), Stone Matrix Asphalt (SMA), Micro-Surfacing, Portland Cement Concrete Pavement (PCCP) and Portland Cement Concrete Pavement (PCCP) rehabilitation using a profiler approved and certified by the Department.

1.2 RELATED SECTIONS

A. Section 02735: Micro-Surfacing

B. Section 02741: Hot Mix Asphalt

C. Section 02742S: Project Specific Surfacing Requirements

D. Section 02744S: Stone Matrix Asphalt

E. Section 02752: Portland Cement Concrete Pavement

F. Section 02786: Open Graded Surface Course

G. Section 02787: Bonded Wearing Course

H. Section 02981: Grinding Pavement

1.3 REFERENCES

A. AASHTO R 43: Quantifying Roughness of Pavements

B. AASHTO R 54: Accepting Pavement Ride Quality When Measured Using Inertial Profiling Systems

C. AASHTO R 57: Operating Inertial Profiling Systems

D. UDOT Materials Manual of Instruction

E. AASHTO M 328: Inertial Profiler

1.4 DEFINITIONS

A. Category 1
   1. Newly constructed pavement surfaces having two or more opportunities for improving ride.

B. Category 2
   1. Newly constructed pavement surfaces without two or more opportunities for improving ride.

C. Opportunity to Improve Ride
   1. Placing Granular Borrow, Untreated Base Course, Treated Base Course, Open-Graded Surface Course (OGSC), Bonded Wearing Course (BWC), Stone Matrix Asphalt (SMA), Rotomilling, Cold-In-Place Recycling, Hot-In-Place Recycling, and each lift of paving.
   2. Lane leveling is not considered an opportunity to improve ride.

D. Pavement Section
   1. Each travel lane or median, 0.1 mile long, sections include:
      a. All traffic lanes
      b. Ramps
      c. Medians 8 ft and wider
      d. Turn lanes
      e. Bridges and approach slabs with final riding surfaces placed as part of the contract

   2. Each pavement section is laid out consecutively from the start of the project.

   3. Localized Roughness Criteria also applies to bike lanes and shoulders.

E. Wheel Path
   1. A continuous parallel line 2.5 ft inside the lane or median lines.

F. Mean Roughness Index (MRI)
   1. Average of two wheel path IRIs taken from each pavement section.

G. Localized Roughness
   1. Profile deviations in a continuous 25-ft pavement.

1.5 SUBMITTALS

A. Certifications for Profilers and Operators.

B. Summary report of acceptance profile testing for the project, including electronic file. Refer to AASHTO R 43.

C. Original raw data files compatible with the ASTM E2560 standard. Refer to AASHTO R 43.

1. Data files collected before corrective work
2. Data files collected for final acceptance

1.6 GENERAL REQUIREMENTS

A. Certify operators and equipment according to UDOT Materials Manual of Instruction 995.

B. Perform all work necessary to prepare the pavement for testing, including sweeping; this is incidental to the work and is not measured for payment.
   1. Seal asphaltic based pavements after corrective grinding.
   2. Include all costs and resources for smoothness testing, preparation, and correction, including traffic control, temporary pavement markings, grinding or milling, disposal of waste material, and flush coat for ground areas in the surfacing bid items.

C. Perform Independent Assurance testing with the Department as directed by the Engineer according to AASHTO R 54 *Verification Testing.*

1.7 ACCEPTANCE

A. The Department evaluates longitudinal deviations for all roadways using acceptance profiles performed by the Contractor.

   1. Determine IRI using the most recent version of Profile Viewer and Analysis (ProVAL) software. Refer to AASHTO R 54 and ASTM E2560. Areas of localized roughness will be identified using the ProVAL “Smoothness Assurance” analysis, calculating IRI with a continuous short interval of 25 ft [7.62 m] and the 250-mm filter applied.

   2. Determine MRI for each Pavement Section with 250-mm filter applied.

B. Limit transverse pavement deviations to less than 3/16 inch from the lower edge of a 10-foot straightedge.

C. Pavement smoothness is evaluated before and after corrective work. Final pavement smoothness acceptance is based on the final profile of all Pavement Sections of the project.

D. Limit localized roughness as specified in Section 02742S
   1. Include profile deviations from bridge decks, approach slabs and transitions, manholes, valves, and other facilities in the profile when the contract requires the adjustment, new construction or reconstruction of these facilities.
   2. Exclude profile deviations from bridge decks, approach slabs and transitions, manholes, valves, and other facilities in the profile when the contract does not include adjustment, new construction or reconstruction of these facilities.
   3. Limit profile deviations in shoulder or bike lane as specified in 02742S.

1.8 INCENTIVE/DISINCENTIVE

A. The Department applies Incentive/Disincentive for final smoothness to Category 1 pavement surfaces longer than 1,000 ft. Refer to Section 02742S.
   1. Prorate incentives/disincentives for partial pavement sections.
   2. Not eligible for incentives:
      a. Pavement requiring corrective action at the time of acceptance testing. Disincentives are based on the MRI obtained at the time of final acceptance re-testing.
      b. Non-PCCP Pavement Section where grinding exceeds 20 yd^2; disincentive remains applicable. The minimum disincentive for these pavement sections is $1,000 each.
      c. Pavements with grinding on the final surface of OGSC, BWC, and Microsurfacing.

B. The Department applies Incentive/Disincentive for Category 2 pavements according to Section 02742S.
   1. The department calculates the percent of improvement using the following formula:

$$\frac{MRI_o - MRI_f}{MRI_o} \times 100$$

Where:

MRI_o = MRI of original roadway surface
MRI_f = MRI of final corrected roadway surface

C. The Department does not apply Incentive/Disincentive to:
   1. Pavements shorter than 1,000 ft
   2. Shoulders
   3. Bike lanes
   4. Medians narrower than 8 ft
   5. Horizontal curves with a centerline curvature radius less than 900 ft and areas within the superelevation transitions to these short radius curves
   6. Tapers
   7. Surfaces within 15 ft of bridge decks and approach slabs not paved as part of the contract

PART 2 PRODUCTS

2.1 PAVEMENTS

A. Hot Mix Asphalt (HMA). Refer to Section 02741

B. Open Graded Surface Course (OGSC). Refer to Section 02786

C. Bonded Wearing Course (BWC). Refer to Section 02787

D. Stone Matrix Asphalt (SMA). Refer to Section 02744S

E. Micro-Surfacing. Refer to Section 02735

F. Portland Concrete Pavement (PCCP). Refer to Section 02752

2.2 FLUSH COAT

A. Tack coat. Refer to Section 02748

PART 3 EXECUTION

3.1 PAVEMENT PROFILE CORRECTION

A. Perform preliminary profiling and roadway smoothness evaluation to identify any defects exceeding acceptance limits.
   1. Correct defects before performing acceptance testing.
      a. Measure and correct localized roughness defects in the underlying surface before placement of the final OGSC, BWC, SMA, or Micro-Surfacing surface course.
      b. Correct localized roughness defects across lanes, medians, and shoulders in widths terminating at a lane line, edge of pavement, or center of the lane by grinding with a device approved by the Engineer. Refer to Section 02981
         1) Include areas not eligible for incentive/disincentive. Refer to this Section, article 1.8, paragraph. B,.
      c. Taper corrected areas for smooth transverse transitions and surface drainage.
      d. Re-profile for correction verification before acceptance testing.
      e. Seal corrected areas in BWC, OGSC, HMA, SMA, and Micro-Surfacing with a flush coat application.
         1) Apply the emulsion according to Section 02748 for tack coat.

3.2 ACCEPTANCE TESTING

A. Notify the Engineer in writing at least two working days before performing acceptance testing for pavement smoothness.
   1. After all corrective work has been performed
   2. Clearly define each of the pavement sections to be evaluated.

B. Perform acceptance testing for smoothness.
   1. Collect longitudinal profiles in each wheel path and in the center of each paved shoulder and bike lane using Department certified profilers and operators in accordance with AASHTO R 54, R57 and M328.
      a. Collect profiles with no filters applied.
   2. Determine the MRI for each Pavement Section
   3. Determine localized roughness using IRI.
   4. Submit a summary report to the Engineer within two working days that includes pavement section identification, profile results, and bump locations showing localized roughness corrections by pavement section.

3.3 PAVEMENT THICKNESS

A. Determine PCCP thickness after smoothness acceptance testing.

B. Re-test other pavements for thickness after grinding as directed by the Engineer.

END OF SECTION

March 30, 2015

SECTION 01554M

TRAFFIC CONTROL

Add Article 3.8:

3.8 NOTIFICATION OF LANE CLOSURES AND SUBSEQUENT OPENINGS

A. Provide advance notification of every lane closure on designated state Routes to the engineer.
   1. Notify the engineer as soon as it is known that a lane closure is necessary to execute the work and at a minimum, 72 hours before the closure.
   2. Notify the engineer immediately when the schedule, location, or need for an upcoming lane closure changes.
   3. Include in the notification the route, the beginning and ending milepost/mile marker, number of lanes to be closed, direction of the closure, the date and time of the beginning of closure, and the date and time of the ending of the closure.
   4. Notification of the engineer may be made in person or via email, phone call or text message.

B. Provide advance notice of every lane closure to third-party public involvement consultant for entry into UDOT Traffic Lane Closure system via UDOT Traffic website. Information should be provided to third-party public involvement consultant 72 hours prior to each closure.

   1. Refer to Section 01315.

C. Provide real-time notification of every lane closure, and subsequent lane opening, via UDOT Lane Closure mobile application. ***(Use iOS or Android smartphone;*** download instructions for app will be provided by UDOT.)
   1. **Lane Closure**: Confirm closure details via mobile application 30 minutes before placing the first traffic control device in the travel lane. *(Mobile application will generate a notification of the upcoming closure 45 minutes prior to scheduled start time; contractor accepts the closure to activate it, or cancels/reschedules the closure as needed.)*
   2. **Lane Opening:** Confirm lane reopening via mobile application 30 minutes prior to removing the last traffic control device in the lane. *(Mobile application will generate a notification 45 minutes prior to scheduled expiration of lane closure; contractor accepts the notification to confirm scheduled end time, or extends the closure as needed.)*
   3. **In the event mobile application is not working or unavailable: Call the TOC at (801) 887-3700** and provide information to activate, modify, or delete lane closure in the UDOT Traffic Lane Closure system. This call must be made 30 minutes prior to placing the first device in the travel lane, and 30 minutes prior to reopening the lane.

D. Include brief summary of lane closure notification plan in Traffic Control Plan narrative.

1. Lane closure notification plan

END OF SECTION

SECTION 01557S

MAINTENANCE OF TRAFFIC (MOT)

Add Section 01557:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. MOT Maintainer

B. Maintenance of Traffic (MOT) plans, Materials, and labor necessary for implementation.

C. Variable message signs and construction signs

1.2 RELATED SECTIONS

A. Section 00555: Prosecution and Progress

B. Section 01554: Traffic Control

C. Section 02891: Traffic Signs

1.3 REFERENCES

A. Manual on Uniform Traffic Control Devices, Latest Edition (MUTCD).

1.4 DEFINITIONS

A. Maintenance of Traffic (MOT): The work necessary to advise the public of changes to normal traffic flow, and to indicate planned detours and alternate routes to closed roads. Use solely as advisory information to the public.

1.5 SUBMITTALS

A. Daily inspection reports on a form acceptable to the Engineer.

B. Proposed MOT plan to the Engineer for approval if a construction phase is proposed that is not covered by a Department supplied MOT plan.
   1. Submit proposed MOT plan to the Engineer 10 working days before the proposed MOT plan is to be implemented.

1.6 POST-BID REQUIREMENTS

A. Department provides MOT plans to be implemented as part of the bid package.

B. Attend a mandatory meeting as detailed in Section 01554.

C. Attendees of the mandatory meeting will review the Contractor's submitted traffic control plans and the Department's supplied MOT plans for compatibility. Modify plans where necessary, as set forth in Section 01554.

D. Do not begin work on the project until written approval of the MOT plan is received from the Engineer. No item of work can begin until the approved MOT plan is implemented for that phase of work.

1.7 MOT MAINTAINER

A. The Traffic Control Maintainer, as specified in Section 01554 is responsible for maintenance of MOT on the project. The Department makes no separate payment for maintenance of MOT.

B. Inspect MOT devices daily for compliance with the MOT plans.

1.8 MAINTENANCE OF MOT DEVICES

A. Maintain traffic control devices per Section 01554.

1.9 WAGE RATES FOR TRAFFIC CONTROL PERSONNEL (FEDERAL AID JOBS ONLY)

A. Refer to Section 01554 for wage rate information.

1.10 PAYMENT PROCEDURES

A. Partial Payments - Based on the percentage of the project completed, excluding the cost of MOT.
   1. Failure to comply with any of the requirements of this special provision will result in non-compliance.

B. Price Adjustments:
   1. The Department reduces payment if the MOT implemented is not in compliance with the approved MOT plan, as determined by the Engineer.
   2. The amount per day by which the Contractor's compensation will be reduced is calculated using the greater of the following:
      a. The daily charge in the Schedule of Liquidated Damages found in Section 00555 or
      b. The Contract lump sum bid price for MOT divided by the number of Contract days.

C. Payment for change in scope: Negotiate a price adjustment for MOT if the Engineer orders a change in the scope of work that requires modification to the approved MOT Plan.

PART 2 PRODUCTS

2.1 SIGNS

A. Refer to Section 02891.

B. Use type and configuration as directed by the MOT plans.

2.2 VARIABLE MESSAGE SIGNS (VMS)

A. Advance warning device
   1. Conform to guidelines set forth in Section 6F.60 of the MUTCD.
   2. Messages can be changed on-site and by dial-up modem

PART 3 EXECUTION

3.1 MODIFICATION OF MOT PLANS

A. Engineer may modify the MOT plans at any time.

B. Implement changes to the MOT plan before the end of the work shift.

C. Each phase of construction must be covered by an approved MOT plan.
   1. Do not begin work until the proposed MOT plan is approved for use, and has been fully implemented.

3.2 TRAFFIC CONTROL DEVICES

A. Installation and Maintenance:
   1. Install appropriate devices for each construction phase as identified in the appropriate MOT plan.
   2. Maintain devices to provide proper, continuous functionality.
   3. Wash devices weekly unless conditions warrant more frequent cleaning.
   4. Replace any device missing any part of the message or background.

B. Channelizing Devices: Use as directed by the MOT plan.
   1. Furnish a daily record of the number and location of all traffic control devices in use.
   2. Remove devices from the site of work when they are not needed for the immediate control of traffic.

3.3 VARIABLE MESSAGE SIGN (VMS)

A. The Department retains control of messages appearing on the VMS. Do not change the location or the message configuration of the VMS unless directed to by the Engineer in writing.

B. Place in view of oncoming traffic without obstructing traffic flow. Relocate VMS to match field conditions at no additional cost to Department.

C. Provide dial-up modem number to the Engineer.

D. Use necessary traffic control devices with VMS to provide safe operation.

E. Remove devices from the site of work when they are not needed for the immediate control of traffic.

F. Unless directed by the Engineer, display advance notification VMS messages for a minimum of seven days prior to any traffic impacts such as start of work, change in traffic directions, etc. at each end of the project.

G. Make two additional VMS signs available at all times during the project to be used as directed by the Engineer at no additional cost to the Department.

3.4 COORDINATION OF SIGNAL OPERATIONS

A. Notify the Engineer seven days prior to implementing a MOT plan (detour plans and alternate route plans) or any traffic control plan that impacts signal operations to allow the Engineer to coordinate any necessary signal timing adjustments with the TOC (Traffic Operations Center).

B. Changes to traffic signal operations will be done by the Department.

END OF SECTION

July 8, 2016

SECTION 01727S

PRECONSTRUCTION SURVEY

Add Section 01727:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Procedures for documenting the existing condition of adjacent properties, prior to construction, in the areas defined under this specification.

B. Monitoring and control of vibrations adjacent to the project site that arises from soil compaction and other vibration-producing activities.

1.2 RELATED SECTIONS Not used

1.3 REFERENCES Not used

1.4 DEFINITIONS Not used

1.5 SUBMITTALS

A. Video surveys in electronic format with accompanying audio.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION

3.1 PRECONSTRUCTION SURVEY

A. Prior to start of work in any given section, perform an existing condition survey of all adjacent properties to document the existing conditions.

B. Accomplish the survey under the direct supervision of a Utah licensed professional engineer familiar with construction work and practices.

C. Gain permission from the property owner for access to private property to document preconstruction conditions.
   1. Send a certified, return receipt requested introductory letter (wording to be reviewed by the Engineer) to inform the property owner of the survey and to request permission to survey the existing conditions.
   2. If the property owner refuses access, notify the Engineer and log all contacts with the property owner.

C. For each property surveyed, document the following conditions:
   1. All foundations, exterior, walls, interior walls and ceilings of buildings clearly and precisely showing and describing any existing damage.
      a. Document the lengths and widths of any existing cracks.
   2. Retaining walls
   3. Driveways
   4. Sidewalks
   5. Swimming pools
   6. Parking lots, and other auxiliary structures that may be at risk of damage due to construction activities.

D. Include in the documentation for each property the date, time, street address, parcel number, and people performing the survey
   1 . Include the names of any owners or owners' representatives.

END OF SECTION

July 7, 2016

SECTION 02072S

GEOGRID

Add Section 02072:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Roadway, roadway embankment, and similar applications.

1.2 RELATED SECTIONS Not Used

1.3 REFERENCES

A. ASTM D 4354: Practice for Sampling of Geosynthetics for Testing

B. ASTM D 4355-05: Standard Test Method for UV and Weather Degradation

C. ASTM D 4759: Practice for Determining the Specification Conformance of Geosynthetics

D. ASTM D 5732-01: Standard Test Method for Determining Flexural Stiffness

E. ASTM D 5818: Practice for Obtaining Samples of Geosynthetics from a Test Section for Assessment of Installation Damage

F. ASTM D 6637: Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-rib Tensile Method

G. U.S. Environmental Protection Agency (U.S. EPA) EPA 9090: Compatibility Test for Wastes and Membrane Liners

H. GRI-GG2: Geosynthetic Institute Test for geogrids junction strength

1.4 DEFINITIONS

A. Geogrid – A biaxial polymeric grid formed by a regular network of integrally connected tensile elements with apertures of sufficient size to

allow interlocking with surrounding soil, rock, or earth to function primarily as reinforcement.

B. Minimum Average Roll Value (MARV) – Value based on testing and determined according to ASTM D 4759.

C. Multi-Layer Geogrid – A geogrid product consisting of multiple layers of grid which are not integrally connected throughout.

D. Traffic Benefit Ratio (TBR) is also known as Traffic Improvement Factor or TIF – A ratio comparing the performance of a pavement cross-section with a geogrid-reinforced base course to a similar cross-section without geogrid reinforcement, based on the number of cycles to failure with failure defined as a selected depth of rut.

E. True Tensile Strength – True resistance to elongation when initially subjected to load measured via ASTM D 6637 without deforming test materials under load before measuring such resistance or employing "secant" or "offset" tangent methods of measurement.

F. Welded Strip geogrid – A geogrid product formed by heat bonding (welding) discrete strips of polymer into a regular network.

G. Woven Geogrid – A geogrid product formed by weaving discrete strips of polymer into a network.

1.5 SUBMITTALS

A. Submit geogrid product sample approximately 4 inches by 7 inches or larger. Refer to ASTM D 4354.

B. Submit geogrid product data sheet and certification from the Manufacturer that the geogrid product supplied meets the requirements of this Section, Article 2.2 including Table 1.

C. Submit Manufacturer's installation instructions and general recommendations.

D. Submit the following to the Engineer at least 15 days before bid letting for alternate geogrid materials that do not meet the requirements of this Section, Article 2.2 including Table 1. The Engineer will respond within 10 days with a written justification to allow or disallow the requested alternate Geogrid. The Engineer will consult with the Region Pavement Design Engineer to decide on and approve the materials.

1. Full-scale laboratory and in-ground testing of pavement structures, in the United State, reinforced with the specific geogrid that quantifies the TBR or structural benefit of the product.
   a. Include full-scale independent research to substantiate the benefits of submitted research.
   b. The geogrid benefit must meet or exceed that of the design geogrid.
2. A list of five comparable projects that are similar in terms of size and application, are located in the United States, and where the results of using the specific alternate geogrid material can be verified after a minimum of five years of service life.
3. A sample 4 x 7 inches or larger.
4. Recommended installation instructions.
5. Additional information as requested by the Engineer to fully evaluate the product.

1.6 DELIVERY STORAGE AND HANDLING

A. Storage and Protection
   1. Prevent excessive mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to the geogrid materials.
   2. Store at temperatures above -20 degrees F (-29 degrees C).
   3. Rolled materials may be laid flat or stood on end.
   4. Do not expose geogrid materials to direct sunlight for a period longer than recommended by the manufacturer.

1.7 QUALITY ASSURANCE

A. Pre-Construction Conference
   1. The Contractor will arrange a meeting at the site with the geogrid material supplier and where applicable, the geogrid installer before the installation of the geogrid.
   2. Notify the Owner and the Engineer at least three days in advance of the time of the meeting.

B. A representative of the geogrid supplier must be available on an “as needed” basis during construction.

1.8 ACCEPTANCE

A. The Department rejects geogrid at installation if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transport, handling or storage.

PART 2 PRODUCTS

2.1 GENERAL

A. Synthetic fiber net at least 85 percent by weight of polypropylene, polyethylene, or polyester.

B. Resistant to chemical attack, rot, and mildew.

C. No tears or defects that will adversely alter properties of product.

2.2 ROADWAY AGGREGATE GEOGRID – SUBGRADE IMPROVEMENT

A. Geogrids are a regular network of integrally connected polymer tensile elements constructed with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil or rock.

B. Geogrids must also be dimensionally stable and able to retain their geometry under manufacture, transport, and installation.

C. Geogrids have the following properties:

Table 1

Geogrid Property Values for SUB-GRADE IMPROVEMENT Minimum Average Roll Values (MARV)					
Geogrid Properties	**Test Method**	**Type 1**		**Type 2**	
		Machine Direction MD[2]	**Perpendicular to Machine Direction XMD[2]**	**Machine Direction MD[2]**	**Perpendicular to Machine Direction XMD[2]**
Type of Geogrid		Punched and Drawn	Punched and Drawn	Punched and Drawn	Punched and Drawn
Rib Shape	Observation	Rectangular or Square	Rectangular or Square	Rectangular or Square	Rectangular or Square
Rib Thickness	Nominal Dimensions	Minimum - 0.03 inch	Minimum – 0.03 inch	Minimum - 0.05 inch	Minimum – 0.05 inch
Nominal Aperture Size	I.D. Callipered	1.0 - 1.3 inch	1.0 -1.3 inch	1.0 - 1.3 inch	1.0 - 1.3 inch
Tensile Strength@2% Strain	ASTM D 6637-09[1]	Minimum – 280 lb/ft	Minimum – 450 lb/ft	Minimum – 410 lb/ft	Minimum – 620 lb/ft
Tensile Strength@5% Strain	ASTM D 6637-09[1]	Minimum – 580 lb/ft	Minimum – 920 lb/ft	Minimum – 810 lb/ft	Minimum – 1340 lb/ft
Ultimate Tensile Strength	ASTM D 6637-09[1]	Minimum – 850 lb/ft	Minimum – 1300 lb/ft	Minimum – 850 lb/ft	Minimum – 1300 lb/ft
Junction Efficiency[3]	GRI-GG2-05	93%		93%	
Flexural Stiffness[4]	ASTM 5732-01	250,000 mg-cm		750,000 mg-cm	
Aperture Stability[5]	Army Corp of Engineer(Tensional Rigidity)	0.32 m-N/deg			
Resistance to Installation Damage[6]	ASTM D 5818-06, ASTM D 6637-09[1]	95 / 93 / 90 %AC/%SW/%GP		95 / 93 / 90 %AC/%SW/%GP	
Resistance to Long Term Degradation[7]	EPA 9090	100%	100%	100%	100%
Resistance to UV Degradation[8]	ASTM D4355-05	100%	100%	100%	100%

1. Resistance to elongation when initially subjected to load measured via ASTM D 6637 without deforming test materials under load before measuring such resistance or employing “secant” or “offset” tangent methods of measurement.
2. Unless indicated otherwise, values shown are minimum average roll values (MARV) determined in accordance with ASTM D 4759.
3. Load transfer capability determined according to GRI-GG2-05 and express as a percentage of the ultimate tensile strength.
4. Resistance to bending force determined according to ASTM D 5732-01, using specimens of width two ribs wide, with transverse ribs cut flush with exterior edges of longitudinal ribs (as a “ladder”) and of length sufficiently long to enable measurement of the overhang dimension. The overall Flexural Stiffness is calculated as the square root of the product of MD and XMD Flexural Stiffness value.
5. Resistance to in-place rotational movement measured by applying a 20 kg-cm(2m-N) moment to the central junction of a 9 inch X 9 inch specimen restrained at its perimeter according with the U.S. Army Corps of Engineers Mythology for measurement of Tensional Rigidity.
6. Resistance to loss of load capacity of structural integrity when subjected to mechanical installation stress in clayery sand (SC), well graded sand(SW) and crushed stone classified as poorly graded gravel(GP). The geogrids will be sampled according to ASTM D 5818-06 and load capacity will be determined according to ASTM D 6637-09.
7. Resistance to loss of load capacity or structural integrity when subject to Chemical aggressive environments according to EPA 9090 immersion testing.
8. Resistance to loss of load capacity or structural integrity when subject to 500 hours of ultraviolet light and aggressive weathering according to ASTM D 4355-05.

D. Acceptance Requirements:
   1. Base the actual minimum average roll values furnished by the manufacturer on representative test results from the manufacturing plant that produced the geogrid.
   2. Meet or exceed each of the specified minimum values.
   3. Clearly label all geogrids as being part of the same production run certified as meeting all applicable requirements.

PART 3 EXECUTION

3.1 GRANULAR BASE REINFORCEMENT

A. Place geogrid at the proper elevation and alignment as shown on the construction drawings.

B. Provide minimum overlap per manufacturer's recommendations.

C. Install geogrid according to the guidelines provided by the manufacturer or as directed by the Engineer.

D. Geogrid may be temporarily secured in place with ties, staples, pins, sand bags, or backfill as required by fill properties, fill placement, weather conditions, or as directed by the Engineer.

E. Place, spread, and compact granular fill material in such a manner that minimizes the development of wrinkles in or movement of the geogrid.

F. Replace at no additional cost to the Department any roll of geogrid damaged before, during, or after installation.
   1. Proper replacement consists of replacing the affected area and overlapping the geogrid one foot on all sides adjacent to the damaged area.
   2. Follow ASTM D 5818 for exposure and retrieval damages done during installation of evaluation samples.

3.2 PROTECTION

A. A minimum loose fill thickness of six inches is required before operation of tracked vehicles over the geogrid.
   1. Keep the turning of tracked vehicles to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
   2. Rubber-tired equipment may pass over the geogrid reinforcement at slow speeds (less than 10 mph) when integrally-formed geogrids are used if subgrade conditions permit.

3. Do not use rubber-tired equipment directly on the geogrid when woven, multi-layer, or welded strip geogrids are used.
4. Avoid sudden braking and sharp turning movements.

END OF SECTION

January 12, 2012

SECTION 02216S

POTHOLE UTILITY

PART I GENERAL

1.1 SECTION INCLUDES

A. Procedure for pot holing utilities during construction activities.

1.2 RELATED SECTIONS

A. Section 01721: Survey

1.3 REFERENCES

A. CI/ASCE 38-02: Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS Not Used

PART 2 PRODUCTS Not Used

PART 3 EXECUTION

3.1 PREPARATION

A. Locations of utilities shown on the plans are approximate and based only on a record search by local controlling agencies and are for general guidance.

B. Use potholing to verify location, elevation and type of existing buried utilities.

C. Contact Blue Stakes before excavating or potholing.

D. Pothole locations of possible conflicts including excavation, pipe culvert extensions, catch basins, and other construction as requested by the Contractor or as directed by the Engineer in writing.

E. Use vacuum excavation or other methods that protect the integrity of the potholed utility.

F. Cooperate with the utility companies to protect their facilities.

G. Adhere to OSHA health and safety practices

H. Request potholing in writing from the Engineer at least 21 calendar days before potholing. Inform the Engineer 24 hours prior to any pothole. Pothole and backfill utility in the presence of the Engineer.

3.2 RECORDS

A. Record coordinates of elevation and horizontal position, owner, material, size, number of ducts, casings and any other information relevant to identifying and establishing utility.

B. Provide written documentation to the Engineer within 72 hours of potholing. Tie all coordinates and benches into the project coordinate system.

3.3 RESPONSIBILITY OF DAMAGED UTILITY

A. The Contractor is solely responsible for any damage to utility facilities resulting from pothole operations. In the event of utility damage, stop work and immediately notify the appropriate agencies, including the utility owner. No compensation for any delays to the project schedule resulting from damages, repair time, materials or any other circumstance due to damages will be made.

3.4 BACKFILL AND CLEAN-UP

A. Backfill potholed utility according to utility owner's specifications when outside of roadway prism. If pothole is within the roadway prism, then backfill according to the most restrictive of either the Department's or the utility owner's specifications. Backfill within 24 hours or as otherwise directed.

B. Backfill potholed utility to the same depth and materials of surrounding pavement or terrain.

C. Provide complete cleanup of the work to equal or better condition than existing prior to potholing.

END OF SECTION

July 7, 2016

SECTION 02332S

LIGHTWEIGHT AGGREGATE BORROW

Add Section 02332:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Supply lightweight aggregate borrow consisting of scoria, pumice, expanded shale, or steel slag for use in roadway embankments. Haul, place, and compact in accordance with these specifications.

B. Obtain material from a qualified source that has been tested to meet the specified requirements and Utah State Environmental Laws for embankment fill.

1.2 RELATED SECTIONS

A. Section 02056: Embankment, Borrow and Backfill

B. Section 02075: Geotextiles

1.3 ACCEPTANCE

A. Provide the Department a certified test report from the material supplier, showing all data required to indicate compliance with the specifications.

B. The Department or its designated representative may sample and/or test any portion of lightweight aggregate borrow that appears non-uniform or non-conforming.

C. Reject any fill product that does not meet requirements of this section.

D. Remove any product found defective after installation and install acceptable product at no additional cost to the Department.

1.4 QUALITY CONTROL

A. The Department or its designated representative will monitor conformance of the lightweight aggregate borrow with the specification requirements.

B. Remove products found defective after installation and install acceptable products at no additional costs to the Department.

1.5 SUBMITTALS

A. Submit technical information (both physical and chemical) to the Department that clearly demonstrates that the proposed material can withstand exposure to the elements without a loss of integrity over a minimum period of 75 years.

PART 2 PRODUCTS

2.1 PUMICE

A. Lightweight aggregate borrow consisting of pumice.

B. Chemically inert, durable, and free draining.

C. Target compacted moist density: 75-85 pounds per cubic foot (pcf)

D. Meet the following gradation:

Table 1

Sieve Size	Percent Passing
4 inch	100
1 ½ inch	80-100
3/8 inch	50-100
No. 4	10-90
No. 16	0-65
No. 50	0-40
No. 200	0-15

2.2 SCORIA

A. Lightweight aggregate borrow consisting of scoria.

B. Chemically inert, durable, and free draining.

C. Target compacted moist density: 62-75 pcf.

D. Meet the following gradation:

Table 2

Sieve Size	Percent Passing
3 inch	100
1 ½ inch	80-100
3/8 inch	40-100
No. 4	10-70
No. 16	0-40
No. 50	0-25
No. 200	0-15

2.3 STEEL SLAG

A. Lightweight aggregate borrow consisting of steel slag.

B. Chemically inert, durable, and free draining.

C. Target compacted moist density: 85-100 pcf

D. Meet the following gradation:

Table 3

Sieve Size	Percent Passing
3 inch	100
1 ½ inch	80-100
3/4 inch	20 – 100
3/8 inch	0 – 20
No. 4	0 - 10
No. 200	0 - 3

2.4 EXPANDED SHALE

A. Lightweight aggregate borrow consisting of expanded shale, clay, or slate.

B. Chemically inert, durable, and free draining.

C. Target compacted moist density: 50-70 pcf

D. Meet one of the following gradations:

Table 4

Sieve Size	Percent Passing	
	Coarse	Medium
3 inch	100	
1 inch	70-100	
3/4 inch	55-100	100
3/8 inch	40-100	80-100
No. 4	0-30	0-30
No. 50	0-15	0-15
No. 200	0-8	0-8

2.5 SEPARATION GEOTEXTILE

A. See Section 02075.

PART 3 EXECUTION

3.1 GENERAL

A. Do not extend lightweight aggregate borrow into the untreated base course. Cover side-slopes consisting of lightweight aggregate borrow in accordance with the landscape plans.

B. Cover the final surface of the lightweight aggregate borrow with Separation Geotextile.

3.2 TEST FILL PROCEDURES

A. Prior to using the material on the project, construct a test fill that is at least 30 feet by 60 feet in plan and 5 feet high using the lightweight aggregate material.

B. Place the material as specified in Article 3.3 and compact to a target moist unit weight equal to 96 percent of the maximum laboratory density as determined by AASHTO T-99.

C. Compact the test lifts with various numbers of passes with a small vibratory drum roller (such as a Cat CS-433C), at low amplitude; or a medium vibratory drum roller (such as a Cat CS- 563C), at low amplitude.

D. The Department will evaluate and approve the test fill to determine the production compaction methods to be used for the material.

3.3 CONSTRUCTION PROCEDURES

A. Place the lightweight aggregate borrow in uniformly thick lifts with a maximum loose thickness of 12 inches.

B. Place steel slag or scoria lightweight aggregate borrow at a moisture content high enough to obtain compaction while remaining below the maximum allowable average compacted moist in-place density.

C. Do not add any moisture to lightweight pumice aggregate, unless specifically approved by the Engineer.
   1. Cover stockpiles of pumice aggregate and keep covered during periods of anticipated significant precipitation.

E. Compact the lightweight aggregate using either smooth-drum vibratory, or track-mounted equipment having an operating weight no greater than 13 tons.
   1. Implement necessary measures to avoid crushing the aggregate.
   2. If crushing occurs, adjustments to the compaction equipment, lift thickness, and/or the number of passes may be required.

E. Conduct in-place density testing as described in Article 3.5.
   1. Average in-place moist density: no greater than the maximum target compacted moist density for the lightweight aggregate borrow supplied, unless approved by the Department.
   2. Maximum in-place moist density in a single area: no more than 2 pcf greater than that specified maximum target compacted moist density.

F. If test results show moist densities less than the minimum target compacted moist density for the lightweight aggregate borrow supplied, the results will be evaluated by the Department.

3.4 COMPACTION TESTING EQUIPMENT CORRECTION FACTOR

A. Perform density calibration testing on the lightweight aggregate borrow prior to use to determine accuracy and possible adjustment factors to be used for nuclear density testing of the lightweight material densities during production placement.
   1. The testing will consist of the Contractor constructing a box of known capacity (at least 13 cu ft, such as 3 x 3 x 1.5 ft) and compacting the lightweight aggregate into the box at varying compactive efforts as requested by the Department.
   2. The Department will conduct direct transmission density tests with the nuclear densometer gage for at least five locations in the box.
   3. At each test location, three readings will be taken by rotating the gage by 120 degrees between each reading.
   4. The readings given by the nuclear densometer gage be compared with the known weight of the material in the box to identify an appropriate correction factor for that (each) specific gage.
   5. A densometer gage that thas been calibrated by the above procedure will be used to calibrate additional gages by comparative testing in the same lightweight aggregate material.

3.5 COMPACTION TESTING PROCEDURES

A. Use a densometer gage that has a known correction factor for the lightweight aggregate borrow supplied in the direct transmission method to test the density of the compacted production material.
   1. Wherever possible, extend the densometer probe a minimum of 12 inches.
   2. Do not use backscatter to evaluate the density of the compacted material.

B. Testing frequency will be as a minimum, in accordance with Section 02056.
   1. Perform testing to represent the entire vertical extent of the lift.

C. The maximum allowable variation in moist density within a single lift at any one site is 8 pcf for the lightweight aggregate borrow.

END OF SECTION

July 8, 2016

SECTION 02334S

EPS GEOFOAM FILL

Add Section 02334:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials for furnishing, fabricating, and placing expanded polystyrene (EPS) "Geofoam" fill.

1.2 RELATED SECTIONS

A. Section 02056: Embankment, Borrow, and Backfill

B. Section 02231: Site Clearing and Grubbing

C. Section 03211: Reinforcing Steel and Welded Wire

D. Section 03310: Structural Concrete

E. Section 03924: Structural Concrete Repair and Sealing

1.3 REFERENCES

A. ASTM D 751 Standard Test Methods for Coated Fabrics

B. ASTM D 814 Standard Test Method for Rubber Property-Vapor Transmission of Volatile Liquids

C. ASTM D 1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics

D. ASTM D 2136 Standard Test Method for Coated Fabrics—Low-Temperature Bend Test

E. ASTM D 6817 Standard Specification for Rigid Cellular Polystyrene Geofoam.

1.4 SUBMITTALS

A. Submit working drawings and design calculations to the Engineer for approval, prepared and signed by a licensed professional engineer (referred to as the EPS engineer), for the EPS geofoam fill and load distribution slab construction.

B. Include plans, profiles, cross-sections, quantities, and details that address the following:
   1. Locations, types, and minimum compressive resistance of EPS geofoam used.
   2. A cast-in-place concrete load distribution slab.
      a. Do not use a precast load distribution slab without prior written approval from the Department.
   3. Provisions for facilities which penetrate the EPS geofoam blocks and load distribution slab (including, but not limited to, drainage catch basins, piping, utilities, and other buried facilities).
   4. Gradual transitions (at slopes no steeper than 4H:1V) between EPS geofoam fill and other embankment fill.
   5. Methods, sequence, and equipment for placing the EPS geofoam blocks and load distribution slab.
   6. Methods of providing continuity across horizontal and vertical planes.
   7. Other applicable protective measures.

C. Allow up to three weeks for the Engineer's review. Within this time, the Engineer will provide either written acceptance of the submittals, with any exceptions noted, or notification the submittals are insufficient.
   1. Upon receiving notification the submittals are insufficient, provide new submittals and allow another two-week period for the Engineer's review.
   2. Do not start EPS geofoam fill and load distribution slab construction prior to receiving full written acceptance by the Engineer.
   3. Working drawings do not supersede the contract drawings.

D. Provide the Engineer with a certified test report from the manufacturer showing all data required to indicate compliance with specifications.

E. Submit a quality assurance plan for testing EPS geofoam blocks to the Engineer.

F. Material Submittals
   1. EPS Geofoam
      a. Provide certification as directed in Specification ASTM D 6817.
      b. Submit sampling and testing results to the Engineer for approval.
   2. Hydrocarbon-resistant Geomembrane
      a. Provide certificate of compliance stating that the hydrocarbon-resistant geomembrane has been tested and satisfies the requirements of this specification.
   3. Structural Concrete
      a. Refer to Section 03310.
   4. Reinforcing Steel and Welded Wire
      a. Refer to Section 03211.

1.5 SAMPLING AND TESTING

A. Complete quality assurance testing and sampling to monitor the conformance of EPS geofoam blocks to the specification requirements.

B. Conduct compressive resistance testing per ASTM D 6817.

C. The Engineer has the right to randomly sample EPS geofoam blocks and reject EPS geofoam blocks that do not conform to the physical requirements or that are damaged in any way.

D. Conduct field sampling to ensure dimensional tolerances and density at regular intervals as directed by the Engineer.

1. Conduct quality control testing for density and geometry using full-sized EPS geofoam blocks.
2. Only use EPS geofoam blocks in conformance with contract requirements for construction.
3. Test and evaluate EPS geofoam block quality and stability prior to shipment of the first EPS geofoam block delivery to the project site.
    a. Test a minimum of 10 samples per 500 cubic yards of material.
    b. Testing can be performed with either a 2-inch by 2-inch by 2-inch cube or a 12-inch by 12-inch by 12-inch cube.
    c. Use ASTM D 1621 to test and evaluate product stability.
    d. Take ten samples from every delivery for the first 15 trucks.
    e. If all samples tested from the first 15 trucks meet the specifications, the Engineer may approve a reduction of the testing frequency to one batch of 10 samples every 500 cubic yards of the material remaining to be delivered.

PART 2 PRODUCTS

2.1 MATERIALS

A. Geofoam

1. Fabricate EPS geofoam blocks using virgin feedstock manufactured into blocks having no more than five percent regrind content.
2. Use EPS geofoam blocks with the following minimum dimensions:
    a. 36 inches high
    b. 48 inches wide
    c. 144 inches long
    d. These are typical minimum dimensions for blocks within the EPS geofoam mass, and may be altered in the working drawings to account for vertical and horizontal geometry on the edges of the geofoam fill.
3. Use EPS geofoam blocks that meet the requirements of ASTM D 6817.
4. Provide EPS geofoam blocks that have the minimum compressive resistance shown on the plans.

5. Use EPS geofoam blocks with flame retardant additives that meet or exceed UL Certifications of Classification as to External Fire Exposure and Surface Burning Characteristics.
6. Use EPS geofoam blocks treated to prevent insect attack as directed by the manufacturer and as approved by the Engineer.

B. Geofoam Design
1. Design each EPS geofoam fill embankment to behave as a single entity during a seismic event.
2. Provide continuity across continuous horizontal and vertical planes.
3. Design and detail shear keys in the working drawings.
   a. This may be accomplished by offsetting blocks within the fill.

C. Hydrocarbon-Resistant Geomembrane
1. Provide geomembrane acceptable for spill containment of hydrocarbons including automobile gasoline, diesel fuel, concrete curing compound, coal tar pitch, asphaltic mastic compound, kerosene, hydraulic fluid, methanol ethanol, mineral spirits and naphtha.
2. Provide geomembrane free from pinholes, tears, and other defects which would cause leakage of liquids through the geomembrane.
3. Provide geomembrane that is flexible and, by its own weight, covers and conforms closely to 90 degree edges and corners of geofoam blocks at ambient temperatures above 45 degrees Fahrenheit without additional heating of the geomembrane.
4. Provide geomembrane that is reinforced or unreinforced.
5. Provide geomembrane manufactured from a tri-polymer of polyvinyl chloride, ethylene interpolymer alloy, and polyurethane or a comparable polymer combination.
6. Provide geomembrane that meets the following physical and chemical requirements:

Table 1

Test Designation	Property	Allowable	Comments
ASTM D 751	Thickness	> 28 mills	
ASTM D 814	Transmission rate	< 0.4 ounces per square foot per 24 hours	
ASTM D 751	Grab tensile strength	> 600 lbs	2 inch grip, 4 inch by 8 inch sample
ASTM D 751	Elongation at break	> 20%	
ASTM D 751	Puncture resistance	> 800 lbs	
ASTM D 2136	Cold crack	No cracking for 4 hours at 30 degrees Fahrenheit	
ASTM D 751	Bonded seam width	> 2 inches	
ASTM D 751	Shear	> 320 lbs	Modified per National Sanitation Foundation Standard 54

7. Replace, at no additional cost, all damaged geomembrane.

2.2 QUALIFICATIONS

A. Use geofoam provided by a manufacturer demonstrating experience in manufacturing EPS geofoam blocks similar to those indicated in the contract documents, a successful record of in-service performance, and sufficient production capacity to produce the required quantity.

B. Use an installer with experience in the installation and handling of EPS geofoam on a minimum of three projects of similar scope within the past five years.

C. Use an EPS engineer having experience in the design and installation of EPS on a minimum of three projects of similar scope within the past five years.

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

A. Clear and grub site per Section 02231. Remove soft or unstable soil and soil particles or rock larger than coarse gravel.

B. Excavate as shown on the plans. Grade to elevations shown on the plans with vertical deviations no greater than 0.4 inches in 10 feet.

C. Remove any standing water or accumulations of snow or ice before placing EPS geofoam blocks.

3.2 PLACE STRUCTURAL FILL

A. Place, compact, and grade 8 inches minimum thickness of granular backfill borrow per plans and Section 02056.

B. Level granular backfill borrow material to plus or minus 1/4 inches vertical per 10 feet horizontal.

3.3 PROTECTION

A. Prevent damage to the EPS geofoam blocks during storage and construction per manufacturer's recommendations and as directed by the Engineer.

B. Care for and handle EPS geofoam blocks per manufacturer's specifications and as directed by the Engineer.

C. Cover any EPS geofoam block that will be exposed to the sun for more than 90 days with opaque material.

D. Protect EPS geofoam blocks from petroleum based solvents such as gasoline or diesel fuel.

E. EPS is considered combustible and should not be exposed to open flame or any ignition source.

F. Correct damage to EPS geofoam blocks as follows, unless otherwise recommended by the EPS engineer and approved by the Engineer:
   1. Slight Damage - Leave in place any EPS geofoam blocks damaged less than 17 cubic inches with no linear dimension greater than 1 foot.
   2. Moderate Damage - Fill with sand any EPS geofoam blocks damaged less than 50 cubic inches with no linear dimension greater than 3 feet 4 inches.
   3. Replace any EPS geofoam block with damage exceeding the Moderate Damage level.
   4. Damaged EPS geofoam blocks may be cut and the undamaged portion used within the EPS geofoam fill, provided the undamaged portion of the EPS geofoam block meets all other requirements.

G. Address safety implications of slippery EPS geofoam surfaces that may occur during wet or cold conditions during construction.

H. Place hydrocarbon-resistant geomembrane in such a way that the EPS geofoam blocks are not damaged.

I. Do not allow construction equipment or vehicles directly on the EPS geofoam blocks or the hydrocarbon-resistant geomembrane.

J. Provide temporary weighting or guying such to temporarily restrain EPS geofoam blocks against wind.

3.4 PLACEMENT

A. Place EPS geofoam fill to the lines and grades as shown in the plans and as directed by the Engineer.

B. Trim all EPS geofoam blocks in the shop as necessary so that all surfaces are smooth and flat and are within tolerance of 0.5% of respective height, width, and length dimensions.

C. Trim in the shop or the field as necessary to match the geometry of the fill being constructed.

D. Construct rows of EPS geofoam blocks that are to receive additional EPS geofoam blocks with a surface variation tolerance of no more than 0.05 feet in any 10-foot interval.

E. Accurately fit adjacent EPS geofoam blocks within a tolerance of 1 inch per vertical joint.

F. Step EPS geofoam fill finished grade a maximum of 2-foot intervals.

G. Trim EPS geofoam blocks in the shop or in the field to construct a 3:1 slope between steps at the top of the EPS geofoam fill finished grade.

H. Use a saw or hot wire to trim EPS geofoam blocks. Alternative cutting methods may be used with approval of the EPS manufacturer.

I. Place final course of EPS geofoam blocks to a finished grade tolerance of plus 0 inches to minus 2 inches over the entire surface.

J. Place each consecutive rows of EPS geofoam blocks rotated 90 degrees in the horizontal plane from the previously placed row to form 2 feet minimum running bond offset.

K. Consecutive vertical joints less than 2 feet apart are not allowed with the exception of the vertical joints at the phasing line shown in the plans.

L. Do not place EPS geofoam blocks on frozen subgrade.

M. Do not place EPS geofoam blocks above EPS geofoam blocks on which ice has developed on the surface.

N. Do not place EPS geofoam blocks when wind speeds exceed 40 mph.

O. Reinforcing steel supports (dobies) are permissible to support reinforcing steel during construction of load distribution slab with approval by the Engineer.

P. Do not use “gripper plates” or steel plates that pierce the EPS geofoam blocks during construction.

3.5 CAST-IN-PLACE LOAD DISTRIBUTION SLAB

A. Construct load distribution slab per Section 03211, Section 03310, and as shown in the roadway plans and/or EPS Geofoam working drawings.

B. Seal all cracks per Section 03924.

END OF SECTION

July 8, 2016

SECTION 02342S

SHOTCRETE

Add Section 02342:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and procedures for producing shotcrete.

1.2 RELATED SECTIONS

A. Section 03055: Portland Cement Concrete

B. Section 03211: Reinforcing Steel and Welded Wire

C Section 09981: Concrete Coating

1.3 REFERENCES

A. AASHTO M 6: Standard Specification for Fine Aggregate for Hydraulic Cement Concrete

B. AASHTO M 80: Standard Specification for Coarse Aggregate for Hydraulic Cement Concrete

C. AASHTO T 11: Standard Method of Test for Materials Finer Than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing

D. AASHTO T 23: Standard Method of Test for Making and Curing Concrete Test Specimens in the Field

E. AASHTO T 24: Standard Method of Test for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

F. AASHTO T 27: Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates

G. AASHTO T 96: Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

H. AASHTO T 121: Standard Method of Test for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

I. AASHTO T 141: Standard Method of Test for Sampling Freshly Mixed Concrete

J. AASHTO T 152: Standard Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method

K. AASHTO T 196: Standard Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method

L. ACI 506R: Guide to Shotcrete

M. ACI 506.2: Specifications for Proportioning Application of Shotcrete

N. ASTM C 1077: Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation

O. ASTM C 1140: Standard Practice for Preparing and Testing Specimens from Shotcrete Test Panels

1.4 DEFINITIONS

A. Shotcrete: Mortar or concrete pneumatically projected into a surface at high velocity.

B. Dry-mix process: Shotcrete in which most of the water is added at the nozzle.

C. Wet-mix process: Shotcrete in which plastic concrete with cement, aggregate, and water are first mixed together before introduction into the delivery hose.

D. Lean or separated shotcrete: Condition in which voids (honeycomb) in the shotcrete binder are visible on a shotcrete surface.

E. Fiber-reinforced shotcrete: Shotcrete mixed with discrete discontinuous fibers commonly made of steel, plastic, or alkali-resistant glass.

F. Rebound: Shotcrete constituents that fail to adhere to the surface on which the shotcrete is being applied.

G. Overspray: Shotcrete material deposited away from the intended receiving surface by air blast.

H. Gun finish: Undisturbed final layer of shotcrete as applied from nozzle without hand finishing; also known as natural or nozzle finish.

I. Primary support: Soil nails, welded wire mesh, reinforcing steel, or shotcrete or any combination thereof, installed in any excavation that renders the excavated space.

J. Additives: Any material added to the basic constituents (cement, water aggregates) of shotcrete mix. Additives may include fibers, admixtures, and cement extenders. They may be added before or during mixing, or immediately prior to shotcrete application.

K. Nozzle operator: Worker on shotcrete crew who manipulates the nozzle, controls consistency of dry-mix shotcrete, and controls final disposition of the material.

1.5 SUBMITTALS

A. Submit shotcrete mix design with mix proportions; aggregate source and grading; cement type and brand; and water source. If hydration stabilizing/extended-set admixtures are proposed, provide type, dosage, and discharge time limit.

B. Submit compressive test results for the proposed mix design using the intended wet-mix or dry-mix process, 30 calendar days prior to the start of work.

C. Submit compressive test results and core grades from test panels within 5 calendar days of core removal from field.

1.6 ACCEPTANCE

A. Based on visual inspection, quality control testing, and materials certifications.

B. Perform quality control testing in accordance with Table 1.

C. Shotcrete compressive strengths meet criteria for shotcrete mix design.

Table 1

Sampling and Testing Schedule			
Property or Characteristic	**Test Methods or Specifications**	**Frequency**	**Sampling Point**
Air Content	AASHTO T 152 or AASHTO T 196	1 per load[1]	Truck, mixer, or agitator[2]
Unit Mass	AASHTO T 121	1 per load[1]	Truck, mixer, or agitator[2]
Compressive Strength	AASHTO T 23	1 set per 50 cy; at least one set per day	Production test panels[3]

[1]When continuous mixing is used, sample every 10 cy.
[2]Sample according to AASHTO T 141.
[3]A single compressive strength test result is the average result from two 3-inch diameter core specimens from the same test panel tested according to AASHTO T 23 at 28 days.

C. Shotcrete that has been damaged by frost, or which lacks uniformity, exhibits segregation, honeycombing, lamination with a shotcrete stage, shows excessive cracking or fails to meet the strength and toughness requirements specified herein is considered defective.
   1. Remove and replace defective shotcrete unless the Engineer indicates otherwise.

D. If samples are taken from the structure, the patch areas used for sampling and testing for compressive strength and other properties immediately after samples have been removed.

E. Test Panels.
   1. Produce a test panel for every 50 cubic yards of each different shotcrete mix placed.
   2. Meet ASTM C 1140 Standard Practice for Preparing and Testing Specimens from Shotcrete Test Panels.
   3. Construct test panels in the same manner as that being used on the project, including distance from nozzle, angle and orientation.
   4. Cure test panels in similar conditions to those anticipated in the field
   5. Field cure test panels until test specimens are taken.

F. Field Compressive Strength.

1. The field compressive strength will be determined from at least three test specimens from each test panel in accordance with ASTM 1140.
2. Remove the test specimens at no more than 26 calendar days age and at an age approved by the Engineer.
3. The test specimens will be cylindrical cores with a diameter of 2 inches, stored in watertight plastic bags and labeled with the project number, test panel number and date of placement.

PART 2 PRODUCTS

2.1 AIR-ENTRAINING ADMIXTURE (WET MIX ONLY)

A. Refer to Section 03055.

B. Air entrainment not to exceed 4% as shot, and 8 to 10% at the pump.

2.2 CHEMICAL ADMIXTURE (WET MIX ONLY)

A. Refer to Section 03055

2.3 BLENDED HYDRAULIC CEMENT

A. Refer to Section 03055

2.4 POZZOLANS

A. Refer to Section 03055

2.5 AGGREGATE

A. Conform to the mix design for a mortar or small-aggregate concrete meeting the minimum compressive strength requirements.

PART 3 EXECUTION

3.1 SHOTCRETE GENERAL REQUIREMENTS

A. Conform to the following:
1. ACI 506R: Guide to Shotcrete
2. ACI 506.2: Specifications for Proportioning Application of Shotcrete
3. Section 03055

3.2 MIX DESIGN

A. Conform to Table 2.

Table 2

Shotcrete Composition				
Type of Shotcrete Process	**Minimum Cement Content**	**Maximum W/C[1] Ratio**	**Air Content Range**	**Minimum 28-day Compressive Strength[2]**
Units	**lb/cy [2]**	**-**	**%**	**psi**
Wet	550	0.55	NA	4,000
Dry	550	0.50	NA	4,000
Wet (with EA)	550	0.45	5 min.	4,000
Dry (with EA)	550	0.45	5 min.	4,000

[1]Water/Cement by weight
[2]According to AASHTO T 23. Mean compressive strength of three cube samples, with no single result less than 0.88 x 4,000 psi. If cores are tested, mean compressive strength of 0.85 x 4,000 psi required, with minimum value of 0.75 x 4,000psi.
NA = Not applicable
EA = Entrained air

B. Use the amount of water required to produce shotcrete of suitable strength, consistency, quality, and uniformity with the minimum amount of rebound.

C. Use the same material types and sources as submitted with the mix design in the field trials and production work.

D. Hydration stabilizing admixtures
   1. Allowed to extend shotcrete delivery time
   2. Base dosage on time needed to delay initial shotcrete set for delivery and discharge on the job
   3. Determine dosage using job site material and field trial mixtures
   4. Extended-set admixture controls the hydration of all cement minerals and gypsum
   5. Deliver and place shotcrete mix within the approved design discharge time limit.
   6. If required, use an approved and compatible hydration activator at the discharge site to insure proper placement and testing.

E. When requested, provide the service from a qualified representative of admixture manufacturer to assist in establishing proper dose of extended-set admixture and to make dosage adjustments required to meet changing job site conditions.

3.3 TEST PANELS

A. Successfully construct test panels prior to starting shotcrete production.

B. Notify the Engineer and allow the Department to witness all phases of test panel construction.

C. Produce test panels for each proposed mix design, each anticipated shooting orientation, and each proposed nozzle operator.

D. In half of the test panels, provide reinforcement of the same size and spacing required for the work.

E. Forms and Construction
   1. Construct wood forms for test panel at least 6-inch thick by 3 ft by 3 ft in size.
   2. Construct separate wood forms for reinforced and unreinforced test panels.

F. Testing
   1. Drill 6 3-inch diameter cores, 3 reinforced and 3 non-reinforced, from each test panel according to AASHTO T 24 to make cylinders at least 3-inch long.
   2. Test the non-reinforced samples for compliance with the specified physical properties in accordance with AASHTO T 23.
   3. Visually grade the reinforced cores for compliance with specified core grade in ACI 506.2 Part 1.7.
   4. Only nozzle operators with a test panel mean core grade less than or equal to 2.5 may place shotcrete. If not initially achieved, a proposed nozzle operator may shoot a second set of test panels.
   5. Satisfy all specified strength requirements.

G. The Engineer will accept or reject the shotcrete mix design based on the results of the test panel construction and testing.
   1. The Department may require additional test panel construction and testing at no additional cost.

END OF SECTION

July 8, 2016

SECTION 02455S

DRIVEN PILES

Delete Section 02455 and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials, equipment and procedures for driving steel piles.

1.2 RELATED SECTIONS

A. Section 03055: Portland Cement Concrete

B. Section 03211: Reinforcing Steel and Welded Wire

1.3 REFERENCES

A. AASHTO M 31: Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

B. AASHTO M 270: Structural Steel for Bridges

C. ASTM A 252: Welded and Seamless Steel Pipe Piles

D. ASTM D 4945: High Strain Dynamic Testing of Piles

E. AASHTO/AWS Welding Specifications

1.4 DEFINITIONS **Not used**

1.5 SUBMITTALS

A. Complete and submit the “Pile and Driving Equipment Data” form located at the end of this Section for each proposed hammer and pile/structure combination.

1. Provide all data in the form necessary to perform a pile driving wave equation analysis, together with preliminary schedule for driving.

2. Include the results of a wave equation analysis and drivability evaluation by the Design-Builder's Geotechnical Engineer demonstrating that the proposed equipment is suitable for driving the piles.
3. Include Manufacturer's product data, specifications, and recommended installation instructions for the submitted pile hammer.

PART 2 PRODUCTS

2.1 PIPE PILE SHELLS

A. Use new pipe pile shells having wall thickness as shown on plans.

B. Meet requirements for ASTM A 252 steel, for either Grade 2 (normal strength) or Grade 3 (high strength) steel.

2.2 STEEL HP SECTION PILES

A. Follow AASHTO M 270 for Grade 36 or 50 steel, as specified in the plans.

2.3 PORTLAND CEMENT CONCRETE

A. Class A(AE) Concrete following Section 03055.

2.4 REINFORCING STEEL

A. Meet AASHTO M 31, Grade 60.

B. Follow requirements in Section 03211.

2.5 PILE DRIVER

A. Verify the equipment can drive piles to the required ultimate driving resistance without damage or without requiring an excessive number of blows to achieve the required tip elevation and capacity before mobilizing pile driver to the site, in accordance with this Section, article 1.5, paragraph A.

B. Mobilize pile driver to the site only after the Design Builder's Geotechnical Engineer indicates that acceptable results of the wave equation analysis have been obtained in accordance with this Section, article 1.5, paragraph A.

C. Remove any mobilized pile driver and related equipment found to be inadequate for the project pile driving conditions, and repeat the requirements of this Section, article 1.5, paragraph A until an acceptable pile driver system is obtained.
   1. Re-mobilize the accepted hammer at no cost to the Department.

D. Provide accurate test information regarding the yield stress values (heat) for each batch of piles to be used on the project.

E. Equip pile driver following Manufacturer's recommendations.

F. Leads:
   1. Used with all types of hammers.
   2. Hold in the required position with guys, stiff braces, or both.
   3. Hold the pile parallel to the leads.
   4. Accommodate the maximum length of the pile segment, and extend to the lowest point that the hammer must reach.
   5. Obtain approval from the Design Builder's Geotechnical Engineer before using followers.
   6. Use fixed leads if necessary to maintain required driving tolerances described in this Section, article 3.3, paragraph C.

G. Drive Cap (or Drive Head): Fits the top of pile and provides full bearing.
   1. For pipe piles, drive cap to have a machined surface to fully engage the end of the pipe.

H. Hammer:
   1. With fully operable adjustable settings.
   2. Rated energy greater than or equal to the value indicated on the foundation plans.
   3. Inspect hammer cushion with the Design Builder's Geotechnical Engineer present before beginning pile driving and after every 100 hours of pile driving.
      a. Replace the cushion when it loses 25 percent or more of its original thickness.

PART 3 EXECUTION

3.1 PREPARATION

A. Complete all foundation excavation before driving piles.

B. Dewater excavation at least 1 ft below bottom of foundation at all times during pile foundation operations.

C. Notify the Department, the Design Builder's Structural Engineer, and the Design Builder's Geotechnical Engineer of any conflicts between the designated position of piles and the locations of existing piles from previous construction, existing utilities, old foundations, or other potential conflicts.
   1. The Design Builder's Structural Engineer designates new pile locations as required, subject to review by the Department.

3.2 DYNAMIC ANALYSIS OF PILE DRIVING

A. Notify the the Engineer at least five working days before pile driving is to begin on the Project, and at least three working days before piles are to be driven on all subsequent abutment and bent/pier foundations.

B. Provide pile driving analyzer (PDA) testing by a qualified PDA firm selected and retained under contract with the Design Builder.

C. The Design Builder's designated PDA Firm conducts high-strain dynamic tests (in accordance with ASTM D 4945) using pile driving analysis (PDA) equipment.
   1. Test the number of piles at each foundation (abutment, bent, or pier foundation) designated on the plans, but in no case fewer than required by the UDOT Geotechnical Manual of Instruction.
   2. Perform the first PDA test on the first pile driven at each abutment and bent/pier foundation, unless the Engineer approves testing of another pile.

D. The Design Builder's Geotechnical Engineer shall either: a) be on site during the PDA testing of the first pile at each support; or b) be in direct telephone contact with the PDA Firm's operator and the inspector covering the pile driving, as necessary to gather sufficient data to establish appropriate driving criteria for each support.

E. Begin installation of dynamic analysis instruments after placing the pile in

the leads.

F. Provide safe working conditions for personnel to safely attach and remove the gages.

G. Monitor the stresses in the piles to ensure that stresses do not exceed 0.9 Fy (yield stress). Reduce the energy of the hammer if the stress exceeds 0.9 Fy.
   1. When steel piles having Fy greater than 36 ksi are required, provide accurate test information regarding the yield stress values for each batch (heat) of piles to be used on the Project.
   2. Reduce the energy of the hammer and/or make other adjustments as necessary, if the measured driving stresses exceed the specified limit.

H. The Design Builder's Geotechnical Engineer evaluates the driving resistance, and establishes driving criteria, using the results of the high-strain dynamic testing and signal matching analyses.
   1. Do not drive other piles in the foundation until the Design Builder's Geotechnical Engineer gives formal notice (confirmed in writing to the Department) that the test results indicate that sufficient capacity has been obtained, and the driving criteria for the remainder of the piles in the foundation have been established.

I. If sufficient capacity is not obtained on initial drive testing, perform a restrike
PDA test on the pile after a sufficient time period (generally 24 hours or more after the initial driving of the pile).
   1. Do not perform restrikes using a cold hammer.
   2. The Design Builder's Geotechnical Engineer will use the results of the PDA test(s) to establish pile toe elevations at the foundation support locations.
   3. The Design Builder's Geotechnical Engineer may revise the pile driving criteria during the dynamic pile testing period.

J. Notify the Design Builder's Geotechnical Engineer and the Department if any of the remaining piles in the foundation do not meet the established driving criteria before moving hammer away from bent/abutment area, or if driving conditions otherwise change.
   1. The Design Builder's Geotechnical Engineer or the Department may require testing additional piles and reestablishing driving criteria for the remaining piles within the foundation.

3.3 PILE INSTALLATION

A. Pre-drill/pre-auger if the designated pile tip elevation cannot be reached by the approved pile driver.
   1. Do not drill holes greater in diameter than the diameter or other maximum dimension of the pile.

B. Pile Splicing:
   1. Use no more than one spliced section shorter than 30 ft for any pile.
   2. Inspect the driven pile section before splicing any pile section to determine if it has been distorted from its original shape, or otherwise damaged from pile driving operations.
      a. Remove the damaged portion where distortion/damage has occurred, before splicing the next segment.
   3. Splice new pile segments parallel with previously driven pile segments.
   4. Butt weld the entire pile cross section using full penetration welds as per AWS D.1.1 for pipe piles and AASHTO/AWS D.1.5 for HP section piles.

C. Keep driven piles within 6 inches of the designated plan location, and within 2 percent of vertical (plumb) throughout the total length of the pile (including bending). This is roughly equivalent to ¼ inch in a foot, or 0.60 inches in 30 inches.
   1. Verify that these criteria have been met, including using a calibrated pile bending probe where necessary, at the end of pile driving before proceeding with backfilling or other associated foundation work.
   2. Notify the Design Builder's Structural Engineer and Geotechnical Engineer, and the Department to determine the appropriate resolution if either requirement is not met.
   3. The Design Builder bears all costs for any measures required to resolve the non-conformance, including the price reduction factors shown this Section, article 3.5.

D. Drive additional piles as required to replace damaged piles and piles driven out of plumb, or plan location at locations designated by the Design Builder's Structural Engineer.

E. Drive down piles that were raised due to driving adjacent piles.

F. Notify the Design Builder's Structural Engineer and Geotechnical Engineer, and the Department of water collecting in open pipe piles so that they can be evaluated for possible damage.
   1. Drive additional piles as described above and abandon damaged piles as directed by the Department as necessary to resolve concerns with pile damage.

G. Cover open-ended pipe piles to prevent the collection of precipitation, other sources of water, or debris.

H. Cutting and Capping Piles:
   1. Remove all damaged material from the top of the piles.
   2. Keep sides of piles at least 9 inches away from nearest edge of pile cap.
   3. Cut off piles with clean, straight-line cuts to the designated elevation at a right angle to the pile axis.
   4. Level all irregularities before placing concrete for pile cap.

I. Fill any annular space between the pipe shell and the surrounding soil with grout or clean sand washed down to reestablish lateral support.

J. Remove all loose and displaced materials from around the completed piles leaving clean, solid surfaces to receive the concrete.

K. Level all irregularities before constructing pile cap.

3.4 CONCRETE FILLING OF CLOSED-END PIPE PILES

A. Remove water and debris from pipe piles before filling with concrete.

B. Receive approval from the Design Builder's Geotechnical Engineer and the Department before concrete placement in pipe piles.

C. Fill pipe piles with specified concrete after compliance with all tolerances and required criteria have been confirmed by the Department.

D. Avoid segregation of the concrete ingredients.

E. Slump at the time of placement: between 4 and 6 inches.

F. Arrange chutes, pipes, etc. used as aids in placing concrete so concrete does not separate (i.e. flows freely without having to be pushed or shoveled).

G. Place concrete in pipe shell either by free fall, or through a tremie, drop chute, or concrete pump.

H. Place concrete to the base without contacting either the rebar cage or the pipe wall.

I. If a hopper or concrete bucket is used, discharge concrete into a funnel-type downpipe centered over the hopper or bucket.
   1. Do not discharge concrete directly from the mixer into the hopper or bucket.

J. Use high frequency internal vibrators to consolidate concrete to at least 3 ft below the bottom of the rebar cage, or to at least 13 ft below the pile cutoff level, whichever is deeper.

K. Do not vibrate concrete that has taken initial set.

L. Vibrate concrete again after inserting cage to eliminate voids around the cage if rebar cage is inserted after concrete has been placed.

M. Place the reinforcement cage into the driven pipe pile when the concrete reaches the planned bottom elevation of the reinforcement for piles larger than 16 inches in diameter.
   1. Support the reinforcement so it remains within 2 inches of the required vertical location.
   2. Support the cage from the top until the concrete reaches the top of the pile.

N. Secure rebar cage in position until concrete is set.

O. Provide lighting to the work site if concrete placement is to occur after daylight hours so all operations are plainly visible.

P. Embed the tops of piles in the concrete pile cap as shown on the plans.

3.5 PRICE REDUCTIONS FOR NONCONFORMING WORK

A. Price Adjustment—Reduction for Deficient-Strength Concrete shall be in accordance with this Section 5-1 (Price Reductions for Non-Conforming Work).
   1. Consider acceptance for concrete in pipe pile shells that are below the specified strength according to this Section.

2. The Department will:
   a. Use the bid price listed in Table 5-1 (Unit Prices for Determining Pay Adjustments For Nonconforming Work) and the pay factors schedule presented in Section 03055 Table 1 to calculate the price reduction for compensation.
   b. Evaluate concrete with a compressive strength deviation of more than 400 psi below the specification to determine capability of the material to maintain the integrity of the concrete-filled pipe pile.
      1) Provide acceptance for either:
         a) A 50 percent pay factor, or
         b) Design-Builder's Designer will direct another pile driven at a suitable location adjacent to the deficient pile and obtain approval from the Department before proceeding.

B. Price Adjustment – Reduction for Out-of-Tolerance Piles

1. Demonstrate technical adequacy for piles driven out of plumb or plan location.
2. The Department will:
   a. Accept piles according to this Section, article 3.5.
   b. Reject any pile driven outside the upper deviation limits shown in Table 1 below.
      1) No payment made for the rejected pile.
   c. Use the bid price listen in Table 5-1 (Unit Prices for Determining Pay Adjustments For Nonconforming Work), and the pay factors schedule presented in Table 1 to calculate the price reduction for compensation.

Table 1

Price Reduction Pay Factors For Non-Conforming Pile Driving Tolerances		
Pay Factor	**Plumb % deviation from 2.0%**	**Plan Location inch deviation from 6 inch**
1.00	0.00 to 0.40	0.00 to 0.75
0.90	0.41 to 0.80	0.76 to 1.50
0.80	0.81 to 1.20	1.51 to 2.25
0.70	1.21 to 1.60	2.26 to 3.00
0.50	1.61 to 2.00	3.01 to 3.75
0.30	2.01 to 2.40	3.76 to 4.50
0.10	2.41 to 3.00	4.51 to 6.00
0.0, Reject	> 3.00	> 6.00

C. The Department will:
   1. Apply pay factors to each pile individually based on the total measured pile length from the specified cutoff elevation.
   2. Apply only the criteria with the lowest pay factor for any one pile.

3.5 PILE AND DRIVING EQUIPMENT DATA FORM

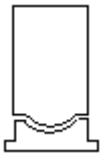
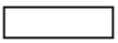
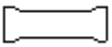
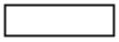
A. The recommended “Pile and Driving Equipment Data” form follows.

END OF SECTION

Sheet # _____

Pile and Driving Equipment Data

Project No: _____
Project Name: _____ County: _____
Drawing No: _____
General Contractor: _____
Pile Driving Contractor/Subcontractor: _____
Phone: _____ FAX: _____
(Piles driven by, foreman): _____
Date Submitted: _____

Hammer Components		**Hammer**	Manufacturer: _____ Model: _____ Type: _____ Serial No: _____ Manufacturer's Maximum Rated Energy: _____(k-ft) Stroke at Maximum Rated Energy: _____(ft) Range in Operating Energy: ____ to ____(ft-k) Range in Operating Stroke: ____ to ____(ft) Modifications: _____
		Ram	Ram Weight: _____ (lbs) Ram Length: _____(ft) (for diesel hammers)
		Anvil	Ram Cross Sectional Area: _____(in^2) (With diesel hammers) Anvil Weight: _____(lbs)
		**Hammer Cushion**	Material #1 Material #2 Name: _____ _____ Area: _____ _____ (in^2) No. of Plates: _____ _____ Thickness: _____ _____ (in) Mod. of Elasticity - E: _____ _____ (psi) Coeff. of Restitution - e: _____ _____
		**Drive Cap**	Helmet Weight: _____(lbs) Bonnet Anvil Block Drive Head
		**Pile Cushion** (Only for Concrete or Timber Piles)	Material: _____ Area: _____ (in^2) No. of Sheets: _____ Thickness/Sheet: _____ (in) Total Thickness of Pile Cushion: _____ (in) Mod. of Elasticity - E: _____ (psi) Coeff. of Restitution - e: _____
Pile		**Pile**	Diameter: _____ (in) Wall Thickness: _____ (in) Taper (if any): _____ Length in Leads: _____ (ft) Ordered Length: _____ (ft) Required Driving Resistance: _____ (kips) Description of Splice: _____ Tip Treatment/Plate Description: _____

Use Separate Data Sheet for Each Proposed Hammer and Pile/Structure Combination

July 8, 2016

SECTION 02456S

PREFABRICATED VERTICAL DRAINS

Add Section 02456:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Products and procedures for installation of prefabricated vertical drains.

B. Special methods of PV drain installation may be necessary for artesian conditions.

1.2 RELATED SECTIONS

A. Section 00725: Scope of Work

1.3 REFERENCES

A. ASTM D 3786: Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method

B. ASTM D 4533: Standard Test Method for Trapezoid Tearing Strength of Geotextiles

C. ASTM D 4631: Standard Test Method for Determining Transmissivity and Storativity of Low Permeability Rocks by In Situ Measurements Using Pressure Pulse Technique

D. ASTM D 4595: Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method

E. ASTM D 4632: Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

F. ASTM D 4716: Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head

G. ASTM D 4751: Standard Test Method for Determining Apparent Opening Size of a Geotextile

H. ASTM D 4833: Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

I. UDOT Minimum Sampling and Testing Guide

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS Not Used

PART 2 PRODUCTS

2.1 GENERAL

A. Use newly manufactured materials consisting of a polyethylene or polypropylene drainage core enclosed in or integrated with a Geotextile jacket.
   1. Provide a jacket that allows free passage of pore-water to the core without loss of soil material or piping.
   2. Provide a core that provides continuous vertical drainage channels.

B. Provide band-shaped PV drains with an aspect ratio (width divided by thickness) not exceeding 40.

2.2 JACKET

A. Provide jacket with a synthetic nonwoven geotextile of 100 percent heat-set continuous filament polypropylene capable of resisting all bending, punching, and tensile forces imposed during installation and during the design life of the drain.

B. Do not use jacket material that is subject to localized damage (e.g. punching through the filter by sand or gravel particles.)

C. Provide jacket material that is sufficiently rigid to withstand lateral earth pressures due to embedment and surcharge so that the vertical flow capacity through the core will not be adversely affected.

D. Provide jacket material that is sufficiently flexible to bend smoothly during installation and induced consolidation settlement without damage.

E. Provide jacket material that will not crack or peel during installation of the drain. Conform to the following specifications:

Test Item	Requirement Designation	Minimum Ave. Roll Value
Grab Tensile Strength:	ASTM D 4631	120 lbs
Trapezoidal Tear:	ASTM D 4533	50 lbs
Puncture Strength:	ASTM D 4833	38 lbs
Mullen Burst Strength:	ASTM D 3786	130 psi
Elongation at Break:	ASTM D 4632	> 50%
Permitivity AOS:	ASTM D 4491	0.45 sec-1
	ASTM D 4751	≤100 sieve

2.3 CORE

A. Provide a core that is continuous polyethylene or polypropylene plastic material fabricated to promote drainage along the axis of the vertical drain, with the following characteristics.

Test Item	Requirement Designation	Minimum Ave. Roll Value
Tensile Strength:	ASTM D 4595	235 lbs

2.4 ASSEMBLED DRAIN

A. Provide assembled PV drains that have mechanical properties (strength and modulus) that equal or exceed those specified for the component jacket and core.

B. Provide assembled drains that are resistant against wet rot, mildew, bacterial action insects, salts in solution in the groundwater, acids, alkalis, solvents, and any other significant ingredients in the site groundwater.

C. Use one single type of assembled PV drain on the Project. Provide an assembled drain with the following minimum properties:

Test Item	Requirement Designation	Minimum Ave. Roll Value
Weight:	N/A	0.8 oz/ft
Width:	N/A	3.8 inch
Thickness:	N/A	1/8 inch
Discharge Capacity:	ASTM D 4716 50 psi	1.5 gpm
	ASTM D 4716 25% Compression	1.5 gpm

D. Label or tag PV drain materials so that the information for sample identification and other quality control purposes can be read from the label. As a minimum, identify each roll by the manufacturer as to lot or control numbers, individual roll number, date of manufacture, manufacturer, and product identification of the jacket and core.

E. Provide PV drain that is wrapped in heavy paper, burlap, plastic, or similar heavy-duty protective covering during shipping. Protect the PV drain from sunlight, mud, dirt, dust, debris, and other detrimental substances during shipping and onsite storage.

F. Reject all material that is damaged during shipment, unloading, storage, handling, or that does not meet the minimum requirements of the PV drain material.

2.5 PV DRAIN LAYER

A. Place a PV drain layer consisting of at least one foot of sand meeting the gradation below, unless another gradation is approved by the Engineer.

Sieve	Percent Passing
2-inch:	100
½-inch:	65-100
¼-inch:	50-100
No. 10:	40-70
No. 40:	10-40
No. 200:	0-5

B. Place PV drain layer prior to PV drain installation.

C. Reject all material not meeting the specified gradation.

D. Accept the sand at the project site.

2.6 QUALITY CONTROL

A. The actual type of PV drain installed are at the option of the Design Builder, provided the requirements of these specifications are met.

B. Notify the Department at least seven days prior to the installation of any drains.

1. Test samples of the unspliced PV drains to be used, and three samples of any proposed splices, at least seven days prior to the installation of any drains.
   a. Provide a sample of unspliced drain at least 10 feet long.
   b. Provide samples of spliced PV drain long enough to include the splice plus 2 feet if unspliced drain on both sides of the splice.
2. Submit manufacturer's literature documenting the physical and mechanical properties of the drain (as a minimum those properties required by the specifications) and other similar projects where the same drain has been installed including details on prior performance on these projects, at least seven days prior to installation.

C. Base acceptance of the PV drain layer on the installed material.
   1. Test in accordance with the Minimum Sampling and Testing requirements.

PART 3 EXECUTION

3.1 INSTALLATION EQUIPMENT

A. Install PV drains with approved modern equipment of a type that causes a minimum disturbance of the subsoil during the installation operation and maintain the mandrel in a vertical position.

B. Install PV drains using a mandrel or sleeve that inserts the PV drain (pushed or vibrated) into the soil. Use a mandrel or sleeve that protects the drain material from tears, cuts, and abrasion during installation and that retracts after each drain is installed.

C. Advance the mandrel with constant load or constant rate of advancement.
   1. Make available a vibrator with an eccentric moment of at least 500 in-lbs for use in areas where constant load or constant rate of advancement methods cannot install the PV drains to the design depths.
   2. Advance PV drains that cannot be installed to the design penetration using only static methods with the use of the vibrator.
   3. Use of the vibrator is not considered under differing site conditions; use the vibrator only in cases where design penetration cannot be achieved by using the full static force available to the mandrel.

D. Predrill or spud through existing embankments or through hard and dense materials prior to installation of the PV drain.
   1. Use a maximum 6-inch-diameter auger/drill/spud/etc. to predrill or spud through embankments or hard and dense materials.
   2. Predrilling is not considered differing site conditions.

E. Minimize the disturbance of the subsoil by using a mandrel or sleeve that has a maximum cross-sectional area of 12.2 inch.
   1. Use of a standard “foot” is allowed, provided that the largest surface area is less than 12.5 inch .
   2. Use a mandrel or sleeve sufficiently stiff to prevent wobble or deflection during installation.

F. Provide a mandrel or sleeve with an anchor rod or similar arrangement at the bottom to permit the installation of the drain and to anchor the drain tip at the required depth at the time of mandrel withdrawal.
   1. Use anchors with dimensions that conform as closely as possible to the dimensions of the mandrel so as to minimize soil disturbance.
   2. Do not install PV drain until the Design Builder’s Geotechnical Engineer has approved the anchor system and installation procedure.

G. Submit drawings describing the size of the mandrel and anchor system at least seven days prior to delivery of the equipment to the site.
   1. Use the smallest surface area required to secure the PV drain.
   2. Use one 8-inch long piece of No. 4 reinforcing steel as the primary anchoring method.
   3. If the primary anchoring method fails to anchor the PV drain, use one 9-inch long piece of No. 4 reinforcing steel as the secondary anchoring method.
   4. If the secondary anchoring method fails to anchor, use one 4-inch by 7-inch sheet metal plate with a sheet metal bale as the final anchoring method.

H. Make a minimum of five attempts to place the PV drain before moving to another area.
   1. Determine areas of “refusal” by moving ahead, skipping approximately five rows of layout at a time, until planned PV drain depths are obtained.

I. Provide equipment and materials to grout PV drains that reach sand layers exhibiting artesian behavior with a low permeability mixture of bentonite, water, Portland cement, and other additives to seal the penetration hole.

3.2 INSTALLATION APPROVAL

A. At least seven days prior to the beginning of initial PV drain installation, submit full details on the materials, equipment, sequence, and method proposed for PV drain.

B. Prior to the installation of production PV drains, demonstrate that equipment, methods, and materials produce a satisfactory installation in accordance with these specifications.

C. If at any time the method of installation does not produce satisfactory PV drains, alter the method and equipment as necessary to comply with these specifications.

3.3 INSTALLATION

A. Locate, number, and stake PV drains. Take all reasonable precautions to preserve the stakes.
   1. Be responsible for any necessary restaking.
   2. Do not vary the as-installed location of the PV drains by more than 6 inches from the plan locations designed on the drawings.

B. Reject PV drains that are more than 6 inches from design plan location or are damaged or improperly installed and abandoned in-place.
   1. Install additional prefabricated vertical drains to replace the damaged ones.

C. Install PV drains from the working surface to the depth shown on the drawings.

D. During PV drain installation, provide a suitable means of determining the depth of the advancing drain at any given time and the length of drain installed at each location.

E. Supply a summary report by the morning following each work-day of PV drains installed the previous day.
   1. Include in the summary drain type, locations, and length to nearest 1-foot quantity of PV drain installed at that location, the location of any PV drains that do not extend to the plan depth, and the locations and depths where vibration was used to install the PV drain.

F. Plumb equipment for installing PV drains prior to installing each drain.

1. Do not deviate from the vertical more than 5.0 inches (0.4 feet) in 10 feet during installation of any drain.

G. Installation techniques requiring driving or jetting are not permitted. Only use limited amounts of injected water to facilitate anchoring PV drains.

H. Perform the installation without any damage to the drain during advancement or retraction of the mandrel.
   1. Alternate raising or lowering the mandrel during advancement is not permitted.
   2. Raising the mandrel is permitted only after completion of a drain installation.

J. Splice or connect the PV drain material to provide continuity of PV material.
   1. Provide a 4- to 8-inch length of PV material protruding above the sand surface at each PV location.
   2. Cut the PV drain material neatly at its upper end at the working grade.

K. Observe precautions necessary for protection of any field instrumentation devices.
   1. Pay for the replacement of any instrumentation equipment that has been damaged or becomes unreliable as a result of these operations.

3.4 PRE-AUGERING/OBSTRUCTIONS

A. Use auguring, spudding, or other methods to loosen the soil and clear obstructions.
   1. Do not allow the auger to penetrate more than two feet into the underlying compressible soil.

B. Be responsible for penetrating overlying fill material as necessary to satisfactorily install the PV drains.
   1. Clear obstructions defined as any man-made or natural object or strata that prevent the proper insertion of the mandrel and installation of the PV drain.

C. Use auguring, spudding, or other approved methods to loosen the soil and any obstruction material prior to the installation of PV drains.
   1. The obstruction clearance procedure is subject to approval by the Engineer.

2. The Engineer's approval does not relieve the Design Builder of responsibility to clear obstructions in accordance with these specifications.

D. If auguring is the selected method use augers with a minimum outside diameter equal to the largest horizontal dimension of the mandrel, shoe, or anchor, whichever is greatest.
   1. Use an auger with a maximum outside diameter of no more than 3 inches greater than the minimum outside diameter.

E. When obstructions are encountered, implement the following procedure in the listed sequence:
   1. Immediately notify the Engineer prior to completing the drain and prior to installing any other drains.
   2. Attempt to install drains adjacent to the obstructed location at the direction of the Design-Builder's Geotechnical Engineer and under his review:
   3. Attempt to install an offset drain within two feet horizontally of the obstructed drain.
   4. Implement obstruction clearance procedures and install the drains at the design location.
   5. Use obstruction clearance procedures only as directed by the Design-Builder's Geotechnical Engineer.

3.5 SPLICING

A. Splice PV drain material by stapling. Provide splices with structural and hydraulic continuity of the drain.

B. Permit a maximum of one splice per drain installed.

3.6 ARTESIAN GROUNDWATER CONDITIONS

A. Subsurface formations may be present along the alignment that contain a hydrostatic head elevation that is higher than the ground surface (artesian).
   1. Where PV drains penetrate to these formations, unacceptable water flow is expected.

B. The Design-Builder's Geotechnical Engineer evaluates initial PV drain installation at each work area to provide information regarding penetration depths, the need for vibration to reach design penetration depths, anchorage of the PV drains, and the presence of artesian water conditions.

1. Following installation of the initial drains, finalize PV drain lengths.

C. Plug all PV drains that reach artesian ground water conditions.

D. Provide drilling or grouting equipment capable of penetrating to the depths of observed artesian groundwater conditions to seal the PV drain hole.

E. The Design-Builder's Geotechnical Engineer determines the need for plugging PV drains and the acceptability of the plugging procedures.

END OF SECTION

July 8, 2016

SECTION 02479S

MONITORING SETTLEMENT OF ADJACENT STRUCTURES

Add Section 02479:

PART 1 GENERAL

1.6 SECTION INCLUDES

A. Materials and procedures for monitoring settlement of adjacent structures that arise from construction of embankments, retaining walls, and other roadway elements.

1.7 RELATED SECTIONS

A. Section 01721S: Survey

1.8 REFERENCES **Not used**

1.9 DEFINITIONS **Not used**

1.10 SUBMITTALS

A. Settlement records of all measurement locations signed by a licensed land surveyor.
   1. Submit according to the schedule specified in Article 3.1.

PART 2 PRODUCTS

A. Provide all stakes, benchmarks, lath, concrete nails, and any other survey supplies necessary to monitor settlement at the locations required.

B. Set necessary benchmarks to monitor settlement as described herein.

C. Provide all survey equipment certified to accomplish closed-level circuits accurate to within one hundredth of a foot or better.

PART 3 EXECUTION

3.2 SETTLEMENT MONITORING

A. Monitor settlement at the locations shown on the plans, conducting the work as follows:

1. Establish and measure elevations of settlement-monitoring locations during daylight hours and at the convenience of the property owner.
2. Make prior arrangements with the property owner to allow access to the property to identify appropriate monitoring locations and make measurements.
3. Identify and permanently mark settlement-monitoring locations using paint, concrete nails, concrete embedded brass caps, or other accepted survey practice method at least 14 calendar days prior to commencing any construction work.
4. Measure the elevation of the settlement-monitoring locations twice within 10 days but at least 2 days prior to commencement of adjacent construction.
5. Perform all elevation measurements to an accuracy of one hundredth of a foot or better using a closed-level circuit.
6. Measure elevations of the settlement-monitoring locations once a week after construction has begun.
7. Continue weekly measurements until the Design-Builder's Geotechnical Engineer determines that the measurements can be discontinued.
8. Provide report of measurements within 24 hours of each set of weekly measurements to the Design-Builder's Geotechnical Engineer and concurrently to the Department.
9. Remove settlement-monitoring identification materials once settlement measurements are discontinued as approved by the Department at Final Owner Acceptance or otherwise and restore locations to their original condition as acceptable to the Department.

END OF SECTION

July 8, 2016

SECTION 02498S

VIBRATION CONTROL DURING CONSTRUCTION RELATED ACTIVITIES

Add Section 02498S:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Procedures for monitoring and controlling vibrations adjacent to the project site that arise from pile driving, soil compaction and other vibration-producing activities.

1.2 RELATED SECTIONS Not used

1.3 REFERENCES Not used

1.4 DEFINITIONS Not used

1.5 SUBMITTALS

A. Vibration records signed by the Vibration Monitoring Specialist.

B. Calibration data and machine documentation for each seismograph used on the project.

1.6 VIBRATION MONITORING SPECIALIST

A. Provide a Vibration Monitoring Specialist who is experienced in vibration monitoring techniques for similar civil and geotechnical work, preparation of vibration monitoring plans and instrumentation, and interpretation and use of vibration records.
   1. The Vibration Monitoring Specialist will possess all required federal, state and local licenses and/or permits.
   2. The Vibration Monitoring Specialist will be responsible for supervision of all field vibration monitoring operations and personnel, and have a minimum 10 years of vibration monitoring experience.

PART 2 PRODUCTS Not used

PART 3 EXECUTION

3.1 PREPARATION

A. Control and monitor vibrations when engaging in construction-related activity near objects, structures or utilities which may be susceptible to damage from ground vibrations.

3.2 EQUIPMENT

A. Use approved seismographs located, at a minimum and as approved by the Engineer, between the vibration source and the closest susceptible objects, structures or utilities.

B. Use seismographs capable of recording particle velocity for three (3) mutually perpendicular components of vibration.

C. Furnish records of seismograph characteristics and factory calibration to the Engineer prior to commencing vibration producing activity.

D. Provide vibration monitoring equipment capable of detecting velocities of 0.1 in/s or less.

E. Use seismographs with response characteristics in the range generally found for the specific construction related activity being monitored.

3.3 MONITORING

A. Do not allow ground motions to exceed the limits identified in article E.

B. Use appropriate care in all vibration inducing operations.
   1. Repair, at no expense to the Department, any damage to neighboring structures or utilities caused by construction related vibrations.

C. Monitor every vibration-inducing activity for which ground motions may exceed 0.09 in/sec. at any structure or utility, using calibrated seismographs containing internal calibration and triaxial orthogonal transducers with a flat frequency response from 2 to 200 hz.
   1. Furnish real-time, permanent time histories of the vibration measurements in terms of particle velocity.
   2. Make vibration monitoring records available to the Engineer no later

than 48 hours after measurements are taken

D. Place transducers in locations approved by the Engineer.
   1. The Department may direct that different features be monitored.

E. Vibration limits are based on instrumentation with a flat frequency response from 2 to 200 hertz.

F. Do not exceed the following maximum ground motions:
   1. 0.2 in/sec for steady state vibrations (vibrations generated by construction traffic, vibrating rollers, etc.)
   2. 0.1 in/sec for steady state vibrations near historic buildings (vibrations generated by construction traffic, vibrating rollers, etc.)
   3. 2.0 in/sec for impact vibrations (pile driving)
   4. 1.0 in/sec for impact vibrations (pile driving) near historic buildings

F. The Engineer may establish different vibration limits for other features.

END OF SECTION

November 14, 2012

SECTION 02583S

JACK AND BORE UTILITY INSTALLATION

Add Section 02583

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and procedures for installing a buried utility by means of jacking and boring.

1.2 RELATED SECTIONS

A. Section 01355: Environmental Protection

B. Section 01554: Traffic Control

C. Section 02056: Embankment, Borrow, and Backfill

D. Section 02316: Roadway Excavation

E. Section 02610: Drainage Pipe

F. Section 02922: Seed, Turf Seed, And Turf Sod

G. Section 03575: Flowable Fill

H. Section 13553: ATMS Conduit

1.3 REFERENCES

A. American Water Works Association (AWWA) Standards

B. Utah Administrative Code

1.4 DEFINITIONS

A. Carrier – A pipe or conduit directly enclosing a utility.

B. Casing – A steel pipe enclosing a carrier for the purpose of providing structural or other protection to the carrier or to allow for carrier replacement without excavation.

C. Roadway Prism – The roadway cross section that contains the embankment, pavement, shoulders and other features, together with the subsoils that underlie the same to the maximum depth of the subject utility.

1.5 SUBMITTALS

A. Two copies of each submittal for review. Include all applicable drawings, calculations, geotechnical reports, and a written work plan in each copy.
   1. Identify in the work plan details of the jack and bore construction, sequence of operations to be performed during construction, a detailed schedule of construction, and a traffic control plan.
   2. Detail sufficiently the drawings, calculations, and descriptions in order to demonstrate to the Engineer whether the proposed materials and procedures will meet the requirements of this Section.
   3. Sign and seal the structural designs and other engineered components by a registered Professional Engineer.

B. Include the following information, divided into the sections listed below:
   1. Geotechnical Report:
      a. Map showing field exploration locations
      b. Summary of field exploration and laboratory testing procedures and results
      c. Description of site surface and subsurface conditions encountered during field investigations
      d. Soil boring Logs
   2. Structural Data:
      a. Casing and carrier material type
      b. Casing and carrier wall thickness
      c. Manufacturer's recommended maximum and minimum fill height limits for the identified casing and carrier
   3. Traffic Control Plan – Comply with Section 01554:
      a. Location and dimensions of any temporary access roads
      b. Location and dimensions of bore pit area "footprint"
      d. Proposed traffic control
      e. Amount of time the footprint will be exposed
   4. Installation Plan:

a. Manufacturer's current recommended installation for each type of pipe used and any incidental materials required for installation
b. Location and dimensions of bore pit
c. Method of shoring, including details for all required ground support
d. Method of controlling line and grade
e. Method of spoil removal, including surface storage and disposal
f. Grouting techniques to be used for filling annular voids caused by over excavation if any, including equipment, pumping and injection procedures, pressure grout types, and mixtures
g. Method of dewatering and disposal
h. Details of casing spacers and casing end seals
i. Emergency safety and repair plan for accidental damage caused to existing utilities, roadway surface, or other features resulting from construction operations

C. Do not begin work until the submittals have been reviewed and accepted by the Engineer.
1. The Engineer will have 10 working days for review and acceptance.
2. Provide new submittals upon receiving notification that the submittals are insufficient.
a. Allow an additional 7 working days for the Engineer's review and acceptance.

D. Alternative mix design: Refer to this Section, article 3.2.G for requirements.

1.6 QUALITY ASSURANCE

A. Third party utilities must meet the requirements of Utah Administrative Code Rule 930-7.

B. Adhere to manufacturer standards for products and installation methods.

1.7 ACCEPTANCE

A. Provide the Engineer horizontal and vertical alignment data, in latitude and longitude coordinates and elevation in feet, pertaining to the termini of installation, including but not limited to the beginning and end points and all intermediate boxes.

B. Perform inspection and acceptance according to Section 02610 for carriers with a diameter greater than 12 inches.

PART 2 MATERIALS

2.1 CASING AND CASING SPACERS

A. Casing
1. Case utilities for the following situations and conditions:
   a. The utility carrier is not structurally capable of resisting loading encountered during installation or during operation beneath highway facilities.
   b. Utility crossings where casing is required by appropriate industry code or special conditions.
   c. Pressurized carrier installed beneath the roadway prism including those installed longitudinally under the roadway
   d. A carrier containing transmittants that are flammable, corrosive, expansive, energized, or environmentally hazardous.
   e. Installations at locations with controlled access where the current or future insertion, removal, replacement, or maintenance of utilities would avoid open trench construction.
   f. As a method of conveying leaking fluids or gasses away from the area directly under the roadway prism to a point of release.
2. Made of steel meeting the requirements of Table 1, having minimum yield strength of 35,000 psi, and be rated for a design life of at least 75 years.

Table 1

Minimum Wall Thickness for Steel Casing (minimum yield strength of 35,000 psi)	
Minimum Thickness	**Diameter of Casing**
¼" (0.2500")	12" or less
5/16" (0.3125")	over 12"-18"
3/8" (0.3750")	over 18"-22"
7/16" (0.4375)	over 22"-28"
½" (0.5000")	over 28"-34"

$^{9}/_{16}$" (0.5625)	over 34"-42"
$^{5}/_{8}$" (0.6250")	over 42"-48"

3. Connect each section of the casing with a full penetration butt weld around the entire circumference of the joint, to achieve a water tight joint. The quality of the weld will conform to AWWA Standard C206, and develop the full strength of the casing wall.
4. No casing is required if the carrier is structurally capable of resisting loading encountered during installation or during operation beneath highway facilities and is not required by this Section, article 2.1.A.
   a. Carrier is to be locatable.
   b. Refer to Section 13553 for requirements for detectable pull tape.

B. Casing Spacer
1. Use to position carrier conduit in casing, and to ensure that no external loads are to be transmitted to the carrier. Do not use wood skids in place of manufactured casing spacer.
2. Manufactured of material having a low coefficient of friction and designed to support the weight of the carrier and associated transmittants.
3. Sized sufficiently to provide a minimum clearance of 2 inches between the outside of carrier, to include bells or couplings, and the inside of casing.
4. Place as required by the Manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

A. Conduct a geotechnical investigation to characterize the nature of the native materials to determine the feasibility of the installation.
1. Interpretation of soil investigation reports and data, investigating the site, and determination of the site soil conditions is the sole responsibility of the Contractor.

B. Verify the position of nearby utilities before installation. Establish a path for the casing installation that will meet minimum clearances required by adjacent utilities while following the plans.

C. The design of a bore pit and required bearing to resist jacking forces is the responsibility of the Contractor.

D. Excavation:
   1. Refer to Sections 02316 and 01355.
   2. Keep bore pit free of water.
      a. Dewater according to the installation plan.
      b. Disposal of water must not cause damage or become a nuisance.

E. Place bore pits outside the AASHTO clear zone.
   1. Refer to TC Series Standard Drawings for mitigation if the bore pits cannot be located outside the AASHTO clear zone.

3.2 INSTALLATION – GENERAL

A. Install the utility specified in the contract documents to the alignment and profile shown on the plans.

B. Continuously monitor the location and alignment of the pilot bore progress to insure compliance with the proposed installation alignment and to verify depth of the bore.
   1. Provide the Engineer as-built drawings and an accurate log of the utility boring upon completion of the bore.

C. Monitor worksite for indications of displacement of the roadway prism and escaping boring fluids.
   1. Suspend work immediately whenever fluids seep to the surface other than in the boring entrance or exit pit or when the paved surface is displaced.
      a. Propose a method for acceptance by the Engineer to prevent further seepage or displacement before resuming the boring operation.
   2. Provide GPS survey of the existing surface within the vicinity of the installation and at other locations as requested by the Engineer before and at the conclusion of the installation.
      a. Changes to the existing surface will be evaluated and repaired at no additional cost to the Department.
      b. Remediation plans must be approved by the Engineer before any work proceeds when required.

D. Repair any buckling of the casing due to jacking forces at no additional cost to the Department.

E. Contain excess boring fluids at the entry and exit points until recycled or removed from the site.
   1. Verify that all boring fluids are disposed of in a manner acceptable to the appropriate local, state, and federal regulations.

F. Leave no exterior voids along the bore hole.
   1. Fill the voids with an approved pressurized grout material at no additional cost to the Department if voids develop greater than the outside diameter of the conduit by 1 inch.

G. Fill the void immediately with flowable fill if an obstruction is hit during construction and the bore path is to be abandoned. Refer to Section 03575 for an approved mix design or submit an alternative mix design to be approved by the Region Materials Engineer.
   1. Submit a new installation plan to the Engineer for approval before resuming work at another location.

H. Do not allow the use of water under pressure (jetting) or puddling to facilitate boring or jacking operations.

I. Seal the ends of the casing and carrier with structural grout to provide a barrier against debris and seepage between the two.

3.3 RESTORE EXCAVATED AREA

A. Restore excavated or disturbed area to pre-installation conditions.

B. Backfill and compact excavation material to match the shape of the surrounding surface. Refer to Section 02056.

C. Topsoil and seed disturbed area. Refer to Section 02922 for seed planting schedule. Use the original soils and plants in wetland areas.

END OF SECTION

July 14, 2016

SECTION 02612S

STEEL PIPE
(AWWA C200, MODIFIED)

Add Section 02612:

PART 1 GENERAL

1.1 THE REQUIREMENTS

A. A Purchase Order has been provided by the Department to Northwest Pipe Company for steel pipe materials.

B. The Contractor shall be responsible for all items included in this Special Provision unless specifically included in the Department's Purchase Order.

C. A copy of the Department's Purchase Order with Northwest Pipe is provided for Contractor's reference. Fully review and understand the details of the Purchase Order. Provide all items necessary for completion of the project in accordance with the Contract Documents.

1.2 RELATED SECTIONS

A. Section 02615S: Steel Pipe Fabricated Specials

B. Section 02621S: Pipeline Coatings and Linings

1.3 REFERENCES

A. ANSI/ASTM A 20:General Requirements for Steel Plates for Pressure Vessels

B. ASTM E 165: Practice for Liquid Penetrant Examination

C. ASTM A 370:Test Methods and Definitions for Mechanical Testing of Steel Products

D. ASTM A 516: Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service

E. ANSI/AWWA C200: Steel Water Pipe 6 In and Larger

F. ANSI/AWWA C205: Cement-Mortar Protective Lining and Coating for Steel Water Pipe - 4 In and Larger - Shop Applied

G. ANSI/AWWA C206: Field Welding of Steel Water Pipe

H. ANSI/AWWA C208:Dimensions for Fabricated Steel Water Pipe Fittings

I. ANSI/AWWA C214: Tape Coating Systems for the Exterior of the Steel Water Pipelines

J. ANSI/AWWA C218:Coating the Exterior of Above Ground Steel Water Pipelines and Fittings

K. ANSI/AWWA C602: Cement-Mortar Lining of Water Pipelines 4-In (100 mm) and Larger - In Place

L. ANSI/AWWA C604: Installation of Steel Water Pipe – 4 In. or Larger

M. ANSI/ASTM A 36: Carbon Structural Steel

N. ANSI/ASTM A 283: Low and Intermediate Tensile Strength Carbon Steel Plates

O. ASTM A 572: High-Strength Low-Alloy Columbium-Vanadium Structural Steel

P. ASTM A 1011/1018: Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

Q. ASTM C 150: Portland Cement

R. ANSI/AWS D1.1: Structural Welding Code – Steel

S. API Standard 1104: Welding Pipelines and Related Structures

T. AWWA M-11: Steel Water Pipe - A Guide for Design and Installation

U. ASME Boiler and Pressure Vessel Code

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS

A. Shop Drawings: Submit shop drawings of pipe and fittings and the following supplemental requirements as applicable.

1. Fabrication Information

a. Pipe/fitting wall construction details which indicate the type and thickness of cylinder; the position, type, size, and area of reinforcement; manufacturing tolerances; maximum

angular joint deflection limitations; and all other pertinent information required for the manufacture and installation of the product.

b. Welded joint details shall be submitted for all joint types, including beveled ends for alignment conformance and deep bell or butt strap joints required for control of temperature stresses.

c. Pipe Fabricator's Credentials: Submit the credentials of the pipe manufacturer/fabricator. Credentials shall include reference names, telephone numbers, and descriptions of projects for pipe conforming to AWWA C200 that is of similar diameter, length, and wall thickness to the pipe in this project. Project description shall include length, diameter, wall thickness, steel metallurgy, location of facility where pipe was manufactured/fabricated, and names of key plant personnel responsible for the manufacturing process. Submit names and qualifications of current plant personnel to be responsible for manufacture of the pipe in this project. To demonstrate ability to meet the schedule requirements of this project, submit project descriptions and manufacturing/fabrication schedules for other currently contracted pipe projects at the Fabricator's plant. The manufacturing / fabrication schedule for the pipe in this project shall be identified on a schedule submittal.

d. Manufacturer's Written Quality Assurance/Control Program.

2. Materials: Material lists and steel reinforcement schedules which include and describe all materials to be utilized. Metallurgical test reports for steel proposed for use on the project. Submit chemical and physical test reports from each heat of steel that indicate the steel conforms to the Project Specifications.

3. Line Layout Information

a. Line layout and marking diagrams compatible with the requirements of AWWA Manual 11 (M-11) and which indicate the specific number of each pipe and fitting and the location of each pipe and the direction of each fitting in the completed line. In addition, the line layouts shall include: the pipe station and centerline elevation at all changes in grade or horizontal alignment; the station and centerline elevation to which the bell end of each pipe will be laid; all elements of curves and bends, both in horizontal and vertical alignment. The location of all metered pipe sections, beveled ends for alignment conformance, and deep bell or butt strap joints for temperature stress control shall be clearly indicated on the diagrams.

b. Dimensional drawings of all valves, fittings, and appurtenances.
c. Drawings showing the location and details of bulkheads for hydrostatic testing of the pipeline, and details for removal of test bulkheads and repair of the lining.
d. Details and locations of closures for length adjustment, temporary access manways, vents, and weld lead pass holes as indicated and as required for construction convenience.

4. Welding Information
   a. Information regarding location, type, size, and extent of all welds with reference called out for Welding Procedure Specifications (WPS) numbers shall be shown on the shop drawings. The shop drawings shall distinguish between shop and field welds. Shop drawings shall indicate by welding symbols or sketches the details of the welded joints, and the preparation of parent metal required to make them.
   b. Written welding procedures for shop and field welds, including WPS's and Procedure Qualification Records (PQR's).
   c. Written nondestructive testing procedure specifications, and nondestructive testing personnel qualifications for shop and field welds.
   d. Current welder performance qualifications (WPQ's) shall be submitted for each welder used prior to its performing any Work either in the shop or field. Qualification testing shall be as specified in Article 1.6 - Quality Assurance, Paragraph H.
   e. Submit the credentials of the certified welding inspectors (CWI's) and quality control specialist for review both the shop and field personnel prior to starting any welding. The credentials shall include, but not be limited to, American Welding Society QC-1 Certification.
   f. Submit personnel qualifications for nondestructive testing (NDT) personnel in accordance with requirements of SNT-TC-1A, level II.
   g. Submit all NDT data for each shop-welded and field-welded joint. This data shall include all testing on each weld joint, including re-examination of repaired welds, using radiographic, magnetic particle, dye penetrant examination, ultrasonic, or air test examination methods specified. Test data shall be reviewed and signed by the welding inspector(s).

h. Submit a welder log for field and shop welding. Log shall list all welders to be used for the Work and the types of welds each welder is qualified to perform.
i. Submit a welding map showing the sequence of welds for all field welds.
j. Submit a written weld repair procedure for each type of shop and field weld proposed for use on the Project.
k. Submit a written rod control procedure for shop and field operations demonstrating how rods will be maintained in good condition throughout the Work. The rod control procedure shall demonstrate how the procedures that will be used to ensure that the proper rods are used for each weld.

5. Handling and Support Information: Detail drawings indicating the type, number and other pertinent details of the slings, strutting and other methods proposed for pipe support and handling during manufacturing, transport, and installation. Calculations supporting the handling and support system design shall be submitted. Drawings and calculations shall be sealed by a registered professional engineer.
6. Control of Temperature Stresses
   a. Submit proposed sequencing of events to control temperature stresses in the pipe wall during installation prior to starting of any field welding.
   b. Submit the proposed sequencing of events or special techniques to minimize distortion of the steel as may result from shop welding procedures.
   c. Submit plan for monitoring pipeline temperatures.
7. Field Lining
   a. Submit field lining contractor's credentials.
   b. Submit a description of lining equipment and personnel to be used.
   c. Submit written procedures for pipe surface preparation, lining application, and curing.
   d. Submit cement mortar mix design.

B. Certifications: Furnish a certified affidavit of compliance for all pipe and other products, materials, or related work provided under this Section, as specified in ANSI/AWWA C200, C205, C602, and C206, respectively, and the following supplemental requirements:
1. Compliance with the additional requirements included in these Contract Documents.
2. Physical and chemical properties of all steel.
3. Hydrostatic test reports.
4. Results of production weld tests.

5. Sand, cement, and mortar tests.
6. Rubber gasket tests.
7. All materials are NSF approved for use with potable water.
8. Certify that pipe temperature complies with Specifications prior to pouring pipe zone material, during and between periods of flowable fill placement, and prior to and during welding temperature control joints (including supporting data).
9. All welds were performed in conformance with these documents.

C. All expenses incurred in making samples or collecting data for certification of tests shall be borne by the Supplier and Contractor at no increased cost to the Department.

1.6 QUALITY ASSURANCE

A. USBR will perform in-plant inspection during fabrication of welded steel pipe at the place of fabrication. USBR inspection does not relieve pipe manufacturer of any responsibility for QA/QC program as specified herein.

B. Certified Welding Inspector (CWI): Furnish the services of a certified welding inspector(s) for all shop and field welding as specified in AWWA C200 and C206. The certified welding inspector(s) shall 100 percent visually inspect all welds, verify proper procedures are being followed using qualified welders, supervise non-destructive testing, and witness Engineer's non-destructive testing. The welding inspector(s) shall submit written certification that all welds were performed in conformance with these documents. All shop weld tests shall be reviewed and signed by the inspector(s).

C. Inspection: All pipe, linings, welds, coatings, and related work shall be subject to inspection at the place of manufacture and/or the place the Work is performed in accordance with the provisions of ANSI/AWWA C200, C205, C206, C602, C209, C214, C215, and C222 as applicable, as supplemented by the requirements herein. Notify the Engineer in writing not less than 21 calendar days prior to the start of any phase of the pipe manufacture, welding, lining, coating, testing, or field operations.

D. Tests: Except as modified herein, all materials used in the manufacture of the pipe shall be tested in accordance with the requirements of ANSI/AWWA C200, C205, C206, and C602, as applicable.
1. Prior to lining with cement-mortar, if applicable, each length of pipe of each diameter and pressure class shall be shop-tested and certified to a pressure of at least 75 percent of the minimum yield

strength of the pipe steel. Test pressure shall be maintained for a sufficient time to observe the weld seams. There shall be no leaks. Any leaks shall be repaired and the pipe retested.

2. Production weld tests as required in ANSI/AWWA C200, except weld tests shall be conducted on each 5,000 feet of production welds at a minimum, and at least one set of tests per operator per work shift shall be performed.

E. Perform said material tests at no additional cost to the Department. The Engineer shall have the right to witness all testing conducted by the Supplier; provided, that the Supplier's schedule is not delayed for the convenience of the Engineer.

F. In addition to those tests specifically required, the Engineer may request additional samples of any material including mixed concrete and lining and coating samples for testing by the Department. The additional samples shall be furnished at no additional cost to the Department.

G. Welding Procedure Specifications: All welding procedures used to fabricate and install pipe shall be in accordance with the ASME Boiler and Pressure Vessel Code (BPVC) for shop welds and ANSI/AWS D1.1 for field welds. Written welding procedures shall be required for all welds, both shop and field. Welds qualified per the ASME BPVC shall include Supplementary Essential Variables for notch-tough welding. All provisions of ANSI/AWS D1.1 pertaining to notch-tough welding shall apply.

H. Welder Performance Qualifications: All welding shall be done by skilled welders, welding operators, and tackers who have had adequate experience in the methods and materials to be used. Welders shall be qualified by the Supplier under the provisions of ASME BPVC for shop welds and ANSI/AWS D1.1 for field welds. Furnish all material and bear the expense of qualifying welders.

I. Shop Nondestructive Testing: Nondestructive testing shall be performed for various weld categories as specified below. Testing shall include submitting written documentation of procedures per Section V, and acceptance criteria shall be in accordance with Section VIII of the ASME Boiler and Pressure Vessel Code.

1. Butt Joint Welds: Spot radiographically examine pipe in accordance with Paragraph UW-52 of the ASME Boiler and Pressure Vessel Code Section VIII, Division 1. If, in the opinion of the Engineer, the butt joint welds cannot readily be radiographed, they shall be 100 percent ultrasonically examined.

2. Fillet Welds: 100 percent examine all fillet welds using the magnetic particle inspection method.
3. Groove Welds: 100 percent ultrasonically examine all groove welds that cannot be readily radiographically spot examined.
4. All Welds: Certified welding inspector shall 100 percent visually examine all welds as a minimum.
5. In addition to weld tests hereinbefore specified, doubler pads shall be air tested as stated in AWWA C206.

J. Onsite Observation: The pipe fabricator shall provide an experienced staff member to train the contractor's installation crews regarding pipe handling, jointing, and backfilling. Training shall be provided for a minimum period to where the Contractor proves proficient at all installation procedures prior to starting the project. The staff member's duties shall include, but not be limited to, the following:
1. Observe the installation and welding of the pipe and fittings.
2. Report any concerns to the Engineer's onsite observer.
3. Answer questions and provide assistance to the Engineer and the Contractor.

K. Pipe Manufacturer/Fabricator:
1. The manufacturer or fabricator of the pipe shall be experienced in fabricating pipe of similar diameters and wall thicknesses required for this Work and shall have the manufacturing capability to meet the schedule requirements of this project.
2. Steel Pipe Fabricators Association (SPFA), Lloyd's Registry Certification, or ISO 9001:2000 Certification.
3. Demonstrate current production capability for volume of Work required for this Project.
4. Experience shall include successful fabrication to AWWA C200 standards of at least 30,000 linear feet of 66-inch and larger pipe with wall thicknesses 0.3125- inch or larger within the 4-year period preceding the bid date, and continuous AWWA C200 manufacturing experience for at least 7 years preceding the bid date.
5. Experience requirement shall apply to the fabrication plant facility and responsible personnel, not to the firm which owns the facility or employs the personnel.
6. See Section 02572S for qualifications for fittings and specials fabricator.

L. All manufacturing shall be done by a single manufacture, including mainline pipe fabrication and lining and coating, under one roof.

PART 2 PRODUCTS

2.1 GENERAL

A. Unless otherwise indicated, steel pipe, linings and coatings shall conform to ANSI/AWWA C200, C205, C602, C210, C214, and C216, as applicable, subject to the following supplemental requirements. The pipe shall be of the diameter and wall thickness shown, shall be furnished complete with welded, and all specials shall be provided as required in Section 02572S - Steel Pipe Fabricated Specials. For pipe larger than 24 inches in diameter, the inside diameter after lining shall not be less than the nominal diameter indicated unless otherwise shown. Pipe 24 inches in diameter and smaller may be provided in standard outside diameters.

B. Markings: Legibly mark all pipes and specials in accordance with the laying schedule and marking diagram. Each pipe shall be numbered in sequence and said number shall appear on the laying schedule and marking diagram in its proper location for installation. All special pipe sections and fittings shall be marked at each end with top field centerline. The word "top" shall be painted or marked on the outside top spigot of each pipe section.

C. Handling and Storage: The pipe shall be handled by use of wide slings, padded cradles, or other devices, designed and constructed to prevent damage to the pipe coating/exterior. The use of chains, hooks, or other equipment which might injure the pipe coating/exterior will not be permitted. Stockpiled pipe shall be suitably supported and shall be secured to prevent accidental rolling and to avoid contact with mud, water, or other deleterious materials. Stockpiled pipe shall be supported on sand or earth berms free of rock exceeding 3 inches in diameter. The ends of all pipe shall be securely bulkheaded or otherwise sealed during transport to the jobsite. All pipe handling equipment and methods shall be acceptable to the Engineer.

D. Pay the cost of replacement or repair of pipe which is damaged at no increased cost to the Department.

E. Strutting: Adequate strutting (stulling) shall be provided on all specials, fittings, and straight pipe so as to avoid damage or distortion to the pipe and fittings during handling, storage, hauling, and installation. The following requirements shall apply:

1. The strutting shall be placed as soon as practicable after the pipe is fabricated or the mortar lining has been applied and shall remain in place while the pipe is loaded, transported, unloaded, installed and backfilled at the jobsite.
2. The strutting materials, size and spacing shall be the responsibility of the Contractor and shall be adequate to prevent deflection and support the earth backfill plus any greater loads which may be imposed by the backfilling and compaction equipment. One strut shall be placed vertical oriented with the top of pipe. One set of struts shall be set 2 feet from each end of each pipe section and at a maximum interval of 15 feet in-between
3. Any pipe damaged during handling, hauling, storage, or installation due to improper strutting shall be repaired or replaced.

F. Laying Lengths: Maximum pipe laying lengths shall not be limited unless specifically required by the Drawings. Final steel pipe lay drawings shall be provided to the Contractor prior to Bid. **Any modification to the Department's Purchase Order and pipeline lay drawings that are desired to accommodate the Contractor's operation shall be paid for at the Contractor's expense.**

G. Lining: The pipe lining shall have smooth dense interior surfaces and shall be free from fractures, excessive interior surface crazing and roughness.

H. Closures and Correction Pieces: Closures and correction pieces shall be provided as required so that closures may be made due to different headings in the pipe laying operation and so that correction may be made to adjust the pipe laying to conform to pipe stationing indicated. The locations of correction pieces and closure assemblies shall be shown on the pipe layout diagrams and shall be subject to the Engineer's review. Any change in location or number of said items shall be approved by the Engineer.

I. Shop-Welded Surfaces: All weld seams on pipe surfaces that will have a flexible tape coating in accordance with Section 02621S - Pipeline Coatings shall be ground such that the maximum weld bead height will not exceed 3/32 inch. All ground weld seams shall be smooth and free of all burrs. Do not grind into, or gouge, the adjacent pipe wall material.

2.2 MATERIALS

A. Cement: Cement for mortar shall conform to the requirements of ANSI/AWWA C205; provided, that cement for mortar coating shall be

Type V, and mortar lining shall be Type II or V, per ASTM C 150. Fly ash or pozzolan shall not be used as a cement replacement.

B. Steel: Provide steel coils for spiral welded steel pipe or steel plate for straight seam welded steel pipe per AWWA C200 and as follows:
   1. Minimum Yield Strength: 36,000 psi
   2. Minimum Tensile Strength: 58,000 psi
   3. Coils: Steel coils shall be made from the continuous cast process or continuous cast slabs, fully killed, fine-grain practice conforming to the physical and chemical characteristics of ASTM A1018/A1018M, SS Grade 36 (Type 2).
   4. Plate: Steel plate shall be fully killed, conform to ASTM A20, and be manufactured to fine-grain practice conforming to the physical and chemical characteristics of ASTM A572/A572M, Grade 42.

C. Pipe shall be manufactured as fabricated pipe per AWWA C200 as modified herein. ASTM pipe manufacturing standards referenced in AWWA C200 shall not be used. Pipe sections shall be fabricated by either of the following methods:
   1. Pipe sections may be spirally welded or fabricated from short cylindrical courses joined circumferentially by complete penetration butt joint welds with not more than two longitudinal seams per course. Longitudinal seams shall be staggered on both sides of the pipe. Measured yield strength shall not exceed 80-percent of measured tensile strength.
   2. Pipe sections may be rolled or pressed from no more than three sheets the full length of the pipe and welded with no more than three longitudinal seams. Patching inserts, overlays, or pounding out of dents will not be permitted. Repair of notches or laminations on second ends will not be permitted. Damaged ends shall be removed as a cylinder and the section end properly prepared. Distorted or flattened lengths shall be rejected. A buckled section shall be replaced as a cylinder.

D. Charpy Tests
   1. General. Steel used in production manufacturing of pipe and specials shall be tested for notch toughness using Charpy V-Notch tests per ASTM A 370. The test acceptance shall be 25 foot-pounds at a test temperature of 30 degrees F.
   2. The Department may elect to increase the Charpy testing to include more steel than indicated above at a negotiated price.

2.3 SPECIALS AND FITTINGS

A. Unless otherwise required, all specials and fittings shall be in accordance with Section 02572S - Steel Pipe Fabricated Specials and shall conform to the dimensions of ANSI/AWWA C208.

2.4 DESIGN OF PIPE

A. General: The pipe shall be steel pipe, mortar-lined and flexible and mortar-coated, with field welded joints as indicated. The pipe shall consist of a steel cylinder, lined with portland cement-mortar as indicated, with an exterior coating as indicated in Section 02621S – Pipeline Coatings and Linings.

B. The pipe shall be manufactured, tested, inspected, and marked according to applicable requirements previously stated and except as hereinafter modified, shall conform to ANSI/AWWA C200.

C. Pipe Dimensions: The pipe shall be of the diameter and wall thickness shown on the Drawings. The minimum (not nominal) steel cylinder thickness for each pipe size shall be as indicated.

D. Specials Dimensions: The specials shall be of the diameter and minimum wall thickness indicated on the Drawings, or as specified in Section 02572S - Steel Pipe Fabricated Specials.

E. Joint Design: Unless otherwise shown, the standard field joint for steel pipe shall be double-welded (fully circumferential) lap joint. Mechanically coupled, or flanged joints shall be required where indicated on the Drawings. Butt-strap joints shall be used only where required for closures or where indicated. The joints furnished shall have the same or higher pressure rating as the abutting pipe. Provide two air test tapped holes for each double welded lap joint, one each side, at spring line of pipe.

F. Lap joints prepared for field welding shall be in accordance with ANSI/AWWA C200. The method used to form, shape and size bell ends shall be such that the physical properties of the steel are not substantially altered. Unless otherwise approved by the Engineer, bell ends shall be formed by an expanding press or by the pipe being moved axially over a die in such a manner as to stretch the steel plate beyond its elastic limit to form a truly round bell of suitable diameter and shape. The ends shall not be rolled. Faying surfaces of the bell and spigot shall be essentially parallel, but in no case shall the bell slope vary more than 2 degrees from the longitudinal axis of the pipe.

G. Moderate deflections and long radius curves may be made by means of beveled joint rings, by pulling standard joints, by using short lengths of pipe, or a combination of these methods; provided that pulled joints shall not be used in combination with bevels and maximum joint deflections are not exceeded. The maximum total allowable angle for beveled joints shall be 5 degrees per pipe joint. Bevels shall be provided on the bell ends. Mitering of the spigot ends will not be permitted. The maximum allowable angle for pulled joints shall be 75 percent of the manufacturer's recommendations or the angle which results from a ¾-inch pull out from normal joint closure, whichever is less. In no case shall pulled joints result in a gap between the bell and spigot at the weld location that exceeds 1/8 inch. All horizontal deflections or fabricated angles shall fall on the alignment, as shown.

H. All vertical deflections shall fall on the alignment within laying tolerance as described in Section 3.2.

I. Shop-applied interior linings and exterior coatings shall be held back from the ends of the pipe as indicated or as otherwise acceptable to the Engineer. Holdback areas shall be coated as hereinafter specified.

J. Temperature Control Lap Joint: A special longer bell end (temperature control lap joint) shall be provided at a maximum spacing of 400 feet to account for movement of the installed pipe due to temperature changes. The pipe manufacturer shall determine the length required for the longer bell as defined by the Contractor's pipe laying procedures and the location of the special bell. Minimum temperature control lap joint length shall be as shown on the Drawings.

K. Joint Shop Coating: All holdback areas for welded joints and all butt straps shall be thoroughly cleaned and given a shop coat of rust-inhibitive primer. The surface preparation and primer shall be compatible with the intended finish coating as specified in Section 02621S – Pipeline Coatings and Lining, as applicable.

L. Shop Fit Test
   1. To ensure that joints may be fully assembled and that excessive annular space between spigots and bells does not exist, and that the pipe meets the requirements of AWWA C200, the pipe fabricator shall perform a shop fit test on a minimum of five joints. The joints to be tested shall be selected by the Engineer based on pipe measurements.
   2. The shop fit test shall join the pipe ends in the shop with the proposed adjacent pipe end.

3. Record the actual annular space, with the data to include as a minimum:
   a. Maximum space at any point.
   b. Minimum space at any point.
   c. Space at 90-degree intervals--top, bottom, and spring line on both sides.
4. The pipe ends shall be match marked after shop assembly.

2.5 CEMENT-MORTAR LINING

A. Cement-Mortar Lining for Shop Application: The interior lining of all steel pipe shall be in accordance with Section 02621S – Pipeline Coating and Linings.

B. The minimum lining thickness shall be as follows, with a tolerance of plus 1/8-inch or minus 1/16-inch:

Nominal Pipe Diameter (in)	Lining Thickness (in)
4 - 10	1/4
11 - 23	5/16
24 - 36	3/8
over 36	½

C. The pipe shall be left bare where field joints occur as indicated. Ends of the linings shall be left square and uniform. Feathered or uneven edges will not be permitted.

D. Defective linings, as determined by the Engineer, shall be removed from the pipe wall and shall be replaced to the full thickness required. Defective linings shall be cut back to a square shoulder in order to avoid feather edged joints. Temperature and shrinkage cracks in the mortar less than 1/16 inch wide need not be repaired. Pipe, specials, or fittings with cracks wider than 1/16 inch shall be rejected or repaired per C205 at the discretion of the Engineer.

E. The progress of the application of mortar lining shall be regulated in order that all hand work, including the repair of defective areas is cured in accordance with the provisions of ANSI/AWWA C205. Cement-mortar for patching shall be the same materials as the mortar for shop or machine lining, except that a finer grading of sand and mortar richer in cement shall be used when field inspection indicates that such mix will improve the finished lining of the pipe.

F. Protection of Pipe Lining/Interior: For all pipe and fittings with plant-applied cement-mortar linings, provide a polyethylene or other suitable bulkhead on the ends of the pipe and on all special openings to prevent drying out of the lining. All bulkheads shall be substantial enough to remain intact during shipping and storage until the pipe is installed.

2.6 EXTERIOR COATING OF PIPE

A. Exterior Coating of Steel Pipe: The exterior coating of all steel pipe shall be in accordance with Section 02621S – Pipeline Coatings and Linings.

B. Field Coating Requirements: Provide heat shrink sleeves for exterior coating of joints following installation in accordance with Section 02621S-Pipeline Coating and Lining.

2.7 PIPELINE MARKING TAPE

A. Metallic tape: Terra Tape Sentry Line Detectable manufactured by Reef Industries, Inc., 9209 Alemeda Genoa Road, Houston, TX 77075, www.reefindustries.com; or approved equal, having the following essential characteristics:
1. Aluminum foil encased in high visibility inert polyethylene jacket.
2. Total thickness: 6.0 mils, minimum.
3. Core foil thickness: 0.30 mils, minimum.
4. Width: 6 inches, minimum.
5. Imprinted on one side, 1-inch-tall, permanent black lettering.
6. Color: as listed below.
7. Joining clips shall be manufacturer's standard tin or nickel coated.
8. Tape shall read “JVWCD Potable Pipeline, Tel #801-256-4401”.

B. Plastic tape: Terra Tape Extra Stretch manufactured by Reef Industries, Inc., 9209 Alemeda Genoa Road, Houston, TX 77075, www.reefindustries.com; or equal, having the following essential characteristics:
1. Polyolefin or similar chemically inert material unsusceptible to alkalies, acids, and chemicals and solvents likely in the soil.
2. Thickness: 8.0 mil, minimum.
3. Width: 12 inches minimum.
4. Color: as listed in below.
5. Imprinted on one side, 1-inch-tall, permanent black lettering on a colored background.
6. Tape shall read “JVWCD Potable Pipeline, Tel #801-256-4401”.

C. Marking Tape Lettering: Lettering for mainline pipeline shall read "Jordan Valley Water Conservancy District – Water Line Buried Below." Lettering for marking tape for other utilities shall read as required by utility owner.

2.8 ABOVE GROUND MARKERS

A. Provide pipeline markers at the locations indicated. Markers in open areas shall be High Visibility Tri-View Utility Marking Posts as manufactured by Rhino Marking and Protection Systems (www.rhinomarkers.com) or approved equal. Coordinate color and lettering with JVWCD/BOR prior to installation. Markers shall be provided at the following locations:
   1. Both sides of street crossings.
   2. At the beginning and end of open areas and at a maximum interval of 500-feet.

B. Brass Caps: Caps shall be 2-1/2-inch diameter brass caps with posts set by epoxy into holes drilled into the curb adjacent to the pipeline. Brass caps and monuments shall be provided in locations as described in the plans. Caps shall be stamped as shown on the detail and shall be provided at the following locations:
   1. Both sides of street crossings.
   2. Within deck of concrete structures (manway, vaults, etc.)

2.9 PIPELINE TESTING AND DISINFECTION

A. All test equipment, chemicals for chlorination, temporary valves, bulkheads, or other water control equipment and materials shall be determined and furnished by the Contractor subject to the Engineer's review. No materials shall be used which would be injurious to the construction or its future function.

B. Used pressure gauges shall be recertified prior to testing.

C. Chlorine for disinfection shall be in the form of liquid chlorine, sodium hypochlorite solution, or calcium hypochlorite granules or tablets.

D. Liquid chlorine shall be in accordance with the requirements of ANSI/AWWA B301. Liquid chlorine shall be used only:
   1. In combination with appropriate gas flow chlorinators and ejectors;
   2. Under the direct supervision of an experienced technician;
   3. When appropriate safety practices are observed.

E. Sodium hypochlorite and calcium hypochlorite shall be in accordance with the requirements of ANSI/AWWA B300 - Hypochlorite.

PART 3 EXECUTION

3.1 GENERAL

A. Not Used.

3.2 INSTALLATION OF PIPE

A. Handling and Storage: All pipe, fittings, and specials shall be carefully handled and protected against damage to lining and coating/interior and exterior surfaces, impact shocks, and free fall. All pipe handling equipment shall be acceptable to the Engineer. Pipe shall not be placed directly on rough ground but shall be supported in a manner which will protect the pipe against injury whenever stored at the trench site or elsewhere. Pipe shall be handled and stored at the trench site in accordance with the requirements stated below. No pipe shall be installed when the lining or coating/interior or exterior surfaces show cracks or other damage that may be harmful as determined by the Engineer. Such damaged lining and coating/interior and exterior surfaces, shall be repaired to the satisfaction of the Engineer, or a new undamaged pipe shall be furnished.

B. All pipe damaged prior shall be repaired or replaced.

C. Inspect each pipe and fitting to insure that there are no damaged portions of the pipe. Remove or smooth out any burrs, gouges, weld splatter or other small defects prior to laying the pipe.

D. Before placement of pipe in the trench, each pipe or fitting shall be thoroughly cleaned of any foreign substance, which may have collected thereon and shall be kept clean at all times thereafter. For this purpose, the openings of all pipes and fittings in the trench shall be closed during any interruption to the Work.

E. Select lifting points that when used, do not result in damage to the pipe.

F. Excavations shall be made as needed to facilitate removal of handling devices after the pipe is laid. Excavation shall be made as needed outside the normal trench section at field joints to permit adequate access to the joints for field connection operations and for application of coating on field joints.

G. Where necessary to raise or lower the pipe due to unforeseen obstructions or other causes, the Engineer may change the alignment and/or the grades. Such change shall be made by the deflection of joints, short lengths of pipe, by the use of beveled joint rings, or by the use of additional fittings. However, in no case shall the deflection in the joint exceed 75 percent of the maximum deflection recommended by the pipe manufacturer or the amount that results in more than a 1/8-inch gap at the weld location, whichever is less. No joint shall be misfit any amount which will be detrimental to the strength and water tightness of the finished joint.

H. Pipe struts shall be left in place until backfilling operations have been completed. After the backfill has been placed to the springline of the pipe, the struts shall be removed and shall be properly disposed. Struts shall not be removed with a torch or any other method that may damage the pipe lining or coating. The parent pipe material shall not be nicked, gouged, or damaged during strut removal. All repairs of gouges or nicks in the parent material shall be made using 3/32-inch maximum diameter E-6010 welding electrodes with a maximum heat input of 5.6 kj per inch. Tack welds, stull metal, weld splatter, slag, and burrs that remain attached to the parent metal surface after cutting shall be ground to within 1/32 inch of the parent metal. Grinding shall not penetrate the parent metal. Notify the Engineer prior to grinding. Following grinding, all pipe surfaces at the tack weld shall be visually inspected for defects. All defects deeper than 1/16 inch shall be repaired by welding in accordance with ANSI/AWSD.1.1 and AWWA/ANSI C206. All inspection work shall be performed by a certified welding inspector.

I. For pipe backfilled with flowable fill, the pipe shall be laid directly on moist sandbags or other suitable supports approved by the Engineer in preparation for flowable fill pipe zone material. Sandbags shall be placed to provide at least 6 inches of flowable fill below the bottom of the pipe. Sandbags shall be spaced at a maximum interval of 8 feet and one set shall be placed within 3 feet on both sides of each joint. Provide additional sandbags as needed to support the pipe on line and grade. For pipe bedded in granular material, no blocking will be permitted, and the bedding shall be such that it forms a continuous, solid bearing for the full length of the pipe. Excavations shall be made as needed to facilitate removal of handling devices after the pipe is laid. Bell holes shall be formed at the ends of the pipe to prevent point loading at the bells or couplings. Excavation shall be made as needed outside the normal trench section at field joints to permit adequate access to the joints for field connection operations and for application of coating on field joints.

J. At all times, means shall be provided to prevent the pipe from floating. Take all necessary precautions to prevent the pipe from floating due to water entering the trench or from backfilling with flowable fill. Assume full responsibility for any damage due to this cause and shall at its own expense restore and replace the pipe to its specified condition and grade if it is displaced due to floating. Maintain the inside of the pipe free from foreign materials and in a clean and sanitary condition until its acceptance by the JVWCD/BOR.

K. Bulkheads
   1. Prior to shipment of pipe with cement mortar lining the lining shall be wetted then a suitable bulkhead shall be attached to each end of the pipe section. This bulkhead shall remain in place and in good condition through transit to the Project.
   2. During construction the openings of all pipe and specials where the pipe and specials have been cement-mortar lined in the shop shall be protected with suitable bulkheads to maintain a moist atmosphere and to prevent unauthorized access by persons, animals, water or any undesirable substance. The bulkheads shall be so designed to prevent drying out of the interior of the pipe. Introduce water into the pipe as needed to keep the mortar moist where moisture has been lost due to damaged bulkheads.

L. Pipe Cleanup: As pipe laying progresses, keep the pipe interior free of all debris. Completely clean the interior of the pipe of all sand, dirt, mortar splatter and any other debris following completion of pipe laying and any necessary interior repairs prior to testing and disinfecting the completed pipeline.

M. Installation Tolerances: Each section of pipe shall be laid in the order and position shown on the laying diagram and the following requirements:
   1. Each section of pipe having nominal diameter 48 inches and larger shall be laid to line and grade, within plus or minus 5 percent of diameter horizontal deviation and plus or minus 2.5 percent of diameter vertical deviation.
   2. In addition to the horizontal and vertical tolerances above, lay the pipe so that no high or low points other than those on the laying diagram are introduced.
   3. Pipe deflection, after backfill but prior to installation of field-applied cement mortar lining, if applied, shall not exceed 2.25 percent for flexible coated pipe and 1.5 percent for cement mortar coated pipe. Deflection shall be measured by the difference in vertical inside diameter in the installed pipe and the manufactured pipe.

4. Pipe not conforming to these criteria or which otherwise impact the ability to complete the Work shall be removed and reinstalled in full conformance with the Contract Documents at no additional cost to the Department.
5. For each section of pipe, record the invert elevation at the lower end and incorporate the data on the Record Drawings.

N. Protection of Pipe: At locations where the pipeline will be crossed with heavy equipment, precautions as approved by the Engineer shall be taken to protect the pipe from damage. Acceptable precautions include: backfilling the pipe trench as necessary to protect the pipe, concrete encasing the pipe, and placing steel plating over the pipe. Any damage to the pipe shall be repaired.

3.3 WELDED JOINTS

A. Welding Procedures, Welding Qualifications, and Testing
1. Field welding procedures, welders, welding operators, and tackers shall be qualified in accordance with AWS D1.1 and as defined in Section 3 of ANSI/AWWA C206 or ANSI/AWWA C200, as applicable. All qualifications shall be in accordance with all-position pipe tests as defined in Section 5 of AWS D1.1.
2. For field welding, the welder qualification testing shall be performed at the site. Previous qualifications will not be accepted. Obtain the services of an independent testing laboratory to perform the welder qualification onsite. Copies of all test data and certifications shall be provided to the Engineer. All costs for welder qualification testing shall be at no increased cost to the Department.
3. Upon completion of each field-welded joint, the welding operator shall mark his regularly assigned identification number and the last two numbers of the year in which the Work was completed, or the Contractor may have a records system that traces a welder's work completion to a specific joint. Steel stamping directly on piping will not be permitted unless "low stress" die stamps, such as interrupted dot or round nose types, are used.
4. All single welded lap joints will be inspected by the Contractor in the presence of the Engineer using magnetic particle or dye penetration methods. Field butt welds will be inspected by the Contractor in accordance with the requirements of API 1104 by the radiographic method and the acceptance criteria of API 1104. Magnetic particle testing is not required for seal welds.
5. All double welded lap joints and butt strap joints shall be air tested by the Contractor in the presence of the Engineer. Repairs and retesting shall be required if any loss of pressure occurs.

6. Inform the Engineer before completed weld joints are to be backfilled so that the joint may be inspected. Assume all costs of exposing backfilled joints for inspection when backfilling preceded the inspection.
7. Personnel performing visual inspection of welds shall be qualified and currently certified as Certified Welding Inspectors (CWI) in accordance with AWS QC1, Standard for Qualification and Certification of Welding Inspectors. Personnel performing nondestructive tests shall be qualified and certified to the requirements of SNT-TC-1A.
    a. The Engineer may also order nondestructive testing by an independent testing laboratory in addition to any testing specified herein. Except as otherwise specified herein, all costs for the independent testing laboratory to inspect and test field welds will be paid for by the Department. Defective welds shall be inspected, repaired, and retested.
    b. Test reports of all laboratory tests shall be submitted as provided in the quality control section.

B. Where exterior welds are performed, adequate space shall be provided for welding and inspection of the joints.

C. Lap Welded Joints: During installation of welded steel pipe in either straight alignment or on curves, the pipe shall be laid so that at any point around the circumference of the joint there is a minimum lap as shown on the Drawings.

D. Butt Straps: Where used or required, shall be as shown on the Drawings.

E. After the pipe and pipe joint are properly positioned in the trench, weld and provide external joint protection for all joints except the special temperature control lap joint hereinafter specified. The length of pipe between special temperature control joints shall be backfilled to at least one foot above the top of the pipe as hereinafter specified. The special temperature control joints shall be welded after the pipe is backfilled to at least one foot above the top of the pipe for the full distance between the temperature control joints upstream and downstream. Joint protection shall be provided for special temperature control joints after completion of the joint welds and tests as specified. Care shall be exercised during the initial backfilling to prevent movement of the pipe and to prevent any backfill material from being deposited on the special temperature control joint.

F. Control of Temperature Stresses

1. Control temperature stresses in accordance with AWWA C206, the approved temperature stress control submittal, and these Specifications. Provide special temperature control lap joints at intervals of 400 feet or less, unless otherwise approved by the Engineer.
2. To control temperature stresses, the unbackfilled special temperature control joint areas of all pipe shall be shaded from the direct rays of the sun by the use of properly supported awnings, umbrellas, tarpaulins, or other suitable materials until the pipe is backfilled at least 1 foot over the top of the pipe. The "temperature control joint area" is defined as the entire length of pipe left exposed near a control joint after placing the pipe backfill between it and the other control joints in each direction. The term "special temperature control joint area" is defined as the entire length of pipe left exposed near a control joint after placing the backfill between it and the other control joints in each direction. Shading materials at the joint area shall not rest directly on the pipe but shall be supported to allow air circulation around the pipe. Shading of the pipe joints need not be performed when the ambient air temperature is below 45 degrees F.
3. At intervals not exceeding 400 feet along welded reaches of the pipeline, at the first regular lap-welded field joints outside concrete encasements and structures, and where shown, the pipe shall be supplied with a special temperature control lap joint and laid with an initial lap of not less than 3 inches greater than the typical lap joint. Where temperature control lap joints occur in a traveled roadway or other inconvenient location, the location of the joint may be adjusted, as acceptable to the Engineer.
4. Provide and install thermocouple temperature gauges to monitor the temperature of the steel pipe wall on the inside top of the pipe as it lays in the trench. All pipe temperature requirements specified herein shall be measured at the top inside of the steel cylinder. Specific temperature requirements for the pipeline steel cylinder shall be met prior to installation of the flowable fill, during and after placement of flowable fill, and during welding of the special temperature control joints. If atmospheric conditions do not allow the conditions to be met, supplemental cooling shall be required. The following outlines the specific temperature control requirements.
    a. Prior to and during placement of the flowable fill, the pipeline steel temperature shall be at or below 90 degrees F. The specified temperature shall be maintained for at least three hours after the placement of flowable fill. The specified

temperature shall be maintained until the line is fully backfilled. Provide supplemental cooling as required.

b. Placement of flowable fill shall proceed in the direction of pipe laying from one special temperature control joint to the next. During placement of flowable fill, the lead end of the pipe section (toward the next special temperature control joint) shall be left unbackfilled or otherwise unrestrained such that the end of the pipe is free to move in response to expansion or contraction due to temperature changes. Flowable fill shall not be placed in a direction which would result in flowable fill placement proceeding in a direction toward previously or simultaneously placed flowable fill without the written permission of the Engineer. The direction of flowable fill placement will not be limited for placement at the short unbackfilled section immediately adjacent to the special temperature control joints.

c. During periods between flowable fill placement operations, any section of pipeline that is backfilled with flowable fill shall be shaded from the direct rays of the sun by the use of properly supported awnings, umbrellas, tarpaulins, or other suitable materials until the pipe is backfilled at least 1 foot over the top of the pipe. The temperature of the partially backfilled pipe shall not be allowed to exceed 110 degrees Fahrenheit at any time. Provide supplemental cooling as required. Shading materials shall not rest directly on the pipe but shall be supported to allow air circulation around the pipe. Shading of the partially backfilled pipe need not be performed when it can demonstrate to the satisfaction of the Engineer, using thermocouple data, that shading is not necessary to meet the specified temperature requirement.

d. Prior to welding the special temperature control joints, the pipeline extending 400 feet each direction from the joint shall be maintained at or below 85 degrees F. Additionally, the pipeline extending 400 feet each direction from the joint shall be backfilled with flowable fill to at least one foot over the top of the pipe. At the specified temperature, the special temperature control joints can be welded. Begin and complete the weld during the coolest interval of suitable length within a 24-hour day. Use the thermocouple temperature data to demonstrate to the Engineer the coolest interval of the day.

e. After welding any temperature control joint, the pipe temperature for 150 feet in each direction from the control joint shall be maintained below 110 degrees F for a minimum

of 24 hours after the temperature control joint area has been backfilled to at least 1 foot over the top of the pipe. This requirement is in addition to the shading and flowable fill placement temperature requirements indicated herein.

G. Prior to the beginning of pouring flowable fill or beginning the welding procedure, any tack welds or joint stops used to position the pipe during laying shall be removed. Any annular space between the faying surfaces of the bell and spigot shall be equally distributed around the circumference of the joint by shimming, jacking, or other suitable means. The weld shall then be made in accordance with ANSI/AWWA C206. Where more than one pass is required, all dirt, slag, and flux shall be removed before the succeeding bead is applied.

H. Testing of Joints: All double welded lap and butt strap joints shall be tested to a minimum of 40-psi air pressure for a period of 10 minutes per AWWA C206. No air leakage will be allowed. If the test pressure drops below 40 psi, paint the welds with a soap solution. Mark any leaks indicated by the escaping gas bubbles and repair and retest joint.

I. Following tests of the joint, the exterior joint spaces shall be coated in accordance with these Paragraph 3.4 Joint Coating and Lining after which backfilling may be completed.

J. Joints: The pipe ends shall be cut straight on joints where butt straps are used for realignment, adjustment, or deflection, and fillet welds shall be made as indicated.

K. Repair of Welds: All welds that are defective shall be repaired to meet the requirements of this Section at no additional cost to the Department. Defects in welds or defective welds shall be removed, and that section of the joint shall then be rewelded. Only sufficient removal of defective material that is necessary to correct the defect is required. After the repair is made, the joint shall be checked by repeating the original test procedure. Welds deficient in size shall be repaired by adding weld metal.

3.4 JOINT COATING AND LINING

A. General: The interior and exterior joint recesses shall be thoroughly wiped clean and all water, loose scale, dirt and other foreign material shall be removed from the inside surface of the pipe. The grout for joint coating and lining shall be cement grout, except that composition shall be one part cement to two parts sand and sufficient water for dry-pack consistency

B. Joint Coating: In accordance with the requirements of Section 02621S – Pipeline Coating.

C. Joint Lining:
1. Clean joint to remove dirt, debris, and other contaminants.
2. Apply a single application of NSF approved acrylic latex bonding admixture (Flex-Con, or equal) to wet out joint for the promotion of adhesion.
3. The grout for joint lining shall be cement grout, except that composition shall be one part cement to two parts sand and sufficient water for dry-pack consistency. NSF approved acrylic latex admixture shall be added to develop a dough like consistency.
4. Mortar mixture is hand packed into the joint area.
5. Joint is troweled smooth to create a uniform transition between existing mortar lined pipe.
6. Joint area is swept clean of debris.
7. After the backfill has been completed to final grade, the interior joint recess of shop-lined pipe shall be filled with grout, tightly packed into the joint recess and troweled flush with the interior surface. All excess shall be removed. At no point shall there be an indentation or projection of the grout exceeding 1/16 inch. With pipe smaller than 24 inches in diameter, before the spigot is inserted into the bell, the bell shall be daubed with grout containing one part cement to two parts sand. The spigot end then shall be forced to the bottom of the bell and excess mortar on the inside of the joint shall be swabbed out.

3.5 MARKING TAPE INSTALLATION

A. Continuously install plastic marking tape along the pipe at the depth and locations shown on the Drawings.

3.6 PIPELINE TESTING

A. Visually inspect the entire pipeline and remove all construction debris, silt, mortar, etc. from the pipeline prior to filling for hydrostatic testing and disinfection. Coordinate schedule for final visual inspection walkthrough with the Engineer.

B. Water for testing and disinfecting water pipelines shall be furnished by the Contractor. Make all necessary provisions for conveying the water from the source to the points of use, and disposal of the water (and dechlorinating - where applicable).

C. All pressure pipelines shall be tested. Disinfection shall be accomplished by chlorination for all pipelines providing potable water or connected to a potable water system. All chlorinating and testing operations shall be performed in the presence of the Engineer.

D. Disinfection operations shall be scheduled as late as possible during the contract time period so as to assure the maximum degree of sterility of the facilities at the time the Work is accepted by the JVWCD/BOR. Samples for bacteriological testing shall be collected by the Contractor, and testing shall be performed by the JVWCD laboratory and at the expense of the Contractor. The Jordan Valley Water Treatment Plant laboratory is can only accept bacteriological samples for testing during working hours Monday through Thursday. Samples shall be turn during these times. Results of the bacteriological testing shall be satisfactory with the State Department of Health or other appropriate regulatory agency.

E. Pipeline pressure tests will include the following tests:
1. Air test of double welded lap and butt strap joints.
2. Hydrostatic pressure test of the complete pipeline, in segments as required to match pipe pressure class.
3. Conduct the discharge in accordance with the Utah Pollutant Discharge Elimination System (UPDES) permit from the Utah Division of Environmental Quality (UDEQ). Apply a reducing agent to the discharged water to neutralize the chlorine residual and meet the chlorine residual limit required under the permit. JVWCD/BOR shall conduct the water quality sampling of the discharge as required by the permit. Notify local agencies, secure appropriate other permits and approvals, and provide erosion control measures for any releases as appropriate. Release of water after pipeline testing and disinfection have been completed shall be only if acceptable to the Engineer.

F. Notification: Notify the Engineer at each of the following stages:
1. Three working days prior to the start of filling the pipeline with water.
2. Three working days prior to the start of chlorination.
3. Twenty-four hours before withdrawing samples for bacteriological testing.
4. Three working days prior to the start of flushing.

3.7 HYDROSTATIC TESTING OF PIPELINES

A. Prior to hydrostatic testing, all pipelines shall be flushed or blown out as appropriate. Test all pipelines either in sections or as a unit. No section of

the pipeline shall be tested until all field-placed concrete or mortar has attained an age of 7 days. The test shall be made by closing valves when available, or by placing temporary bulkheads in the pipe and filling the line slowly with water. Ascertaining that all test bulkheads are suitably restrained to resist the thrust of the test pressure without damage to or movement of the adjacent pipe. Any unharnessed sleeve-type couplings, expansion joints, or other sliding joints shall be restrained or suitably anchored prior to the test, to avoid movement and damage to piping and equipment. Provide sufficient temporary air tappings in the pipelines to allow for evacuation of all entrapped air in each pipe segment to be tested. After completion of the tests, such taps shall be permanently plugged. Care shall be taken to see that all air vents are open during filling.

B. The pipeline shall be filled at a rate not to exceed 2-feet per second as calculated by using the cross-sectional area based on the inside diameter of the pipe and which will not cause any surges or exceed the rate at which the air can be released through the air valves at a reasonable velocity and all the air within the pipeline shall be properly purged. After the pipeline or section thereof has been filled, it shall be allowed to stand under a slight pressure for at least 24 hours to allow the concrete or mortar lining, as applicable, to absorb what water it will and to allow the escape of air from any air pockets. During this period, bulkheads, valves, and connections shall be examined for leaks. If leaks are found, corrective measures satisfactory to the Engineer shall be taken.

C. The hydrostatic test shall consist of holding the test pressure on the pipeline for a period of 4 hours. The test pressure for distribution and transmission pipelines shall be as shown on the drawings measured at the lowest point of the pipeline section being tested. No pressure test will be required for overflow/drain lines. All visible leaks shall be repaired in a manner acceptable to the Engineer.

D. In the case of pipelines that fail to pass the prescribed leakage test, determine the cause of the leakage, take corrective measures necessary to repair the leaks, and again test the pipelines at no additional cost to the Department.

E. The pipeline shall be drained after successful completion of the hydrostatic test.

3.8 DISINFECTING PIPELINES

A. General: All potable water pipelines shall be disinfected in accordance with the requirements of ANSI/AWWA C651 - Disinfecting Water Mains as modified herein.

B. Prior to disinfecting the pipeline for potable water services and before placing into service for other water pipelines, flush the pipeline to remove any debris, rocks, or other foreign material that may have entered the pipe. Provide all required material, labor and equipment to complete flushing. Provide the water for flushing. Make appropriate provision and preparations for disposal of flushing water, satisfying all local, state and federal rules, laws, regulations and ordinances.

C. Continuous Feed Method: Disinfect in accordance with ANSI/AWWA C651 except that:
   1. The water in the pipe shall contain 50 mg/l free chlorine.
   2. After 24 hours of disinfection, the residual free chlorine shall be at least 25 mg/l at the pipeline extremities.

D. Chlorinating Valves: During the process of chlorinating the pipelines, all valves and other appurtenances shall be operated while the pipeline is filled with the heavily chlorinated water.

E. Final Flushing: After the applicable retention period, the heavily chlorinated water shall be flushed from the pipeline until chlorine measurements show that the concentration in the water leaving the pipeline is no higher than that generally prevailing in the system or is acceptable for domestic use. If there is any question that the chlorinated discharge will cause damage to the environment, a reducing agent shall be applied to the water to neutralize thoroughly the chlorine residual remaining in the water. See the appendix of AWWA C651 for acceptable neutralization methods for heavily chlorinated water.

F. Sampling Ports: Provide sampling ports along the pipeline as defined in AWWA C651. Taps may be made at manways and air valves to help facilitate the spacing requirement.

G. Bacteriological Testing: After final flushing and before the pipeline is placed in service, a sample, or samples shall be collected from the end of the line and at other locations as designated by the Engineer, and shall be tested by JVWCD for bacteriological quality in accordance with the requirements of the State Department of Health or other appropriate regulatory agency. For this purpose the pipe shall be refilled with fresh potable water and left for a period of 24 hours before any sample is collected. Should the initial disinfection treatment fail to produce

satisfactory bacteriological test results, the disinfection procedure shall be repeated until acceptable results are obtained.

3.9 CONNECTIONS TO EXISTING SYSTEM

A. Where connections are to be made to an existing potable water system, the interior surfaces of all pipe and fittings used in making the connections shall be swabbed or sprayed with a one percent hypochlorite solution before they are installed. Thorough flushing shall be started as soon as the connection is completed and shall be continued until discolored water is eliminated.

END OF SECTION

March 16, 2016

SECTION 02618S

DRAINAGE PIPE LINER

Add Section 02618:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Drainage lining methods such as polyvinyl chloride (PVC) fold-and-form, cured in place pipe (CIPP), and segmental thermoplastic pipe.

1.2 RELATED SECTIONS

A. Section 02610: Drainage Pipe

1.3 REFERENCES

A. AASHTO M 326: Polyethylene (PE) Liner Pipe, 300- to 1600-mm Diameter, Based on Controlled Outside Diameter

B. AASHTO LRFD Bridge Design Specifications

C. ASTM D 790: Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

D. ASTM D 1784: Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

E. ASTM D 5813: Cured-In-Place Thermosetting Resin Sewer Piping Systems

F. ASTM F 1216: Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

G. ASTM F 1504: Folded Poly (Vinyl Chloride) (PVC) Pipe for Existing Sewer and Conduit Rehabilitation

H. ASTM F 1743: Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)

I. ASTM F 1867: Installation of Folded/Formed Poly (Vinyl Chloride) (PVC) Pipe Type A for Existing Sewer and Conduit Rehabilitation

J. ASTM F 1871: Folded/Formed Poly (Vinyl Chloride) Pipe Type A for Existing Sewer and Conduit Rehabilitation

K. ASTM F 1947: Installation of Folded Poly (Vinyl Chloride) (PVC) Pipe into Existing Sewers and Conduits

L. ASTM F 2019: Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS

A. Include the following information into a single submittal for review for each drainage pipe to be lined. Use the naming convention used in the plans for each location. Divide information into the sections listed below.
   1. Work Area
      a. Locations and dimensions of any temporary access roads
      b. Locations and dimensions of pipe liner assembly and insertion area “footprints”
      c. Distance of insertion footprint from the traveled way
      d. Amount of time the footprint will be exposed
      e. Shoring method when excavation is proposed
      f. Written access agreements from property owners when work area is outside Department Right of Way
   2. Preparation
      a. Host pipe cleaning
      b. Management of flows in the host pipe
      c. Initial pipe inspection
   3. Installation
      a. Method of pipe liner installation and finishing
      b. Bulkhead and grouting details for segmental thermoplastic and metal liner
      c. Curing method identifying required curing times, temperatures, and pressures
      d. Any potential for producing contaminant concentrations in excess of surface water quality standards or ambient groundwater quality standards, as applicable

e. Control and disposal of any contaminants from materials or installation methods during and after installation
f. Final pipe inspection

4. Product Data
   a. Structural calculations and recommended size and wall thickness of pipe liner. The host pipe is considered to be fully deteriorated and unable to carry loads.
      1) Meet or exceed AASHTO HL-93 or interstate alternate loading according to AASHTO LRFD Bridge Design Specifications and interim specifications for pipe liner load capacity.
   b. Maximum allowable external grouting pressure on pipe liner and joints for segmental thermoplastic liners.
   c. Certification that the pipe liner supplied will provide a minimum 75 year service life based on site characteristics such as such as soil resistivity, soil and water pH, and abrasion potential.
5. Mix Designs
   a. Grout Mix design
   b. Trial batch test data

PART 2 PRODUCTS

2.1 PVC FOLD-AND-FORM LINER

A. PVC resin manufactured from virgin materials containing no fillers.
   1. Meet or exceed the physical property requirements in ASTM F 1504 or ASTM F 1871 for the cell classification as defined in ASTM D 1784.

B. Do not use greater than 24 inch diameter.

2.2 CIPP LINER

A. Fabric tube consisting of one or more layers of absorbent non-woven felt fabric, felt/fiberglass, or fiberglass meeting the requirements of ASTM D 5813 and ASTM F 1216, ASTM F 1743, and ASTM F 2019.
   1. CIPP liner that meets or exceeds the following physical properties outlined in Table 1.

Table 1

Minimum Physical Properties		
Property	**Test Method ASTM**	**Value**
Initial Flexural Modulus	ASTM D 790	250,000 PSI @73º F
Flexural Strength	ASTM D 790	4,500 PSI @73º F

2. Use a sufficient quantity of resin for impregnation to fill the volume of air voids in the pipe liner with additional allowance for polymerization and for any migration of resin into the cracks and joints in the host pipe.
   a. Color the resin with a pigment compatible with the resin system as specified by the resin manufacturer.

2.3 SEGMENTAL THERMOPLASTIC LINER

A. Solid wall or profile wall segmental thermoplastic pipe liner having fused or interlocking joints.
   1. Solid wall polyethylene pipe. Refer to AASHTO M 326.
   2. Profile wall thermoplastic pipe. Refer to Section 02610.

2.4 SEGMENTAL METAL LINER

A. Not used

2.5 GROUT

A. Cementitious grout mixture that is approved by the pipe liner manufacturer having the following characteristics.
   1. Suitable with the site conditions, construction methods, and pipe liner structural capacity.
   2. Compressive strength between 100 and 400 psi
      a. Determine strength from trial batches at 28 days
   3. Fluidity to completely fill voids and the annular space between the host pipe and the pipe liner without segregating
   4. Fly ash not to exceed 30 percent of cementitious material
   5. Shrinkage not to exceed 1 percent by volume

B. Obtain approval from the Engineer for an alternate material.

PART 3 EXECUTION

3.1 GENERAL

A. Furnish the type of drainage pipe liner shown in the plans with the following exception:
   1. Select from any of the drainage pipe liner products listed in this Section, Part 2 meeting the allowable pipe size reduction when no specific product is shown in the plans.

3.2 PREPARATION

A. General
   1. Perform all work within the limits of the Department right of way unless written agreements are in place with adjacent property owners.
   2. Provide adequate control of water in the host pipe when necessary.
      a. Repair damage caused as a result of flow control or lack thereof.
   3. Provide the necessary controls to prevent material from being transported downstream.

B. Host Pipe Cleaning
   1. Remove all material to include sediment, rocks, and miscellaneous debris to inspection and install the pipe liner.
   2. Use a cleaning method and tools that will not cause damage to the pipe or surrounding roadway features.
      a. Notify the Engineer when cleaning could result in damage.
      b. Do not cause erosion of surrounding areas from cleaning operations.
      c. Minimize sediment from being transported downstream.
   3. Collect and properly dispose of all material removed.

C. Host Pipe Inspection
   1. Perform remote inspection for pipes with a nominal diameter less than 48 inches using a closed-circuit television (CCTV) crawler.
   2. Perform a visual inspection for pipes with diameter greater than 48 inches.
   3. Inspect the condition of the host pipe and the suitability of the pipe liner installation. Document and notify the Engineer of the following:
      a. Collapsed or impassable sections of the pipe
      b. Horizontal or vertical alignment deviations
      c. Structural concerns
      d. Loss of material surrounding the pipe exterior
      e. Infiltration of water

f. Repairs required to perform the installation

4. The Department reserves the right to eliminate pipe lining from the contract if the Engineer determines that a host pipe cannot be lined.

D. Drainage Pipe Liner
1. Verify host pipe internal size and length before ordering pipe liner.
2. PVC fold-and-form and CIPP liner dimensions
   a. Size the pipe liner to have an outside diameter that will tightly fit the inside of the host pipe.
   b. Provide sufficient pipe liner length to continuously line the host pipe with no intermediate joints.
3. Segmental Thermoplastic liner dimensions
   a. Size the pipe liner to have an outside dimension that will freely pass through the host pipe and accommodate grout placement.
   b. Use only one type of pipe liner and joint system in any single host pipe.

3.3 INSTALLATION

A. General
1. Remove all sediment and debris that might have accumulated after the initial cleaning immediately before installing the pipe liner.
2. Handle and install the pipe liner in a manner that will not cause damage to the pipe liner.
3. Provide a smooth finish and a tight seal between the pipe liner and the drainage structure walls at pipe penetrations.
4. Restore all lateral and inlet connections.
5. Reinspect the rehabilitated pipe upon completion and before acceptance by the Engineer.
   a. Evaluate pipe liners that contain dry spots, wrinkles, delamination, holes, cracks, joint gaps, soft spots, blisters, or other defects.
      1) Repair or replace damaged or improperly installed pipe liner.

B. PVC fold-and-form and CIPP Liner
1. Meet minimum installation requirements according to ASTM F 1867 or ASTM F 1947 for PVC fold-and form
2. Meet minimum installation requirements according to ASTM F 1216 or ASTM F 1743 for CIPP.
3. Follow the manufacturer's recommended curing and relaxation period required to hold the pipe liner against the host pipe.

a. Provide sufficient gauges, monitoring devices, and tests to determine the effectiveness of the curing.

C. Segmental Thermoplastic Liner

1. Construct a bulkhead at each end of the host pipe to fully support the fluid thrust loads exerted by the placement of grout.
   a. Vent bulkheads to allow release of trapped air as the grout flows into the annular space.
2. Provide a minimum of 24 hrs for the pipe liner temperature to equalize within the host pipe before placing grout.
3. Fill the entire full length of annular space between the host pipe and the pipe liner with grout.
   a. Provide sufficient gauges, monitoring devices, and tests to determine the effectiveness of the grout placement.
4. Do not exceed the pipe liner maximum specified grouting pressure.
   a. Use a pumping unit with a pressure meter and valves capable of limiting grout pumping pressures to the maximum pressure recommended by the manufacturer at the end of the discharge pipe.
5. Place grout in lifts to avoid excessive buoyant forces or grouting pressures.
   a. Allow each lift to cure sufficiently before proceeding with next lift.
6. Remove any internal braces or bands once the grout is sufficiently cured and before acceptance.

END OF SECTION

June 30, 2016

SECTION 02621S

PIPELINE COATING AND LINING

Add Section 02621:

PART 1 GENERAL

1.1 REQUIREMENTS

A. This section covers the work necessary to apply external coating and internal lining on steel pipe, field coating of joints, and field repair of coating damage, complete.

B. Steel pipe shall be supplied from the fabricator with a tape wrap coating system and the dielectric coating system shall be over coated with cement mortar.

C. Schedule and coordinate the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.

1.2 RELATED SECTIONS

A. Section 02570S: Steel Pipe

B. Section 02575S: Steel Pipe Fabricated Specials

C. Section 13114S: Corrosion Monitoring

D. Section 13115S: Cathodic Protection

1.3 REFERENCES

A. This specification recognizes AWWA, NACE, and SSPC standards as minimum industry standards and they are referenced for purpose of conformance, except where modified in this section. The requirements of this specification section have been written to a higher design standard with the intent of achieving a long term coating performance of 100 years.

B. AWWA C205: Cement-Mortar Protective Lining and Coating for Steel Water Pipe-4-inch and Larger- Shop Applied.

C. AWWA C210: Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.

D. AWWA C214: Tape Coating Systems for the Exterior of Steel Water Pipelines.

E. AWWA C216: Heat-shrinkable Cross-linked Polyolefin Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines.

F. NACE RP-0274: High Voltage Electrical Inspection of Pipeline Coatings Prior to Installation.

G. SSPC-SP-1: Solvent Cleaning Surface Preparation

H. SSPC-SP-2: Hand Tool Cleaning Surface Preparation

I. SSPC-SP-3: Power Tool Cleaning Surface Preparation

J. SSPC-SP-5: White metal Abrasive Blast Surface Preparation

K. SSPC-SP-6: Commercial Abrasive Blast Surface Preparation

L. SSPC-SP-10: Near White Metal Abrasive Blast Surface Preparation

M. SSPC-SP-11: Power Tool Cleaning to Bare Metal

1.4 DEFINITIONS

A. Manufacturer's Representative: Employee of coating manufacturer who is factory trained and knowledgeable in all technical aspects of their products and systems. Sales representatives are not acceptable as a technical representative unless written authorization from the coating manufacture is provided which states the sales representative has full authority to act on the behalf of the coating manufacturer.

1.5 SUBMITTALS

A. Shop Drawings: Catalog cuts and other information for all products proposed. Provide copy of approved coating system submittals to the coating applicator.

Quality Control Submittals: Furnish the following:

1. Applicator's Experience with list of references substantiating compliance.
2. Coating manufacturer's certification stating the individual coating applicators have met the qualification certification requirements as specified this section.
3. Coating manufacturer shall provide a copy of the manufacturer's coating application quality assurance manual.
4. If the manufacturer of field-applied coating differs from that of the shop applied primer, provide written confirmation from both manufacturers' that the two coating materials are compatible.

1.6 QUALITY ASSURANCE

A. Coating Applicator's Experience and Certification:
   1. Coating Application Company and coating application supervisor (Certified Applicator) shall have a minimum of 5 year's experience applying the specified coating system.
   2. Coating application personnel, whom have direct coating application responsibility, shall have a minimum of 2 years practical experience in application of the indicated coating system.
   3. Coating applicator shall be certified by the coating manufacturer as an approved applicator.

B. Coating and/or lining manufacturer technical representative shall be present for a minimum of one day technical assistance and instruction at the start of coating and/or lining operations within the shop. During this visit, the technical representative shall observe surface preparation and coating application and conduct tests of the coating to insure conformance with application instructions, recommended methods, and conditions.

C. Coating and/or lining manufacturer's technical representative shall be onsite for one working day, minimum, at the start of each construction season to inspect coating application and procedures in the field. During this visit, the technical representative shall observe surface preparation and coating application and conduct tests of the coating to insure conformance with application instructions, recommended methods, and conditions.

D. Coating and/or lining manufacturer shall include 8 hours per month of field or shop coating technical support when requested by the Engineer.

E. Technical representative shall provide a written report to the Engineer for each visit. Report shall include copies of test data collected, description of observations, and all recommended corrective actions. Report shall be submitted within 5 working days after the visit. When deemed necessary by the Engineer, work will not be permitted to proceed until the recommended corrective actions have been implemented. After all corrective recommendations have been completed; the manufacturer representative shall return and certify that the application complies with the manufacturer's coating application recommendations.

F. Additional visits by the manufacturer's representative shall be made at sufficient intervals during surface preparation and coating or lining as may be required for product application quality assurance, and to determine compliance with manufacturer's instructions, and as may be necessary to resolve problems attributable to, or associated with, manufacturer's products furnished for this project.

1.7 ABBREVIATIONS

MDFT	Minimum Dry Film Thickness
mil	Thousandths of an Inch

1.8 SPECIAL WARRANTY REQUIREMENTS

A. Warrant to the Department and guarantee the work under this section against defective workmanship and materials for a period of two (2) years commencing on the date of final acceptance of the work.

1.9 OBSERVATION OF WORK

A. Give the Department Representative a minimum of 14 days advance notice of the start of any work to allow scheduling for shop or field observation.

B. Provide Department Representative a minimum 3 days' notice for actual start of surface preparation and coating application work.

C. Provisions shall be made to allow Department's representative full access to facilities and appropriate documentation regarding coating application.

D. Observation by the Department's representative or the waiver of observation of any particular portion of the work shall not be construed to

relieve the responsibility to perform the work in accordance with these Specifications.

E. Materials shall be subject to testing for conformance with this specification as the Department's representative may elect, prior to or during incorporation into the work.

PART 2 PRODUCTS

2.1 GENERAL

A. Coatings and linings will be stored and handled per manufacturer's written directions.

B. Exterior and interior pipe and fitting surfaces shall be prepared and coated in accordance with referenced standards, written instructions of the coating or lining manufacturer, and these specifications, whichever is more stringent.

C. Pipeline coating or lining shall be the product of a single manufacturer. Product substitutions during the project will not be permitted, without ENGINEER approval.

2.2 SHOP-APPLIED EXTERIOR COATINGS

A. General
   1. Steel pipe shall be coated in accordance with AWWA C214, except as modified herein.
   2. Mortar over coat of dielectric coating shall be provided over Tape Wrap coating system (C214) and where specified or indicated on the Drawings. Steel pipe to receive a cement mortar overcoat shall be shop-coated with the required coating system and a 1-inch thick, minimum, cement mortar overcoat as specified herein.
   3. Buried dielectrically coated pipe and fittings passing through a concrete structure wall or floor shall be coated for a minimum of two-inches beyond the interior wall or floor surface.

B. Polyethylene Tape Wrap:
   1. Pipe shall be coated with an 80 mil (nominal), tape-coating systems applied in accordance with AWWA C214, except as modified herein.
      a. Primer: Polyken 1019, 1027, 1029, or as recommended by the coating manufacturer.

b. Weld Stripe Tape: Polyken 931 (no backing), 25 mils nominal, 4-inches wide minimum.
c. Inner Wrap: Polyken 989 YGIII, 20 mils nominal, corrosion protection layer.
d. Middle Wrap: Polyken 955 YGIII, 30-mils nominal, mechanical protection layer. **Middle wrap may be eliminated when a cement mortar overcoat is required.**
e. Outer Wrap: Polyken 956 YGIII, 30 mils nominal, mechanical protection layer.
f. Surface Preparation:
(1) Steel Pipe: SSPC-SP5, White Metal blast, 2.5 mils blast profile, minimum.

2. Tape Coating:
a. Tape layers shall have adhesive for the full width of the tape. Adhesive shall have the ability to stick to itself and to the proceeding tape layer or pipe.
b. Each layer shall be a different color or shade with the outer layer white.
c. Outer wrap shall have sufficient ultraviolet (UV) inhibitors to resist above grade exposure for a minimum of 12 months or the proposed storage and construction time, whichever is greater.
d. Tape width shall be 12-inches maximum. Wider tape will be conditionally allowed if the coating applicator can demonstrate that proper tensioning can be maintained and mechanical wrinkling prevented throughout the coating application. If at any time during the pipe fabrication tape quality becomes inconsistent with a wider tape, the Engineer can require the remainder of the pipe to be coated using the maximum specified tape width.
e. Tape coated steel pipe shall be provided with a cement mortar overcoat as specified this section.

C. Plural Component Epoxy:
1. General:
a. Plural component, epoxy coating system shall be applied as specified herein with the exception that AWWA C210 is incorporated by reference for product qualification and application requirements only.
b. Where there is a conflict between C210 and this specification, the more stringent requirement shall apply.
2. Shop Surface Preparation:

a. Steel pipe: SSPC-SP5, White Metal blast, 3.00 mil profile, minimum, or as required by the manufacturer, whichever is greater.

3. Shop Applied Coating Requirements:
   a. Thickness: One coat, 35 mils total dry film thickness, minimum, or as required to meet limits specified for holiday and coating defects, this section.
   b. Epoxy: Self-priming, plural component, 100 percent solids, non-extended epoxy, suitable for burial or immersion, and meeting the requirements of AWWA C210 and the following, whichever is more stringent:
      1) Resistance to Water Immersion (ASTM D870) or Wet Adhesion
         a) Acceptance criteria:
            (1) Not greater than 10 percent loss of substrate adhesion when compared to substrate adhesion in an unexposed area of the same sample with adhesion tests completed within 12 to 24 hours after test termination. Average of three pulls per exposure area.
            (2) No blistering or underfilm corrosion when viewed at 10x magnification.
         b) Adhesion Testing:
            (1) Method: ASTM D4541, Method E
            (2) Equipment: Type V, Delfesko Automatic AT Positest
            (3) Dollies: 20 mm and 14 mm, scored to metal substrate
            (4) Test Speed: 100 psi per second (both 14 and 20 mm)
         c) Test Duration: 30 and 60 days
      2) Cathodic Disbondment (ASTM G95)
         a) Acceptance criteria: 8 mm, maximum
         b) Potential: -3.00 volts
         c) Test Duration: 28 days
         d) Evaluation: Measured from original holiday radius to edge of staining on metal surface.
      3) Water Absorption (ASTM D570)
         a) Acceptance Criteria: 1.80 percent, maximum
         b) Test Duration: 30 day and 60 day
      4) Long-Term Adhesion Test:

(a) Acceptance Criteria: Not more than 10 percent loss of adhesion over duration of test. Differential based on the highest average adhesion result to the lowest average adhesion result.

(b) Test Duration: 1 day, 7 days, 3 weeks, 2 months, and then monthly for total test duration of 12 months.

(c) Sample Preparation:

(1) SSPC-SP5, white metal abrasive blast, 3.00 mils profile, minimum.

(2) Test area shall not exceed 18-inches by 18-inches.

(3) Steel plate shall be a curved steel plate with a minimum radius of 15 inches to minimize standing water on the test panel.

(4) Sample shall be exposed to ambient, outdoor conditions for the full duration of the test.

(d) Test Procedure:

(5) Long term adhesion shall be based on an 8 pulls per test period with the 3 lowest pulls discarded.

(6) Test results per each test period shall be an average of the five highest pulls.

(7) All adhesion pulls and their failure mode shall be recorded and those included in the average calculation shall be identified.

(8) All adhesion tests shall be repaired to prevent water runoff from affecting subsequent adhesion tests.

c. Shall be one of the following products:

(1) Tnemec Series 431, Kansas City, MO

(2) Or approved equal

D. Cement Mortar Overcoat

1. Cement mortar overcoat shall be applied over tape wrap coating system (C214) on steel pipe and fittings in accordance with AWWA C205, except as modified herein.

2. Holdback:

a. Mortar overcoat shall be held back of dielectric coating a minimum of 3 inches for overlap of field applied joint coating onto dielectric coating system.

3. Shop Applied Coating System:
   a. Cement: Conform to ASTM C150, Type II.
   b. Aggregate shall be silica sand or other aggregate that is not subject to leaching. Conform to ASTM C33.
   c. Cement mortar mixture shall consist of 1 part cement to not more than 3 parts aggregate.
   d. Water for cement mortar: Clean and free from organic matter, strong alkalis, vegetable matter, and other impurities. Use no more than 4-1/2 gallons of water per sack of cement.
   e. Cement mortar coating: Nominal 1-inch thick coating with permitted tolerance of ±1/4-inch.

2.3 SHOP-APPLIED INTERIOR LININGS

A. Cement Mortar Lining:
   1. Clean and cement mortar line steel pipe and fittings in accordance with AWWA C205.
   2. Cement: Conform to ASTM C150, Type II.
   3. Shop applied cement mortar lining shall be uniform in thickness over the full length of the pipe joint.
   4. Aggregate shall be silica sand or other aggregate that is not subject to leaching. Conform to ASTM C33.
   5. Water for cement mortar: Clean and free from organic matter, strong alkalis, vegetable matter, and other impurities.

B. Liquid Applied Epoxy Coating:
   1. Cement Mortar Lined Steel Pipe:
      a. Provide liquid epoxy primer and lining in all cement mortar lined metallic pipe at insulating joints for a minimum of two pipe diameters centered over the insulated joint.
      b. Epoxy lining shall be polyamine or polyamide cured, NSF approved for potable water contact in accordance with ANSI/NSF Standards 60 and 61, and capable of achieving full cure before placement in service or exposure to water.
      c. Application:
         (1) Apply in two coats at equivalent spread rate for 6 mils dry film thickness per coat with coating application efficiency of 80 percent.
         (2) Epoxy shall be applied over the cement mortar lining where specified for the pipeline lining material.

(3) Cement mortar shall be allowed to cure for a minimum of 15 days prior to surface preparation and coating application or 7 days with steam curing. Mortar lining shall be dry when epoxy lining is applied.

(4) Prepare the cement mortar lining by abrasive blasting to remove all laitance and provide a surface profile equivalent to 80 grit sandpaper.

2. Steel Pipe Lining:
   a. Where epoxy lining is specified or shown on drawings, epoxy lining shall be applied directly to the steel surface.
   b. Surface Preparation: SP-5, White Metal Abrasive Blast
   c. Epoxy Lining: Polyamine or polyamide high build epoxy, NSF 60 and 61 approved, suitable for continuous immersion, and capable of achieving full cure before placement in service or exposing to water.
   d. Application: Apply in three coats at 5 mils minimum dry film thickness per coat with separate stripe coat at welds.

2.4 FIELD APPLIED COATINGS

A. General
   1. All buried miscellaneous metal components installed on the pipeline and that is supplied bare or with a shop coating system that is not equal to the specified pipeline coating shall be coated in the field with one of the following coating systems.
   2. Miscellaneous metal components shall include, but not be limited too, all exposed metals surfaces, including bolts, couplings, flanges, valves, adapters, pipe spools, and other miscellaneous metal components.
   3. Coating system applied shall conform to the manufacturer's requirements and shall be applied in accordance with the application requirements of the coating system.

B. Epoxy Coating:
   1. Coating System:
      a. Surface Preparation: SP11 Power Tool to Bare Metal or SSPC-SP10, near white abrasive blast, 2.5 mils blast profile, minimum.
      b. Primer: As required by the coating manufacturer.
      c. High Build Epoxy Coating:
         (1) Two component, high build polyamide or polyamine cured epoxy coating, suitable for direct burial or immersion, dries to touch in 2 or more hours, suitable for immersion or burial after full cure of coating.

(2) Acceptable manufacturers:
(a) ICI Devoe
(b) Sherwin Williams
(c) Carboline
(d) Or approved equal

d. Fast Cure Epoxy Coating:
(1) Two component, 100% solids by volume, fast cure epoxy coating suitable for direct burial or immersion, dry to touch in less than 1 hour at 72 degrees, capable of curing while immersed or buried.
(2) Acceptable Manufacturers:
(a) TC 7010, Tapecoat Inc
(b) Protal 7125, North American Denso

2. Application:
a. Epoxy coatings on interior of pipe shall be NSF approved coatings suitable for potable water contact in accordance with ANSI/NSF Standards 60 and 61, unless otherwise approved by the Engineer.
b. Ensure that epoxy coating selected is suitable for the application temperatures anticipated and that project schedule will allow adequate cure time before backfill or immersion based on surface temperatures at the time of application.
c. Epoxy coating shall be used for coating concrete embedded surfaces to a distance of 4 inches outside the interior and exterior surfaces of concrete wall or floors. Epoxy coating at concrete penetrations shall be a minimum of 12 mils dry film thickness.

C. Heat Shrink Sleeves:
1. Coating System:
a. Surface preparation: SP11 Power Tool to Bare Metal or SSPC-SP10, near white abrasive blast.
b. Filler Material:
(1) Filler material shall adhere to the pipe and heat shrink sleeve. Size and type shall be as recommended by the sleeve manufacturer for type of pipe and joint.
(2) Filler mastic for joints subject to weld after backfill shall exceed 500 degrees F melting temperature.
c. Heat Shrink Sleeve:
(1) Heat shrink, cross-linked polyolefin wrap or sleeve with a mastic sealant, 85-mils nominal thickness, suitable for pipeline operating temperature, as recommended by the manufacturer.

(2) Provide standard recovery sleeve for welded or bell and spigot steel pipe joints. High recovery sleeves shall be provided for mechanical or bell and spigot ductile iron pipe, flange joints, and coupling style joints.

(3) Width of heat shrink sleeves shall be sufficient to overlap existing coating 2-inches minimum. Overlap on tape coated steel pipe shall be based on a sequential 2-inch wide step from outer wrap to middle wrap to inner wrap.

(4) Sleeve shall meet requirements for "Well After Backfill" when allowed and approved by Engineer.

d. Coating Manufacturer's:

(1) Canusa,

(2) Raychem-Covalence,

(3) Or equal.

2. Application:

a. Heat shrink sleeves shall be applied to buried or concrete encased pipeline joints only. Application on vault piping or where exposed to the weather will not be allowed.

b. Provide filler material for all rolled or Carnegie joints, flanges, and couplings and all step changes greater than 1/8-inch.

c. Filler material shall be applied in a manner and of sufficient thickness that no tenting or voids remain under the heat shrink sleeve.

d. Consider sleeve shrinkage and joint profile in determining sleeve width required. Overlapping of two or more heat shrink sleeves to achieve the necessary width on pipe joints will not be permitted without Engineer approval.

e. All transitions from tape wrap to epoxy or other brush, roller, or spray applied protective coating system shall be coated at the transition with a heat shrink sleeve with minimum 3-inch overlap onto both coating systems.

2.5 SPECIALS, FITTINGS, AND CONNECTIONS

A. Coating and lining application for special sections, connections, and fittings for steel pipe shall conform to coating system and application requirements as specified this section.

B. Specials, fittings, and connections shall be defined as any pipe section with turnouts for blowoffs, interconnects, any valve, or other appurtenances; tees; crosses; wyes; laterals; manholes; mitered angles or elbows; and pipes which require special fabrication that prevents

mechanical production application of the specified coating system from end to end of pipe joint.

C. In addition to the items listed as specials, the following items shall also be considered as specials:
   1. All pipe joint sections entering a structure.
   2. Pipe joints with pass through holes.

D. Hand applied tape coatings will not be permitted on any specials, valves, fittings, connections, and couplings.

E. Specials, fittings, and connections shall be externally coated with a plural component epoxy coating system, applied from end to end of pipe joint on all specials, fittings, and connections.

2.6 EXTERIOR PIPE JOINT FIELD COATING

A. Pipe joints shall be field coated after pipe assembly in accordance with AWWA C216, except as modified this section.

B. Field joint coating shall be compatible with the shop-applied coating system.

C. All joints on pipe shall be coated with a heat shrink coating material.

D. Field joint coating materials shall be as specified for Field Applied Coatings, this section.

2.7 FIELD APPLIED INTERIOR JOINT COATING

A. Mortar Lining:
   1. After the backfill has been completed to final grade, the interior joint recess shall be filled with grout. The grout shall be tightly packed into the joint recess and trowelled flush with the interior surface. Excess shall be removed.
   2. At no point shall there be an indentation or projection of the mortar exceeding 1/16-inch.
   3. With pipe smaller than 24-inches in diameter, before the spigot is inserted into the bell, the bell shall be daubed with grout. The joint shall be completed and excess mortar on the inside of the joint shall be swabbed out.

2.8 REPAIR OF COATINGS AND LININGS

A. General
   1. Coating or lining repair materials shall be compatible with the shop-applied coating or lining system and shall be approved by the coating or lining manufacturer.
   2. Coating repair materials shall be as required for the coating system and repair classification as defined this section.

B. Coating Repair Materials
   1. Heat Shrink Sleeves (major repair):
      a. Filler Mastic: Provide mastic filler to fill tape void as required.
      b. Full Wrap Coating: Cross-linked polyolefin wrap with a mastic sealant, 85-mil thickness nominal, suitable for pipeline operating temperature, sleeve material recovery as recommended by the manufacturer. Sleeve length shall provide a minimum of 3 inches overlap onto intact pipe coating.
      c. Manufacturer's: Canusa, Raychem (Polyken), or equal
   2. Heat-Applied Patches (minor repair)
      a. Heat applied adhesive, polyolefin backed, mastic coated tape, 12-inches maximum size.
      b. Patch shall provide a minimum of 2 inches overlap onto intact pipe coating.
      c. CRP patch as manufactured by Canusa, PERP patch as manufactured by Raychem (Polyken), or equal.
   3. Plural Component Epoxy Coating or Lining
      a. Major repairs in the shop will be completed using the coating material specified for the coating or the lining. Coating shall be reapplied using plural component spray equipment by a manufacturer certified coating applicator.
      b. Major repairs in the shop or field shall be completed using heat shrink sleeves as specified this section.
      c. Coating material for minor repairs shall be single use epoxy or polyurethane kits similar to the existing coating
      d. Pinhole holidays or adhesion test coating repairs shall be with minor repair coating material specified or fast cure epoxy, such as Protal 7125 as manufactured by North American Denso, Inc.

PART 3 EXECUTION

3.1 ENVIRONMENTAL LIMITATIONS

A. General

1. Products shall comply with federal, state, and local requirements limiting the emission of volatile organic compounds and worker exposure.
2. Comply with applicable federal, state, and local, air pollution and environmental control regulations for surface preparation, blast cleaning, disposition of spent aggregate and debris, and coating application.
3. Do not perform abrasive blast cleaning whenever the relative humidity exceeds 85 percent, whenever surface temperature is less than 5 degrees above the dew point of the ambient air.
4. Do not apply coatings when:
    a. Surface and ambient temperatures exceeds the maximum or minimum temperatures recommended by the coating manufacturer or these specifications,
    b. In dust or smoke-laden atmosphere, blowing dust or debris, damp or humid weather, or under conditions that could cause icing on the metal surface.
    c. When it expected that surface temperatures would drop below 5 degrees above dew point within 4 hours after application of coating.
    d. Whenever relative humidity exceeds 85 percent.
5. Where weather conditions or project requirements dictate, provide and operate heaters and/or dehumidification equipment to allow pipe surfaces to be abrasive blasted and coated as specified and in accordance with the manufacturers coating application recommendations.
6. Work activities can be restricted by the ENGINEER until adequate temperature and humidity controls are in place and functioning within the environmental limits specified.
7. Coating applicator shall provide a monitoring system approved by the coating manufacturer that constantly records pipe and coating conditions during coating application. Recorded monitoring parameters shall include pipe temperature, line speed, holiday test and other parameters applicable to the type of coating.

B. Temperature Control
1. In cold weather or if moisture collects on the pipe, preheat pipe to a temperature between 45 and 90 degrees or 5 degrees above dew point, whichever is greater.
2. When temperatures are above or below the coating manufacturers recommended application temperatures, provide temperature controls as necessary to permit work to precede within the manufacturer's temperature limitations.

3. Provide tenting, insulating blankets, baffles, or bulkheads as required to zone and control heating or cooling effectiveness.
4. Heating shall be with indirect fired heaters that do not increase humidity levels within the work area. Heaters shall be sized for the area to be heated.

3.2 SURFACE PREPARATION

A. General
1. Inspect and provide substrate surfaces prepared in accordance with these Specifications and the printed directions and recommendations of coating manufacturer whose product is to be applied.
2. Visible oil, grease, dirt, and contamination shall be removed in accordance with SSPC-SP1, solvent cleaning.
3. Surface imperfections such as metal slivers, burrs, weld splatter, gouges, or delaminations in the metal shall be removed by filing or grinding prior to abrasive surface preparation.
4. Protect prepared pipe from humidity, moisture, and rain. All flash rust, imperfections, or contamination on cleaned pipe surface shall be removed by reblasting.
5. Priming and coating of pipe shall be completed the same day as surface preparation.

B. Weld Surface Preparation
1. Requirements:
   a. Spray applied coating systems do not require weld grinding.
   b. Welds on tape wrap coated pipe shall be either ground flush or a weld stripe tape applied over the weld, at the pipe fabricator's option, unless otherwise specified.
2. Weld Grinding:
   a. Under the weld grinding option, welds higher than 1/32 inch above pipe surface shall be ground to a tolerance of +1/32 inch to 0-inch above the pipe surface as measured on the lowest side of the weld.
3. Weld Stripe Tape:
   a. Weld stripe tape will be applied to primed metal.
   b. Tape will either have no polyethylene backing or will be double sided adhesive tape to permit adhesion of the inner corrosion protection layer to the weld stripe tape.
   c. Apply tape with a pressure roller to fully conform the tape to the weld surface.
   d. Adhesion of the weld stripe tape shall be as specified for the coating system.

C. Steel Surface Preparation

1. Surface preparation of steel pipe shall be in accordance with SSPC surface preparation standards utilizing the degree of cleanliness specified for the coating system to be applied or as specified herein, whichever is more stringent.
2. Grit and/or shot abrasive mixture and gradation shall be as required to achieve the degree of cleanliness and coating adhesion specified.
3. Pipe cleaned by abrasive blasting with recyclable steel grit and/or shot or other abrasive shall be cleaned of debris and spent abrasive in an air wash separator.
4. Polyurethane coated steel shall have a sharp angular surface profile equal to or greater than the minimum depth specified.
5. After abrasive blasting surfaces and before coating application, the metal surface shall be cleaned of residual dust to a minimum of Grade 2 per ISO Standard 8502-3, Test for the Assessment of Surface Cleanliness.
6. Work shall be performed in a manner that does not permit the cleaned metal surface to rust back or flash rust.
7. Rust back or flash rust shall be fully removed with the steel surface cleanliness equal to the metal surface cleanliness prior to rust back or flash rusting. Determination of the equivalent surface cleanliness shall be at the Engineer's sole discretion.

3.3 SHOP-APPLIED COATING SYSTEMS

A. Tape Wrap Coating

1. Applicator shall provide a monitoring system approved by the tape manufacturer that constantly records pipe and tape conditions during coating application. Recorded monitoring parameters shall include, but not be limited to, pipe temperature; line speed, primer and tape roll body temperature, and tape tension.
2. Pipe surface temperature shall be between 45 and 120 degrees and 5 degrees above dew point, whichever is greater.
3. Tape roll temperature shall be in accordance with the manufacturer's recommendations, but shall not be less than 55 degrees for the inner wrap and 65 degrees for the outer wraps.
4. Apply a uniform coat of primer as recommended by the manufacturer without skips, runs, or sags. Allow to properly dry prior to applying the tape as required by the tape manufacturer and as necessary to achieve maximum tape adhesion. Rug type application will not be allowed.
5. If welds are not ground flush, apply a weld stripe tape to longitudinal or spiral pipe welds prior to application of the inner wrap.
6. Tape layers shall be applied continuously with the use of hydro-tension tape stands. Tension shall be maintained between the manufacturer's minimum and maximum tension recommendations or as required to achieve approximately 2.0 percent reduction in tape width.
7. Inner tape wrap shall adhere tightly to the pipe surface. Coating shall be 100 percent adhering to the metal surface and shall not have any visible damage, wrinkles, voids, disbondment, contamination, or holidays.
8. Tape coating adhesion testing shall be performed on the pipe as specified this section.
9. Holidays testing shall be conducted on the inner layer tape prior to proceeding with subsequent tape layers. All holidays detected shall be primed and patch using coating repair procedures specified herein.
10. Perform coating and lining repairs as specified in this section.

B. Plural Component Epoxy Coating

1. Applicator Qualifications:
    a. Equipment will be certified by the coating manufacturer to meet the requirements for material mixing, temperature control, application rate, and ratio control for multi-part coatings.

b. Equipment not meeting the written requirements of the coating manufacturer shall be rejected for coating application until repairs or replacement of the equipment is made to the satisfaction of the Engineer.

c. Personnel responsible for the application of the coating system shall have certification of attendance at the coating manufacturer's training class within the last three years. The certified applicator shall be present during all coating application work and shall have responsibility for controlling all aspects of the coating application.

2. Pipe surface temperature shall be between 50 and 100 degrees or 5 degrees above dew point, whichever is greater.

3. Coating application shall be performed in an environmentally controlled shop area that meets or exceeds the written environmental application requirements of the coating manufacturer. Application in outdoor conditions will not be acceptable without adequate environmental shelter, environmental controls, and/or dehumidification.

4. Coating adhesion and holidays testing shall be tested as specified this section.

5. Coating manufacturer shall provide to the Engineer a copy of the manufacturer's coating application quality assurance manual prior to beginning coating application. Strict conformance to the requirements of the manual will be required. Deviation from the requirements of the manual will be grounds for the Engineer to reject the applied coating.

6. Unacceptable Coating Application

   a. Coating applied under improper environmental conditions will be rejected.

   b. Pipes that exceed the allowable quantity of coating defects, regardless of size or cause, shall be rejected.

   c. Coating which fails the adhesion or holiday testing as specified this section shall be rejected.

   d. Pipe coating that is subject to off ratio application, blistering, or is not applied in conformance with the coating manufacturer's written instructions or recommendations shall be rejected.

7. Rejected coating shall be removed from the full length of the pipe to bare metal and reapplied using proper application methods in accordance with the coating manufacturer's written instruction and the requirements of these specifications.

8. Perform coating and lining repairs as specified in this section.

C. Cement Mortar Overcoat Coatings

1. Dielectrically coated steel pipe, when specifically required or specified, shall have a cement mortar overcoat applied over the dielectric pipe coating in accordance with AWWA C205, except as modified herein.
2. Cement Mortar Overcoat:
   a. Cement mortar overcoat dielectrically coated steel pipe as specified in AWWA C205, except mortar coating shall be applied over exterior pipe coating.
   b. Mortar coating shall be held back 3 inches, minimum, behind dielectric coating system cut back at joints.
3. Coating Defects:
   a. Cracking in the mortar “armor” coat less than 1/8-inch in width will be acceptable.
   b. Disbondment of the cement coating over a dielectric coating system should be anticipated and will not be grounds for repair or rejection of the pipe.
   c. Losses of cement mortar coating due to impact, movement, or shipping damage shall be repaired in accordance with C205.
4. Joint Coating:
   a. Joints do not require field application of cement mortar overcoat when properly coated with heat shrink sleeve joint coating system.

3.4 EXTERIOR COATING HOLDBACK

A. Coating holdbacks shall be straight and cut through the full thickness of the coating.

B. Cutbacks shall be completed in a manner that permits field coating of joints in accordance with the manufacturer’s recommendations and as specified herein.

C. Holdbacks shall be as required for pipe joints as listed below. Pipe manufacturer may adjust holdback limits as required for special joint assemblies, and with consideration for the joint coating provided and joint welding requirements.

Tape wrap coating	
Push-on joint, spigot	4-inches, minimum
Push-on, bell	Flush with bell end
Welded, spigot	3 inches, minimum

Welded, Bell	4-inches, minimum
Polyurethane coating	
Push-on joint, spigot	1-inch before centerline of gasket
Push-on, bell	Flush with bell end
Welded, spigot	3 inches, minimum
Welded, Bell	4-inches, minimum
Extruded polyolefin	
Welded joints	As specified in AWWA C215
Push-on joints	Not applied to bell or spigot

D. Holdback Corrosion Protection:
   1. Holding primer for corrosion protection of cutbacks or holdbacks shall be compatible with the specified joint coating system and weld after backfill requirements, where applicable.
   2. Approved holdback primers are:
      a. Tnemec Omnithane – Suitable for all joints, except joints subject to weld after backfill
      b. Tnemec 90E-92 Ethyl Silicate Inorganic Zinc Primer – suitable for all joints, including weld after backfill joints.
      c. ICI Devoe Cathacoat 304V Ethyl Silicate Inorganic Zinc Primer – suitable for all joints including weld after backfill joints.
      d. Polyken Tape Primers – Not allowed
   3. Primer shall not result in running or melting of the coating or cause toxic fumes when heated during welding on weld after backfill joints.
   4. Application and thickness of holding primer shall be in accordance with the coating manufacturer's recommendations, but shall not impair the clearances required for proper joint installation.
   5. Primer application on spigot end of weld after backfill pipe joints shall be held back 1 to 2 inches from end of spigot or as necessary to prevent toxic fumes during field welding.
   6. Any corrosion within the holdback areas shall be abrasively blasted to near white metal in accordance with SP10 or power tool cleaned to bare metal in accordance with SP11 prior to applying joint coating.

3.5 PIPE LINING APPLICATION

A. Shop-applied Cement Mortar Lining:
   1. Centrifugally line straight sections of pipe. Lining of special pieces or fittings shall be by mechanical, pneumatic, or hand placement. Provide cement mortar lining of uniform thickness. Finish to a smooth dense surface.
   2. Steel plate specials larger than 16 inches in diameter shall have lining reinforced with 2-inch by 4-inch No. 13-gage welded steel wire mesh.
   3. Centrifugally line straight sections of pipe. Lining of special pieces or fittings shall be by mechanical, pneumatic, or hand placement. Provide cement mortar lining of uniform thickness. Finish to a smooth dense surface.
   4. Brace and support pipe during lining application to minimize pipe distortion or vibration. Bracing and supports shall not damage the pipe, coating, or lining.
   5. Tightly close ends of pipe and fittings with plastic sheet caps. Plastic end caps shall be of sufficient thickness and strength to resist shipping, handling, and storage stresses.
   6. Damage to the cement mortar lining, including disbondment, cracking, or blistering, caused by improper curing, shipping, handling, or installation shall be repaired in accordance with AWWA specifications and to the satisfaction of the Engineer.
   7. Other requirements of mortar lining materials and processes: As specified in AWWA C205.

B. Liquid Epoxy Lining:
   1. Where epoxy lining is specified or shown on drawings, epoxy lining shall be applied directly to the steel surface after abrasively blasting to SSPC SP-5, White metal blast.
   2. Prepare and coat the interior of cement mortar lined pipe at insulating joints with two coats of epoxy coating.
   3. Mortar lining shall be prepared by abrasive blasting to remove all laitance and create a suitable anchor profile
   4. Epoxy coating applied at insulating joints shall be applied to both sides of the insulating joint for a minimum of one pipe diameter. If only one side of the joint can be coated the coating shall be applied for a minimum of two pipe diameters.
   5. Mortar lining shall be allowed to cure 15 days or steam cured not less than 7 days prior to surface preparation of the mortar and epoxy coating application. Hand applied mortar lining shall be allowed to cure a minimum of 15 days or as required to meet the coating manufacturer's requirements for application on cement or concrete, whichever is greater.

6. Mortar lining shall be dry during epoxy lining application.
7. Epoxy coating shall be applied in two coats minimum, at a total coating thickness of 16 mils dry film thickness. Coating applied over cement mortar lining shall be applied in a manner that will minimize gassing and pinholes in the completed lining.

3.6 FIELD COATING JOINTS

A. Surface Preparation:
   1. All joints shall be prepared as follows:
      a. Remove all oil and grease contamination from pipe and adjacent coating in accordance with SSPC-SP1, Solvent cleaning.
      b. Without Holdback Primer:
         (1) Clean pipe surface and adjacent coating of all corrosion and other foreign contaminates in accordance with SSPC-SP11, Power Tool Cleaning to Bare Metal or abrasive blast joints in accordance with SSPC-SP10, near white metal blast.
         (2) Clean the full circumference of the pipe and a minimum of 4 inches onto the existing coating.
         (3) No profile is required with SP-11 preparation and heat shrink sleeve joint coating.
      c. With Holdback Primer:
         (1) All joints with a holdback primer shall be prepared by removing all oil and grease in accordance with SSPC-SP1, Solvent Cleaning, followed by spot preparation of visible corrosion or rust in accordance with SSPC-SP11, Power Tool Cleaning to Bare Metal.
         (2) Clean the full circumference of the pipe and a minimum of 4 inches onto the existing coating.
   2. Remove all loose or damage pipe coating at joint and either repair the coating as specified herein or increase the length of the joint coating, where reasonable and practical.
   3. Electrically test completed joint coating for holidays with high voltage spark tester at Engineer's direction or if damage to the joint coating occurs.

B. Weld After Backfill' Joint Requirements:
   1. Post welding of joints (weld after backfill) is not allowed.

C. Heat Shrink Sleeve Joint Coating:
   1. Store, handle, and apply field heat shrink sleeve coatings in accordance with AWWA C216 and these specifications.

2. Store sleeves in shipping box until use is required. Keep dry and sheltered from exposure to direct sunlight. Store off the ground or concrete floors and maintain at a temperature between 60 and 100 degrees as recommended by the sleeve manufacturer.
3. Metal surface shall be free of all dirt, dust, and surface corrosion prior to sleeve application.
4. Complete surface preparation of joint as specified.
5. Preheat pipe uniformly as recommended by the sleeve manufacturer. Monitor pipe temperature using a surface temperature gauge, infrared thermometer, or color changing crayons. Protect preheated pipe from rain, snow, frost, or moisture with tenting or shields and do not permit the joint to cool.
6. Fill all cracks, crevices, gaps, and step changes greater than 1/8 inch with filler mastic. Application of filler material shall be in accordance with the manufacturer's instructions for the full circumference of the pipe and in a manner that does not cause tenting of the applied sleeve.
7. Apply heat shrink sleeve when it is at a minimum temperature of 60 degrees and while maintaining the pipe temperature above the preheat temperature specified. Apply sleeve in accordance with the manufacturer's instructions and center the sleeve over the joint to provide a minimum 2-inch overlap onto the existing pipe coating.
8. Completed joint sleeve shall be fully bonded to the pipe and existing coating surface without voids. Mastic beading shall be visible along the full circumference of the sleeve. There shall be no wrinkling or excessive burns on the sleeves. Sleeves that do not meet these requirements shall be removed and the joint recoated as directed by the Engineer. Minor damage may be repaired using heat applied patch material as specified for minor coating repairs.
9. Allow the sleeve to cool before backfilling. In hot climates, provide shading from direct sunlight. Water quenching will be allowed only when permitted by the sleeve manufacturer.
10. Heat shrink joint coatings which have become wrinkled or disbonded because of prolonged exposure to UV light or thermal cycling shall be removed and replaced.
11. Double coating of defective or damaged heat shrink coatings will not be permitted. Any double coated heat shrink sleeves shall be immediately rejected, removed, and recoated.

D. Cement Mortar Joint Coating:
   1. Joints of cement mortar coated pipe shall be cement mortar coated in accordance with AWWA C205.
   2. Polyethylene Foam Joint Diapers:

a. Cut into strips wide enough to match uncoated field joint area.
b. Slit to thickness of 1/4 inch that will expose a hollow or open cell surface on one side.
c. Foam liner shall be attached to fabric backing with open or hollow cells facing towards pipe.
d. Foam strip shall cover full interior circumference of grout band with sufficient length to permit 8-inch overlap of foam at or near top of joint.
e. Splices to provide continuity of material will be permitted.
f. Protect polyethylene foam material from direct sunlight.

3. Field repair cement mortar coating in accordance with AWWA C205.

3.7 REPAIR OF COATING AND LININGS

A. General:
1. All areas where holidays are detected or coating is visually damaged, such as blisters, tears, rips, bubbles, wrinkles, cuts, or other defects shall be repaired. Areas where no holidays are detected, but are visually damaged shall also be repaired.
2. Maximum defects allowable shall be as specified herein for the coating system.

B. Tape Wrap Coating Repairs:
1. General:
a. No more than five repairs per joint of pipe will be permitted with tape wrap coating, excluding adhesion test damage. The coating on any pipe with more than five coating repairs or with more than two areas of coating damage greater than five square feet will be rejected.
b. Pipes exceeding the maximum number or size of coating defects shall be stripped, reblasted, and recoated.
c. Pipe arriving in the field with defects or repairs exceeding the maximum number or size of coating defects will be returned to the shop for recoated.
d. The number of layers and total thickness of the tape repair coating shall be the same as the shop-applied coating; unless heat applied coating materials is used.
e. Wipe the area to be repaired with solvent for a minimum distance of 4 inches outside the damaged area.
2. Defect Size:
a. Minor repairs - repairs that are less than 8 inches in the greatest dimension, measured after cutout of damaged tape

layers. Damage to the inner tape layer will be considered minor only if repairs are made using heat applied patch materials.

b. Major repairs - repairs that exceed 8-inches in the greatest dimension or where damage to the inner tape layer has occurred and hand applied tape repairs will be used.

3. Minor Repairs:
   a. Complete minor repairs using a heat applied coating patch material.
   b. Cut patch material to overlap onto the undamaged coating a minimum of 2 inches on all sides with 1-inch radius on each corner of the patch.
   c. Carefully remove damaged layers by cutting the coating with a sharp knife without cutting or damaging the inner wrap.
   d. Cut middle and outer layers in stepped fashion to expose 1-inch or more of the underlying tape layer for the circumference of the repair.
4. Major Repairs (Over 24-inches Diameter):
   a. Cigarette wrap coating repairs shall be with heat shrink sleeves as specified for joints.
   b. Carefully remove damaged layers by cutting the coating with a sharp knife without cutting or damaging the inner wrap.
   c. Holiday test the inner wrap and if a holiday is detected cut outer layers back to fully exposed the holiday(s) and retest for holidays.
   d. Cut middle and outer layers in stepped fashion to expose 1-inch or more of the underlying tape layer for the circumference of the repair.
   e. Width of sleeve shall be the width of the damaged area plus 4-inch overlap. Multiple sleeves may be used for larger repairs, but must be overlapped a minimum of 2 inches.
5. Major Repairs (24-inch Diameter or Less)
   a. Cigarette wrap repairs on pipe less than 24-inches with either hand applied tapes as specified or heat shrink sleeves as specified for major repairs on pipe over 24-inches in diameter at the Contractor's option.
   b. Carefully remove damaged layers by cutting the coating with a sharp knife without cutting or damaging the inner wrap. Holiday test the inner wrap and if a holiday is detected apply one extra layer of repair tape.
   c. Clean surfaces by solvent wiping and applying primer over the inner tape layer for a minimum of 6-inches onto the outer wrap in all directions.

d. Apply first layer of repair coating, over lapping 1-inch or more onto undamaged coating in all directions. On larger areas, lap the repair tape within a minimum of 1-inch overlap, offsetting the overlap from the previous layer overlap, until the area is properly covered.
e. Repeat for each tape layer damaged with each succeeding layer applied at 90 degrees to the preceding layers and overlapping onto the undamaged coating a minimum of 2-inches.
f. Apply the last tape layer, use the cigarette wrap method for the full pipeline circumference covering all previous repair layers and overlapping a minimum of 2-inches onto undamaged coating. The ends of the cigarette wrap shall be pointed downward.

C. Plural Component Epoxy Coating or Lining Repairs
1. General
a. Complete coating or lining repairs in accordance with the coating manufacturers written instructions and these specifications, whichever is stricter.
2. Defect Size:
a. Minor repairs - repairs that are less than 8-inches in the greatest dimension.
b. Major repairs - repairs that exceed 8-inches in the greatest dimension.
3. Maximum Quantity of Defects Allowed:
a. Coating or lining repairs on any joint of pipe shall not exceed 1.5 per 100 square feet of surface area.
(1) Two or more minor repairs within a 6-inches diameter circle will be considered a single repair.
(2) Repairs for adhesion testing will not be included in the total number of repairs.
b. Major repairs shall not exceed three per pipe joint and the combined area shall not be greater than 30 percent of the pipe.
c. Pipes exceeding the maximum number or size of coating defects shall be stripped of coating, reblasted, and recoated.
d. Pipe arriving in the field with defects or repairs exceeding the maximum number or size of coating defects will be returned to the shop for recoated.
4. Minor Repairs:
a. Surface Preparation: Clean and feather the defect by power tool sanding with 80 grit or coarser sandpaper to roughen

the existing coat and feather the edges of the defect for a minimum of 2-inches around the defect.

b. Shop repair Materials:
   (1) Single use polyurethane coating kits that controls mix ratio.
   (2) Two component, fast cure epoxy coating, in controlled mix ratio packaging.
      (a) Protal 7125, North American Denso Inc, or equal
      (b) Or equal.
   (3) Coating Manufacturer's polyurethane coating repair products subject to Engineer approval.

c. Field Repair Materials:
   (1) Heat applied coating materials; CRP Patch, Canusa; PERP Patch, Tyco Adhesives, or approved equal.
   (2) Two component, fast cure epoxy coating, in controlled mix ratio packaging.
      (a) Protal 7125, North American Denso, Inc,
      (b) Or equal.
   (3) Single use polyurethane coating kits using single use packaging that controls mix ratio.
   (4) Coating Manufacturer's polyurethane coating repair products subject to Engineer approval.

d. Clean and feather the defect by power tool sanding with 80 grit or coarser sandpaper to roughen the existing coating and feather defect edges minimum of 2-inches.

e. Apply a single coat of the specified patch coating material at the specified coating thickness.

f. Repair coating adhesion shall be 50 percent of the specified coating adhesion.

5. Major Repairs:
   a. Surface Preparation:
      (1) The metal surface and surrounding coating shall be abrasively blasted in accordance with SSPC-SP10, near white metal, or to equal in cleanliness and profile as the original surface preparation.
      (2) Existing coating shall be feathered and roughened to the equivalent of 40 grit sandpaper.
   b. Shop Repair Materials:
      (1) Same material as the pipeline coating or lining and shall be applied by using plural component spray equipment.
   c. Field Repair Materials:

(1) Same material as the pipeline coating or lining and shall be applied by using plural component spray equipment.
(2) Heat shrink sleeves as specified for pipeline joints.

d. One coat of the specified original coating material shall be applied over the repaired surface at the specified thickness.
e. Repair adhesion shall be equal to the specified coating adhesion.

3.8 INSPECTION AND TESTING

A. General
1. Applicator shall inspect and test the coating system in accordance with referenced standards and these specifications, whichever is more stringent.
2. Quality control testing as specified in AWWA standards are minimum industry standards and it is the intent of this specification to provide a higher level of quality control for the objective of achieving maximum coating performance. If any conflict between this specification and referenced standards occurs, the more stringent requirement shall apply and any interpretation of this requirement or results shall be with the objective of achieving maximum coating performance.
3. The frequency of the testing shall be determined by the applicator, but shall not be less than the requirements of this specification.

B. Surface Profile Testing
1. Surface profile of abrasive blasted surfaces to be tested with “Press-O-Film” tester tape or equivalent in accordance with NACE RP287.
2. Tester tape shall be suitable for the intended profile height.
3. Profile shall be measured to a minimum tolerance of 0.1 mils, maximum.
4. Electronic surface profilometer shall be used, where deemed necessary, to verify tester tape measurements.

C. Adhesion Testing
1. General
a. Adhesion testing shall be conducted at the shop prior to shipment. Pipe shipped without adhesion testing will be field-tested. Pipe rejected in the field will be returned to the shop for repair.

b. Coating adhesion testing shall be conducted on each pipe lot coated. The quantity of coating adhesion tests shall be the greater of the following:
   (1) Two pipes will be tested for the first 3,000 square feet of coating application plus on additional pipe for each increment of 2,000 square feet of coating application in excess of the first 3,000 square feet
   (2) Not less than 25 percent of each pipe produced within a lot.

c. A pipe lot is defined as the quantity of pipe that is coated by a single crew within a 12 hour or less work shift.

d. The pipe coating applicator shall repair all coating damage from shop adhesion testing.

e. Adhesion tests will be performed not less than 24 hours after coating application. Tests conducted prior to 24-hours will be acceptable only if the test meets or exceeds the adhesion criteria specified and the test was requested by the pipe fabricator.

f. Pipe for adhesion testing shall be randomly selected.

g. Department or Department's Representative has the right to conduct additional adhesion testing as deemed necessary to assure the pipe meets or exceeds the requirements of this specification at any time and location.

h. Prior to beginning any QA/QC testing, the pipe fabricator, coating manufacturer, and Engineer shall review dolly attachment procedures, adhesion test procedures, and data recording requirements for the project and ensure that test personnel are qualified and capable of performing the testing in accordance with required test standards and these specifications.

2. Rejection of Pipeline Coating or Lining
   a. Each pipe that fails the adhesion criteria, as defined this section, shall be rejected.
   b. If any pipe within a lot that fails to meet the adhesion criteria specified for the coating type, the pipe coating will be rejected and all pipes within the lot will be classified as rejected. Each remaining pipe within the rejected pipe lot will then be individually tested and rejected on a pipe-by-pipe basis in conformance with the test procedures and criteria specific to the coating type.
   c. All rejected pipe shall have the coating fully removed from the pipe and the pipe abrasive blasted and recoated.

3. Tape Coating Adhesion Testing:
   a. Adhesion Acceptance Criteria:

(1) Inner tape coating shall have an adhesion to substrate of 20 pounds per inch width, minimum, for steel pipe when tape is pulled in a continuous manner at an angle of 180 degrees to the pipe surface. .

b. Test Procedures

(1) Adhesion testing shall be conducted prior to application of the cement mortar overcoat, where applicable. Pipe that has been mortar coated prior to adhesion testing shall have the mortar coating removed as directed by the Engineer and of sufficient dimensional area to permit the adhesion test to be conducted.

(2) Adhesion tests shall be conducted at temperatures above 60 degrees and less than 75 degrees.

(3) Pulling tension shall be continuous, without stopping, and monitored throughout the length of the pull, which shall be not less than 12-inches in length.

(4) Adhesion test shall be prepared by making two parallel cuts through the coating, 1-inch apart, of sufficient length for the test pull. Peel the coating back at one end and attach the tension scale to the coating with a suitable clamp. Mark the coating at one (1) inch increments from 0 to 12-inches.

(5) The pull tension shall be recorded for each inch of pull. The two highest and two lowest readings shall be discarded and the remaining values averaged. Pull speed shall be between 5 and 10 seconds per inch. If significant elongation of the tape backing occurs, pull speeds may exceed 10 seconds per inch provided the minimum adhesion rating can still be achieved.

c. Adhesion Pull Records and Evaluation

(1) Failure shall be by cohesive failure of the adhesive only. Delamination failure, defined as separation of the adhesive from the backing material, will result in rejection of the tape lot.

(2) Intermittent skip failures will be counted as zero pounds of adhesion and included in the calculations for average coating adhesion.

(3) Adhesive failure, defined as separation of the adhesive from the metal substrate, will be rejected.

(4) Pipe that fails the test by delamination will be retested on two other pipes within the same lot of coated pipe.

Failure of any two pipes within the lot will result in rejection of all pipes coated with the rejected tape lot.

4. Plural Component Epoxy Adhesion Testing:
   a. General:
      (1) Adhesion testing shall be performed in accordance with this specification section.
      (2) Adhesion testing procedures and evaluations per AWWA C210 are specifically excluded under this specification.
   b. Coating and Lining Adhesion Acceptance Criteria
      (1) Coating applied to each pipe is acceptable if first dolly pull test exceeds 1,750 psi, minimum.
      (2) If first dolly pull is less than 1,750 psi, two additional tests shall be performed with acceptance based on "Best of Three" evaluation method defined herein.
   c. Pipe Lot Performance Criteria:
      (1) Each lot of coated pipe shall be evaluated for general coating application based a median value for all coating or lining adhesion tests performed on a lot of pipe, which shall be greater than 2,000 psi.
      (2) Any pipe lot failing the Pipe Lot Performance Criteria shall be classified as rejected until 100 percent of the pipe within the pipe lot has been tested for adhesion. Each pipe that fails the coating adhesion criteria shall be rejected.
   d. Test Procedures
      (1) Coating adhesion testing shall be with self-aligning pneumatic pull off equipment, such as the Delfesko Positest AT-A, and test procedures in accordance with ASTM D4541, except as modified in this section.
         (a) All adhesion tests shall be performed at an applied load rate of 100 psi per second, plus or minus 10 psi. Automatic pull rate adhesion test equipment shall be used.
         (b) Adhesion tests shall be based on the ASTM D4541 using standard 20 mm dollies.
         (c) Adhesion testing shall be based on three tests. All three tests shall be conducted by the same person, test equipment, and test procedure, and must be completed within a 30 minute period.
         (d) All adhesion tests shall be conducted within an area not to exceed 6-inches by 6-inches.

(e) All dollies shall be scored to metal substrate using manual methods and tools, normal to the pipe surface, and in a manner that does not stress or over heat the coating.

(f) All adhesion tests shall be performed to glue or coating failure or test termination, whichever comes first.

(2) Dollies for adhesion testing shall attached to the coating surface using an two part epoxy or cyanoacrylate glue and allowed to cure for a minimum of 12 hours before testing or until full cure, whichever is greater. Glue type used shall be determined by the pipe fabricator and coating manufacturer for the pipe diameter, temperatures, and environmental conditions.

(3) Adhesion testing shall be performed at temperatures between 55 and 90 degrees F or at temperatures as recommended by the coating manufacturer. Testing up to 115 degrees F or below 45 degrees will be permitted if tests can demonstrate no statistically detectable effect on test results and subject to Coating Manufacturer and Engineer approval.

e. Adhesion Test Evaluation and Records

(1) The “Best of three” evaluation method shall be defined as two of three test values less than the Acceptance Criteria, which shall result in rejection of the pipe coating.

(2) All adhesion tests shall be considered as valid and suitable for acceptance or rejection of the coating, except where retesting is allowed.

(3) Adhesion test failure shall be by adhesive or substrate and cohesive failure as defined below:

(a) Adhesive or substrate failure is defined as a percentage of separation of the coating from the steel substrate or between distinct coating layers.

(b) Cohesive failure is defined as a percentage of failure within the coating, resulting in coating remaining both on the steel substrate and test dolly.

(4) Retesting of coating adhesion tests will be allowed when any test is glue failure at 25 percent or more of dolly surface area and the test value is less than the Acceptance Criteria or the Minimum Criteria.

(5) All coating adhesion retesting shall be within the same 6-inch by 6-inch test area as the original adhesion testing.

(6) Disputed adhesion tests shall be retested as defined for adhesion retesting. Dolly attachment and adhesion retesting shall be witnessed by the Department's representative.

(7) Adhesion tests will be conducted on pipe coating and lining independently and will be accepted or rejected independently.

(8) Records of all adhesion tests shall be maintained in an electronic spreadsheet that includes the following information:

(a) Pipe identification,
(b) Pipe coating date,
(c) Adhesion test date,
(d) Surface tested (interior or exterior),
(e) Surface temperature at time of test,
(f) Coating thickness,
(g) tensile force applied,
(h) Applied load rate per second,
(i) Mode of failure, and
(j) Percentage of failure types, previously defined, relative to dolly surface area,
(k) Dolly size and attachment glue used.
(l) If different coatings are tested, the records shall include coating manufacturer and product number.

f. Adhesion Test Repairs

(1) Complete adhesion repairs as specified this section.

(2) Repair patches on the polyurethane coating shall be randomly selected for adhesion testing in a manner as described herein and at the discretion of the coating inspector conducting the adhesion tests. Adhesion of repairs shall be as specified for the type of repair.

D. Holiday Testing

1. Holiday test the inner layer of tape wrap coatings after application and prior to the subsequent tape layer in accordance with AWWA C214 and NACE Standard RP-0274.

2. Holiday tests on epoxy or polyurethane coatings or linings will be conducted on the completed coating or lining after cure or 24-hours, whichever is less, using a high voltage spark test in

accordance with NACE Standard RP-0274 and these specifications.

3. Coating thickness used for high voltage holiday testing setting shall be the minimum specified coating thickness.

E. Dry Film Thickness Testing

1. Coatings shall be tested for dry film thickness using a properly calibrated magnetic pull off, eddy current, or ultrasonic equipment.
2. Coating thickness measurements shall be conducted as necessary and without limitation. Testing conformance to the requirements of SSPC PA-2 is specifically excluded from this specification.

3.9 HANDLING, TRANSPORTATION, AND STORAGE

A. Pipe shall be handled in such a manner as to protect the pipe and coating from damage.

B. Coated pipe shall not be shipped or installed until coating has developed full adhesion and cure.

C. During coating application, storage, loading, transportation, unloading, laying and installation, every precaution shall be taken to protect and prevent damage to pipe, lining, and coating. Forklift equipment shall have all bearing surfaces padded with suitable padding material. Lift pipe with web slings a minimum of 12-inch wide and of a type that will not damage the coating. Metal chains, cable, tongs, forklifts or other equipment likely to damage the coating will not be permitted. Dragging or skidding of pipe on grade or in the trench will not be permitted.

D. Provide transportation vehicles with padded bolsters between each layer of pipe and heavy padding under load ties. Bolsters shall be curved to fit the outside of the pipe and 12 inches wide, minimum. All pipe contact locations shall be heavily padded with carpet and strips of the outer tape wrap material (adhesive side against the carpet) during shipment to the project site and from the storage yard to the point of installation.

E. Pipe shall not be stored on rocks, gravel, or other hard materials that might damage the coating. Pipe shall not be laid on asphalt without suitable padding at all contact points.

F. Pipe shall be inspected at the project site for damage. Any damage to the pipe, lining, or coating shall be repaired as directed if, in the opinion of the Engineer, a satisfactory repair can be made; otherwise, the damaged section shall be replaced.

G. No metal tools or heavy objects shall be permitted to come into contact unnecessarily with the finished coating. Workmen shall not be permitted to walk on the coating except when absolutely necessary and approved by the Engineer. When permitted, shoes with rubber or composition soles and heels or other suitable footwear that will not damage coating shall be used.

H. Long-term Exposure:
   1. Pipe shall either be provided with UV inhibitor for lengthy of above grade exposure or covered to prevent UV degradation of outer wrap.
   2. Amount of UV stabilizers required will depend on the project location, laying schedule, anticipated length of exposure, and type of coating.
   3. Manufacturer shall be consulted for recommended UV inhibitors requirements.
   4. Protective covering can be colored plastic sheeting, canvas, or other UV blocking material. Clear plastic sheets are not acceptable.
   5. Areas of coating that display UV degradation shall be removed and repaired.

END OF SECTION

June 30, 2016

SECTION 02641S

FLEXIBLE INTERNAL JOINT REPAIR

Add Section 02641:

PART 1 GENERAL

1.1 THE REQUIREMENTS

A. Install and test all flexible rubber joints seals, retaining bands, and accessories to ensure a bottle tight seal around the full inside circumference of the pipe joint area.

B. Test and remove all flexible rubber joint seals following completion of the SR-154 highway reconstruction by others.

1.2 RELATED SECTIONS

A. Section 02612S: Steel Pipe

B. Section 02621S: Pipeline Coating and Lining

1.3 REFERENCES Not Used

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS

A. Certifications of experience for the flexible internal joint repair installer.

B. Submit manufacturer's product data and installation instructions.

C. Provide documentation from all test and surveys associated with flexible internal joint installation and repair.

D. Confined Space Entry Permit which covers the scope of work to be performed inside the pipe.

1.7 QUALITY CONTROL

A. All components used for potable water applications are NSF 61 drinking water approved classified by Underwriters Laboratories.

B. Installer shall have at a minimum 30 years of turnkey installation experience and have installed over 225,000 seals.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Flexible seals, retaining rings and hardware will be supplied by the Department. Materials will be located at the Utah Department of Transportation maintenance shop at 4632 West 7800 South in West Jordan, Utah.

B. Receive the materials at the UDOT location and transport them to and from the job site.

C. Equipment and personal will be available to load the materials.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Weko-Seal by Miller Pipeline Corporation.

B. Engineer approved equal.

2.2 FLEXIBLE INTERNAL SEAL (WATER)

A. Ethylene Propylene Diene Monomer (EPDM) rubber seal and type 304 stainless steel retaining bands which are designed to internally stop joint leakage or infiltration.

PART 3 EXECUTION

3.1 PRECONSTRUCTION INSPECTION

A. Perform visual inspection of the pipe to document condition of existing pipe interior prior to construction

B. Survey (3D Laser Scan) section of pipeline to document pre construction vertical dimension (roundness) of pipe and vertical alignment of pipe (elevation, slope, bends and offsets).

C. Stage materials and tooling as close to the entry points as possible.

D. Insure all safety policies and guidelines are in place, including training of all personnel. A written confined space plan and job hazard analysis (JHA) shall be in place before entry or any work begins.

3.2 MORTAR LINED STEEL PIPE JOINT PROTECTION

A. Remove the mortar lining at the joint locations where the seals will seat directly on the steel pipe wall. Create a clean neat cut line of the mortar at least 3" beyond either side of the seal position.

B. Remove dirt, scale, and any other debris from the steel pipe walls in areas where the seals are to be installed. Cleaning shall be performed everywhere the mortar is removed and the steel is exposed. Cleaning operations shall be accomplished by hand brushing and scraping, pneumatic wire brush, pneumatic grinder, and/or oil free air jet.

C. Aquad Epoxy shall be applied and cured on each side of the spiral welds and where the restraining bands intersect to create a feathered, smooth transition and a good smooth sealing surface.

D. After completion of the installation of the flexible joint seal, any bare metal on either side of the seal shall be repaired using a sand / cement mix per AWWA standard.

E. Air test joints for leakage in accordance with manufacturer's requirements. Provide documentation of air test results.

F. Survey (3D Laser Scan) section of pipeline to document preconstruction vertical dimension (roundness) of pipe and vertical alignment of pipe (elevation, slope, bends, and offsets).

G. Flush, test, and disinfect pipeline prior to filling per AWWA.

3.3 REINFORCED CONCRETE PIPE JOINT PROTECTION

A. Remove dirt, scale, and any other debris from pipe walls in areas where the seals are to be installed. Cleaning shall be performed at least 3" beyond either side of seal position. Cleaning operations shall be

accomplished by hand brushing and scraping, pneumatic wire brush, pneumatic grinder, and/or oil free air jet.

B. All high/low surface imperfections running axially through or part way through the sealing surface must be removed before installation of the seals. Any joint gaps, low areas, or deep imperfections must be properly filled with approved non-toxic joint filler and rendered smooth to suit the prepared surface of the joint area.

C. Install flexible interior joint seal in accordance with manufacturer's requirements.

D. Air test joints for leakage in accordance with manufacturer's requirements. Provide documentation of air test results.

E. Survey (3D Laser Scan) section of pipeline to document preconstruction vertical dimension (roundness) of pipe and vertical alignment of pipe (elevation, slope, bends, and offsets).

F. Flush, test, and disinfect pipeline prior to filling per AWWA.

3.4 POST CONSTRUCTION INSPECTION AND JOINT REPAIR

A. Perform visual inspection of the pipe to document condition of existing pipe interior after construction.

B. Air test joints for leakage in accordance with manufacturer's requirements. Provide documentation of air test results.

C. Survey (3D Laser Scan) section of pipeline to document post construction vertical dimension (roundness) of pipe and vertical alignment of pipe (elevation, slope, bends, and offsets).

D. After air test of joints do the following:

1. No Settlement or Damage Observed:
   - Remove flexible internal joint seal.
   - Repair cement mortar lining as required.

2. Failure of Joint Air Test:
   - Remove flexible joint seal and install interior a butt-strap on the 78" Reach 2 steel pipe, or install an interior weld around the circumference on the 66" concrete cylinder Reach 3 pipe as shown on the plans.
   - Repair cement mortar lining as required.

3. Joint Air Test Passes:

- At the discretion of governing agency, remove flexible joint seal and install interior butt-strap repair or interior weld per governing agencies standards.
- Repair cement mortar lining as required.

E. Flush, test, and disinfect pipeline prior to filling per AWWA.

END OF SECTION

SECTION 02651S

CORROSION MONITORING SYSTEM

Add Section 02651:

PART 1 GENERAL

1.1 WORK INCLUDED:

A. This section covers the work necessary to furnish and install a corrosion monitoring system, which includes test stations and pipe joint bonds for electrical continuity, complete.

B. Have a third party Corrosion Expert to perform Contractor required quality control testing as defined this section.

1.2 STANDARDS

A. The following standards are included by reference:
1. NACE SP-0169
2. NACE SP-0177

1.3 QUALITY CONTROL

A. All CONTRACTOR specified testing shall be performed by a third party Corrosion Expert whom holds a current NACE accreditation as a Cathodic Protection Specialist (CP-4) or Cathodic Protection Technologist (CP-3), and/or a registered professional engineer with verifiable expertise in corrosion control and cathodic protection.

B. Performed quality control testing shall include the following tests, which shall be performed as defined this section.
1. Joint Bond Resistance test
2. Other Testing as specified in Section 13115, Cathodic Protection

1.4 DEFINITIONS

A. Electrically Continuous Pipeline: A pipeline which has a linear electrical resistance equal to or less than the sum of the resistance of the pipe plus the maximum allowable joint bond resistance for each bonded pipe joint as specified in this section.

B. Electrical Isolation: The condition of being electrically isolated from other metallic structures (including, but not limited to, piping, reinforcement, casings) and the environment as defined in NACE Recommended Practice SP0169.

1.5 SUBMITTALS:

A. Shop Drawings: Catalog cuts and other information for products proposed for use.

B. Quality Assurance Submittals:
1. Manufacturers' Certificates of Compliance.
2. Field Test Reports.
3. Qualifications of NACE Accredited Testing Personnel.

PART 2 MATERIALS

2.1 GENERAL:

A. Like items of materials provided hereunder shall be the end product of one manufacturer to achieve standardization for appearance, maintenance, and replacement.

B. Materials and workmanship as specified in this section shall be installed concurrently with pipe installation. Coordinate all work specified herein with related sections.

2.2 SUPPLIERS:

A. Alternate suppliers will be considered, subject to approval of the ENGINEER. Address given is that of the general office; contact these offices for information regarding the location of their representative nearest the project site.
1. Corrpro, Inc., Chicago, IL www.corrpro.com
2. Farwest Corrosion Control, Gardena, CA www.farwestcorrosion.com

3. Hoff Company, Inc. , Denver, CO www.pipelinesupplies.com
4. MESA Products, Tulsa, OK www.mesaproducts.com
5. Northtown Products, Huntington Beach, CA www.northtownproducts.com

2.3 JOINT BONDS

A. General:

1. All joint bonds provided either by pipe manufacturer or meet the following minimum requirements:
   a. All connections on a joint bond shall be welded or soldered.
   b. Mechanical or compression type connections shall not be permitted.
   c. Bonds and welds shall exhibit sufficient strength and flexibility to allow thermal movement of the pipe after pipe backfill without cracking or breakage.
   d. Bond connections to pipe shall be with an Engineer approved welding method.
2. All installed bonds shall be insulated or coated copper with all exposed copper field coated to prevent galvanic corrosion of the pipe.

B. Ductile or Cast Iron Pipe, External Bonds:

1. Single-conductor, No. 2 AWG stranded copper wire with 600-volt HMWPE insulation, 18 inches long, with formed copper sleeve on each end of the wire.
2. Quantity of joint bonds per pipe joint by pipe diameter shall be as defined below:

Bond Type	Two Bonds	Three Bonds	Four Bonds
#2 AWG Wire	16” or less	42” or less	Over 42”

3. Connection of wire joint bonds to pipe shall be with the thermite weld method using molds and cartridges as recommended by the welder manufacturer for bond type used.
4. Bonds shall be as manufactured by Erico Products, Continental Industries, or approved equal. Third party manufactured bonds shall be approved by the Engineer for conformance with the requirements of this specification and proper thermite welding.

C. Coated Steel Pipe, External Bonds:

1. Rolled joint or Carnegie joint bonds shall be one of the following types at the CONTRACTOR’s option:

a. Wire Bond: Single-conductor, No. 2 AWG stranded copper wire with 600-volt HMWPE or THWN insulation, 18 inches long, with a formed copper sleeve on each end of the wire.

b. Strap Bond:

(1) Solid copper strap, 1-1/4-inch wide by 1/16-inch thick, equivalent to 1/0 AWG wire, with two punched holes for thermite welding to the pipe. Strap holes shall be sized for the thermite weld mold and shall provide for physical centering of the mold over the hole.

(2) Strap bond shall be 12-inches long with dielectric coating applied to the center 8-inches of the strap bond. Strap bonds provided without a dielectric coating shall be coated prior to installation with filler mastic as specified for heat shrink sleeves in Section 09 90 10, Pipeline Coating and Lining.

(3) Strap bonds shall be as manufactured by Erico Products, Continental Industries, Hoff Company, or approved equal. Third party manufactured strap bonds shall be approved by the Engineer for conformance with the requirements of this specification and proper thermite welding.

c. Use of manufactured steel bonding clips will not be permitted with heat shrink sleeve coated joints.

D. Flange joints:

1. Flanged joint bonds shall be one of the following types at the CONTRACTOR's option:
   a. Steel rod, 5/8-inch diameter, length as required, arc welded to flange. Steel rod bonds will not be allowed where welding to the flange is not approved by the Engineer.
   b. Single-conductor, No. 2 AWG stranded copper wire with 600-volt HMWPE insulation, 18 inches long, with a formed copper sleeve on each end of the wire.
2. Quantity of joint bonds per pipe joint shall be as defined below:

Bond Type	Two Bonds	Three Bonds	Four Bonds
Steel Rod	36" or less	72" or less	Over 72"
#2 AWG Wire	NA	30" or less	Under 60"

3. Connection of wire joint bonds to pipe shall be with the thermite weld method using molds and cartridges as recommended by the welder manufacturer for bond type used.

4. Coat steel rod bonds with fast curing epoxy after welding to joint as specified in this Section, except when pipe is specified to be coated in accordance with Section 09900, PAINTING.

E. Cement Mortar Coated Steel or Concrete Cylinder Pipe, External Bonds:

1. Steel pipe with dielectric coating and cement mortar overcoat shall be bonded as specified for coated steel pipe.
2. Joint bonds shall be one of the following types at the CONTRACTOR's option:
   a. Manufactured steel bonding clips for arc welding to bell and spigot of joint, as shown on the Drawings..
   b. Z-Bar bond fabricated of 3/8-inch diameter steel rod with total length not to exceed 6-inches. Bond shall be bent with offset of ends to fit between the bell and spigot of the joint and shall allow for 2-inches of weld length to both the bell and the spigot.
   c. Three bonds per joint, minimum.
3. Quantity of joint bonds per pipe joint shall be as defined below:

Bond Type	Two Bonds	Three Bonds	Four Bonds
Manufactured Clip	NA	54" or less	Over 54"
Z-Bar	NA	54" or less	Over 54"

4. Arc welding of bonds to pipe shall be performed by a qualified welder.
5. Completed welds shall have electrical resistance less than specified maximum joint bond resistance and shall not crack or break due to thermal contraction of pipe following pipe backfill.

F. Sleeve Coupling, Flanged Coupling Adapter, and Other Non-standard Joints:

1. Ductile Iron Pipe:
   a. Bond: No. 2 AWG wires, 24 inches long, HMWPE insulation, with two 12-inch long THHN insulated No. 12 AWG wire pigtails,
   b. Manufacturer: Erico Products Inc. (Cadweld), Cleveland, OH, Hoff Company, Denver, Colorado, or equal.
2. Steel Pipe:
   a. Solid copper strap, 1-1/4-inch wide by 1/16-inch thick, equivalent to 1/0 AWG wire, with five punched holes for thermite welding to the coupling follower rings, middle, ring, and pipe. Strap bond shall be fabricated for the length of the coupling with sufficient additional length for 1 inch of joint movement. Strap holes shall be sized for the thermite weld

mold and shall provide for physical centering of the mold over the hole.

b. Strap bond shall be as manufactured by Erico Products, Continental Industries, Hoff Company, or approved equal. Third party manufactured copper strap bonds shall be approved by the Engineer for conformance with the requirements of this specification and proper thermite welding.

3. Bond Quantity per Joint: Provide the quantity of bonds per pipe diameter as defined below:

Bond Type	Two Bonds	Three Bonds	Four Bonds
Copper Strap	NA	54” or less	Over 54”
No. 2 Wire Bond	NA	54” or less	Over 54”

a. Connection of wire or copper strap joint bonds to pipe shall be with the thermite weld method using molds and cartridges as recommended by the welder manufacturer for the bond type used.

2.4 CATHODIC PROTECTION TEST STATIONS

A. Post Style, Steel Conduit:

1. Test Box:

a. Cast aluminum with thread hub suitable for mounting to a 2-inch x 3-inch reducer. Reducing bushings will not be permitted.

b. Manufacturer and Product:

(1) Type T, C, and I Stations: Gerome Manufacturing, Testox 700 series (rectangle), except where Type TR stations required for remote monitoring capable.

(2) Type F, A, and TR Stations: Gerome Manufacturing, Testox 2000 series (rectangle) with 2” threaded hub.

B. Street Reducer:

a. Hot dipped galvanized 2-inch x 3-inch reducer and close nipple.

1. Terminal Block:

a. Plastic or glass-reinforced laminated, 1/4-inch thick with seven terminals for Type T, C, and I test stations.

b. Plastic or glass-reinforced laminated, 1/4-inch thick with eleven terminals for Type F, A, and TR test stations.

c. Terminal heads shall have special heads to keep them from turning or shall be easily accessible from both sides of the terminal block without requiring its removal.
d. Terminal studs, washers, and nuts shall be stainless steel.

2. Mounting Structure:
   a. Rigid hot dipped galvanized steel conduit 3-inches diameter, threaded at one end (minimum), length as required for installation requirements.
   b. PVC long radius sweep elbow, 1-inch diameter, for wire protection as shown on Drawings.

2.5 REFERENCE ELECTRODES:

A. Prepackaged Copper-Copper Sulfate Reference Electrodes:
1. Material: Permanent type, copper-copper sulfate reference electrode suitable for direct burial with a minimum design life of 40 years, minimum.
2. Lead Wire:
   a. As specified under wire, this section,
   b. Length of 50 feet or as required for splice free installation.
3. Backfill: As recommended by the reference electrode manufacturer.

2.6 WIRE:

A. Pipe and Test Lead Wires:
1. Pipe Test Wires: No. 10 AWG wire, single-conductor, stranded copper with 600-volt, TW, THWN, or HMWPE insulation. Color coded insulation as specified.
2. Insulation Color: Color shall indicate the function of each test wire and shall be as follows:
   a. Pipe: White
   b. Reference electrodes: Yellow
   c. Casings: Orange
3. Reference Electrode Wires: No. 14 or 12 AWG wire single-conductor, stranded copper with 600-volt, TW, THWN, USE2, or HMWPE insulation. Color code insulation as specified. Wire length of 25 feet or as required for splice free installation.

2.7 CONDUIT, LOCKNUTS, AND STRAPS:

A. Outdoors, Exposed Conduit
1. Rigid conduit shall be rigid galvanized steel.
2. Fittings, junction boxes, pull boxes, and outlet bodies shall be hot-dipped galvanized iron.

3. Locknuts, conduit clamps, and other miscellaneous hardware shall be hot dipped galvanized steel. Galvanized items shall be hot-dipped galvanized in accordance with ASTM A153.
4. Conduit clamps shall be two piece, malleable iron, one hole, strap and clamp back spacer, O. Z. Gedney 14-100G and 143G or similar, for mounting to surfaces with either lag bolts or concrete wedge anchors, as shown on the Drawings.

B. Buried Conduit:
1. Conduit shall be PVC coated rigid steel.

2.8 THERMITE WELD MATERIALS:

A. General:
1. Thermite weld materials consist of wire sleeves, welders, and weld cartridges according to the weld manufacturer's recommendations for each wire size and pipe or fitting size and material.
2. Welding materials and equipment shall be the product of a single manufacturer. Interchanging materials of different manufacturers is not acceptable.

B. Molds: Graphite, as recommended by manufacture for pipe and wire size.

C. Adapter Sleeves:
1. For No. 12 AWG and No. 2 AWG wires.
2. Prefabricated factory sleeve joint bonds or bond wires with formed sleeves made in the field are acceptable. Attach field-formed joint bonds sleeves with the appropriate size and type of hammer die furnished by the thermite weld manufacturer.
3. Extend wire conductor 1/8 inch beyond the end of the adapter sleeve.

D. Cartridges:
1. Steel: 32 grams, maximum.
2. Cast and Ductile Iron: 45 grams, maximum, XF-19 Alloy.

E. Welders and Cartridges: For attaching copper wire to pipe material:

Pipe Material	**Weld Type**	**Cartridge Size, Max.**
No. 6 AWG Wire & Smaller		
Steel	HA, VS, HC	15 gm

Ductile or Cast Iron	HB, VH, HE	25 gm
No. 4 AWG Wire & Smaller		
Steel	HA, VS, HC	25 gm
Ductile or Cast Iron	HB, VH, HE	32 gm
No. 2 Wire Joint Bonds		
Steel	FS	32 gm
Ductile or Cast Iron	FC	45 gm
Concrete Cylinder Pipe	HA, GR	32 gm
Copper Strap Joint Bonds		
Steel	M-128	15 gm

F. Welding Materials Manufacturers:
1. Erico Products Inc. (Cadweld), Cleveland, OH.
2. Continental Industries, Inc. (Thermo-Weld), Tulsa, OK.

2.9 COATING REPAIR MATERIAL FOR PIPE AND FITTINGS

A. General:
1. Complete coating repairs in accordance with recommendations of the pipe or fitting manufacturer.

B. Coating Requirements:
1. Steel Pipes:
    a. Coal tar based coatings: Koppers Bitumastic 50 or Denso or Tapecoat wax tape coatings; or equal, 20 mils dry film thickness, minimum.
    b. Polyurethane or Epoxy Coatings: Fast cure epoxy, 20 mils dry film thickness, minimum
    c. Tape Wrap or Extruded Polyethylene Coating: Thermite Weld Cap, Canusa CRP Patch, or Raychem PERP patch, or equal
    d. Cement Mortar Coating: Same as required for Concrete Cylinder Pipe.
2. Ductile iron Pipe:
    a. Fast cure epoxy
    b. Thermite weld cap
3. Concrete Cylinder Pipe:
    a. Cement mortar, 1-inch minimum cover.

C. Coating Materials:
1. Thermite Weld Caps:
   a. Royston Laboratories Handi-Cap IP, prefabricated primerless thermite weld cap and coating system.
   b. Provide primer unless specifically stated in product data sheet that no primer is required.
2. Fast Cure Epoxy Coating:
   a. 100 percent solids, fast curing epoxy suitable for submerged or buried conditions.
   b. Acceptable products or equal:
      (1) Denso Protal 7125 (low temperature) or Protal 7300
      (2) Tapecoat TC 7010
      (3) 3M ScotchKote 323

2.10 CONCRETE

A. ASTM C94-90, Option A

B. Cement: ASTM C150-89, type II with minimum cement content of 6.5 bags (611 pounds) per cubic yard.

C. Coarse Aggregate Size: ¾ inches

D. Minimum Compressive Strength: 4,000 psi at 28 days with maximum water-cement ratio of 0.45.

E. Air Entrainment:
1. ASTM C260, nontoxic after 30 days and containing no chlorides.
2. Not less than 5 nor more than 7.5 percent entrained air at the project site.

2.11 OTHER MISCELLANEOUS MATERIALS

A. Test Station Wire Terminations: One-piece, tin-plated crimp-on ring tongue connector as manufactured by Burndy Co. or Thomas and Betts.

PART 3 EXECUTION

3.1 GENERAL:

A. The installation of the facilities herein specified and described shall conform to the latest applicable NEC rules.

B. The workmanship shall be of the highest grade and shall be in strict accordance with material manufacturer's instructions. Equipment or materials damaged in shipment or in the course of installation shall be replaced.

C. Examine all Drawings and coordinate his work so as to avoid conflicts, errors, delays, and unnecessary interference with the construction of the facilities and to avoid duplication of the work such as excavation, filling, etc. In the event of any conflicts in the Specifications, the ENGINEER shall be consulted.

3.2 PIPE JOINT BONDING, NEW PIPE

A. To form an electrically continuous pipeline and associated appurtenances, all metallic pipe joints shall be electrically bonded; including buried, vault, and manhole pipe, fittings, and restrained joints; except threaded, welded, or insulated joints.

B. Install the quantity of joint bonds at each joint required to be bonded as specified this section or shown on the Drawings. Should the specifications and drawings conflict, the larger quantity shall apply.

C. Electrical connection of bonds to pipe and fittings shall be by thermite or arc welding process. Bolted, compression, or mechanical connections will not be permitted.

D. Test each bonded joint for electrical resistance as specified under CONTRACTOR QUALITY CONTROL TESTING, this section.

3.3 TEST STATION INSTALLATION

A. General:
1. Test station location, type, and style shall be as shown on the Drawings.
2. Test stations may be relocated up to ±25 feet for site conditions without ENGINEER approval. Relocation greater than ±25 feet must be approved by the ENGINEER.
3. Maintain records showing actual pipeline stationing of test station wire connections to the pipe.
4. Records of actual pipeline stationing shall be provided to ENGINEER prior to preliminary electrical continuity testing by ENGINEER.
5. Test stations shall be generally located as follows:
    a. Install Type T test stations or other type test stations as required or at 1/4 mile intervals, but not greater than 1,500 feet.
    b. Install a Type C test station at both end of cased crossings.
6. Locate post-mounted test stations directly over the pipe and, where possible, at protected locations such as structures, fences, manholes, power poles, or edges of cultivated land.
7. All offset test station wires shall be protected with PVC coated rigid steel conduit from pipeline centerline to within 6-inches of test station as shown on the Drawings. Do not connect rigid conduit to test station.

B. Style:
1. Test station style shall be as shown on the Drawings and as follows:
2. Post mount style test stations shall be steel conduit style as shown on the Drawings.

C. Installation:
1. Post mounted test station:
    a. Height shall be between 36 to 42 inches above finish grade.
    b. Post shall be concrete encased as shown on the Drawings.

D. Test Wires:
1. Wires shall be attached to the pipe as specified under WIRE CONNECTIONS, this section.
2. Wire connections shall be an individual connection with not less than 6-inches separation from other connections. Common connections will not be allowed. Where a steel tab is welded to pipe for test wire connections, a separate tab shall be provided for each wire connection.
3. Wires shall be buried a minimum of 24 inches below finished grade, except in undeveloped or cultivated areas where test wires shall be a minimum of 30-inches below finished grade.

4. Wires shall be direct buried except where test station offset is required. Offset wires shall be installed in PVC coated rigid steel conduit from the centerline of the pipeline to 6-inches from test station. Rigid conduit shall not be connected to the test station.
5. Provide 12-inch diameter loop in wires at the pipeline connection, at each end of rigid conduit when required, and below post mounted test stations to prevent wires from being stressed or broken.
6. Connect all wires to terminal board.
7. Make wire connections to test station terminals with crimp-on ring tongue terminals, except where solid wire is specified.

3.4 REFERENCE ELECTRODE INSTALLATION

A. Remove plastic or paper wrapper and place reference electrode within the pipeline trench excavation 6 inches from pipe in a vertical position and activate reference electrode per manufacturer's written instructions.

B. Install reference electrode centered between foreign pipelines and utility owner's pipeline at pipe crossing location as shown on Drawings.

C. Backfill hole with select native material in 6-inch layers and hand tamp each layer around anode. Use only native soil for backfill; do not use sand or flowable fill. Exercise care not to strike reference cell or lead wire with tamper.

D. Terminate reference electrode wire in test station on separate terminal.

3.5 THERMITE WELD WIRE CONNECTIONS:

A. Use thermite weld method for electrical connection of copper wire to steel, ductile iron, and cast iron surfaces. Observe proper safety precautions, welding procedures, thermite weld material selection, and surface preparation as recommended by the material manufacturer. Assure that pipe or fitting wall thickness is of sufficient thickness that the thermite weld process will not damage the pipe or fitting wall's integrity or damage the lining in any way.

B. Before the connection is made, the surface shall be cleaned to bare metal by making a 2-inch by 2-inch window in the coating, and then filing or grinding the surface with a vitrified wheel to produce a bright metal finish. Wire sleeves shall be installed on the ends of the wire before welding to the metal surface.

C. After the weld connection is cooled, remove slag, visually inspect, and physically test wire connection by hitting with a hammer. Remove and replace any defective connections.

D. Make wire connections to concrete cylinder pipe by thermite welding to the shop welded steel plates provided on the pipe for this purpose.

E. Coat each completed wire connection as specified, this section. If lining is damaged by welding, repaired in accordance with the lining applicator's recommendations.

3.6 TRENCHING AND BACKFILL

A. General
1. Complete excavations and trenching regardless of the type, nature, or condition of materials encountered, and as required to accomplish specified construction to lines and grades shown.
2. Complete all utility notifications prior to performing trenching and excavations work.
3. Take care to avoid damage to existing structures and utilities during excavating and trenching process. Location may be modified, where approved by the ENGINEER, to minimize possible damage to existing structures. Trench shall be of uniform depth and width, level, smooth, and free of sharp objects.

B. Trench Depths:
1. Trench depths vary for conditions and requirements. Trench depths provided are minimum requirements. Meet minimum requirements or that required by local utilities, ordinances, or regulations, whichever is more stringent.
2. Minimum depths for cathodic protection or corrosion monitoring work shall be as defined herein or shown on the Drawings. If in conflict, the more stringent shall apply.
   a. Pipeline Test wires, undeveloped — 24-inches (direct bury)
   b. Pipeline Test wires, roadways — 30-inches (conduit)
   c. All other — 30-inches

C. Safety
1. Slope, shore, or brace excavations and trenches in accordance with OSHA regulations as necessary to prevent caving during excavation in unstable material, or to protect adjacent structures, property, workers, and the public.

2. Assume sole responsibility for ensuring safety of trenches and conformance to OSHA trench safety requirements.

D. Backfill and Compaction
1. Backfill trench with import backfill materials, as specificed.
2. Compaction requirements shall be as specified for the pipeline or 90 percent compaction, whichever is more stringent. Backfill within 5 feet of roadways, paved areas, or other traffic areas shall be compacted to 95 percent.
3. Do not use backfill material of frozen or consolidated debris. Leave the trench with the excess backfill material neatly mounded, but not more than 4 inches above the existing ground level, for the entire width of the trench in undeveloped areas.
4. Replace topsoil in developed, landscaped, or cultivated areas.

3.7 CONCRETE:

A. Concrete used for slabs shall conform to the requirements for concrete in Section CONCRETE.

B. Finish all concrete work to a smooth trowelled finish with radius edges.

C. All forms shall be removed from concrete work prior to final acceptance and removed from the project site.

3.8 QUALITY CONTROL TESTING

A. General:
1. Correct all construction defects identified during testing.
2. Provide engineer with 7 days advance notice of completion for Engineer acceptance testing.
3. Contractor required testing as defined herein shall be performed by a Corrosion Expert, with qualifications as specified this section, whom is an employee or subcontractor to the Contractor.

B. Joint Bond Resistance Test:
1. General
   a. Test completed joint bonds for electrical continuity using a digital low resistance ohmmeter.
   b. Joint bond quality control test shall be performed on all bonded joints after the bonds are installed but before backfilling of the pipe.
   c. Furnish all equipment and materials as required for test.
2. Digital Low Resistance Ohmmeter Test Method:

a. Required Equipment And Materials:
   (1) One AVO Model DLRO10, digital low resistance ohmmeter or equivalent instrument.
   (2) One set of duplex, helical spring point leads with current and potential points, AVO Model No. 242011-7, or equivalent wire lead set.

b. Test Procedure:
   (1) Measure the resistance of joint bonds with the low resistance ohmmeter in accordance with the manufacturer's written instructions.
   (2) Use the helical handspikes to contact the pipe on each side of the joint, without touching the thermite weld or the bond. The contact area shall be cleaned to bright metal by filing or grinding and without any surface rusting or oxidation.
   (3) Record the measured joint bond resistance on the test form described herein.
   (4) Repair any damaged pipe coating in accordance with WIRE CONNECTIONS, this section.

3. Joint Bond Acceptance:
   a. Joint bond resistance shall be less than or equal to the maximum allowable bond resistance values shown below.

	Max. Allowable Resistance (micro-ohms)		
Joint Type	**Two Bonds/Joint**	**Three Bonds/Joint**	**Four Bonds/Joint**
No. 2 AWG wire (Steel)	162	108	81
No. 2 AWG wire (DIP)	185	123	93
Copper Strap (12-inch)	64	43	32
Copper Strap (9-inch)	48	32	24
Coupling, 24” No. 2 AWG	212	142	106
Coupling, 24” Copper Strap	128	85	64
MLC Steel Pipe Clips	NA	55	42
Z-bars	142	95	71

   b. For bond quantities greater than shown above obtain maximum allowable bond resistance from the Engineer.
   c. Temove and replace all joint bonds on a joint that exceeds the maximum allowable resistance. Replacement joint

bonds shall be retested for compliance with the specified bond resistance.

d. Any defective joint bond discovered during SYSTEM TESTS AND INSPECTION shall be located, excavated, repaired, and backfilled.

4. Test Records: Records shall be made of each bonded pipeline during the test and submitted to the ENGINEER. These records shall include:
   a. Description and location of the pipeline tested.
   b. Starting location and direction of test.
   c. Date of test.
   d. Joint type.
   e. Measured joint bond resistance
5. Report: Submit a QC report upon completion of joint bond resistance testing which includes the information listed above.

C. Concrete Reinforcement Isolation Test:
1. Pipe penetrations as listed below shall be tested for electrical isolation from electrical grounding and concrete reinforcement by a Corrosion Expert.
2. Perform concrete reinforcement isolation tests where concrete reinforcement isolation is required on the Drawings.
3. Electrical isolation test method and evaluation criterion to be utilized by Corrosion Expert is to be submitted in writing for approval by ENGINEER prior to beginning field testing.
4. Testing shall be conducted prior to concrete placement and shall be monitored during concrete placement to ensure no electrical shorts between the pipe and tank occur.
5. Corrosion Expert shall prepare a report certifying the concrete reinforcement is properly isolated and describe test method used to verify electrical isolation upon completion of the isolation test.
6. Electrical shorted detected and identified during Engineer performed SYSTEM TESTS AND INSPECTIONS, shall be located and repaired at Contractor's sole expense.
7. Submit a written report prepared by the Corrosion Expert certifying concrete reinforcement isolation, testing method(s), test data, and any corrective action required.

3.9 SYSTEM TESTS AND INSPECTION

A. General
1. All testing specified herein shall be performed by the Engineer and shall include:
   a. Preliminary electrical continuity testing of the full pipeline.

b. Other tests as specified in Section 13115, Cathodic Protection.

2. Correct all construction defects identified during testing.
3. Provide ENGINEER with one week advance notice of completion of corrosion monitoring system work.

B. Electrical Continuity Testing:

1. Preliminary Continuity Test By Engineer
   a. After the pipeline construction is completed and all test stations have been installed, the ENGINEER shall test all pipelines with joint bonds for electrical continuity using the four-wire lineal pipe resistance test method.
   b. Test will be conducted with a minimum test current of 15 amperes using a portable rectifier or dc welder.
   c. An electrically continuous pipeline will be defined as a pipe or section of pipe that has a linear electrical resistance equal to or less than the sum of the resistance of the pipe plus the maximum allowable joint bond resistance for each joint as specified in this section.
   d. Locate electrically discontinuous joints at his sole expense as specified herein.
   e. Each discontinuous section of pipe shall be retested by the Engineer after all continuity repairs are completed to demonstrate that the pipeline is electrically continuous. Engineer retesting costs shall be at the Contractor's expense.
2. Electrical Discontinuity Location:
   a. Assume sole responsibility for location and repair of all discontinuous or high resistance joints bonds using a test method determined by the CONTRACTOR. Regardless of test method used to locate discontinuous joints, final acceptance of discontinuous sections shall be determined by the lineal pipe resistance method.
   b. After all discontinuous or high resistance joint bonds are repaired, the repaired section shall have a resistance less than or equal to the calculated allowable lineal pipe resistance as determined by the initial final continuity testing.
   c. Existing joint bonds damaged during excavation of the pipe for repairs or temporary wire connections shall be repaired.
   d. Existing test stations shall be protected from damage. When damage occurs complete repairs while the excavation is open. Undisclosed test station damage that requires repairs to be made after backfilling the excavation will be repaired at the CONTRACTOR sole expense.

e. Upon completion of continuity repairs, the ENGINEER shall retest the continuity of repaired sections at the CONTRACTOR's expense.

END OF SECTION

June 30, 2016

SECTION 02652S

CATHODIC PROTECTION SYSTEM

Add Section 02652:

PART 1 GENERAL

1.1 WORK INCLUDED:

A. This section covers the work necessary to furnish and install an impressed current cathodic protection system, complete.

B. Coordinate and install electrical service to each cathodic protection (CP) station as shown on the Drawings.

C. Utility service connection and service extension fees and charges to be paid by JVWCD/BOR.

1.2 STANDARDS

A. The following standards are included by reference:
1. NACE SP-0169
2. NACE SP-0177

1.3 QUALITY CONTROL

B. All CONTRACTOR specified testing shall be performed by a Corrosion Expert whom is NACE accredited as a Cathodic Protection Specialist or Cathodic Protection Technologist, or registered professional engineer with verifiable expertise in corrosion control and cathodic protection.

D. Contractor performed testing shall include the following tests, which shall be performed as defined this section.
1. Functional testing of cathodic protection stations
2. Other testing as specified in Section 13114, Corrosion Monitoring System.

E. Connection of anodes, energizing and testing of cathodic protection system, and other tests as defined under “System Tests and Inspections” shall be performed by the Engineer unless specifically stated otherwise this section.

1.4 DEFINITIONS

A. Active column: Active column of a Deep Well groundbed shall be that portion of the groundbed which discharges current, and consist of anodes and coke breeze.

F. Inactive column: Inactive column of a groundbed shall be that portion of the column that does not discharge current, and consist of the backfill, casing, and/or grout or concrete seal that is above the active column.

G. Cathodic Protection Station: A cathodic protection station or CP Station shall consist of the rectifier, remote monitoring, electrical service, subpanel or safety disconnect switch, all conduits, and concrete slab required for a complete and functional station.

1.5 SUBMITTALS:

A. Shop Drawings: Catalog cuts and other information for products proposed for use.

B. Quality Assurance Submittals:
1. Field Test Reports.
2. Qualifications of NACE Accredited Testing Personnel.

PART 2 MATERIALS

2.1 GENERAL:

A. Like items of materials provided hereunder shall be the end product of one manufacturer to achieve standardization for appearance, maintenance, and replacement.

B. Materials and workmanship as specified in this section shall be installed concurrently with pipe installation. Coordinate all work specified herein with related sections.

2.2 SUPPLIERS:

A. Alternate suppliers will be considered, subject to approval of the ENGINEER. Address given is that of the general office; contact these offices for information regarding the location of their representative nearest the project site.

1. Corrpro, Inc., Chicago, IL www.corrpro.com
2. Farwest Corrosion Control, Gardena, CA www.farwestcorrosion.com
3. Hoff Company, Inc. , Denver, CO www.pipelinesupplies.com
4. MESA Products, Tulsa, OK www.mesaproducts.com
5. Northtown Products, Huntington Beach, CA www.northtownproducts.com

2.3 REFERENCE ELECTRODES:

A. Prepackaged Copper-Copper Sulfate Reference Electrodes:
1. Material: Permanent type, copper-copper sulfate reference electrode suitable for direct burial with a design life of 40 years, minimum.
2. Wire: No. 14 AWG stranded copper wire with yellow, 600-volt TW, THWN, or USE2 insulation. Wire length of 50 feet or as required for splice free installation.
3. Connection: The wire shall be attached to the electrode and insulated with the manufacturer's standard connection. Connection shall be stronger than the wire.
4. Backfill: As recommended by reference electrode manufacturer.

2.4 WIRE:

A. Rectifier DC Wires:
1. No. 2 AWG wire shall be single-conductor, stranded copper wire with 600-volt, high molecular weight polyethylene (HMWPE) insulation, black.

B. Impressed Current Anode Wire:
1. Single-conductor, No. 8 AWG stranded copper.
2. Deep Well Anodes: 20-mil thick cross-linked Kynar or ECTFE floropolymer (Halar) primary insulation and high molecular weight polyethylene (HMWPE) outer insulation.

C. Test Wires:
1. Pipe Test Wires: No. 10 AWG wire, single-conductor, stranded copper with 600-volt, TW, THWN, or HMWPE insulation. Color coded insulation as specified.
2. Reference Electrode Wires: No. 14 AWG wire single-conductor, stranded copper with 600-volt, TW, THWN, USE2, or HMWPE insulation. Color coded insulation as specified.
3. Insulation Color: Color shall indicate the function of each test wire and shall be as follows:

a. Pipe: White
b. Reference electrodes: Yellow

D. AC Power Service:
1. Subpanel to Rectifier: No. 10 AWG, minimum, stranded copper wire, Type THHN or THWN cable with quantity of conductors as required for source voltage and phasing with ground wire. Colors in conformance with NEC requirements.
2. Underground Service: Provided by electrical utility from transformer to meter base.

2.5 DEEP WELL GROUNDBED

A. Surface Casing
1. PVC well casing, conforming to ASTM F-480, Schedule 40.

B. Street Reducer:
1. General
a. Sealing materials for wells shall conform to the State of Utah water well regulations or as specified herein, whichever is more stringent.
2. External Sanitary Seal (annulus area between the surface casing and soil):
a. Bentonite Grout:
(1) Mixture of granular bentonite and water in a ratio of not less than 8 pounds of bentonite or expansive clay per gallon of water.
(2) Slurry shall not be less than 50 percent expansive clay with the grain size of the remainder to be not greater than coarse sand.
(3) Bentonite shall be commercially produced product specifically designed for well sealing. Acceptable products are **Aquaguard, Quick-Grout, Plug-Gel, Shur-Gel, Enviro-Plug,** or equivalent material.
b. Unhydrated Bentonite Chips
(1) Material: Unhydrated sodium bentonite, specifically designed for well sealing.
(2) Gradation: Medium chips, 1/4 inch, minimum, to 3/8 inch, maximum, dust and fines not to exceed 2 percent by weight.
(3) Application Restrictions:
(a) Not allowed for sanitary sealing casings over 50 feet in length,

(b) Gravity feeding from the surface at depths greater than 30 feet or with water in the hole will shall require monitor rod to insure bentonite chips do not bridge and that annular space fills from bottom to top.

(4) Manufacturers:
(a) Wyoming Ben, Enviroplug Medium
(b) Baroid, Holeplug
(c) Or Equal

3. Casing Internal Seal (inactive column area): Unhydrated Bentonite chips.

C. Vent Pipe:
1. Active Column Vent
a. Loresco “Allvent”, 1-inch diameter, solvent welded joints, slotted PVC vent pipe as manufactured by Loresco International, Hattiesburg, MS.
b. Slotted vent pipe shall be installed in the active anode column area and extend 15 feet into the inactive column.
2. Inactive Column Vent
a. Inactive column vent pipe shall be 1-inch, schedule 40 PVC with solvent welded joints.
3. Surface Vent:
a. ASTM A53-90b standard hot dipped galvanized steel pipe, 1-inch diameter with 180-degree gooseneck at the top.
b. Coat threads and any damage to the galvanized coating with one coat of inorganic zinc rich primer.

D. Anode Centralizers
1. Metal assemblies that can be securely attached to the anodes to center them in the drilled well.
2. No sharp edges or bolts will be permitted on the centralizers.
3. Centralizers shall not block the well or impair installation of the anode, anode wires, or coke breeze.

E. Deep Well Seal:
1. Two-piece, cast iron seal with a rubber packer to form a watertight seal.
2. Seals shall permit conduit and vent pipe penetrations through the seal with the rubber packing sealing the annular space watertight.
3. Provide plugs for all unused holes.
4. Seal installation shall be watertight.
5. Manufactured by Campbell Manufacturing, Inc., Bechtelsville, PA; Berkeley Pump Company; Jacuzzi Brothers Inc.; or equal.

2.6 IMPRESSED CURRENT ANODES

A. Cast Iron Anodes

1. Impressed current anodes for shall be Modified high silicon cast iron of the following alloy composition:

MODIFIED HIGH-SILICON CAST IRON

Silicon	14.20 to 14.75 percent
Chromium	3.25 to 5.00 percent
Manganese	1.50 percent, maximum
Carbon	0.70 to 1.10 percent
Copper	0.50 percent, maximum
Molybdenum	0.20 percent, maximum
Iron	Remainder

2. Anodes shall be TA equivalent tubular anodes for center tapped anode wire connections as shown on the drawings.
3. Anodes shall be 45 pounds bare weight, minimum, and 84 inches long, minimum, tubular anodes with center tapped anode wire connections.
4. Lead Wire:
   a. No. 8 AWG stranded copper with insulation as specified under WIRE, this section.
   b. Lead wire shall be of sufficient length to extend splice-free from anode connection to the anode junction box.
   c. Connection of lead wire to the anode shall be by the manufacturer's standard connection and shall be stronger than the wire.
5. Packaging:
   a. Lead wire shall be coiled and bound in such a manner as necessary to protect the insulation from damage during shipment.
   b. Anodes shall be protected from breakage.
   c. Damaged anodes or lead wire will be cause for replacement of the lead wire and anode.
6. Wire Labels: Label the end of each deep well anode wire with the anode number and lead wire length. Number anodes sequentially from bottom to top.

2.7 COKE BREEZE:

A. Coke breeze shall be lubricated calcined petroleum of the following composition:

Volatile Matter	0.7 to 1.8 percent
Ash	1.3 percent maximum
Sulfur	1.9 percent maximum
Fixed Carbon	95.0 percent minimum
Particle Size	100 percent less than 16-mesh
Density	68 pounds per cubic foot, minimum

B. Acceptable coke breeze shall be Loresco SC-3 as manufactured by Loresco International, Hattiesburg, MS.

2.8 ANODE JUNCTION BOX

A. Terminal Box:
   1. NEMA 250-85, Type 3R, 14-gauge steel, minimum thickness, with inside dimensions not less than 12 inches by 12 inches by 4 inches deep or as required for the quantity of anodes.
   2. Hinged door with padlock hasp.

B. Hardware: Secure door with stainless steel quick release latches and hinges. Screw or bolt mounted or secured doors will not be acceptable

C. Coating: Hot dipped galvanized in accordance with ASTM A153

D. Terminals and Connectors: Furnish a separate panel board, buss bar, and terminal strip or terminal block connectors, and nickel plated brass fasteners for connecting the anode lead terminals to the rectifier positive lead. Provide separate terminal and shunt for each anode lead. Quantity of terminals shall be as shown on the Drawings for quantity of anodes per groundbed

E. Shunts: Holloway Type RS, 0.01 ohm.

F. Equipment Tags: Provide each junction box with original manufacturer's equipment tag that identifies the original equipment manufacturer, model number, serial number, and any applicable electrical ratings. Equipment tags with vendor or distributor name will not be acceptable.

G. Manufacturer: Anode junction box shall be Universal Model ATB or ATB-S as manufactured by Universal Rectifiers Inc., Rosenberg, TX.

2.9 RECTIFIER:

A. Rectifiers shall be air cooled, constant current controlled rectifier meeting NEMA MR-20-1958 standards.

B. Voltage output shall be controlled with a minimum of 24 evenly divided transformer tap settings.

C. Constant current solid state control circuits shall maintain the current output within 2 percent of the set value while varying the voltage or current from 1 to 100 percent of the rated dc voltage. The solid state controller boards shall be fully encapsulated and/or plated as required to prevent corrosion of the boards, components, and connections in an industrial exposure

D. The rectifiers shall be designed to operate continuously at full rated output at an ambient temperature of 45 degrees C with an ac input of 120/240 volts, single phase, 60-Hz. The rectifier shall be capable of operation at 110 percent of rated input without damage to the rectifier components.

E. Push button type circuit breakers for ac input or secondary ac breaker shall not be permitted.

F. The stack shall provide a continuous DC output as shown on the Drawings, minimum. The rectifying elements shall be a full wave bridge, silicon diode stack. The rectifier stack shall be protected from over voltage surge with metal oxide varisters and over current with current-limiting devices.

G. Lightning protection devices shall be provided on the ac input and dc output of rectifier.

H. Supply the rectifier with separate DC voltage and current meter and external panel mounted shunt in series with the ammeter. The meters shall be accurate to within 2 percent of the actual voltage and current output and shall be d'varsonal-jeweled movement. Meters shall be tested and calibrated at the factory. Meters will be tested in the field for accuracy. The manufacturer shall replace inaccurate meters.

I. Transformer, ac circuit breaker, rectifier stacks, constant current control circuit boards, lightning arrestors, DC output meters, and all wiring connections shall be housed in an 11 -gauge steel, hot dipped galvanized cabinet suitable for pole mounting. The cabinet shall be provided with hinge doors on the front and one side with slide out rack assembly. Cabinet shall be provided with hasp for padlocking and shall be sealed to

protect the interior components from weather, vandalism, and nest building insects.

J. Rectifiers shall be manufactured to include remote monitoring equipment connections and internal mercury relay switch for current interruption as specified, this section. Remote monitoring provisions included with rectifiers shall include:
   1. Mercury relay switch with current capacity of 120 percent of the rated DC output, minimum, and input switching voltage of 10 to 14 volts DC, 500 mA maximum, or as specified for remote monitoring equipment this section.
   2. Terminal strips with individual terminals for pipe test wires, reference electrodes, and power supply to remote monitoring equipment.
   3. Power terminals shall be 2-ampere, minimum, 10 to 25 volt ac, supply power for remote monitoring unit, as specified this section.
   4. AC power supply to remote monitoring unit shall be protected with an independent overload circuit breaker and isolating transformer.

K. Remote monitoring connection terminals shall be provided by the rectifier manufacturer with double screw terminal strips mounted on the panel board for connection of remote monitoring equipment to be supplied by others. Terminal strip shall have all rectifier connections completed and terminated on the terminal strip with engraved identification or approved equivalent for the following connections:
   1. Terminal Block No. 1 (Eight Terminals)
      a. DC Volts, Positive
      b. DC Volts, Negative
      c. DC Shunt Millivolts, Positive
      d. DC Shunt Millivolts, Negative
      e. Power Terminal #1, 10 to 25 volts ac
      f. Power Terminal #2, 10 to 25 volts ac
      g. Relay Switch, Positive, 10 to 14 volts DC
      h. Relay Switch, Negative, 10 to 14 volts DC
   2. Terminal Block No. 2 (Eight Terminals)
      a. Reference
      b. Pipe #1a
      c. Pipe #1b

L. Supply each rectifier with an operation and maintenance manual that includes an electrical schematic of the rectifier, parts list with replacement part numbers, and troubleshooting procedures.

M. Provide each rectifier with original manufacturer's equipment tag that identifies the original equipment manufacturer, rectifier model number, serial number, ac input, and dc output ratings. Equipment tags with vendor or distributor name will not be permitted and will be rejected and replaced.

N. Rectifier manufacturer shall be Universal Rectifiers Inc. Rosenberg, Texas.

2.10 REMOTE MONITORING

A. Provide Watchdog Model Scout remote monitoring unit (RMU) manufactured by Elecsys, Olathe, Kansas, with CDMA cellular telemetry.

B. Supply one RMU per rectifier or rectifier circuit and provide all mounting hardware needed for external or internal mounting as required by the JVWCD/BOR.

C. RMU shall have interruption capabilities compatible with the relay supplied with the rectifier. Coordinate RMU supply power and relay electrical requirements with the rectifier manufacturer.

D. Connect RMU to rectifier and provide the following monitoring:
1. Rectifier output voltage, ±200 volts DC range
2. Rectifier output amperage, ±100 millivolts DC range
3. Pipe to Soil Potential, ±10 volts DC range
4. AC voltage detection
5. Rectifier interrupter relay output, 10 to 14 volts dc

2.11 AC ELECTRICAL SERVICE:

A. Utility Underground Service
1. Meter base and disconnect switch as shown on Drawings.
2. Single Phase Meter base: 240-volt, single-phase, three-wire, 100-ampere, 2-inch threaded hubs, manual link bypass, per electrical utility requirements.
3. Electrical Subpanel:
   a. Heavy-duty, outdoor, NEMA 3R rainproof rated at 240 volts, single phase, 75 amperes, and six single pole circuit capacity, minimum.
   b. Supply with thermal break circuit breakers sized for electrical loads and voltages as follows:
      (1) Rectifier Circuit: Two Pole, 30 ampere.
      (2) Convenience Outlet: Single pole, 20 ampere.

4. Subpanel: Heavy-duty, NEMA 3R rain tight, rated at 240 volts, 60 amperes, two-pole, six circuit spaces, minimum. Supply with two pole thermal break circuit breaker sized for the ac current flow at maximum rectifier output but not to exceed 125 percent of maximum rectifier output.
5. Conduit:
    a. General: Must conform to electrical utility requirements
    b. Size: 2-inch diameter minimum, 36-inch minimum long radius sweeps, or as required by the electrical utility.
    c. Material: Rigid fiberglass or electrical grade Schedule 40 gray PVC.

B. Grounding
1. Ground Rod: Copper-clad steel, 5/8-inch diameter, 8-feet long.
2. Ground Wire and Clamp: No. 6 AWG solid copper wire with a high copper content alloy or bronze bolt-on ground rod clamp.

2.12 RACEWAY AND DUCT BANKS:

A. Outdoors, Exposed Conduit
1. Conduit: Rigid hot dipped galvanized steel, 1-inch diameter, minimum, or as shown on Drawings.
2. Fittings and outlet bodies: Cast malleable iron, hot-dipped galvanized iron.
3. Joints: Threaded, watertight.

B. Buried or Concrete Encased Conduit:
1. Conduit: Rigid, electrical grade, schedule 40 gray PVC, 1-inch diameter, minimum, or as shown on Drawings.
2. Joints: Solvent welded or threaded, watertight.
3. Sweep elbows: PVC coated rigid steel with threaded joints.

C. Flexible conduit:
1. Flexible conduit for ac power from the entrance switch to the rectifier shall be PVC coated, waterproof flexible conduit.
2. Use of flexible conduit shall be minimized and shall be acceptable for use only where other fittings and elbows are not readily available.

D. Conduit Hardware and Supports;
1. Conduit Mounting - Hot dipped galvanized Unistrut modular supports and hardware. Cadmium or electroplated zinc coating will not be allowed.

2. Locknuts, conduit clamps, and other miscellaneous hardware shall be hot dipped galvanized steel. Galvanized items shall be hot-dipped galvanized in accordance with ASTM A153. Two hole straps will not be permitted.
3. Conduit clamps shall be two piece, malleable iron, one hole, strap and clamp back spacer, O. Z. Gedney 14-100G and 143G or similar, for mounting to surfaces with either lag bolts or concrete wedge anchors, as shown on the Drawings.
4. All miscellaneous hardware shall be hot dipped galvanized steel or the same material as the conduit.

E. Precast Electrical Boxes:
1. Cover: HDPE or Fiberlyte cover, 3,000 lbs vertical load minimum, or as required for application, whichever is greater, 10-inch by 15-inch minimum dimensions.
2. Body: Fiberlyte or polymer concrete, slope sides, minimum depth 18-inches.
3. Hardware: Stainless steel hex cover lock.
4. Load Requirements: As required for location as follows.
   a. Open or non-traffic areas: 3,000 lbs vertical
   b. Parkway or Greenbelt: 3,000 lbs vertical
   c. Intermittent Light Vehicle Traffic: 12,000 lbs vertical

F. Protective Coatings:
1. Galvanized items shall be hot-dipped galvanized in accordance with ASTM A153.

2.13 PROTECTIVE BARRIERS

A. CP Station Railing
1. Posts: New steel pipe, standard weight, 4-inch diameter, 8 feet maximum on center spacing.
2. Post Caps: Welded steel plate with vent hole or concrete filled at CONTRACTOR's option.
3. Rails: New steel pipe, standard weight, 2-inch diameter
4. Joints: Welded, except for front rails which shall be bolted.
5. Coating: Hot dipped galvanized, in accordance with ASTM A153 after fabrication.
6. Bolts: Galvanized steel or Type 304 stainless steel
7. Configuration and Size: As shown on the Drawings.

B. Deep Well Railing
1. Posts: New steel pipe, standard weight, 2-inch diameter

2. Post Caps: Welded steel plate with vent hole or concrete filled at CONTRACTOR's option.
3. Rails: New steel pipe, standard weight, 2-inch diameter
4. Joints: Welded
5. Coating: Hot dipped galvanized, in accordance with ASTM A153 after fabrication.
6. Configuration and Size: As shown on the Drawings.

2.14 THERMITE WELD MATERIALS:

A. General:
1. Thermite weld materials consist of wire sleeves, welders, and weld cartridges according to the weld manufacturer's recommendations for each wire size and pipe or fitting size and material.
2. Welding materials and equipment shall be the product of a single manufacturer. Interchanging materials of different manufacturers is not acceptable.

B. Molds: Graphite, as recommended by manufacture for pipe and wire size.

C. Adapter Sleeves:
1. For No. 12 AWG and No. 2 AWG wires.
2. Prefabricated factory sleeve joint bonds or bond wires with formed sleeves made in the field are acceptable. Attach field-formed joint bonds sleeves with the appropriate size and type of hammer die furnished by the thermite weld manufacturer.
3. Extend wire conductor 1/8 inch beyond the end of the adapter sleeve.

D. Cartridges:
1. Steel: 32 grams, maximum.
2. Cast and Ductile Iron: 45 grams, maximum, XF-19 Alloy

E. Welders and Cartridges: For attaching copper wire to pipe material:

Pipe Material	**Weld Type**	**Cartridge Size, Max.**
No. 6 AWG Wire & Smaller		
Steel	HA, VS, HC	15 gm
Ductile or Cast Iron	HB, VH, HE	25 gm
No. 4 AWG Wire & Smaller		
Steel	HA, VS, HC	25 gm
Ductile or Cast Iron	HB, VH, HE	32 gm

F. Welding Materials Manufacturers:
1. Erico Products Inc. (Cadweld), Cleveland, OH.
2. Continental Industries, Inc. (Thermo-Weld), Tulsa, OK.

2.15 COATING REPAIR MATERIAL FOR PIPE AND FITTINGS

A. General:
1. Complete coating repairs in accordance with recommendations of the pipe or fitting manufacturer.

B. Coating Requirements:
1. Steel Pipe:
   a. Coal tar based coatings: Koppers Bitumastic 50 or Denso or Tapecoat wax tape coatings; or equal, 20 mils dry film thickness, minimum.
   b. Polyurethane or Epoxy Coatings: Fast cure epoxy, 20 mils dry film thickness, minimum
   c. Tape Wrap or Extruded Polyethylene Coating: Thermite Weld Cap, Canusa CRP Patch, or Raychem PERP patch, or equal
   d. Cement Mortar Coating: Same as required for Concrete Cylinder Pipe.
2. Ductile iron Pipe:
   a. Fast cure epoxy
   b. Thermite weld cap
3. Concrete Cylinder Pipe:
   a. 1-inch, minimum, cover of cement mortar.

C. Coating Materials:

1. Thermite Weld Caps:
   a. Royston Laboratories Handi-Cap IP, prefabricated primerless thermite weld cap and coating system.
   b. Provide primer unless specifically stated in product data sheet that no primer is required.
2. Fast Cure Epoxy Coating:
   a. 100 percent solids, fast curing epoxy suitable for submerged or buried conditions.
   b. Acceptable products or equal:
      (1) Denso Protal 7125 (low temperature) or Protal 7300
      (2) Tapecoat TC 7010
      (3) 3M ScotchKote 323

2.16 CONCRETE

A. Class AA(AE) per UDOT specification Section 03055 Portland Cement Concrete.

2.17 ROCK MULCH

A. Where indicated on the Drawings for landscape rock mulch.

B. Color of rock mulch to be selected by Jordan Valley WCD.

C. Material shall consist of hard, durable particles of proper size and gradation, and it shall be free from loam, clay, excess fines, coal and coal byproduct materials, and deleterious materials. Submit certified laboratory testing depicting chloride limits of less than 100 parts per million and pH exceeding 6.5. The size of the particles shall be uniformly graded as follows:

Sieve No. or Size	Percent Passing (by weight)
1 1/2"-inch	100
3/4 inch	20 - 55
¼-inch or smaller	5

D. Acceptable aggregate shall be angular with some rounded aggregate.

PART 3 EXECUTION

3.1 GENERAL:

A. The installation of the facilities herein specified and described shall conform to the latest applicable NEC rules.

B. The workmanship shall be of the highest grade and shall be in strict accordance with material manufacturer's instructions. Equipment or materials damaged in shipment or in the course of installation shall be replaced.

C. Examine all Drawings and coordinate his work so as to avoid conflicts, errors, delays, and unnecessary interference with the construction of the facilities and to avoid duplication of the work such as excavation, filling, etc. In the event of any conflicts in the Specifications, the ENGINEER shall be consulted.

3.2 STORAGE AND HANDLING:

A. Store all cathodic protection rectifiers and electrical components off the ground and keep them dry at all times.

B. Protect against weather, condensation, and mechanical damage.

C. Immediately remove from the project site all mechanically damaged anodes.

3.3 REFERENCE ELECTRODE INSTALLATION

A. Remove plastic or paper wrapper and place reference electrode within the pipeline trench excavation 12 inches from pipe in a vertical position.

B. Soak reference electrode in water for 30 minutes, minimum, before installation. Test potential of reference electrode against standard reference electrode in soak water at end of 30 minutes.

C. Install one reference electrode within 12-inches of pipeline. At foreign pipe crossings provide two reference electrodes and place one reference electrode within 12-inch of each pipeline and with corrosion coupons as shown on the Drawings.

D. Backfill hole with select native material in 6-inch layers and hand tamp each layer around anode. Use only native soil for backfill; do not use sand. Exercise care not to strike reference cell or lead wire with tamper.

E. Terminate reference electrode wire in rectifier, as required.

3.4 CATHODIC PROTECTION STATION ABANDONMENT

A. Existing cathodic protection station (CPS) located at approximately 5200 South Bangerter Highway as shown on the Plan and Profile drawings.
B. CPS shall be removed and deep anode groundbed abandoned in accordance with State of Utah Well Abandonment regulations and as shown on the Drawings.
C. Original design drawings of Cathodic Protection Station No. 1 are included with reference drawings.
D. Cathodic protection abandonment shall be completed after the new cathodic protection system is installed and functional testing is completed as defined this section.
E. Removal of the existing cathodic protection station shall include:
    1. Obtaining a State of Utah Well Abandonment permit and complying with all required submittals and procedures.
    2. Filling the deep anode groundbed vent pipe with neat cement by pumping through a tremie pipe from the bottom of the vent pipe.
    3. Excavation, cutting of the surface casing, and placement of the sealing materials as shown on the Drawings.
    4. Coordinating with UP&L for the disconnection of the existing electrical service.
    5. Disassembly, removal, and salvage of rectifier, ac meter, anode junction box, concrete slabs, and all above grade appurtenances.
    6. Removal of any existing test stations on the existing section of Jordan Aqueduct Reach 3 to be abandoned in place.
    7. Excavating and removal of all wires to the pipeline to a minimum depth of two feet and seal the ends of the remaining wire. Removal of wires to the pipe is not required.

3.5 DEEP WELL GROUNDBED INSTALLATION:

A. General:
    1. Drilling, electrical logging of well, lowering of anodes, coke breeze placement, and backfilling shall be done in a continuous operation and shall be observed by the ENGINEER.
    2. A certified water well driller in current standing in the State of Utah and shall obtain all drilling permits, start cards, submit notification of work completion, and submit drilling logs in accordance with state regulations.
    3. Driller will be solely responsible for all aspects of the drilling and well construction until well completion.
    4. Drilling of the groundbed shall be in accordance with the methods and procedures of the best recognized drilling practices and shall

comply with the rules and regulations of the State, County, City, or other governing bodies having jurisdiction.

5. Deep well groundbeds shall be sealed as specified herein or as required by well drilling regulations. The most stringent requirements shall apply.
6. Take necessary precautions to avoid entrance of foreign matter, movement of soil strata, or collapsing of the well during the progress of the work. Should movement of soil strata or collapse of the drilled well interfere with proper completion of the ground bed, recover the wires and anode strings, where possible, and ream or redrill the well.
7. The driller shall maintain a log describing the depth and type of formations encountered during drilling. Copies of the log shall be submitted to the ENGINEER and appropriate government authorities.
8. Wells not completed in accordance with the State water well or other applicable regulations and this specification will be subject to rejection and replacement at the CONTRACTOR's sole expense.

B. Drilling:

1. Coordinate the actual location of the ground bed in the field with the ENGINEER before drilling begins. Verify and locate all buried utilities prior to beginning drilling operations.
2. Provide a holding sump to contain and store drilling fluids and cuttings.
3. Excavation of a temporary mud pit on the project site will not be permitted.
4. Provide drilling mud containment and disposal system to prevent mud from entering drainages, storm drains, gutters, streams, or leaving the project site.
5. Size the holding sump for the project and take all precautions necessary to prevent spillage or overflow of drilling fluids. All overflow or spillage shall be contained. Clean all spills and overflows and, if necessary, will clean drainages, storm drains and manholes impacted by uncontained drilling fluids.
6. Transport and dispose of all drilling fluids and cuttings to an approved disposal location.
7. Spillage or leakage of oil or hydraulic fluids shall be contained and controlled by the Driller. All oil contamination on the drilling site resulting from drilling equipment shall be contained, cleaned up, and properly disposed of the project site.
8. Over drill well to compensate for sloughing or heaving during anode installation.

C. Casing
   1. Construct the well and set surface casing straight and plumb. Casing length as shown on drawings is the minimum length, determine casing requirements based on anticipated drilling conditions and as defined in this section.
   2. Surface casing shall be set prior to completion of the first 100 feet of the well.
   3. Casing, other than surface casing, shall not be installed or left in the well unless in the driller's estimation it is necessary for successful completion of the well.
   4. Plastic casing may be installed in the inactive column, at the CONTRACTOR's option, but shall not extend into the active column.
   5. If steel casing is installed into the active column, it shall be cut 100 feet below the ground surface and the top portion jacked up to provide a 25 foot, minimum, separation between the upper casing and the top of the active column. Complete cutting of the steel casing before anodes are installed. Jacking operations must be completed before installation of anodes.
   6. Drilled hole for surface casing shall be 4 inches in diameter greater than casing outside diameter, minimum.
   7. Surface casing shall be provided with a sanitary seal as specified herein and in accordance with State water well regulations, whichever is more stringent.

D. Placement of Casing Seals:
   1. External Sanitary Seal
      a. Install sanitary seal in annular space between casing and soil.
      b. Place casing sanitary seal by tremie pipe and pumping of bentonite grout if casing is greater than 50 feet or groundwater is present within the well.
      c. The seal placement shall be done continuously and in a manner that will ensure the entire filling of the annular space in one operation.
      d. No drilling operations will be permitted until neat cement or grout has cured.
         (1) Curing time for portland cement, Type I or II, is a minimum of 72 hours and for type III a minimum of 36 hours.
         (2) Addition of an accelerator will be permitted subject to written approval from the State Water Engineer.

(3) Bentonite grout set time shall be determined based on manufacturer's recommendations or observations of a mixed grout sample taken from the pumped stream.

2. Casing Internal Seal
   a. After the coke breeze settlement is completed and anode settlement is stopped, the casing shall be filled with the specified sealing material.
   b. Placement of the sealing material will be with plastic tremie pipe only for slurry type seals. Inserting of the tremie pipe shall be performed in a manner that will not damage the wire insulation.
   c. Granular sealing materials may be top loaded, but shall be performed at a rate that will not result in bridging of the seal material.

E. Electrical Logging:
   1. Flush the well and electrically log the well in the presence of the ENGINEER to determine the soil characteristic along the length of the well.
   2. Electrical Logging Method: Measure current output of first anode as it is lowered into the well. Test using suitable meters, connections to a low resistance ground, and a method to measure the down hole wire length or provide footage identification markings on the wire.
   3. Record current output readings and depth from the surface continuously or at 5-foot increments for the entire well depth. Note depth of groundwater at time of electrical logging.

F. Lowering of Anodes:
   1. Anode installation to be observed by the ENGINEER
   2. Install anodes and coke breeze the same day as the completion of the drilling and electrical logging.
   3. If loading is delayed more than 8 hours after drilling is completed or if loading cannot be completed before sunset or end of working hours, whichever comes first, the drill stem and bit should be reinserted and run back to the bottom of the well with sufficient rotation and circulation to ensure that the drilled well is prepared for anode installation.
   4. If the well is drilled with mud, the well shall be flushed out with clean water in a continuous process before or after the anodes are lowered, at the CONTRACTOR's option, until the return fluid has a mud weight of not more than 9.2 pounds per gallon to allow for proper settlement of coke. The ENGINEER shall inspect the return fluid before coke breeze pumping will be permitted to begin.
   5. Attach anode centralizers to each of the anodes prior to lowering. Attach deepest anode to the vent pipe. Lower anode and vent pipe to the bottom of the well. Lower the remaining anodes individually until all anodes are suspended in the well.
   6. The bottom of the vent pipe shall be capped and each joint of pipe solvent welded in accordance with the manufacturer's recommendations. Drilling of the vent pipe to prevent floating is prohibited and will result in rejection of the vent pipe.
   7. Prevent foreign matter from entering the vent pipe during anode installation and casing seal placement. Clear any blockage of the vent pipe. Failure to clear the vent pipe will result in rejection of the ground bed. Vent pipe shall be permitted to flow water during coke breeze pumping to flush any mud and cuttings from within the vent.
   8. Any damage to anodes or cut, gouged, or scraped wire insulation will result in rejection of the anode and lead wire. Implement means to protect the anode lead wires during and following anode installation.

G. Backfilling of Anode Well:
   1. Keep well full of water during installation of the coke breeze.
   2. Prepare coke breeze slurry with potable water in accordance with the manufacturer's written recommendations. Pump the slurry into the well through a steel or plastic tremie pipe. Pump coke breeze in an even and continuous manner from the bottom of the well to the top as the tremie pipe is slowly withdrawn. Top-loading the coke breeze, by pouring coke breeze into the well will not be permitted.

3. Throughout coke breeze pumping, displaced water and mud shall be collected and stored for disposal. Discharge of mud and water into the storm drains or public right-of-ways, or roadways will not be allowed. Determine and provide the storage capacity required. Should the water and mud storage capacity be inadequate for the project, work will be terminated until adequate capacity is provided. Loss of materials or collapse of the well due to termination of the loading operation will be at the CONTRACTOR's sole expense.
4. Care shall be taken during pumping of the coke breeze to avoid coke breeze bridging or collapse of the well. If the well collapses or coke breeze bridges, take necessary steps to resolve the problem at his sole expense.
5. Restrain anodes from settling during and following coke breeze installation for 24 hours, minimum, for coke breeze settlement and compaction. Maintain anode restraint until all anode settlement stops.
6. After the coke breeze is installed and has settled for 24 hours the ENGINEER shall measure the depth to the top of the coke breeze column. If required, additional coke breeze shall be added by pumping or top loading to the specified elevation. Coke breeze shall not be less than 100 feet below finished grade elevation. Remove any excess coke breeze at his sole expense.
7. When the coke breeze has properly settled and has been placed to the proper depth, fill the inactive column with the specified sealing material to within 4 feet of ground surface.

H. Anode Wire Terminations:
1. Cut a smooth hole in the side of the casing for routing wires to the anode junction box. All below grade penetrations of the surface casing shall be watertight.
2. Anode wires shall be installed in conduit from the ground bed to the anode junction box. The completed electrical conduit shall be watertight.
3. Seal both ends of all conduits from the ground bed with urethane foam to prevent ground bed gases from entering the conduit, anode junction box, or rectifier.
4. Anode lead shall be terminated in numerical order in correspondence to anode depth.

I. Groundbed and Vent Pipe Termination:
1. Connect the surface pipe directly to the plastic vent pipe with a solvent welded by threaded connection adapter.
2. Terminated vent pipe as shown on the Drawings.

3. After all wire terminations and vent pipe connections are completed, complete filling of the inactive column with the specified sealing material.
4. Plumb and support vent pipe during seal placement and while the seal sets or compacts.

J. Cleanup:
1. The drilling site shall be kept neat and orderly under all circumstances.
2. All excess equipment and cuttings shall be removed daily when required by the prevailing conditions at the drilling site.
3. Remove all mud, waste products, and tailings from the project site and dispose of at an approved disposal site.
4. The project sites shall be restored to a condition equivalent to their original condition before construction started and to the satisfaction of the ENGINEER.
5. Damage to sidewalks, curbs, roads, and driveways shall be restored to original condition or better.

3.6 ANODE TERMINAL BOX INSTALLATION

A. Connect the rectifier positive wire and anode wires to the anode junction box terminals.

B. Label wires in the terminal box with permanent tags identifying the anode number and rectifier lead.

C. Connect numbered anodes in consecutive order from top to bottom with anode terminals starting at number 1 on the top left-hand side.

D. Maintain sufficient slack to keep the wire from being unduly stressed, damaged, or broken during backfill.

E. All conduits entering the anode junction box shall be sealed with urethane foam to prevent groundbed gases from entering the junction box.

F. Anode junction boxes shall be not less than 24 inches above the concrete slab. Concrete slabs shall be not less than 3 inches above finish grade and provided with soil retention curbing or walls in finish grades with slopes greater than 1:3

3.7 CATHODIC PROTECTION STATION INSTALLATION:

A. Install a cathodic protection (CP) station, which includes rectifier mounting pad, ac power from the subpanel to the rectifier, and all AC and DC electrical hardware necessary for the rectifier installation.

B. Install and connect an AC power service to each CP Station location as shown on Drawings.

C. Furnish and install AC electrical service except as follows:
   1. Conductors from utility power source utility to meter base to be provided by Electrical Utility.
   2. Underground splice boxes and transformers as required to be furnished by the electrical utility.
   3. Underground conduit and trenching shall be furnished and installed and shall in conformance with the electrical utility requirements.

D. Cathodic protection (CP) station installation and location shall be as shown on the Drawings, except when the Drawings and local or State electrical codes are contradictory. In such cases, local or State electrical codes shall prevail. Final site location and orientation shall be adjusted in the field for site conditions and installation requirements and shall be approved by the Engineer.

E. DC leads to the rectifier shall be as specified this section. Wires shall be buried in accordance with Trenching and Backfill, this section. All wire leads shall be free of splices. Insulation on leads shall be free of cuts or abraded areas.

F. Provide two pipe test lead wires from the protected structure and one reference electrode and terminate all wires on the rectifier panel board.

G. Rectifier negative, structure test wires, and reference electrode wire shall be installed in direct buried DC conduit as shown on the drawings.

H. Upon completion of CP station installation CONTRACTOR to perform functional test of system in accordance with Quality Control Testing, this section.

3.8 ELECTRICAL SERVICE:

A. General
   1. Electrical service to be provided under Rocky Mountain Power Work Order #6211105, electrical service estimator is Henry Tsosie.

2. Electrical power service shall be installed by the CONTRACTOR in accordance with local electrical utility requirements and shall meet or exceed local or NEC codes.
3. Electrical service shall be underground unless shown otherwise on the Drawings.
4. Electrical service shall be installed by a licensed electrician.
5. CONTRACTOR shall obtain a local building permit and coordinate inspection of the completed electrical service.
6. Electrical utility connection fees and electrical extension costs will be paid by the OWNER.

B. Underground Service
1. Provide all materials, trenching, backfill, compaction, conduit, and equipment bases necessary for installation of a conduit from the originating power source to the meter pedestal service panel.
2. Provide flat pull string or poly rope with 500 pounds tensional capacity for utility installation of power conductors from the originating pole or source to the meter base.
3. Underground service shall be installed in conduit, buried 24 inches, minimum, below finish grade in sand backfill in conformance with electrical utility requirements.
4. Underground conduit shall not be greater than 150 feet and more than 270 degrees of combined bends between pull boxes without written approval of the electrical utility.
5. Conduit shall be free of dirt and debris, sealed to prevent infiltration of water, and ends capped.

3.9 ELECTRICAL AND COMMUNICATION DUCTWORK:

A. Underground AC and communication duct bank, DC duct bank, vault raceway, and all electrical conductors shall be installed by a Utah licensed electrician.

B. AC electrical, dc wires, and communication conduits shall be separate conduits installed in accordance with NEC and as shown on the Drawings.

C. All duct banks less than shall be sand backfilled.

D. Underground conduit, except electrical utility conduits, shall not be greater than 250 feet long with not more than 360 degrees of combined bends between pull boxes without written approval of the ENGINEER.

E. Conduit shall be free of dirt and debris, joints solvent welded to prevent infiltration of water and debris, and ends capped.

F. Provide each conduit with a flat pull string or poly rope with 500 pounds tensional capacity for installation of conductors.

G. Electrical contractor shall be furnished and installed AC conductors, circuit breakers, and all associated hardware for electrical service to the rectifiers from subpanel.

3.10 THERMITE WELD WIRE CONNECTIONS:

A. Use thermite weld method for electrical connection of copper wire to steel, ductile iron, and cast iron surfaces. Observe proper safety precautions, welding procedures, thermite weld material selection, and surface preparation as recommended by the material manufacturer. Assure that pipe or fitting wall thickness is of sufficient thickness that the thermite weld process will not damage the pipe or fitting wall's integrity or damage the lining in any way.

B. Before the connection is made, the surface shall be cleaned to bare metal by making a 2-inch by 2-inch window in the coating, and then filing or grinding the surface with a vitrified wheel to produce a bright metal finish. Wire sleeves shall be installed on the ends of the wire before welding to the metal surface.

C. After the weld connection is cooled, remove slag, visually inspect, and physically test wire connection by tapping with a hammer. Remove and replace any defective connections.

D. Make wire connections to concrete cylinder pipe by thermite welding to the shop welded steel plates provided on the pipe for this purpose.

E. Coat each completed wire connection as specified, this section. If lining is damaged by welding, repaired in accordance with the lining applicator's recommendations.

3.11 TRENCHING AND BACKFILL

A. General:
   1. Complete excavations and trenching regardless of the type, nature, or condition of materials encountered, and as required to accomplish specified construction to lines and grades shown.
   2. Complete all utility notifications prior to performing trenching and excavations work.

3. Take care to avoid damage to existing structures and utilities during excavating and trenching process. Locations may be modified, where approved by the ENGINEER, to minimize possible damage to existing structures.
4. Trench shall be of uniform depth and width, level, smooth, and free of sharp objects.

B. Trench Depths:
   a. Trench depths provided are minimum requirements. Meet minimum requirements listed, as required by local utilities, ordinances, or regulations, or as shown on the Drawings, whichever is more stringent.
   b. Minimum depths for cathodic protection or corrosion monitoring work shall be as follows:
      (1) Secondary Electrical Services: 30-inches (conduit)
      (2) Primary Electrical Services 42-inches (conduit)
      (3) Pipeline Test wires, undeveloped 30-inches (direct bury)
      (4) Pipeline Test wires, roadways 24-inches (conduit)
      (5) Rectifier Connection Wires, undeveloped 30-inches (direct bury)
      (6) Rectifier Connection Wires, developed 24-inches (conduit)
      (7) Rectifier Connection Wires, plant 30-inches (duct bank)
      (8) All other 30-inches

C. Safety
   1. Slope, shore, or brace excavations and trenches in accordance with OSHA regulations.
   2. Provide shoring as necessary to prevent caving during excavation in unstable material, or to protect adjacent structures, property, workers, and the public.
   3. Assume sole responsibility for ensuring safety of trenches and conformance to OSHA trench safety requirements.

D. Backfill and Compaction
   1. Backfill trench with excavated backfill materials, unless excavated material is unsuitable for meeting compaction requirements.
   2. Provide imported backfill material where indicated on the Drawings or where excavated material is unsuitable for compaction.
   3. All trenches shall be compacted to 90 percent, minimum, or as specified for the pipeline whichever is more stringent.

4. Concrete slab base material and trenches within 5 feet of roadways, paved areas, or other traffic areas shall be compacted to 95 percent, minimum.
5. Within roadways or where required by local entities, provide a control low strength material (CLSM) to cover the pipe for a minimum of 12-inches or to fill vacuum holes within paved areas. CLSM shall meet the following performance requirements:
6. Total calculated air content: Not less than 8.0 percent nor greater than 12.0 percent.
7. Minimum unconfined compressive strength: Not less than 50 pounds per square inch measured at 28 days.
8. Maximum unconfined compressive strength: Not greater than 150 pounds per square inch measured at 28 days.
9. Wet Density: No greater than 132 pounds per cubic foot.
10. Do not use backfill material of frozen or consolidated debris. Leave the trench with the excess backfill material neatly mounded, but not more than 4 inches above the existing ground level, for the entire width of the trench in undeveloped areas.
11. Replace topsoil in developed, landscaped, or cultivated areas as specified in Surface Restoration, this section.

3.12 QUALITY CONTROL TESTING

A. General:
1. Correct all construction defects identified during testing.
2. Provide engineer with 7 days advance notice of completion for Engineer acceptance testing.
3. Contractor required testing as defined herein shall be performed by a Corrosion Expert, with qualifications as specified this section, whom is an employee or subcontractor to the Contractor.

B. Functional Testing of Cathodic Protection Stations
1. Perform a function test of each cathodic protection station installed.
2. Functional testing shall demonstrate the following items are functional and ready for Engineer performed energizing and testing:
   a. AC power service from meter base to rectifier circuit breaker is operational and functional.
   b. Rectifier produces dc voltage and current output up to the maximum dc current output rating of the rectifier.
   c. Rectifier controller cards are fully functional and providing control of the rectifier output as specified.
   d. All impressed current anodes are discharging dc current.
   e. Remote monitoring system is installed and correctly wired.

3. Upon completion of functional testing, the rectifier shall be left in a de-energized state for Engineer performed System Tests and Inspection.
4. If electrical service is not installed at the time of the functional test, provide a generator with the wattage and voltage output necessary to power the system from the meter base utility connection terminals and complete all testing as defined for functional testing.

3.13 SYSTEM TESTS AND INSPECTION

A. General
   1. All testing specified herein shall be performed by the Engineer and shall include:
      a. Preliminary electrical continuity testing of the full pipeline.
      b. Cathodic protection system energizing and testing.
   2. Correct all construction defects identified during testing.
   3. Provide ENGINEER with one week advance notice of completion of cathodic protection work.

B. Cathodic Protection System Energizing and Testing:
   1. After the installation of the cathodic protection system is completed, the ENGINEER shall energize and adjust the system output and ensure proper installation of the cathodic protection system.

END OF SECTION

September 10, 2007

SECTION 02662S

CORE AND GROUT

PART I GENERAL

1.1 SECTION INCLUDES

A. Core cut and grout new pipe into an existing concrete structure wall.

1.2 RELATED SECTIONS

A. Section 03211: Reinforcing Steel and Welded Wire

1.3 REFERENCES

A. ASTM C 109 Compressive Strength of Hydraulic Cement Mortars (Using 2-in or [50-mm] Cube Specimens)

PART 2 PRODUCTS

2.1 MATERIALS

A. Grout
1. Proportions by Volume: One part Portland Cement to two parts Sand.
2. Mix thoroughly with water to form a stiff workable plastic putty.
3. Compressive Strength: ASTM C 109, 2800 psi in 28 days.

PART 3 EXECUTION

3.1 CONSTRUCTION

A. Core drill the existing concrete structure wall so that the flow line of the new pipe matches the pipe flow line shown on the plans. Core the hole 2 inch to 4 inch larger than the outside diameter of the connecting pipe.

B. Recoat exposed rebar per Section 03211.

C. Center the connecting pipe within the core hole and adequately brace to carry the full weight of the pipe prior to grouting of the void area.

D. Grout the void between the pipe and the hole cored in the existing concrete wall. Fill joints, voids, and pockets, completely. Form a watertight joint, uniformly finished inside and out.

END OF SECTION

August 9, 2016

SECTION 02721S

UNTREATED BASE COURSE (UTBC)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Production, construction, and compaction of UTBC used for pavements, shoulders, and incidental construction.

1.2 RELATED SECTIONS

A. Section 01572: Dust Control and Watering

1.3 REFERENCES

A. AASHTO T 11: Materials Finer than 75-μm (No. 200) Sieve in Mineral Aggregates by Washing

B. AASHTO T 19: Bulk Density ("Unit Weight") and Voids in Aggregate

C. AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates

D. AASHTO T 89: Determining the Liquid Limit of Soils

E. AASHTO T 90: Determining the Plastic Limit and Plasticity Index of Soils

F. AASHTO T 96: Resistance to Degradation of Small-Sized Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

G. AASHTO T 180: Moisture-Density Relations of Soils Using a 4.54 kg (10 lb) Rammer and 457 mm (18 in) Drop

H. AASHTO T 193: The California Bearing Ratio

I. AASHTO T 255: Total Evaporable Moisture Content of Aggregate by Drying

J. AASHTO TP 61: Determining the Percent of Fracture in Coarse Aggregate

K. UDOT Minimum Sampling and Testing Requirements

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS

A. Submit a written report for approval for each aggregate class and source, a minimum of five working days prior to placement. Include the following:
   1. Aggregate suitability. Refer to this Section, Part 2, Products.
   2. Name of supplier and location of source.
   3. Maximum Dry Density and Optimum Moisture Content. Refer to AASHTO T 180, Method D.
   4. Job mix gradation including single values for each sieve size 1 inch and finer, within the gradation limits of Table ~~2~~ 3.

1.6 ACCEPTANCE

A. Acceptance sampling and testing of material is in accordance with UDOT Minimum Sampling and Testing Requirements.

B. Type I Placement – Pavement Section includes placement for Curb or Curb and Gutter when in conjunction with placement for pavement section.
   1. Use Class A aggregate, Table ~~1~~ 2.
   2. The Engineer takes random samples from the grade and tests for moisture, gradation, and laboratory density, and performs In-place Density determinations.
   3. Meet gradation limits and applicable tolerances of Table ~~2~~ 3 for each gradation test. Each sublot will be evaluated separately and not averaged with other sublots.
   4. Meet minimum density test average of 97 percent of maximum laboratory density with no test less than 94 percent.

C. Type II Placement – Incidental includes placement for Curb, Curb & Gutter, Driveways, Pedestrian Access Ramps, Sidewalk, Waterways, Flatwork, and other items of work in the contract to which UTBC is included and not measured or paid for separately.
   1. Use Class A or B aggregate, Table ~~1~~2.
   2. The Engineer takes random samples from the grade and tests for moisture, gradation, and laboratory density, and performs In-place Density determinations.
   3. Meet gradation limits and applicable tolerances of Table ~~2~~ 1 for each gradation test. Each sublot will be evaluated separately and not averaged with other sublots.

4. Meet minimum density test average of 95 percent of maximum laboratory density with no test less than 92 percent.

D. Type III Placement – Shoulder
1. Use Class A, B or C aggregate, Table ~~1~~ 2.
2. Adjust moisture content prior to compaction.

E. Price Adjustments – Gradation:
1. Based upon the number of samples and the minimum pay factor.
2. Pay factor for aggregate gradation when tested in accordance with ASHTO T 27 are indicated in Table 1.

Table 1
Pay Factors for Aggregate Gradation

SIEVE SIZES	PAY FACTOR	GRADATION TOLERANCE Max-Min
1/2 inch and larger	1.00	0.0 – 10.8
	0.95	10.9 – 12.4
	0.90	12.5 – 13.5
	0.80	13.6 – 15.3
	0.70	15.4 – 16.7
3/8 inch	1.00	0.0 – 9.8
	0.95	9.9 – 11.3
	0.90	11.4 – 12.3
	0.80	12.4 – 13.9
	0.70	14.0 – 15.2
No. 4	1.00	0.0 – 8.8
	0.95	8.9 – 10.1
	0.90	10.2 – 11.0
	0.80	11.1 – 12.5
	0.70	12.6 – 13.6
No. 16	1.00	0.0 – 6.9
	0.95	7.0 – 7.9
	0.90	8.0 – 8.6
	0.80	8.7 – 9.8
	0.70	9.9 – 10.7
No. 200	1.00	0.0 – 2.9
	0.95	3.0 – 3.3
	0.90	3.4 – 3.6
	0.80	3.7 – 4.1
	0.70	4.2 – 4.5

F. Correct material that does not meet the specified criteria by scarifying, placing additional material, re-mixing, reshaping and re-compacting when directed by the Engineer. Rework unacceptable material at no additional cost to the Department.

G. Do not place additional material on any unaccepted layer. Cease production when any two out of three consecutive production days are in a price reduction.

H. Remove products found defective after placement and replace with acceptable products at no additional cost to the Department when directed by the Engineer.

I. Any sublot lower than 0.70 pay factor is considered reject able material. Any sublot in reject may stay in place at the direction of the Engineer, with a 50 percent pay factor.

J. Contractor is allowed 1 retroactive target change per year, per project, to be applied within seven calendar days from notification of out of specification gradation.

PART 2 PRODUCTS

2.1 AGGREGATES

A. Well-graded, clean, hard, tough, durable and sound mineral aggregates consisting of crushed stone, crushed gravel or crushed slag; free of organic matter and contamination from chemical or petroleum products; meeting the requirements of Table 2.

Table 2

Aggregate Properties				
	Aggregate Class			
	A	**B**	**C**	
Dry Rodded Unit Weight	Not less than 75 lb/ft^3			AASHTO T 19
Liquid Limit/Plastic Index	Non-plastic		PI ≤ 6	AASHTO T 89 AASHTO 90
Aggregate Wear	Not to exceed 50 percent.			AASHTO T 96
Gradation	Table 2			AASHTO T 11 AASHTO T 27
CBR with a 10 lb surcharge measured at 0.20 inch penetration	70% Minimum		N/A	AASHTO T 193
Two Fractured Faces	50 % Min	N/A	N/A	AASHTO TP 61

B. Establish the job mix (target) gradation for the 1 inch sieve and finer within the gradation limits. Refer to AASHTO T 11 and AASHTO T 27.

Table 3

Gradation Limits		
Sieve Size	**Job Mix Gradation Target Band**	~~**Job Mix Gradation Tolerance**~~
1½ inch	100	
1 inch	90 – 100	~~±9.0~~
¾ inch	70 – 85	~~±9.0~~
½ inch	65 – 80	~~±9.0~~
⅜ inch	55 – 75	~~±9.0~~
No. 4	40 – 65	~~±7.0~~
No. 16	25 – 40	~~±5.0~~
No. 200	7 – 11	~~±3.0~~

Percent passing based on total aggregate (dry weight), and fine and coarse aggregate having approximately the same bulk specific gravities. See Table 1 for gradation tolerances and pay factors.

PART 3 EXECUTION

3.1 INSTALLATION

A. Mixing: Provide moisture content of ± 2 percent of optimum at the time of placement. Refer to AASHTO T 180, Method D and AASHTO T 255.

B. Procedures for changing the Job-Mix Gradation
   1. Submit changes in writing 24 hours prior to placement for approval by the Engineer.

C. Placing: Place in layers of uniform thickness and compact each layer to a thickness not to exceed a 6 inch depth. Do not place on any frozen surface. Refer to Section 01572.

D. Finishing: Uniform line and grade with surface deviations no more than ⅜ inch in 10 ft in any direction.
   1. Profile Tolerance — Correct any profile deviations greater than ⅜ inch.
      a. Rework minimum of 4-inch lift to achieve homogeneous density.
      b. Determine limits of correction based on extent of deviation.
      c. Continue finishing until existing deviation is less than ⅜ inch.

E. Compaction: Maintain optimum moisture content ± 2 percent.
   1. Use appropriate compaction equipment adjacent to abutments, backwalls, approach slabs, wing walls, retaining walls, and other structures.
   2. Use a minimum of two passes with a roller for Type III placement or as directed by the Engineer.

END OF SECTION

December 16, 2014

SECTION 02735M

MICRO-SURFACING

Delete Article 1.3, paragraph Q through S and replace with the following:

Q. AASHTO PP 72-11: Recovering Residue from Emulsified Asphalt Using Low-Temperature Evaporative Techniques

R. ASTM D 6372: Testing and Construction of Micro-Surfacing

S. ASTM D 7405: Multiple Stress Creep and Recovery (MSCR) of Asphalt Binder Using a Dynamic Shear Rheometer

Delete Table 3 and replace with the following:

Table 3

Modified Emulsion Residue By Distillation		
Test Method	**Description**	**Specification**
AASHTO T 49	Penetration, 25° C	40-90
AASHTO T 53	Softening point	57° C Min
AASHTO T 59-modified (a)	Residue by distillation	62% Min.
AASHTO T 316	Rotational Viscosity 135° C	650 CPS Min
Modified Emulsion Residue By Evaporation, AASHTO PP 72-11 Procedure B		
AASHTO T 315 (b)	Original DSR, G* at 58º C, kPa	7 - 14
AASHTO T 315 (b)	Original DSR, Phase Angle, δ, at 58º C	75 Max.
ASTM D 7405 (b)	Multiple Stress Creep Recovery (MSCR) at 64º C, % recovery at 3.2 kPa stress level	25 Min.

(a) Modified distillation procedure – Heat emulsion residue to 177 ± 5° C and maintain that temperature for 20 min. Perform the distillation within 60 ± 15 min.

(b) Do not reheat on completion of evaporation. Complete residue testing within 48 hr of performing the evaporation procedure. Pull small specimens from the evaporation sample for rheological testing and ball by hand using gloves that will not affect the residue such as nitrile gloves.

END OF SECTION

July 19, 2016

SECTION 02742S

PROJECT SPECIFIC SURFACING REQUIREMENTS

Add Section 02742:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Required PG Asphalt Binder or emulsion

B Required minimum asphalt binder content for SMA mixes

C. Number of gyrations (N_{values}) to use for Superpave Mix Design

D. PCCP Pavement Texture Type

E. Acceptance criteria for pavement smoothness

1.2 RELATED SECTIONS **Not Used**

1.3 REFERENCES **Not Used**

1.4 DEFINITIONS **Not Used**

1.5 SUBMITTALS **Not Used**

1.6 ACCEPTANCE

A. Pavement Smoothness Incentives/Disincentives.

Table 1

Incentives and Disincentives for Category 1 Pavements		
MRI Range (inches/mile by pavement section)	**Dollars/Pavement Section**	
	Asphalt Pavements	Portland Cement Concrete
≤ 40.0	$750	$1500
40.1 - 50.0	$500	$1000
50.1 – 60.0	$250	$500
60.1 – 70.0	0	0
70.1 – 80.0	-$250	-$500

80.1 – 90.0	-$500	-$100
>90.0	Corrective Action	

B. Localized Roughness Limits

Table 2

Localized Roughness Limits	
Roadway	**IRI w/base length of 25 ft. (in./mile)**
Interstate including ramps	≤ 160
Bridge decks, approach slabs & transitions, manholes and valves	≤ 200
Non-interstate	≤ 160
Urban roadways with speed limits less than 45 mph	≤ 160
Shoulders and Bike Lanes	≤ 190 (single profile)

C. Percent Improvement Incentives/Disincentives

Table 3

Category 2 Pavements	
% Improvement per Pavement Section	Incentive/Disincentive Dollars/Pavement Section
≥85.0	$500
75.0 to 84.9	$400
65.0 to 74.9	$300
55.0 to 64.9	$200
45.0 to 54.9	$100
40.0 to 44.9	0
30.0 to 39.9	-$100
20.0 to 29.9	-$200
<20.0	Corrective Action

PART 2 PRODUCTS

2.1 MIXES

A. Hot Mix Asphalt (HMA): (HMA – ½" not under PCCP)
   1. PG 64-34 Asphalt
   2. $N_{initial}$ 7 N_{design} 75 N_{final} 115

B. Hot Mix Asphalt (HMA): (HMA – ½" under PCCP)
   1. PG 58-28 Asphalt
   2. $N_{initial}$ 7 N_{design} 75 N_{final} 115

PART 3 EXECUTION

A. PCCP Pavement Texture
   1. Texture Type: Longitudinal Tining

END OF SECTION

November 14, 2012

SECTION 02746M

HYDRATED LIME

Add the following to Article 1.6:

B. Comply with UDOT Quality Management Plan 514 Hot Mix Asphalt

Delete Article 3.1, paragraph B and replace with the following:

B. Method A: Dynamic Feed Lime Slurry
   1 Lime Slurry – One part lime and at least three parts water by weight. The amount of added water to meet the 3:1 lime slurry may be adjusted to account for the moisture in the stockpile. Use lime slurry with a minimum of one part water by weight of lime.
   2. Add at least 1 percent lime by weight of the virgin aggregate.
   3. Deliver lime slurry to the twin shaft pugmill for mixing with aggregate. The virgin aggregate/lime mixture will contain at least 3 percent water by weight of the virgin aggregate after the pugmill
   4. Adjust quantity (percent) of lime as necessary, based on results of Hamburg Wheel Tracker test.
   5. Verify that Lime Slurry equipment is operating at all times. The Engineer may require Method B, marination of the aggregate/hydrated lime mixture in the stockpile if the HMA is supplied without hydrated lime slurry treatment.

Delete Article 3.1, paragraph C4 and replace with the following:

4. Provide sufficient free moisture to thoroughly wet the aggregate and activate the lime before introducing hydrated lime.
   a. The aggregate/lime mixture will contain at least 3 percent water by weight of the virgin aggregate.

Delete Article 3.2, paragraph A and replace with the following:

A. Control, monitor, and document the lime addition process according to the requirements of the UDOT Quality Management Plan 514 Hot-Mix Asphalt.

END OF SECTION

February 18, 2015

SECTION 02752S

PORTLAND CEMENT CONCRETE PAVEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and procedures for constructing Portland Cement Concrete Pavement.

1.2 RELATED SECTIONS

A. Section 00555: Prosecution and Progress

B. Section 01452: Pavement Smoothness

C. Section 03055: Portland Cement Concrete

D. Section 03152: Concrete Joint Control

E. Section 03211: Reinforcing Steel and Welded Wire

1.3 REFERENCES

A. AASHTO M 157: Ready-Mixed Concrete

B. AASHTO T 22: Compressive Strength of Cylindrical Concrete Specimens

C. AASHTO T 24: Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

D. AASHTO T 325: Estimating the Strength of Concrete in Transportation Construction by Maturity Tests

E. American Concrete Institute (ACI) Standards

F. UDOT Minimum Sampling and Testing Requirements

G. UDOT Quality Management Plan

1.4 DEFINITIONS

A. Panel – Area of pavement within a traffic lane or shoulder bound by two transverse joints.

1.5 SUBMITTALS

A. All submittals required in Section 03055.
   1. Mix design trial batch information to include flexural test results.

B. Certified scale axle weights for each haul unit for yardage to be hauled when requested by the Engineer.

C. Portland cement concrete pavement texturing plan for approval at least 14 calendar days before concrete placement to the Engineer and the Region Pavement Engineer.

D. A written plan for approval at least 14 calendar days before concrete placement specifically showing:
   1. Production methods
   2. Handling and placing
   3. Protection and curing including hot or cold weather plan or both

E. Verification that the batch plant meets the requirements of the UDOT Quality Management Plan for Ready-Mix Concrete.

F. Joint layout plan to the Engineer for approval at least 14 calendar days before concrete placement.

G. Cylinder storage device
   1. Written procedures for approval at the request of the Engineer, explaining operation and required monitoring or care of the device. Refer to this Section, article 2.7.

1.6 ACCEPTANCE

A. Acceptance sampling and testing of material is according to UDOT Minimum Sampling and Testing Requirements.

B. Point of acceptance for air content is the in-place pavement.
   1. Sampling and testing will be performed at the point of placement with necessary adjustments applied based on correlation testing. The Department will:
      a. Perform air test on concrete placed in front of the paver and again from the same load in the finished pavement. Record any change in air content.
      b. Adjust acceptance limits for air content according to results of correlation testing to provide final in-place air content that meets the requirements specified in Section 03055.

c. Perform at least one correlation test for each day of paving operations.

2. The Engineer will mark for later removal any areas determined to be reject material.
   a. Coordinate the timing for removal of reject material with the Engineer

C. Department will assess price adjustments for strength, thickness, and surface smoothness separately on the contract bid price**.**

D. Thickness
1. Contractor obtains cores for thickness according to AASHTO T 24 after all grinding for smoothness is completed.
   a. The Engineer marks core location.
   b. One thickness core per 12,000 ft^2
2. Determine the acceptability and pay factors for deficient thickness areas using Table 1.

Table 1

Price Reductions for Deficient Thickness	
Deficient Thickness (inches)	**Pay Factor**
0 to ⅛	1.00
⅛ to ¼	0.90
¼ to ½	0.75
½ to ¾	0.60
>¾	Reject

   a. The Engineer may accept pavement deficient by more than ¾ inch at 50 percent pay or require removal and replacement.
   b. Make all corrections, including removal and replacement, at no additional cost to the Department.
   c. Contractor takes two additional cores for any deficient core (one on each side) where the thickness varies by ⅛ inch. Locate the new core midway between the deficient core and each of the adjacent cores.
   d. The Engineer graphs the deficient areas by plotting new cores and the original cores to define deficient areas, assuming the following:

      1) The graph represents the thickness of the pavement.
      2) The thickness varies linearly along the pavement length from core depth to core depth.
      3) The pavement is a constant depth in the transverse direction.

3. Acceptance for thickness may be determined through alternate methods from coring with written approval from the Engineer.
   a. The Engineer obtains concurrence and written approval from the District Engineer and Region Materials Engineer.

E. Compressive Strength Acceptance
1. Compressive strength is determined by the average of three cylinders, which constitutes one strength test. Department will use Table 2 to determine pay adjustments for concrete compressive strength.
   a. The pay adjustment applies to the test lot represented by the strength test.
   b. The Engineer evaluates all concrete with a compressive strength of more than 400 PSI below specification to determine structural integrity of the concrete pavement. This pavement may be accepted at 50 percent pay factor or removed and replaced at the discretion of the Engineer.

Table 2

Pay Adjustments for Compressive Strength Based on 28 days	
psi below f ’$_c$ (4,000)*	**Pay Factor**
1 to 100	0.95
101 to 200	0.90
201 to 300	0.85
301 to 400	0.80

*Section 03055 Table 4

2. Hand-placement areas will be considered separately, refer to Section 03055 testing frequency.
3. Retesting –
   a. The Engineer notifies the Contractor, within three calendar days of determining the 28-day compressive strength, if any test is below specifications. The Contractor has the option to contest the compressive strength results. If contesting the results, the Contractor obtains one set of three cores at no additional cost to the Department and at the approximate location where the contested test cylinders were obtained as determined by the Engineer. Compressive strength shall be the average of the results of the three cores and payment will be based on Table 2. However, if the compressive strength of any one of the cores differs by 10% or more than the average of the three, payment will be based on the lowest compressive strength of the individual cores, as per Table 2. Do not apply a correction factor to compressive strength results. Results of the core testing replaces the

results of the cylinder test results and are binding on both the Contractor and the Department. .

b. An independent third party testing agency will conduct referee testing at no additional cost to the Department.
   Testing laboratories must:
   i. Be a Department qualified concrete lab.
   ii. Use UDOT TTQP personnel qualified as Concrete Testing Technician and Concrete Strength Testing Technician.

c. Retesting must be completed within 40 calendar days after placement.

d.. Obtain and test cores. Refer to AASHTO T 22 and AASHTO T 24. e. Fill the core holes with the same concrete mix or product approved by the Engineer within 24 hours after coring.

f. Ensure the holes are cleaned, with no standing water before filling with concrete.

g. Consolidate the concrete by rodding or vibrating.

h. Strike off level with the pavement surface and texture.

i. Protect concrete in core holes from any damage for at least 48 hrs.

4. Dispute of the original cylinder compressive strength test results will not be considered when the contractor does not fully comply with the requirements of providing a cylinder storage device, refer Section 02752.2.7.

F. Smoothness
   1. Evaluate and refer to Section 01452.

G. Quantity adjustment when paving over existing pavement surfaces.
   1. Adjust quantity when accepted batched volume overruns or under runs neat-line volume.
      a. The Engineer and Contactor determine accepted batched volume at time of placement.
      b. Accepted batched volume is the total batched material adjusted to design yield minus rejected or wasted material.
   2. Adjust quantity before any price adjustment for non-specification material.
   3. Determine overrun/underrun quantity by the following formula:

$$QA = 0.5\left(\frac{V_a - V_n}{V_n}\right)Q_m$$

QA	=	Adjusted quantity in yd^2
V_a	=	Accepted Volume
V_n	=	Neat-line Volume
Q_m	=	Measured quantity in yd^2

PART 2 PRODUCTS

2.1 CONCRETE

A. Use AA(AE) concrete. Refer to Section 03055.
   1. Meet a 28 day flexural strength of 650 psi verified through trial batch.

2.2 CONCRETE CURING COMPOUND

A. . ASTM C309, Type 2, Class A

2.3 EXPANSION JOINT MATERIALS

A. Refer to Section 03152.

2.4 JOINT SEALERS

A. Use hot applied joint sealant for all joints meeting Section 03152.

2.5 STEEL REINFORCEMENT

A. Tie Bar – Grade 60 or higher, deformed reinforcing steel. Refer to Section 03211.

B. Dowel Bars – Grade 60 or higher, smooth steel rod. Refer to Section 03211.

C. Chairs and Basket assemblies. Refer to Section 03211.

2.6 BATCH PLANT

A. Meet the requirements of the UDOT Quality Management Plan for Ready-Mix Concrete.

2.7 CYLINDER STORAGE DEVICE

A. Use a device that maintains a temperature of 60 degrees F to 80 degrees F and is equipped with an automatic 24 hour temperature recorder, accurate within 2 degrees and with a permanent recording feature. A 24 hour test run may be required.

B. Use device or devices with the capacity to accommodate the required test cylinders for at least two day's operation.
   1. Cease concrete operation when the storage capacity is reached.

C. Make the storage devices available on the job site at least 48 hours before placement.

2.8 VEHICLES FOR HAULING

A. Permissible to use:
   1. End dump trucks with watertight beds and end gates and rounded corners.
   2. Agitator trucks with open tops.
   3. Transit mixers that conform to AASHTO M 157.

B. Do not use bottom or belly dump units.

2.9 SLIP FORM PAVER

A. Self-propelled machine with no fluid leaks equipped with automatic line and grade control capability.

B. Capabilities
   1. Spreading the dumped concrete uniformly across the grade by an auger or a traveling strike-off device.
   2. Vibrating, tamping, striking-off, and shaping the concrete to the desired line grade and thickness in one continuous pass.

C. Vibrator Minimum Requirements
   1. Eccentric Diameter 1⅞ inch
   2. Frequency7,000 to 9,000 vibrations per minute
   3. Spacing 18 inch maximum, mounted longitudinally

D. Mount vibrators to provide adequate concrete consolidation. Do not interfere with dowel bar basket assemblies.

E. Monitor the Operation of Vibrators
   1. Check each vibrator at the beginning and ending of each day.
   2. Repair or replace vibrators as necessary.
   3. Stop paving operations immediately if any indication of malfunction occurs.

4. Resume operations only after repairing or replacing the vibrator.

F. Use trailing forms long enough to leave a smooth, straight, vertical edge.

2.10 FINISHING/TEXTURING EQUIPMENT

A. Burlap drag unless using artificial-turf drag.

B. Texturing equipment as approved by the Engineer.

C. Curing compound application machine with a fully atomizing type power spray and a wind protection hood.

PART 3 EXECUTION

3.1 LINE AND GRADE CONTROL

A. Use a system that limits deviations in the pavement surface to ⅛ inch and deviations in the vertical edge of the pavement to ¼ inch and maintains specified pavement thickness.

B. Slip Form Paving
1. Establish the necessary stakes for line and grade control over existing surfaces and provide the elevation control benchmarks.
2. Equip machinery with a control system that automatically controls concrete placement to the specified longitudinal grades.

C. Formed Paving
1. Keep forms free from warps, bends, kinks, and equal in depth to the specified pavement edge.
2. Tightly join form sections by an interlocking joint free of vertical and horizontal movement.
3. Stop paving operations if the side forms do not meet or hold line and grade.

D. Profile grind pre-existing adjacent pavement before concrete placement. Profile grinding of pre-existing pavement is measured and paid separately, or as extra work.

3.2 BATCH AND MIX

A. Refer to AASHTO M 157.

B. Separate and stockpile in two sizes coarse aggregate sizes 2 inch to No. 4 sieve and 1½ inch to No. 4 sieve with the separation being made on the 1 inch and ¾ inch respectively.

C. Mixing – Conform to the standard and operate the drum at manufacturer's recommended speed.
   1. Conduct mixing efficiency tests at the start of concrete placement and evaluate as specified in AASHTO M 157, Annex A-1.
   2. Increase mixing time in 10-second increments if necessary until the mixer efficiency evaluation is passed.3. Correct poor mixing efficiency at no additional cost to the Department.
   3. Do not allow buildup of cement or mortar on the mixer drums and blades.
   4. Mix for at least 30 seconds after the last addition of water or cement is made after initial batching.

D. Maintain a minimum mixing time of 80 seconds at the manufacturer's recommended mixing speed after all materials are in the drum. The actual mixing time is required to be part of the information automatically printed on each computerized batch ticket. Each individual batch ticket is to accompany the mix to the job site and be delivered to the Department at the job site.

E. Do not add water to the mix after acceptance testing.

3.3 PLACE CONCRETE

A. Keep the base surface moistened 500 ft in front of the paver without allowing areas of standing water.

B. Discharge and place the mixed concrete within the time frame listed below after introducing the mixing water to the cement and aggregates. Concrete not placed within the following time period may be rejected. The Engineer, in conjunction with the Region Materials Engineer, may approve alternate time periods based on concrete and ambient temperatures.
   1. Non-agitating Haul Equipment 45 minutes
   2. Agitating Haul Equipment 75 minutes

C. Do not interfere with dowel basket assemblies if redistributing the concrete in front of the paver. Minimize redistributing the concrete in front of the paver. The Engineer may retest the concrete if redistribution occurs.

D. Provide vibrators to thoroughly consolidate concrete.
   1. Position vibrators on finishing equipment ahead of strike-off auger or final screed.

2. Vibrate, screed, and mechanically tamp the spread concrete. Thoroughly vibrate adjacent to and along the faces of the forms.
   a. Stop vibrating and tamping elements when the forward movement of the paver stops.
3. Use hand-operated vibrators on a regular pattern, not to exceed 12 inches in each direction, for hand placements.

E. Workmanship conforms to ACI 304R-00.

F. Do not add water to the surface for finishing.
1. Paving operations may be shut down and the concrete rejected if water is added.
2. Do not use evaporation retarders unless directed by the Engineer.

G. Provide protection for existing surfaces when placing concrete in an adjoining longitudinal section (companion placement).
1. Do not place concrete for companion placement before existing concrete has achieved a compressive strength of at least 2,500 psi, determined by Maturity Method, AASHTO T 325, or cast cylinders.
2. Repair any damage to existing pavement resulting from companion placement at no cost to the Department.

3.4 HANDLE AND PLACE REINFORCING STEEL

A. Keep reinforcing steel clean, free from damage, and free from distortion.

B. Place tie bars in the middle third of the slab as shown in the plans.
1. Refer to PV Series Standard Drawings.
2. Place in the direction of paving and parallel to the slab surface.
3. Place by using automatic bar inserters, support on chairs, through forms, or drilled and epoxied. Manual insertion is not permitted.
4. Maintain at least 6 inch clearance between tie bars and dowel bars.
   a. Adjust tie bar spacing at the transverse joints to provide specified clearance.
b. Do not adjust dowel bar locations.

C. Place load transfer dowel bars in the middle third of the slab depth, parallel to the centerline and surface of the slab. Limit deviations from parallel to ¼ inch for the length of the dowel bar.

D. Verify location of reinforcing steel.
1. Provide nondestructive verification of reinforcing steel location within the hardened concrete slab for 10% of the pavement at no additional cost to the Department.

a. Calibrate verification equipment within 7 days prior to the first paving day and provide a copy of calibration report to the Engineer.
b. The Engineer randomly selects the testing sites and witnesses the testing.
c. Verify steel placement within 5 days after each production day's paving.
d. Test all joints for each of the selected pavement panels.
e. Test all of the joints for each adjacent panel when noncompliant steel locations are identified.

2. Individual Dowel/Tie Bar Rejection Criteria
   a. Rotational Alignment: any dowel bar with misalignment greater than 1.5 in. from perpendicular to the joint.
   b. Longitudinal shift: any bar not embedded a minimum of 1/3 of the bar length on each side of the joint.
   c. Depth: any bar within 3 inches of the pavement surface.
3. Provide documentation of verification testing results to the Department for each pavement panel tested. Include the following information:
   a. Test location, identified by station and offset.
   b. Rotational Alignment, identify steel orientation and amount of misalignment.
   c. Longitudinal shift, location of steel with respect to joint. Identify length of steel bar embedded on each side of joint.
   d. Depth, identify the depth of the steel bar, at each end, from the pavement surface.
   e. Paving date of pavement panel and the date of verification testing.
   f. Name of individual conducting verification testing and name of UDOT representative witnessing testing.
4. Remove and replace a full pavement panel where the reinforcing steel meets or exceeds the dowel/tie bar rejection criteria or, at the sole discretion of the Engineer, the full pavement panels may be accepted at 50% of the original unit bid price.
   a. Pavement panels accepted at the reduced rate: saw cut only the reinforcing steel identified as noncompliant for each joint.
   b. A maximum of 3 consecutive transverse joints per sublot may be saw cut and the associated pavement panels accepted at the reduced price.
   c. Pavement panels with reinforcing steel within 3 inches of the pavement surface are not eligible to be left in place with the price reduction.

3.5 FINISH

A. Finish the surface smooth and true to grade by machine float immediately after placing concrete. Finish at a rate equal to the progress of the paving operation.

B. Shut down the mixing operation until the situation is resolved if preliminary finishing is delayed more than 30 minutes after initial screeding.

C. Fill honeycomb areas in the vertical edge of the pavement with mortar.

D. Texture the pavement by burlap drag unless the final texture includes artificial turf drag.
   1. Use at least three plies of wet burlap and drag parallel to the centerline without tearing.
   2. Complete the drag finish with one pass.
   3. Spray water directly on the final burlap drag only in the quantity necessary to keep the burlap wet.

3.6 PAVEMENT TEXTURE

A. Provide a written texturing plan to the Engineer for approval before placing pavement. Show texturing locations and describe methods that will be used for hand texturing. Refer to Table 3.

Table 3

Pavement Texturing Options	
> 50 mph	**≤ 50 mph**
Longitudinal Tining	Longitudinal Tining
Diamond Grinding	Diamond Grinding
Transverse Tining	Transverse Tining
	Artificial Turf Drag

B. Demonstrate the performance of the texturing application method before starting main line paving.

C. Longitudinal Tining
   1. Produce grooves of approximately ⅛ inch wide by ⅛ inch deep spaced ¾ inch apart and parallel to the longitudinal joint.
   2. Keep tining devices clean and free from encrusted mortar and debris to provide uniform groove dimensions.
   3. Time tining so that the grooves do not close up.

D. Diamond Grinding
   1. Produce resultant surface in a parallel, corrugated type texture.
      a. Allowable width of grooves is $^1/_{16}$ inch to ¼ inch.
      b. Allowable distance between grooves is $^1/_{16}$ inch to ¼ inch.
      c. Maximum allowable height of ridges is approximately $^1/_{16}$ inch.
   2. Maintain cross slope drainage.

E. Transverse Tining
   1. Produce randomly spaced ½ inch to ¾ inch transverse grooves approximately ⅛ inch deep.

F. Artificial Turf Drag
   1. Drag artificial turf along the pavement in the direction of paving.
   2. Use plastic turf that is wide enough to cover the entire pavement width and produce a uniform texture with corrugations $^1/_{16}$ inch to ⅛ inch deep.
   3. Use turf with a blade density of 7,200 blades/ft^2 and each blade at least ¾ inch long.
   4. Continuously monitor the texturing operation.
   5. Weight the turf if necessary to produce an acceptable texture using a uniformly distributed load.
   6. Remove buildup of cementitious or other materials that may produce an uneven or unacceptable texture.

G. Grinding may be required to correct unacceptable texturing.

H. Rumblestrips
   1. Install by diamond grinding when required.
   2. Rotomilling is not an acceptable method of installation.

3.7 CURE

A. Apply curing compound to the entire pavement surface and exposed edges immediately after completing finishing operations.
   1. Apply the curing compound in two approximately equal applications.
   2. Apply the second application in the opposite longitudinal direction as the first at a combined application rate equal to 100 ft^2/gal.
   3. Allow at least 30 minutes between applications.
   4. Hand spray small and irregular areas and areas inaccessible to mechanical spraying equipment.
   5. Immediately apply curing compound to the edges of the pavement after form removal.

B. Stop the paving operations if the curing compound application behind the paving machine is delayed until the problem is resolved.
   1. Use fogging to keep the pavement moist until the curing compound application resumes.
   2. Prevent damage to the pavement surface texture.

3.8 PROTECTION

A. Protect pavement against all damage and marring.
   1. Construct crossings to bridge the concrete as approved by the Engineer when necessary at no additional cost to the Department.

B. Do not allow Contractor hauling equipment or traffic on the pavement until 100 percent of the design strength has been achieved. Verify strength by one of the following:
   1. Maturity method – AASHTO T 325
   2. Cast cylinders

C. Do not permit hauling equipment or traffic on the pavement before all sawed joints are sealed.

3.9 JOINTS

A. Construct contact joints, sawed joints, or transverse expansion joints as shown in the plans and approved joint layout.

B. Keep the faces of all joints at right angles to the top surface of the pavement with all longitudinal joints parallel to the centerline and coinciding with the traffic lane lines.

C. Longitudinal Contact Joints
   1. Do not allow the finished surface across longitudinal contact joints to deviate from a straight line by more than ¼ inch in 10 ft when tested with a straight edge.
   2. Cease operations until specified tolerances are achieved if the edge slump requirements are not satisfied within 200 ft.
   3. Repair the edge by the following procedures if the edge slump exceeds the specified ¼ inch in 10 ft before placing adjacent concrete:
      a. Saw off the slumped edge to the full thickness with a diamond saw.
      b. Drill holes in the sawed edge and epoxy in new tie bars.
      c. Profile grinding may be considered as approved by the Engineer.
   4. Straighten bent tie bars and re-coat with epoxy paint at the bend point before placing concrete in the adjacent lane.

D. Transverse Contact Joints
   1. Construct transverse contact joints normal to the centerline without keyways on the vertical face.
   2. Use No. 10 by 18 inch dowel bars placed midpoint in the slab at 12 inches on center and embedded 9 inches on each side.
   3. Form joints with bars placed through the form or saw joints with bars drilled and epoxied.

E. Longitudinal and Transverse Sawed Joints
   1. Single cut all transverse and longitudinal joints. Refer to PV Series Standard Drawings.
   2. Saw joints before uncontrolled cracking occurs.
   3. Conduct continuous sawing operations during both day and night regardless of weather conditions.
   4. Provide lighting during nighttime sawing.
   5. Thoroughly clean and dry joints before placing sealant.
      a. Clean the joint using at least 100 psi air.
      b. Equip air compressors with operating oil and water traps.
   6. Fill the longitudinal joints to within 1/4 inch of the finished surface. Overfilling joints may require removal and replacement of joint sealant at no cost to the Department. Refer to PV Series Standard Drawings.
   7. Match joints in adjacent lanes to form a continuous line across the pavement width including the concrete shoulders.

3.10 DEFECTIVE PAVEMENT PANELS

A. The Engineer determines defective panels before substantial completion.

B. Repair or replace defective pavement panels at no additional cost to the Department.
   1. Complete repairs before acceptance testing for smoothness.

C. Remove and replace panels when multiple full depth cracks separate the panel into three or more pieces.

D. Use methods that do not disturb or damage adjacent panels.

E. Remove and replace panel portions with any full depth transverse crack within 4 ft or less of a transverse sawed joint.

F. Drill and epoxy tie-bars/dowel bars as required into existing pavement.

G. Match the profile and texture of existing pavement.

H. Repair any crack connecting joints appearing before substantial completion.
   1. Rout to a 1 inch depth by ⅛ inch width and seal with silicone sealant. Refer to Section 03152.

I. Leave tight random cracks less than $^1/_{64}$ inch wide undisturbed.

3.11 LIMITATIONS – GENERAL

A. Meet to limitations of Section 03055 except as modified below.

B. Night Operations
   1. Provide proper lighting from ½ hour after sunset to ½ hour before sunrise according to Section 00555.

C. Precipitation
   1. Cease operation when rain is threatening.
   2. Remove, replace, or repair any pavement damaged by rain or hail as directed at no additional cost to the Department.

D. Surface Evaporation
   1. Limitations apply at any time of the year when any combination of air temperature, relative humidity, and wind velocity have the potential to impair the quality of fresh or hardened concrete or otherwise result in abnormal properties. .
   2. Prepare all materials required for accepted evaporation control measures and have them available on site so that specified measures can be executed as necessary.
   3. Initiate accepted evaporation control measures when concrete and air temperatures, relative humidity of the air, and the wind velocity have the capacity to evaporate water from a free water surface at a rate that is equal to or greater than 0.2 lb/ft^2/h. Determine the evaporation rate of surface moisture by use of the Menzel Formula. Refer to ACI 305 3.1.

E. Mix Consistency
   1. Cease operations when 3 consecutive paving sublots warrant acceptance at a reduced rate due to compressive strength.
   2. Cease operations upon having 4 consecutive batches rejected due to noncompliant air content of the mix.
   3. Operations may not resume until the issues have been resolved to the satisfaction of the Engineer. Associated delays are not compensable monetarily or to the project schedule.

F. Verification of Reinforcing Steel

Cease operations upon identifying 20% or more of the pavement panels with non-compliant steel reinforcement. Operations may not resume until the issues have been resolved to the satisfaction of the Engineer. Associated delays are not compensable monetarily or to the project schedule.

3.12 LIMITATIONS – COLD WEATHER

A. Cold weather limitations apply when the temperature is forecast to fall below 40 degrees F within 14 calendar days of placement.

B. Provide written description of methodology used to comply with cold weather requirements. Comply with the following requirements for placing concrete in cold weather:
   1. Do not use chemical additives in the concrete to prevent freezing.
   2. Provide all necessary cold weather protection for in-place concrete using items such as covers, insulation, and heat.
   3. Do not place concrete in contact with frozen surfaces.
   4. Adequately vent combustion-type heaters that produce carbon monoxide.
   5. Protect the concrete from freezing when the ambient air temperature drops to 36°F or below until a compressive strength of at least 3,500 psi has been achieved, determined by either:
      a. Maturity method – AASHTO T 325
      b. Field cure cylinders
   6. Maintain moist conditions for exposed concrete to avoid loss of moisture from the concrete due to heat applied.
   7. Limit the drop in temperature next to the concrete surfaces when removing heat to 20 degrees F during any 12 hour period until the surface temperature of the concrete reaches that of the atmosphere.
   8. Determine the concrete surface temperature.
   9. Paving may begin when base surface temperature is 36 degrees F in the shade and rising.
   10. Cease operations when the ambient temperature is 45 degrees F in the shade and decreasing.
   11. Remove and replace concrete damaged by frost action at no additional cost to the Department.
   12. Do not use material containing frost or lumps.

C. Heating Aggregate and Water
   1. Provide and operate heating devices at no additional cost to the Department when heated aggregates are required.
   2. Use aggregates free of ice.
   3. Heat aggregates uniformly, avoid overheating or developing hot spots.

4. Use either steam or dry heat.

3.13 LIMITATIONS – HOT WEATHER

A. Discontinue paving when ambient air temperature exceeds 100 degrees F in the shade.

END OF SECTION

July 30, 2015

SECTION 02769S

GRINDING FOR GROOVED-IN PAVEMENT MARKINGS

Add Section 02769:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Procedures for the grinding of pavement markings for the installation of Grooved-In Pavement Marking Paint.

B. The grinding provides that the markings are below the surface to prevent damage by snowplows or other traffic that might damage or cause the paint to be lifted.

1.2 RELATED SECTIONS

A. Section 02765S: Pavement Marking Paint

B. Section 02768: Pavement Marking Materials

1.3 REFERENCES Not Used

1.4 DEFINITIONS

A. Non-Contrast Striping – striping that is applied over bare pavement without the use of black accents.

B. Contrast Striping – broken lines, lane drop lines, and dotted lines that are applied over or in conjunction with an 8 inch black line.

C. Contrasting options
1. Continuous: created by applying pavement markings over an 8 inch solid black line.
2. Background Option 1: Created by applying colored markings simultaneously with a 2 inch to 3 inch black line on each side of the marking for paint. A 1.5 inch minimum black is acceptable for tape.
3. Background: Option 2: Created by applying colored markings over an 8 inch broken black line. The black line extends 6 inches past the overlying marking on each end.

1.5 SUBMITTALS Not Used

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Provide and operate a grooving machine, grinder, or saw that is:
   1. Capable of grinding or cutting to the required depth and cross section.
   2. Self-propelled with sufficient power, traction, and stability to maintain an accurate depth of cut.

B. Do not allow walk behind machines for longitudinal lines.

C. Dry grind only. Do not use water in the grinding process unless approved in writing by the Engineer.

D. Use appropriate cleaning equipment capable of sweeping and picking up millings during and after grinding operations.

2.2 PAVEMENT MARKING PAINT

A. Refer to Section 02765S.

PART 3 EXECUTION

3.1 PREPARATION

A. Establish line control as specified in Section 02765S or Section 02768 whichever is applicable prior to grinding.

3.2 GRINDING

A. Grind pavement along lane lines or in pavement message areas to specified depth, width, length.

B. Depth.
   1. 140 mils minimum for contrast striping or messages.
   2. 120 mils minimum non-contrast striping and messages.
   3. Use manufacturers recommended depth for non-painted messages.

C. Width
   1. 8-9 inches for 8 inch lines or contrast striping.
   2. 5.5-6 inches for 4 inch non-contrast striping.
   3. As necessary to apply messages.

D. Length
   1. Match line length and spacing as specified in standard drawings for broken lines, lane drop lines, and dotted lines (non-contrast or contrast).
   2. Grind as continuous groove for solid lines.

3.3 CLEANING

A. Remove and clean all millings from the surface as work progresses.
   1. Milled material is the property of the Contractor.

B. Thoroughly clean grooved areas with an adequate compressed air acceptable by the Engineer before applying pavement-marking paint.

C. Remove all remaining pavement markings that are to be contrasted prior to application of black paint. Do not apply black contrast paint over any existing markings.

3.4 APPLYING PAVEMENT MARKING PAINT

A. Apply black paint first or in conjunction for contrast striping. Do not use glass beads in black contrast paint.

B. Apply white and yellow lines in groove. Refer to Section 02765S.

C. Black and white lines may be applied in a single application if the appropriate application rates can be achieved, in which case Background Option 1 would be used.

END OF SECTION

March 15, 2016

SECTION 02776M

CONCRETE FLATWORK

Add Article 3.4, paragraph D:

D. Expansion Joints for Curbs (B3, B5, & M2, single and back-to-back)
   1. Follow the Expansion-Contraction Joint Detail shown in Standard Drawing GW 4A.
   2. Place an expansion joint between each plowable end section and the curb located behind it.
   3. Place expansion joints a minimum of every 150 linear feet of curb (single or back-to-back) installed. Match the joint locations when placing on PCCP.

END OF SECTION

July 11, 2016

SECTION 02831S

RETAINING WALL- ALTERNATE SYSTEMS

Add Section 02831:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Select from the following wall systems for retaining walls indicated as Contractor-selected alternative systems. Refer to the project plans for situation and layout drawings.

1. MSE Wall- Reinforced Earth Company Retaining Wall (refer to Section 02833S or 02837S)
2. MSE Wall- SSL MSE *Plus* Retaining Wall (refer to Section 02833S or 02837S)
3. MSE Wall- Tricon Retained Soil Wall (refer to Section 02833S or 02837S)
4. MSE Wall- VISTAWALL Stabilized Earth Wall (refer to Section 02833S or 02837S)
5. MSE Wall- HRW Eureka MSE Wall (refer to Section 02837S)
6. MSE Wall- ARES Geogrid Retaining Wall (refer to Section 02834S or 02838S)
7. MSE Wall- KeySystem I Retaining Wall (refer to Section 02835S)
8. MSE Wall - KeySystem II Retaining Wall (refer to Section 02836S)
9. MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02836S)
10. MSE Wall – MESA Retaining Wall (refer to Section 02836S)
11. MSE Wall – Versa-Lok/Miragrid Soil Wall (refer to Section 02836S)
12. MSE Wall – Anchor Landmark Reinforced Soil Wall (refer to Section 02836S)
13. MSE Wall – Alan Block AB Three and AB Clasics Segmental Retaining Walls (refer to Section 02836S)

14. MSE Wall – Vertica Retaining Wall (refer to Section 02836S)

15. PMGW – Mountain West Precast Redi-Rock Wall (refer to Section 02839S)

16. PMGW – Harper Precast ReCon Wall (refer to Section 02839S)

17. PMGW – Nephi Sandstone Precast Redi-Rock Wall (refer to Section 02839S)

1.2 RELATED SECTIONS

A. Section 02832S: Select Backfill for MSE Walls

B. Section 02833S: MSE Walls Using Concrete Facing Panels and Metal Reinforcing Elements

C. Section 02834S: MSE Walls Using Concrete Facing Panels and Geogrid Reinforcing Elements

D. Section 02835S: MSE Walls Using Modular Block Units and Metal Reinforcing Elements

E. Section 02836S: MSE Walls Using Modular Block Units and Geogrid Reinforcing Elements

F. Section 02837S: Two-Stage MSE Walls Using Concrete Facing Panels and Metal Reinforcing Elements

G. Section 02838S: Two-Stage MSE Walls Using Concrete Facing Panels and Geogrid Reinforcing Elements

H. Section 02839S: Prefabricated Modular Gravity Wall (PMGW) Systems Using Large Modular Block Units

1.3 REFERENCES

A. AASHTO LRFD Bridge Design Specifications

B. FHWA Design of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume I, Federal Highway Administration Report No. FHWA-NHI-10-024

1.4 DEFINITIONS Not Used

1.5 WALL SYSTEM SELECTION

A. Notify the Engineer in writing before the preconstruction conference which option listed in Article 1.1 will be used.

B. Use only one wall system for the Contractor-selected alternative.

C. Do not change the wall type after the preconstruction conference without written approval from the Engineer.

1.6 DESIGN REQUIREMENTS

A. Incorporate FHWA Design of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes guidelines, and AASHTO LRFD Specifications, and Interim Specifications for Highway Bridges in design of the selected wall system in addition to, or as modified by, the following:
   1. For all walls, or sections of walls, located within 50 feet of abutments for essential or critical bridges, use a design earthquake peak horizontal ground acceleration coefficient corresponding to a 3% probability of exceedance in 75 years. For walls near normal bridges and all other walls, or sections of walls, more than 50 feet away from bridge abutments, use an acceleration coefficient corresponding to a 7% probability of exceedance in 75 years.
   2. Design retaining wall panel/modular block connections in all cases to not fail during the seismic event corresponding to 3% probability of exceedance in 75 years.

3. The Contractor-selected Wall Company is responsible for all stability calculations, except global stability and bearing capacity.
4. Minimum service life of 75 years.
5. The Wall Company is responsible to ensure that drainage features do not negatively impact the wall system, and that the drainage system can function properly through/beneath the wall as the Project Designer intends, without negatively impacting the wall system. This includes checking the drainage system details, and/or developing appropriate MSE reinforcement design details in the vicinity of the drainage features (pipes, catch basins, etc.) within the reinforcement mass, and for the outlet point at the wall face (see article 1.6.A.2).
6. Sections 02832S through 02839S as applicable for the selected wall system.
7. Provide corrosion protection for metallic reinforcement by one of the following two measures:
    a. Provide sacrificial steel sufficient for a corrosion rate of at least 0.80 mils per exposed surface per year after 16 years of corrosion protection service allowed for the galvanized coating.
    b. Provide a protective geomembrane (either PVC or HDPE) of at least 30 mils thickness a minimum of 2 feet below the base of the pavement section (below the bottom of the granular borrow layer), sloping downwards towards the back of the reinforced mass (i.e. away from the wall face) at a grade of 4 percent, and lapped upward against the back side of the wall facing. Design the metallic reinforcement to provide sacrificial steel sufficient for the following minimum corrosion rates per exposed surface per year, after 16 years of corrosion protection service for the galvanized coating:
        - Above the Geomembrane: 0.80 mils
        - Below the Geomembrane: 0.50 mils
8. Use a vertical spacing of primary reinforcement not exceeding 30 inches for single-stage walls, or 24 inches for two-stage walls to provide a coherent MSE reinforced soil mass. This may require modification of panels.
9. In accordance with Section 11 of the AASHTO LRFD Bridge Design Specifications, provide horizontal benches at least 4 feet in width at the base of walls to be founded on earth slopes.
    a. Benches may be eliminated for walls located adjacent to concrete slope-protected slopes.
10. Use the following soil design properties:
    a. Select Backfill for MSE Walls: properties determined by the Wall Company with the concurrence of the Design-Builder's Geotechnical Engineer, based on testing of representative

samples of the material to be used, and consistent with the requirements of Section 02832S.

b. Retained soil and foundation soil: properties specified by the Design-Builder's Geotechnical Engineer based on the results of subsurface investigations and laboratory testing.

1.7 SUBMITTALS

A. Submit to the Design-Builder's Structural and Geotechnical Engineers for review and approval, and to the Engineer and the Department's Geotechnical Engineer, working drawings and design calculations for the wall construction prepared and signed by a licensed professional engineer, including all plans, profiles, cross sections, quantities, and details that address the following:

1. Cast-in-place concrete coping/cap to the facing panels/blocks to be aesthetically pleasing and to adequately support any fence and/or barrier. Do not use precast coping without prior written approval from the Engineer.

2. Provisions for facilities which penetrate the wall face or soil reinforcing elements (including, but not limited to, drainage catch basins, piping, foundation elements, guard-rail posts, and other buried facilities).

3. MSE wall design measures to accommodate surface and subsurface drainage details.

4. Proposed architectural treatment detail for wall facing elements and proposed color of concrete. Provide architectural treatment for all walls consistent throughout the project and matching all other structural elements incorporated in the project.

5. Design calculations sufficient to demonstrate the walls have been designed in accordance with the required criteria.

B. Allow up to 10 working days for review. Within this time, the Design-Builder's Engineers provide either written approval of the submittals with any exceptions noted, or notification the submittals are insufficient.

1. Upon receiving notification the submittals are insufficient, provide new or revised submittals for review and approval.
2. Do not start wall construction until receiving written approval.
3. Address to the Engineer's satisfaction any comments provided by the Department, prior to proceeding with the work.

1.8 ACCEPTANCE

A. Non-Conformance of Select Backfill for MSE Walls

1. Select Backfill placed and found to be out of conformance with the chemical characteristic requirements of Section 02832S may be allowed to remain in place at a reduced price in accordance with this paragraph as decided by the Engineer. Refer to Section 02832S for sampling and testing requirements.

2. The Engineer will use Table 5-1 (Unit Prices for Determining Pay Adjustments For Nonconforming Work) and the applicable pay factor in Table 1 to calculate the price adjustment.

3. When deviations exceed those listed for a pay factor of 0.50 in Table 1, replace nonconforming work.

B. Non-Conformance for Out-of-Tolerance Wall Facing Elements

1. If structural adequacy can be demonstrated, facing elements either placed or that become out-of-tolerance from those specified in the applicable wall system section (02833S through 02839S) before final acceptance may be allowed to remain in place at a reduced price in accordance with this paragraph as decided by the Engineer.
2. The Engineer will use the Table 5-1 (Unit Prices for Determining Pay Adjustments For Nonconforming Work) and the applicable pay factor in Table 2 to calculate the price adjustment.
3. The Wall Company and the Engineer will evaluate all wall facing element cases when deviations exceed those listed for a pay factor of 0.50 in Table 2 , replace nonconforming work.

C. Price adjustment calculation. The applicable pay factors in Tables 1 and 2 will be applied to the entire wall. However, only the most critical of any one of the backfill criteria or the facing elements tolerances (i.e. the one having the lowest pay factor), will be applied.

PART 2 PRODUCTS

2.1 MATERIALS

A. As specified in Sections 02832S through 02839S for the selected wall system.

PART 3 EXECUTION

3.1 INSTALLATION

A. As specified in Sections 02832S through 02836S for the selected wall system.

3.2 PRICE REDUCTION FOR NON-COMFORMING WORK

A. See Tables 1 and 2 for pay factors.

Table 1

PAY FACTORS FOR NON-CONFORMING MSE WALL SELECT BACKFILL						
Deviations of Backfill Chemical Test Results from the Limits Specified in Section 02832S*						
	Pay Factor	1 Test	Avg. of 2 Tests	Avg. of 3 Tests	Avg. of 4 Tests	Avg. of 5 or More Tests
Resistivity (ohm-cm) AASHTO T 288	1.00	0 to 200	0 to 190	0 to 180	0 to 170	0 to 150
	0.95	201 to 400	191 to 380	181 to 360	171 to 340	151 to 300
	0.90	401 to 600	381 to 570	361 to 540	341 to 510	301 to 450
	0.80	601 to 800	571 to 760	541 to 720	511 to 680	451 to 600
	0.70	801 to 1000	761 to 950	721 to 900	681 to 850	601 to 750
	0.60	1001 to 1200	951 to 1140	901 to 1080	851 to 1020	751 to 900
	0.50a	over 1200	over 1140	over 1080	over 1020	over 900
a - But no one test below 1600 ohm-cm will be accepted.						
pH AASHTO T 289	1.00	0 to 0.20	0 to 0.18	0 to 0.16	0 to 0.14	0 to 0.12
	0.90	0.21 to 0.40	0.19 to 0.36	0.17 to 0.32	0.15 to 0.28	0.13 to 0.24
	0.80	0.41 to 0.60	0.37 to 0.54	0.33 to 0.48	0.29 to 0.42	0.25 to 0.36
	0.70	0.61 to 0.80	0.55 to 0.72	0.49 to 0.64	0.43 to 0.56	0.37 to 0.48
	0.60	0.81 to 1.00	0.73 to 0.90	0.65 to 0.80	0.57 to 0.70	0.49 to 0.60
	0.50b	---	over 0.90	over 0.80	over 0.70	over 0.60
b - But no one test below 5.0 or above 10.0 will be accepted						
Chlorides (ppm) AASHTO T 291	1.00	0 to 14	0 to 12	0 to 10	0 to 8	0 to 6
	0.95	15 to 28	13 to 24	11 to 20	9 to 16	7 to 12
	0.90	29 to 42	25 to 36	21 to 30	17 to 24	13 to 18
	0.80	43 to 56	37 to 48	31 to 40	25 to 32	19 to 24
	0.70	57 to 70	49 to 60	41 to 50	33 to 40	25 to 30
	0.60	71 to 84	61 to 72	51 to 60	41 to 48	31 to 36
	0.50c	over 84	over 72	over 60	over 48	over 36
c - But no one test above 200 ppm will be accepted.						
Sulfates (ppm) AASHTO T 290	1.00	0 to 50	0 to 45	0 to 40	0 to 35	0 to 30
	0.95	51 to 90	46 to 80	41 to 70	36 to 60	31 to 50
	0.90	91 to 130	81 to 115	71 to 100	61 to 85	51 to 70
	0.80	131 to 170	116 to 150	101 to 130	86 to 110	71 to 90
	0.70	171 to 210	151 to 185	131 to 160	111 to 135	91 to 110
	0.60	211 to 250	186 to 220	161 to 190	136 to 160	111 to 130
	0.50d	over 250	over 220	over 190	over 160	over 130
d - But no one test above 500 ppm will be accepted.						

* Refer to Section 02832S for minimum sampling and testing frequency. The Engineer determines locations and any additional tests required to evaluate the overall backfill mass.

Table 2

PAY FACTORSFOR OUT-OF-TOLERANCE MSE WALL FACING ELEMENTS						
Mean of the Deviations of Wall Placement Tolerances from the Limits Specified in Section 02833S to 02839S (based on the percentage of wall face having the maximum out-of-tolerance measurements)						
	Pay Factor	**1 to 5%**	**6 to 10%**	**11 to 20%**	**21 to 30%**	**30% or more**
Horizontal Alignment (percent) Spec: 0.7%	1.00	0 to 0.40	0 to 0.35	0 to 0.30	0 to 0.25	0 to 0.20
	0.90	0.41 to 0.80	0.36 to 0.70	0.31 to 0.60	0.26 to 0.50	0.21 to 0.40
	0.80	0.81 to 1.20	0.71 to 1.05	0.61 to 0.90	0.51 to 0.75	0.41 to 0.60
	0.70	1.21 to 1.60	1.06 to 1.40	0.91 to 1.20	0.76 to 1.00	0.61 to 0.80
	0.60	1.61 to 2.00	1.41 to 1.75	1.21 to 1.50	1.01 to 1.25	0.81 to 1.00
	0.50	2.01 or more	1.76 or more	1.51 or more	1.26 or more	1.01 or more
Vertical Alignment* (percent) Spec: 0.7%	1.00	0 to 0.40	0 to 0.35	0 to 0.30	0 to 0.25	0 to 0.20
	0.90	0.41 to 0.80	0.36 to 0.70	0.31 to 0.60	0.26 to 0.50	0.21 to 0.40
	0.80	0.81 to 1.20	0.71 to 1.05	0.61 to 0.90	0.51 to 0.75	0.41 to 0.60
	0.70	1.21 to 1.60	1.06 to 1.40	0.91 to 1.20	0.76 to 1.00	0.61 to 0.80
	0.60	1.61 to 2.00	1.41 to 1.75	1.21 to 1.50	1.01 to 1.25	0.81 to 1.00
	0.50	2.01 or more	1.76 or more	1.51 or more	1.26 or more	1.01 or more
Plumbness* (percent) Spec: 0.5%	1.00	0 to 0.50	0 to 0.41	0 to 0.32	0 to 0.23	0 to 0.18
	0.95	0.51 to 0.64	0.42 to 0.54	0.33 to 0.43	0.24 to 0.33	0.19 to 0.26
	0.90	0.65 to 0.78	0.55 to 0.66	0.44 to 0.54	0.34 to 0.43	0.27 to 0.35
	0.85	0.79 to 0.92	0.67 to 0.79	0.55 to 0.66	0.44 to 0.52	0.36 to 0.43
	0.80	0.93 to 1.06	0.80 to 0.91	0.67 to 0.77	0.53 to 0.62	0.44 to 0.52
	0.70	1.07 to 1.20	0.92 to 1.04	0.78 to 0.88	0.63 to 0.72	0.53 to 0.60
	0.60	1.21 to 1.34	1.05 to 1.17	0.89 to 0.99	0.73 to 0.82	0.61 to 0.68
	0.50	1.35 or more	1.18 or more	1.00 or more	0.83 or more	0.69 or more
Levelness (percent) Spec: 0.5%	1.00	0 to 0.30	0 to 0.28	0 to 0.26	0 to 0.24	0 to 0.22
	0.90	0.31 to 0.60	0.29 to 0.56	0.27 to 0.52	0.25 to 0.48	0.23 to 0.44
	0.80	0.61 to 0.90	0.57 to 0.84	0.53 to 0.78	0.49 to 0.72	0.45 to 0.66
	0.70	0.91 to 1.20	0.85 to 1.12	0.79 to 1.04	0.73 to 0.96	0.67 to 0.88
	0.60	1.21 to 1.50	1.13 to 1.40	1.05 to 1.30	0.97 to 1.20	0.89 to 1.10
	0.50	1.51 or more	1.41 or more	1.31 or more	1.21 or more	1.11 or more
Joint Width (inches) Specs: Panel: 0.5 – 1.2 Block: 0.12– 0.5	1.00	0 to 0.10	0 to 0.09	0 to 0.08	0 to 0.07	0 to 0.06
	0.90	0.11 to 0.20	0.10 to 0.18	0.09 to 0.16	0.08 to 0.14	0.07 to 0.12
	0.80	0.21 to 0.30	0.19 to 0.27	0.17 to 0.24	0.15 to 0.21	0.13 to 0.18
	0.70	0.31 to 0.40	0.28 to 0.36	0.25 to 0.32	0.22 to 0.28	0.19 to 0.24
	0.60	0.41 to 0.50	0.37 to 0.45	0.33 to 0.40	0.29 to 0.35	0.25 to 0.30
	0.50	0.51 or more	0.46 or more	0.41 or more	0.36 or more	0.31 or more
Joint Offset (inches) Specs: Panel: 0.4 Block: 0.25	1.00	0 to 0.20	0 to 0.19	0 to 0.18	0 to 0.17	0 to 0.16
	0.90	0.21 to 0.40	0.20 to 0.38	0.19 to 0.36	0.18 to 0.34	0.17 to 0.32
	0.80	0.41 to 0.60	0.39 to 0.57	0.37 to 0.54	0.35 to 0.51	0.33 to 0.48
	0.70	0.61 to 0.80	0.58 to 0.76	0.55 to 0.72	0.52 to 0.68	0.49 to 0.64
	0.60	0.81 to 1.00	0.77 to 0.95	0.73 to 0.90	0.69 to 0.85	0.65 to 0.80
	0.50	1.01 or more	0.96 or more	0.91 or more	0.86 or more	0.81 or more

* For modular block walls these tolerances are measured from the specified wall batter as indicated in 02835 S and 02836 S.

END OF SECTION

September 1, 2016

SECTION 02832S

SELECT BACKFILL FOR MSE WALLS

Add Section 02832:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Placement procedures and requirements for backfill used in constructing MSE walls.

1.2 RELATED SECTIONS

A. Section 02056: Embankment, Borrow, and Backfill

B. Section 02831S: Retaining Wall-Alternate Systems

1.3 REFERENCES

A. AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates

B. AASHTO T 90: Determining the Plastic Limit and Plasticity Index of Soils

C. AASHTO T 99: Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12 in.) Drop

D. AASHTO T 104: Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate

E. AASHTO T 236: Direct Shear Test of Soils Under Consolidated Drained Conditions

F. AASHTO T 267: Determination of Organic Content in Soils by Loss on Ignition

G. AASHTO T 288: Determining Minimum Laboratory Soil Resistivity

H. AASHTO T 289: Determining pH of Soil for Use in Corrosion Testing

I. AASHTO T 290: Determining Water-Soluble Sulfate Ion Content in Soil

J. AASHTO T 291: Determining Water-Soluble Chloride Ion Content in Soil

K. AASHTO T 310: In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

FHWA Publication No. FHWA-NHI-09-087, Corrosion/Degradation of Soil Reinforcements for MSE Walls and Reinforced Soil Slopes

1.4 SUBMITTALS

A. Provide the Engineer with a certificate of compliance, from an AASHTO accredited and UDOT qualified testing lab, certifying the material complies with this section.
   1. Provide the Engineer with copies of the results of all tests performed to determine the Select Backfill source meets the requirements of this section.

B. Provide the Engineer with copies of test results from a UDOT qualified lab for the tests described under article 1.5, Acceptance.

1.5 ACCEPTANCE

A. In addition to the initial testing to verify the Select Backfill source meets the requirements of this section, at a minimum, obtain on-site samples during construction and perform testing at the following frequencies.
   1. Gradation: Every 5,000 cubic yards of backfill used
   2. Electrochemical: Every 10,000 cubic yards of backfill used

B. Include all costs for sampling and testing in the bid price for the work.
   1. The Department will make no separate payment for the cost of sampling and testing required in accordance with this section, except as follows:
   2. The Engineer reserves the right to require additional testing, such as when suspecting a change in the Select Backfill.
      a. When additional testing performed at the direction of the Engineer indicates there is no change in the material and the material is in compliance with the requirements of this section, the Department will pay for the cost of additional sampling and testing as extra work.

C. Density
   1. The Department will perform at least one in-place moisture/density determination per lift of backfill for each 100 feet of wall length (minimum two tests per lift) in accordance with AASHTO T 310.
      a. Tests will be made at random locations and/or at specific locations determined by the Engineer.
   2. Do not proceed with the placement of each layer of soil reinforcement and overlying lift of backfill until the Engineer indicates and records that all backfill placement and density requirements (including in the 3-foot light equipment zone) have been met.

PART 2 PRODUCTS

2.1 SELECT BACKFILL

A. Use backfill free from frozen, organic, and otherwise deleterious materials. Conform to the following gradation limits as determined by AASHTO T 27:

Table 1

Select Backfill Gradation (percent passing)		
Sieve Size	**Metallic Reinforcement**	**Geogrid Reinforcement**
4 inch	100	–
¾ inch	–	100
No. 40	0 – 60	0 – 60
No. 200	0 –15	0 –15

B. Geogrid reinforcement may use the Select Backfill gradation specified in Table 1 for metallic reinforcement only under the following conditions:

1. Make arrangements with the wall company to perform site and material specific installation damage testing with a representative sample of the proposed backfill.
    a. Perform testing in accordance with the guidelines provided in FHWA Publication No. FHWA-NHI-09-087. Determine the installation damage reduction factor in accordance with the test, but no less than 1.2.
    b. Assume all costs for performing the tests and certification of the test results by a registered engineer qualified in this subject/field.
    c. Assume any additional costs for the purchase of materials and/or construction of the wall based on the installation damage reduction factor obtained from the testing.

2. Provide additional material specific installation damage testing at the direction of the Engineer when a change in the backfill characteristics from the original tested representative sample is suspected.
    a. Assume all costs for performing this additional testing and certification of the test results by a registered engineer.
    b. Assume any additional costs for the purchase of materials and/or construction of the wall based on the installation damage reduction factor obtained from additional testing.

C. Use backfill with a Plasticity Index (PI) of 6 or less, as determined by AASHTO T 90.

D. Use backfill with an internal friction angle of not less than 34 degrees as determined by AASHTO T 236, using a sample of the material compacted to 95 percent of maximum density at optimum moisture content, determined by AASHTO T 99, Method D.
   1. Internal friction angle testing is not required for backfill material that has at least 80 percent of the material retained on the 3/4 inch sieve.

E. Use backfill that:
   1. Is substantially free of shale or other soft particles of poor durability.
   2. Has a sodium sulfate soundness loss of less than 15 percent after 5 cycles, determined in accordance with AASHTO T 104.
   3. Has an organic content less than one percent as determined by AASHTO T 267 on the portion of the material finer than the No. 10 sieve.

F. Meet electrochemical properties specified in Table 2

2.2 FREE DRAINING GRANULAR BACKFILL

A. Place Free Draining Granular Backfill along the wall face in accordance with this Section.
   1. Refer to Section 02056 for Free Draining Granular Backfill gradation requirements.
   2. For geogrid reinforcement applications, use a maximum particle size of 3/4 inch.

B. Meet the electrochemical properties specified in Table 2

Table 2

Electrochemical Requirements			
Property	**Metallic Reinforcement**	**Geogrid Reinforcement**	**Test Method**
Resistivity	Minimum 3000 ohm-cm, at 100% saturation*	N/A	AASHTO T 288
pH	6.0 – 10.0	5.5 – 10.0**	AASHTO T 289
Chlorides	Maximum 100 ppm	N/A	AASHTO T 291
Sulfates	Maximum 200 ppm	N/A	AASHTO T 290

*Do not follow Note 6 of AASHTO T 288 to find lowest possible resistivity (where soil is in a slurry state). Only saturate soil to 100% saturation, where a sheen of water is seen at the top surface of the sample in the soil box.
**Maximum pH value for polyester geogrid is 9.0 unless long-term immersion testing performed according to FHWA-NHI-09-087 shows acceptable performance. For pH> 8.0, use a durability reduction factor (RF_D) of 1.3 for polyester geogrid.

PART 3 EXECUTION

3.1 INSTALLATION

A. Excavation and Foundation Preparation:
   1. Excavate and grade foundation area to the lines and grades shown on the drawings, or as directed by the Engineer.
   2. Make the width of excavation equal to or exceeding the length of soil reinforcing elements.
   3. Compact the foundation using at least three passes of a lightweight, steel, smooth-drum vibratory roller, or as otherwise determined by the Engineer before the wall construction.
   4. Remove unsuitable foundation soils and replace with Select Backfill, or with other suitable material determined by the Engineer, placed and compacted as specified in this article

B. MSE Wall:
   1. Follow erection of each course of panel/modular block with placement of Select Backfill.
      a. Complete backfill at the front of the wall before backfilling more than 4 feet above the bottom of the lowermost facing element.
   2. Do not damage or disturb wall materials or misalign facing panels/modular blocks during backfill placement.
   3. Remove and replace or correct, as directed by the Engineer, wall materials damaged or disturbed during backfill placement at no cost to the Department.
   4. Remove and replace or correct, as directed by the Engineer, Select Backfill not meeting the specified requirements at no cost to the Department.
   5. Make the moisture content of the Select Backfill during placement and compaction uniform throughout each layer.
   6. Determine the optimum moisture content in accordance with AASHTO T 99, Method D.
   7. Place Select Backfill with the moisture not greater than the optimum moisture content, nor less than four percentage points below optimum.

8. Remove any Select Backfill with placement moisture content in excess of the optimum moisture content.
    a. Select Backfill may be reused, provided it is aerated or otherwise reworked until the moisture content is uniform and acceptable throughout the entire lift.
9. Do not exceed 12 inches (loose) in lift thickness.
    a. Decrease the lift thickness as necessary to obtain the specified density.
    b. Place backfill in uniformly thick layers.
10. Compact backfill to at least 95 percent of the maximum density, AASHTO T 99, Method D.
11. When placing backfill over the soil reinforcement, begin placement 3 to 5 feet from the wall face and proceed away from the wall to prevent the reinforcement from bunching towards the wall face.
12. Operate all placement and compaction equipment parallel to the wall face.
13. Place and compact each layer of backfill in a level manner before placing subsequent backfill layers.
14. Rubber-tired equipment may pass over the reinforcement only at slow speeds (less than 5 mph). Avoid sudden braking and sharp turning.
15. Do not use sheeps-foot or other grid-type rollers for compacting backfill within the limits of the soil reinforcement.
16. During the initial stage of wall construction, to avoid pushing the facing elements out of alignment, do not place or compact backfill against the facing elements until the first layer of soil reinforcement has been installed and one lift of Select Backfill has been placed and compacted over the reinforcement layer.
17. For all subsequent layers of backfill, before placement of the reinforcement, place and compact the backfill to an elevation 2 inches above the reinforcement connection from a point approximately 18 inches behind the back face of the wall facings (panels, modular blocks) to the end of the reinforcing, unless otherwise shown on the plans at specific locations.
18. Achieve compaction within 4 to 5 feet of the back face of the wall facing units and within 2 feet of any obstructions (“light equipment zone”), by at least three passes of a suitable lightweight or medium-weight (hand-held or hand-guided) mechanical roller, tamper, or vibratory compactor.
    a. When compacting a thin leveling lift along the reinforcement connections level, use compaction equipment with a static weight of less than 800 pounds within this zone.
    b. Use a maximum lift thickness within this zone as warranted by the type of compaction equipment actually used.
    c. Compact within this light equipment zone to within 3 inches of the facing elements.

d. Exercise care in the compaction process to avoid misalignment of the facing elements.

19. Place Free Draining Granular Backfill within a zone behind the wall extending at least 30 inches from the front face of the wall facings (but at least 12 inches in width measured from the bottom of each backfill lift), and at least 24 inches in width behind the first-stage wire/grid facing of 2-stage wall systems and behind the wire/grid facing of internal phased-construction walls.
    a. Place and compact Free Draining Granular Backfill as specified above for the light equipment zone.
20. Use backfill placement and compaction methods to assure that no voids are present beneath the soil reinforcement elements before backfilling over the reinforcement.
21. Place soil reinforcing elements normal to face of wall in plan view.
    a. If necessary, skew elements (minimizing skew angle) to avoid obstructions, but no more than 15 degrees unless approved by the Wall Company.
22. At the end of each day's operation, slope the backfill away from the wall to direct runoff of rainwater away from the wall face.
    a. Do not allow surface runoff from adjacent areas or groundwater to enter the wall construction site, including at the front face of the wall.
23. Place the top level of soil reinforcement parallel to the top of the facing unit a distance below the top of the wall as shown on the plans.
    a. Place the top level of soil reinforcement at least 3 inches below the bottom of the barrier slab lip or the bottom of the concrete gutter behind the coping.
24. Gradually deflect the upper reinforcement elements downward to avoid conflicts with paving and subgrade preparation.
    a. Pay particular attention to special conditions such as where roadway super-elevation is anticipated.
    b. Maximum deflection of the reinforcement elements is 8 inches or as otherwise noted on the plans.
25. Slope the top of the backfill along the wall such that the top reinforcement layer is covered with at least 16 inches of Select Backfill.

END OF SECTION

July 11, 2016

SECTION 02833S

MSE WALLS USING CONCRETE FACING PANELS AND METAL REINFORCING ELEMENTS

Add Section 02833:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and construction requirements for mechanically stabilized earth (MSE) walls using a wall system (refer to Section 02831S) approved by the Engineer using concrete facing panels and metal reinforcing elements.

B. Provide and install face panels, reinforcing steel, tie strips, fasteners, joint filler, select backfill, and all necessary attachments from the selected Wall Company.

1.2 RELATED SECTIONS

A. Section 02831S: Retaining Wall-Alternate Systems

B. Section 02832S: Select Backfill for MSE Walls

C. Section 03055: Portland Cement Concrete

D. Section 03211: Reinforcing Steel and Welded Wire

E. Section 03310: Structural Concrete

F. Section 03390: Concrete Curing

G. Section 03924: Structural Concrete Repair and Sealing

1.3 REFERENCES

A. AASHTO M 111: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

B: AASHTO M 232: Zinc Coating (Hot-Dip) on Iron and Steel Hardware

C. ASTM A 325: Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

D. ASTM A 572: High-Strength Low-Alloy Columbium-Vanadium Structural Steel

E. ASTM A 709M: Structural Steel for Bridges

F. ASTM A 1011: Standard Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

G. UDOT Quality Management Plans

1.4 SUBMITTALS

A. Submit sample of the texture of the panel face for the Engineer's approval.

B. Provide submittals in accordance with Section 02831S and working drawings including design details which protect the reinforcement connections from corrosion.

C. Do not start work on any wall until working drawings have been reviewed and approved by the Design-Builder's Engineers and all Department comments have been addressed.

D. Certificate of compliance for incorporated materials along with copies of results of any tests performed.

E. Wall Company's construction manual for the specific wall system.

F. Certification from the Wall Company that the completed wall(s) meet all Department and Wall Company specifications/requirements for the specific wall system.
   1. Where the Department's and the Wall Company's specifications or requirements differ, apply the stricter of the two.

1.5 ACCEPTANCE

A. Panel Acceptance
   1. Meet 28-day minimum compressive strength of 4000 psi.
   2. Do not transport panels to the site before seven days after fabrication and until:
      a. A minimum 28-day compressive strength of 4000 psi has been achieved, or

b. A minimum compressive strength of 3000 psi has been achieved at 14 days.

3. All panels to be visually free of defects and will be rejected if they:
   a. Do not meet the above requirements.
   b. Contain defects due to imperfect molding.
   c. Have any honeycomb.
   d. Have open texture on front face.
   e. Have cracks or spalls that exceed the limits specified in article 3.4

PART 2 PRODUCTS

2.1 PRECAST CONCRETE WALL PANELS

A. Obtain approval from the Engineer for the architectural treatment for all MSE panel walls.

B. Concrete. Class AA(AE) per Section 03055 and Section 03310, having a minimum 28-day compressive strength of 4000 psi.

C. Reinforcing steel to have a minimum cover of 2.0 inches.

D. Casting
   1. Use only a UDOT qualified supplier for precast concrete panel fabrication in accordance with UDOT Precast/Prestressed Concrete Structures Quality Management Plan.
      a. Do not cast panels on site.
   2. Cast panels on a flat area or approved architectural treatment, with the front face down.
      a. Set tie strip guides at back face.
   3. Place concrete in each unit without interruption.
      a. Vibrate with approved equipment to prevent stone pockets or cleavage planes.
      b. Use clean, unused form oil.

E. Reinforcement Connections
   1. Cast at least two soil reinforcement connection levels into all full-size concrete panels.
      a. Where only two connection levels are cast in panels, locate the levels in two different horizontal planes separated by at least one-third the panel height.

F. Curing
   1. Keep surfaces wet and moist until the curing compound is applied.

2. Complete all patching or surface finishing before applying compound.
3. Spray the entire surface of the concrete with a membrane curing compound. Apply the curing compound at a uniform rate of 1.25 oz/ft^2.
4. Immediately re-spray any membrane damage which occurs during the curing period.
5. Leave forms in place until they can be removed without damage to the unit.

G. Concrete Finish
1. Provide a Class 1 finish for front face of panels.
   a. The thickness of the architectural treatment is in addition to the required design thickness.
2. Provide a uniform surface finish for the back face of panels.
   a. Roughly screen the finish to eliminate open pockets of aggregate and surface distortions in excess of 1/4 inch.

H. Tolerances
1. All dimensions ± 1/8 inch.
2. Angular distortion with regard to the height of panel not to exceed 3/16 inch in 5 feet.
3. Surface defects on form surfaces not more than 1/8 inch in 5 feet.

I. Marking
1. Mark the date of manufacture and panel-type designation on the rear of each panel so that it is legible during installation.

2.2 REINFORCING STEEL

A. Epoxy coated in accordance with Section 03211.

2.3 LEVELING PAD CONCRETE

A. Class A or Class B concrete mixes in accordance with Section 03055.

2.4 REINFORCING ELEMENTS

A. Hot rolled from steel bars, galvanize coated 3.4 mils thick, meeting minimum requirements of ASTM A 572, Grade 65; AASHTO M 111.

B. All reinforcing elements to be the specified size and free from defects.

2.5 REINFORCED WELDED WIRE MESH AND LOOP INBEDS

A. Meet minimum requirements of Section 03211 with galvanized coating at least 3.4 mils thick.

2.6 TIE STRIPS

A. Shop fabricated, hot rolled steel conforming to minimum requirements of ASTM A 709M, Grade 345; AASHTO M 111; and ASTM A 1011 Grade 345 or equivalent, galvanize coated at least 3.4 mils thick.

2.7 PANEL FASTENERS

A. Bolts and nuts to be hexagonal cap screw and galvanize coated, meeting minimum requirements of ASTM A 325 and AASHTO M 232.

2.8 OTHER FASTENERS

A. Fasteners to wingwalls and abutment walls, if required, to be provided by the Wall Company.

2.9 DAMAGED GALVANIZATION

A. Spray with zinc paint, covering the entire area that has been damaged, as an alternative to replacement of any reinforcing steel, reinforcing elementss, wire mesh or fasteners that have damaged galvanization.

2.10 CURING COMPOUND

A. Refer to Section 03390

2.11 GEOTEXTILE

A. Cover horizontal and vertical joints between panels, when required, by a geotextile of type and grade recommended by the Wall Company.

2.12 ADHESIVE

A. Per Wall Company's standard.

2.13 BEARING PADS

A. Horizontal rubber bearing pads to be of the type and grade recommended and supplied by the Wall Company.

2.14 LIFTING DEVICES

A. Per Wall Company’s standard.

2.15 SELECT BACKFILL

A. Refer to Section 02832S.

2.16 MATERIALS FOR CRACK AND SPALL REPAIR

A. Refer to Section 03924.

PART 3 EXECUTION

3.1 GENERAL

A. Arrange for a qualified representative (minimum five years experience with MSE wall design and construction) from the selected Wall Company to be directly involved and provide technical assistance during all phases of construction of the wall(s).
   1. The Wall Company representative is to be at the project site for at least the first five working days of wall construction and until all aspects of wall construction have been satisfactorily demonstrated to the MSE Wall Company representative and the Engineer. The MSE Wall Company representative is to subsequently visit the site at least once every 10,000 sq. ft. of wall face construction, or as otherwise determined by the Engineer.
   2. The Wall Company representative is responsible for training the Contractor's wall construction crew(s) and Department inspectors in proper quality control for construction of the walls.
      a. If one or more construction crew members change, the Wall Company representative is responsible to train the new crew member(s).
   3. During each site visit, the representative is to meet with the Engineer near the conclusion of the visit to report on the observed wall construction procedures, including providing a copy of the field report.

B. Provide the Wall Company's construction manual to the Engineer, and assure that the wall system-specific requirements in the manual are integrated into the wall construction.

C. Provide a final field observations report from the Wall Company that specifically addresses that the completed wall(s) meet all Department and Wall Company specifications/requirements and what deficiencies exist, if any.

1. Where the Department's and the Wall Company's specifications/requirements differ, apply the stricter of the two requirements.

D. Haul, store, and ship wall materials so as to minimize the potential of producing any type of defects.
   1. Store panels to avoid damage to connection pieces, such that the tie strips do not bend.

E. Perform excavation and foundation preparation (including removal of unsuitable soils) as specified in Section 02832S.

F. Construct wall system in accordance with the approved plans, specifications, and the Wall Company's recommendations and construction manual.

3.2 LEVELING PAD

A. Prepare the subgrade soils and/or fill so as to cast the leveling pad to the design elevations shown on the drawings and to ensure complete contact of the retaining wall units with the base.

B. Furnish and place concrete in accordance with Section 03055.

C. Place cast-in-place concrete leveling pad upon undisturbed in-situ soils, or upon properly placed and compacted fill as per Section 02832S.

D. If shown on the Wall Company's approved drawings, a maximum 3-inch wide gap may be left between the end of the leveling pad and the adjacent higher panel where the wall steps up
   1. Ensure the entire pad is poured on firm compacted fill or undisturbed subgrade soils.
   2. Provide for the MSE backfill in the zone behind the gap to be fully retained.
   3. Backfill the gap before the remaining backfill in front of the wall face is placed.

E. Place leveling pad to a thickness of at least 6 inches.

F. Allow leveling pad to cure for at least 12 hours before placing concrete panels.

3.3 WALL CONSTRUCTION

A. Place wall backfill and reinforcement as specified in Section 02832S.

B. Handle panels by means of lifting device set into upper edge or side of the panels and set in position vertically.

C. Place panels on successive horizontal lifts in the sequence shown on the approved plans as backfill placement proceeds.

D. Place panels initially at a slight batter towards the backfill as recommended by the Wall Company to compensate for outward rotation of the panel upon fill placement and compaction.

E. Place bearing pads as required by the Wall Company to prevent concrete-to-concrete contact between panels.

F. Use rubber, wood, or metal shims as necessary to make final adjustments to the wall panel to facilitate level placement of the panel.
   1. Do not leave wood shims at any location.

G. Where reinforcement is obstructed by elements such as piles, drilled shafts, guardrail posts, catch basins, drop inlets, culverts, etc. in the wall soil reinforcement zone, modify the reinforcement design using one of the following alternatives:
   1. If the reinforcement is modified, design the surrounding reinforcement layers to carry the additional load.
   2. Place a structural frame around the obstruction which is capable of transferring loads from the reinforcements on one side of the obstruction to reinforcements on the other side of the obstruction.
   3. If the soil reinforcement consists of discrete strips or bar mats rather than continuous sheets, splay the reinforcement around the obstruction.

H. Place soil reinforcement elements normal to the face of the wall in plan view.
   1. Where required to splay the reinforcement around obstructions, skew the reinforcement (minimizing the skew angle to no more than 15 degrees).
      a. Maintain a set-back for reinforcement of at least 2 inches from piles or other metallic obstructions.
      b. Do not exceed horizontal spacing between longitudinal reinforcing of 7 feet.
      c. Separate any overlapping soil reinforcing elements with a minimum thickness of select backfill specified by the Wall Company.

I. Where reinforcement elements are to be connected using bolts and nuts, use a crescent or socket-head ratchet wrench to securely hand-tighten the nut.

1. Do not use pneumatic equipment.

J. Wall alignment tolerances.
   1. Horizontal alignment: 0.7 percent (for example 2.5 inches in 30 feet).
   2. Vertical tolerance: 0.7 percent (for example 0.85 inches in 10 feet).
   3. Overall vertical tolerance of the wall (plumbness from top to bottom): 0.5 percent (for example 1.2 inches in 20 feet of wall height).
   4. Wall panel levelness tolerance: 0.5 percent (for example 1.2 inches in 20 feet).

K. Install panels so that joints are uniform.
   1. The maximum allowable offset in any panel joint is 0.40 inch.
   2. Joint width is 1.2 inches maximum and 0.50 inch minimum.

L. Check panel tolerance and reset before placement of the next panel if out of tolerance.

3.4 CRACK AND SPALL REPAIR CRITERIA FOR CONCRETE PANELS

A. A fully penetrating crack is defined as a crack extending through the cross-section of the precast panel from the front face to the back face of the unit.

B. Cracks at Front Face of Panel:
   1. Panels with one or two partially penetrating cracks with widths less than or equal to 12 mils are acceptable.
   2. Reject panels with fully penetrating cracks, or cracks wider than 12 mils.
   3. No more than two cracks per individual panel are allowed without further evaluation.

C. Cracks at Back Face of Panel:
   1. Partially penetrating cracks with widths less than or equal to 12 mils are acceptable.
   2. Partially penetrating cracks with widths between 12 mils and 30 mils are acceptable when repaired with surface sealant according to subparagraph F, Crack Repair Procedures.
   3. Evaluate partially penetrating cracks wider than 30 mils for acceptance with epoxy injection according to subparagraph F, Crack Repair Procedures.
   4. No more than two repairable cracks per individual panel are allowed without further evaluation.

D. Spalls at Front Face of Panel:

1. Spalls with widths less than 4.0 inches and depths less than 2.0 inches may be repaired with a patching material acceptable to the Engineer of the same color as panel concrete. Resultant repair to be approved by the Engineer.
2. Reject panels with spalls wider than 4.0 inches or deeper than 2.0 inches.
3. Measure spall depth from the structural thickness of the panel excluding architectural surface finish.
4. Panels with more than two spalls are subject to further evaluation before acceptance.

E. Spalls at Back Face of Panel:
   1. Spalls with widths less than 4.0 inches and depths less than 2.0 inches may be repaired with a patching material acceptable to the Engineer. Resultant repair to be approved by the Engineer.
   2. Reject panels with spalls wider than 4.0 inches or deeper than 2.0 inches.
   3. Panels with more than four spalls are subject to further evaluation before acceptance.

F. Crack Repair Procedures:
   1. Surface Sealing: Prepare surface and apply a sealant acceptable to the Engineer according to Manufacturer's instructions.
   2. Epoxy Injection: Prepare surface and inject cracks with Department-approved product according to Manufacturer's instructions.

G. Spall Repair Procedures:
   1. Prepare surface and apply patching material according to Manufacturer's instructions, and as acceptable to the Engineer.

END OF SECTION

July 11, 2016

SECTION 02834S

MSE WALLS USING CONCRETE FACING PANELS AND GEOGRID REINFORCING ELEMENTS

Add Section 02834:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and construction requirements for mechanically stabilized earth (MSE) walls using a wall system (see Section 02831S) approved by the Engineer using concrete facing panels and geogrid reinforcing elements.

B. Provide and install face panels, reinforcing steel, geogrid, fasteners, joint filler, select backfill, and all necessary attachments from the selected Wall Company.

1.2 RELATED SECTIONS

A. Section 02831S: Retaining Wall -Alternate Systems

B. Section 02832S: Select Backfill for MSE Walls

C. Section 03055: Portland Cement Concrete

D. Section 03211: Reinforcing Steel and Welded Wire

E. Section 03310: Structural Concrete

F. Section 03390: Concrete Curing

G. Section 03924: Structural Concrete Repair and Sealing

1.3 REFERENCES

B. AASHTO M 32: Steel Wire, Plain, for Concrete Reinforcement

C. AASHTO M 55: Steel Welded Wire Reinforcement, Plain, for Concrete

D. AASHTO M 111: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

E. AASHTO M 232: Zinc Coating (Hot-Dip) on Iron and Steel Hardware

F. ASTM D 5262: Standard Test Method for Evaluating the Unconfined Tension Creep and Creep Rupture Behavior of Geosynthetics

G. ASTM D 6637: Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method

H. UDOT Quality Management Plans

1.4 SUBMITTALS

A. Submit sample of the texture of the panel face for the Engineer's approval.

B. Provide submittals in accordance Section 02831S and working drawings including all design details.

C. Do not start work on any wall until working drawings have been reviewed and approved by the Design-Builder's Engineers and all Department comments have been addressed.

D. Certificate of Compliance for incorporated materials along with copies of results of any tests performed.

E. Wall Company's construction manual for the specific wall system.

F. Certification from the Wall Company that the completed wall(s) meet all Department and Wall Company specifications/requirements for the specific wall system.
   1. Where the Department's and the Wall Company's specifications or requirements differ, apply the stricter of the two.

1.5 ACCEPTANCE

A. Panel Acceptance

   1. Meet 28-day minimum compressive strength of 4000 psi.
   2. Do not transport panels to the site before seven days after fabrication and until:
      a. A minimum 28-day compressive strength of 4000 psi has been achieved, or
      b. A minimum compressive strength of 3000 psi has been achieved at 14 days.
   3. All panels to be visually free of defects and will be rejected if they:
      a. Do not meet the above requirements
      b. Contain defects due to imperfect molding

c. Have any honeycomb
d. Have open texture on front face
e. Have cracks or spalls that exceed the limits specified in article 3.5

PART 2 PRODUCTS

2.1 PRECAST CONCRETE WALL PANELS

A. Obtain approval from the Engineer for the architectural treatment for all MSE panel walls.

B. Concrete. Class AA(AE) per Section 03055 and Section 03310, having a minimum 28-day compressive strength of 4000 psi.

C. Reinforcing steel to have a minimum cover of 2.0 inches.

D. Casting
1. Use only a UDOT-qualified supplier for precast concrete panel fabrication in accordance with UDOT Precast/Prestressed Concrete Structures Quality Management Plan
   a. Do not cast panels on site.
2. Cast panels on a flat area or approved architectural treatment, with the front face down.
   a. Set tie strip guides at back face.
3. Place concrete in each unit without interruption.
   a. Vibrate with approved equipment to prevent stone pockets or cleavage planes.
   b. Use clean, unused form oil.

E. Reinforcement Connections
1. Cast at least two soil reinforcement connection levels into all full-size panels.
   a. Where only two connection levels are cast in panels, locate the levels in two different horizontal planes separated by at least one-third the panel height.

F. Curing.
1. Keep surfaces wet and moist until the curing compound is applied.
2. Complete all patching or surface finishing before applying compound.
3. Spray the entire surface of the concrete with a membrane curing compound. Apply the compound at a uniform rate of 1.25 oz/ft^2 of area.

4. Immediately re-spray any membrane damage which occurs during the curing period.
5. Leave forms in place until they can be removed without damage to the unit.

G. Concrete Finish
   1. Provide a Class 1 finish for front face of panels.
      a. The thickness of the architectural treatment is in addition to required design thickness.
   2. Provide a uniform surface finish for the back face of panels.
      a. Roughly screen the finish to eliminate open pockets of aggregate and surface distortion in excess of 1/4 inch.

H. Tolerances
   1. All dimensions ± 1/8 inch.
   2. Angular distortion with regard to the height of panel not to exceed 3/16 inch in 5 feet.
   3. Surface defects on form surfaces not more than 1/8 inch in 5 feet.

I. Marking
   1. Mark the date of manufacture and panel type designation on the rear side of each panel so that it is legible during installation.

2.2 REINFORCING STEEL

A. Epoxy coated in accordance with Section 03211.

2.3 LEVELING PAD CONCRETE

A. Use Class A or Class B concrete mixes in accordance with Section 03055.

2.4 GEOGRID

A. Use geogrid consisting of a regular grid network of integrally connected, discontinuous, select high-density polyethylene or polypropylene resin polymer tensile elements.
   1. Aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil and/or rock.
   2. Structure to be dimensionally stable and be able to retain its geometry under manufacture, transport, and installation.

B. Provide creep rupture test for 75-year design life per ASTM D5262.

C. Provide ultimate strength, minimum per ASTM D6637 and utilize geogrid reinforcement reduction factors as appropriate for the Project.

D. Carefully inspect all soil reinforcement and attachment devices to ensure they are true to size and free from defects.

E. Prevent mud, wet concrete, epoxy, and other contaminants from coming in contact with and affixing to the soil reinforcement and inserts, that would interfere with the geogrid connections.

F. Store soil reinforcement products as recommended by the Wall Company.

2.5 REINFORCED WELDED WIRE MESH AND LOOP INBEDS

A. Meet minimum requirements of Section 03211 with galvanized coating at least 3.4 mils thick.

2.6 PANEL FASTENERS

A. Bolts and nuts to be hexagonal cap screw and galvanize coated, meeting minimum requirements of ASTM A-325 and AASHTO M 232.

2.7 OTHER FASTENERS

A. Fasteners to wingwalls and abutment walls, if required, to be provided by the Wall Company.

2.8 CURING COMPOUND

A. Refer to Section 03390.

2.9 GEOTEXTILE

A. Cover horizontal and vertical joints between panels, when required, by a geotextile of the type and grade recommended by the Wall Company.

2.10 ADHESIVE

A. Per Wall Company's standard.

2.11 LIFTING DEVICES

A. Per Wall Company’s standard.

2.12 BEARING PADS

A. Horizontal rubber bearing pads to be of the type and grade recommended and supplied by the Wall Company.

2.13 SELECT BACKFILL

A. Refer to Section 02832S.

2.14 MATERIALS FOR CRACK AND SPALL REPAIR

A. Refer to Section 03924.

PART 3 EXECUTION

3.1 GENERAL

A. Arrange for a qualified representative (minimum five years experience with MSE wall design and construction) from the selected Wall Company to be directly involved and provide technical assistance during all phases of construction of the wall(s).
   1. The Wall Company representative is to be at the project site for at least the first five working days of wall construction and until all aspects of wall construction have been satisfactorily demonstrated to the MSE Wall Company representative and the Engineer. The MSE Wall Company representative is to subsequently visit the site at least once every 10,000 sq. ft. of wall face construction, or as otherwise determined by the Engineer.
   2. The Wall Company representative is responsible for training the Contractor's wall construction crew(s) and Department inspectors in proper quality control for construction of the walls.
      a. If one or more construction crew members change, the Wall Company representative is responsible to train the new crew member(s).
   3. During each site visit, the representative is to meet with the Engineer near the conclusion of the visit to report on the observed wall construction procedures, including providing a copy of the field report.

B. Provide the Wall Company's construction manual to the Engineer, and assure that the wall system-specific requirements in the manual are integrated into the wall construction.

C. Provide a final field observations report from the Wall Company that specifically addresses that the completed wall(s) meet all Department and Wall Company specifications/requirements and what deficiencies exist, if any.
   1. Where the Department's and the Wall Company's specifications/requirements differ, apply the stricter of the two requirements.

D. Haul, store, and ship wall materials so as to minimize the potential of producing any type of defects.
   1. Store panels to avoid damage to connection pieces, such that the tie strips do not bend.

E. Perform excavation and foundation preparation (including removal of unsuitable soils) as specified in Section 02832S.

F. Construct wall system in accordance with the approved plans, specifications, and the Wall Company's recommendations and construction manual.

3.2 LEVELING PAD

A. Prepare the subgrade soils and/or fill so as to cast the leveling pad to the design elevations shown on the drawings and to ensure complete contact of the retaining wall units with the base.

B. Furnish and place concrete in accordance with Section 03055.

C. Place cast-in-place concrete leveling pad upon undisturbed in-situ soils, or upon properly placed and compacted fill as per Section 02832S.

D. If shown on the Wall Company's approved drawings, a maximum 3-inch wide gap may be left between the end of the leveling pad and the adjacent higher panel where the wall steps up.
   1. Ensure the entire pad is poured on firm compacted fill or undisturbed subgrade soils.
   2. Provide for the MSE backfill in the zone behind the gap to be fully retained.
   3. Backfill the gap before the remaining backfill in front of the wall face is placed.

E. Place leveling pad to a thickness of at least 6 inches.

F. Allow leveling pad to cure for at least 12 hours before placing concrete panels.

3.3 GEOGRID INSTALLATION

A. Verify the correct orientation (roll direction) of the geogrid.

B. Place geogrid horizontally on the compacted backfill at the proper design.

C. Connect geogrid to the concrete wall units as specified by the Wall Company.

D. Pull the geogrid taut to eliminate loose folds and remove slack in the geogrid at the wall unit connections, pretension the geogrid, and stake or otherwise secure the back edge of the geogrid before and during backfill and compaction.

E. Follow the Wall Company's overlap requirements for uniaxial and biaxial geogrids.

F. Where reinforcement is obstructed by elements such as piles, drilled shafts, guardrail posts, catch basins, drop inlets, culverts, etc. in the wall soil reinforcement zone, modify the reinforcement design using one of the following alternatives:
   1. If the reinforcement is modified, design the surrounding reinforcement layers to carry the additional load.
   2. Place a structural frame around the obstruction which is capable of transferring loads from the reinforcements on one side of the obstruction to reinforcements on the other side of the obstruction.
   3. If the soil reinforcement consists of discrete strips or bar mats rather than continuous sheets, splay the reinforcement around the obstruction.

3.4 WALL CONSTRUCTION

A. Place wall backfill and reinforcement as specified in Section 02832S.

B. Handle panels by means of lifting device set into upper edge or side of the panels and set in position vertically.

C. Place panels on successive horizontal lifts in the sequence shown on the approved plans as backfill placement proceeds.

D. Place panels initially at a slight batter towards the backfill as recommended by the Wall Company to compensate for outward rotation of the panel upon fill placement and compaction.

E. Place bearing pads as required by the Wall Company to prevent concrete-to-concrete contact between panels.

F. Use rubber, wood, or metal shims as necessary to make final adjustments to the wall panel to facilitate lever placement of the panel.
   1. Do not leave wood shims at any location.

G. Wall alignment tolerances.

1. Horizontal alignment: 0.7 percent (for example 2.5 inches in 30 feet).
2. Vertical tolerance: 0.7 percent (for example 0.85 inches in 10 feet).
3. Overall vertical tolerance of the wall (plumbness from top to bottom): 0.5 percent (for example 1.2 inches in 20 feet of wall height).
4. Wall panel levelness tolerance: 0.5 percent (for example 1.2 inches in 20 feet).

H. Install panels so that joints are uniform.
1. The maximum allowable offset in any panel joint is 0.40 inch.
2. Joint width is 1.2 inches maximum and 0.50 inch minimum.

I. Check panel tolerance and reset before placement of the next panel if out of tolerance.

3.5 CRACK AND SPALL REPAIR CRITERIA FOR CONCRETE PANELS

A. A fully penetrating crack is defined as a crack extending through the cross-section of the precast panel from the front face to the back face of the unit.

B. Cracks at Front Face of Panel:
4. Panels with one or two partially penetrating cracks with widths less than or equal to 12 mils are acceptable.
5. Reject panels with fully penetrating cracks, or cracks wider than 12 mils.
6. No more than two cracks per individual panel are allowed without further evaluation.

C. Cracks at Back Face of Panel:
5. Partially penetrating cracks with widths less than or equal to 12 mils are acceptable.
6. Partially penetrating cracks with widths between 12 mils and 30 mils are acceptable when repaired with surface sealant according to subparagraph F, Crack Repair Procedures.
7. Evaluate partially penetrating cracks wider than 30 mils for acceptance with epoxy injection according to subparagraph F, Crack Repair Procedures.
8. No more than two repairable cracks per individual panel are allowed without further evaluation.

D. Spalls at Front Face of Panel:
1. Spalls with widths less than 4.0 inches and depths less than 2.0 inches may be repaired with an approved patching material of the same color as panel concrete. Resultant repair to be approved by the Engineer.

2. Reject panels with spalls wider than 4.0 inches or deeper than 2.0 inches.
3. Measure spall depth from the structural thickness of the panel excluding architectural surface finish.
4. Panels with more than two spalls are subject to further evaluation before acceptance.

E. Spalls at Back Face of Panel:
1. Spalls with widths less than 4.0 inches and depths less than 2.0 inches may be repaired with a patching material acceptable to the Engineer. Resultant repair to be approved by the Engineer.
2. Reject panels with spalls wider than 4.0 inches or deeper than 2.0 inches.
3. Panels with more than four spalls are subject to further evaluation before acceptance.

F. Crack Repair Procedures:
1. Surface Sealing: Prepare surface and apply a sealant acceptable to the Engineer according to Manufacturer's instructions.
2. Epoxy Injection: Prepare surface and inject cracks in accordance with Section 03924.

G. Spall Repair Procedures:
1. Prepare surface and apply patching material according to Manufacturer's instructions, and as acceptable to the Engineer.

END OF SECTION

July 11, 2016

SECTION 02835S

MSE WALLS USING MODULAR BLOCK UNITS AND METAL REINFORCING ELEMENTS

Add Section 02835:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and construction requirements for mechanically stabilized earth (MSE) walls using a wall system (see Section 02831S) approved by the Engineer using modular block units for the wall face and metal reinforcing elements.

B. Provide and install modular block wall units, metal reinforcement, joint filler, and all necessary attachments from the selected Wall Company.

1.2 RELATED SECTIONS

A. Section 02831S: Retaining Wall- Alternate Systems

B. Section 02832S: Select Backfill for MSE Walls

C. Section 03055: Portland Cement Concrete

D. Section 03211: Reinforcing Steel and Welded Wire

E. Section 03310: Structural Concrete

1.3 REFERENCES

A. ASTM C 140: Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units

B. ASTM C 331: Standard Specification for Lightweight Aggregates for Concrete Masonry Units

C. ASTM C 1262: Standard Test Method for Evaluating the Freeze-Thaw Durability of Dry-Cast Segmental Retaining Wall Units and Related Concrete Units

D. ASTM C 1372: Standard Specification for Dry-Cast Segmental Retaining Wall Units

E. ASTM D 5262: Standard Test Method for Evaluating the Unconfined Tension Creep and Creep Rupture Behavior of Geosynthetics

F. ASTM D 6637: Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-rib Tensile Method

1.4 SUBMITTALS

A. Submit for acceptance at least 10 days before beginning manufacture of the concrete modular block units, a sample of the proposed block texture and at least three color samples of the proposed block units, matched to colors of local features or as otherwise indicated by the Engineer.

B. Provide the Engineer submittals in accordance with Section 02831S and the appropriate working drawings.

C. Do not start work on any wall until all required submittal items have been reviewed and approved by the Design-Builder's Engineers and all Department comments have been addressed.

D. Provide certificates of compliance from a UDOT-qualified testing lab, certifying that the select backfill, the modular block facing units, and the geogrid complies with this section, and the results of all tests performed for the tests described in this section.

E. Provide the Wall Company's construction manual for the specific wall system.

F. Certification from the Wall Company that the completed wall(s) meet all Department and Wall Company specifications/requirements for the specific wall system.
   1. Where the Department's and the Wall Company's specifications or requirements differ, apply the stricter of the two.

1.5 ACCEPTANCE

A. Modular Block Units and Cap Blocks: Meet 28-day compressive strength of 4000 psi.
   1. Do not transport block units to the site until:
      a. A minimum 28-day compressive strength of 4000 psi has been achieved.
      b. Regardless of strength gain, do not transport block units to the site before seven days after fabrication.

B. All modular block facing units and cap blocks to be visually free of defects and will be rejected for not meeting any of the requirements specified in article 2.1. In addition, any of the following defects will be cause for rejection:
   1. Defects that indicate imperfect molding.
   2. Defects indicating honeycomb or other open-texture concrete .
   3. Cracked or severely chipped block units.
   4. Color variation on exposed face(s) of block unit due to excess form oil or other reasons.

PART 2 PRODUCTS

2.1 CONCRETE MODULAR BLOCK UNITS

A. Meet the following requirements for drycast concrete block units and cap blocks:

   1. Have a minimum 28-day compressive strength of 4,000 psi in accordance with ASTM C 140.
   2. Conform to ASTM C 1372, except as otherwise specified.
   3. Conform to the following freeze-thaw test requirements for the lot of block units produced for use in this project in accordance with ASTM C 1262.
      a. Minimum acceptable performance defined as weight loss at the conclusion of 150 freeze-thaw cycles not exceeding 1 percent of the block unit's initial weight for a minimum of 4 of the 5 block unit specimens tested.
      b. Per Engineer's approval, Project specific freeze-thaw durability tests may be substituted by the tests of units made with the same material, concrete mix design, manufacturing process, and curing method, conducted not more than 12 months prior to delivery. An independent laboratory to provide reports and certifications of the above tests as per ASTM C 1262 and C 1372 as appropriate.
   4. Have a maximum water absorption in accordance with ASTM C 140 no greater than 1 percent above the water absorption content of the lot of block units produced and successfully tested for the freeze-thaw test specified in item 3 above for all concrete block units.
   5. Conform to ASTM C 140 for testing of drycast concrete block units.

B. Manufactured using a combination of cement, aggregates, admixtures, and other constituents meeting the requirements of Section 03055.

1. Verify the compatibility of all components and with the environment in which the block will be used, including sulfate soils and/or groundwater.
2. Lightweight aggregates are subject to the Engineer's approval and must meet the requirements of ASTM C 331.

C. Provide block units with permissible variations of plus 0.12 inch and minus 0.06 inch.

D. Provide block units having angled sides capable of producing concave and convex alignment curves with a minimum radius of 3.3 feet.

E. Provide block units having a polymeric efflorescence control admixture.

F. Finish and Appearance
1. All units to be sound and free from cracks or other defects that would interfere with the proper placement of the unit or significantly impair the strength or permanence of the construction.
2. Minor cracks incidental to the usual method of manufacture or minor chipping resulting from shipment and delivery are not grounds for rejection.
3. Assure the exposed face or faces of units are free of chips, cracks or other imperfections when viewed from a distance of 30 feet under diffused lighting.
4. Up to five percent of a shipment may contain slight cracks or small chips not longer than 1 inch.

G. Notify the Engineer in writing at least 72 hours before beginning the casting of concrete modular block units.

H. Sampling
1. Acceptance of the concrete units with respect to compressive strength will be determined on a lot-by-lot basis.
   a. Randomly sample the lot in accordance with ASTM C 140. Core compressive strength test specimens or conform to the saw-cut coupons provisions of Section 5.2.4 of ASTM C 140. Refer to Table 1 for sampling frequency.

Table 1

Lot Size	**Samples**
0-8,000	3 units
Greater than 8,000	2 additional units per additional 8000

2. Provide additional samples if required by the Engineer.

I. Acceptance
   1. Units will be rejected for not meeting any of the requirements specified above. In addition, any of the following defects will be cause for rejection:
      a. Defects that indicate imperfect molding.
      b. Defects indicating honeycomb or open-texture concrete.
      c. Cracked or severely chipped units.
      d. Color variation on exposed face(s) of unit due to excess form oil or other reasons.

2.2 LEVELING PAD CONCRETE

A. Use Class AA, A or B concrete mixes in accordance with Section 03055.

2.3 MODULAR BLOCK-UNIT FILL

A. Use free-draining crushed stone, 3/8 to 3/4-inch within the modular block units requiring fill material.

2.4 REINFORCING ELEMENTS

A. Hot rolled from steel bars, galvanize coated 3.4 mils thick, meeting minimum requirements of ASTM D1784, Grade 65; AASHTO M-111 and ASTM A-123.

B. To be the specified size (see 02831S, article 1.1E-1) and free from defects.

2.5 REINFORCED WELDED WIRE MESH AND LOOP INBEDS

A. Meet minimum requirements of AASHTO M-32 and AASHTO M-55; and have galvanized coating 3.4 mils thick as per AASHTO M-111 (ASTM A-123).

2.6 FIBERGLASS AND STEEL PINS

A. Provide ½ inch diameter fiberglass connecting pins, where used, having a minimum flexural strength of 128 ksi and short beam shear of 6.5 ksi.

B. Provide steel connecting pins galvanized coated 3.4 mils thick, meeting Wall Company requirements.

2.7 OTHER FASTENERS

A. Fasteners to wingwalls and abutment wall, if required, to be provided by the selected Wall Company.

2.8 DAMAGED GALVANIZATION

A. Spray with zinc paint, covering the entire area that has been damaged, as an alternative to replacement of any reinforcing steel, reinforcing elements, wire mesh or fasteners that have damaged galvanization.

2.9 GEOTEXTILE

A. Cover horizontal and vertical joints between block units by a geotextile of the type and grade recommended by the Wall Company.

2.10 WALL CAP ADHESIVE

A. Use a medium-viscosity synthetic elastomeric polymer adhesive, such as “Titebond Heavy Duty Construction Adhesive”, or Engineer approved equivalent.

2.11 SELECT BACKFILL

A. Refer to Section 02832S- Select Backfill for MSE Walls.

PART 3 EXECUTION

3.1 GENERAL

A. Arrange for a qualified representative (minimum 5 years experience with MSE wall design and construction) from the selected Wall Company to be directly involved and provide technical assistance during all phases of construction of the wall(s).
   1. The Wall Company representative is to be at the project site for at least the first five working days of wall construction and until all aspects of wall construction have been satisfactorily demonstrated to the MSE Wall Company representative and the Engineer. The MSE Wall Company representative is to subsequently visit the site at least once every 10,000 sq. ft. of wall face construction, or as otherwise determined by the Engineer.
   2. The Wall Company representative is responsible for training the Contractor’s wall construction crew(s) and Department inspectors in proper quality control for construction of the walls.
      a. If one or more construction crew members change, the Wall Company representative is responsible to train the new crew member(s).
   3. During each site visit, the representative is to meet with the Engineer near the conclusion of the visit to report on the observed

wall construction procedures, including providing a copy of the field report.

B. Provide the Wall Company's construction manual to the Engineer, and assure that the wall system-specific requirements in the manual are integrated into the wall construction.

C. Provide a final field observations report from the Wall Company that specifically addresses that the completed wall(s) meet all Department and Wall Company specifications/requirements and what deficiencies exist, if any.
   1. Where the Department's and the Wall Company's specifications/requirements differ, the stricter of the two requirements applies.

D. Haul, store and ship wall materials so as to minimize the potential of producing any type of defects.

E. Perform excavation and foundation preparation (including removal of unsuitable soils) as described in Section 02832S.

F. Construct the wall system in accordance with the approved plans, this specification, and the Wall Company's recommendations and construction manual.

3.2 LEVELING PAD

A. Prepare the subgrade soils and/or fill so as to cast the leveling pad to the design elevations shown on the drawings to ensure complete contact of the retaining wall units with the base.

B. Place cast-in-place concrete leveling pad upon undisturbed in-situ soils or upon properly placed and compacted fill as per Section 02832S.

C. Place leveling pad to a minimum thickness of 6 inches.

D. Placement requirements in accordance with Section 03055.

E. Allow leveling pad to cure for at least 12 hours before placing modular block units.

3.3 MODULAR BLOCK UNIT INSTALLATION

A. Place wall backfill as described in Section 02832S.

B. Place the first course of modular block units on the leveling pad. Check the wall units for level and alignment. The first course is the most important to ensure accurate and acceptable results.

C. Ensure block units are in full contact with the leveling pad.

D. Install connecting devices in block units as required by the Wall Company.

E. For block units requiring fill material, fill all voids in block units with modular block unit fill. Tamp fill. Ensure each wall course is completely filled, backfilled, and compacted before proceeding to the next wall course.

F. Where connecting pins are used, lay up each course ensuring connecting pins protrude into adjoining courses above at least 1 inch.

G. Pull each block unit forward, away from the embankment, against connecting pins in the previous course and backfill as the course is completed. Repeat procedure to the extent of the wall height.

H. As appropriate where the wall changes elevation, the units can be stepped with grade or turned into the embankment with a convex return end. Provide appropriate buried units on the compacted leveling pad in the area of the convex return end.

I. Wall alignment tolerances.
1. Horizontal alignment: 0.7 percent (for example 2.5 inches in 30 feet).
2. Vertical tolerance: 0.7 percent (for example 0.85 inches in 10 feet).
3. Overall vertical tolerance of the wall (plumbness from top to bottom): 0.7 percent (for example 1.7 inches in 20 feet of wall height).
4. Levelness tolerance: 0.5 percent (for example 1.2 inches in 20 feet).

J. Install block units so that joints are uniform.
1. During construction the maximum allowable offset in any block joint is 0.25 inch.
2. Joint width is 0.50 inch maximum and 0.12 inch minimum.

3.4 STEEL SOIL REINFORCEMENT INSTALLATION

A. Lay the steel reinforcement horizontally on the compacted backfill at the proper elevations as designed.

B. Connect steel reinforcement to the block units as required by Wall Company.

C. Pull the reinforcement taut to eliminate any slack; then secure the back edge of the reinforcement before and during backfilling and compaction.

D. Assuming reinforcement is obstructed by elements such as piles, drilled shafts, guardrail posts, catch basins, drop inlets, culverts, etc. in the wall soil reinforcement zone, modify the reinforcement design using one of the following alternatives:
   1. If reinforcement is modified, design the surrounding reinforcement layers to carry the additional load.
   2 Place a structural frame around the obstruction which is capable of transferring loads from the reinforcements on one side of the obstruction to reinforcements on the other side of the obstruction.
   3. If the soil reinforcement consists of discrete strip or bar mats rather than continuous sheets, splay the reinforcements around the obstruction.

E. Place soil reinforcement normal to the face of the wall in plan view.
   1. Where required to splay the reinforcement around obstructions, skew the reinforcement (minimizing the skew angle to no more than 15 degrees).
   2. Maintain a set-back for reinforcement of at least 2 inches from piles or other metallic obstructions. Do not exceed horizontal spacing between longitudinal reinforcement of 7 feet.
   3. Separate any overlapping soil reinforcement elements with a minimum thickness of select backfill specified by the Wall Company.

3.5 WALL CAP INSTALLATION

A. Provide a permanent connection between the wall cap and the top course of the wall units using wall cap adhesive as described in article 2.10. Construct according to the Wall Company drawings and specifications.

3.6 CERTIFICATES OF COMPLIANCE

A. Furnish to the Engineer copies of the certificate of compliance for materials and the results of any tests performed.

END OF SECTION

July 11, 2016

SECTION 02836S

MSE WALLS USING MODULAR BLOCK UNITS AND GEOGRID REINFORCING ELEMENTS

Add Section 02836:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and construction requirements for mechanically stabilized earth (MSE) walls using a wall system (see Section 02831S) approved by the Engineer using modular block units for the wall face and geogrid reinforcing elements.

B. Provide and install modular block units, geogrid reinforcement, joint filler, and all necessary attachments from the selected Wall Company.

1.2 RELATED SECTIONS

A. Section 02831S: Retaining Wall-Alternate Systems

B. Section 02832S: Select Material for MSE Walls

C. Section 03055: Portland Cement Concrete

D. Section 03211: Reinforcing Steel and Welded Wire

E. Section 03310: Structural Concrete

1.3 REFERENCES

A. ASTM C 140: Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units

B. ASTM C 331: Standard Specification for Lightweight Aggregates for Concrete Masonry Units

C. ASTM C 1262: Standard Test Method for Evaluating the Freeze-Thaw Durability of Dry-Cast Segmental Retaining Wall Units and Related Concrete Units

D. ASTM C 1372: Standard Specification for Dry-Cast Segmental Retaining Wall Units

E. ASTM D 5262: Standard Test Method for Evaluating the Unconfined Tension Creep and Creep Rupture Behavior of Geosynthetics

F. ASTM D 6637: Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-rib Tensile Method

1.4 SUBMITTALS

A. Submit for acceptance at least 10 days before beginning manufacture of the concrete modular block units, a sample of the proposed block texture and at least three color samples of the proposed block units, matched to colors of local features or as otherwise indicated by the Engineer.

B. Provide the Engineer submittals in accordance with Section 02831S and the appropriate working drawings.

C. Do not start work on any wall until all required submittal items have been reviewed and approved by the Design-Builder's Engineers and all Department comments have been addressed.

D. Provide certificates of compliance from a UDOT-qualified testing lab, certifying that the select backfill, the modular block facing units, and the geogrid complies with this section, and the results of all tests performed for the tests described in this section.

E. Provide the Wall Company's construction manual for the specific wall system.

F. Certification from the Wall Company that the completed wall(s) meet all Department and Wall Company specifications/requirements for the specific wall system.
   1. Where the Department's and the Wall Company's specifications or requirements differ, apply the stricter of the two.

1.5 ACCEPTANCE

A. Modular Block Units and Cap Blocks: Meet 28-day compressive strength of 4000 psi.
   1. Do not transport block units to the site until:
      a. A minimum 28-day compressive strength of 4000 psi has been achieved
      b. Regardless of strength gain, do not transport block units to the site before seven days after fabrication.

B. All modular block facing units and cap blocks to be visually free of defects and will be rejected for not meeting any of the requirements specified in article 2.1. In addition, any of the following defects will be cause for rejection:
   1. Defects that indicate imperfect molding.
   2. Defects indicating honeycomb or other open-texture concrete .
   3. Cracked or severely chipped block units.
   4. Color variation on exposed face(s) of block unit due to excess form oil or other reasons.

C. Geogrid: Free of defects and will be rejected if it does not meet the requirements stated in article 2.3.

PART 2 PRODUCTS

2.1 CONCRETE MODULAR BLOCK UNITS

A. Meet the following requirements for drycast concrete modular block units and cap blocks:
   3. Have a minimum 28-day compressive strength of 4,000 psi in accordance with ASTM C 140.
   4. Conform to ASTM C 1372, except as otherwise specified.
   5. Conform to the following freeze-thaw test requirements for the lot of block units produced for use in this project in accordance with ASTM C 1262.
      a. Minimum acceptable performance defined as weight loss at the conclusion of 150 freeze-thaw cycles not exceeding 1 percent of the block unit's initial weight for a minimum of 4 of the 5 block unit specimens tested.
      b. Per Engineer's approval, Project specific freeze-thaw durability tests may be substituted by the tests of units made with the same material, concrete mix design, manufacturing process, and curing method, conducted not more than 12 months prior to delivery. An independent laboratory to provide reports and certifications of the above tests as per ASTM C 1262 and C 1372 as appropriate.
   4. Have a maximum water absorption in accordance with ASTM C 140 no greater than 1 percent above the water absorption content of the lot of block units produced and successfully tested for the freeze-thaw test specified in item 3 above for all concrete block units.
   5. Conform to ASTM C 140 for testing of drycast concrete block units.

B. Provide concrete block manufactured using a combination of cement, aggregates, admixtures, and other components meeting the requirements of Section 03055.
   1. Verify the compatibility of all components and the environment in which the block will be used, including sulfate soils and/or groundwater.
   2. Lightweight aggregates are subject to the Engineer's approval and must meet the requirements of ASTM C 331.

C. Provide block units with permissible variations of plus 0.12 inch and minus 0.06 inch.

D. Provide block units having angled sides capable of producing concave and convex alignment curves with a minimum radius of 4 feet.

E. Provide block units having a polymeric efflorescence control admixture.

F. Finish and Appearance
   1. All block units to be sound and free from cracks or other defects that would interfere with the proper placement of the unit or significantly impair the strength or permanence of the construction.
   2. Minor cracks incidental to the usual method of manufacture or minor chipping resulting from shipment and delivery are not grounds for rejection.
   3. Assure the exposed face or faces of units are free of chips, cracks or other imperfections when viewed from a distance of 30 feet under diffused lighting.
   4. Up to five percent of a shipment may contain slight cracks or small chips not longer than 1 inch.
   5. The faces of the exposed corner facing block units to have the same approved architectural finish as the main face.

G. Notify the Engineer in writing at least 72 hours before beginning the casting of concrete modular block units.

H. Sampling
   1. Acceptance of the block units with respect to compressive strength will be determined on a lot-by-lot basis.
      a. Randomly sample the lot in accordance with ASTM C 140. Core compressive strength test specimens or conform to the saw-cut coupons provisions of Section 5.2.4 of ASTM C 140. Refer to Table 1 for sampling frequency.

Table 1

Lot Size	Samples
0-8,000	3 units
Greater than 8,000	2 additional units per additional 8000

2. Provide additional samples if required by the Engineer.

2.2 LEVELING PAD CONCRETE

A. Use Class AA, A ,or B concrete mix as per Section 03055.

2.3 GEOGRID

A. Use geogrid consisting of a regular grid network of integrally connected, discontinuous, select high-density polyethylene, polypropylene resin polymer or polyester tensile elements (specified for wall system selected) with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil and/or rock.
   1. Geogrid structure to be dimensionally stable and be able to retain its geometry under manufacture, transport, and installation.

B. Provide creep rupture test for 75-year design life per ASTM D5262.

C. Provide ultimate strength, minimum per ASTM D6637 and utilize geogrid reinforcement reduction factors as appropriate for the Project.

D. Inspect all soil reinforcement and attachment devices to ensure they are true to size and free from defects that may impair their strength and durability.

E. Prevent mud, wet concrete, epoxy and similar contaminants from coming in contact with and affixing to the soil reinforcement and inserts, that would interfere with the geogrid connections.

F. Store soil reinforcement products as recommended by the Wall Company.

2.4 FIBERGLASS PINS

A. If required, provide ½-inch diameter fiberglass connecting pins having a minimum flexural strength of 128 ksi and short beam shear of 6.5 ksi.

2.5 OTHER FASTENERS

A. If required, provide fasteners to wingwalls and abutment wall from the selected Wall Company.

2.6 SELECT BACKFILL

A. Refer to Section 02832S- Select Backfill for MSE Walls.

2.7 MODULAR BLOCK UNIT FILL

A. Use free-draining crushed stone, predominantly 3/8 to 3/4-inch, with no more than 5 percent passing the No 200 sieve, within the modular block units requiring fill material.

2.8 GEOTEXTILE

A. Cover horizontal and vertical joints between block units by a geotextile of the type and grade as recommended by the Wall Company.

2.9 WALL CAP ADHESIVE

A. Use a medium-viscosity synthetic elastomeric polymer adhesive, such as “Titebond Heavy Duty Construction Adhesive”, or Engineer-approved equivalent.

PART 3 EXECUTION

3.1 GENERAL

A. Arrange for a qualified representative (minimum 5 years experience with MSE wall design and construction) from the selected Wall Company to be directly involved and provide technical assistance during all phases of construction of the wall(s).
   1. The Wall Company representative is to be at the project site for at least the first five working days of wall construction and until all aspects of wall construction have been satisfactorily demonstrated to the MSE Wall Company representative and the Engineer. The MSE Wall Company representative is to subsequently visit the site at least once every 10,000 sq ft of wall face construction, or as otherwise determined by the Engineer.
   2. The Wall Company representative is responsible for training the Contractor’s wall construction crew(s) and Department inspectors in proper quality control for construction of the walls.
      a. If one or more construction crew members change, the Wall Company representative is responsible to train the new crew member(s).
   3. During each site visit, the representative is to meet with the Engineer near the conclusion of the visit to report on the observed

wall construction procedures, including providing a copy of the field report.

B. Provide the Wall Company's construction manual to the Engineer, and assure that the wall system-specific requirements in the manual are integrated into the wall construction.

C. Provide a final field observations report from the Wall Company that specifically addresses that the completed wall(s) meet all Department and Wall Company specifications/requirements and what deficiencies exist, if any.
   1. Where the Department's and the Wall Company's specifications/requirements differ, apply the stricter of the two requirements.

D. Perform excavation and foundation preparation (including removal of unsuitable soils) as described in Section 02832S.

E. Construct the wall system in accordance with the approved plans, this specification, and the Wall Company's recommendations and construction manual.

3.2 LEVELING PAD

A. Prepare the subgrade soils and/or fill so as to cast the leveling pad to the design elevations shown on the drawings, to ensure complete contact of the retaining wall units with the base.

B. Place cast-in-place concrete leveling pad as per Section 03055 upon undisturbed in-situ soils, or upon properly placed and compacted fill as per Section 02832S.

C. Place leveling pad to a minimum thickness of 6 inches.

D. Placement requirements in accordance with Section 03055.

E. Allow leveling pad to cure for at least 12 hours before placing modular block units.

3.3 MODULAR BLOCK UNIT INSTALLATION

A. Place wall backfill as described in Section 02832S.

B. Place the first course of modular block units on the leveling pad. Check the wall units for level and alignment. The first course is the most important to ensure accurate and acceptable results.

C. Ensure block units are in full contact with the leveling pad.

D. Install connecting devices in block units if required by the Wall Company.

E. For block units requiring fill material, fill all voids in block units with modular block unit fill. Tamp fill. Ensure each wall course is completely filled, backfilled, and compacted before proceeding to the next wall course.

F. Where connecting pins are used, ensure connecting pins protrude into adjoining courses above at least 1 inch.

G. Pull each block unit forward, away from the embankment, against connecting devices in the previous course and backfill as the course is completed. Repeat procedure to the extent of the wall height.

H. As appropriate where the wall changes elevation, the units can be stepped with grade or turned into the embankment with a convex return end. Provide appropriate buried units on the compacted leveling pad in the area of the convex return end.

I. Wall alignment tolerances.
1. Horizontal alignment: 0.7 percent (for example 2.5 inches in 30 feet).
2. Vertical tolerance: 0.7 percent (for example 0.85 inches in 10 feet).
3. Overall vertical tolerance of the wall (plumbness from top to bottom): 0.7 percent (for example 1.7 inches in 20 feet of wall height).
4. Levelness tolerance: 0.5 percent (for example 1.2 inches in 20 feet).

J. All joints to be uniform.
1. During construction the maximum allowable offset in any block joint is 0.25 inch.
2. Joint width is 0.50 inch maximum and 0.12 inch minimum.

3.4 GEOGRID INSTALLATION

A. Verify the correct orientation (roll direction) of the geogrid.

B. Lay the geogrid soil reinforcement horizontally on the compacted backfill at the proper elevations as designed.

C. Connect geogrid to the concrete wall units as required by Wall Company.

D. Pull the geogrid taut to eliminate loose folds and removing slack in the geogrid at the wall unit connections, pretension the geogrid, and then stake or otherwise secure the back edge of the geogrid before and during backfill and compaction.

E. Follow the Wall Company's guidelines relative to overlap requirements of uniaxial and biaxial geogrid.
   1. Assuming reinforcement is obstructed by elements such as piles, drilled shafts, guardrail posts, catch basins, drop inlets, culverts, etc. in the wall soil reinforcement zone, modify the reinforcement design using one of the following alternatives:
   2. If reinforcement is modified, design the surrounding reinforcement layers to carry the additional load.
   3. Place a structural frame around the obstruction which is capable of transferring loads from the reinforcements on one side of the obstruction to reinforcements on the other side of the obstruction.

3.5 WALL CAP INSTALLATION

A. Provide a permanent connection between the wall cap and the top course of the block units using wall cap adhesive as described in article 2.9. Construct according to the Wall Company drawings and specifications.

3.6 CERTIFICATES OF COMPLIANCE

A. Furnish to the Engineer copies of the certificate of compliance for materials and the results of any tests performed.

END OF SECTION

July 11, 2016

SECTION 02837S

TWO-STAGE MSE WALLS USING CONCRETE FACING PANELS AND METAL REINFORCING ELEMENTS

Add Section 02837S:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and construction requirements for two-stage mechanically stabilized earth (MSE) walls using a wall system (refer to Section 02831S) approved by the Engineer using concrete facing panels and metal reinforcing elements.

B. Provide and install face panels, reinforcing steel, tie strips, fasteners, joint filler, select backfill, and all necessary attachments from the selected Wall Company.

1.2 RELATED SECTIONS

A. Section 02831S: Retaining Wall-Alternate Systems

B. Section 02832S: Select Backfill for MSE Walls

C. Section 03055: Portland Cement Concrete

D. Section 03211: Reinforcing Steel and Welded Wire

E. Section 03310: Structural Concrete

F. Section 03390: Concrete Curing

G. Section 03924: Epoxy Injection and Sealing

1.3 REFERENCES

A. AASHTO M 111: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

B: AASHTO M 232: Zinc Coating (Hot-Dip) on Iron and Steel Hardware

C. ASTM A 325: Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

D. ASTM A 572: High-Strength Low-Alloy Columbium-Vanadium Structural Steel

E. ASTM A 709M: Structural Steel for Bridges

F. ASTM A 1011: Standard Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

G. UDOT Quality Management Plans

1.4 SUBMITTALS

A. Submit sample of the texture of the panel face for the Engineer's approval.

B. Provide submittals in accordance with Section 02831S and working drawings including design details which protect the reinforcement connections from corrosion.

C. Do not start work on any wall until working drawings have been reviewed and approved by the Design-Builder's Engineers and all Department comments have been addressed.

D. Certificate of compliance for incorporated materials along with copies of results of any tests performed.

E. Wall Company's construction manual for the specific wall system.

F. Certification from the Wall Company that the completed wall(s) meet all Department and Wall Company specifications/requirements for the specific wall system.
   1. Where the Department's and the Wall Company's specifications or requirements differ, apply the stricter of the two.

1.5 ACCEPTANCE

A. Panel Acceptance
   1. Meet 28-day minimum compressive strength of 4000 psi.
   2. Do not transport panels to the site before seven days after fabrication and until:
      a. A minimum 28-day compressive strength of 4000 psi has been achieved, or

b. A minimum compressive strength of 3000 psi has been achieved at 14 days.

3. All panels to be visually free of defects and will be rejected if they:
   a. Do not meet the above requirements.
   b. Contain defects due to imperfect molding.
   c. Have any honeycomb.
   d. Have open texture on front face.
   e. Have cracks or spalls that exceed the limits specified in article 3.4

PART 2 PRODUCTS

2.1 PRECAST CONCRETE WALL PANELS

A. Obtain approval from the Engineer for the architectural treatment for all MSE panel walls.

B. Concrete. Class AA(AE) per Section 03055 and Section 03310, having a minimum 28-day compressive strength of 4000 psi.

C. Reinforcing steel to have a minimum cover of 2.0 inches.

D. Casting
   1. Use only a UDOT qualified supplier for precast concrete panel fabrication in accordance with UDOT Precast/Prestressed Concrete Structures Quality Management Plan.
      a. Do not cast panels on site.
   2. Cast panels on a flat area or approved architectural treatment, with the front face down.
      a. Set tie strip guides at back face.
   3. Place concrete in each unit without interruption.
      a. Vibrate with approved equipment to prevent stone pockets or cleavage planes.
      b. Use clean, unused form oil.

E. Reinforcement Connections
   1. Cast at least two soil reinforcement connection levels into all concrete panels.
      a. Where only two connection levels are cast in panels, locate the levels in two different horizontal planes separated by at least one-third the panel height.

F. Curing
   1. Keep surfaces wet and moist until the curing compound is applied.

2. Complete all patching or surface finishing before applying compound.
3. Spray the entire surface of the concrete with a membrane curing compound. Apply the curing compound at a uniform rate of 1.25 oz/ft^2.
4. Immediately re-spray any membrane damage which occurs during the curing period.
5. Leave forms in place until they can be removed without damage to the unit.

G. Concrete Finish
1. Provide a Class 1 finish for front face of panels.
   a. The thickness of the architectural treatment is in addition to the required design thickness.
2. Provide a uniform surface finish for the back face of panels.
   a. Roughly screen the finish to eliminate open pockets of aggregate and surface distortions in excess of 1/4 inch.

H. Tolerances
4. All dimensions ± 1/8 inch.
5. Angular distortion with regard to the height of panel not to exceed 3/16 inch in 5 feet.
6. Surface defects on form surfaces not more than 1/8 inch in 5 feet.

I. Marking
1. Mark the date of manufacture and panel-type designation on the rear of each panel so that it is legible during installation.

2.2 REINFORCING STEEL

A. Epoxy coated in accordance with Section 03211.

2.3 LEVELING PAD CONCRETE

A. Class A or Class B concrete mixes in accordance with Section 03055.

2.4 REINFORCING ELEMENTS

A. Hot rolled from steel bars, galvanize coated 3.4 mils thick, meeting minimum requirements of ASTM A 572, Grade 65; AASHTO M 111.

B. All reinforcing elements to be the specified size and free from defects.

2.5 REINFORCED WELDED WIRE MESH AND LOOP INBEDS

A. Meet minimum requirements of Section 03211 with galvanized coating at least 3.4 mils thick.

2.6 WIRE FACING UNITS

A. Wire facing units to be shop fabricated of cold-drawn steel wire conforming to the minimum requirements of AASHTO M-32 (ASTM A-182) and welded into the finished configuration in accordance with AASHTO M-55 (ASTM A-185). Galvanizing to conform to the minimum requirements of AASHTO M-111 (ASTM A-123).

2.7 TIE STRIPS

A. Shop fabricated, hot rolled steel conforming to minimum requirements of ASTM A 709M, Grade 345; AASHTO M 111; and ASTM A 1011 Grade 345 or equivalent, galvanize coated at least 3.4 mils thick.

2.8 PANEL FASTENERS

A. Bolts and nuts to be hexagonal cap screw and galvanize coated, meeting minimum requirements of ASTM A 325 and AASHTO M 232.

2.9 OTHER FASTENERS

A. Fasteners to wingwalls and abutment walls, if required, to be provided by the Wall Company.

2.10 CONNECTOR RODS

A. Connector rods to be fabricated from cold-drawn steel wire conforming to the minimum requirements of AASHTO M-32 (ASTM A-82); and be galvanized in accordance with AASHTO M-111 (ASTM A-123).

2.11 HAIRPIN CONNECTORS

A. Hairpin connectors to be shop fabricated of hot-rolled steel conforming to the minimum requirements of ASTM A-572, Grade 345 or equivalent; and be galvanized in accordance with AASHTO M-111 (ASTM A-123).

2.12 DAMAGED GALVANIZATION

A. Spray with zinc paint, covering the entire area that has been damaged, as an alternative to replacement of any reinforcing steel, reinforcing elements, wire mesh or fasteners that have damaged galvanization.

2.13 CURING COMPOUND

A. Refer to Section 03390

2.14 GEOTEXTILE

A. Cover horizontal and vertical joints between panels, when required, by a geotextile of type and grade recommended by the Wall Company.

2.15 ADHESIVE

A. Per Wall Company's standard.

2.16 BEARING PADS

A. Horizontal rubber bearing pads to be of the type and grade recommended and supplied by the Wall Company.

2.17 LIFTING DEVICES

A. Per Wall Company's standard.

2.18 SELECT BACKFILL

A. Refer to Section 02832S.

2.19 MATERIALS FOR CRACK AND SPALL REPAIR

A. Refer to Section 03924.

PART 3 EXECUTION

3.1 GENERAL

A. Arrange for a qualified representative (minimum five years experience with MSE wall design and construction) from the selected Wall Company to be directly involved and provide technical assistance during all phases of construction of the wall(s).
   1. For both the first and second stage of wall construction, the Wall Company representative is to be at the project site for at least the first five working days of wall construction and until all aspects of wall construction have been satisfactorily demonstrated to the MSE Wall Company representative and the Engineer. The MSE Wall Company representative is to subsequently visit the site at least

once every 10,000 sq. ft. of wall face construction, or as otherwise determined by the Engineer.

2. The Wall Company representative is responsible for training the Contractor's wall construction crew(s) and Department inspectors in proper quality control for construction of the walls.
    a. If one or more construction crew members change, the Wall Company representative is responsible to train the new crew member(s).
3. During each site visit, the representative is to meet with the Engineer near the conclusion of the visit to report on the observed wall construction procedures, including providing a copy of the field report.

B. Provide the Wall Company's construction manual to the Engineer, and assure that the wall system-specific requirements in the manual are integrated into the wall construction.

C. Provide a final field observations report from the Wall Company that specifically addresses that the completed wall(s) meet all Department and Wall Company specifications/requirements and what deficiencies exist, if any.
1. Where the Department's and the Wall Company's specifications/requirements differ, apply the stricter of the two requirements.

D. Haul, store, and ship wall materials so as to minimize the potential of producing any type of defects.
1. Store panels to avoid damage to connection pieces such that the tie strips do not bend.

E. Perform excavation and foundation preparation (including removal of unsuitable soils) as specified in Section 02832S.

F. Construct wall system in accordance with the approved plans, specifications, and the Wall Company's recommendations and construction manual.

3.2 LEVELING PAD

A. Prepare the subgrade soils and/or fill so as to cast the leveling pad or reinforced concrete footing to the design elevations shown on the drawings and to ensure complete contact of the retaining wall units with the base.

B. Furnish and place concrete in accordance with Section 03055.

C. Place cast-in-place concrete leveling pad upon undisturbed in-situ soils, or upon properly placed and compacted fill as per Section 02832S. Place leveling pad to a thickness of at least 6 inches after the required settlement has been achieved following the first-stage wall construction.

D. Allow leveling pad to cure for at least 12 hours before placing concrete panels.

3.3 WALL CONSTRUCTION

A. Place wall backfill and reinforcement for two-stage MSE walls as specified in Section 02832S, and in the Wall Company's Approved-for-Construction drawings.

B. Backfill the void behind the first-stage facing by placing the backfill in two approximately equal lifts, and compacting with lightweight equipment in accordance with Section 02832S.

C. Placement of Select Material as wall backfill to closely follow the erection of each course of wire facing units.

D. Place backfill in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the wire facing units.

E. Where reinforcement is obstructed by elements such as piles, drilled shafts, guardrail posts, catch basins, drop inlets, culverts, etc. in the wall soil reinforcement zone, modify the reinforcement design using one of the following alternatives:

1. If the reinforcement is modified, design the surrounding reinforcement layers to carry the additional load.
2. Place a structural frame around the obstruction which is capable of transferring loads from the reinforcements on one side of the obstruction to reinforcements on the other side of the obstruction.
3. If the soil reinforcement consists of discrete strips or bar mats rather than continuous sheets, splay the reinforcement around the obstruction.

F. Place soil reinforcement elements normal to the face of the wall in plan view.

1. Where required to splay the reinforcement around obstructions, skew the reinforcement (minimizing the skew angle to no more than 15 degrees).
   a. Maintain a set-back for reinforcement of at least 2 inches from piles or other metallic obstructions.

2. Do not exceed horizontal spacing between longitudinal reinforcing of 7 feet.
3. Separate any overlapping soil reinforcing elements with a minimum thickness of select backfill specified by the Wall Company.

G. Where reinforcement elements are to be connected using bolts and nuts, use a crescent or socket-head ratchet wrench to securely hand-tighten the nut.
   1. Do not use pneumatic equipment.

H. Construct the first-stage facing within 2 inches of the design vertical and horizontal alignments (excluding bulging).

I. Prevent significant bulging of the first-stage facing between reinforcing layers.
   1. Where bulging exceeds 3 inches between reinforcing layers, remove and reconstruct this portion of the wall.
   2. Bulging will be measured by a plumb straight-edge, or by using a plumb-bob string held in front of the wall face.
   3. The bulge measurement is the difference in the horizontal measurement from the straight edge or plumb-bob string to the location of maximum bulge and the reinforcement layer immediately above or below the budge (whichever is greater).

J. Proceed with placement of the second stage wall panels after confirmation is given by the Engineer that the required settlement has been achieved.

K. Handle panels by means of lifting device set into upper edge of the panels and set in position vertically.

L. Place bearing pads as required by the Wall Company to prevent concrete-to-concrete contact between panels.

M. Use rubber, wood, or metal shims as necessary to make final adjustments to the wall panel to facilitate level placement of the panel.
   1. Do not leave wood shims at any location.

N. Construct to and maintain wall facing tolerances as follows:
   1. Horizontal alignment: 0.7 percent (for example 2.5 inches in 30 feet)
   2. Vertical tolerance: 0.7 percent (for example 0.85 inches in 10 feet)
   3. Overall vertical tolerance (plumbness from top to bottom): 0.7 percent (for example 1.7 inches in 20 feet of wall height)
   4. Levelness: 0.5 percent (for example 1.2 inches in 20 feet)

O. Install panels so that joints are uniform. The maximum allowable offset in any panel joint is 0.40 inch. Joint width is 1.2 inches maximum and 0.50 inch minimum.

P. Check panel tolerance and reset before placement of the next panel if out of tolerance.

3.4 CRACK AND SPALL REPAIR CRITERIA FOR CONCRETE PANELS

G. A fully penetrating crack is defined as a crack extending through the cross-section of the precast panel from the front face to the back face of the unit.

H. Cracks at Front Face of Panel:
1. Panels with one or two partially penetrating cracks with widths less than or equal to 12 mils are acceptable.
2. Reject panels with fully penetrating cracks, or cracks wider than 12 mils.
3. No more than two cracks per individual panel are allowed without further evaluation.

I. Cracks at Back Face of Panel:
1. Partially penetrating cracks with widths less than or equal to 12 mils are acceptable.
2. Partially penetrating cracks with widths between 12 mils and 30 mils are acceptable when repaired with surface sealant according to subparagraph F, Crack Repair Procedures.
3. Evaluate partially penetrating cracks wider than 30 mils for acceptance with epoxy injection according to subparagraph F, Crack Repair Procedures.
4. No more than two repairable cracks per individual panel are allowed without further evaluation.

J. Spalls at Front Face of Panel:
1. Spalls with widths less than 4.0 inches and depths less than 2.0 inches may be repaired with a patching material acceptable to the Engineer of the same color as panel concrete. Resultant repair to be approved by the Engineer.
2. Reject panels with spalls wider than 4.0 inches or deeper than 2.0 inches.
3. Measure spall depth from the structural thickness of the panel excluding architectural surface finish.
4. Panels with more than two spalls are subject to further evaluation before acceptance.

K. Spalls at Back Face of Panel:

1. Spalls with widths less than 4.0 inches and depths less than 2.0 inches may be repaired with a patching material acceptable to the Engineer. Resultant repair to be approved by the Engineer.
2. Reject panels with spalls wider than 4.0 inches or deeper than 2.0 inches.
3. Panels with more than four spalls are subject to further evaluation before acceptance.

L. Crack Repair Procedures:

1. Surface Sealing: Prepare surface and apply a sealant acceptable to the Engineer according to Manufacturer's instructions.
2. Epoxy Injection: Prepare surface and inject cracks with Department-approved product according to Manufacturer's instructions.

G. Spall Repair Procedures:

1. Prepare surface and apply patching material according to Manufacturer's instructions, and as acceptable to the Engineer.

END OF SECTION

July 11, 2016

SECTION 02838S

TWO-STAGE MSE WALLS USING CONCRETE FACING PANELS AND GEOGRID REINFORCING ELEMENTS

Add Section 02838S:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and construction requirements for two-stage mechanically stabilized earth (MSE) walls using a wall system (refer to Section 02831S) approved by the Engineer using concrete facing panels and geogrid reinforcing elements.

B. Provide and install face panels, reinforcing steel, geogrid, fasteners, joint filler, select backfill, and all necessary attachments from the selected Wall Company.

1.2 RELATED SECTIONS

A. Section 02831S: Retaining Wall-Alternate Systems

B. Section 02832S: Select Backfill for MSE Walls

C. Section 03055: Portland Cement Concrete

D. Section 03211: Reinforcing Steel and Welded Wire

E. Section 03310: Structural Concrete

F. Section 03390: Concrete Curing

G. Section 03924: Epoxy Injection and Sealing

1.3 REFERENCES

A. AASHTO M 32: Steel Wire, Plain, for Concrete Reinforcement

B. AASHTO M 55: Steel Welded Wire Reinforcement, Plain, for Concrete

C. AASHTO M 111: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

D: AASHTO M 232: Zinc Coating (Hot-Dip) on Iron and Steel Hardware

E. ASTM A 325: Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

F. ASTM A 572: High-Strength Low-Alloy Columbium-Vanadium Structural Steel

G. ASTM A 709M: Structural Steel for Bridges

H. ASTM A 1011: Standard Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

I. ASTM D5262: Standard Test Method for Evaluating the Unconfined Tension Creep and Creep Rupture Behavior of Geosynthetics

J. ASTM D6637: Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method

K. UDOT Quality Management Plans

1.4 SUBMITTALS

A. Submit sample of the texture of the panel face for the Engineer's approval.

B. Provide submittals in accordance with Section 02831S and working drawings including design details.

C. Do not start work on any wall until working drawings have been reviewed and approved by the Design-Builder's Engineers and all Department comments have been addressed.

D. Certificate of compliance for incorporated materials along with copies of results of any tests performed.

E. Wall Company's construction manual for the specific wall system.

F. Certification from the Wall Company that the completed wall(s) meet all Department and Wall Company specifications/requirements for the specific wall system.
   1. Where the Department's and the Wall Company's specifications or requirements differ, apply the stricter of the two.

1.5 ACCEPTANCE

A. Panel Acceptance
   1. Meet 28-day minimum compressive strength of 4000 psi.
   2. Do not transport panels to the site before seven days after fabrication and until:
      a. A minimum 28-day compressive strength of 4000 psi has been achieved, or
      b. A minimum compressive strength of 3000 psi has been achieved at 14 days.
   3. All panels to be visually free of defects and will be rejected if they:
      a. Do not meet the above requirements.
      b. Contain defects due to imperfect molding.
      c. Have any honeycomb.
      d. Have open texture on front face.
      e. Have cracks or spalls that exceed the limits specified in article 3.4

PART 2 PRODUCTS

2.1 PRECAST CONCRETE WALL PANELS

A. Obtain approval from the Engineer for the architectural treatment for all MSE panel walls.

B. Concrete. Class AA(AE) per Section 03055 and Section 03310, having a minimum 28-day compressive strength of 4000 psi.

C. Reinforcing steel to have a minimum cover of 2.0 inches.

D. Casting
   1. Use only a UDOT qualified supplier for precast concrete panel fabrication in accordance with UDOT Precast/Prestressed Concrete Structures Quality Management Plan.
      a. Do not cast panels on site.
   2. Cast panels on a flat area or approved architectural treatment, with the front face down.
      a. Set tie strip guides at back face.
   3. Place concrete in each unit without interruption.
      a. Vibrate with approved equipment to prevent stone pockets or cleavage planes.
      b. Use clean, unused form oil.

E. Reinforcement Connections

1. Cast at least two soil reinforcement connection levels into all concrete panels.
    a. Where only two connection levels are cast in panels, locate the levels in two different horizontal planes separated by at least one-third the panel height.

F. Curing
1. Keep surfaces wet and moist until the curing compound is applied.
2. Complete all patching or surface finishing before applying compound.
3. Spray the entire surface of the concrete with a membrane curing compound. Apply the curing compound at a uniform rate of 1.25 oz/ft^2.
4. Immediately re-spray any membrane damage which occurs during the curing period.
5. Leave forms in place until they can be removed without damage to the unit.

G. Concrete Finish
1. Provide a Class 1 finish for front face of panels.
    a. The thickness of the architectural treatment is in addition to the required design thickness.
2. Provide a uniform surface finish for the back face of panels.
    a. Roughly screen the finish to eliminate open pockets of aggregate and surface distortions in excess of 1/4 inch.

H. Tolerances
7. All dimensions ± 1/8 inch.
8. Angular distortion with regard to the height of panel not to exceed 3/16 inch in 5 feet.
9. Surface defects on form surfaces not more than 1/8 inch in 5 feet.

I. Marking
1. Mark the date of manufacture and panel type designation on the rear of each panel so that it is legible during installation.

2.2 REINFORCING STEEL

A. Epoxy coated in accordance with Section 03211.

2.3 LEVELING PAD CONCRETE

A. Class A or Class B concrete in accordance with Section 03055.

2.4 GEOGRID

A. Use geogrid consisting of a regular grid network of integrally connected, select high-density polyethylene or polypropylene resin polymer tensile elements.
   1. Aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil and/or rock.
   2. Structure to be dimensionally stable and be able to retain its geometry under manufacture, transport, and installation.

B. Provide creep rupture test for 75-year design life per ASTM D5262.

C. Provide ultimate strength, minimum per ASTM D6637 and utilize geogrid reinforcement reduction factors as appropriate for the Project.

D. Carefully inspect all soil reinforcement and attachment devices to ensure they are true to size and free from defects.

E. Prevent mud, wet concrete, epoxy, and other contaminants from coming in contact with and affixing to the soil reinforcement and inserts, that would interfere with the geogrid connections.

F. Store soil reinforcement products as recommended by the wall company.

2.5 REINFORCED WELDED WIRE MESH AND LOOP INBEDS

A. Meet minimum requirements of Section 03211 with galvanized coating at least 3.4 mils thick.

2.6 WIRE FACING UNITS

A. Wire facing units to be shop fabricated of cold-drawn steel wire conforming to the minimum requirements of AASHTO M-32 (ASTM A-182) and welded into the finished configuration in accordance with AASHTO M-55 (ASTM A-185). Galvanizing to conform to the minimum requirements of AASHTO M-111 (ASTM A-123).

2.7 FASTENERS

A. Fasteners to wingwalls and abutment walls, if required, to be provided by the Wall Company.

2.8 CONNECTOR RODS

A. If steel connector rods are required, fabricate from cold-drawn steel wire conforming to the minimum requirements of AASHTO M-32 (ASTM A-82); and be galvanized in accordance with AASHTO M-111 (ASTM A-123).

2.9 HAIRPIN CONNECTORS

A. If steel hairpin connectors are required, shop fabricate hot-rolled steel conforming to the minimum requirements of ASTM A-572, Grade 345 or equivalent; and be galvanized in accordance with AASHTO M-111 (ASTM A-123).

2.10 DAMAGED GALVANIZATION

A. Spray with zinc paint, covering the entire area that has been damaged, as an alternative to replacement of any reinforcing steel, wire mesh or fasteners that have damaged galvanization.

2.11 CURING COMPOUND

A. Refer to Section 03390

2.12 GEOTEXTILE

A. Cover horizontal and vertical joints between panels, when required, by a geotextile of type and grade recommended by the Wall Company.

2.13 ADHESIVE

A. Per Wall Company's standard.

2.14 BEARING PADS

A. Horizontal rubber bearing pads to be of the type and grade recommended and supplied by the Wall Company.

2.15 LIFTING DEVICES

A. Per Wall Company’s standard.

2.16 SELECT BACKFILL

A. Refer to Section 02832S.

2.17 MATERIALS FOR CRACK AND SPALL REPAIR

A. Refer to Section 03924.

PART 3 EXECUTION

3.1 GENERAL

A. Arrange for a qualified representative (minimum five years experience with MSE wall design and construction) from the selected wall company to be directly involved and provide technical assistance during all phases of construction of the wall(s).
   1. For both the first and second stage of wall construction, the wall company representative is to be at the project site for at least the first five working days of wall construction and until all aspects of wall construction have been satisfactorily demonstrated to the MSE wall company representative and the Engineer. The MSE wall company representative is to subsequently visit the site at least once every 10,000 sq. ft. of wall face construction, or as otherwise determined by the Engineer.
   2. The wall company representative is responsible for training the Contractor's wall construction crew(s) and Department inspectors in proper quality control for construction of the walls.
      a. If one or more construction crew members change, the wall company representative is responsible to train the new crew member(s).
   3. During each site visit, the representative is to meet with the Engineer near the conclusion of the visit to report on the observed wall construction procedures, including providing a copy of the field report.

B. Provide the wall company's construction manual to the Engineer, and assure that the wall system-specific requirements in the manual are integrated into the wall construction.

C. Provide a final field observation report from the wall company that specifically addresses that the completed wall(s) meet all Department and wall company specifications/requirements and what deficiencies exist, if any.
   1. Where the Department's and the wall company's specifications/requirements differ, apply the stricter of the two requirements.

D. Haul, store, and ship wall materials so as to minimize the potential of producing any type of defects.
   1. Store panels to avoid damage to connection pieces, such that the tie strips do not bend.

E. Perform excavation and foundation preparation (including removal of unsuitable soils) as specified in Section 02832S.

F. Construct wall system in accordance with the approved plans, specifications, and the wall company's recommendations and construction manual.

3.2 LEVELING PAD

A. Prepare the subgrade soils and/or fill so as to cast the leveling pad or reinforced concrete footing to the design elevations shown on the drawings and to ensure complete contact of the retaining wall units with the base.

B. Furnish and place concrete in accordance with Section 03055.

C. Place cast-in-place concrete leveling pad upon undisturbed in-situ soils, or upon properly placed and compacted fill as per Section 02832S. Place leveling pad to a thickness of at least 6 inches after the required settlement has been achieved following the first-stage wall construction.

D. Allow leveling pad to cure for at least 12 hours before placing concrete panels.

3.3 GEOGRID INSTALLATION

A. Verify the correct orientation (roll direction) of the geogrid.

B. Place geogrid horizontally on the compacted backfill at the proper design.

C. Connect geogrid to the first-stage facing as specified by the wall company.

D. Pull the geogrid taut to eliminate loose folds and remove slack in the geogrid at the wire facing connections, pretension the geogrid, and stake or otherwise secure the back edge of the geogrid before and during backfill and compaction.

E. Follow the wall company's overlap requirements for uniaxial and biaxial geogrids.

F. Where reinforcement is obstructed by elements such as piles, drilled shafts, guardrail posts, catch basins, drop inlets, culverts, etc. in the wall soil reinforcement zone, modify the reinforcement design using one of the following alternatives:

4. If the reinforcement is modified, design the surrounding reinforcement layers to carry the additional load.

5. Place a structural frame around the obstruction which is capable of transferring loads from the reinforcements on one side of the obstruction to reinforcements on the other side of the obstruction.

3.4 WALL CONSTRUCTION

A. Place wall backfill and reinforcement for two-stage MSE walls as specified in Section 02832S, and in the Wall Company's Approved-for-Construction drawings.

B. Backfill the void behind the first-stage facing by placing the backfill in two approximately equal lifts, and compacting with lightweight equipment in accordance with Section 02832S.

C. Placement of Select Material as wall backfill to closely follow the erection of each course of wire facing units.

D. Place backfill in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the wire facing.

E. Construct the first-stage facing within 2 inches of the design vertical and horizontal alignments (excluding bulging).

F. Prevent significant bulging of the first-stage facing between reinforcing layers.
   1. Where bulging exceeds 3 inches between reinforcing layers, remove and reconstruct this portion of the wall.
   2. Bulging will be measured by a plumb straight-edge, or by using a plumb-bob string held in front of the wall face.
   3. The bulge measurement is the difference in the horizontal measurement from the straight edge or plumb-bob string to the location of maximum bulge and the reinforcement layer immediately above or below the budge (whichever is greater).

G. Proceed with placement of the second stage wall panels after confirmation is given by the Engineer that the required settlement has been achieved.

H. Handle panels by means of lifting device set into upper edge or side of the panels and set in position vertically.

I. Place bearing pads as required by the Wall Company to prevent concrete-to-concrete contact between panels.

J. Use rubber, wood, or metal shims as necessary to make final adjustments to the wall panel to facilitate level placement of the panel.
   1. Do not leave wood shims at any location.

K. Construct to and maintain wall facing tolerances as follows:
   3. Horizontal alignment: 0.7 percent (for example 2.5 inches in 30 feet)
   4. Vertical tolerance: 0.7 percent (for example 0.85 inches in 10 feet)
   3. Overall vertical tolerance (plumbness from top to bottom): 0.7 percent (for example 1.7 inches in 20 feet of wall height)
   4. Levelness: 0.5 percent (for example 1.2 inches in 20 feet)

L. Install panels so that joints are uniform. The maximum allowable offset in any panel joint is 0.40 inch. Joint width is 1.0 inch maximum and 0.50 inch minimum.

M. Check panel tolerance and reset before placement of the next panel if out of tolerance.

3.4 CRACK AND SPALL REPAIR CRITERIA FOR CONCRETE PANELS

A. A fully penetrating crack is defined as a crack extending through the cross-section of the precast panel from the front face to the back face of the unit.

B. Cracks at Front Face of Panel:
   4. Panels with one or two partially penetrating cracks with widths less than or equal to 12 mils are acceptable.
   5. Reject panels with fully penetrating cracks, or cracks wider than 12 mils.
   6. No more than two cracks per individual panel are allowed without further evaluation.

C. Cracks at Back Face of Panel:
   5. Partially penetrating cracks with widths less than or equal to 12 mils are acceptable.
   6. Partially penetrating cracks with widths between 12 mils and 30 mils are acceptable when repaired with surface sealant according to subparagraph F, Crack Repair Procedures.
   7. Evaluate partially penetrating cracks wider than 30 mils for acceptance with epoxy injection according to subparagraph F, Crack Repair Procedures.
   8. No more than two repairable cracks per individual panel are allowed without further evaluation.

D. Spalls at Front Face of Panel:
   5. Spalls with widths less than 4.0 inches and depths less than 2.0 inches may be repaired with a patching material acceptable to the

Engineer of the same color as panel concrete. Resultant repair to be approved by the Engineer.

6. Reject panels with spalls wider than 4.0 inches or deeper than 2.0 inches.
7. Measure spall depth from the structural thickness of the panel excluding architectural surface finish.
8. Panels with more than two spalls are subject to further evaluation before acceptance.

E. Spalls at Back Face of Panel:

4. Spalls with widths less than 4.0 inches and depths less than 2.0 inches may be repaired with a patching material acceptable to the Engineer. Resultant repair to be approved by the Engineer.
5. Reject panels with spalls wider than 4.0 inches or deeper than 2.0 inches.
6. Panels with more than four spalls are subject to further evaluation before acceptance.

F. Crack Repair Procedures:

3. Surface Sealing: Prepare surface and apply a sealant acceptable to the Engineer according to Manufacturer's instructions.
4. Epoxy Injection: Prepare surface and inject cracks with Department-approved product according to Manufacturer's instructions.

G. Spall Repair Procedures:

1. Prepare surface and apply patching material according to Manufacturer's instructions, and as acceptable to the Engineer.

END OF SECTION

July 11, 2016

SECTION 02839S

PREFABRICATED MODULAR GRAVITY WALL (PMGW) SYSTEMS USING LARGE MODULAR BLOCK UNITS

Add Section 02839S:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and construction requirements for PMGW walls as specified in Section 02831S.

B. Provide and install the prefabricated modular gravity block wall units and all necessary appurtenances from the selected Wall Company.

1.2 RELATED SECTIONS

A. Section 02056: Embankment, Borrow, and Backfill

B. Section 02317: Structural Excavation

C. Section 03055: Portland Cement Concrete

D. Section 03310: Structural Concrete

E. Section 02831S: Retaining Wall - Alternate Systems

1.3 REFERENCES

A. ASTM C140: Sampling and Testing Concrete Masonry Units and Related Units

B. ASTM C331: Lightweight Aggregates for Concrete Masonry Units

C. ASTM D412: Vulcanized Rubber and Thermoplastic Elastomers-Tension

D. ASTM D1248: Polyethylene Plastics Extrusion Materials For Wire and Cable

E. ASTM D3034: Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings

F. American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications

G. National Concrete Masonry Association (NCMA):
   1. NCMA SRWU-1 Test Method for Determining Connection Strength of SRW
   2. NCMA SRWU-2 Test Method for Determining Shear Strength of SRW

1.4 SUBMITTALS

A. Submit sample of the texture for the Engineer's approval.

B. Submit for approval at least 3 color samples of proposed segmental concrete unit colors (if integral color is required), matched to colors of local features or as otherwise indicated, at least four weeks before beginning manufacture of the block units.

C. Provide working drawings and other applicable submittals in accordance with Section 02831S.

D. Do not start work on any wall until working drawings have been reviewed and approved by the Design-Builder's Engineers and all Department comments have been addressed.

E. Certificate of compliance for incorporated materials along with copies of results of any tests performed.

F. Certification from the Wall Company that the completed wall(s) meet all Department and Wall Company specifications.
   1. Where the Department's and the Wall Company's specifications differ, the stricter of the two apply.

1.5 ACCEPTANCE

A. Prefabricated Modular Gravity Block Units:
   1. Compressive Strength: Minimum 28-day of 4000 psi. Modular gravity block units which meet 75 percent of 28-day strength within 7 days are acceptable for placement in the wall.
      a. Acceptance is determined on a lot basis.
      b. The lot will be randomly sampled in accordance with ASTM Specification C140.
      c. Test specimens will be cored or conform to the saw-cut coupons provisions of ASTM Specification C140, Section 6.2.4.
      d. Block sampling frequency:

Table 1

Lot Size	**Samples**
0-2,000	4 units
Greater than 2,000	1 unit per 1,000

e. Provide additional samples if requested by the Engineer.

2. Dimension Tolerances:
   a. Height: +/- 3/16”
   b. Width: +/- 1/2” unless field cut for fitting purposes.
   c. Depth: No less than the unit design depth of the blocks.

3. Finish and Appearance:
   a. Modular gravity block units to be sound, free from visual defects, and free from cracks or other defects that interfere with the proper placement of the unit or impair the strength or durability of the construction.
   b. Assure the exposed face or faces of units are free of chips, cracks, or other imperfections when viewed from a distance of 30 feet under diffused lighting.
   c. Acceptance will be at the Engineer’s discretion.
   d. Up to five percent of a shipment may contain slight cracks or small chips not longer than 1 inch.

4. Block units will be rejected for failure to meet any of the above specified requirements. In addition, units will be rejected for any of the following defects:
   a. Defects that indicate imperfect molding
   b. Defects indicating honeycomb or open-texture concrete
   c. Cracked or severely chipped units
   d. Color variation on exposed face(s) of unit

B. Completed Wall Construction Tolerances:
   1. Horizontal alignment (including curves and corners) is 0.7 percent (for example 2.5 inches in 30 feet).
   2. Adjacent block tolerance is 1 percent (for example 0.4 inches in 3 feet).
   3. The overall vertical tolerance of the wall (plumbness from top to bottom) not to exceed 1 percent (for example 0.8 inches in 6 feet of wall height).
   4. Level tolerance not to exceed 0.5 percent (for example 1.2 inches in 20 feet).
   5. Ensure all joints are uniform. Maximum allowable offset in any block joint is 0.5 inch. Maximum joint width is 0.25 inch.

PART 2 PRODUCTS

2.1 CONCRETE MODULAR BLOCK UNITS

A. Concrete. Class AA(AE) per Section 03055 and Section 03310, having a minimum 28-day compressive strength of at least 4000 psi.

B. Manufacture concrete block using a combination of cement, aggregates, admixtures, and other components meeting the requirements of Section 03055.
   1. Verify the compatibility of all components and the environment in which the block will be used, including sulfate soils and/or groundwater.
   2. Lightweight aggregates are subject to the Engineer's approval and meet the requirements of ASTM C331.

C. Provide block units having angled sides capable of producing concave and convex alignment curves with a minimum radius as specified in the Wall Company's layout drawings.

D. Notify the Engineer in writing at least 72 hours before beginning the casting of concrete modular block units.

2.2 ADHESIVE

A. Use a urethane or polyurethane adhesive which is specifically described as forming a bond with concrete and masonry materials. Minimum tensile stress of 225 psi and minimum elongation of 600% (ASTM D412).
   1. Product examples meeting these criteria are Sikabond Construction Adhesive and Geocel 3500.

2.3 DRAINAGE PIPE

A. If required in Construction Drawings, use perforated or slotted PVC drainage pipe manufactured in accordance with ASTM D3034 or corrugated HDPE pipe manufactured in accordance with ASTM D1248.

2.4 SELECT MATERIAL FOR PMGW

A. Use Select Material for PMGW which is free from frozen, organic and otherwise deleterious materials.

B. Conform to the following gradation limits as determined by AASHTO T-27 / ASTM D422:

Table 2

Gradation for Select Material for PMGW Walls	
Sieve Size	**Percent passing**
2 inch	100
¾ inch	75-100
No. 4	0-60
No. 40	0-30
No. 200	0-5

C. Use Select Material for PMGW that:
   1. Is substantially free of shale or other soft, poor durability particles.
   2. Has an organic content less than 1 percent as determined by AASHTO T-267 on the portion of the material finer than the No. 10 sieve.

D. Furnish the Engineer with a copy of all test results performed to meet the requirements of this section of the specification.

PART 3 EXECUTION

3.1 GENERAL

A. Arrange for a qualified representative (minimum five years experience with PMGW wall design and construction) from the selected Wall Company to be directly involved and provide technical assistance during all phases of construction of the wall(s).
   1. The Wall Company representative is to be at the project site for at least the first five working days of wall construction and until all aspects of wall construction have been satisfactorily demonstrated to the PMGW Wall Company representative and the Engineer. The PMGW Wall Company representative is to subsequently visit the site at least once every 10,000 sq. ft. of wall face construction, or as otherwise determined by the Engineer.
   2. The Wall Company representative is responsible for training the Contractor's wall construction crew(s) and Department inspectors in proper quality control for construction of the walls.
      a. If one or more construction crew members change, the Wall Company representative is responsible to train the new crew member(s).
   3. During each site visit, the representative is to meet with the Engineer near the conclusion of the visit to report on the observed wall construction procedures, including providing a copy of the field report.

B. Provide the Wall Company's construction manual to the Engineer, and assure that the wall system-specific requirements in the manual are integrated into the wall construction.

C. Provide a final field observations report from the Wall Company that specifically addresses that the completed wall(s) meet all Department and Wall Company specifications/requirements and what deficiencies exist, if any.
   1. Where the Department's and the Wall Company's specifications/ requirements differ, the stricter of the two requirements applies.

D. Haul, store, and ship wall materials to minimize the potential of producing any type of defects.

E. Perform excavation and foundation preparation (including removal of unsuitable soils) as specified in Section 02317.

F. Construct the wall system in accordance with the approved plans, specifications, and the Wall Company's recommendations and construction manual.

G. Do not place any block until it has been cured for at least 7 days and meets all acceptance criteria.

3.2 LEVELING PAD INSTALLATION

A. Prepare the subgrade soils and/or fill to install the leveling pad to the design elevations shown on the drawings, to ensure complete contact of the retaining wall units with the base so that there are no voids beneath or between units.
   1. Remove all foundation soils found to be unsuitable and replace with Select Material for PMGW placed and compacted as described in this Section.

B. Place Select Material for PMGW leveling pad to a thickness of at least 6 inches on undisturbed in-situ soils or on properly placed and compacted fill as per this Section.

C. Provide a level surface on which to place the first course of block units.

D. Width of the leveling pad extends at least 6 inches in front and 6 inches in back of the base unit footprint.

E. Compact leveling pad material in accordance with Section 02056 so as to provide a smooth, hard surface on which to place the first course of units.

3.3 PMGW BLOCK UNIT INSTALLATION

A. Make the width of excavation equal to or exceeding the required backfill. Refer to the approved plans for backfill dimensions from the back face of the wall.

B. Place the first course of modular block units on the leveling pad. Verify that the wall units are level and properly aligned.

C. Ensure block units are in full contact with the leveling pad.

D. Place unit faces in contact end to end. Do not allow any gaps one-half inch or greater.

E. Follow erection of each course of wall blocks with placement of Select Material for PMGW. Complete backfill at the front of the wall prior to backfilling more than 4 feet above the bottom of the lowermost facing block.
   1. Minimum bury depth of the bottom block is 1.0 ft.
   2. Do not damage, disturb or misalign block units during backfill placement.
   3. Do not exceed individual block height (loose) in lift thickness. Decrease the lift thickness as necessary to obtain the specified density. Place backfill in uniformly thick layers.

F. Ensure each wall course is completely filled, backfilled, and compacted before proceeding to the next wall course.
   1. Compact backfill to at least 95 percent of the maximum density, AASHTO T-99, Method C or D (with oversized correction, outlined in Note 7 of T-99).
   2. Place and compact each layer of backfill in a level manner before placing subsequent backfill layers.

G. Lay each successive course making sure that the bottom recess is in full contact with the unit locators of the course below. Pull unit forward as far as possible.

H. Check and maintain level and wall batter. Do not use shims.

I. Clean the top of each course before setting additional courses.

J. At the end of each day's operation, slope the backfill away from the wall to direct runoff of rainwater away from the wall face.
   1. Do not allow surface runoff from adjacent areas to enter the wall construction site.

3.4 WALL CAP INSTALLATION

A. Provide a permanent connection between the wall cap and the top course of the wall units. Construct according to the Wall Company's drawings and specifications.
   1. Use a urethane or polyurethane adhesive which is specifically described as forming an excellent bond with concrete and masonry materials.
      a. Minimum tensile stress of 225 psi (ASTM D412).
      b. Minimum elongation of 600% (ASTM D412).

B. Clean and apply exterior concrete cap adhesive to top course of wall units before placement of cap unit.

C. Trim sides of interior cap units to insure proper fit of wall cap. Do not leave cut surfaces exposed to view in the finished wall.

D. Fill and compact soil to finished grade.

END OF SECTION

March 16, 2011

SECTION 02845S

MEDIAN REFLECTORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and construction requirements for median reflectors.

1.2 RELATED SECTIONS Not Used

1.3 REFERENCES Not Used

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS

A. Submit manufacturer's specifications and product information to Engineer for approval prior to ordering median reflectors.

PART 2 PRODUCTS

2.1 MEDIAN REFLECTOR

A. Use a reflector product that is designed for use as a raised pavement marker that will not break or detach from the surface under normal traffic loading conditions.

B. Use a product that provides adequate retroreflectivity to be easily seen by approaching traffic in all approaching lanes. Use yellow reflectors.

2.2 CONSTRUCTION ADHESIVE

A. Use construction adhesive that meets the recommendation of the reflector manufacturer. Adhesive should create a permanent bond with the concrete curb surface that will not become dislodged under normal roadway conditions including rain, snow, and ice.

PART 3 EXECUTION

3.1 MEDIAN REFLECTOR

A. Place median reflectors per manufacturer's recommendations.

B. Place median reflectors so that reflectors are aligned with the direction of oncoming lanes in both directions.

C. Install reflectors within one foot of the object marker signs on the ends of the raised medians between the plowable end sections and the signs, then install reflectors at even spacing along raised median curbing with a maximum spacing of 50 feet and a minimum spacing of 40 feet.

D. Place two additional pavement markers at intersecting streets and driveways spaced 12 inches apart located at approximately the center of the approaching lane of the cross street. Align these reflectors toward the cross street approaching traffic

END OF SECTION

July 13, 2016

SECTION 02871S

SOIL NAIL RETAINING WALLS

Add Section 02871:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements for the design and construction of permanent soil nail retaining walls.

B. All labor, materials, and equipment to complete the work, including the following:
1. Excavate in staged lifts
2. Drill soil nail drill holes
3. Install soil nail bars with centralizers
4. Grout soil nails
5. Supply and install specified drainage features
6. Supply and install bearing plates, washers, nuts, and other required hardware
7. Construct the initial and final soil nail wall facing.

C. Monitoring and control of deformations of the soil nail wall, surrounding ground, utilities, and other facilities existing at the time of construction.

D. Requirements for verification and proof tests including, load schedules, expected soil grout bond strengths, frequency of tests, and testing equipment.

1.2 RELATED SECTIONS

A. Section 02342S: Shotcrete

B. Section 03055: Portland Cement Concrete

C. Section 03211: Reinforcing Steel

D. Section 05120: Structural Steel

1.3 REFERENCES

A. AASHTO M 31: Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

B. AASHTO M 85: Portland Cement

C. AASHTO M 111: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

D. AASHTO M 232: Zinc Coating (Hot-Dip) on Iron and Steel Hardware

E. AASHTO M 252: Corrugated Polyethylene Drainage Pipe

F. AASHTO M 270: Structural Steel for Bridges

G. AASHTO T 106: Compressive Strength of Hydraulic Cement Mortar

H. ACI 506.2: Specification for Shotcrete

I. ASTM A 615: Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

J. ASTM A 722: High-Strength Steel Bars for Prestressed Concrete

K. ASTM A 775: Epoxy-Coated Steel Reinforcing Bars

L. ASTM C 33: Concrete Aggregates

M. ASTM C 109: Compressive Strength of Hydraulic Cement Mortars

N. ASTM C 642: Density, Absorption, and Voids in Hardened Concrete

O. ASTM D 1621: Compressive Properties of Rigid Cellular Plastics

P. ASTM D 1784: Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

Q. ASTM D 1785: Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

R. ASTM D 3034: Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

S. ASTM D 4285: Indicating Oil or Water in Compressed Air

T. ASTM D 4380: Density of Bentonitic Slurries

U. ASTM D 4716: Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head

V. FHWA Geotechnical Engineering Circular No. 7: Soil Nail Walls - Reference Manual, Report No. FHWA-NHI-14-007, February 2015 (FHWA GEC7)

1.4 DEFINITIONS

A. Soil Nail Bar: Generic term referring to a reinforcing bar grouted into a drilled hole installed in the ground.

B. Soil Nail Retaining Wall: An earth-retaining structure built from the top down in existing ground using steel reinforcement grouted into the ground to reinforce the earth adjacent to the excavation with a reinforced shotcrete facing.

C. Soil Nailing Work: Includes, but is not limited to, excavation according to the phasing shown in the Contractor's accepted plans; drilling soil nail holes to the specified length and orientation; providing, placing, and grouting soil nail bars into the drill holes; testing installed bars; installing wall drainage elements; placing shotcrete reinforcement, applying shotcrete facing over the reinforcement; attaching bearing plates and nuts; conducting soil nail testing; placing the final structural and architectural facing, and installing instrumentation.

D. Soil Nail Designer: Professional Engineer licensed in the State of Utah having the required experience in design of soil nail walls, and retained by the Design-Builder to design the soil nail wall system and provide soil nail design services during construction of the system.

E. Solid Bar Soil Nail (SBSN): Soil nail with solid steel reinforcing bar, installed by placing bar in a drilled hole then grouted.

F. Hollow Bar Soil Nail (HBSN): Hollow core and self-drilling bar advanced into the soil by drilling with a sacrificial bit as grout is injected through the bar.

G. Facing and Wall Drainage Work: Includes, but is not limited to, furnishing all materials and labor necessary for placing and securing geocomposite drainage material, connection pipes, footing drains, weep holes, and horizontal drains, drainage gutter, permanent facing, leveling pads, and connectors, and free-draining granular backfill.

H. Working Drawings: Plans produced by the Contractor that supplement the contract plans to provide information not included in the contract documents, but that is required to fabricate, erect, transport or temporarily support the structure or structural elements in the completion of the work.
   1. Working drawings do not supersede the contract plans.

I. Bird's Beak: The spaces above the bottom elevations of the inclined drill hole openings at the face of the wall after grout placement.

1.5 SUBMITTALS

A. Submit all soil nail working drawings and other design and construction submittals outlined below to the Design-Builder's Structural and Geotechnical Engineers, as well as to the Department.
   1. Where the requirements below indicate that a submittal is for approval, obtain the written approval of the Design-Builder's Structural and Geotechnical Engineers prior to proceeding with the work.
   2. In all cases, address to the Engineer's satisfaction any comments provided by the Department, prior to proceeding with the work.

B. At least 30 days before the planned start of wall excavation, submit for approval the Soil Nail Contractor Qualifications, including:
   1. The company name.
   2. List of at least three projects in the last five years demonstrating successful construction of permanent soil nail retaining walls totaling at least 10,000 ft^2 of wall face area and at least 500 permanent soil nails. Include the following for each project:
      a. Project name and location.
      b. Owner's name and current phone number.
      c. A brief description of the scope of work and approximate date of the project completion.
      d. List of any planned subcontractors for design or construction.
   3. List of the following personnel and their experience with permanently anchored or nailed structures:
      a. Supervising engineer
      b. Drill operators
      c. On-site supervisors assigned to the project.
   4. Written documentation of the shotcrete finisher's and nozzlemen's qualifications including proof of ACI Shotcrete Nozzleman certification for approval at least seven days before beginning wall excavation.
   5. Use only those individuals meeting experience requirements for this project.

a. Do not substitute for these individuals without written approval.
b. Suspend soil nailing work if the Contractor substitutes unapproved project personnel for approved personnel.
c. Contractor is fully liable for all additional costs and schedule impacts resulting from work suspension due to substitution of unapproved personnel.

C. At least 30 days before planned start of wall excavation, submit for approval the Soil Nail Designer Qualifications, including:
1. The company name.
2. List of at least three projects in the last five years demonstrating successful design of permanent soil nail retaining walls, including:
   a. Project names and locations.
   b. Owner's names and current phone numbers.
   c. Brief descriptions of the scope of work and approximate completion dates for each project.
3. The name of the Soil Nail Designer and professional engineer licensing information.
4. Use only those individuals meeting experience requirements for this project.
5. Do not substitute for these individuals without written approval.
   a. Suspend work if Contractor substitutes unapproved project personnel for approved personnel.
   b. Contractor is fully liable for all additional costs and schedule impacts resulting from work suspension due to substitution of unapproved personnel.

D. Site Survey Information
1. Provide necessary survey and alignment control for the excavation of each lift, location of drill holes, and verification of limits of soil nail wall construction.
2. Establish a pre-excavation baseline by making not less than one set of readings two weeks prior to soil nail wall excavation.
   a. Survey equipment to be capable of resolving vertical settlements of as little as 0.08 inches and lateral deflections to 0.04 inches.
   b. All readings to reference a fixed point or benchmark that will remain unaffected by excavation or other construction activities.
   c. Continue readings for at least two months following the completion of soil nail wall.
   d. Submit a report of the readings within 24 hours of obtaining the readings.

E. Working Drawings

1. At least 21 calendar days before the planned start of wall excavation, submit for approval Detailed Soil Nail Wall Drawings..
2. Verify the limits of the wall and ground survey data before preparing drawings.
3. Include the following in the drawings:
   a. Details, dimensions, quantities, ground profiles, utilities, existing structures, and cross-sections necessary to construct the wall.
   b. Specifications for all materials, procedures, and quality control applicable to the construction of the soil nail walls.
   c. Specifications for sacrificial verification nail testing (minimum of two nails per wall) and for proof testing of production nails, along with necessary detail drawings for the proposed jacking support, framing, and bracing to be used.
4. Provide a plan view of each wall that identifies the following:
   a. A reference baseline and elevation datum.
   b. The offset from the construction centerline or baseline to the face of the wall at its base at all changes in horizontal alignment.
   c. Beginning and end of wall stations.
   d. Right-of-way and permanent or temporary construction easement limits.
   e. Locations of all known active and abandoned existing utilities/structures or other potential interferences.
   f. The centerline of any drainage structure, sewer, or pipe behind, passing through, or passing under or over the wall.
   g. Details on how soil nail walls will avoid bridge abutment piles, if applicable.
   h. Limit of longest nails.
   i. Subsurface exploration logs, with locations shown on a plan view of the proposed wall alignment with appropriate reference base lines to fix the locations of the explorations relative to the wall.
5. Provide an elevation view of each wall that identifies the following:
   a. The elevation at the top of the wall, at all horizontal and vertical break points, and at least every 10 ft along the wall.
   b. Beginning and end of wall stations.
   c. The distance along the face of the wall to all steps in the wall base.
   d. Wall elevation view showing nail locations and elevations; vertical and horizontal nail spacing; and the location of wall drainage elements and permanent facing expansion/contraction joints (as required) along the wall length.
   e. Existing and finish grade profiles both behind and in front of the wall.

6. Include the following additional information and details:
   a. All necessary cross section(s) to construct the wall
   b. Elevations at the base of the wall and the top of leveling pads for casting CIP facing (if applicable).
   c. Design parameters and applicable codes.
   d. General notes for constructing the wall including construction sequencing or other special construction requirements.
   e. Horizontal and vertical curve data affecting the wall and wall control points. Match lines or other details to relate wall stationing to centerline stationing.
   f. A listing of the summary of quantities on the elevation drawing of each wall showing estimated square feet of wall face areas and other quantities.
   g. Soil nail wall typical sections including staged excavation lift elevations, wall and excavation face batter, nail spacing and inclination, nail bar sizes, and corrosion protection details.
   h. A typical detail of production and test nails defining the nail length, minimum drill hole diameter, inclination, and test nail bonded and unbonded test lengths.
   i. Details, dimensions, and schedules for all nails, reinforcing steel, wire mesh, bearing plates, headed studs, etc. and/or attachment devices for shotcrete.
   j. Details, dimensions, and schedules of all reinforcing steel including reinforcing bar bending details.
   k. Details and dimensions for wall appurtenances such as barriers, coping, drainage gutters, fences, etc.
   l. Details for terminating walls and adjacent slope construction.
   m. Method of soil nail corrosion protection.
   n. Facing finishes, color and architectural treatment requirements for permanent wall facing elements, if applicable.
7. Submit supporting engineering calculations, including the following:
   a. A written summary that describes the overall soil nail wall design.
   b. Applicable code requirements and design references.
   c. Design criteria including estimated soil shear strengths (friction angle and cohesion), unit weights, and ground-grout pullout resistances, steel resistances, shotcrete resistances, and nail drill hole diameter assumptions.
   d. Include data from any additional subsurface borings, laboratory work, or other subsurface data collected.
   e. Values and associated load factors used in design for pullout resistance, surcharges, soil/rock unit weights, nail head strengths, and strengths of steel, shotcrete, and concrete materials. Global stability and soil resistance/load factors used in LRFD verifications.

f. Design calculation sheets with the project number, wall location, designation, date of preparation, initials of designer and checker, and page number at the top of each page. Provide an index page with the design calculations.
g. An explanation of any symbols and computer programs used in the design.
h. Critical wall cross-section geometry including soil/rock strata and location, magnitude, and direction of slope or external surcharge loads, and piezometric levels (if applicable) with critical slip surface shown along with minimum calculated global stability soil factor of safety, and required nail lengths and strengths (nail bar sizes and grades) for each nail row.
i. Structural design calculations for wall facing and nail head/facing connections including consideration of facing flexural and punching shear strength, headed stud tensile strength, upper cantilever, minimum reinforcement ratio, cover and splice requirements.
j. Other design calculations including, but not limited to, soil nail wall stability at critical stages of construction under prevailing surcharge loads; external soil nail wall stability; and fill compaction criteria.

8. Prepare drawings according to the following:
   a. Submit drawings electronically in PDF format. Use 11 x 17 inch sheets with a 1½ inch blank margin on the left edge. Place the following information in the title block in the lower right corner of each sheet:
      1) State Project Designation
      2) State Project Name
      3) State Structure Number
      4) Contractor, Fabricator, or Erector Name
      5) Contractor, Fabricator, or Erector Drawing Number
      6) Contractor, Fabricator, or Erector Sheet Number
   b. Revise and resubmit drawings when directed by the Design-Builder's Engineers or when necessary to address Department comments.
   c. Provide the seal of a PE or SE licensed in the State of Utah.
9. Prepare engineering calculations according to the following:
   a. Submit calculations electronically in PDF format. Use 8½ x 11 inch sheets with a 1-inch blank margin on the left edge or 11 x 17 inch sheets with a 1½ inch blank margin on the left edge. Title block location is at the top of 8½ x 11 inch sheets or the lower right corner of 11 x 17 inch sheets. Place the following information in the title block:
      1) State Project Designation
      2) State Project Name
      3) State Structure Number

4) Contractor, Fabricator, or Erector Name
5) Contractor, Fabricator, or Erector Drawing Number
6) Contractor, Fabricator, or Erector Sheet Number

b. Provide the seal of a PE or SE licensed in the State of Utah on the cover sheet of all engineering calculations.
c. Certify that engineering calculations have been checked according to the Department QC/QA Procedures.

10. Allow at least 14 calendar days for review and approval of working drawings and supporting calculations.
    a. This review period applies each time the drawings and calculations are submitted.
11. Do not deviate from the approved drawings unless the deviation is recommended in writing by the Soil Nail Designer and authorized by the Engineer.
    a. Assume the responsibility for costs incurred due to faulty detailing or fabrication.
    b. Revise the drawings when plan dimensions are revised due to field conditions or for other reasons.

F. Submit As-Built Drawings within 30 days after completion of the work.
1. Provide the locations of the nails in the top row for each wall. Include Northings, Eastings, elevation, azimuth, and inclination (to the nearest 0.1 inch and 0.5 degrees).
2. Include survey datum.
3. Provide revised design calculations signed and sealed by a PE or SE licensed in the State of Utah for all design changes made during the construction of the wall.

G. At least 21 days before beginning wall excavation, submit for approval the Construction Plan, including the following:
1. Project start date and proposed detailed wall construction sequence and phasing plan.
2. Proposed methods to contain grout, shotcrete, and void-filling materials within the project area and the UDOT ROW.
3. Proposed drilling methods, equipment, and drill hole diameters.
4. Proposed methods of soil nail installation.
5. Shotcrete wet or dry-mix methods and procedures for placing shotcrete.
6. Monitoring and instrumentation plan indicating how the wall facing will be surveyed daily to monitor displacements. Include locations of measurement points and frequency and methods of measurement.
7. Procedures for placing nail grout, grout quality control plan, and equipment.

H. At least 14 days before beginning wall excavation, submit the following Equipment Calibration and quality control items:
   1. Calibration data for all testing equipment including load cells, test jacks, pressure gages, and grout pumps.
   2. Calibrations must have been performed by an independent testing lab within 60 days of the submittal date.
      a. Calibrate jack and pressure gage as a single unit.
      b. Include date tested, device identification number, and calibration results, certified with an accuracy of at least 2% of the applied certification loads by a qualified independent testing laboratory within 90 days of submittal.
      c. Testing may not be performed until the Design-Builder's Engineers approve the calibration reports.

I. Material Submittals
   1. Manufacturer's certificates of compliance, product data, specifications, and recommended installation instructions for furnished materials, including, but not limited to:
      a. soil nail bar ultimate strength
      b. soil nail bar yield strength
      c. welded wire reinforcement steel
      d. reinforcement steel
      e. couplers
      f. studded anchor plates
      g. epoxy coating
      h. encapsulation
      i. geocomposite drainage strip
      j. centralizers
      k. geotextiles
      l. prefabricated drain grates
   2. Nail grout mix design, including:
      a. Compressive strength test results, per AASHTO T106/ASTM C109, supplied by a qualified independent testing lab and verifying specified minimum 3-day and 28-day grout compressive strengths.
      b. Test nail grout at a frequency of no less than one test cube for every 50 cubic yards of grout placed.
         1) Report grout cube shrinkage.
         2) Provide grout cube test results within 24 hours of testing.
      c. For neat cement grout, include specific gravity test results of the fresh grout used for compressive testing.
   3. Shotcrete mix design with compressive strength test results.

J. Soil Nail Wall Verification and Proof Test Results
   1. Submit Verification and Proof test reports within 48 hours of the test.

2. Report failed Verification and Proof Nail test results immediately to the Engineer and the Soil Nail Designer, with the soil nail location, bonded and unbonded length, maximum load held, and the failure load.

K. Document the pre-construction condition of the site, existing structures and facilities before beginning any wall construction activity.
   1. During construction, observe the conditions above the soil nail wall on a daily basis for signs of ground movement in the vicinity of the wall.
   2. Immediately notify the Soil Nail Designer, the Design-Builder's Engineers, and the Engineer if signs of movement such as new cracks in structures, increased size of old cracks or separation of joints in structures, foundations, or paved and unpaved surfaces are observed.

L. Shotcrete production summary
   1. Prepare for each shift and submit within 24 hours.
   2. Include the following:
      a. Quantity and location of shotcrete applied including Sketches.
      b. Observations of success or problems of equipment operation, application, final product conditions, and any other relevant issues during production and application.
      c. Description of placement equipment.
      d. Batch number(s) if applicable

M. Shotcrete quality control records
   1. Submit field quality control test reports within 2 working days of performing the tests.
   2. Include the following:
      a. Sample identification, including mix design and test panel number and orientation.
      b. Date and time of sample preparation including sample dimensions.
      c. Date, time, and type of test.
      d. Complete test results including load and deformation data during testing, sketch of sample before and after testing, visual grade of cores, and any unusual occurrences observed.
      e. Names and signatures of people performing the test
      f. Location of steel reinforcement, if used, covered by shotcrete.
      g. Name of nozzle operator.

PART 2 PRODUCTS

2.1 SOIL NAILS AND HARDWARE

A. Provide fully threaded solid- or hollow-bars continuous with approved couplings, threaded to allow proper attachment of bearing plate, washer, and nut.
   1. SBSNs
      a. AASHTO M 31 Grade 75, or better, #7 solid threaded bar
   2. HBSNs
      a. Fully threaded hollow-steel tubing that serves as drilling steel, grout transfer medium, and reinforcing element of the soil nail.
      b. AASHTO M 31 Grade 75 or better, 0.60 in^2 minimum cross sectional area.
      c. Uniform elongation without necking $A_{gt} \geq 5\%$
      d. Minimum Charpy impact resistance of 40 Joules at -20 degrees C
      e. If required, provide bar couplers with seals or similar mechanism to ensure minimum grout loss and means of transferring percussive drilling forces.
      f. Select drill bits based on subsurface data and minimum grout column requirements, with a minimum of 2 ports for grout exit.

B. Provide bar couplings that develop the full nominal tensile capacity of the soil nail bar as certified by the manufacturer.

C. Provide the following corrosion protection methods:
   1. For SBSNs, use fusion-bonded epoxy-coated bars with 0.012 to 0.017 inch coating thickness.
      a. Conform to ASTM A775 but omit bend test requirements.
      b. The design may omit coating at the wall anchorage end over the length provided for threading the nut against the bearing plate.
      c. Zinc galvanized coating a minimum of 3.4-mil thick may be used in lieu of epoxy coating.
         1) Meet AASHTO M 111 for galvanized bars and AASHTO M 232 for galvanized hardware.
   2. For HBSNs, provide sacrificial steel in accordance with FHWA GEC 7.
   3. For all bars, provide at least 1.0 inch of grout cover between the soil nail bar and the surrounding soil.
   4. Store and protect all bars such that epoxy or galvanized coating and bar surface and threads are undamaged.

D. Centralizers
   1. For SBSNs, use centralizers manufactured from Schedule 20 or 40 PVC pipe securely attached to the soil nail bar with coated wire.
      a. Size centralizers to position the soil nail bar within 1.0 inch of the center of the drill hole
      b. Space centralizers no greater than 10 ft apart and 1.5 ft from the end of each nail.
      c. Use centralizers that allow tremie pipe insertion to the bottom of the hole, and to allow grout to freely flow up the hole.
   2. For HBSNs used in permanent applications, use steel centralizers attached to the bar in front of the couplings, at spacing no greater than 10 feet.

E. Provide nail grout consisting of neat cement or sand/cement mixture having a minimum 3-day compressive strength of 1,500 psi and a minimum 28-day compressive strength of 3,000 psi per AASHTO T 106, and specific gravity between 1.80 and 1.90.
   1. For SBSNs, use sand for grout and meeting requirements of ASTM C33.
   2. For HBSNs, do not use sand in the nail grout mix.
   3. Use Type II Portland Cement meeting AASHTO M 85.
   4. Admixtures may be used to control bleed, improve flowability, reduce water content, and/or retard set as specified in the accepted submittals.
      a. Use only admixtures that are compatible with the grout and mixed according to the manufacturer's recommendations.
      b. Do not use accelerators.
   5. Do not add water to grout conforming to the mix design to improve workability.
   6. Test grout specific gravity with a mud balance according to the procedure in ASTM D4380.
      a. Comply with any requests by the Engineer to test the grout with a mud balance at any time, particularly if the specific gravity appears to be less than 1.80.

2.2 SHOTCRETE

A. Use shotcrete conforming to Section 02342S.
   1. Produce shotcrete by either a wet-mix or dry-mix process.
   2. Apply shotcrete in one or more layers, pneumatically projected through a hose at high velocity against a prepared surface.

2.3 CONCRETE

A. Class AA(AE). Refer to Section 03055.

2.4 REINFORCING STEEL AND WELDED WIRE

A. Refer to Section 03211.

2.5 GEOCOMPOSITE DRAIN STRIP

A. Use a drainage strip consisting of a drainage core (e.g., geonet) and an attached or encapsulating filtration geotextile, with the drainage core meeting the following:
   1. At least 85% by mass polypropylenes, polyester, polyamine, polyvinyl chloride, polyolefin, or polystyrene.
   2. Compressive strength of at least 40 psi in accordance with ASTM D1621 Procedure A.
   3. Flow rate of at least 0.1 gallons per second per foot of strip width under a gradient of 1.0 tested in accordance with ASTM D4716.

B. Use Miradrain 6000, Amerdrain 500, or equivalent geocomposite drainage strip recommended by the Soil Nail Designer and accepted by the Engineer.

C. Provide drainage geotextile and geocomposite drain strips in rolls wrapped with a protective covering and labeled to identify the production run.
   1. Store/stockpile geotextiles and geocomposites in a manner which protects the fabric from mud, dirt, dust, debris, and shotcrete rebound.
   2. Do not remove the protective wrapping until immediately before material is installed.
      a. Avoid extended exposure to ultraviolet light.

2.6 UNDERDRAIN ELEMENTS

A. Use underdrain and perforated pipe meeting requirements of ASTM D1785 Schedule 40 PVC solid and perforated wall; cell classification 12454-B or 12454-C, wall thickness SDR 35, with solvent or elastomeric joints

B. Use fittings for underdrain and perforated pipe meeting requirements of ASTM D3034, cell classification 12454-B or 12454-C, wall thickness SDR-35, with solvent or elastomeric joints.

2.7 STUDDED ANCHOR PLATES

A. AASHTO M270, Grade 36. Refer to Section 05120.

B. Galvanize after fabrication according to AASHTO M 111.

2.8 ARCHITECTURAL SURFACE FINISH

A. Cast-in-place concrete or pre-cast concrete panels with formed surface texture meeting the project aesthetics plan.

2.9 EQUIPMENT

A. Equipment for mixing and placing grout shall have the following characteristics.
   1. Mix grout with a high-shear colloidal mixer with separate holding tank and water and cement dosing system to ensure continuous grouting independent from mixing.
   2. Minimum grout pump flow rate 15 gpm for bars < 2 inch diameter and 45 gpm for bars ≥ 2 inch diameter.
   3. Minimum grout pump pressure capability of 250 psi in sands/gravels and 1,500 psi in clays/silts.

B. For dry-mix shotcrete, provide a water storage tank at the job site and a positive displacement pump with regulating valve that is accurately controlled to provide water at the pressures and volumes recommended by the delivery machine manufacturer.

C. Use equipment capable of handling and applying shotcrete containing the specified maximum size aggregate and admixtures.

D. Provide and air hose and blow pipe to clear dust and rebound during shotcrete application.

E. Use an air supply system capable of supplying the delivery machine and hose with air at the pressures and volumes recommended by the machine manufacturer.
   1. Do not use air supply systems that are incapable maintaining constant air pressure or deliver oil-contaminated air measured as described in ASTM D 4285.

F. Use a shotcrete delivery machine capable of supplying material to the delivery hose at a uniform rate.
   1. The ejection from the nozzle must adhere to the treated surface with minimum rebound and maximum density when the nozzle is held in the range of 3-6 ft from the target surface.

PART 3 EXECUTION

3.1 SOIL NAIL WALL GENERAL REQUIREMENTS

A. Design and construct permanent soil nail retaining walls at the locations shown on the drawings.

B. Perform additional exploration and testing to supplement the Department-provided geotechnical data as deemed appropriate to complete final design.

3.2 SOIL NAIL WALL DESIGN REQUIREMENTS

A. Design the soil nail walls using the LRFD procedures contained in FHWA GEC 7.

B. Account for applicable traffic and construction equipment surcharge loads in the design.

C. Extend shotcrete and permanent facing at the toe of the walls to at least 2 ft below the finished grade at front face of wall at all points.

D. Provide a total reinforced structural concrete facing thickness of at least 10 inches, including initial shotcrete and final cast-in-place concrete facing (if used), but excluding precast facing panels and architectural relief.
   1. At a minimum, provide reinforcement in the structural concrete wall face consisting of No. 4 bars at 12-inch spacing in both directions.
      a. Supplement this minimum reinforcing with additional bars or with wire mesh as required by the design.

E. Provide expansion joints and contraction joints at appropriate intervals for the wall design, as specified in FHWA GEC 7.

F. Locate the top row of nails within 2 ft of the top of the wall.

G. Arrange soil nails so that the distance between the lower course of nails and the average base of the wall is less than two thirds of the average vertical nail spacing.

H. Provide a minimum design life of 75 years for the soil nail walls and all components, and include supporting data and calculations in the design submittal.

I. Perform the soil nail design to consider the locations of existing utilities or obstructions in the area of construction.

J. Wall locations and wall batter angles are shown on the plans.

1. The minimum permissible wall facing batter for the soil nail design is 2 degrees.

K. Provide backwall drainage through weep holes.
   1. Transmit backwall drainage down the wall through geotextile drainage mats.
   2. Drainage from multiple mats may be collected and conveyed to a single weep hole if the conduit is appropriately sized.

L. Include provisions to prevent concentrated flow over the top surface of the walls.

M. Design all soil nail walls to withstand seismic ground shaking having a 3% probability of exceedance in 75 years.

3.3 SOIL NAIL WALL CONSTRUCTION REQUIREMENTS

A. Excavation
   1. Do not exceed the short-term ground stand-up height or a distance equal to the vertical nail spacing plus the required reinforcing lap distance, whichever is less, for the exposed unsupported excavation face height.
      a. Flash coat exposed surface with up to 1” of shotcrete as required to maintain cut face stability where recommended by the Soil Nail Designer.
   2. Excavate the final wall excavation line and apply shotcrete during the same work shift, unless otherwise approved.

B. Soil Nail Installation
   1. Provide a soil nail length necessary to develop the load capacity and satisfy acceptance criteria for the required design load.
   2. Place soil nail drill holes at the locations, elevations, orientations, and lengths shown on the plans.
   3. Use drilling methods and equipment that are suited to the ground conditions and in accordance with the submittals.
   4. Use cased drilling methods or other suitable means to support the sides of the drill holes if needed.
   5. Replace soil nail bars exhibiting abrasions, cuts, welds, weld spatter, corrosion, or pitting.
   6. Replace or repair soil nail bars exhibiting damage to epoxy coating at no additional cost.
   7. Inspect epoxy coating on soil nail bars before insertion into the drill hole.

C. Install Soil Nails
   1. Conform to stationing and horizontal spacing shown on the plans.

2. Install top row of nails no more than 2 feet vertically from the design elevation of the finished soil nail retaining wall elevation.
a. Install subsequent rows at a maximum 4 feet vertical spacing under the bridge structure and under median, and a maximum 5 feet vertical spacing elsewere.
3. Install bottom row of nails a minimum of 2 feet and a maximum of 3 feet above the bottom of the excavation.
4. Eliminate bottom row of nails where second row from bottom is within 2 feet of the bottom of the excavation.
5. Horizontally stagger every other row of each column of nails midway between nail columns.
a. Maintain maximum horizontal spacings noted on plans.
6. Place soil nail bars within 6 inches of layout in any direction
7. Install nails to the lengths shown on the plans.
8. Maintain nail vertical inclination within 2 degrees of the inclination shown on plans.
9. Nails may be splayed up to 10 degrees horizontally to avoid obstructions such as piles, drainage features, utilities, etc.
a. Note location of splayed nails and reason for splay on working drawings.
10. Inform the Soil Nail Designer and the Engineer immediately if nails cannot be installed at plan locations.
a. Resolve conflicts as recommended in writing by the Soil Nail Designer after receiving authorization from the Engineer.

D. Grouting
1. Grout the drill hole after installation of the soil nail bar and within 2 hours of completing drilling.
2. Inject grout at the lowest point of each drill hole through a hollow bar soil nail, grout tube, casing, hollow-stem auger, or drill rods.
3. Place the outlet end of the grout delivery tube below the surface of the grout as the conduit is withdrawn to prevent the creation of voids.
4. Fill the drill hole in one continuous operation.
    a. Do not allow cold joints in the grout column except at the top of the test-bond length of proof-tested production nails.
5. For hollow-bar soil nails, use a high-shear colloidal mixer with a separate holding tank capable of continuous grouting that is independent from mixing.
    a. Minimum pump flow rate of 15 gpm.
6. Consider the hollow bar soil nails to be completed when the final grout returns to the excavation face, signaling that drilling spoils have been removed.
7. Fill bird’s beaks with additional grout after placing a temporary cover in front of the drill hole.
    a. Alternatively, fill bird’s beaks with shotcrete.

E. Soil Nail Testing

1. General
    a. Conduct verification tests on sacrificial nails at locations shown on the Nailing Pattern sheets in the plans.
    b. Perform proof testing on production soil nails.
        1. Test at least 5 percent of production soil nails, and
        2. Test no fewer than one production nail per row on each soil nail wall, and distribute the locations of proof tests evenly across the vertical and horizontal extent of the wall face.
    c. Perform testing at any nail after the nail grout and shotcrete facing have cured for at least 72 hours, or have attained their specified 3-day compressive strength.
    d. Do not apply loads greater than 80% of the minimum guaranteed ultimate tensile strength of the soil nail bar for Grade 150 bars, or 90% of the yield strength of the soil nail bar for minimum Grade 75 bars.
    e. Calculate nominal pullout resistance per unit length of soil nail utilizing a bond strength q_u of 16psi.
        1. Alternately calculate the design load DL based on the allowable design soil-grout adhesion bond strength of 8psi.
    f. Use Verification and Proof test nails having a minimum 3 feet unbonded length.
        1. Clean out the hollow bar unbonded length after bar installation.
        2. Placing a PVC pipe bond breaker without cleanout will not be sufficient to provide unbonded length.
    g. Measure and verify void for unbonded length prior to testing.
    h. Provide Verification test nails having a minimum 10-ft bonded length and Proof test nails having a minimum of 10 feet bonded length, unless tests are performed on production nails less than 12 feet in length.
2. Equipment
    a. Provide testing equipment including dial gages, dial gage support, jack and pressure gage, load cell, and a reaction frame as shown on plans.
    b. Use a pressure gage with a maximum graduation of 50 psi or use calibrated load cell for load steps.
    c. Support dial gages on a frame that is independent from the jacking and the wall.
    d. Measure nail head movement with at least 2 dial gages capable of measuring to 0.001 inch
3. Verification Testing

a. Perform the 2 verification tests per wall at locations shown on the plans.
b. Conduct on sacrificial nails prior to installation of production soil nails in order to confirm the appropriateness of the Contractor's drilling and installation methods and validate the design nail pullout resistance.
c. Conduct on nails of the same design and constructed with the same methods to be used on production nails.
d. Perform verification tests on soil nails with a known bonded length and a measured unbonded length.
e. Select a bonded length, L_{BVT}, as follows:
   1. Select L_{VBTmax}

      For Grade 75 or better, and other mild steel in accordance with ASTM A615, calculate the maximum length, L_{BVTmax} as

$$L_{BVT\,\max} = \frac{A_t \times f_y \times C_{RTY}}{r_{PO}} \qquad \text{EQ1}$$

      For Grade 150 and other high strength steel in accordance with ASTM A722, calculate the maximum length as

$$L_{BVT\,\max} = \frac{A_t \times f_u \times C_{RTU}}{r_{PO}} \qquad \text{EQ2}$$

      Where:

      C_{RTY} = reduction coefficient for mild-grade steel = 0.9
      C_{RTU} = reduction coefficient for high-grade steel = 0.8
      At = cross-sectional area of the test soil nail bar
      f_y = nominal yield resistance of test soil nail bar (mild steel)
      f_u = minimum ultimate tensile strength of test soil nail bar (high-strength steel)
      r_{PO} = nominal pullout resistance per unit length of soil nail = $\pi \times q_u \times D_{DH}$
      q_u = bond strength
      D_{DH} = drill hole diameter

   2. If LVBTmax > 10 ft, 10 ft ≤ LVBT ≤ LVBTmax

3. If LVBTmax < 10 ft, LVBT = 10 ft, increase the test soil nail bar size as needed, and recalculate LVBTmax until LVBTmax > 10 ft.

4. Calculate the maximum load during the verification test, defined as the Verification Test Load (VTL), as follows:

$$VTL = L_{BVT} \times r_{PO} \quad \text{EQ3}$$

f. Conduct verification tests by incrementally loading verification test nails to pullout or a maximum test load VTL in accordance with the loading schedule presented in Table 1.

g. Record soil nail movements at each load increment and at each time step. Zero dial gages after the alignment load (AL) has been applied.

h. Optionally, load verification test nails beyond VTL. After applying VTL, reduce loading to the AL and record the permanent set. Hold each load increment for at least 10 minutes.

i. Monitor the verification test nail for creep at a load of 0.75 VTL. Measure and record nail movements during the creep portion of the test in increments of 1 minute, 2, 3, 5, 6, 10, 20, 30, 50, and 60 minutes. Maintain the load during the creep test to within 2% of the intended load by using a load cell. Repump jack as needed to maintain load during hold times.

j. Optionally, perform stepped unloading. Consider between 1 to 7 intermediate steps in stepped unloading. If performed, hold each load step until gage readings are stable.

Table 1

Verification Test Loading Schedule		
Load	**Load**	**Hold Time (minutes)[2]**
AL	AL[1]	1
0.25DL	0.13 VTL	10 (record soil nail head movement at 1, 2, 5, 6, 10)
0.5DL	0.25 VTL	10 (record soil nail head movement at 1, 2, 5, 6, 10)
0.75DL	0.38 VTL	10 (record soil nail head movement at 1, 2, 5, 6, 10)
1.0DL	0.50 VTL	10 (record soil nail head movement at 1, 2, 5, 6, 10)
1.25DL	0.63 VTL	10 (record soil nail head movement at 1, 2, 5, 6, 10)
1.5DL	0.75 VTL (Creep Test)	10 (record soil nail head movement at 1, 2, 5, 6, 10, 30, 50, 60)

1.75DL	0.88 VTL	10
2.0DL	1.00 VTL	10
AL	AL	1[3]

[1]AL = 0.025 VTL or 0.05DL
[2]Measure soil nail head movement after each load increment has been achieved and at each indicated time step
[3]Record permanent soil nail movement

4. Proof Testing
   a. Demonstrate successful proof testing on at least 5% of production soil nails in each nail row or a minimum of one per row.
   b. Do not count verification tests towards the minimum of 5% of production nails.
   c. Perform proof tests on soil nails with a known bonded length and a measured temporary unbonded length.
   d. Select a bonded length (L_{BPT}) for the proof tests such that L_{BPT} is 10 ft or L_{BPTmax}, whichever is smaller.
   e. For Grade 75 or better, and other mild steel in accordance with ASTM A615, calculate the maximum length L_{BPTmax} as

$$L_{BPT\,\max} = \frac{A_t \times f_y \times C_{RTY}}{r_{PO} \times 0.75} \qquad \text{EQ4}$$

   f. For Grade 150 and other high strength steel in accordance with ASTM A722, calculate the maximum length L_{BPTmax} as

$$L_{BPT\,\max} = \frac{A_t \times f_u \times C_{RTU}}{r_{PO} \times 0.75} \qquad \text{EQ5}$$

   g. Allow for bond lengths less than 10 ft for production proof nails shorter than 12 ft.
   h. Do not proof test fully grouted nails
   i. Calculate the maximum load for proof tests, defined as the Proof Test Load (PTL), as follows:

$$PTL = L_{BPT} \times r_{PO} \times 0.75 \qquad \text{EQ6}$$

   j. Conduct proof tests by incrementally loading the proof test nail according to the test loading schedule in Table 2.
   k. Hold each load increment until stabilized and record soil nail movements at each load increment and time interval shown in Table 2.

l. Maintain all load increments to within 5% of the intended load. Repump jack as needed to maintain load during hold times.

m. Rezero dial gages after the alignment load is applied.

n. Perform creep tests at 1.00 PTL, beginning as soon as PTL is applied. Measure and record soil nail movement at 1 minute, 2, 3, 5, 6, and 10 minutes. If the nail movement measured between 1 minute and 10 minutes exceeds 0.04 inch, maintain the maximum test load for 50 additional minutes, and record soil nail movements at 20, 30, 50, and 60 minutes.

Table 2

Proof Test Loading Schedule		
Load	**Load**	**Hold Time (minutes)[3]**
AL[1]	AL[1]	1
0.25DL	0.17 PTL	Until movement stabilizes
0.5DL	0.33 PTL	Until movement stabilizes
0.75DL	0.50 PTL	Until movement stabilizes
1.0DL	0.67 PTL	Until movement stabilizes
1.25DL	0.83 PTL	Until movement stabilizes
1.5DL	1.0 PTL (Creep Test)[2]	10 (record soil nail head movement at 1, 2, 5, 6, 10)
AL	AL	1

[1]AL = alignment load ≤ 0.025 VTL or 0.05DL
[2]If soil nail movement measured between 1 and 10 minutes exceeds 0.04 inch, maintain PTL for 50 more minutes and record movements at 20, 30, 50, and 60 minutes. Record permanent soil movement.
[3]If the soils reinforced with nails are relatively susceptible to deformation or creep, hold each load increment for 10 minutes and record soil nail movement at 1, 2, 5, 6, and 10 minutes.

F. Soil Nail Test Acceptance Criteria

1. Verification test results: meet all of the following criteria:

a. The total creep movement is less than 0.08 inch between the 6- and 60- minute readings, and the creep rate is linear or decreasing throughout the creep test load hold period.

b. The total movement (ΔVTL) measured at VTL exceeds 80% of the theoretical elastic elongation of the unbonded length (L_{UB}) of the test nail, as depicted below in Equation 7.

$$\Delta VTL > 0.8\frac{VTL \times L_{UB}}{E \times A_t} \qquad \text{EQ7}$$

Where: E = Young's Modulus of steel (29,000 ksi)

c. Pullout does not occur before achieving 0.1 x VTL

2. Proof test results
   a. Creep movement between the 1- and 10-minute readings is less than 0.04 inch.
   b. If creep movement exceeds 0.04 inch between the 1- and 10-minute readings, the creep movement between the 6- and 60-minute readings must be less than 0.08 inch, and the creep rate must be linear or decreasing throughout the creep test load hold period.
   c. The total soil nail movement (ΔPTL) measured at PTL exceeds 80% theoretical elastic elongation of the unbonded length, as depicted below in Equation 8:

$$\Delta PTL > 0.8\frac{PTL \times L_{UB}}{E \times A_t} \qquad \text{EQ8}$$

   d. Pullout does not occur before the test load is 1.0 x PTL
   e. The temporary unbonded test length in proof tests is successfully maintained for subsequent satisfactory grouting. If the unbonded test length of production proof test nails cannot be satisfactorily grouted after testing, consider the proof nail to be sacrificial and replace with an additional production nail installed at no additional cost.

G. Soil Nail Test Rejection
   1. Verification Test Soil Nails
      a. Develop alternative design and/or installation methods recommended by the Soil Nail Designer, and install replacement verification test nails.
   2. Proof Test Soil Nails
      a. Provide the Soil Nail Designer's recommended resolution.
      b. The Engineer may require replacement of some or all installed production nails between a failed proof test nail and the adjacent passing proof test nail.
      c. Alternatively, the Engineer may require installation and testing of additional proof test nails to verify that adjacent previously installed production nails have sufficient nominal pullout resistance.

H. Wall Drainage
   1. Install and secure all elements of the soil nail wall drainage as shown on the drawings.

2. Wall drainage includes geocomposite drainage mat, PVC connection pipes, soil nail wall footing drains, and weep holes, as shown on the drawings.
3. Construct wall drainage to provide continuous and unrestricted flow to discharge water collected behind the wall face.
4. Excluding wall footing drains, construct all wall drainage elements prior to shotcreting.
5. Geocomposite drainage mats
    a. Center between columns of soil nails, as shown on the drawings.
    b. Minimum width = 12 inches
    c. Secure to the excavation face in a vertically continuous manner, with the geotextile side against the ground
    d. Prevent contamination of the geotextile with shotcrete.
6. Footing drains
    a. Install at the bottom of the wall, as shown on the drawings
    b. Envelop the footing drain aggregate and pipe with drainage geotextile such that they conform to the dimensions of the trench.
    c. Overlap the drainage geotextile on top of the drainage aggregate as shown on the drawings.
    d. Repair or replace damage drainage geotextile.

I. Shotcrete
1. Prepare shotcrete application surface according to the following:
    a. Prepare surface to line and grade.
    b. Clean loose material, mud, rebound, and other foreign matter.
    c. Remove curing compound on previously placed shotcrete surfaces by sandblasting.
    d. Install approved depth gages to indicate the thickness of shotcrete layers.
    e. Install depth gages on 6-ft centers longitudinally and transversely with at least 2 gages per increment of surface area to receive shotcrete.
    f. Moisten surfaces.
2. Place when ambient temperature is 40 degrees F or greater. Do not apply shotcrete during high winds or heavy rain. Protect and maintain shotcrete at a temperature above 40 degrees F until shotcrete has achieved a minimum strength of 750 psi.
3. Do not apply to frozen surfaces.
4. Use acceptable nozzle operators who have fabricated acceptable test panels for this project.
5. Apply dry-mix shotcrete within 45 minutes of batching. Apply wet-mix shotcrete within 90 minutes of batching.

6. Direct shotcrete at right angles to the receiving surface except when shooting ground reinforcing bars.
7. Apply in a steady and uninterrupted flow, in a circular fashion to build up the required layer thickness. If flow becomes intermittent, direct the flow away from the work area until it becomes steady.
8. Make the surface of each shotcrete layer uniform and free of sags, drips, or runs.
9. Limit the layer thickness of each shotcrete application to 2 inch. Thicker applications may be approved if the contractor can demonstrate that no sloughing or sagging is occurring. If additional thickness is required, broom or scarify the applied surface and allow the layer to harden. Dampen the surface before applying an additional layer.
10. Remove laitance, loose material, and rebound. Promptly remove rebound from the work area.
11. Taper construction joints to a thin edge over a distance of at least 1 ft. Wet the joint surface before placing additional shotcrete on the joint. Do not use square construction joints.
12. Install shotcrete final face finish using undisturbed gun finish as applied from the nozzle or a rod, broom, wood float, rubber float, steel trowel, or rough screeded finish as shown on the plans.
13. Where shotcrete is used to backfill bird's beaks position shotcrete nozzle into the mouth of the drillhole to completely fill the void.
14. Attachment of bearing plate and nut
    a. Attach a bearing plate, washers, and nut to each nail head as shown on the plans.
    b. Seat the bearing plate uniformly on the shotcrete while the facing is still plastic and before its initial set. Hand-wrench tighten the nut.
    c. Set the bearing plate in a bed of grout if needed to provide uniform contact between the plate and the shotcrete. Re-tighten the nut by hand with a wrench after the grout has set for 24 hours.
15. Refer to Table 3 for tolerances

Table 3

Construction Tolerances	
Item	**Tolerance**
Horizontal location of welded wire reinforcement, reinforcing bars, and headed studs	3/8 inch
Location of headed studs on bearing plate	¼ inch
Spacing between reinforcing bars	1 inch
Reinforcing lap	1 inch
Thickness of shotcrete if troweled or screeded	9/16 inch
Thickness of concrete if left as shot	1 1/8 inch
Planeness of finish surface, gap under 10-ft straight edge, if troweled or screeded	9/16 inch
Planeness of finish surface, gap under 10-ft straight edge, if left as shot	1 1/8 inch
Nail head bearing plate deviation from parallel to wall face	10 degrees

16. Do not place welded wire reinforcement directly against the soil. Place welded wire reinforcement in a manner to provide a minimum of 1 inch of shotcrete cover between the soil and the welded wire reinforcement.
17. Provide shotcrete test cores both from preconstruction test panels, construction test panels, and if needed from the constructed wall face. Conduct shotcreting and coring of test panels and the wall face using qualified personnel in the presence of the Engineer according to ACI 506.2. Refer to Section 02342S.
18. Deliver, store and handle materials in a manner that will prevent contamination, segregation, corrosion or damage.

END OF SECTION

August 3, 2016

SECTION 02924S

NOXIOUS WEED CONTROL

Add Section 02924:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Controlling the introduction and spread of noxious weeds on construction projects.

1.2 RELATED SECTIONS Not Used

1.3 REFERENCES

A. Utah Noxious Weed Act, Utah Administrative Code (UAC) Rule R68-9

1.4 DEFINITIONS

A. Noxious weeds subject to control are those identified on Utah Noxious Weed Act and County Declared Noxious Weed List which are currently found growing within the project location.

B. Refer to the Section, article 3.3 for a list of the Utah State Noxious Weeds (Table 1) and the County Declared Noxious Weeds (Table 2).

1.5 SUBMITTALS Not Used

1.6 PAYMENT PROCEDURES

A. Include payment for cleaning earth-moving construction equipment under mobilization.

B. Pay for the control of noxious weeds using pre-emergent, selective, and non-selective herbicides by the unit area.

1.7 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Follow all regulatory, application, and safety precautions listed by the herbicide manufacturer.
   2. Apply herbicides using only state licensed pesticide applicators.

1.8 SEQUENCING

A. Clean all earth-moving equipment before bringing them on the project.

B. Treat existing noxious weeds 10 days before starting earthwork operations.

PART 2 PRODUCTS

2.1 HERBICIDE

A. Refer to this Section, article 3.3 for a list of noxious weeds subject to control and the recommended herbicide for each species.

B. Use commercially available herbicides specified to control the noxious weed species identified.

PART 3 EXECUTION

3.1 PREPARATION

A. Use high-pressure water blasting or steam cleaning methods to clean all earth-moving construction equipment (scrapers, bulldozers, excavators, backhoes, trenchers) of dirt, mud, and seed residue before initially entering the project.

3.2 EXAMINATION

A. Verify and locate all noxious weeds on the project. Coordinate with Engineer if assistance is needed for identification.

3.3 CONTROLLING NOXIOUS WEEDS

A. Spray noxious weeds located within the project limits before starting earth disturbing activities and if they appear during construction. Use appropriate herbicides and recommended rates to control spread of noxious weeds (See Noxious Weed Tables 1 and 2 below). Apply herbicide as directed on the manufacturer's label.

B. State of Utah and County Declared Noxious Weed Tables:

Table 1 – State of Utah Noxious Weed List

Class 1A: Early Detection Rapid Response (EDRR) – Watch List Declared noxious and invasive weeds not native to the state of Utah and not known to exist in the State that pose a serious threat to the state and should be considered as a very high priority.		
Common Name	***Scientific Name***	**Herbicide** (Active Ingredient)
Common crupina	*Crupina vulgaris*	aminocyclopyrachlor + chlorsulfuron
African rue	*Peganum harmala*	glyphosate, imazapyr or metsulfuron
Small bugloss	*Anchusa arvensis*	2,4-D + dicamba
Mediterranean sage	*Salvia aethiopis*	2,4-D, clopyralid or picloram
Spring millet	*Milium vernale*	2,4-D
Syrian beancaper	*Zygophyllum fabago*	glyphosate, imazapic, picloram or metsulfuron
Ventenata (North Africa grass)	*Ventenata dubia*	imazapic or sulfosulfuron
Plumeless thistle	*Carduus acanthoides*	Clopyralid or 2,4-D
Malta starthistle	*Centaurea melitensis*	Aminopyralid, 2,4-D, clopyralid or dicamba
Class 1B: Early Detection Rapid Response (EDRR) Declared noxious and invasive weeds not native to the State of Utah that are known to exist in the state in very limited populations and pose a serious threat to the state and should be considered as a very high priority.		
Common Name	***Scientific Name***	**Herbicide** (Active Ingredient)
Camelthorn	*Alhagi maurorum*	2,4-D or dicamba
Garlic mustard	*Alliaria petiolata*	glyphosate
Purple starthistle	*Centaurea calcitrapa*	picloram or clopyralid
Goatsrue	*Galega officinalis*	2,4-D, dicamba or metsulfuron
African mustard	*Brassica tournefortii*	glyphosate, 2,4-D, or triclopyr
Giant reed	*Arundo donax*	glyphosate, triclopyr, or imazapyr
Japanese knotweed	*Polygonum cuspidatum*	dicamba

Blueweed (Vipers bugloss)	*Echium vulgare*	2,4-D amine
Elongated mustard	*Brassica elongata*	metsulfuron or chlorsulfuron
Common St. Johnswort	*Hypericum perforatum*	2,4-D or metsulfuron
Ox-eye daisy	*Chrysanthemum leucanthemum*	dicamba, picloram or clopyralid
Cutleaf vipergrass	*Scorzonera laciniata*	2,4-D

Class 2: Control

Declared noxious and invasive weeds not native to the state of Utah, that pose a threat to the state and should be considered a high priority for control. Weeds listed in the control list are known to exist in varying populations throughout the state. The concentration of these weeds is at a level where control or eradication may be possible.

Common Name	***Scientific Name***	**Herbicide** (Active Ingredient)
Leafy spurge	*Euphorbia esula*	dicamba or picloram
Medusahead	*Taeniatherum caput-medusae*	glyphosate
Rush skeletonweed	*Chondrilla juncea*	picloram, clopyraid or 2,4-D
Spotted knapweed	*Centaurea maculosa*	2,4-D + dicamba, picloram or clopyralid
Purple loosestrife	*Lythrum salicaria*	glyphosate (aquatic label)
Squarrose knapweed	*Centaurea virgata*	2,-4D, dicamba or picloram
Dyer's woad	*Isatis tinctoria*	2,4-D + dicamba or chlorsulfuron
Yellow starthistle	*Centaurea solstitialis*	picloram or clopyralid
Yellow toadflax	*Linaria vulgaris*	picloram
Diffuse knapweed	*Centaurea diffusa*	2,4-D + dicamba, picloram or clopyralid
Black Henbane	*Hyoscyamus niger*	picloram + metsulfuron
Dalmation toadflax	*Linaria dalmatica*	imazapic or picloram

Class 3: Containment

Declared noxious and invasive weeds not native to the State of Utah that are widely spread. Weeds listed in the containment noxious weeds list are known to exist in various populations throughout the state. Weed control efforts may be directed at reducing or eliminating new or expanding weed populations. Known and established weed populations, as determined by the weed control authority, may be managed by any approved weed control methodology, as determined by the weed control authority. These weeds pose a threat to the agricultural industry and agricultural products.

Common Name	***Scientific Name***	**Herbicide** (Active Ingredient)

Russian knapweed	*Centaurea repens*	picloram, clopyralid or chlorsulfuron
Houndstounge	*Cynoglossum officinale*	picloram
Perennial pepperweed (Tall whitetop)	*Lepidium latifolium*	metsulfuron or chlorsulfuron
Phragmites (Common reed)	*Phragmites australis ssp.*	glyphosate (aquatic label)
Tamarisk (Saltcedar)	*Tamarix ramosissima*	aminopyralid + triclopyr
Hoary cress (Whitetop)	*Cardaria draba*	2,4-D + dicamba or shlorsulfuron
Canada thistle	*Cirsium arvense*	2,4-D, dicamba, picloram
Poison hemlock	*Conium maculatum*	picloram
Musk thistle	*Carduus nutans*	2,4-D amine, metsulfuron, picloram
Quackgrass	*Elytrigia repens*	glyphosate
Jointed goatgrass	*Aegilops cylindrica*	glyphosate, impazapic
Bermudagrass *	*Cynodon dactylon*	glyphosate
Perennial Sorghum spp. (Johnsongrass)	*Sorghum halepense* and *Sorghum almum*	glyphosate
Scotch thistle (Cotton thistle)	*Onopordum acanthium*	2,4-D amine, metsulfuron, or picloram
Field bindweed (Wild Morning-glory)	*Convolvulus ssp.*	2,4-D + dicamba or picloram
Puncturevine (Goathead)	*Tribulus terrestris*	2,4-D anime

* Bermudagrass (*Cynodon dactylon*) shall not be a noxious weed in Washington County and shall not be subject to provisions of the Utah Noxious Weed Law within the boundaries of that county. It shall be a noxious weed throughout all other areas of the State of Utah and shall be subject to the laws therein.

Class 4: Prohibited

Declared noxious and invasive weeds, not native to the State of Utah, that pose a threat to the state through the retail sale or propagation in the nursery and greenhouse industry. Prohibited noxious weeds are annual, biennial, or perennial plants that the commissioner designates as having the potential or are known to be detrimental to human or animal health, the environment, public roads, crops, or other property.

Common Name	***Scientific Name***	**Herbicide** (Active Ingredient)
Cogongrass (Japanese blood grass)	*Imperata cylindrica*	glyphosate or imazapyr
Myrtle spurge	*Euphorbia myrsinites*	glyphosate or dicamba
Dames Rocket	*Hesperis matronalis*	glyphosate or triclopyr

Scotch broom	*Cytisus scoparius*	glyphosate or triclopyr
Russian olive	*Elaeagnus angustifolia*	aminopyralid + triclopyr

Table 2 – County Declared Noxious Weeds

Common Name	***Scientific Name***	**Herbicide** (Active Ingredient)
Beaver County		
Bull thistle	*Cirsium vulgare*	2,4-D amine or dicamba
Davis County		
Buffalobur	*Solanum rostratum*	2,4-D or dicamba
Duchesne County		
Western Water hemlock	*Cicuta douglasii*	2,4-D amine or dicamba
Garfield County		
Rubber Rabbitbrush	*Ericameria nauseosa*	2,4-D, dicamba, clopyralid or metsulfuron
Iron County		
Bull thistle	*Cirsium vulgare*	2,4-D amine or dicamba
Whorled milkweed	*Asclepias subverticillata*	2,4-D + dicamba or picloram
Juab County		
Blue flowering lettuce	*Lactuca tatarica*	2,4-D amine, impazapyr or metsulfuron
Morgan County		
Burdock	*Arctium minus*	2,4-D + dicamba
San Juan County		
Buffalobur	*Solanum rostratum*	2,4-D or dicamba
Whorled milkweed	*Asclepias subverticillata*	2,4-D + dicamba or picloram
Summit County		
Burdock	*Arctium minus*	2,4-D + dicamba
Uintah County		
Common teasel	*Dipsacus fullonum*	2,4-D amine
Washington County		
Halogeton	*Halogeton glomeratus*	2,4-D
Silverleaf nightshade	*Solanum elaegnifolium*	glyphosate or imazapyr
Whorled milkweed	*Asclepias subverticillata*	2,4-D + dicamba or

		picloram
Wayne County		
Bull thistle	*Cirsium vulgare*	2,4-D amine or dicamba

END OF SECTION

March 7, 2013

SECTION 03152M

CONCRETE JOINT CONTROL

Add the* following*:

PART 3 EXECUTION

3.1 RE-SEALING JOINTS WITH HOT-APPLIED JOINT SEALANT

A. Clean joints using compressed air at a minimum of 100 psi.

B. Apply hot-poured joint sealant to the joint prior to opening to traffic.

C. <u>Do not overfill joints.</u>

D. Allow hot-poured joint sealant to cure prior to opening to traffic to prevent tracking of the sealant.

E. Apply sealant with a fine tip nozzle capable of placing the material in the joint.

F. Plowable pavement marker sealant removed by grinding operation
1. Seal the cavities left from the removed plowable pavement markers the same as above.

END OF SECTION

July 12, 2016

SECTION 03310M

STRUCTURAL CONCRETE

Delete Article 2.1, paragraph A and replace with the following:

A. Class AA(AE) concrete, maximum shrinkage 0.03 percent at 28 days - refer to AASHTO T 160. Maximum water to cementitious ratio (w/c) 0.40. All other properties refer to Section 03055.

END OF SECTION

July 12, 2016

SECTION 03312S

STRUCTURAL CONCRETE FOR DECKS AND APPROACH SLABS

Add Section 03312:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and procedures for producing low shrinkage Portland Cement Concrete for bridge decks and approach slabs.

B. Materials and procedures for constructing structural concrete for bridge decks and approach slabs.

1.2 RELATED SECTIONS

A. Section 03055: Portland Cement Concrete

B. Section 03152: Concrete Joint Control

C. Section 03211: Reinforcing Steel and Welded Wire

D. Section 03310: Structural Concrete

E. Section 05832: Expansion Joints

1.3 REFERENCES

A. AASHTO M 6: Fine Aggregate for Portland Cement Concrete

B. AASHTO M 80: Coarse Aggregate for Portland Cement Concrete

C. AASHTO M 85: Portland Cement

D. AASHTO M 111: Zinc (Hot-dip Galvanized) Coatings on Iron and Steel Products

E. AASHTO M 154: Air-Entraining Admixtures for Concrete

F. AASHTO M 157: Ready-Mixed Concrete

G. AASHTO M 194: Chemical Admixtures for Concrete

H. AASHTO M 235: Epoxy Resin Adhesives

I. AASHTO M 295: Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

J. AASHTO M 307: Silica Fume Used in Cementitious Mixtures

K. AASHTO T 121: Density (Unit Weight), Yield, and Air Content of Concrete

L. AASHTO LRFD Bridge Construction Specifications

M. ASTM C 150: Portland Cement

N. ASTM C 157: Length Change of Hardened Hydraulic Cement Mortar and Concrete

O. ASTM C 309: Liquid Membrane-Forming Compounds for Curing Concrete

P. ASTM C 578: Rigid, Cellular Polystyrene Thermal Insulation

Q. ASTM C 1116/C 1116M - Standard Specification for Fiber-Reinforced Concrete

R. ASTM C 595: Blended Hydraulic Cements

S. ASTM C 1157: Hydraulic Cement

T. ASTM C 1579 - Standard Test Method for Evaluating Plastic Shrinkage Cracking of Restrained Fiber Reinforced Concrete (Using a Steel Form Insert)

U. ASTM C 1567: Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)

V. ASTM C 1602: Mixing Water Used in the Production of Hydraulic Cement Concrete

W. UDOT Minimum Sampling and Testing Requirements Manual

X. UDOT Quality Management Plan

Y. UDOT Quality Control/Quality Assurance (QC/QA) Procedures

1.4 DEFINITIONS

A. Microsynthetic Fiber – Synthetic fibers with diameters or equivalent diameters less than 0.012 inch.

B. Macrosynthetic Fiber – Synthetic fibers with diameters or equivalent diameters greater than 0.012 inch.

C. Monofilament- Single filament fiber, typically cylindrical in cross-section.

1.5 SUBMITTALS

A. Mix design for Class AA(AE) concrete for approval.
   1. Provide, as a key component to the mix design, a well graded combined aggregate structure.
   2. Submit a combined gradation for the mix design. Provide targets for each required sieve ($^{3}/_{4}$", $^{1}/_{2}$", $^{3}/_{8}$", #4, #8, #16, #30, #50, #100, #200), for the purpose of production control and acceptance.
   3. Perform the trial batch using full production operations.
      a. Use the same components in the trial batches that will be used in the project. Accelerators and site-added air-entrainment can be incorporated in the trial batch but are not required. The Contractor assumes responsibility for the compatibility of all admixtures with the mix design and their potential effects on concrete properties.
      b. Personnel performing and witnessing trial batches and performing compressive and flexural strength testing must be Department TTQP Concrete and Concrete Strength Testing qualified.
      c. The Department or its representative is to witness the trial batch.
      d. Compressive and flexural strength testing for verification of trial batches will be performed by an AASHTO accredited laboratory, approved through the Department Laboratory Qualification Program.

C. Test results establishing a density (unit weight) target of freshly mixed concrete according to AASHTO T 121.

D. Test results verifying the coarse and fine aggregate used according to this Section, article 2.1, paragraph D.

E. Test results for any proposed mix design for potential reactivity of coarse and fine aggregates according to the requirements of the UDOT Quality Management Plan for Ready-Mix Concrete.

F. Test results to determine the ability of the combinations of cementitious materials and aggregates to control the reactivity when using potentially reactive aggregates in a mix design.

G. Shrinkage test results according to ASTM C 157.

H. Verification that cement used is from a pre-qualified supplier. Refer to this Section, article 2.1, paragraph B.5.

I. Written plan for admixtures. Refer to this Section, article 2.1, paragraph

J. Verification that fly ash or other pozzolan used is from a pre-qualified supplier. Refer to this Section, article 2.1, paragraph G.

K. Verification that the batch plant meets the requirements of the UDOT Quality Management Plan for Ready-Mix Concrete.

L. Cold and hot weather plans.

M. Surface evaporation plan according to Section 03310.

N. Concrete Placement and Finishing Plan for approval at least 10 days before the Pre-Activity Meeting.
   1. Include the following:
      a. Description of equipment, materials, and personnel for placing, finishing, and curing concrete
      b. Methods for placing, finishing, and curing concrete.
      c. Placement schedule, including placement rates, time of day, duration, deck section being placed, etc.
      d. Quality control plan.

1.6 ACCEPTANCE

A. Acceptance is according to UDOT Minimum Sampling and Testing Requirements Section 03055 with the following exceptions:
   1. Frequency requirements for Slump are suspended
   2. Test fresh concrete density (unit weight) according to AASHTO T121 at the same frequency as Air Content and Concrete Temperature.
      a. Batch fails if the unit weight of the fresh concrete in the field varies more than ± 5 lb/ft^3 from the target density for fresh concrete established by the mix design
   3. Reject batch if water/cementitious ratio exceeds the water/cementitious ratio established in the trial batch.

B. Pre-approve stockpiles before production. Provide quality control sieve analysis during production**.**

1. For acceptance, allow a variance of the sieve targets established by the mix design and submitted to the Department (this Section, article 1.5, paragraph A) as determined in Table 1.

Table 1

Sieve Size	**Percent Passing Allowable Tolerance**
$^3/_4$", $^1/_2$", $^3/_8$"	± 10%
#4, #8	± 5 %
#16, #30, #50	± 4%
#100 and #200	± 3%

C. The Department may accept the item at a reduced price when concrete is below specified strength and does not have a separate strength pay factor.

1. The pay factor will be applied to the quantity of the bid item that is represented by the strength tests that fall below a specified strength.
2. The Department will calculate the pay factor using Table 2 based on 28 day compressive strength.

Table 2

Price Reduction for 28 Day Compressive Strength	
Psi below Specified Strength	**Pay Factor**
1-200	0.98
201-400	0.95
More than 400	Reject

3. The Engineer may accept a “reject” lot based on an engineering analysis and concurrence from the Region Materials Engineer. Apply a pay factor of 0.50 if a reject lot is allowed to remain in- place.

PART 2 PRODUCTS

2.1 CONCRETE

A. Concrete Class and Mix Requirements

1. Refer to the requirements in Table 3.

Table 3

Class	Coarse Aggregate or Sieve Size	Max. Water/ Cementitious Ratio	Air Content Percent (%)*	Mix Design Compressive Strength *f* 'cr (psi)	28 Day Minimum Compressive Strength *f* 'c (psi) **
AA(AE)	1" to No. 4	0.40	5.0 - 7.5	5,200	4,000
	¾" to No. 4	0.40	5.0 - 7.5	5,200	4,000

* Values listed represent in-place air content. Make necessary adjustments for impacts to air content due to placement.

2. Maximum nominal size of coarse aggregate:
   a. Not larger than $^1/_5$ the narrowest dimension between sides of forms.
   b. Not larger than ⅓ the depth of slabs.
   c. Not larger than ¾ the minimum clear distance between reinforcing bars or between bars and forms, whichever is less.

3. Do not exceed water/cementitious ratio.
   a. Calculate the water/cementitious ratio (w/c) according to the following formula:

$$\frac{W}{C} = \frac{Water}{Cement + Pozzolan}$$

4. Do not exceed 30 percent total pozzolan in any mix unless approved or otherwise specified.

5. Do not exceed a shrinkage limit of 0.03 percent at 28 days when tested according to ASTM C 157.

B. Cement
   1. Use Type II Portland cement or blended hydraulic cement unless otherwise specified. Refer to ASTM C 150, ASTM C 595, ASTM C 1157.

   2. Portland Cement
      a. Refer to Tables 1 and 3 in ASTM C 150.
      b. Refer to Table 2 in ASTM C150 for low-alkali cement.

   3. Blended Hydraulic Cement
      a. Blended hydraulic cement substituted for portland cement:
         1) Use ASTM C 1567 to verify that expansion is less than 0.1 percent 14 days after the zero reading.
         2) Refer to the equivalent cements listed in Table 4.

b. Do not exceed 30 percent total pozzolan limit when adding flyash to a blended hydraulic cement.
   1) Submit documentation of the total pozzolan content with the mix design.

Table 4

Portland Cement/Blended Hydraulic Cement Equivalencies		
AASHTO M 85 (Low Alkali)	**ASTM C 595**	**ASTM C 1157**
*Type I	IP	GU
Type II	IP (MS)	MS
*Type III	-	HE
*Type V	-	HS

* Use only when specified

4. Do not use cement that contains lumps or is partially set.
5. Use cement from the list of Department qualified suppliers list maintained by the Department Materials Quality Assurance Section.
6. Do not mix cements originating from different sources.
7. Do not use air-entrained cement.
8. Department will sample and test the cement according to UDOT Quality Management Plan 502: Cement.

C. Synthetic Fiber Reinforcement
1. Provide products from one manufacturer.
2. Microsynthetic fiber, use monofilament synthetic fibers at 2 lb. per cu. yd. of concrete mix.
3. Macrosynthetic fiber, a minimum flexural strength ratio ($R_{e,3}$) of 25 percent when tested in accordance with ASTM C 1609/C 1609M is required. Use 4 lb. per cu. yd. of concrete mix.
4. Store the fibers in a dry, covered area, free of contamination.
5. Evaluate trial batches to ensure workability of the concrete.
6. Conform to ASTM C 1116/C 1116M, Type III and the requirements of ICC-ES AC32 Section 3.1.1 (plastic shrinkage reinforcement) and Section 3.1.2 (shrinkage and temperature reinforcement).
7. Do not introduce fibers at the same time as the cement is being introduced. Mix for at least five minutes after the addition of the fibers.

D. Aggregate
1. Coarse Aggregate for Normal Concrete Mixes
   a. Use coarse aggregate that meets AASHTO M 80 physical properties.
   b. Do not exceed percentages of deleterious substances as specified in AASHTO M 80, Table 2, for Class A aggregates.

2. Fine Aggregate for Normal Concrete Mixes
    a. Use fine aggregate that meets AASHTO M 6 physical properties.
    b. Do not exceed percentages of deleterious substances as specified in AASHTO M 6, Table 2, for class A aggregates, using option “b” for material finer than the No. 200 sieve.
3. Provide a well graded combined gradation.

E. Water
1. Use potable water or water that meets ASTM C 1602, including Table 2.

F. Admixtures
1. Do not use calcium chloride.
2. Air Entrainment according to AASHTO M 154, including Section 5.
3. Water Reducing Agents
    a. Refer to AASHTO M 194.
    b. High Range Water Reducer (HRWR) – Submit a written plan for approval with the trial batch that shows proper attention will be given to ingredients, production methods, handling, and placing.
4. Accelerators – Refer to AASHTO M 194.
5. Set Retarding Admixtures – Refer to AASHTO M 194.
    a. Establish the effective life of the set-retarding admixture by trial batch if set retarding admixtures are required due to haul times exceeding the time limitations in Section 03055.
    b. Do not exceed any manufacturer recommendations for the use of the set retarding admixture.
    c. Do not re-dose the concrete with additional set retarding admixture.
    d. Add set retarding admixture at the batch plant at the time of initial batching operations.
    e. Show on batch tickets the amount of admixture used.
    f. Time of placement is established by the trial batch and supersedes the requirements in Section 03055 .
6. Site-added air-entrainment – Refer to AASHTO M 154.
    a. Limit the use of site-added air-entraining agents to one addition per load, regardless of quantity.
    b. Use pre-measured admixtures.
    c. Record amount used on batch ticket.
    d. Rotate the drum at least 30 revolutions at the mixing speed recommended by the supplier.
    e. Retest fresh concrete density (unit weight). Refer to this

Section,
article 1.6, paragraph

G. Pozzolan
   1. Fly Ash
      a. Class F according to AASHTO M 295 except Table 2.
      b. Fly ash may be sampled and tested for compliance at any time.
         1) Loss on Ignition (LOI) - Not to exceed 3 percent.
         2) Allowable CaO content - Not to exceed 15 percent.
         3) Use fly ash from the list of Department pre-qualified sources maintained by Department Central Materials.
         4) Label the storage silo for fly ash to distinguish it from cement.
         5) Use different size unloading hoses and fittings for cement and fly ash.
   2. Use pozzolan from the list of Department qualified suppliers list maintained by the Department Central Materials.
   3. Department will sample and test the pozzolan according to the UDOT Quality Management Plan 507: Flyash and Pozzolan.

2.2 REINFORCING STEEL AND WELDED WIRE

A. Refer to Section 03211.

2.3 JOINTS AND SEALERS

A. Premolded and Preformed Joint Filler – Refer to Section 03152.

2.4 BACKER ROD

A. Use backer rod composed of closed-cell polyethylene foam of sufficient size to prevent the sealant from passing to the bottom of the groove. Refer to Section 03152.

2.5 WATERSTOPS

A. Refer to Section 03152.

2.6 RIGID PLASTIC FOAM

A. Preformed, extruded, cellular polystyrene thermal insulation material that has a water absorption property of 0.3 or less. Refer to ASTM C 578.

2.7 CURING COMPOUND

A. Refer to ASTM C 309, Type I D, Class A.

2.8 FORMS

A. Plywood, wood, metal, glass, or a combination of these materials.

2.9 MISCELLANEOUS STEEL ITEMS

A. Galvanize all miscellaneous steel items permanently cast into structural concrete elements. Refer to AASHTO M 111.

2.10 EPOXY ADHESIVE

A. Refer to AASHTO M 235, Type II.

PART 3 EXECUTION

3.1 PREPARATION

A. Pre-Activity Meeting
   1. Contractor, Department, and Supplier personnel involved with completing the work must attend the Pre-Activity Meeting.
   2. Conduct Pre-Activity meeting within 48 hours prior to concrete placement.
   3. Provide notification of the meeting to the Engineer 10 days in advance.
   4. Discuss items specific to bridge deck and approach slab concrete work including the following:
      a. Methods for placing, finishing, and curing.
      b. Schedule, production rates, construction practices, and quality control procedures.
      c. Required submittals.
      d. Sampling and testing.
      e. Verification of placement and clearances of reinforcing steel.

B. Aggregate Stockpiles
   1. Construct stockpile platforms so that subgrades are prevented from intruding into aggregates.
   2. Build stockpiles at least two days before use.
   3. Provide an operator and front-end loader to help the Engineer take aggregate samples.
   4. Aggregate may not be accepted more than 30 days before use.
   5. Construct stockpiles to minimize segregation of aggregates.

6. Allow washed aggregates to drain to uniform moisture content before use (12 hr minimum).

C. Falsework
   1. Refer to Section 03310.

D. Forms
   1. Refer to Section 03310.

3.2 BATCH MATERIALS

A. Refer to AASHTO M 157.

3.3 MIX DESIGN

A. Design the cementitious system to mitigate potential alkali-aggregate reactivity.
   1. Use a minimum of 20 percent flyash by weight of the total cementitious system.

B. Use only concrete mixes that have been approved by the Department

3.3 DECK SLABS

A. Do not place parapet forms or parapet for at least seven days and until it has attained required design strength or leave all falsework in place and design it to carry all additional loads that are part of the parapet placement process.

3.5 PLACE CONCRETE

A. Place concrete according to the approved Concrete Placement and Finishing Plan.

B. Refer to Section 03310

3.6 PUMP CONCRETE

A. Refer to Section 03310

3.7 LIMITATIONS

A. Refer to Section 03310.

3.8 CYLINDER STORAGE DEVICE

A. Refer to Section 03055.

3.9 EXPANSION JOINTS

A. Expansion joints – Refer to Section 05832

B. Adjust joint widths as shown on the plans.

3.10 CONSTRUCTION JOINTS

A. Refer to Section 03310.

3.11 CONCRETE SURFACE FINISHING CLASSIFICATIONS

A. Refer to Section 03310.

3.12 CONCRETE SURFACE FINISHING

A. Refer to Section 03310.

3.13 CONCRETE SURFACE FINISHING PROCEDURES

A. Finish concrete according to the approved Concrete Placement and Finishing Plan

B. Refer to Section 03310

3.14 CURE BRIDGE DECKS AND APPROACH SLABS

A. Cure all newly placed concrete to prevent loss of water for at least 14 continuous days as follows:
   1. Formed surfaces
      a. Cure formed surfaces of concrete by retaining the forms in place without loosening for the required curing time period.
      b. Seal formed surfaces by applying a liquid membrane curing compound immediately after forms are removed and necessary finishing has been done when forms are removed during the required curing time period.
         1) Apply membrane-curing compound uniformly at the manufacturer's recommended rate, but not less than 100 ft2/gal.
         2) Immediately repair any areas damaged during the specified curing period by re-spraying.
         3) Do not use on surfaces where rubbed finish is required or on surfaces of construction joints unless it

is removed by sand blasting before placing concrete against the joint.

2. Exposed surfaces
   a. Cure the top surfaces of bridge decks and approach slabs by a combination of the liquid membrane-curing compound method and the water method.
   b. Apply membrane-curing compound so that no portion of the deck or approach slab is exposed to the atmosphere for more than 20 minutes after the tining or finishing operation.
      1) Apply membrane-curing compound uniformly at the manufacturer's recommended rate but not less than 100 ft2/gal.
      2) Use a work bridge that follows immediately after the finishing machine to allow application of the curing compound while the concrete is still plastic.
   c. Completely cover all newly placed concrete areas in bridge decks and approach slabs with material that retains moisture and does not prevent evaporation, such as cotton or burlap mats as soon as the concrete is sufficiently set to support the materials.
      1) Secure the cotton or burlap mats to prevent wind or other forces from removing them.
      2) Do not damage the finish.
   d. Keep the entire area of newly placed concrete damp continuously for 14 days after placement.
      1) Do not erode or damage the surface.
      2) Prevent excess water from impacting traffic on in- service roadways.
3. Fogging
   a. Fogging may be used to increase the relative humidity above the fresh concrete and minimize the loss of moisture through evaporation when necessary.
   b. To curb effects of low humidity, wind or high temperatures before the application of curing materials, concrete being placed and finished for bridge decks and approach slabs may be protected from damage due to rapid evaporation by fogging.
   c. Incorporate the use of compressed air misters that atomize the water, producing a very fine mist and not a spray when fogging equipment is used.
      1) Use equipment that allows for adjusting the rate of fogging depending on the conditions that are present.
      2) Do not aim misters in a direction lower than horizontal at 5 ft above the concrete surface.

3) Do not use fogging to apply excess water to the concrete surface to aid finishing.
4) Discontinue fogging when a fine coating of water or sheen is visible on the concrete surface.

d. Do not affect the water/cement ratio of the concrete.

B. Follow the cold and hot weather limitations for curing according to Section 03310.

3.15 FORM REMOVAL

A. Refer to Section 03310.

3.16 CLEAN

A. Refer to Section 03310.

END OF SECTION

3—EXCEPTIONS

Exceptions to UDOT Standard Specifications and Supplemental Specifications

These Contract provisions revise the Utah Department of Transportation's *2012 Standard Specifications for Road and Bridge Construction* as modified by the 2012 Supplemental Specifications, and contain requirements generally applicable to the Work to be performed by Design-Builder. In certain cases, provisions in the Standard Specifications have been superseded by other provisions of the Contract Documents.

Any conflicts, ambiguities, or lack of clarity in regards to items included in this Exceptions, will be interpreted and defined by the Department in its sole discretion. The Design-Builder shall not take advantage of any apparent conflict, omission, ambiguity, inconsistency, inaccuracy, deficiency, or inadequacy related to the definition of roles and responsibilities in the execution of the Work. Should it appear that any definition of roles and responsibilities is contrary to the philosophy of such established by this exception, it is the responsibility of the Design-Builder to request a determination by the Department related to the respective roles and responsibilities of the Design-Builder and the Department.

The Standard Specifications are incorporated herein except as otherwise provided in the Contract Documents, and with the following general exceptions:

General Exceptions

1. When these Standard Specifications refer to "Engineer", such reference shall mean the definition given in Part 1, Appendix A (Acronyms and Definitions List), except when specified otherwise within these General Exceptions.
2. When these Standard Specifications refer to "Contractor", such reference shall mean the Design-Builder, except when specified otherwise within these General Exceptions.
3. Decisions regarding price adjustments outlined in these Standard Specifications shall be the responsibility of the Engineer as defined in Part 1, Appendix A (Acronyms and Definitions List), with such decisions coordinated with the Department.
4. Decisions regarding reject materials, especially in regards to allowing nonconforming Work to remain in place at a reduced payment, will always be the Department's.
5. When these Standards Specifications refer to the project, projects, or UDOT project, such references shall mean the Project.
6. All references to measurement and payment shall be disregarded except as provided in General Exception 7 below.
7. When these Standard Specifications refer to any payments or adjustments above the Contract Amount, or similar phrases, such references will be disregarded. It is the intent that the payment of the Contract Amount will be full compensation for all Work performed pursuant to the Design-Build Contract unless provided for in Part 2 (General Provisions). An exception is that a Change

Order pursuant to Part 2 (General Provisions) may be issued by the Department for incentives provided for in the Standard Specifications.

8. When these Standard Specifications describe actions, materials, means, or methods that are required and that are qualified by phrases of direction, designation, or permission of the Engineer (e.g., "directed by the Engineer", "direction of the Engineer", "Engineer may direct", "discretion of the Engineer", "designated by the Engineer", "Engineer designated", or "permission from the Engineer"), such phrases shall be disregarded. If it is not clear whether a phrase should be disregarded, the Department will make that decision in its sole discretion. When these Standard Specifications refer to persons, offices, or divisions within the Department, such reference shall mean Department.

9. When an approval or authorization of the Engineer is required in these Standard Specifications for the use of alternative or substituted processes, material, or components, the Engineer shall mean Department.

10. When these Standard Specifications refer to an approval of any correction or repair that deviates from the Contract requirements, follow the requirements of Part 2 (General Provisions).

11. When these Standard Specifications provide that reports, records, or other documents shall be submitted or furnished to the Department, such reports shall be made available upon request to the Department and do not have to be submitted, provided no other requirement exists for submittal.

12. When these Standard Specifications require approval of shop drawings, falsework drawings, or erection plans, such approval shall be from the Engineer as defined in Part 1, Appendix A (Acronyms and Definitions List).

13. When these Standard Specifications require actions, materials, means, or methods that are not designated in the Released for Construction Documents, such phrases shall be disregarded.

14. When these Standard Specifications refer to the "Engineer" ordering work beyond the scope of work in the Contract, such phrases shall be disregarded, and the Design-Builder shall refer to Part 2 (General Provisions).

15. Wherever references to "Engineer" result in testing or acceptance procedures being assigned to the Engineer, acceptance shall be on behalf of the Department.

16. Any references in these Standard Specifications to the Engineer that refer to the time period after Final Acceptance shall mean the Department.

17. When these Standard Specifications require notifications to the Engineer, Engineer shall mean the Department and Engineer.

18. When these Standard Specifications refer to approval of the ability to work during times and dates other than those specified, the Approval shall be the Department's.

19. Wherever these Standard Specifications refer to an approved product or laboratory, such references shall mean Department Approved product or laboratory

20. Wherever these Standard Specifications refer to a pre-qualified supplier, such references shall mean Department pre-qualified suppliers; pre-qualified according to the UDOT Quality Management Plans.

21. Unless otherwise specified, when these Standard Specifications refer to Department performing tests, such references shall mean the Design-Builder.

22. For any references to Liquidated Damages, refer to Part 2 (General Provisions). This does not apply to incentive/disincentive provision.

23. For references to Substantial Completion, construction completion, project completion, and Contract Completion, refer to Part 2 (General Provisions).

24. Warranties shall be covered under the Warranty Provisions of Part 9 (Warranty Provisions).

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS

PART 6:

THIRD-PARTY AGREEMENTS

Final Issued September 15, 2016

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1. AT&T Corp. Master Utility Agreement (Draft)
2. CenturyLink Statewide Utility Relocation Agreement (Executed)
3. CenturyLink QC Project Agreement (Partially Executed)
4. Comcast Cable Master Utility Agreement (Executed)
5. First Digital Telecom Master Utility Agreement (Draft)
6. Kearns Improvement District (Draft)
7. Manuel Bros., Inc. Master Utility Agreement (Draft)
8. MCI Communications Services (Verizon Business) Master Utility Agreement (Draft)
9. Questar Gas Company Statewide Utility Relocation Agreement (Executed)
10. Rocky Mountain Power (PacifiCorp) Statewide Utility Relocation Agreement (Executed)
11. Rocky Mountain Power (PacifiCorp) Project Agreement No. 1 (Executed)
12. South Jordan City Master Utility Agreement (Draft)
13. South Valley Sewer District Master Utility Agreement (Executed)
14. Syringa Networks, LLC Telecommunications Facility Exchange Agreement (Executed)
15. Taylorsville City Master Utility Agreement (Draft)
16. Taylorsville Bennion Improvement District Master Utility Agreement (Draft)
17. United States Bureau of Reclamation & Jordan Valley Water Conservancy District Project Agreement (Draft)
18. Welby Jacobs Canal (Draft)
19. City of West Jordan Master Utility Agreement (Draft)
20. Zayo Group, LLC Master Utility Agreement (Partially Executed)

GENERAL

The Design-Builder shall perform all of the Department's obligations in each Third-Party Agreement, except for payment to Third Parties for Third-Party-performed work. The Department retains its rights and responsibilities pertaining to cost share reimbursement, audit, oversight, and any other elements of the Third-Party Agreements at the Department's sole discretion.

A T & T CORP.
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this _____ day of_____, 20_____, by and between the **Utah Department of Transportation**, ("UDOT") and **AT&T Corp.**, doing business as AT & T Corp., a Registered Corporation in the State of New York licensed to operate in the State of Utah , ("Company") (each as "Party" and jointly as "Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, UDOT's design-build contractor ("Design-Builder") will complete the design and administer construction of the Project; and

WHEREAS, UDOT has identified Company facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, the Company desires for the Design-Builder to design and construct the Company's Utility Work necessitated by the Project with the exception of cable/hand hold procurement, pulling, and splicing; and

WHEREAS, the Company will perform the necessary design review, inspection, cable/hand hold procurement, pulling, and splicing to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering Utility Work to be accomplished by the Company and UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

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AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

Company's contact person is Rob Williamson, telephone number (208) 338-2816, and e-mail rlwilliamson@att.com.

After awarding the Project, UDOT will provide the Company with the Design-Builder contact information, hereinafter referred to as "Design-Builder Third Party Manager".

2. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the Company's facilities and requirements for inclusion in this Agreement and the request for proposals, UDOT gave the Company authorization for preliminary design engineering on April 26, 2016.

3. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the Company.

4. PROJECT COORDINATION

Company and UDOT agree to have the Design-Builder include in the Project, items of Utility Work for the Company's facilities.

During the development of the Project design, the Company and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the Company's facilities can be avoided. If Utility Work is required, UDOT will be responsible to propose and provide a location for the facilities. UDOT will provide the Company with Project design plans as early as possible, and will schedule and meet with the Company to review the design, construction, estimates of cost, and scheduling for the Company's Utility Work at specific locations

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on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

The Company shall advise UDOT's Project Representative of the approximate time required for completion of the Utility Work and shall diligently pursue its Utility Work so that completion can be accomplished according to the pre-determined time schedule negotiated by the Company and UDOT in the supplemental agreement issued hereto for a specific Project location. The Company shall immediately notify UDOT's Project Representative by phone call or email, of its discovery of any occurrence or unforeseen circumstances that would prevent the Company from completing its Utility Work according to the time schedule provided. In addition, the Company shall describe the circumstances in writing within 24-hours of the discovery to UDOT's Project Representative.

5. COMPANY REQUIREMENTS

UDOT will comply with the following Company Utility Work requirements:

a. The Company requires two 2 months per location to engineer Utility Work estimates.
b. Exercise all due caution while working near the facilities in order to prevent damage to the facilities.
c. To notify Company by telephone at (800) 252-1133 at least 48 hours prior to performing any construction, demolition or repairs at the facilities location.
d. To perform construction, demolition, repair, modifications, additions, and any other activities in compliance with all applicable laws and regulations and in a manner that does not interfere with the operations of Company.

6. UDOT TO DESIGN AND CONSTRUCT A PORTION OF UTILITY WORK

UDOT shall perform the necessary design work, cost estimating for its Utility Work, field and office engineering, furnish all materials (except cables and hand holds necessary to accommodate the Utility Work), and perform the Utility Work (except pulling and splicing), necessitated by the Project.

UDOT will design the Utility Work in accordance with Company's standards regularly followed by the Company in its own work and not considered a betterment. In the event of a conflict between UDOT and Company standards, the higher standard will be applied.

UDOT will secure permits required for Utility Work for Company's facilities.

UDOT shall protect existing facilities, including services, which are not to be relocated or adjusted, belonging to Company after notice to and in coordination with Company.

UDOT will supply as-constructed plans for the Utility Work it performs, in AutoCAD format, upon completion of any required Utility Work.

7. COMPANY TO PERORM INSPECTION AND CONSTRUCT A PORTION OF THE UTILITY WORK

The Company will perform inspection of the Utility Work for the Company's facilities that will be performed by UDOT. UDOT will accomplish the Utility Work on the Company's facilities in

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accordance with the plans and specifications approved by the Company. Changes or additions to the plans and specifications shall be approved by the Company and UDOT through a supplemental agreement.

The Company will provide all cables, hand holds, pulling, and splicing, necessary to accommodate the Utility Work of its facilities on the Project. The Company requires 30 days' notice to schedule splicing and fiber pulls and will determine the splicing window based on the circuit.

8. STANDARD SPECIFICATIONS AND REGULATIONS

The Company, while engaged in the preliminary design and Utility Work of its facilities, shall comply with UDOT's 2012 Standard Specifications for Road and Bridge Construction and Utah Administrative Code R930-7.

9. UNDERBUILT AND FACILITY REMOVAL REQUIREMENTS

The Company is responsible to see to the removal of all Company-owned underbuilt facilities from utility poles that will be relocated or removed due to the Project.

10. RIGHT-OF-WAY

Any easements or replacement right-of-way required in conjunction with the Utility Work of Company's facilities will be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8-7.

11. MAINTENANCE OF TRAFFIC (MOT), TRAFFIC CONTROL, CLEAR/GRUB, AND SURVEYING

UDOT will provide MOT and traffic control for Utility Work at no cost to the Company. The Company is responsible to coordinate Utility Work schedules and traffic control needs with UDOT to facilitate the Project schedule and minimize impacts to the public. Except in the case of emergencies, Company's Utility Work on the Project will be scheduled in compliance with the requirements of the Limitation of Operations contained in UDOT's Design-Builder contract with respect to lane closures, peak hour Utility Work restrictions, holiday and special event limitations, etc.

UDOT will provide, at no cost to the Company, clearing and grubbing for the Utility Work as required by the Company and in accordance with UDOT's Standard Specifications.

Surveying and staking of roadway facilities as required by the Company will be provided by UDOT in accordance with UDOT's Standard Specifications. The cost of the surveying and staking will be at UDOT's expense and the Company will have no obligation for the cost of surveying. Any of UDOT's survey control stakes or bench markers, which are removed or damaged by the Company, shall be reestablished by UDOT at Company's expense.

12. BETTERMENT WORK

If the Company desires to include betterment work in the Project at any specific location, UDOT may agree to the betterment work providing the difference in costs between the functionally

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equivalent required Utility Work and the Company's desired betterment work, that is not required by the Project, shall be at the sole cost of the Company and the betterment work can reasonably be accommodated without delaying UDOT's Project. The betterment work will be addressed by a separate supplemental agreement between UDOT and the Company.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

13. SUPPLEMENTAL AGREEMENTS

UDOT and the Company shall enter into individual supplemental agreements to cover Utility Work at specific Project locations. Each supplemental agreement will include a description and location of the Utility Work to be performed, design drawings showing the original and proposed locations of the Company's facilities, Utility Work schedules, cost estimates from all Parties, participation shares for UDOT and the Company, any proposed betterment work, and any necessary right-of-way documents. The estimates do not account for increases due to unknown and unforeseen hardships in accomplishing the Utility Work. A copy of the format of the proposed supplemental agreement is marked Exhibit "A" that is incorporated by reference.

The Company will require a 2 week review and approval period for any final supplemental agreement submitted to the Company by UDOT.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental agreement approved in writing by the Parties is required prior to the start of Utility Work on the changes or additions.

14. UDOT AUTHORIZATION TO PROCEED WITH UTILITY WORK

The Company shall not perform any Utility Work until the supplemental agreement for the Utility Work is signed by the Company and received by UDOT. UDOT will review and approve the supplemental agreement and will issue an authorization to proceed to the Company for each specific Utility Work location.

15. UDOT TO NOTIFY THE COMPANY BEFORE BEGINNING UTILITY WORK

UDOT will notify the Company at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto, to allow the Company time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis. Should UDOT fail to give advance notification and Utility Work is performed without the presence of a Company inspector, UDOT will, at no cost to the Company, facilitate inspection of the Utility Work including, if necessary, uncovering the Utility Work.

16. COMPANY TO NOTIFY UDOT AND THE DESIGN-BUILDER BEFORE BEGINNING COMPANY PERFORMED UTILITY WORK

The Company will notify UDOT's Project Representative as well as the Design-Builder Project Representative at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto. The Company will give subsequent notifications of when

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and where the Company will be performing Utility Work to UDOT's Field Representative and the Design-Builder Project Representative on a day-to-day basis. Such subsequent notifications can be informal. Failure on the part of the Company to give proper notification to UDOT's Field Representative and the Design-Builder Project Representative will be cited to the Company and that portion of the Company's Utility Work performed while not under the surveillance of the UDOT Field Representative may be deducted from the reimbursement at UDOT's discretion for.

17. INSPECTION

The Company shall provide on-call engineering support by the Company's engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during the Utility Work, and to perform the necessary inspection for the Company's Utility Work installed by UDOT.

a. The Company engineer and/or inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on Company's facilities in accordance with the plans and specifications provided and/or approved by the Company, including changes or additions to the plans and specifications, which are approved by the Parties hereto.
b. The Company shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on the Company's facilities. The Company shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.
c. UDOT will respond to the Company's concerns within 24-hours of written notification.
d. The Company, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns the Company may have with acceptance of the facilities upon completion of the Utility Work.
e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Company's Utility Work does not relieve the Company of its duty in the performance of the Utility Work or to ensure compliance with acceptable standards.

18. DAILY RECORDKEEPING

UDOT's Field Representative, will keep daily records of the inspection and Utility Work performed by the Company forces. Daily records will be in duplicate on a form to be prepared by the Company or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance, and Certification Manager. The daily records shall be signed by UDOT's Field Representative, the Company or its authorized representatives.

19. REIMBURSEMENT FOR COMPANY'S UTILITY WORK

In accordance with Utah Code §72-6-116(3)(a)(ii), UDOT will reimburse the Company 50% of the cost of Utility Work of its facilities on state highways and the Company shall pay the remainder of the cost of the Utility Work. UDOT will reimburse the Company 100% of the cost of Utility Work of its facilities located on a public utility easement, on a Company-owned private easement or fee property. The Company shall provide UDOT with a copy of the public utility easement or subdivision plat, private easement or fee title. The Utility Work and reimbursement

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for Company's facilities required by the Project will be in conformance with the requirements of Utah Administrative Code R930-8.

The Company shall submit itemized bills covering its actual costs incurred for performing the Utility Work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

UDOT Contracts and Compliance Specialist
4501 South 2700 West
Construction Office, Box 148220
Salt Lake City, Utah 84114-8220

Itemized bills shall bear the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement, and be submitted to UDOT within 60 days following completion of the Utility Work by the Company on the Project. Otherwise, previous payments to the Company may be considered final, except as agreed to between the Parties in advance. UDOT will reimburse the Company within 60 days after receipt of the billings, but only for those items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the Company to submit final billings within 6 months of the completion of the Utility Work will result in UDOT's disallowance of that portion of Utility Work reimbursement.

If the Company owes a balance to UDOT, the Company will reimburse UDOT within 60 days after receipt of billing from UDOT.

20. SALVAGE CREDIT

In accordance with 23 C.F.R. §645.117 all materials from Company's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on this Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties hereto.

In accordance with 23 C.F.R. §645.117, all materials from the existing facilities, which are recovered in suitable condition for reuse by the Company and not reused on the Project, shall be credited to the cost of the Project at current stock prices. If the materials are not suitable for reuse, they shall be credited at such other prices as agreed upon between the Company and UDOT following inspection of the recovered material.

21. PROJECT DESIGN CHANGES

If UDOT changes the Project design after the Company has completed its design review; or if the Company has completed its portion of the Utility Work of its facilities based on previously approved design plans; the cost of the second design review and/or Utility Work is to be paid in full by UDOT. UDOT will make adjustments for any additional time that may be required for the Company to perform Utility Work on its facilities when required.

22. COMPANY'S COSTS DIFFER BY MORE THAN 10%

If the Company's actual costs incurred for its force account work differs more than 10% plus or minus per line item from the amount contained in the supplemental agreements, the

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Company is required to submit a letter of explanation with its billings indicating how and why the difference in costs occurred.

23. **RIGHT TO AUDIT**

UDOT and FHWA shall have the right to audit all cost records and accounts of the Company pertaining to this Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. §645, subpart A. Should this audit disclose that the Company has been underpaid, UDOT will reimburse the Company within 60 days upon submission of additional billing to cover the underpayment. Should this audit disclose that the Company has been overpaid, the Company will reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For the purpose of audit the Company is required to keep and maintain its records of Utility Work covered herein for a minimum of 3 years after final payment is received by the Company from UDOT.

The Company shall have the right to review UDOT's cost documentation for the Utility Work performed on behalf of the Company.

24. **ACCEPTANCE**

UDOT will provide notification to the Company for acceptance of the Utility Work upon completion of the final inspection. Company will have 60 days to respond in writing to UDOT with any additional comments in regards to the Utility Work. In the event that UDOT does not receive a written response within 60 days, UDOT will designate the Utility Work accepted by the Company. Upon acceptance of the Utility Work, the Company will accept, own and maintain its facilities. To the extent it may lawfully do so, Company further agrees to relieve UDOT from any responsibility or liability that may result for its new facilities or the operation thereof.

25. **ACCESS & MAINTENANCE**

Access for maintenance and servicing of Company's facilities located on the Project right-of-way will be allowed only by permit issued by UDOT. Company will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

26. **FORCE MAJEURE**

An event of force majeure is an unforeseeable event or circumstance which is beyond the control and without the fault or negligence of the party affected and which by the exercise of reasonable diligence the party affected was unable to prevent, which by way of illustration can include, but is not limited to the following:

a. riot, war, invasion, act of foreign enemies, hostilities, acts of terrorism, civil war or rebellion;

b. tornados, earthquakes, flood, fire or other physical natural disaster; and

c. strikes at a national level or industrial disputes at a national level, or strike or industrial disputes by labor not employed by the affected party, its subcontractors or its suppliers and which affect an essential portion of the works but excluding any industrial dispute

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which is specific to the performance of the utility relocation or this Agreement.

Neither party is responsible for any failure to perform its obligations under this Agreement if it is prevented or delayed in performing those obligations by an event of force majeure. Only those obligations directly affected by an event of force majeure are excused. Where there is an event of force majeure, the party prevented from or delayed in performing its obligations in this Agreement must immediately notify the other party giving full particulars of the event of force majeure preventing that party from, or delaying that party in performing its obligations in this Agreement and that party must use its reasonable efforts to mitigate the effect of the event of force majeure upon its performance of the contract and to fulfill its obligations.

Upon completion of the event of force majeure, the party affected must as soon as reasonably practicable recommence the performance of its obligations in this agreement. If the effected party is the Company, the Company must provide a revised schedule to minimize the effects of the prevention or delay caused by the event of force majeure.
UDOT shall not be responsible for any costs or losses to the Company caused by the event of force majeure.

27. **MISCELLANEOUS**

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.

b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and Company.

c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.

d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power, and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

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IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

AT & T Corp.

_____

Title: _____

Date: _____

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

Approved as to Form

_____

Title: Assistant Attorney General

Date: _____

UDOT Comptroller Office Contract Administrator

_____

Title:

Date: _____

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AT & T CORP
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT"), and **AT & T**, a Registered Corporation of the State of New York licensed to operate in the State of Utah, ("Company") each as ("Party") and jointly as ("Parties").

The Parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the MUA remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

UDOT and Company will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)

b. The Company requirements as shown in the MUA – Company Requirements, are modified as follows:

c. Anticipated duration of Utility Work as shown on Exhibit "B" that is incorporated by reference:

d. Betterments included:

TOTAL ESTIMATED COST OF SUPPLEMENTAL AGREEMENT _____	**$0.00**
TOTAL ESTIMATED COST OF COMPANY PERFORMED UTILITY WORK	$0.00
TOTAL ESTIMATED COST OF UDOT PERFORMED UTILITY WORK	$0.00
COMBINED TOTAL ESTIMATED COST OF UTILITY WORK	**$0.00**
TOTAL ESTIMATED AMOUNT OF COMPANY PARTICIPATION @ 50%	$0.00
TOTAL ESTIMATED AMOUNT OF UDOT PARTICIPATION @ 50%	$0.00

2. UDOT will notify the Company's contact person, Rob Williamson, Telephone No. (208) 338-2816, email rlwilliamson@att.com at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

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IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

AT & T Corp.

_____

Title: _____

Date: _____

. . . . . .

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

UDOT Comptroller Office Contract Administrator

_____

Title:

Date: _____

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STATEWIDE UTILITY RELOCATION AGREEMENT

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THIS STATEWIDE UTILITY RELOCATION AGREEMENT, made and entered into this 1st day of April, 2014, by and between the **UTAH DEPARTMENT OF TRANSPORTATION**, hereinafter referred to as **"UDOT"** and Qwest Corporation dba CenturyLink QC (**CENTURYLINK)**, a Registered Corporation in the State of Colorado, and on behalf of itself and its affiliates, hereinafter referred to as the **"COMPANY."**

RECITALS:

WHEREAS, UDOT has jurisdiction over state Highway Rights of Way and administers the programming, development and completion of State and Federal highway projects (referred to herein as Project or collectively as Projects); and

WHEREAS, the **COMPANY** is a telecommunication utility owning and operating cable and fiber optic and related facilities (Facilities), within state highway rights-of-way under Statewide License Agreement and within **COMPANY** owned easements and fee title property; and

WHEREAS, certain highway Projects will require the relocation, adjustment, or protection of **COMPANY** Facilities; and

WHEREAS, for the purpose of expediting the performance and reimbursement of required relocation work on State and Federal Aid Highway Projects, it is the desire of the parties to enter into this Statewide Utility Relocation Agreement (Agreement) with the understanding that the parties will enter into future Project Agreements, which are supplemental to this Agreement, to address the scope of work, schedule, and other requirements for specific Projects; and

WHEREAS, this Agreement**,** along with the Project Agreements supplemental hereto, is made to set out the terms and conditions that will govern the relocation work.

TERMS:

1. PROJECT AGREEMENTS

A. For each Project, **UDOT** will prepare a Project Agreement. All terms in the Project Agreements shall be supplemental to the terms of this Agreement. In the case of an inconsistency between the terms of this Agreement and the terms of a Project Agreement, the terms of the Project Agreement shall control. In some cases, particularly when **UDOT** engages a design builder or a construction manager general contractor, the parties may enter into Supplemental Agreements to the Project Agreement. The Project Agreements and Supplemental Agreements should address utility relocation work for specific Project locations and include a description of the work, the party to perform the work, the location of the work, review times, the estimated duration of the work, scheduled completion date, an estimate of the cost to each party, any proposed betterments, including a plan showing the existing and proposed locations of the Facilities, and any necessary right-of-way documents as applicable. The estimates contained in the Project Agreements will be based upon material and labor prices as of the date of the estimate and do not account for increases due to unforeseen circumstances in accomplishing the relocation work.

B. The parties hereto agree to use a form Project Agreement to describe and perform the actual work on individual Projects, a copy of which is marked "EXHIBIT B" attached hereto and thereby made a part hereof.

2. PROJECT DEVELOPMENT AND COORDINATION

A. During the design phase of any Project, **UDOT** and **COMPANY** will identify the extent of the conflicts and propose and provide a mutually agreeable location to which the Facilities can be relocated. **UDOT** will provide the **COMPANY** with Project design plans as early as possible, and will schedule and meet with the **COMPANY** to review the right-of-way and environmental requirements, design, construction, cost estimates, and scheduling for the **COMPANY's** utility relocation work at specific locations on the Project to ensure maximum lead time for advance order of materials and scheduling of work force.

B. **COMPANY** shall advise **UDOT** of the approximate time required for completion of the Relocation Work and all known limitations including permit and regulatory approvals, dependency upon work of other parties, lead times for acquiring materials, notifications, and scheduling work crews. **UDOT** will, by its standard specifications and/or special provisions, make its contractor aware of the coordination and cooperation required for timely completion of utility work. **UDOT**'s contractor shall be advised of the approximate schedule for completion of said work and the **COMPANY** shall diligently pursue its work so that completion can be accomplished according to an agreed upon schedule, and as soon as possible after having been authorized to proceed.

C. If either party or their contractors intend to implement a redesign, scope or schedule change, **UDOT** and **COMPANY** shall meet in advance and coordinate to identify the change and the potential impact to both parties, including but not limited to costs and scheduling.

D. The **COMPANY** shall notify **UDOT**, or its contractor if so designated by **UDOT**, within seventy two (72) hours of its discovery of any occurrence or unforeseen circumstances that would prevent the **COMPANY** from completing the Relocation Work according to the time schedule established in the Project Agreement.

E. For Projects subject to federal Buy America requirements, as determined by **UDOT**, materials composed predominantly of iron or steel that are permanently incorporated into the work are subject to 23 CFR 635.410, Buy America requirements. **COMPANY** will provide **UDOT's** Resident Engineer with signed Buy America Certifications prior to or at the time subject materials are delivered to the project site, according to the specific instructions and format set forth in the attached Exhibit A.

3. DESIGN BUILD PROJECTS

A. During the proposal phase of any design build Project, **UDOT** shall schedule a meeting with **COMPANY** and **UDOT's** prospective contractors. The purpose of the meeting will be to determine if conflicts with the **COMPANY's** Facilities can be avoided and to provide prospective contractors with parameters within which **COMPANY's** Facilities can be relocated. **COMPANY** and **UDOT** will also meet one time individually with each prospective contractor.

B. All provisions of this Agreement apply to Design Build Projects unless stated otherwise.

4. BETTERMENT WORK

If the **COMPANY** desires to include a betterment in the utility work at any specific location, **UDOT** will allow for betterment work to be performed, provided the parties can reasonably coordinate the Project schedule to accommodate the betterment work without increasing Project costs or delaying the Project. Betterment is defined as set forth in 23 CFR 645, Section 645.105, Definitions. Specifically, betterment is any upgrading of the facility being relocated that is not attributable to the highway construction and is made solely for the benefit of and at the election of the **COMPANY**. Any upgraded facility due solely to the lack of equivalent replacement does not constitute a betterment. The difference in costs between the minimum construction required as a result of the Project and the **COMPANY's** desired construction shall be at the **COMPANY's** sole expense. The actual costs for the **COMPANY's** participation shall be determined upon completion and final billing for the relocation work.

5. COMPANY REQUIREMENTS

A. The **COMPANY** is required to comply with all applicable service interruption notification times and restrictions required by their customer service contracts, the Public Service Commission, Public Safety Agencies, the Federal Aviation Administration, etc.

B. Existing fiber loops will not be cut to add additional splices. Replacement fiber will be placed between designated splice points, even if it extends beyond the project limits. Replacement copper will be placed from pedestal to pedestal. No buried splices will be allowed under new pavement sections. These requirements may be modified upon written agreement by the Parties.

6. UDOT PROJECT RESPONSIBILITIES

A. In accordance with current policies and directives, **UDOT** may perform Subsurface Utility Engineering, Quality Levels A and B, within the limits of a Project. Additional work required to determine the vertical location of underground Facilities at specific, critical locations will be reviewed and if test holes are required, such costs will be shared between the parties on the same basis of responsibility as described in Section 7. A summary of the costs will be provided to the **COMPANY,** and the **COMPANY's** proportional share of the actual cost will be withheld from the **COMPANY**'s relocation reimbursement.

B. If, during the design phase of a Project, a major scope change is implemented after **COMPANY**'s design has been finalized and approved, **COMPANY** will be reimbursed 100% for redesign costs. **UDOT** will adjust any existing schedules to allow for any reasonable time that may be required for the **COMPANY** to redesign or modify its plans and relocate its Facilities when **UDOT** or its contractors requires the redesign.

C. **UDOT,** through its contractors, will provide surveying and staking of roadway facilities as required by the **COMPANY,** in accordance with **UDOT's** Standard Specifications, Section 01721, Survey, 3.16, Utilities. The cost of the surveying and staking will be at **UDOT**'s expense and will not be recovered from the **COMPANY**. Any of **UDOT**'s survey control stakes or bench markers which are removed or damaged by the **COMPANY** shall be reestablished by **UDOT** at **COMPANY's** expense.

D. **UDOT** will require its contractors to protect in place any existing facilities belonging to the **COMPANY**, including services, which, with the concurrence of the **COMPANY**, will not be relocated or adjusted during the proposed construction activities.

E. If, during the construction phase, **UDOT**'s contractor is allowed to accelerate the agreed upon baseline or proposal schedule, **UDOT** will hold the contractor responsible for 100% of the cost for a **COMPANY** approved contract engineer to perform tasks needed to meet the accelerated schedule which exceeds the **Company's** anticipated engineering schedule.

F. **UDOT** will require its contractor to reopen any splice pits the contractor covered prior to **COMPANY** crews completing splicing activities at no cost to the **COMPANY**, provided **COMPANY** is following their work schedule as agreed upon by **UDOT** and **COMPANY**.

7. COMPANY TO DESIGN AND CONSTRUCT UTILITY WORK

A. The **COMPANY**, with its regular engineering and construction forces at its standard schedule of wages and working hours, or through its qualified contractors with whom it has continuing contracts or has obtained contracts upon appropriate solicitation, will perform the necessary design work, field and office engineering, and shall furnish all materials and perform the construction work on its Facilities, necessitated by the Project. In performance of said work, the **COMPANY** and its contractors will adhere to the requirements of Utah Administrative Code R930-7 Utility Accommodation, as amended.

B. The **COMPANY** is required to meet clear zone requirements as defined in AASHTO's "Roadside Design Guide" and minimum vertical and horizontal clearances as defined in R930-7 Utility Accommodation, as amended.

C. The **COMPANY**, while engaged in the relocation of its Facilities, shall comply with **UDOT's** Standard Specification for Road and Bridge Construction Section 01355, Subpart 1.13, Discovery of Historical, Archeological or Paleontological Objects, if performing work within UDOT's right-of-way.

D. **COMPANY** provided traffic control devices shall conform to the standards set forth in the Manual on Uniform Traffic Control Devices ("MUTCD"), as adopted by **UDOT**. All flagging personnel shall be certified.

E. **COMPANY** employees and contractors working in the highway right-of-way shall comply with requirements of MUTCD Section 6D.03. concerning high-visibility safety apparel, as amended.

8. UDOT MAY DESIGN AND CONSTRUCT CERTAIN UTILITY FACILITIES

A. The **COMPANY** will perform design review and cost estimating; provide electronic equipment and splicing; and perform inspection with its own forces. The **COMPANY** may, at its discretion, allow **UDOT** to perform relocation design and/or construction work through qualified engineering and construction contractors appearing on the **COMPANY's** current preapproved list to perform the Utility Work, necessitated by a Project. If conduit, cable, fiber, pedestals and placing of such are required for the Utility Work, **UDOT** will obtain the materials from the contractors on the **COMPANY's** preapproved list. The **COMPANY** makes no representations as to the quality of work performed by the engineers and construction contractors on the **COMPANY's** preapproved list.

B. The **COMPANY** will require a four (4) week period after proposed design plans are delivered to the **COMPANY**, to review **UDOT**'s engineer's or contractor's design plans and the **COMPANY**'s pricing, and for internal approvals**. UDOT,** or its engineer or contractor shall provide to **COMPANY,** design plans in the following two (2) formats: (1) a civil engineered design package and (2) a format consistent with **COMPANY**'s internal telecommunications record keeping system. The **COMPANY** will approve the relocation plans and cost estimates in writing before incorporation into the Project or Supplemental Agreements.

C. **UDOT's** engineer or contractor will be required to provide the **COMPANY** with a schedule for the completion of their performed work before the **COMPANY** can prepare and submit a schedule for their performed work.

D. The **COMPANY** will perform inspection of the work on the **COMPANY's** facilities that will be performed by **UDOT**'s contractor. It is agreed that **UDOT**'s contractor will accomplish the work on the **COMPANY's** facilities in accordance with the plans and specifications approved by the **COMPANY**. Changes or additions to said plans and specifications shall be approved by the **COMPANY**. The **COMPANY** through their inspection of the contractor's work, will provide **UDOT's** Resident Engineer with information covering any problems or concerns the **COMPANY** may have with acceptance of said Facilities upon completion of construction.

E. The **COMPANY** will require two (2) business days notice to schedule a construction inspector for each location.

F. The **COMPANY** requires at least ninety (90) days notice to schedule splicing, and will determine the splicing window based on the types of circuit(s) and the requirements of Home Land Security and the Federal Aviation Administration (FAA).

G. If **UDOT's** contractor will be installing betterment facilities for the **COMPANY**, the Contractor will provide the **COMPANY** with a schedule of prices or a price breakdown for any betterment work requested. If the cost of the betterment work is not within 15% of the standard **COMPANY** costs, **COMPANY** will be allowed to have one of its approved contractors perform the betterment work in accordance with Paragraph 4 of this agreement. If **COMPANY's** contractor is to place the betterment, UDOT's contractor will grant reasonable access to open trenches and any area within the project limits required to construct the betterment, as determined by UDOT.

9. CHANGES IN WORK

In the event there are changes in the scope of the work, extra work, or changes in the planned work covered by this Agreement or Project Agreement, a modification will be approved in writing by the parties thereto prior to the start of work on said changes or additions.

10. COMPANY TO NOTIFY UDOT AND ITS CONTRACTOR BEFORE BEGINNING CONSTRUCTION WORK

The **COMPANY** will notify **UDOT's** Resident Engineer or authorized representative as identified in the Project Agreement at least 48 hours in advance of beginning any work. Such notification can be by telephone, email or in writing.

11. EMERGENCY WORK

When the **COMPANY** experiences an emergency unrelated to its work on the highway Project, it will take care of said emergency, after which it will again notify **UDOT** as to when work will be resumed on the Project.

12. DAILY RECORD KEEPING

UDOT, through its Resident Engineer or authorized representative, will keep daily record of the work performed by the **COMPANY**. The daily record shall be signed by **UDOT's** Project representative and the **COMPANY** or their authorized representatives as required and a copy shall be retained by the parties to this Agreement. If emergencies occur requiring the **COMPANY's** work forces to leave the job, record keeping shall be resumed upon return to the Project.

13. REIMBURSEMENT FOR COMPANY'S WORK

A. Pursuant to Utah Code Section 72-6-116, as amended, **UDOT** will reimburse the **COMPANY** 50% of the cost of all **COMPANY** costs related to the relocation work for its Facilities within State right-of-way, and 100% of the cost of all **COMPANY** costs related to the relocation work for its Facilities located within **COMPANY** owned easement, fee property or a public utility easement as defined in Section 54-3-27.

If the **COMPANY**'s Facilities are relocated from a **COMPANY** owned easement, fee title or public utility easement to State right-of-way and the **COMPANY** transfers its property interest without cost to **UDOT**, **UDOT** will reimburse the **COMPANY** 100% of the relocation costs caused by **UDOT**'s projects in the future.

B. Reimbursable costs will be developed in accordance with 23 CFR, Part 645, Subpart A.

C. The **COMPANY** will submit itemized bills covering its actual costs incurred for performing the work covered by the Project Agreements hereto, bearing the Project number together with supporting sheets on a monthly or quarterly basis.

D. **COMPANY** will also send one final and complete billing of all actual costs incurred within six months following completion of the work by the **COMPANY** on the Project to:

UDOT Contracts, Estimates and Agreements Specialist
4501 South 2700 West, Box 148220
Salt Lake City, Utah 84114-8220

E. In the event **COMPANY** fails to send a final bill to **UDOT** within six months of completion of **Company** work, **UDOT** may send notice to **COMPANY** requesting a final bill. **COMPANY** will have 45 days to respond with a final bill or will forfeit payment for the unbilled portion of the work. Both parties agree to cooperatively work together in good faith to resolve any disputes on the final billing within sixty (60) days after UDOT receives the final bill from **COMPANY**.

F. **UDOT** will reimburse the **COMPANY** within sixty (60) days after receipt of said billings but only for items complying fully with the provisions of 23 CFR, Part 645, Subpart A, Utility Relocations, Adjustments and Reimbursements. **UDOT** will provide a written explanation of any billings not reimbursed and the **COMPANY** shall have thirty (30) days from the date of such explanation to cure any deficiencies and re-submit to **UDOT**.

14. SALVAGE CREDIT

All materials from the existing **COMPANY** Facilities, which are recovered in suitable condition for reuse by the **COMPANY** and not reused on the Project, shall be credited to the cost of the Project at current stock prices in accordance with 23 CFR 645.117. If the recovered materials are not suitable for reuse, they shall be credited at salvage prices or such other prices as agreed upon between the **COMPANY** and **UDOT** following inspection of the recovered material.

15. COSTS DIFFER BY MORE THAN TEN PERCENT

If **COMPANY's** actual costs incurred for its reimbursable work differs more than 10% (plus or minus) per line item from the amount contained in the Project Agreement Cost Estimate, then **COMPANY** is required to submit a letter of explanation with its billings indicating why and how said difference in costs occurred.

16. AUDIT

UDOT and/or the Federal Highway Administration shall have the right to audit all cost records and accounts of the **COMPANY** pertaining to the Project in accordance with 23 CFR, Part 645, Subpart A. Should this audit disclose that the **COMPANY** has been underpaid, the **COMPANY** will be reimbursed by **UDOT** upon submission of additional billing to cover the underpayment. Should this audit disclose that the **COMPANY** has been overpaid, the **COMPANY** will reimburse **UDOT** in the amount of the overpayment. For the purpose of audit the **COMPANY** is required to keep and maintain its records of work covered herein for a minimum of three years after final payment is received by the **COMPANY** from **UDOT**.

17. MISCELLANEOUS

A. In the event of any dispute relating to this Agreement, resulting in litigation, the prevailing party shall be entitled to recover all costs, including reasonable attorney fees.The provisions of this Agreement are severable, and should any provision be deemed void, unenforceable or invalid, such provision shall not affect the remainder of this Agreement.

B. This Agreement shall be governed by the laws of the State of Utah and applicable federal law. Any litigation shall be instituted only in a court of competent jurisdiction, whether state or federal, located within the State of Utah.

C. This Agreement may be terminated by either party by providing 30 day written notice of termination to the other party. Any such termination shall not affect the validity of any previously executed Project Agreements or any other agreements supplemental to this Agreement.

****

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized officers as of the day and year first above written.

STATE OF UTAH)

) §

COUNTY OF Salt Lake)

Subscribed and sworn to before me this 1 Day of April, 2014.

Notary Public

Residing in: Davis County

Commissions Expires: 2/12/17

(IMPRESS SEAL)

APPROVED AS TO FORM:

By: _____
Counsel for **COMPANY**

Qwest Corporation dba CenturyLink QC (CENTURYLINK), A Registered Corporation in the State of Colorado on behalf of itself and its affiliates

By: _____

Title:: Director of Network operations

Date: 4/1/14

WHITNEY BENTZ
Notary Public State of Utah
My Commission Expires on:
February 12, 2017
Comm. Number: 662761

****

UTAH DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:

By: _____

Title: UDOT Statewide Utilities Engineer

Date: 02 April 2014

APPROVED:

By: _____

Title: UDOT Project Development Director

Date: 4/2/14

APPROVED AS TO FORM:

By: _____

Title: Assistant Attorney General

Date: 4/1/2014

COMPTROLLER'S OFFICE

By: _____

Title: UDOT Comptroller Office Contract Administrator

Date: 4-15-14

Exhibit A
BUY AMERICA

Federal-aid projects are subject to Title 23 CFR Part 635.410, Buy America Requirements. This federal regulation requires a domestic manufacturing process for all steel or iron products that are permanently incorporated into federal-aid highway construction projects. This includes relocation projects performed by utility companies and reimbursed by the Utah Department of Transportation. This exhibit establishes the required documentation and Utility Company responsibilities to demonstrate compliance with this federal law. A copy of the federal regulation can be found at: http://www.fhwa.dot.gov/construction/contracts/buyam_qa.cfm

A. All products predominantly manufactured from steel and iron must be manufactured in the United States to be considered domestic.

1. All manufacturing processes of the steel and iron material in a product such as melting, rolling, extruding, machining, bending, grinding, drilling, and coating must occur within the United States.
2. Coating includes all processes that protect or enhance the value of the material to which the coating is applied. The material applied as a coating is not subject to Buy America.

B. Maintain Material Certifications of Compliance for each manufacturing and coating process for three (3) years after delivery to project site. Upon request provide access to these documents to the Utah Department of Transportation and the Federal Highway Administration.

1. Include as a minimum the following information for Material Certifications of Compliance for Buy America:
   a. Signed mill test report.
   b. Signed certification by each Fabricator and Manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States.
   c. Material descriptions, quantities, and means of material identification such as heat numbers, lot numbers, and other industry identification markings for each process the material underwent so the final product can be tracked through a step process from melting to final product.
   d. Tracking of quantities is not required for coating operations.

2. Include all steel or iron materials that can't be substantiated as being of domestic origin in cost documentation for foreign steel or iron.

C. The above requirement does not preclude a minimal use of foreign steel or iron, provided the cost of the steel or iron used does not exceed one tenth of one percent (0.1 percent) of the total contract amount or $2,500, whichever is greater. The contract referenced here is the contract between the Utah Department of Transportation and the Utility Company. Maintain satisfactory cost documentation to describe the minimal use materials being incorporated into the project when foreign steel or iron is used.

D. The following are exempt from Buy America:
1. Temporary steel or iron materials.
2. Materials left in place for the contractor's convenience
3. Nuts, bolts, washers, screws, tie wire, spacers, and other miscellaneous steel or iron parts that are considered common off-the-shelf products.
4. Fencing stays, clips, staples, or other miscellaneous fencing components.
5. Manufactured products that are less than 90% steel or iron content by volume when it is delivered to the job site for installation. Pre-cast concrete items such as pipe, manholes, boxes and vaults still need to meet the Buy America requirements.
6. Miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct predominately steel or iron products are not subject to Buy America requirements. These miscellaneous items include but are not limited to, lifting hooks, concrete chairs, cabinets, covers, shelves, clamps, fittings, and sleeves.

E. Provide a written Company Certification (using the included form below) that all delivered steel and iron items subject to Buy America as defined above are manufactured domestically.

COMPANY CERTIFICATION

Certification Requirement for 23 CFR 635.410 Buy America

This project will be utilizing federal funds. Please complete, sign and submit this Buy America Certification to UDOT's Resident Engineer prior to or at the time subject materials are delivered to the project site.

Buy America Certification

I certify that all materials provided for use on Federal Aid Highway Project #_____, except for minimal use materials, meet the requirements of 23 CFR 635.410 Buy America and any amendments thereto. Material Certificates of Compliance for each manufacturing and coating process performed during the production of these materials are on file and will be made available for review by the Utah Department of Transportation and the Federal Highway Administration upon request.

Signature _____

Name _____

Title _____

Company Name _____

Date _____

Estimated Dollar Value of Minimal Use Materials Provided _____

Project No. _____; _____ County
Project Name:_____
CenturyLink
Job No. _____
CID No. _____ PIN _____

EXHIBIT B

CENTURYLINK

PROJECT AGREEMENT

Supplement to Statewide Utility Relocation Agreement, Finance No. XXXXXX

THIS PROJECT AGREEMENT, made and entered into this_____ day of _____, 20_____, by and between the **UTAH DEPARTMENT OF TRANSPORTATION**, hereinafter referred to as **"UDOT"** and **QWEST CORPORATION DBA CENTURYLINK QC**, a Registered Corporation in the State of Colorado, hereinafter referred to as the **"COMPANY",**

The parties hereto entered in to a **STATEWIDE UTILITY RELOCATION AGREEMENT** dated _____ **UDOT** Finance No. XXXXXX. All the terms of said **STATEWIDE AGREEMENT** remain in full force and effect unless otherwise specified herein.

NOW THEREFORE, it is agreed by and between the parties hereto as follows:

1. The **COMPANY** will perform the following described work in accordance with the terms and conditions of the **STATEWIDE UTILITY RELOCATION AGREEMENT.**

   Description of work to be performed, including location:

   (Plan Sheets and Right of Way Documents, if applicable, attached)

   Party performing the work:

   Anticipated duration of work:

   Estimated Total Cost of Work:
   (Detailed Estimate attached)

Project No. _____; _____ County
Project Name:_____
CenturyLink
Job No. _____
CID No. _____ PIN _____

Betterments Included:

2. **UDOT** will perform the following described work in accordance with the terms and conditions of the **STATEWIDE UTILITY RELOCATION AGREEMENT.**

   Description of work to be performed, including location:

3. Work to be completed under this Project Agreement is subject to the following:

   Special Provisions

   -
   -
   -

4. The **COMPANY** shall be reimbursed by **UDOT** for XXX% of the actual costs incurred by the **COMPANY** for performing the work covered herein. An Estimate of the total cost of said work was furnished by the **COMPANY** to **UDOT** under date of _____ in the total amount of _____Dollars ($_____). A copy of the details of said estimates are marked "EXHIBIT A" attached hereto and thereby made a part hereof.

   TOTAL ESTIMATED COST TO UDOT IS $_____

   TOTAL ESTIMATED COST TO THE COMPANY IS $_____

   NOTE: The above are estimates only. Total payment to the **COMPANY** by **UDOT** will be based on the actual costs incurred as determined after completion of construction.

5. Upon signature and return of four copies of this Project Agreement to **UDOT**, the **COMPANY** is authorized to proceed with the work covered herein.

Project No. _____; _____ County
Project Name:_____
CenturyLink
Job No. _____
CID No. _____ PIN _____

****

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

STATE OF UTAH)
§
COUNTY OF)

Subscribed and sworn to before me this _____Day of _____, 20____.

_____
Notary Public
Residing in:
Commissions Expires:

QWEST CORPORATION DBA CENTURYLINK QC, A Registered Corporation in the State of Colorado

By: _____

Title:: _____

Date: _____

(IMPRESS SEAL)

****

RECOMMENDED FOR APPROVAL:

_____
Utility and Railroad Coordinator
Date: _____

UTAH DEPARTMENT OF TRANSPORTATION

By_____
Region Director
Date: _____

APPROVED AS TO FORM:

The Utah State Attorney General's Office has previously approved all paragraphs in this Agreement as to form.

UDOT COMPTROLLER'S OFFICE:

_____
Contract Administrator
Date: _____

01 April 2014

CENTURYLINK QC
PROJECT AGREEMENT

Supplement to Statewide Utility Relocation Agreement, Finance No. 158015

THIS PROJECT AGREEMENT, made and entered into this_____ day of _____, 20___, by and between the **UTAH DEPARTMENT OF TRANSPORTATION**, hereinafter referred to as **"UDOT"** and **QWEST CORPORATION DBA CENTURYLINK QC**, a Registered Corporation in the State of Colorado, hereinafter referred to as the **"COMPANY."**

The parties hereto entered in to a **STATEWIDE UTILITY RELOCATION AGREEMENT** dated April 2, 2014, **UDOT** Finance No. 158015. All the terms of the **STATEWIDE UTILITY RELOCATION AGREEMENT** remain in full force and effect unless otherwise specified herein.

NOW THEREFORE, it is agreed by and between the parties hereto as follows:

1. PROJECT INFORMATION

UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as S-0154(12)11, Salt Lake County, 4 Interchanges on Bangerter Highway hereinafter referred to as the "Project". UDOT's design-build contractor will complete the design and administer construction of the Project. The project contractor will hereinafter be referred to as the "Design-Builder".

2. PROJECT CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462 and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

Company's contact person for the Project is Daren Keller, telephone number (801) 356-6975, e-mail darren.keller@centurylink.com, and mailing address 75 East 100 North, Provo, Utah 84601.

After awarding the Project, UDOT will provide the Company with the Design Builder contact information, hereinafter referred to as "Design-Builder Project Representative."

3. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the Company's Utilities and requirements for inclusion in this Agreement and the Request for Proposals, UDOT gave the Company authorization for preliminary design engineering on April 26, 2016.

4. PROJECT REQUIREMENTS

The Company desires to design and construct its own Utility Work necessitated by the Project and shall conduct the Utility Work in accordance with the specific terms of the Statewide Utility Relocation Agreement.

The Company shall not commence performing any Utility Work until the Project Agreement is executed by both Parties and the Company receives an Authorization to Proceed letter.

****

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

QWEST CORPORATION DBA CENTURYLINK QC,
A Registered Corporation in the State of Colorado

By: K.C. [signature]

Title: Mgr Engineering & Construction

Date: 8/24/16

Recommended For Approval:

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

Title: Project Director

Date: _____

Approved as to Form

Title: Assistant Attorney General

Date: _____

UDOT Comptroller Office Contract Administrator

Title: _____

Date: _____

178140

BANGERTER

Project No. S-0154(12)11, Salt Lake County
4 Interchanges on Bangerter Highway
COMCAST CABLE
Charge ID No. 71939 PIN 12566

25695

COMCAST CABLE
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this 8 day of Aug, 2016, by and between the **Utah Department of Transportation**, ("UDOT") and **Comcast Cable**, doing business as Comcast Cable, a Registered Corporation in the State of Utah, ("Company") (each as "Party" and jointly as "Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, the design-build contractor will complete the design and administer construction of the Project ("Design-Builder"); and

WHEREAS, UDOT has identified Company facilities within the limits of the Project, which may necessitate the relocation, protection or adjustment of the facilities ("Utility Work"); and

WHEREAS, the Company desires to design and construct its own Utility Work necessitated by the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement, the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering Utility Work to be accomplished by the Company at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

Company's contact person is David Mascarenas, telephone number (801) 831-6622, and e-mail david_mascarenas@cable.comcast.com.

After awarding the Project, UDOT will provide the Company with the Design-Builder contact information, hereinafter referred to as "Design-Builder Project Representative."

2. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the Company's facilities and requirements for inclusion in this Agreement and the request for proposals, UDOT gave the Company authorization for preliminary design engineering on April 26, 2016.

3. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the Company

4. PROJECT COORDINATION

During the development of the Project design, Company and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the Company's facilities can be avoided. The Parties shall confer until a resolution is reached on each potential conflict.

If Utility Work for the Company's facilities is required to accommodate the Project, UDOT will be responsible to propose and provide a location for the facilities. UDOT will provide the Company with Project design plans as early as possible, and will schedule and meet with the

Company to review the design, construction, estimates of cost, and scheduling for the Company's Utility Work at specific locations on the Project to insure maximum lead time for advance order of materials and work force scheduling.

The Company shall advise UDOT's Project Representative of the approximate time required for completion of the Utility Work and shall diligently pursue its Utility Work so that completion can be accomplished according to the pre-determined time schedule negotiated by the Company and UDOT in the supplemental agreement issued hereto for a specific Project location. The Company shall immediately notify UDOT's Project Representative by, phone call or email, of its discovery of any occurrence or unforeseen circumstances that would prevent the Company from completing its Utility Work according to the time schedule provided. In addition, the Company shall describe the circumstances in writing within 24-hours of the discovery to UDOT's Project Representative.

5. COMPANY REQUIREMENTS

UDOT will comply with the following Company requirements:

a. Company requires advance notice of 72 hours for emergency splicing, 5 business days for normal splicing, and 2-4 weeks' notice for larger distribution lines.
b. Company's maintenance hours of operation are between 1:00 a.m. and 6:00 a.m. The Company does not allow disruption of its cable television services.

6. COMPANY TO DESIGN AND CONSTRUCT ITS UTILITY WORK

The Company, with its regular engineering and construction forces at its standard schedule of wages and working hours, or through qualified contractors with whom they have continuing contracts, shall perform the necessary design work in accordance with Company's standards regularly followed by the Company and not considered a betterment, cost estimating, field and office engineering, furnish all materials, and perform the Utility Work necessitated by the Project.

7. STANDARD SPECIFICATIONS AND REGULATIONS

The Company, while engaged in the preliminary design and Utility Work of its facilities, shall comply with UDOT's 2012 Standard Specifications for Road and Bridge Construction and Utah Administrative Code R930-7.

8. UNDERBUILT AND FACILITY REMOVAL REQUIREMENTS

The Company is responsible to remove all Company-owned underbuilt facilities from utility poles that will be relocated or removed due to the Project.

9. RIGHT-OF-WAY

Any easements or replacement right-of-way required in conjunction with the Utility Work of Company's facilities will be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8-7.

10. MAINTENANCE OF TRAFFIC (MOT), TRAFFIC CONTROL, CLEAR/GRUB, AND SURVEYING

UDOT will provide MOT and traffic control for Utility Work at no cost to the Company. The Company is responsible to coordinate Utility Work schedules and traffic control needs with UDOT to facilitate the Project schedule and minimize impacts to the public. Except in the case of emergencies, Company's Utility Work on the Project will be scheduled in compliance with the requirements of the Limitation of Operations contained in UDOT's Design-Builder contract with respect to lane closures, peak hour work restrictions, holiday and special event limitations, etc.

UDOT will provide, at no cost to the Company, clearing and grubbing of the roadway as required by the Company and in accordance with UDOT's Standard Specifications.

Surveying and staking of roadway facilities as required by the Company will be provided by UDOT in accordance with UDOT's Standard Specifications. The cost of the surveying and staking will be at UDOT's expense and the Company will have no obligation for the cost of surveying. Any of UDOT's survey control stakes or bench markers which are removed or damaged by the Company shall be reestablished by UDOT at the Company's expense.

11. BETTERMENT WORK

If the Company desires to include betterment work in the Project at any specific location, UDOT may agree to the betterment work provided the difference in costs between the functionally equivalent required Utility Work and the Company's desired betterment work shall be at the sole cost of the Company, and the betterment work can reasonably be accommodated without delaying UDOT's Project. The betterment work will be addressed by a separate supplemental agreement between UDOT and the Company.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

12. SUPPLEMENTAL AGREEMENTS

UDOT and the Company shall enter into individual supplemental agreements to cover Utility Work at specific Project locations. Each supplemental agreement will include a description and location of the Utility Work to be performed, design drawings showing the original and proposed locations of the facilities, Utility Work schedules, cost estimates, participation shares for UDOT and the Company, any proposed betterment work, and any necessary right-of-way documents. The cost estimates will be based upon the prices of materials and labor current as of the date of the estimates. The estimates do not account for increases due to unknown and unforeseen hardships in accomplishing the Utility Work. A copy of the format of the proposed supplemental agreement is marked Exhibit "A" that is incorporated by reference.

The Company will require a 2 week review and approval period for any final supplemental agreement submitted to the Company by UDOT.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental agreement signed by the Parties is required prior to the start of Utility Work on the changes or additions.

13. UDOT AUTHORIZATION TO PROCEED WITH UTILITY WORK

The Company shall not perform any Utility Work until the supplemental agreement for the Utility Work is signed by the Company and received by UDOT. UDOT will review and approve the supplemental agreement and will issue an authorization to proceed to the Company for each specific Utility Work location.

14. COMPANY TO NOTIFY UDOT AND THE DESIGN-BUILDER BEFORE BEGINNING COMPANY-PERFORMED UTILITY WORK

The Company will notify UDOT's Resident Engineer as well as the Design-Builder Project Representative at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto. The Company will give subsequent notifications of when and where the Company will be performing Utility Work to UDOT's Field Representative and the Design-Builder Project Representative on a day-to-day basis. Such subsequent notifications can be informal. Failure on the part of the Company to give proper notification to UDOT's Field Representative and the Design-Builder Project Representative will be cited to the Company and that portion of the Company's Utility Work performed while not under the surveillance of the UDOT Field Representative may be deducted from the reimbursement at UDOT's discretion

15. DAILY RECORD KEEPING

UDOT's Field Representative will keep daily records of the Utility Work performed by the Company forces. Daily records will be kept on forms to be prepared by the Company or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance, and Certification Manager. The daily records shall be signed by UDOT's Field Representative, and the Company or its authorized representative. Copies of the Utility Work daily records shall be retained by the Parties.

16. REIMBURSEMENT FOR COMPANY'S UTILITY WORK

In accordance with Utah Code §72-6-116(3)(a)(ii), UDOT will reimburse the Company 50% of the cost of Utility Work to accommodate a state highway project and the Company shall pay the remainder of the cost. UDOT will reimburse the Company 100% of the cost of Utility Work for facilities located on a public utility easement or subdivision plat, on a Company-owned private easement, or fee property. The Company shall provide UDOT with a copy of the public utility easement, private easement or fee title. The Utility Work and reimbursement will be in conformance with the requirements of Utah Administrative Code R930-8.

The Company shall submit itemized bills covering its actual costs incurred for performing the Utility Work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

UDOT Contracts and Compliance Specialist
4501 South 2700 West
Construction Office, Box 148220
Salt Lake City, Utah 84114-8220

Itemized bills shall bear the Project number, supplemental agreement number, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement and be submitted to UDOT within 60 days following completion of the Utility Work by the Company on the Project. Otherwise, previous payments to the Company may be considered final, except as agreed to between the Parties in advance.

UDOT will reimburse the Company within 60 days after receipt of the billings, but only for those items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the Company to submit the billings within 6 months of the completion of the Utility Work will result in UDOT's disallowance of reimbursement for that portion of Utility Work.

17. SALVAGE CREDIT

In accordance with 23 C.F.R. §645.117, all materials from the existing facilities, which are recovered in suitable condition for reuse by the Company and not reused on the Project, shall be credited to the cost of the Project at current stock prices. If the materials are not suitable for reuse, they shall be credited at such other prices as agreed upon between the Company and UDOT following inspection of the recovered material.

18. REDESIGN AND REWORK OF UTILITY WORK DUE TO PROJECT CHANGES

If the Company's design of Utility Work has been completed and accepted by UDOT and the Company is required to redesign the Utility Work or redesign and reconstruct the Utility Work as a result of UDOT changing the Project design, the cost of the redesign or redesign and increased cost for the reconstruction of Utility Work will be paid in full by UDOT. UDOT will make adjustments for any additional time that may be required for the Company to redesign or modify its plans or re-work Utility Work due to UDOT changing the design after acceptance of the design plans for the Utility Work.

19. COMPANY'S COSTS DIFFER BY MORE THAN 10%

If the Company's actual costs incurred for its force account work differs more than 10% plus or minus per line item from the amount contained in the supplemental agreements, the Company is required to submit a letter of explanation with its billings indicating how and why the difference in costs occurred.

20. AUDIT

UDOT and the Federal Highway Administration shall have the right to audit all cost records and accounts of the Company pertaining to the Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. §645, subpart A. Should this audit disclose that the Company has been underpaid, UDOT will reimburse the Company upon submission of

additional billing to cover the underpayment. The Company shall submit the additional billing within 60 days from the date of the notification of the underpayment. Should this audit disclose that the Company has been overpaid, the Company will reimburse UDOT in the amount of the overpayment within 60 days of notification of audit findings. For the purpose of audit the Company is required to keep and maintain its records of Utility Work covered herein for a minimum of 3 years after final payment is received by the Company from UDOT.

21. ACCESS AND MAINTENANCE

Access for maintenance and servicing of Company's facilities located on the right-of-way of the Project will be allowed only by permit issued by UDOT to the Company. The Company will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

22. MISCELLANEOUS

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of the Agreement at the request of the other Party.

b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and Company.

c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.

d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power, and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

****

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

Comcast Cable

Title: Merlin Jensen VP of Operations

Date: 7/26/16

Recommended For Approval:

Title: Utility and Railroad Leader

Date: 8/8/16

Utah Department of Transportation

Title: Project Director

Date: Aug 8, 2016

Approved as to Form

Title: Assistant Attorney General

Date: 8/09/2016

UDOT Comptroller Office Contract Administrator

Title:

Date: 8-10-16

COMCST CABLE
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT") and **Comcast Cable**, **doing business as** Comcast Cable, a Registered Corporation in the State of Utah, ("Company") (each as "Party" and jointly as "Parties").

The Parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the MUA remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. Company will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)

   b. The Company requirements as shown in MUA – Company Requirements, are modified as follows:

   c. Anticipated duration of Utility Work as shown on Exhibit "B" that is incorporated by reference:

   d. Betterments included:

TOTAL ESTIMATED COST OF SUPPLEMENTAL AGREEMENT _____	**$0.00**
TOTAL ESTIMATED AMOUNT OF COMPANY PARTICIPATION @ 50%	$0.00
TOTAL ESTIMATED AMOUNT OF UDOT PARTICIPATION @ 50%	$0.00

2. The Company will notify UDOT's Project Representative, _____, Telephone No. _____, email_____ and the Design-Builder's Representative, _____, Telephone No. _____, email_____ at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

Comcast Cable

_____

Title: _____

Date: _____

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

UDOT Comptroller Office Contract Administrator

_____

Title:

Date: _____

FIRST DIGITAL TELECOM
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this _____ day of_____, 20_____, by and between the **Utah Department of Transportation**, ("UDOT") and **First Digital Telecom**, , a Company in the State of Utah, ("Company") (each as "Party" and jointly as "Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, UDOT's design-build contractor ("Design-Builder") will complete the design and administer construction of the Project; and

WHEREAS, UDOT has identified Company facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, the Company desires for the Design-Builder to design and construct the Company's Utility Work except cable/pedestal procurement, pulling, and splicing necessitated by the Project; and

WHEREAS, the Company will perform the necessary review and approval for the design and construction of its Utility Work, provide cable/pedestal procurement, pulling, splicing, and construction inspection to accommodate the Project Utility Work; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering Utility Work to be accomplished by the Company and UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

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AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. **INFORMATION**

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

Company's contact person is Ryan Finch, telephone number (801) 636-5350, and e-mail rfinch@firstdigital.com.

After awarding the Project, UDOT will provide the Company with the Design-Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

2. **AUTHORIZATION FOR DESIGN WORK**

In order to facilitate coordination and obtain technical information about the Company's facilities and requirements for inclusion in this Agreement and the request for proposals, UDOT gave the Company authorization for preliminary design engineering on April 26, 2016.

3. **SUBSURFACE UTILITY ENGINEERING**

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the Company.

4. **PROJECT COORDINATION**

Company and UDOT agree to have the Design-Builder include in the Project, items of Utility Work for the Company's facilities.

During the development of the Project design, the Company and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the Company's facilities can be avoided. If Utility Work is required, UDOT will be responsible to propose and provide a location for the facilities. UDOT will provide the Company with Project design plans as early as possible, and will schedule and meet with the Company to review the design, construction, estimates of cost, and scheduling for the Company's Utility Work at specific locations

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on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

The Company shall advise UDOT's Project Representative of the approximate time required for completion of the Utility Work and shall diligently pursue its Utility Work so that completion can be accomplished according to the pre-determined time schedule negotiated by the Company and UDOT in the supplemental agreement issued hereto for a specific Project location. The Company shall immediately notify UDOT's Project Representative by phone call or email, of its discovery of any occurrence or unforeseen circumstances that would prevent the Company from completing its Utility Work according to the time schedule provided. In addition, the Company shall describe the circumstances in writing within 24-hours of the discovery to UDOT's Project Representative.

5. COMPANY REQUIREMENTS

UDOT will comply with the following Company Utility Work requirements**:**

1. Company splicing hours are from 12:00 p.m. to 5:00 a.m.
2. Provide minimum 12 inch separation of conduit from power in joint trench.
3. Include #14 gauge tracer wires in all conduits.
4. The Company will require a 2 week review and approval period for proposed designs, estimate review, and internal approvals after design plans and estimates are delivered to the Company.

6. UDOT TO DESIGN AND CONSTRUCT A PORTION OF UTILITY WORK

UDOT shall perform the necessary design work, cost estimating, field and office engineering, furnish all materials except cables and pedestals, and perform the Utility Work except pulling and splicing, necessitated by the Project.

UDOT will design the Utility Work in accordance with Company's standards regularly followed by the Company in its own work and not considered a betterment. In the event of a conflict between UDOT and Company standards, the higher standard will be applied.

UDOT will secure permits required for Utility Work for Company's facilities.

UDOT will supply as-constructed plans for the Utility Work it performs, in PDF format**,** upon completion of any required Utility Work.

7. COMPANY TO PERORM INSPECTION AND CONSTRUCT A PORTION OF THE UTILITY WORK

The Company will perform inspection of the Utility Work for the Company's facilities that will be performed by UDOT. UDOT will accomplish the Utility Work on the Company's facilities in accordance with the plans and specifications approved by the Company. Changes or additions to the plans and specifications shall be approved by the Company and UDOT through a supplemental agreement.

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The Company will provide all cables, pedestals, pulling, and splicing necessary to accommodate the Utility Work of its facilities on the Project. The Company requires 2 weeks' notice to schedule splicing and fiber pulls and will determine the splicing window based on the circuit.

8. STANDARD SPECIFICATIONS AND REGULATIONS

The Company, while engaged in the preliminary design and Utility Work of its facilities, shall comply with UDOT's 2012 Standard Specifications for Road and Bridge Construction and Utah Administrative Code R930-7.

9. UNDERBUILT AND FACILITY REMOVAL REQUIREMENTS

The Company is responsible to see to the removal of all Company-owned underbuilt facilities from utility poles that will be relocated or removed due to the Project.

10. RIGHT-OF-WAY

Any easements or replacement right-of-way required in conjunction with the Utility Work of Company's facilities will be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8-7.

11. MAINTENANCE OF TRAFFIC (MOT), TRAFFIC CONTROL, CLEAR/GRUB, AND SURVEYING

UDOT will provide MOT and traffic control for Utility Work at no cost to the Company. The Company is responsible to coordinate Utility Work schedules and traffic control needs with UDOT to facilitate the Project schedule and minimize impacts to the public. Except in the case of emergencies, Company's Utility Work on the Project will be scheduled in compliance with the requirements of the Limitation of Operations contained in UDOT's Design-Builder contract with respect to lane closures, peak hour Utility Work restrictions, holiday and special event limitations, etc.

UDOT will provide, at no cost to the Company, clearing and grubbing for the Utility Work as required by the Company and in accordance with UDOT's Standard Specifications.

Surveying and staking of roadway facilities as required by the Company will be provided by UDOT in accordance with UDOT's Standard Specifications. The cost of the surveying and staking will be at UDOT's expense and the Company will have no obligation for the cost of surveying. Any of UDOT's survey control stakes or bench markers, which are removed or damaged by the Company, shall be reestablished by UDOT at Company's expense.

12. BETTERMENT WORK

If the Company desires to include betterment work in the Project at any specific location, UDOT may agree to the betterment work providing the difference in costs between the functionally equivalent required Utility Work and the Company's desired betterment work, that is not required by the Project, shall be at the sole cost of the Company and the betterment work can reasonably

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be accommodated without delaying UDOT's Project. The betterment work will be addressed by a separate supplemental agreement between UDOT and the Company.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

13. SUPPLEMENTAL AGREEMENTS

UDOT and the Company shall enter into individual supplemental agreements to cover Utility Work at specific Project locations. Each supplemental agreement will include a description and location of the Utility Work to be performed, design drawings showing the original and proposed locations of the Company's facilities, Utility Work schedules, cost estimates from all Parties, participation shares for UDOT and the Company, any proposed betterment work, and any necessary right-of-way documents. The estimates do not account for increases due to unknown and unforeseen hardships in accomplishing the Utility Work. A copy of the format of the proposed supplemental agreement is marked Exhibit "A" that is incorporated by reference.

The Company will require a 2 week review and approval period for any final supplemental agreement submitted to the Company by UDOT.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental agreement approved in writing by the Parties is required prior to the start of Utility Work on the changes or additions.

14. UDOT AUTHORIZATION TO PROCEED WITH UTILITY WORK

The Company shall not perform any Utility Work until the supplemental agreement for the Utility Work is signed by the Company and received by UDOT. UDOT will review and approve the supplemental agreement and will issue an authorization to proceed to the Company for each specific Utility Work location.

15. UDOT TO NOTIFY THE COMPANY BEFORE BEGINNING UTILITY WORK

UDOT will notify the Company at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto, to allow the Company time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis. Should UDOT fail to give advance notification and Utility Work is performed without the presence of a Company inspector, UDOT will, at no cost to the Company, facilitate inspection of the Utility Work including, if necessary, uncovering the Utility Work.

16. COMPANY TO NOTIFY UDOT AND THE DESIGN-BUILDER BEFORE BEGINNING UTILITY WORK

The Company will notify UDOT's Project Representative as well as the Design-Builder Project Representative at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto. The Company will give subsequent notifications of when

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and where the Company will be performing Utility Work to UDOT's Field Representative and the Design-Builder Project Representative on a day-to-day basis. Such subsequent notifications can be informal. Failure on the part of the Company to give proper notification to UDOT's Field Representative and the Design-Builder Project Representative will be cited to the Company and that portion of the Company's Utility Work performed while not under the surveillance of the UDOT Field Representative may be deducted from the reimbursement at UDOT's discretion for.

17. INSPECTION

The Company shall provide on-call engineering support by the Company's engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during the Utility Work, and to perform the necessary inspection for the Company's Utility Work installed by UDOT.

a. The Company engineer and/or inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on Company's facilities in accordance with the plans and specifications provided and/or approved by the Company, including changes or additions to the plans and specifications, which are approved by the Parties hereto.
b. The Company shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on the Company's facilities. The Company shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.
c. UDOT will respond to the Company's concerns within 24-hours of written notification.
d. The Company, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns the Company may have with acceptance of the facilities upon completion of the Utility Work.
e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Company's Utility Work does not relieve the Company of its duty in the performance of the Utility Work or to ensure compliance with acceptable standards.

18. DAILY RECORDKEEPING

The Company will keep daily records of the inspection and Utility Work performed by the Company forces. Daily records will be in duplicate on a form to be prepared by the Company or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance, and Certification Manager. The daily records shall be signed by UDOT's Field Representative and the Company or its authorized representatives.

19. REIMBURSEMENT FOR COMPANY'S UTILITY WORK

In accordance with Utah Code §72-6-116(3)(a)(ii), UDOT will reimburse the Company 50% of the cost of Utility Work of its facilities on state highways and the Company shall pay the remainder of the cost of the Utility Work. UDOT will reimburse the Company 100% of the cost of Utility Work of its facilities located on a public utility easement, on a Company-owned private

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easement or fee property. The Company shall provide UDOT with a copy of the public utility easement or subdivision plat, private easement or fee title. The Utility Work and reimbursement for Company's facilities required by the Project will be in conformance with the requirements of Utah Administrative Code R930-8.

The Company shall submit itemized bills covering its actual costs incurred for performing the Utility Work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

UDOT Contracts and Compliance Specialist
4501 South 2700 West
Construction Office, Box 148220
Salt Lake City, Utah 84114-8220

Itemized bills shall bear the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement, and be submitted to UDOT within 60 days following completion of the Utility Work by the Company on the Project. Otherwise, previous payments to the Company may be considered final, except as agreed to between the Parties in advance. UDOT will reimburse the Company within 60 days after receipt of the billings, but only for those items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the Company to submit final billings within 6 months of the completion of the Utility Work will result in UDOT's disallowance of that portion of Utility Work reimbursement.

If the Company owes a balance to UDOT, the Company will reimburse UDOT within 60 days after receipt of billing from UDOT.

20. SALVAGE CREDIT

In accordance with 23 C.F.R. §645.117 all materials from Company's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on this Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties hereto.

In accordance with 23 C.F.R. §645.117, all materials from the existing facilities, which are recovered in suitable condition for reuse by the Company and not reused on the Project, shall be credited to the cost of the Project at current stock prices. If the materials are not suitable for reuse, they shall be credited at such other prices as agreed upon between the Company and UDOT following inspection of the recovered material.

21. PROJECT DESIGN CHANGES

If UDOT changes the Project design after the Company has completed its design review; or if the Company has completed its portion of the Utility Work of its facilities based on previously approved design plans; the cost of the second design review and/or Utility Work is to be paid in full by UDOT. UDOT will make adjustments for any additional time that may be required for the Company to perform Utility Work on its facilities when required.

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22. **COMPANY'S COSTS DIFFER BY MORE THAN 10%**

If the Company's actual costs incurred for its force account work differs more than 10% plus or minus per line item from the amount contained in the supplemental agreements, the Company is required to submit a letter of explanation with its billings indicating how and why the difference in costs occurred.

23. **RIGHT TO AUDIT**

UDOT and FHWA shall have the right to audit all cost records and accounts of the Company pertaining to this Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. §645, subpart A. Should this audit disclose that the Company has been underpaid, UDOT will reimburse the Company within 60 days upon submission of additional billing to cover the underpayment. Should this audit disclose that the Company has been overpaid, the Company will reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For the purpose of audit the Company is required to keep and maintain its records of Utility Work covered herein for a minimum of 3 years after final payment is received by the Company from UDOT.

The Company shall have the right to review UDOT's cost documentation for the Utility Work performed on behalf of the Company.

24. **ACCEPTANCE**

UDOT will provide notification to the Company for acceptance of the Utility Work upon completion of the final inspection. Company will have 60 days to respond in writing to UDOT with any additional comments in regards to the Utility Work. In the event that UDOT does not receive a written response within 60 days, UDOT will designate the Utility Work accepted by the Company. Upon acceptance of the Utility Work, the Company will accept, own and maintain its facilities. To the extent it may lawfully do so, Company further agrees to relieve UDOT from any responsibility or liability that may result for its new facilities or the operation thereof.

25. **ACCESS & MAINTENANCE**

Access for maintenance and servicing of Company's facilities located on the Project right-of-way will be allowed only by permit issued by UDOT. Company will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

26. **MISCELLANEOUS**

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.

b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and Company.

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c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.

d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power, and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

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IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

First Digital Telecom

_____

Title: _____

Date: _____

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

Approved as to Form

_____

Title: Assistant Attorney General

Date: _____

UDOT Comptroller Office Contract Administrator

_____

Title:

Date: _____

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FIRST DIGITAL TELECOM
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT"), and **First Digital Telecom**, a Company in the State of Utah, ("Company") each as ("Party") and jointly as ("Parties").

The Parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the MUA remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. UDOT and Company will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)

   b. The Company requirements as shown in the MUA – Company Requirements, are modified as follows:

   c. Anticipated duration of Utility Work as shown on Exhibit "B" that is incorporated by reference:

   d. Betterments included:

TOTAL ESTIMATED COST OF SUPPLEMENTAL AGREEMENT _____	**$0.00**
TOTAL ESTIMATED COST OF COMPANY PERFORMED UTILITY WORK	$0.00
TOTAL ESTIMATED COST OF UDOT PERFORMED UTILITY WORK	$0.00
COMBINED TOTAL ESTIMATED COST OF UTILITY WORK	**$0.00**
TOTAL ESTIMATED AMOUNT OF COMPANY PARTICIPATION @ 50%	$0.00
TOTAL ESTIMATED AMOUNT OF UDOT PARTICIPATION @ 50%	$0.00

2. UDOT will notify the Company's contact person, Ryan Finch, Telephone No. (801)636-5350, email rfinch@firstdigital.com at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

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IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

First Digital Telecom

_____

Title: _____

Date: _____

. . . . . .

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

UDOT Comptroller Office Contract Administrator

_____

Title:

Date: _____

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KEARNS IMPROVEMENT DISTRICT
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this _____day of_____, 20_____, by and between the **Utah Department of Transportation**, ("UDOT"), and **Kearns Improvement District**, a Local Improvement District of the State of Utah, ("District") each as ("Party") and jointly as ("Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, the design-build contractor will complete the design and administer construction of the Project ("Design-Builder"); and

WHEREAS, UDOT has identified District facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, the District desires for the Design-Builder to design and perform the Utility Work on the District's facilities necessitated by the Project; and

WHEREAS, the District will perform the necessary design review and inspection to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement, the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering the Utility Work to be accomplished by UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

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AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. PROJECT RESPONSIBLE FOR COST

In accordance with Utah Code § 72-6-116(3)(a)(ii), UDOT is responsible for 100% of the cost of the Utility Work of District's facilities for those costs that comply with Utah Administrative Code R930-8.

2. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

District's contact person is Greg Anderson, telephone number (801) 912-0282, and e-mail ganderson@kearnsid.org.

After awarding the Project, UDOT will provide the District with the Design Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

3. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the District's facilities and requirements for inclusion in this Agreement and the Request for Proposals, UDOT gave the District authorization for preliminary design engineering on April 26, 2016.

4. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the District.

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5. PROJECT COORDINATION

The District requested that UDOT include items of Utility Work for relocating and adjusting District's facilities in the Project.

During the development of the Project design, the District and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the District's facilities can be avoided. If Utility Work for the District's facilities is required by the Project, UDOT will be responsible to identify the conflicts and to design and construct the Utility Work of the District's facilities. The District will perform the necessary design reviews prior to the start of Utility Work. UDOT's Project Representative will be responsible for coordinating with other utility companies as it relates to District's facilities.

6. DISTRICT REQUIREMENTS

UDOT will comply with the following District Utility Work requirements**:**

a. Size and depth of District Utility crossings must be determined and recorded prior to any Project directional boring or excavation activities near the District's facilities.
b. A District representative must be present during potholing, crossing, or relocation activities of District facilities.
c. The District requires review of material and product specification submittals for District approval prior to installation.
d. All District water service interruptions require following activities:
    i. Coordinate with the District for notification procedures to its serviced customer(s) and for processes to minimize service interruptions.
    ii. The District must approve the extent of service interruptions before Utility Work begins.
e. Notification must be given to the District prior to performing any potholing, crossing, or Utility Work on the District facilities. Utility Work installed without notification to the District will require remedial efforts for District acceptance. See section 11 below.
f. UDOT will supply as-constructed plans, in AutoCadd format, upon completion of any required Utility Work including betterment work.

7. UDOT TO DESIGN AND CONSTRUCT DISTRICT'S UTILITY WORK

UDOT will schedule and meet with the District to review the design and scheduling of the Utility Work for the District's facilities at specific locations on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

UDOT will design the Utility Work in accordance with District's standards regularly followed by the District in its own work and not considered a betterment. In the event of a conflict between UDOT and District standards, the higher standard will be applied.

b. The District's current standards and specifications, dated September 2016, can be found at the District web site http://kearnsid.org/engspecs.PDF that is incorporated by reference.
c. UDOT will secure permits required for Utility Work of District's facilities.

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8. **RIGHT-OF-WAY**

Any easements or replacement right-of-way required in conjunction with the Utility Work of District's facilities will be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8.

9. **BETTERMENT WORK**

If the District desires to include betterment work in the Project at any specific location UDOT may agree to the betterment providing the difference in costs between the functionally equivalent required Utility Work and the District's desired betterment work that is not required by the Project shall be at the sole cost of the District and the betterment work can be accommodated without delaying UDOT's Project. The betterment work will be addressed by separate supplemental agreement between UDOT and the District.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

10. **SUPPLEMENTAL AGREEMENTS**

UDOT and the District shall enter into supplemental agreements to cover Utility Work at specific Project locations. As part of the supplemental agreement, UDOT will provide design plans and Utility Work schedules for review and approval by the District prior to start of the Utility Work. A copy of the format of the proposed supplemental agreement is marked Exhibit "A" that is incorporated by reference.

The District will require a 2 week review and approval period for any final supplemental agreement submitted to the District by UDOT.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental agreement approved in writing by the Parties is required prior to the start of Utility Work on the changes or additions.

11. **UDOT TO NOTIFY DISTRICT BEFORE BEGINNING UTILITY WORK**

UDOT will notify the District at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto, to allow the District time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis.

12. **DISTRICT TO NOTIFY UDOT**

District's personnel shall notify UDOT's Field Representative upon arriving and leaving the Project site for verification of inspecting Utility Work. District's personnel will comply with all applicable OSHA and Project safety requirements while within the Project limits.

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13. **INSPECTION**

The District shall provide on-call engineering support by District's engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during Utility Work, and to perform the necessary inspection on the District's facilities installed by UDOT.

a. The District's engineer and/or inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on District's facilities in accordance with the plans and specifications provided and/or approved by the District, including changes or additions to the plans and specifications, which are approved by the Parties hereto.
b. The District shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on the District's facilities. The District shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.
c. UDOT will respond to District's concerns within 24-hours of written notification.
d. The District, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns the District may have with acceptance of the facilities upon completion of the Utility Work.
e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Utility Work does not relieve the District of its duty in the performance of the Utility Work or to ensure compliance with acceptable standards.

14. **DAILY RECORDKEEPING**

UDOT's Field Representative will keep daily records of the inspection performed by the District. Daily inspection records will be in duplicate on a form to be prepared by the District or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance and Certification Manager. The inspection records shall be signed by UDOT's Field Representative, and the District or its authorized representatives. Copies of the inspection records shall be retained by the parties to this Agreement.

15. **REIMBURSEMENT**

UDOT will not reimburse the District for costs incurred by District personnel for design review, observation, inspection, and operation of valves performed as part of their regularly assigned duties. Should it become necessary for the District to procure outside services to perform design review, observation, or inspection to accommodate UDOT's Utility Work and Project schedule, the District shall notify UDOT. Upon concurrence by UDOT, a supplemental agreement for the cost of the services will be executed at which time the District may procure outside services through appropriate solicitation.

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16. **SUBMITTAL OF ITEMIZED BILLS**

The District shall submit itemized bills covering the actual costs incurred for outside services to perform design review, oversight, and inspection work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

UDOT Contracts and Compliance Specialist
Utah Department of Transportation
PO Box 141510
SLC, UT 84114-1510

Itemized bills shall bear the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement and be submitted to UDOT within 60 days following completion of outside services by the District on the Project. Otherwise, previous payments to the District may be considered final, except as agreed to between the Parties in advance.

UDOT will reimburse the District within 60 days after receipt of the billings, but only for items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the District to submit final billings within 6 months of the completion of outside services will result in UDOT's disallowance of that portion of outside services performed by the District.

17. **SALVAGED MATERIALS**

All materials from District's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on this Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties hereto.

18. **RIGHT TO AUDIT**

UDOT and the Federal Highway Administration shall have the right to audit all cost records and accounts of the District pertaining to this Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. § 645, subpart A. Should this audit disclose that the District has been underpaid, the District will be reimbursed by UDOT within 60 days upon submission of additional billing to cover the underpayment. Should this audit disclose that the District has been overpaid, the District will reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For purpose of audit the District is required to keep and maintain its records of outsides services covered herein for a minimum of 3 years after final payment is received by the District from UDOT.

19. **ACCEPTANCE AND MAINTENANCE**

Upon completion of the Utility Work of District facilities by UDOT, the District will accept, own, and maintain its own facilities. The District shall be the sole owner of the facilities upon completion of the Project unless otherwise agreed to by the Parties. To the extent it may lawfully do so, District further agrees to relieve UDOT from any responsibility or liability that may result from its new facilities or the operation thereof.

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20. **ACCESS**

It is understood that access for maintenance and servicing of District's facilities located on the right-of-way of the Project will be allowed only by permit issued by UDOT to the District, and that the District will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

21. **INDEMNIFICATION**

UDOT and the District are both governmental entities subject to the Governmental Immunity Act. Each Party agrees to indemnify, defend, and save harmless the other from and against all claims, suits and costs, including attorneys' fees for injury or damage of any kind, arising out of its negligent acts, errors or omissions of its officers, agents, contractors or employees in the performance of this Agreement, and from and against all claims, suits, and costs, including attorneys' fees for injury or damage of any kind. Nothing in this paragraph is intended to create additional rights to third parties or to waive any of the provisions of the Governmental Immunity Act. The obligation to indemnify is limited to the dollar amounts set forth in the Governmental Immunity Act, provided the Act applies to the action or omission giving rise to the protections in this paragraph. The indemnification in this paragraph shall survive the expiration or termination of this Agreement.

22. **MISCELLANEOUS**

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.

b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and District.

c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.

d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

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IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

ATTEST:

Kearns Improvement District

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(IMPRESS SEAL)

. . . . . .

Recommended For Approval:

Utah Department of Transportation

_____ _____

Title: Utility and Railroad Leader **Title:** Project Director

Date: _____ **Date:** _____

Approved as to Form

Comptroller Office

_____ _____

Title: Assistant Attorney General **Title:** Contract Administrator

Date: _____ **Date:** _____

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KEARNS IMPROVEMENT DISTRICT
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT"), and **Kearns Improvement District**, a Local Improvement District of the State of Utah, ("District") each as ("Party") and jointly as ("Parties").

The parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the Master Utility Agreement remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. UDOT will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)
   b. The District requirements as shown in the MUA – District Requirements, are modified as follows:
      i.
   c. Anticipated duration of Utility Work:
   d. Total estimated cost of District's (100% reimbursable) outside services: (Detailed Estimate Attached)

2. UDOT will notify the District's Project Representative, Greg Anderson, telephone number (801) 912-0282, and e-mail ganderson@kearnsid.org at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

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IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

Kearns Improvement District

ATTEST:

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(Impress Seal)

. . . . . .

RECOMMENDED FOR APPROVAL: **UTAH DEPARTMENT OF TRANSPORTATION**

_____ _____

Title: Utility and Railroad Leader **Title:** Project Director

Date: _____ **Date:** _____

_____

UDOT Comptroller Office
Contract Administrator

. . . . . .

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MANUAL BROS., INC.
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this _____ day of_____, 20_____, by and between the **Utah Department of Transportation**, ("UDOT") and **Manual Bros., Inc.**, a Company in Delaware, ("Company") (each as "Party" and jointly as "Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, UDOT's design-build contractor ("Design-Builder") will complete the design and administer construction of the Project; and

WHEREAS, UDOT has identified Company facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, the Company desires for the Design-Builder to design and construct the Company's Utility Work necessitated by the Project; and

WHEREAS, the Company will perform the necessary review and approval for the design and construction of its Utility Work to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering Utility Work to be accomplished by the Company and UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

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AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462 and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

Company's contact person is Tony Cole, telephone number (303) 459-8368, and e-mail tcole@quantappower.net.

After awarding the Project, UDOT will provide the Company with the Design-Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

2. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the Company's facilities and requirements for inclusion in this Agreement and the request for proposals, UDOT gave the Company authorization for preliminary design engineering on April 26, 2016.

3. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the Company.

4. PROJECT COORDINATION

Company and UDOT agree to have the Design-Builder include in the Project, items of Utility Work for the Company's facilities.

During the development of the Project design, the Company and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the Company's facilities can be avoided. If Utility Work is required, UDOT will be responsible to propose and provide a location for the facilities. UDOT will provide the Company with Project design plans as early as possible, and will schedule and meet with the Company to review the design, construction, estimates of cost, and scheduling for the Company's Utility Work at specific locations

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on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

The Company shall advise UDOT's Project Representative of the approximate time required for completion of the Utility Work and shall diligently pursue its Utility Work so that completion can be accomplished according to the pre-determined time schedule negotiated by the Company and UDOT in the supplemental agreement issued hereto for a specific Project location. The Company shall immediately notify UDOT's Project Representative by phone call or email, of its discovery of any occurrence or unforeseen circumstances that would prevent the Company from completing its Utility Work according to the time schedule provided. In addition, the Company shall describe the circumstances in writing within 24-hours of the discovery to UDOT's Project Representative.

5. COMPANY REQUIREMENTS

UDOT will comply with the following Company Utility Work requirements:

a. Comply with design, material, and construction standards shown in Exhibit "A", that is incorporated by reference.
b. Notify Company a minimum of 21 days in advance of all Utility Work.
c. Entire new duct bank structure must be installed and fiber optic cable installed/spliced BEFORE any part of existing duct bank structure is removed.
d. Color coding must be replicated in the new structure using Duct Configuration shown in Exhibit "B", that is incorporated by reference.
e. The Company will require a 2 week review and approval period for proposed designs, estimate review, and internal approvals after design plans and estimates are delivered to the Company.

6. UDOT TO DESIGN AND CONSTRUCT UTILITY WORK

UDOT shall perform the necessary design work, cost estimating, field and office engineering, furnish all materials and perform the Utility Work necessitated by the Project.

UDOT will design the Utility Work in accordance with Company's standards regularly followed by the Company in its own work and not considered a betterment. In the event of a conflict between UDOT and Company standards, the higher standard will be applied.

UDOT will secure permits required for Utility Work for Company's facilities.

UDOT will supply as-constructed plans for the Utility Work it performs, in AutoCad format**,** upon completion of any required Utility Work. See Company standards shown in Exhibit "A" for as-constructed requirements.

7. COMPANY TO PERORM INSPECTION OF THE UTILITY WORK

The Company will perform inspection of the Utility Work for the Company's facilities that will be performed by UDOT. UDOT will accomplish the Utility Work on the Company's facilities in accordance with the plans and specifications approved by the Company. Changes or additions to

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the plans and specifications shall be approved by the Company and UDOT through a supplemental agreement.

8. STANDARD SPECIFICATIONS AND REGULATIONS

The Company, while engaged in the preliminary design and Utility Work of its facilities, shall comply with UDOT's 2012 Standard Specifications for Road and Bridge Construction and Utah Administrative Code R930-7. Company specification are listed as Exhibit "A". In the event of a conflict between UDOT and Company standards, the more stringent standard will be applied.

9. RIGHT-OF-WAY

Any easements or replacement right-of-way required in conjunction with the Utility Work of Company's facilities will be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8-7.

10. MAINTENANCE OF TRAFFIC (MOT), TRAFFIC CONTROL, CLEAR/GRUB, AND SURVEYING

UDOT will provide MOT and traffic control for Utility Work at no cost to the Company. Except in the case of emergencies, the Utility Work on the Project will be scheduled in compliance with the requirements of the Limitation of Operations contained in UDOT's Design-Builder contract with respect to lane closures, peak hour Utility Work restrictions, holiday and special event limitations, etc.

UDOT will provide, at no cost to the Company, clearing and grubbing for the Utility Work as required by the Company and in accordance with UDOT's Standard Specifications.

Surveying and staking of roadway facilities as required by the Company will be provided by UDOT in accordance with UDOT's Standard Specifications. The cost of the surveying and staking will be at UDOT's expense and the Company will have no obligation for the cost of surveying. Any of UDOT's survey control stakes or bench markers, which are removed or damaged by the Company, shall be reestablished by UDOT at Company's expense.

11. BETTERMENT WORK

If the Company desires to include betterment work in the Project at any specific location, UDOT may agree to the betterment work providing the difference in costs between the functionally equivalent required Utility Work and the Company's desired betterment work, that is not required by the Project, shall be at the sole cost of the Company and the betterment work can reasonably be accommodated without delaying UDOT's Project. The betterment work will be addressed by a separate supplemental agreement between UDOT and the Company.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

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12. SUPPLEMENTAL AGREEMENTS

UDOT and the Company shall enter into individual supplemental agreements to cover Utility Work at specific Project locations. Each supplemental agreement will include a description and location of the Utility Work to be performed, design drawings showing the original and proposed locations of the Company's facilities, Utility Work schedules, cost estimates from all Parties, participation shares for UDOT and the Company, any proposed betterment work, and any necessary right-of-way documents. The estimates do not account for increases due to unknown and unforeseen hardships in accomplishing the Utility Work. A copy of the format of the proposed supplemental agreement is marked Exhibit "C" that is incorporated by reference.

The Company will require a 2 week review and approval period for any final supplemental agreement submitted to the Company by UDOT.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental agreement approved in writing by the Parties is required prior to the start of Utility Work on the changes or additions.

13. UDOT AUTHORIZATION TO PROCEED WITH UTILITY WORK

The Company shall not perform any Utility Work inspection until the supplemental agreement for the Utility Work is signed by the Company and received by UDOT. UDOT will review and approve the supplemental agreement and will issue an authorization to proceed to the Company for each specific Utility Work location.

14. UDOT TO NOTIFY THE COMPANY BEFORE BEGINNING UTILITY WORK

UDOT will notify the Company at least 14 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto, to allow the Company time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis. Should UDOT fail to give advance notification and Utility Work is performed without the presence of a Company inspector, UDOT will, at no cost to the Company, facilitate inspection of the Utility Work including, if necessary, uncovering the Utility Work.

15. COMPANY TO NOTIFY UDOT AND THE DESIGN-BUILDER BEFORE BEGINNING UTILITY WORK

The Company will notify UDOT's Resident Engineer as well as the Design-Builder Project Representative at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto. The Company will give subsequent notifications of when and where the Company will be performing Utility Work to UDOT's Field Representative and the Design-Builder Project Representative on a day-to-day basis. Such subsequent notifications can be informal. Failure on the part of the Company to give proper notification to UDOT's Field Representative and the Design-Builder Project Representative will be cited to the Company and that portion of the Company's Utility Work performed while not under the surveillance of the UDOT Field Representative may be deducted from the reimbursement at UDOT's discretion for.

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16. **INSPECTION**

The Company shall provide on-call engineering support by the Company's engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during the Utility Work, and to perform the necessary inspection for the Company's Utility Work installed by UDOT.

a. The Company engineer and/or inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on Company's facilities in accordance with the plans and specifications provided and/or approved by the Company, including changes or additions to the plans and specifications, which are approved by the Parties hereto.
b. The Company shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on the Company's facilities. The Company shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.
c. UDOT will respond to the Company's concerns within 24-hours of written notification.
d. The Company, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns the Company may have with acceptance of the facilities upon completion of the Utility Work.
e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Company's Utility Work does not relieve the Company of its duty in the performance of the Utility Work or to ensure compliance with acceptable standards.

17. **DAILY RECORDKEEPING**

The Company and UDOT will keep daily records of the inspection and Utility Work performed by the onsite forces. Daily records will be in duplicate on a form to be prepared by the Company and UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance, and Certification Manager. The daily records shall be signed by UDOT's Field Representative and the Company or its authorized representatives.

18. **REIMBURSEMENT FOR COMPANY'S UTILITY WORK**

In accordance with Utah Code §72-6-116(3)(a)(ii), UDOT will reimburse the Company 50% of the cost of Utility Work of its facilities on state highways and the Company shall pay the remainder of the cost of the Utility Work. UDOT will reimburse the Company 100% of the cost of Utility Work of its facilities located on a public utility easement, on a Company-owned private easement or fee property. The Company shall provide UDOT with a copy of the public utility easement or subdivision plat, private easement or fee title. The Utility Work and reimbursement for Company's facilities required by the Project will be in conformance with the requirements of Utah Administrative Code R930-8.

The Company shall submit itemized bills covering its actual costs incurred for performing the Utility Work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

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UDOT Contracts and Compliance Specialist
4501 South 2700 West
Construction Office, Box 148220
Salt Lake City, Utah 84114-8220

Itemized bills shall bear the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement, and be submitted to UDOT within 60 days following completion of the Utility Work by the Company on the Project. Otherwise, previous payments to the Company may be considered final, except as agreed to between the Parties in advance. UDOT will reimburse the Company within 60 days after receipt of the billings, but only for those items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the Company to submit final billings within 6 months of the completion of the Utility Work will result in UDOT's disallowance of that portion of Utility Work reimbursement.

If the Company owes a balance to UDOT, the Company will reimburse UDOT within 60 days after receipt of billing from UDOT.

19. SALVAGE CREDIT

In accordance with 23 C.F.R. §645.117 all materials from Company's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on this Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties hereto.

In accordance with 23 C.F.R. §645.117, all materials from the existing facilities, which are recovered in suitable condition for reuse by the Company and not reused on the Project, shall be credited to the cost of the Project at current stock prices. If the materials are not suitable for reuse, they shall be credited at such other prices as agreed upon between the Company and UDOT following inspection of the recovered material.

20. PROJECT DESIGN CHANGES

If UDOT changes the Project design after the Company has completed its design review; or if the Company has completed its portion of the Utility Work of its facilities based on previously approved design plans; the cost of the second design review and/or Utility Work is to be paid in full by UDOT. UDOT will make adjustments for any additional time that may be required for the Company to perform Utility Work on its facilities when required.

21. COMPANY'S COSTS DIFFER BY MORE THAN 10%

If the Company's actual costs incurred for its inspection differs more than 10% plus or minus per line item from the amount contained in the supplemental agreements, the Company is required to submit a letter of explanation with its billings indicating how and why the difference in costs occurred.

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22. **RIGHT TO AUDIT**

UDOT and FHWA shall have the right to audit all cost records and accounts of the Company pertaining to this Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. §645, subpart A. Should this audit disclose that the Company has been underpaid, UDOT will reimburse the Company within 60 days upon submission of additional billing to cover the underpayment. Should this audit disclose that the Company has been overpaid, the Company will reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For the purpose of audit the Company is required to keep and maintain its records of Utility Work covered herein for a minimum of 3 years after final payment is received by the Company from UDOT.

The Company shall have the right to review UDOT's cost documentation for the Utility Work performed on behalf of the Company.

23. **ACCEPTANCE**

UDOT will provide notification to the Company for acceptance of the Utility Work upon completion of the final inspection. Company will have 60 days to respond in writing to UDOT with any additional comments in regards to the Utility Work. In the event that UDOT does not receive a written response within 60 days, UDOT will designate the Utility Work accepted by the Company. Upon acceptance of the Utility Work, the Company will accept, own and maintain its facilities. To the extent it may lawfully do so, Company further agrees to relieve UDOT from any responsibility or liability that may result for its new facilities or the operation thereof.

24. **ACCESS & MAINTENANCE**

Access for maintenance and servicing of Company's facilities located on the Project right-of-way will be allowed only by permit issued by UDOT. Company will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

25. **MISCELLANEOUS**

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.
b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and Company.
c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.
d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power, and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the

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same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

26. **ASSIGNMENT**

Company may assign this Agreement in whole, or in part, to a Permitted Assignee. As used herein, the term "Permitted Assignee" shall mean (a) any Affiliate of Company, (b) any Person that purchases all or substantially all of the assets of Company, or any other Person formed by or surviving the merger or consolidation of Company and any other person or (c) any institutional lender to whom this Agreement is assigned as collateral security for any indebtedness of Company or any Affiliate of Company, provided that such collateral assignment is subject to the terms of this Agreement. Upon any assignment to a Permitted Assignee, the assignor shall remain jointly and severally liable with the Permitted Assignee for the performance under this Agreement. Company may assign this agreement to any other assignee that is not a Permitted Assignee, provided that Company is not in default under this Agreement and that such other assignee shall expressly assume in writing all obligations and liabilities with respect to this Agreement, with the prior written consent of UDOT which consent shall not be unreasonably withheld.

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IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

Manual Bros., Inc.

_____

Title: _____

Date: _____

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

Approved as to Form

_____

Title: Assistant Attorney General

Date: _____

UDOT Comptroller Office Contract Administrator

_____

Title:

Date: _____

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STANDARDS

COMPANY DRAWINGS REQUIREMENTS:

UDOT will supply as-constructed plans for the Utility Work it performs for the Company Utility Work upon completion. In the event UDOT performs including any services which alter the route, including but not limited to line, depth of cover, adding or removing hand-holes markers or conduits, etc.,

In the event the re-route is greater than 1,000 feet, UDOT shall provide updates in both hard copy and electronic format (Auto-CAD Release 14.0 or 2000) within 30 days of completion of the change, i.e. completion of cable relocation project.

AS-CONSTRUCTED DRAWINGS MUST CONTAIN A MINIMUM OF THE FOLLOWING:

a) Drawing size of 11" by 17".

b) Table showing the list of drawings.

c) As-constructed Drawings showing the following:

- Conduit length summary
- Number of Terminals
- Number of POPs
- Number of Splice Manholes
- Number of Intermediate Manholes
- Number of Leased Manholes First Digital
- Number of Buried Splice Vaults
- Number of Buried Pull Vaults

d) Information showing the location of the running line, relative to permanent landmarks, including but not limited to, railroad mileposts, boundary crossings and utility crossings. All information shall be geographically accurate. The running line will be stationed horizontally.

e) Splice locations with amount of slack coil.

f) Manhole and hand-hole locations with any amount of slack coil noted.

g) Conduit information (type, length, expansion joints, etc.).

h) ROW detail (type, centerline distances, boundaries, waterways, and road crossings, known utilities and obstacles).

Drawings will be updated with actual field data during and after construction.

MATERIALS:

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PVC conduit shall be a minimum of schedule 40 wall thickness, HDPE conduit shall be SDR-11. Follow Duct Configuration shown in Exhibit "B".

The use of steel pipe shall be avoided, whenever possible. If carbon steel pipe must be used, written approval of Company is required.

Hand-holes (vaults) and covers shall be constructed from polymer concrete with a vault load-bearing capacity as per ANSI/SCTE 77 2002 as shown in Table 1 below:

TABLE 1: ANSI/SCTE 77 2002 VAULT LOAD BEARING REQUIREMENTS			
APPLICATION	LOADING	REQUIREMENTS	
TIER 8: Sidewalk or off-roadway applications with a safety factor for non-deliberate vehicular traffic.	Vertical	Design Load	8000 pounds
		Test Load	12000 pounds
	Lateral	Design Load	600 pounds/sq. ft.
		Test Load	900 pounds/sq. ft.
TIER 15: Driveway, parking lot, and off-roadway applications subject to occasional non-deliberate heavy vehicular traffic.	Vertical	Design Load	15000 pounds
		Test Load	22500 pounds
	Lateral	Design Load	800 pounds/sq. ft.
		Test Load	1200 pounds/sq. ft.
AASHTO H-20: Deliberate vehicular traffic applications.	Certified pre-cast concrete, cast iron or AASHTO recognized materials		
Ratings are for vaults to be installed at grade level to 48 inches of cover. Installation at depth greater than 48 inches requires an increase in the vault rating.			

ATT
ATT
First Digital

Hand-hole lids shall be equipped with an EMS marker for electronic locating capability. If a hand-hole lid is not equipped with an EMS marker, an EMS ball must be buried 2 - 4 feet below ground directly over the hand-hole box.

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MINIMUM DEPTH OF COVER:
(a) Minimum cover required in placement of conduit shall be 42 inches to top of conduit, except where field conditions dictate otherwise as referenced below.

(b) For conduit systems with manhole access, the depth of cover shall be a minimum 36 inches to top of conduit.

(c) At locations where conduit crosses other subsurface utilities or other structures, the conduit shall be installed to provide adequate vertical clearance (minimum of 12 inches) and the applicable minimum depth can be maintained; otherwise the conduit will be installed under the existing utility or other structure. If, however, adequate clearance cannot be obtained and the conduit must be placed above, the cable shall be encased in steel pipe and HDPE conduit.

(d) At road crossings, the conduit shall be placed at a minimum depth of 60" below the bottom of the ditch.

(e) In rock, the conduit depth shall be:
36 inches - 42 inches in HDPE,

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24 inches - 36 inches in HDPE encased in steel,
18 inches - 24 inches in HDPE or PVC or steel and concrete encased.

(f) PVC and HDPE conduit will be back-filled with 6 inches of select materials (padding) in rock areas. MDl Polyurethane channel (Fiber-Rockgard by Chempro, Inc. or equivalent) may be used as protective cover in lieu of select material padding.

(g) Buried Hand-holes: 36 inches minimum depth to top of the hand-hole. The placement of hand-holes in cropland and pastures shall be avoided if at all possible, for access reasons. If this cannot be avoided, then the top of the hand-hole shall be placed at least 3 feet below the maximum depth attained by the agricultural equipment, due to hand-dig zone requirements.

BURIED CABLE WARNING TAPE:
All conduits will be installed with buried cable warning tape except where existing steel pipelines or existing conduit systems are used. Buried cable warning tape shall be 6 inches wide and display a written message similar to: “Warning: Buried Fiber Optic Cable," Manuel Bros. name and 800 number one call number repeated every 24 inches. The warning tape shall generally be placed at 12 to 24 inches below grade and directly above the conduit.

CONDUIT CONSTRUCTION:
Conduits may be placed by means of trenching, plowing, jack and bore, push-pull method, or directional bore. Conduits will generally be placed on a level grade parallel to the surface, with only gradual changes in grade elevation.

Conduit crossings of roads maintained by government bodies and railroad crossings will be encased in steel conduit, except where the cable is placed with 10 feet or more of cover. In the latter case, HDPE is adequate.

Conduit placed by the push-pull method (that is using a push rod, followed by pulling conduit) may use HDPE, PVC, or steel conduit.

All directional bores will use HDPE equivalent to Schedule 80 PVC or better or steel conduit.
In areas prone to lightning, HDPE is the preferred material.

All conduits placed on bridges shall have expansion joints placed at each structural (bridge) expansion joint or at least every 300 feet, whichever is the shorter distance. For bridges under 100 feet, at least one conduit expansion joint will be placed, even if there is no bridge expansion joint.

INNERDUCT INSTALLATION:
Innerduct(s) shall be installed in all steel conduits. No cable will be placed directly in any split/solid steel conduit without innerduct.
Innerduct(s) shall extend beyond the end of all conduits a minimum of eighteen (18) inches.

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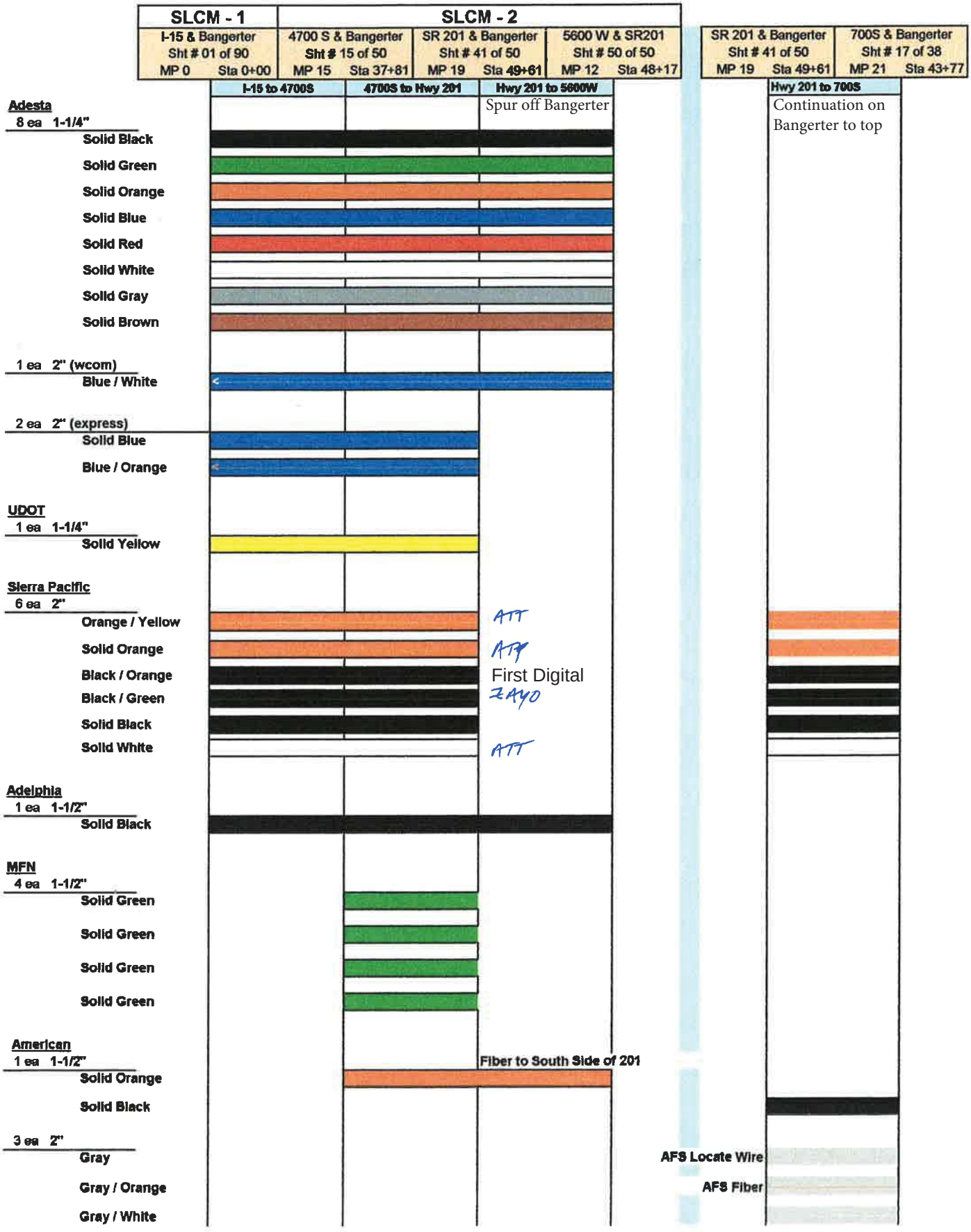
EXHIBIT B
DUCT CONFIGURATION



MCI COMMUNICATION SERVICES
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this _____ day of_____, 20_____, by and between the **Utah Department of Transportation**, ("UDOT") and **MCI Communication Services**, a Delaware Corporation, ("Company") (each as "Party" and jointly as "Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, UDOT's design-build contractor ("Design-Builder") will complete the design and administer construction of the Project; and

WHEREAS, UDOT has identified Company facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, the Company desires for the Design-Builder to design and construct the Company's Utility Work except cable and pedestal procurement, pulling, and splicing necessitated by the Project; and

WHEREAS, the Company will perform the necessary review and approval for the design, cable and pedestal procurement, pulling, and splicing, and construction inspection to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering Utility Work to be accomplished by the Company and UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

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AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

Company's contact person is David McAllister, telephone number (303) 214-7115, and e-mail david.mcallister@verizon.com.

After awarding the Project, UDOT will provide the Company with the Design-Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

2. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the Company's facilities and requirements for inclusion in this Agreement and the request for proposals, UDOT gave the Company authorization for preliminary design engineering on April 26, 2016.

3. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the Company.

4. PROJECT COORDINATION

Company and UDOT agree to have the Design-Builder include in the Project, items of Utility Work for the Company's facilities.

During the development of the Project design, the Company and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the Company's facilities can be avoided. If Utility Work is required, UDOT will be responsible to propose and provide a location for the facilities. UDOT will provide the Company with Project design plans as early as possible, and will schedule and meet with the Company to review the design, construction, estimates of cost, and scheduling for the Company's Utility Work at specific locations

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on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

The Company shall advise UDOT's Project Representative of the approximate time required for completion of the Utility Work and shall diligently pursue its Utility Work so that completion can be accomplished according to the pre-determined time schedule negotiated by the Company and UDOT in the supplemental agreement issued hereto for a specific Project location. The Company shall immediately notify UDOT's Project Representative by phone call or email, of its discovery of any occurrence or unforeseen circumstances that would prevent the Company from completing its Utility Work according to the time schedule provided. In addition, the Company shall describe the circumstances in writing within 24-hours of the discovery to UDOT's Project Representative.

5. COMPANY REQUIREMENTS

UDOT will comply with the following Company Utility Work requirements:

a. The Project and/or Utility Work shall not impact the operation of Company's facilities from November 15 through January 15 without prior written approval from Company. The Project schedule shall be developed accordingly.

6. UDOT TO DESIGN AND CONSTRUCT A PORTION OF UTILITY WORK

UDOT shall perform the necessary design work, cost estimating, field and office engineering, furnish all materials (except cable and pedestal) and perform the Utility Work (except pulling and splicing) necessitated by the Project.

UDOT will design the Utility Work in accordance with Company's standards regularly followed by the Company in its own work and not considered a betterment. In the event of a conflict between UDOT and Company standards, the higher standard will be applied.

UDOT will secure permits required for Utility Work for Company's facilities.

UDOT will supply as-constructed plans for the Utility Work it performs, in _____ format**,** upon completion of any required Utility Work.

7. COMPANY TO PERORM INSPECTION AND CONSTRUCT A PORTION OF THE UTILITY WORK

The Company will perform inspection of the Utility Work for the Company's facilities that will be performed by UDOT. UDOT will accomplish the Utility Work on the Company's facilities in accordance with the plans and specifications approved by the Company. Changes or additions to the plans and specifications shall be approved by the Company and UDOT through a supplemental agreement.

The Company will provide all cables, pedestals, pulling and splicing necessary to accommodate the Utility Work of its facilities on the Project. The Company requires 30 days' notice to schedule splicing and fiber pulls and will determine the splicing window based on the circuit.

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8. STANDARD SPECIFICATIONS AND REGULATIONS

The Company, while engaged in the preliminary design and Utility Work of its facilities, shall comply with UDOT's 2012 Standard Specifications for Road and Bridge Construction and Utah Administrative Code R930-7.

9. UNDERBUILT AND FACILITY REMOVAL REQUIREMENTS

The Company is responsible to remove all Company-owned underbuilt facilities from utility poles that will be relocated or removed due to the Project.

10. RIGHT-OF-WAY

Any easements or replacement right-of-way required in conjunction with the Utility Work of Company's facilities will be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8-7.

11. MAINTENANCE OF TRAFFIC (MOT), TRAFFIC CONTROL, CLEAR/GRUB, AND SURVEYING

UDOT will provide MOT and traffic control for Utility Work at no cost to the Company. The Company is responsible to coordinate Utility Work schedules and traffic control needs with UDOT to facilitate the Project schedule and minimize impacts to the public. Except in the case of emergencies, Company's Utility Work on the Project will be scheduled in compliance with the requirements of the Limitation of Operations contained in UDOT's Design-Builder contract with respect to lane closures, peak hour Utility Work restrictions, holiday and special event limitations, etc.

UDOT will provide, at no cost to the Company, clearing and grubbing for the Utility Work as required by the Company and in accordance with UDOT's Standard Specifications.

Surveying and staking of roadway facilities as required by the Company will be provided by UDOT in accordance with UDOT's Standard Specifications. The cost of the surveying and staking will be at UDOT's expense and the Company will have no obligation for the cost of surveying. Any of UDOT's survey control stakes or bench markers, which are removed or damaged by the Company, shall be reestablished by UDOT at Company's expense.

12. BETTERMENT WORK

If the Company desires to include betterment work in the Project at any specific location, UDOT may agree to the betterment work providing the difference in costs between the functionally equivalent required Utility Work and the Company's desired betterment work, that is not required by the Project, shall be at the sole cost of the Company and the betterment work can reasonably be accommodated without delaying UDOT's Project. The betterment work will be addressed by a separate supplemental agreement between UDOT and the Company.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

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13. SUPPLEMENTAL AGREEMENTS

UDOT and the Company shall enter into individual supplemental agreements to cover Utility Work at specific Project locations. Each supplemental agreement will include a description and location of the Utility Work to be performed, design drawings showing the original and proposed locations of the Company's facilities, Utility Work schedules, cost estimates from all Parties, participation shares for UDOT and the Company, any proposed betterment work, and any necessary right-of-way documents. The estimates do not account for increases due to unknown and unforeseen hardships in accomplishing the Utility Work. A copy of the format of the proposed supplemental agreement is marked Exhibit "A" that is incorporated by reference.

The Company will require a 2 week review and approval period for any final supplemental agreement submitted to the Company by UDOT.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental agreement approved in writing by the Parties is required prior to the start of Utility Work on the changes or additions.

14. UDOT AUTHORIZATION TO PROCEED WITH UTILITY WORK

The Company shall not perform any Utility Work until the supplemental agreement for the Utility Work is signed by the Company and received by UDOT. UDOT will review and approve the supplemental agreement and will issue an authorization to proceed to the Company for each specific Utility Work location.

15. UDOT TO NOTIFY THE COMPANY BEFORE BEGINNING UTILITY WORK

UDOT will notify the Company at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto, to allow the Company time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis. Should UDOT fail to give advance notification and Utility Work is performed without the presence of a Company inspector, UDOT will, at no cost to the Company, facilitate inspection of the Utility Work including, if necessary, uncovering the Utility Work.

16. COMPANY TO NOTIFY UDOT AND THE DESIGN-BUILDER BEFORE BEGINNING UTILITY WORK

The Company will notify UDOT's Project Representative as well as the Design-Builder Project Representative at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto. The Company will give subsequent notifications of when and where the Company will be performing Utility Work to UDOT's Field Representative and the Design-Builder Project Representative on a day-to-day basis. Such subsequent notifications can be informal. Failure on the part of the Company to give proper notification to UDOT's Field Representative and the Design-Builder Project Representative will be cited to the Company and that portion of the Company's Utility Work performed while not under the surveillance of the UDOT Field Representative may be deducted from the reimbursement at UDOT's discretion for.

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17. INSPECTION

The Company shall provide on-call engineering support by the Company's engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during the Utility Work, and to perform the necessary inspection for the Company's Utility Work installed by UDOT.

a. The Company engineer and/or inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on Company's facilities in accordance with the plans and specifications provided and/or approved by the Company, including changes or additions to the plans and specifications, which are approved by the Parties hereto.
b. The Company shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on the Company's facilities. The Company shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.
c. UDOT will respond to the Company's concerns within 24-hours of written notification.
d. The Company, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns the Company may have with acceptance of the facilities upon completion of the Utility Work.
e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Company's Utility Work does not relieve the Company of its duty in the performance of the Utility Work or to ensure compliance with acceptable standards.

18. DAILY RECORDKEEPING

The Company will keep daily records of the inspection and Utility Work performed by the Company forces. Daily records will be in duplicate on a form to be prepared by the Company or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance, and Certification Manager. The daily records shall be signed by UDOT's Field Representative and the Company or its authorized representatives.

19. REIMBURSEMENT FOR COMPANY'S UTILITY WORK

In accordance with Utah Code §72-6-116(3)(a)(ii), UDOT will reimburse the Company 50% of the cost of Utility Work of its facilities on state highways and the Company shall pay the remainder of the cost of the Utility Work. UDOT will reimburse the Company 100% of the cost of Utility Work of its facilities located on a public utility easement, on a Company-owned private easement or fee property. The Company shall provide UDOT with a copy of the public utility easement or subdivision plat, private easement or fee title. The Utility Work and reimbursement for Company's facilities required by the Project will be in conformance with the requirements of Utah Administrative Code R930-8.

The Company shall submit itemized bills covering its actual costs incurred for performing the Utility Work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

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UDOT Contracts and Compliance Specialist
Utah Department of Transportation
PO Box 141510
SLC UT 84114-1510

Itemized bills shall bear the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement, and be submitted to UDOT within 60 days following completion of the Utility Work by the Company on the Project. Otherwise, previous payments to the Company may be considered final, except as agreed to between the Parties in advance. UDOT will reimburse the Company within 60 days after receipt of the billings, but only for those items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the Company to submit final billings within 6 months of the completion of the Utility Work will result in UDOT's disallowance of that portion of Utility Work reimbursement.

If the Company owes a balance to UDOT, the Company will reimburse UDOT within 60 days after receipt of billing from UDOT.

20. SALVAGE CREDIT

In accordance with 23 C.F.R. §645.117 all materials from Company's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on this Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties hereto.

In accordance with 23 C.F.R. §645.117, all materials from the existing facilities, which are recovered in suitable condition for reuse by the Company and not reused on the Project, shall be credited to the cost of the Project at current stock prices. If the materials are not suitable for reuse, they shall be credited at such other prices as agreed upon between the Company and UDOT following inspection of the recovered material.

21. PROJECT DESIGN CHANGES

If UDOT changes the Project design after the Company has completed its design review; or if the Company has completed its portion of the Utility Work of its facilities based on previously approved design plans; the cost of the second design review and/or Utility Work is to be paid in full by UDOT. UDOT will make adjustments for any additional time that may be required for the Company to perform Utility Work on its facilities when required.

22. COMPANY'S COSTS DIFFER BY MORE THAN 10%

If the Company's actual costs incurred for its force account work differs more than 10% plus or minus per line item from the amount contained in the supplemental agreements, the Company is required to submit a letter of explanation with its billings indicating how and why the difference in costs occurred.

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23. **RIGHT TO AUDIT**

UDOT and FHWA shall have the right to audit all cost records and accounts of the Company pertaining to this Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. §645, subpart A. Should this audit disclose that the Company has been underpaid, UDOT will reimburse the Company within 60 days upon submission of additional billing to cover the underpayment. Should this audit disclose that the Company has been overpaid, the Company will reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For the purpose of audit the Company is required to keep and maintain its records of Utility Work covered herein for a minimum of 3 years after final payment is received by the Company from UDOT.

The Company shall have the right to review UDOT's cost documentation for the Utility Work performed on behalf of the Company.

24. **ACCEPTANCE**

UDOT will provide notification to the Company for acceptance of the Utility Work upon completion of the final inspection. Company will have 60 days to respond in writing to UDOT with any additional comments in regards to the Utility Work. In the event that UDOT does not receive a written response within 60 days, UDOT will designate the Utility Work accepted by the Company. Upon acceptance of the Utility Work, the Company will accept, own and maintain its facilities. To the extent it may lawfully do so, Company further agrees to relieve UDOT from any responsibility or liability that may result for its new facilities or the operation thereof.

25. **ACCESS & MAINTENANCE**

Access for maintenance and servicing of Company's facilities located on the Project right-of-way will be allowed only by permit issued by UDOT. Company will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

26. **MISCELLANEOUS**

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.

b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and Company.

c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.

d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power, and authority to execute this Agreement for

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and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

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IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

MCI Communication Services

_____

Title: _____

Date: _____

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

Approved as to Form

_____

Title: Assistant Attorney General

Date: _____

UDOT Comptroller Office Contract Administrator

_____

Title:

Date: _____

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MCI COMMUNICATION SERVICES
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT"), and **MCI Communication Services**, a Delaware Corporation, ("Company") each as ("Party") and jointly as ("Parties").

The Parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the MUA remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. UDOT and Company will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)

   b. The Company requirements as shown in the MUA – Company Requirements, are modified as follows:

   c. Anticipated duration of Utility Work as shown on Exhibit "B" that is incorporated by reference:

   d. Betterments included:

TOTAL ESTIMATED COST OF SUPPLEMENTAL AGREEMENT _____	**$0.00**
TOTAL ESTIMATED COST OF COMPANY PERFORMED UTILITY WORK	$0.00
TOTAL ESTIMATED COST OF UDOT PERFORMED UTILITY WORK	$0.00
COMBINED TOTAL ESTIMATED COST OF UTILITY WORK	**$0.00**
TOTAL ESTIMATED AMOUNT OF COMPANY PARTICIPATION @ 50%	$0.00
TOTAL ESTIMATED AMOUNT OF UDOT PARTICIPATION @ 50%	$0.00

2. UDOT will notify the Company's contact person, David McAllister, Telephone No. (303) 214-7115, email david.mcallister@verizon.com at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

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IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

MCI Communication Services

_____

Title: _____

Date: _____

. . . . . .

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

UDOT Comptroller Office Contract Administrator

_____

Title:

Date: _____

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Statewide Agreement Covering the Coordination and Reimbursement for **COMPANY's** Facility Adjustments and Relocations Throughout the State of Utah
QUESTAR GAS COMPANY

STATEWIDE UTILITY RELOCATION AGREEMENT

THIS STATEWIDE UTILITY RELOCATION AGREEMENT, (Agreement) is made and entered into this 19 day of July, 20 16, by and between the **UTAH DEPARTMENT OF TRANSPORTATION**, hereinafter referred to as "**UDOT**" and **QUESTAR GAS COMPANY**, a Registered Corporation in the State of Utah, hereinafter referred to as the "**COMPANY**." The Utah Department of Transportation and Questar Gas Company are referred to herein individually as a "Party" or collectively as the "Parties."

RECITALS:

WHEREAS, UDOT has jurisdiction over State Highway Rights of Way and administers the programming, development and completion of State and Federal-aid eligible projects (referred to herein as Project or collectively as Projects); and

WHEREAS, COMPANY is a natural gas utility and owns natural gas facilities (Facilities), that are located within State Highway Rights of Way under a Statewide Utility License Agreement and within **COMPANY** owned easements or fee title property; and

WHEREAS, certain Projects will require the relocation, adjustment, or protection of **COMPANY** Facilities, and the **COMPANY** is required by State Law to perform this work (Utility Work) when necessary to accommodate a Project; and

WHEREAS, to expedite the Utility Work and reimbursement of Utility Work on Projects, it is the desire of the Parties to enter into this Agreement with the understanding that the Parties will enter into future Project Agreements, which are supplemental to this Agreement, to address the scope of work, schedule, reimbursement amounts, and other requirements for each Project; and

WHEREAS, this Agreement, along with the Project Agreements shall govern the terms and conditions for each Project;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which hereby acknowledged, the Parties agree to the following terms and conditions.

TERMS AND CONDITIONS

1. PROJECT IDENTIFICATION AND DEVELOPMENT

A. For each Project the Parties agree to enter into a Project Agreement. **UDOT** will prepare a Project Agreement in substantially the same form as the agreement attached hereto as Exhibit A. All terms in the Project Agreements shall be supplemental to the terms of this Agreement. In the case of an inconsistency between the terms of this Agreement and the terms of a Project Agreement, the terms of the Project Agreement shall control.

B. In some cases, particularly when **UDOT** engages a Design Builder or a Construction Manager General Contractor, the Parties may enter into Supplemental Agreements to the Project

Agreement. In this case, the Project Agreement may be limited to contact information and a description of anticipated work. The Supplemental Agreements will address Utility Work for specific Project locations and include a description of the work, the Party to perform the work, the location of the work, the estimated duration of the work, an estimate of the cost to each Party, any proposed betterments, a plan showing the existing and proposed location of the Facilities, and any necessary right-of-way documents. The estimates contained in the Project Agreement and Supplemental Agreements will be based upon material and labor prices as of the date of the estimate and do not account for increases due to unforeseen circumstances in accomplishing the Utility Work.

2. PROJECT COORDINATION

A. During the request for proposal phase of any Design Build Project, **UDOT** shall schedule a meeting with **COMPANY** and **UDOT's** prospective contractors. The purpose of the meeting will be to determine if conflicts with the **COMPANY's** Facilities can be avoided and to provide prospective contractors with parameters within which **COMPANY's** Facilities can be relocated. **COMPANY** and **UDOT** will also meet one (1) time individually with each prospective contractor for the same purpose.

B. During the design phase of any Project, **UDOT** and **COMPANY** will work in good faith to identify the extent of any conflicts and propose and provide a mutually agreeable location to which the Facilities can be relocated. **UDOT** will provide the **COMPANY** with Project design plans as early as possible, and will schedule and meet with the **COMPANY** to review the right-of-way and environmental requirements, design, construction, cost estimates, and scheduling for the **COMPANY's** Utility Work at specific locations on the Project to ensure maximum lead time for advance order of materials and scheduling of work force.

C. **COMPANY** shall provide **UDOT** with an estimated time for completion of the Utility Work and any potential limitations including permit and regulatory approvals, dependency upon work of other parties, lead times for acquiring materials, outage windows, and scheduling work crews. **UDOT** will, by its standard specifications and/or special provisions, make its contractor aware of the coordination and cooperation required for timely completion of the Utility Work and will advise the contractor of the approximate schedule for completion of the Utility Work during Project advertisement. After UDOT awards the Project to its contractor, UDOT will schedule a meeting with the COMPANY and the COMPANY shall meet with UDOT's representative and UDOT's contractor to develop a detailed work plan and schedule for Utility Work. The COMPANY shall submit to UDOT written acknowledgement of the approved schedule. The **COMPANY** shall diligently pursue its work so that completion can be accomplished according to the approved schedule after receiving written authorization to proceed.

D. The **COMPANY** shall notify **UDOT**, or its contractor if so designated by **UDOT**, as soon as practicable but no later than two (2) working days of its discovery of any occurrence or unforeseen circumstances that would prevent the **COMPANY** from completing the Utility Work according to the time schedule established in the Project Agreement.

E. After the Project Agreement is executed by the Parties, any change in the scope of the work, extra work, or change in the planned work covered by this Agreement or the Project Agreement will be noted in the daily records and is valid only if made by written authorization and Change Order executed by both Parties prior to the start of the revised work. The **COMPANY** will provide to **UDOT** detailed estimates for the Change Order work. If the change of work is significant, **UDOT** may require a Supplemental Agreement.

3. COMPANY REQUIREMENTS

A. After design work is complete and the Project Agreement has been executed, **COMPANY** may require up to six (6) months for the acquisition of materials for high pressure (HP) Facilities and seven (7) weeks for acquisition of materials for intermediate high pressure (IHP) Facilities.

B. The Parties shall develop a Project schedule for the relocation of **COMPANY's** Facilities. Utility Work on **COMPANY** Facilities from October 1 through April 15 will be avoided, unless otherwise agreed to in writing. Utility Work between April 16 and September 30 may be performed depending upon the **COMPANY's** system requirements.

C. The Parties may agree to abandon retired lines in place in accordance with **UDOT** and **COMPANY** procedures. Abandoned lines remain the property of **COMPANY**. If abandoned lines are removed, **COMPANY** will perform the work and the cost of removal will be included in the Project costs and shared by **UDOT** and **COMPANY** under the terms of the Project Agreement.

4. UDOT PROJECT RESPONSIBILITIES

A. **UDOT**, through its contractors, will provide surveying and staking of roadway facilities as required by the **COMPANY,** in accordance with **UDOT's** Standard Specifications, Section 01721, Survey, 3.16, Utilities. The cost of the surveying and staking will be at **UDOT's** sole expense and the **COMPANY** will have no obligation for surveying. Any of **UDOT's** survey control stakes or bench markers which are removed or damaged by the **COMPANY** shall be reestablished by **UDOT** at **COMPANY's** expense.

B. **UDOT** will adjust any existing schedule to allow for any reasonable time that may be required for the **COMPANY** to redesign or modify its plans and relocate its Facilities when **UDOT** requires the redesign. If **UDOT** substantially changes the Project design after the **COMPANY** has completed or is in the process of completing its relocation design; or if the **COMPANY** has completed the relocation of its Facilities based on previously approved design plans, the cost of the second design and/or relocation is to be paid in full by **UDOT**.

C. In accordance with current policies and directives, **UDOT** may perform Subsurface Utility Engineering, Quality Levels A and B, within the limits of a Project. Additional work required to determine the vertical location of underground Facilities at specific, critical locations will be reviewed with the **COMPANY**. A summary of the costs will be provided to the **COMPANY**, and the **COMPANY's** proportional share of the actual cost will be withheld from the **COMPANY's** relocation reimbursement.

5. COMPANY TO DESIGN AND CONSTRUCT UTILITY WORK

A. **COMPANY**, with its regular engineering and construction forces at its standard schedule of wages and working hours, or through its qualified contractors with whom it has continuing contracts or has obtained contracts upon appropriate solicitation, shall perform the necessary design work, field and office engineering, and shall furnish all materials and perform the construction work on its Facilities, necessitated by the Project.

The need for overtime or other additional costs necessary to meet **UDOT's** schedule, allowable outage windows or available lane closures for the completion of the Utility Work will be evaluated and agreed upon in advance by the Parties. In performance of the Utility Work, the **COMPANY**

and its contractors will adhere to the requirements of Utah Administrative Codes R930-7 and R930-8.

B. **COMPANY**, while engaged in the adjustment or relocation of its Facilities, will comply with any applicable requirements of 23 C.F.R. § 635.410, Buy America Requirements. Buy America Certification forms, if required, shall be included in Project Agreements. **COMPANY** may require additional time for the acquisition of materials due to the Buy America requirements.

C. **COMPANY** shall include within its design of the relocated Facilities the clear zone requirements as defined in AASHTO's "Roadside Design Guide" and minimum vertical and horizontal clearances as defined in R930-7.

D. **COMPANY**, while engaged in the relocation of its Facilities shall comply with **UDOT's** Standard Specification for Road and Bridge Construction Section 01355, Subpart 1.13, Discovery of Historical, Archeological or Paleontological Objects if performing work within **UDOT's** right-of-way.

E. **COMPANY** provided traffic control devices shall conform to the standards set forth in the Manual on Uniform Traffic Control Devices (MUTCD) as adopted by **UDOT**. All flagging personnel shall be certified.

F. **COMPANY** employees and contractors working in the highway right-of-way shall comply with current requirements of MUTCD Section 6D.03. concerning high-visibility safety apparel.

6. COMPANY TO NOTIFY UDOT AND ITS CONTRACTOR BEFORE BEGINNING CONSTRUCTION WORK

Parties agree to cooperatively work together during construction, communicate frequently and coordinate the Utility Work. The **COMPANY** will notify **UDOT's** Project Representative as identified in the Project Agreement at least forty-eight (48) hours in advance of beginning any work. Such notification can be by telephone, email, in person or in writing. Subsequent notification of when and where the **COMPANY** will be performing work will be given by the **COMPANY** to **UDOT's** Project Representative on a day-to-day basis. In the event **COMPANY** fails to provide notice of work, which results in conflicts with other contractors on the Project site, **COMPANY** will demobilize its personnel and contractor at its own cost. Any work performed without proper notification to **UDOT's** Project Representative must be made available at **COMPANY's** expense for inspection by **UDOT** upon request or verified in another acceptable manner to **UDOT**. Failure on the part of the **COMPANY** to give proper notification to **UDOT** may result in **UDOT's** disallowance of reimbursement for that portion of the **COMPANY's** work performed while not under the surveillance of the **UDOT's** Project Representative.

7. DAILY RECORD KEEPING

UDOT, through its Project Representative, will keep a daily record of the Utility Work performed by the **COMPANY** for each Project, in a form acceptable to both Parties. The daily record shall be signed by **UDOT's** Project Representative and the **COMPANY**, or its authorized representatives, as required and a copy shall be retained by the Parties to this Agreement. If emergencies occur requiring the **COMPANY's** work forces to leave the job, record keeping shall be resumed upon return to the Project.

8. EMERGENCY WORK

When the **COMPANY** experiences an emergency unrelated to its work on the Project, it will take care of said emergency, after which it will again notify **UDOT** as to when work will be resumed on the Project.

9. REIMBURSEMENT FOR COMPANY'S UTILITY WORK

A. Reimbursement eligibility will be determined in accordance with Utah Code Section 72-6-116 and Utah Administrative Code R930-8.

B. Reimbursable costs for the Utility Work will be developed in accordance with 23 C.F.R. § 645, Subpart A. The **COMPANY** will submit itemized bills covering its actual costs incurred for performing the work covered by the Project Agreements hereto, bearing the Project number together with supporting sheets on a monthly or quarterly basis.

C. **COMPANY** will send one (1) final and complete billing of all actual costs incurred within six (6) months following completion of Utility Work by the **COMPANY** on the Project to:

UDOT Contracts and Compliance Specialist
4501 South 2700 West, Box 148220
Salt Lake City, Utah 84114-8220

In the event **COMPANY** fails to send a final bill to **UDOT** within six (6) months of completion of its work, **UDOT** may send notice to **COMPANY** requesting a final bill. **COMPANY** will have forty-five (45) days to respond with a final bill or will forfeit payment for the unbilled portion of the work. Both Parties agree to cooperatively work together in good faith to resolve any disputes on the final billing within sixty (60) days after **UDOT** receives the final bill from **COMPANY**. **UDOT** will reimburse the **COMPANY** within sixty (60) days after receipt of said billings or after disputes on final bill are resolved. Reimbursement will be limited to items complying fully with the provisions of 23 C.F.R. § 645, Subpart A.

10. BETTERMENT WORK

Betterment work is defined as set forth in 23 C.F.R. § 645, Section 645.105, Definitions. Specifically, betterment is "any upgrading of the facility being relocated that is not attributable to the highway construction and is made solely for the benefit of and at the election of the utility". If the **COMPANY** desires to include betterment in the Utility Work at any specific location, **UDOT** will allow betterment work to be performed, provided the Parties can reasonably coordinate the Project schedule to accommodate the betterment work without delaying the Project. The difference in costs between the minimum construction required as a result of the Project and the **COMPANY's** desired construction shall be made at the sole expense of **COMPANY**.

11. SALVAGE CREDIT

All materials from the existing Facilities, which are recovered in suitable condition for reuse by the **COMPANY** and not reused on the Project, shall be credited to the cost of the Project at current stock prices in accordance with 23 C.F.R. § 645.117. If the recovered materials are not suitable for reuse, they shall be credited at salvage prices, if any, or such other prices as agreed upon between the **COMPANY** and **UDOT** following inspection of the recovered material.

12. COSTS DIFFER BY MORE THAN TEN PERCENT

The **COMPANY's** final billings of completed Utility Work should follow as closely as possible the order of the items in the detailed estimates contained in the Project Agreements or Supplemental Agreements, and will be provided in a format that allows comparisons to be made with the approved plans and estimates. If the **COMPANY's** actual costs incurred for its force account work differs more than ten percent (10%) plus or minus per cost category from the estimated amount contained in the Project Agreements or Supplemental Agreements, the **COMPANY** is required to submit a letter of explanation with its billings indicating how and why the difference in costs occurred.

13. AUDIT

UDOT and the Federal Highway Administration shall have the right to audit all cost records and accounts of the **COMPANY** pertaining to the Project in accordance with 23 C.F.R. § 645, Subpart A. Should this audit disclose that the **COMPANY** has been underpaid, the **COMPANY** will be reimbursed by **UDOT** upon submission of additional billing to cover the underpayment. Should this audit disclose that the **COMPANY** has been overpaid, the **COMPANY** will reimburse **UDOT** in the amount of the overpayment. For the purpose of audit the **COMPANY** is required to keep and maintain its records of Utility Work covered herein for a minimum of three (3) years after final payment is received by the **COMPANY** from **UDOT**.

14. RIGHT-OF-WAY ACQUISITION

COMPANY owns rights-of-way, easements and fee property (collectively the Existing Property) from which Facilities are relocated to accommodate Projects. For all Existing Property **COMPANY** relinquishes to accommodate a Project, **UDOT** will replace the property with new property (collectively, the New Property). The New Property will be at a location agreeable to both Parties, with dimensions comparable to the Existing Property, and the terms of the conveyance documents shall be acceptable to **COMPANY**. For New Property that **UDOT** may acquire through eminent domain, **COMPANY** may elect to have **UDOT** acquire such New Property on behalf of **COMPANY**. In the event **COMPANY** elects to have New Property with dimensions greater than the dimensions of the Existing Property, **COMPANY** shall be responsible for the incremental costs due to the increased dimensions of the New Property unless the increased dimensions are required by law or regulation.

15. FORCE MAJEURE

An event of force majeure is an unforeseeable event or circumstance which is beyond the control and without the fault or negligence of the party affected and which by the exercise of reasonable diligence the party affected was unable to prevent, including without limitation strikes, riots, earthquakes, epidemics, sabotage, terrorist actions, wars, fires, floods, weather, materials shortage, power failure, telecommunications outage, acts of God, governmental restrictions, regulations or controls, judicial orders, or other failures, interruptions or errors not directly caused by the parties.

Neither party is responsible for any failure to perform its obligations under this Agreement if it is prevented or delayed in performing those obligations by an event of force majeure. Only those obligations directly affected by an event of force majeure are excused.

Where there is an event of force majeure, the party prevented from or delayed in performing its obligations in this Agreement must immediately notify the other party giving full particulars of the event of force majeure preventing that party from, or delaying that party in performing its obligations in this Agreement and that party must use its reasonable efforts to mitigate the effect of the event of force majeure upon its performance of the contract and to fulfill its obligations.

Upon completion of the event of force majeure, the party affected must as soon as reasonably practicable recommence the performance of its obligations in this agreement. If the affected party is the Company, the Company must provide a revised schedule to minimize the effects of the prevention or delay caused by the event of force majeure.

An event of force majeure does not relieve a party from liability for an obligation to perform according to the Agreement. Neither party shall be responsible to the other for any costs or losses caused by the event of force majeure.

16. CONFIDENTIAL INFORMATION

UDOT is subject to the requirements of the Government Records Access Management Act ("GRAMA") or other applicable law. If Company provides a record that it believes should be protected pursuant to Utah Code Section 63G-2-305(1) or (2), the Company shall comply with Utah Code Section 63G-2-309 and mark the documents as confidential.

17. TERM AND TERMINATION

A. This Agreement expires five (5) years from the date of execution. Upon expiration of this Agreement, the parties will negotiate in good faith the terms of renewal. The terms and conditions of this Agreement will remain in effect until the new agreement between the parties becomes effective, but in no event shall such renewal period exceed twelve (12) months following expiration of this Agreement unless otherwise agreed to by the Parties.

B. This Agreement may be terminated by either party by providing sixty (60) day written notice of termination. Any such termination shall not affect the validity of any previously executed Project Agreement or Supplemental Agreement. Notice shall be given as follows:

UDOT:	Questar Gas Company:
UDOT Legal Counsel 4501 South 2700 West P.O. Box 148455 Salt Lake City, UT 84144	Questar Gas Company General Counsel P.O. Box 45360 Salt Lake City, UT 84145

18. ASSIGNMENT:

COMPANY may assign or transfer its rights and obligations under this Agreement to any parent, affiliate, or subsidiary of COMPANY, to any entity having fifty percent (50%) or more direct or indirect common ownership with COMPANY, or to any successor-in-interest, provided the assignee or transferee

agrees to be bound by all terms and conditions of this Agreement. Otherwise, COMPANY shall not transfer, assign or delegate its rights or obligations under this Agreement without the prior written consent of UDOT. This Agreement shall be binding upon and inure to the benefit of the Parties' permitted successors and assigns.

19. MISCELLANEOUS

A. In the event of any dispute relating to this Agreement, resulting in litigation, the prevailing Party shall be entitled to recover all costs, including reasonable attorney fees.

B. The provisions of this Agreement are severable, and should any provision be deemed void, unenforceable or invalid, such provision shall not affect the remainder of this Agreement.

C. This Agreement shall be governed by the laws of the State of Utah.

D. This Agreement supersedes the previously executed STATEWIDE UTILITY RELOCATION AGREEMENT between the Parties dated November 4th, 2009.

****

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized officers as of the day and year first above written.

ATTEST:

By: _____
Name

Date: _____

QUESTAR GAS COMPANY, a Registered Corporation of the State of Utah

By: _____
Vaughn W. Shosted
Title: Vice President Operations

Date: 30 June 2016

APPROVED AS TO FORM:

By: _____
Counsel for **COMPANY**

****

UTAH DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:

By: _____

Title: Statewide Utilities & Railroads Engineer

Date: 14 July 2016

APPROVED:

By: _____

Title: Project Development Director

Date: July 19, 2016

APPROVED AS TO FORM:

By: _____

Title: Assistant Attorney General

Date: 07/18/2016

COMPTROLLER'S OFFICE

By: _____

Title: Contract Administrator

Date: 7-27-16

Exhibit A
PROJECT AGREEMENT

Project No. _____, _____ County
Address
QUESTAR GAS COMPANY
QGC Ref No. _____
CID No._____ PIN _____

QUESTAR GAS COMPANY

PROJECT AGREEMENT

Supplement to Statewide Utility Relocation Agreement, Finance No. 160000

THIS PROJECT AGREEMENT, made and entered into this _____day of _____, 20__, by and between the **UTAH DEPARTMENT OF TRANSPORTATION**, hereinafter referred to as "**UDOT**" and **QUESTAR GAS COMPANY**, a Registered Corporation in the State of Utah, hereinafter referred to as the "**Company**."

This Project Agreement is part of and subject to the terms and conditions of the **STATEWIDE UTILITY RELOCATION AGREEMENT** dated _____ **UDOT** Finance No. 160000, hereinafter referred to as "Statewide Agreement". All the terms of the Statewide Agreement remain in full force and effect unless otherwise specified herein.

The parties hereto agree as follows:

1. **Company's** contact person for the Project is, [insert name], telephone number (XXX) XXX-XXXX and email, XXXX@XXXX.com.

   UDOT's Project Representative is [Insert name and title], telephone number (XXX) XXX-XXXX and email XXXXX@utah.gov.

   UDOT's Resident Engineer is [Insert name], telephone number (XXX) XXX-XXXX and email XXXX@utah.gov.

2. The **Company** will perform the following described Utility Work in accordance with the terms and conditions of the Statewide Agreement.

   Location of Utility Work:

   Description of Utility Work to be performed, including proposed location:

   (Plan Sheets and Right of Way Documents attached as "**EXHIBIT A**", that is incorporated by reference.)

   Party performing the Utility Work:

   Anticipated duration of Utility Work:

   Estimated dates of Utility Work:
   (Includes allowable outage windows)

   Estimated Total Cost of Utility Work:
   (Detailed Estimate attached)

SAMPLE

Project No. _____, _____ County
Address
QUESTAR GAS COMPANY
QGC Ref No. _____
CID No._____ PIN _____

Betterments Included:

*[**UDOT** and **Company** will discuss and include these items in Project Agreement if applicable:*

- *Party responsible for and timing of removal of pavement, other hard surface, trees, fencing, signs, buildings etc.*
- *Party responsible for backfill, material and compaction requirements for backfill.*
- *Party responsible for final grading and hard surface restoration.*
- *Party responsible for traffic control, including safety barriers, plates, and restrictions/requirements for lane closures.]*

3. Utility Work to be completed under this Project Agreement is subject to the following:

Special Provisions

- Buy America. [*List specific Buy America requirements applicable to this Project.*] Specific certification requirements are marked "**EXHIBIT C**" that is incorporated by reference.

- Other limitations to the Project.

  [***UDOT** and **Company** will discuss and include these items in Project Agreement if applicable:*
  - *Limits of loading over pipe, including cover/equipment restrictions*
  - *High pressure inspection*
  - *Night Work]*

4. The **Company** shall be reimbursed by **UDOT** for XXX% of the actual costs incurred by the **Company** for performing the Utility Work covered herein. An estimate of the total cost of said Utility Work was furnished by the **Company** to **UDOT** in the total amount of $_____. A copy of the details of the estimate are marked "**EXHIBIT B**" that is incorporated by reference.

TOTAL ESTIMATED COST TO UDOT IS $_____

TOTAL ESTIMATED COST TO THE COMPANY IS $_____

NOTE: The above are estimates only. Total payment to the **Company** by **UDOT** will be based on the actual costs incurred as determined after completion of construction.

5. Upon signature and return of this Project Agreement to **UDOT**, the **Company** is authorized to proceed with the Utility Work covered herein.

****

SAMPLE

Project No. _____, _____ County
Address

QUESTAR GAS COMPANY

QGC Ref No. _____

CID No._____ PIN _____

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

ATTEST:

By:_____

Title:_____

Date: _____

QUESTAR GAS COMPANY (IHP),
a Registered Corporation of the State of Utah

By:_____

Title:_____

Date: _____

(IMPRESS SEAL)

****

RECOMMENDED FOR APPROVAL:

By:_____
Region Utility and Railroad Leader

Date: _____

UTAH DEPARTMENT OF TRANSPORTATION

By:_____
Region Director

Date: _____

APPROVED AS TO FORM:

The Utah State Attorney General's Office has previously approved all paragraphs in this Agreement as to form.

UDOT COMPTROLLER'S OFFICE:

_____
Contract Administrator

Date: _____

SAMPLE

168511

STATEWIDE UTILITY RELOCATION AGREEMENT

between

Utah Department of Transportation

&

PacifiCorp -24210

This Statewide Utility Relocation Agreement (referred to herein as Agreement), made and entered into this 7 day of Dec, 20 15, by and between the UTAH DEPARTMENT OF TRANSPORTATION, hereinafter referred to as "UDOT" and Rocky Mountain Power, an unincorporated division of PACIFICORP, an Oregon Corporation, hereinafter referred to as the "Company" or "RMP". The Utah Department of Transportation and Rocky Mountain Power are referred to herein individually as a "Party" or collectively as the "Parties."

RECITALS

1. UDOT has jurisdiction over state Highway rights of way and administers the programming, development and completion of State and Federal-aid eligible projects (referred to herein as "Project" or collectively as "Projects") in Utah.

2. RMP is a regulated electricity utility serving Utah, and owns, operates and maintains an extensive utility infrastructure, including transmission and distribution wirelines, poles, vaults, substations, plants and all associated facilities (referred to herein as "Facilities"). Some Facilities are located within State highway rights-of-way under Statewide Utility License Agreements.

3. Certain projects to expand or alter the transportation infrastructure occasionally necessitate the protection or relocation of Facilities.

4. The Parties have entered into an agreement titled Statewide Agreement for the Acquisition or Replacement of Utility Easements and Rights of Way, dated the 19th day of January 2005 that sets forth the manner in which property interests are addressed for the relocation of Facilities.

5. For the purpose of expediting the performance and reimbursement of the relocation work on Projects, it is the desire of the Parties to enter into this Agreement with the understanding that the Parties will enter into future Project Agreements which are supplemental to this Agreement which will address the scope of work, schedule, reimbursement amounts, and other requirements for each specific Project.

AGREEMENT

NOW THEREFORE, in accordance with the foregoing Recitals, which are incorporated into this Agreement by reference, and for and in consideration of the mutual covenants and agreements hereafter set forth, the mutual benefits to the Parties to be derived herefrom, and other valuable consideration, the receipt and sufficiency of which the Parties acknowledge, it is hereby agreed as follows:

1. Notification and Preliminary Design. UDOT will notify the Company of Projects where Company Facilities may require relocation or protection in place and will meet with the Company to review and discuss proposed Project plans.

2. Project Meetings. The Parties will participate in periodic Project status meetings, to be held at such times and places as the Parties mutually agree.

3. Company and UDOT Design Coordination. The Company and UDOT shall consult in good faith to reasonably minimize Facility relocation costs, Project costs and delays and determine an appropriate Project strategy for each potentially impacted Facility. The Parties will share Project design details throughout the design process. Company will submit documentation of existing property rights for Facilities within the proposed project limits as early as possible and proposed property rights needed as a result of the Project and Facility relocation designs.

4. Relocation Design, Betterments, Estimate and Construction Duration.

a. The Company, with its regular engineering forces at its standard schedule of wages and working hours, or through its qualified contractors with whom it has continuing contracts or has obtained contracts pursuant to a competitive process, shall diligently perform the necessary design, field and office engineering. Designs will adhere to Company's current standards. The Company may use external consultants to oversee any or all aspects of design, and permitting.

b. The Company will submit to UDOT any betterment requests as early as possible. UDOT will allow for betterment work to be performed, provided the Parties can reasonably coordinate the Project schedule to accommodate the betterment work without delaying the Project. Betterment is defined as set forth in 23 CFR, Section 645.105. Specifically, betterment is any upgrading of the Facility being relocated that is not attributable to the highway construction and is made solely for the benefit of and at the election of the Company. Betterment credit to a Project is not required for improvements which are required by law under governmental and appropriate regulatory commission code, or required by current design practices regularly followed by the Company in its own work, and there is a direct benefit to the highway project. The Company will be responsible for increased costs due to betterment. The actual costs for the Company's participation shall be determined upon completion and final billing for the relocation work.

c. UDOT may perform Subsurface Utility Engineering, Quality Levels A and B, within the limits of a Project. Additional work required to determine the vertical location of underground facilities at specific locations will be reviewed with the Company and subject to the proportional cost share as set forth in the Project Agreement.

d. UDOT and Company will work together in good faith to identify and resolve conflicts between the Project and Company's Facilities. UDOT acknowledges that, for typical projects, Company's design requires up to three (3) months for both underground and overhead power lines after approved roadway design plans are delivered to the Company. Facility design for relocation of transmission Facilities may require significantly longer lead time.

e. The Company shall include within its design of the relocated Facilities within UDOT's right of way the minimum vertical and horizontal clearances as defined in Utah Administrative Code R930-7 Utility Accommodation, as amended.

f. Company will submit to UDOT the Company's proposed design; detailed cost estimates; a reasonable construction duration including all known limitations including permit and regulatory approvals, anticipated outage windows, advance ordering of materials, dependency upon work of

other parties, and scheduling of work crews; communication contacts; and other details necessary for UDOT to prepare contract documents and a Project Agreement.

5. Project Agreements.

a. For each Project, UDOT will prepare a Project Agreement. In the case of an inconsistency between the terms of this Agreement and the terms of a Project Agreement, the terms of the Project Agreement shall control, unless expressly stated otherwise. The Project Agreement form is attached as "EXHIBIT A".

b. The Company shall designate a representative in the Project Agreement, who will be the Company's liaison with respect to the matters covered by the Project Agreement. The Company's representative shall coordinate with UDOT's Utilities Coordinator for the Project regarding the matters described in the Project Agreement.

6. Rights of Way. The replacement of rights-of-way shall be consistent with the terms and conditions set forth in the Statewide Agreement for the Acquisition or Replacement of Utility Easements and Rights of Way and Utah Administrative Code R930-8. In the event of a conflict Utah Administrative Code R930-8 controls.

7. UDOT Contractor Selection process. UDOT will engage in its process to bid and award Project work to a contractor. During the proposal phase of any Design Build Project, at UDOT's discretion, the Company and UDOT will meet with each prospective contractor to review the preliminary design with UDOT's bidders.

8. Notice to Proceed.

a. The Company shall not commence performing the work under any Project Agreement until the Project Agreement is executed by both Parties and the Company is authorized in writing by UDOT to begin work.

b. UDOT, through its contractors, will provide surveying and staking of roadway facilities as required by the Company, in accordance with UDOT's Standard Specifications, Section 01721, Survey, 3.16, Utilities. The cost of the surveying and staking will be at UDOT's expense and will not be recovered from the Company. Any of UDOT's survey control stakes or bench markers which are removed or damaged by the Company shall be reestablished by UDOT at Company's expense.

c. UDOT will adjust any existing schedule to allow for any reasonable time that may be required for the Company to redesign or modify its plans and relocate its Facilities when UDOT requires the redesign.

9. Company to Construct.

a. The Company, with its regular engineering and construction forces at its standard schedule of wages and working hours, or through its qualified contractors with whom it has continuing contracts or has obtained contracts pursuant to a competitive process, shall perform the necessary design work, construction and relocation work with commercially reasonable diligence. The Company may use external consultants to oversee any or all aspects of permitting, construction and relocation.

b. The Company while engaged in the relocation of its Facilities shall comply with UDOT's Standard Specification for Road and Bridge Construction Section 01355, Subpart 3.8, Discovery of Historical, Archeological or Paleontological Objects, Features, Sites, or Human Remains if performing work within UDOT's right-of-way.

c. Company provided traffic control devices shall conform to the standards set forth in the Manual on Uniform Traffic control Devices ("MUTCD") as adopted by UDOT. All flagging personnel shall be certified.

d. Company employees and contractors working in the highway right-of-way shall comply with current requirements of MUTCD Section 6D.03, concerning high-visibility apparel.

e. The Company shall notify UDOT's Project Representative as identified in the Project Agreement at least forty-eight (48) hours in advance of initiating construction under the Project Agreement. Subsequent notification of when and where the Company will be performing work will be given by the Company to UDOT's Project Representative on a day-to-day basis. In the event the Company fails to give proper notification to UDOT and UDOT's Project Representative is not available to execute the daily work record, UDOT may disallow reimbursement for that portion of the Company's work performed while not under the surveillance of UDOT's Project Representative. Notwithstanding the foregoing, in the event UDOT's Project Representative is not present while work is being performed despite notice having been given by the Company, then UDOT may not disallow reimbursement for such work for the sole reason that UDOT's Project Representative was not present. At its election, UDOT shall be permitted to observe the performance of all construction. The Company and its contractors will perform their work in adherence with the requirements of Utah Administrative Code R930-7 Utility Accommodation, as amended.

10. Company to Perform Work Consistent With Project Schedule.

a. The Parties hereby acknowledge the importance of completing the work in a manner consistent with the overall schedule for the Project. Accordingly, the Parties shall coordinate and agree upon a schedule for the design, construction and final completion of the work, including any Company elected betterment work to be performed by the Company in conjunction with the work. The Parties shall execute a written acknowledgement of the approved schedule which shall, upon execution, be incorporated into and made a part of a Project Agreement.

b. The Company agrees to begin its work as soon as possible after having received a written authorization to proceed and to use reasonable efforts to complete all work in accordance with the agreed upon schedule. The need for additional costs necessary to meet the Project schedule will be evaluated and agreed upon in advance by the Parties.

c. The Company shall notify UDOT within seventy two (72) hours of its discovery of any occurrence or unforeseen circumstances that would prevent the Company from completing its work according to the agreed upon Project schedule.

d. When the Company experiences an emergency unrelated to its work on the highway Project, it will address of said emergency, after which the Company will again notify UDOT as to when work will be resumed on the Project.

11. Daily Record Keeping. UDOT, through its Project Representative, will keep a daily record of the relocation work performed by the Company. The daily record shall be signed by UDOT's Project Representative and the Company's authorized representative and a copy shall be retained by the Parties to this Agreement. If emergencies occur requiring the Company's work forces to leave the job, record keeping shall be resumed upon return to the Project.

12. Change in Work. After each Project Agreement is executed by the Parties, significant changes in the planned scope of work covered by the Project Agreement or extra work is valid only if made in writing and executed by both Parties prior to the start of the revised work or extra work.

13. Standard of Care. The Company shall be solely responsible for the performance of all its work. The Company (including its contractors, consultants and other agents) shall perform all work in a good and workmanlike manner and in conformance with all applicable federal, state and local laws and regulations.

14. Company to Submit Invoices for Reimbursable Work.

a. Reimbursement eligibility will be determined in accordance with Utah Code Section 72-6-116, as amended. Reimbursable costs for the relocation work will be limited to items complying fully with the provisions of 23 CFR Part 645, Subpart A

23 RM 07 Dec '15

b. The Company will submit itemized bills to UDOT covering Company's actual costs incurred for performing the work covered by the Project Agreements, bearing the Project number together with supporting sheets on a monthly or quarterly basis.

c. The Company shall submit to UDOT one final and complete billing within six months of completion of the work for the actual Project costs, together with supporting documentation. In the event Company fails to send a final bill to UDOT within six months of completion of its work, UDOT may send notice to Company requesting a final bill. Company will have 45 days to respond with a final bill or will forfeit payment for the unbilled portion of the work.

d. The Parties agree to cooperatively work together in good faith to resolve any disputes on billings. UDOT will reimburse the Company within sixty (60) days after receipt of Company's billings or after disputes are resolved.

e. The billings and supporting documentation shall be submitted to:

UDOT Contracts, Estimates and Agreements Specialist
4501 South 2700 West, Box 148220
Salt Lake City, Utah 84114-8220

RM 07 Dec '15

15. Salvage Credit. All materials from the existing Facilities, which are recovered in suitable condition for reuse by the Company and not reused on the Project, shall be credited to the cost of the Project at current stock prices in accordance with 23 CFR 645.117. If the recovered materials are not suitable for reuse, they shall be credited at salvage prices or such other prices as agreed upon between the Company and UDOT following inspection of the recovered material.

16. Company's Costs Differ by More Than 10%. The Company shall match its billings of completed work with the detailed estimates contained in the Project Agreements. If the Company's actual costs incurred for reimbursable work differs more than ten percent (10%) plus or minus from the estimated amount contained in the Project Agreements, the Company shall submit a letter of explanation to UDOT with its billings describing how and why said difference in costs occurred.

17. Audit. UDOT and the Federal Highway Administration shall have the right to audit all cost records and accounts of the Company pertaining to the Project in accordance with 23 CFR, Part 645, Subpart A. Should this audit disclose that the Company has been underpaid, the Company will be reimbursed by

UDOT upon submission of additional billing to cover the underpayment. Should this audit disclose that the Company has been overpaid, the Company will reimburse UDOT in the amount of the overpayment after written notice. For the purpose of audit the Company is required to keep and maintain its records of work covered herein for a minimum of three years after final payment is received by the Company from UDOT.

18. Buy America. Materials composed primarily of iron or steel that are permanently incorporated into the work on this project are subject to 23 CFR 635.410, Buy America requirements. Company's responsibility for "Buy America" compliance is limited to providing UDOT's Project Representative with signed supplier certifications (which may be in electronic form) at or prior to the time of installation, according to the specific instructions and format set forth in the attached "EXHIBIT B". Buy America Certification is required only for the following specific items identified by UDOT: (i) steel transmission or distribution pole structures (exclusive of any cross arms, guy wires and anchors, transformers, insulators, cutouts, surge arrestors, switches, hardware, fasteners, brackets, base plate, conductor or other separately-provided attachments to be ordered separately and thereafter affixed to the poles structures); (ii) steel or iron conduit and risers; (iii) steel rebar to be furnished in conjunction with: concrete foundations, concrete transmission or distribution pole structures, or any pre-fabricated concrete vaults or similar concrete structures; and (iv) grates and covers for utility vaults and similar structures. Company shall have no obligation to furnish Buy America certificates with respect to any other materials, and shall have no further obligations regarding the domestic content of goods furnished.

Company has developed estimating, supply chain and materials handling procedures to implement these requirements and agrees to follow such procedures. In the event that Company fails to furnish Buy America certificates for any of the foregoing items in accordance with these requirements, UDOT may withhold reimbursement with respect to those items. Except for claims involving Company's fraud, willful misconduct or gross negligence, in no event shall Company's liability for its failure to comply with this Section exceed the reimbursement value of the items for which Company has failed to deliver the required certificate.

19. Terms.

a. The provisions of this Agreement are severable, and should any provision be deemed void, unenforceable or invalid, such provision shall not affect the remainder of this Agreement.

b. This Agreement does not supersede or modify any applicable federal or state statute, regulation, or rule.

c. This Agreement shall be governed by the laws of the State of Utah and applicable federal law. Any litigation shall be instituted only in a court of competent jurisdiction, whether state or federal, located within the State of Utah.

d. This Agreement supersedes the previously executed Master Agreement, State of Utah, Finance No. 998240, between the Parties dated January 6th, 1999.

e. This Agreement may be terminated by either Party by providing 30 day written notice of termination to the other Party. Any such termination shall not affect the validity of any Project Agreement executed prior to the date of termination of this Agreement.

f. To the fullest extent permitted by law, each of the Parties hereto waives any right it may have to a trial by jury in respect of litigation directly or indirectly arising out of, under or in connection with this Agreement. Each Party further waives any right to consolidate any action in which a jury trial has been waived with any other action in which a jury trial cannot be or has not been waived.

****

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized officers as of the day and year first above written.

Rocky Mountain Power, a division of PACIFICORP, an Oregon Corporation doing business as Rocky Mountain Power

By: _____
Vice President, Operations
Rocky Mountain Power

Title: _____

Date: 11-24-15

****

UTAH DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:

By: _____
Title: Statewide Utilities & Railroads Engineer

Date: 07 Dec 2015

APPROVED:

By: _____
Title: Project Development Director

Date: 12/07/15

APPROVED AS TO FORM:

By: _____
Title: Assistant Attorney General

Date: 12/07/15

COMPTROLLER'S OFFICE

By: _____
Title: Contract Administrator

Date: 12-16-15

Project No. XXXXXX; XXXXX County
Project Name: XXXXXX
Company Name
CID No. XXXXX PIN XXXXX

Exhibit A

ROCKY MOUNTAIN POWER PROJECT AGREEMENT NO. _____

Supplement to Statewide Utility Relocation Agreement

This Project Agreement is made and entered into this _____ day of _____, 20___, by and between the UTAH DEPARTMENT OF TRANSPORTATION, an agency of the State of Utah hereinafter referred to as "UDOT" and Rocky Mountain Power, an unincorporated division of PACIFICORP, an Oregon Corporation, hereinafter referred to as the "Company" or "RMP", to that certain Statewide Utility Relocation Agreement between the Parties dated _____, UDOT Finance No. _____. All the terms of said Agreement remain in full force and effect unless otherwise specified herein.

The Parties hereto agree as follows:

1. The Company will perform the following described work in accordance with the terms and conditions of the Statewide Utility Relocation Agreement.

   Location of work:

   Description of work:

   Detailed work plans, specifications, and proposed locations are included in Exhibit A and incorporated by reference.

   Anticipated duration of work:

   Project specific special provisions:

   Betterments included:

   Buy America requirements:

   A detailed cost estimate is included in Exhibit B and incorporated by reference.

TOTAL ESTIMATED COST	**$_____**
TOTAL ESTIMATED UDOT PARTICIPATION	**$_____**
TOTAL ESTIMATED COMPANY PARTICIPATION	**$_____**

2. UDOT's Project Representative is, _____, Telephone No. ___-___-____, email _____. Company's Representative is, _____, Telephone No. ___-___-____, email _____.

3. Company shall notify UDOT's Project Representative at least forty-eight (48) hours in advance of beginning the work covered herein, in accordance with the specific terms of the Statewide Utility Relocation Agreement, as applicable.

(Add additional Paragraphs, if required)

3. The Company shall not commence performing the work covered herein until the Project Agreement is executed by both Parties and the Company receives an Authorization to Proceed letter.

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

Rocky Mountain Power, a division of PACIFICORP, an Oregon Corporation doing business as Rocky Mountain Power

By: _____

Title: _____

Date: _____

****

RECOMMENDED FOR APPROVAL:

_____
Region Utility and Railroad Leader
Date: _____

UTAH DEPARTMENT OF TRANSPORTATION

By_____
Region Director
Date: _____

APPROVED AS TO FORM:

The Utah State Attorney General's Office has previously approved all paragraphs in this Agreement as to form.

Date__/__/__

UDOT COMPTROLLER'S OFFICE:

_____
Contract Administrator
Date: _____

Exhibit B

FORM OF BUY AMERICA CERTIFICATE TO BE UTILIZED

Certification Requirement for 23 CFR 635.410 Buy America

This project will be utilizing federal funds. Please complete this Buy America Certification and return at or prior to the time the applicable materials are delivered.

Buy America Certification

I certify that all materials provided to _____for use on a Federal Aid Highway Project meet the requirements of 23 CFR 635.410 Buy America and any amendments thereto. Material Certificates of Compliance for each manufacturing and coating process performed during the production of these materials are attached.

Signature _____

Name _____

Title _____

Supplier Company Name _____

Date _____

Purchase Order Number _____

INSTRUCTIONS FOR COMPLETING THE BUY AMERICA CERTIFICATE

A. All products manufactured from steel and iron must be manufactured in the United States to be considered domestic.
   1. All manufacturing processes of the steel and iron material in a product such as melting, rolling, extruding, machining, bending, grinding, drilling, and coating must occur within the United States.
   2. Nondomestic raw materials are permitted so long as the melting and all subsequent manufacturing processes occur domestically.
   3. Coating includes all processes that protect or enhance the value of the material to which the coating is applied. The material applied as a coating is not subject to Buy America.

B. Include as a minimum the following information for Material Certifications of Compliance for Buy America:
   1. Signed mill test report.
   2. Signed certification by each Fabricator and Manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States.
   3. Material descriptions, quantities, and means of material identification such as heat numbers, lot numbers, and other industry identification markings for each process the material underwent so the final product can be tracked through a step process from melting to final product.
   4. Tracking of quantities is not required for coating operations.

C. Include all steel or iron materials that can't be substantiated as being of domestic origin in cost documentation for foreign steel or iron.

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BANGERTER

Project No. S-0154(12)11, Salt Lake County
4 Interchanges on Bangerter Highway
ROCKY MOUNTAIN POWER
25593 Charge ID No. 71939 PIN 12566

ROCKY MOUNTAIN POWER
PROJECT AGREEMENT NO. 1

Supplement to Statewide Utility Relocation Agreement

This Project Agreement is made and entered into this 19 day of July, 2016, by and between the UTAH DEPARTMENT OF TRANSPORTATION, an agency of the State of Utah hereinafter referred to as "UDOT" and Rocky Mountain Power, an unincorporated division of PACIFICORP, an Oregon Corporation, hereinafter referred to as the "Company" or "RMP", to that certain Statewide Utility Relocation Agreement between the Parties dated December 7, 2015, UDOT Finance No. 168511. All the terms of said Agreement remain in full force and effect unless otherwise specified herein.

The Parties hereto agree as follows:

1. **PROJECT INFORMATION**

   UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, hereinafter referred to as the "Project". UDOT's design-build contractor will complete the design and administer construction of the Project. The Project contractor will hereinafter be referred to as the "Design-Builder".

2. **PROJECT CONTACT INFORMATION**

   UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462 and e-mail aspendlove@utah.gov.

   UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

   UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

   Company's Representative is Suzan Jensen, telephone number (801) 220-2444, and e-mail Suzan.Jensen@rockymountainpower.net.

3. **COMPANY PROJECT REQUIREMENTS**

   Company and UDOT shall conduct the Utility Work in accordance with the specific terms of the Statewide Utility Relocation Agreement.

   The Company shall not commence performing the Utility Work covered in any subsequent Project Agreement until each Project Agreement is executed by both Parties and the

Company receives an Authorization to Proceed letter from UDOT's Project Utility and Railroad Leader.

4. **UDOT PROJECT RESPONSIBILITIES**

After awarding the Project, UDOT will provide the Company with the Design-Builder contact information, hereinafter referred to as "Design-Builder Third Party Manager".

UDOT shall provide trenching, conduit, and bedding material per Company specifications for all underground Utility Work, unless otherwise agreed upon and coordinated through a Project Agreement with the Company. Reimbursement eligibility will be determined in accordance with Utah Code Section 72-6-116.

UDOT shall provide all coordination, survey, maintenance of traffic, traffic control, and clearing and grubbing for all Utility Work at no cost to the Company.

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

Rocky Mountain Power

By: _____

Title: Vice President, Operations Rocky Mountain Power

Date: 7-14-16

Recommended For Approval:

_____
Title: Utility and Railroad Leader

Date: 7/19/16

Utah Department of Transportation

_____
Title: Project Director

Date: Jul 19, 2016

Approved as to Form

_____
Title: Assistant Attorney General

Date: 7/27/2016

UDOT Comptroller Office Contract Administrator

_____
Title:

Date: 7-27-16

SOUTH JORDAN CITY
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this _____day of_____, 20_____, by and between the **Utah Department of Transportation**, ("UDOT"), and the **City of South Jordan**, a Municipal Corporation of the State of Utah, ("City") each as ("Party") and jointly as ("Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, the design-build contractor will complete the design and administer construction of the Project ("Design-Builder"); and

WHEREAS, UDOT has identified City facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, City desires for the Design-Builder to design and perform the Utility Work on the City's facilities necessitated by the Project; and

WHEREAS, City will perform the necessary design review and inspection to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement, the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering the Utility Work to be accomplished by UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

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AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. PROJECT RESPONSIBLE FOR COST

In accordance with Utah Code § 72-6-116(3)(a)(ii), UDOT is responsible for 100% of the cost of the Utility Work of City's facilities for those costs that comply with Utah Administrative Code R930-8.

2. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or his designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or his designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

City's contact person is Brad Klavano, City Engineer, telephone number (801) 254-3742, and e-mail bklavano@sjc.utah.gov, or his designated representative, as assigned.

After awarding the Project, UDOT will provide the City with the Design Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

3. AUTHORIZATION FOR DESIGN WORK

To facilitate coordination and obtain technical information about City's facilities and requirements for inclusion in this Agreement and the Request for Proposals, UDOT gave City authorization for preliminary design engineering on April 26, 2016.

4. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. UDOT shall review with City additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project.

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5. PROJECT COORDINATION

City requested that UDOT include items of Utility Work for relocating and adjusting City's facilities in the Project.

During the development of the Project design, City and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with City's facilities can be avoided. If Utility Work for City's facilities is required by the Project, UDOT shall be responsible to identify the conflicts and to design and construct the Utility Work of City's facilities. City shall perform the necessary design reviews prior to the start of Utility Work. UDOT's Project Representative shall be responsible for coordinating with other utility companies as it relates to City's facilities.

6. CITY REQUIREMENTS

UDOT will comply with the following City Utility Work requirements**:**

a. UDOT shall supply as-constructed plans, in PDF format, upon completion of any required Utility Work.

7. UDOT TO DESIGN AND CONSTRUCT CITY'S UTILITY WORK

UDOT shall schedule and meet with City to review the design and scheduling of the Utility Work for City's facilities at specific locations on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

a. UDOT shall design the Utility Work in accordance with City's standards regularly followed by City in its own work and not considered a betterment. If there is a conflict between UDOT and City standards, the higher standard will be applied. A copy of City's standards can be found at http://www.southjordancity.org/engineering-CSS.asp that is incorporated by reference.
b. UDOT will secure permits required for Utility Work of City's facilities.

8. RIGHT-OF-WAY

Any easements or replacement right-of-way required in conjunction with the Utility Work of City's facilities shall be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8.

9. BETTERMENT WORK

City Aesthetics and Landscaping Betterment Work ("Betterment Work") is described in attached Exhibit "A" that is incorporated by reference.

If City desires to include additional betterment work in the Project at any specific location UDOT may agree to the betterment provided the difference in costs between the functionally equivalent required Utility Work and City's desired betterment work that is not required by the Project shall be at the sole cost of City and the betterment work can be accommodated without delaying

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UDOT's Project. The additional betterment work shall be addressed by separate supplemental agreement between the Parties.

Once a Design-Builder has been selected by UDOT, any additional betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the additional betterment work.

10. SUPPLEMENTAL AGREEMENTS

UDOT and City shall enter into supplemental agreements to cover Utility Work at specific Project locations. As part of each supplemental agreement, UDOT shall provide design plans and Utility Work schedules for review and approval by City prior to starting the Utility Work. A copy of the format of the proposed supplemental agreement is marked Exhibit "B" that is incorporated by reference.

UDOT shall provide City e a two-week review and approval period for any final supplemental agreement submitted to City by UDOT.

If there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, the Parties must first agree in writing to a modification to the supplemental agreement before the Utility Work on the changes or additions begins.

11. UDOT TO NOTIFY CITY BEFORE BEGINNING UTILITY WORK

UDOT shall notify City at least two business days before beginning any Utility Work covered by any supplemental agreements hereto, to allow City time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis.

12. CITY TO NOTIFY UDOT

City's personnel shall notify UDOT's Resident Engineer upon arriving and leaving the Project site for verification of inspecting Utility Work. City's personnel will comply with all applicable OSHA and Project safety requirements while within the Project limits.

13. INSPECTION

City shall provide on-call engineering support by the City Engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during Utility Work, and to perform the necessary inspection on City's facilities installed by UDOT.

a. The City Engineer and/or City's inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on City's facilities in accordance with the plans and specifications provided and/or

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approved by City, including changes or additions to the plans and specifications, which are approved by the Parties.

b. City shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on City's facilities. City shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.

c. UDOT shall respond to City's concerns within 24-hours of written notification.

d. City, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns City may have with acceptance of the facilities upon completion of the Utility Work.

e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Utility Work does not relieve the City of its duty to review and inspect the Utility Work or to ensure compliance with acceptable standards.

14. DAILY RECORDKEEPING

UDOT's Resident Engineer will keep daily records of the inspection performed by City. Daily inspection records shall be in duplicate on a form to be prepared by City or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance and Certification Manager. The Parties shall sign the inspection records and retain copies of the inspection records.

15. REIMBURSEMENT

UDOT will not reimburse City for costs incurred by City personnel for design review, observation, inspection, and operation of valves performed as part of their regularly assigned duties. Should it become necessary for City to procure outside services to perform design review, observation, or inspection to accommodate UDOT's Utility Work and Project schedule, City shall notify UDOT. Upon concurrence by UDOT, a supplemental agreement for the cost of the services shall be executed at which time City may procure outside services through appropriate solicitation.

16. SUBMITTAL OF ITEMIZED BILLS

City shall submit itemized bills covering the actual costs incurred for outside services to perform design review, oversight, and inspection work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

UDOT Contracts and Compliance Specialist
Utah Department of Transportation
PO Box 141510
SLC UT 84114-1510

Itemized bills shall include the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement, and be submitted to UDOT within 60 days following completion of outside services by City on the Project. Otherwise, previous payments

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to City may be considered final, except as agreed to between the Parties in advance.

UDOT will reimburse City within 60 days after receipt of the billings, but only for items complying fully with the provisions of Utah Administrative Code R930-8. Unless the parties otherwise agree in writing that more time is needed to submit a final billing, failure on the part of City to submit final billings within six months of the completion of outside services will result in UDOT's disallowance of that portion of outside services performed by City.

17. **SALVAGED MATERIALS**

Materials from City's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on the Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties.

18. **RIGHT TO AUDIT**

UDOT and the Federal Highway Administration shall have the right to audit all City cost records and accounts pertaining to the Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. § 645, subpart A. Should an audit disclose that City has been underpaid, UDOT shall reimburse City within 60 days of notification of audit finding in the amount of underpayment. Should an audit disclose that City has been overpaid, City shall reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For purpose of audit City is required to keep and maintain its records of outside services covered herein for a minimum of three years after City receives final payment from UDOT.

19. **ACCEPTANCE AND MAINTENANCE**

Upon UDOT's completion of the Utility Work of City facilities, and City's acceptance of the Utility Work, City shall own and maintain its facilities. City shall be the sole owner of the facilities upon completion of the Project unless otherwise agreed to by the Parties.

20. **ACCESS**

City acknowledges that access for maintenance and servicing of City's facilities located on the Project right-of-way requires a permit issued by UDOT to City, and that City must obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

INDEMNIFICATION

UDOT and City are both governmental entities subject to the Governmental Immunity Act. Each Party agrees to indemnify, defend, and save harmless the other from and against all claims, suits and costs, including attorneys' fees for injury or damage of any kind, arising out of its negligent acts, errors or omissions of its officers, agents, contractors or employees in the performance of this Agreement, and from and against all claims, suits, and costs, including attorneys' fees for injury or damage of any kind. Nothing in this paragraph is intended to create additional rights to third parties or to waive any of the provisions of the Governmental Immunity Act. The obligation to indemnify is

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limited to the dollar amounts set forth in the Governmental Immunity Act, provided the Act applies to the action or omission giving rise to the protections in this paragraph. The indemnification in this paragraph shall survive the expiration or termination of this Agreement.

21. **MISCELLANEOUS**

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.
b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and City.
c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.
d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

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IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

ATTEST:

City of South Jordan

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(IMPRESS SEAL)

. . . . . .

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

Approved as to Form

_____

Title: Assistant Attorney General

Date: _____

Comptroller Office

_____

Title: Contract Administrator

Date: _____

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CITY OF SOUTH JORDAN AESTHETIC AND LANDSCAPE BETTERMENTS

City has requested the following Betterment Work be included with the Project Utility Work:

UDOT shall include the following Aesthetics and Landscaping Betterment Work items into the Project Utility Work. UDOT shall supplement up to $100,000.00 towards Aesthetics and Landscaping Betterment Work. UDOT and City shall enter into supplemental agreements to cover Aesthetics and Landscaping Betterment Work described below. City shall be responsible for paying the actual costs greater than $100,000.00 associated with the Aesthetics and Landscaping Betterment Work items, based on the items UDOT actually installs.

Description of Aesthetics and Landscaping Betterment Work:

Element	Desired City Betterment
Railing:	1. Black vinyl coated chain-link used for chain link within Project boundaries. 2. Black powder coat all galvanized railings.
Sidewalks:	1. Replace in kind six-foot sidewalk at no betterment cost.
Lighting and Traffic Signal Poles:	1. Black powder coated signal poles, mast arms, and lights. 2. Black powder coated sign poles with decorative slip bases, and dome caps. 3. Category 1 decorative street lighting along 11400 South (bridge) matching the spacing of existing Category 1 lights within City's limits.
Park Strip, Median & Island Treatments:	1. Landscaping with sod, trees, plants, and irrigation within 11400 South remaining area at "Oval-a-Bout," north and south of the "Oval-a-bout", for remaining area that will not be constructed as part of the 11400 South roadway reconfiguration. 2. Replace in kind City landscaped park strips at no betterment costs.
Landscaping:	1. Xeriscaping with plants and Irrigation similar to I-15 and 11400 South landscaping in the vicinity of Bangerter Highway and 11400 Interchange. 2. Any existing landscaping disturbed by the Project to be replaced in kind with all existing irrigation systems reconnected.

SOUTH JORDAN CITY
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT"), and the **City of South Jordan**, a Municipal Corporation of the State of Utah, ("City") each as ("Party") and jointly as ("Parties").

The parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the Master Utility Agreement remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. UDOT will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)

   b. The City requirements as shown in the MUA – City Requirements, are modified as follows:
      i.

   c. Anticipated duration of Utility Work:

   d. Total estimated cost of City's (100% reimbursable) outside services: (Detailed Estimate Attached)

2. UDOT will notify the City's Project Representative, Raymond Garrison, Telephone No. (801) 253-5230, email rgarrison@sjc.utah.gov at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

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IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

City of South Jordan

ATTEST:

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(Impress Seal)

. . . . . .

RECOMMENDED FOR APPROVAL: **UTAH DEPARTMENT OF TRANSPORTATION**

_____ _____

Title: Utility and Railroad Leader **Title:** Project Director

Date: _____ **Date:** _____

_____

UDOT Comptroller Office
Contract Administrator

. . . . . .

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BANGERTER

Project No. S-0154(12)11, Salt Lake County
4 Interchanges on Bangerter Highway
SOUTH VALLEY SEWER DISTRICT
Charge ID No. 71939 PIN 12566

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SOUTH VALLEY SEWER DISTRICT
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this 19th day of July, 2016, by and between the **Utah Department of Transportation**, ("UDOT"), and **South Valley Sewer District**, a political subdivision of the State of Utah, ("District") each as ("Party") and jointly as ("Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, the design-build contractor will complete the design and administer construction of the Project ("Design-Builder"); and

WHEREAS, UDOT has identified District facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, the District desires for the Design-Builder to design and perform the Utility Work on the District's facilities necessitated by the Project; and

WHEREAS, the District will perform the necessary design review and inspection to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement, the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering the Utility Work to be accomplished by UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. PROJECT RESPONSIBLE FOR COST

In accordance with Utah Code § 72-6-116(3)(a)(ii), UDOT is responsible for 100% of the cost of the Utility Work of District's facilities for those costs that comply with Utah Administrative Code R930-8.

2. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

District's contact person is Mike Foerster, telephone number (801) 571-1166, and e-mail mikef@svsewer.com.

After awarding the Project, UDOT will provide the District with the Design Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

3. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the District's facilities and requirements for inclusion in this Agreement and the Request for Proposals, UDOT gave the District authorization for preliminary design engineering on April 26, 2016.

4. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the District.

5. PROJECT COORDINATION

The District requested that UDOT include items of Utility Work for relocating and adjusting District's facilities in the Project.

During the development of the Project design, the District and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the District's facilities can be avoided. If Utility Work for the District's facilities is required by the Project, UDOT will be responsible to identify the conflicts and to design and construct the Utility Work of the District's facilities. The District will perform the necessary design reviews prior to the start of Utility Work. UDOT's Project Representative will be responsible for coordinating with other utility companies as it relates to District's facilities.

6. UDOT TO DESIGN AND CONSTRUCT DISTRICT'S UTILITY WORK

UDOT will schedule and meet with the District to review the design and scheduling of the Utility Work for the District's facilities at specific locations on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

a. UDOT will secure permits required for Utility Work of District's Utilities.
b. UDOT will supply as-constructed plans, in PDF format specified by the District, upon completion of any required Utility Work.
c. UDOT will issue a satisfactory 1 year warranty bond covering the Utility Work completed on the District's Utilities. UDOT will cause the bond to be issued by the Design Builder directly to the District.

7. DISTRICT REQUIREMENTS

UDOT will comply with the following District requirements:

a. The design and construction of the District's Utility Work shall be in accordance with the District's standards regularly followed by the District in its own work and not considered a betterment. In the event of a conflict between UDOT and District standards, the higher standard will be applied. A copy of the District's standards dated May 23, 2012 standards can be found at http://www.svsewer.com/wp-content/uploads/2012/08/Design-Standars-and-Construction-Specifications-of-SVSD-October-30-2014.pdf and are incorporated by reference.

8. REPLACEMENT RIGHT-OF-WAY

The District owns certain easements granting it the right to operate, construct and maintain its Utilities at its existing locations. To accommodate the Project, UDOT will relocate the District's existing Utilities by constructing a replacement facility that is both functionally equivalent to the existing facility and necessary for continuous operation of the District's Utilities, the Project economy, or sequence of highway construction in accordance with Utah Administrative Code R930-8. UDOT will acquire, at UDOT's sole expense, replacement right-of-way required for the Utility Work in

accordance with Utah Administrative Code R930-8. If the District's Utilities are relocated outside of UDOT's right-of-way, UDOT will obtain an easement for the District using the form provided by the District that is attached hereto as EXHIBIT "A". If the District's Utilities are relocated from a District-owned easement or fee property into UDOT's right-of-way and UDOT does not compensate the District for the easement or fee property, UDOT shall pay 100% of the costs to relocate the District's Utilities when future UDOT projects require the relocation. When the District's Utilities are relocated from a District-owned easement or fee property into UDOT's right-of-way and UDOT does not compensate the District for the easement or fee property, UDOT shall issue encroachment permits at no cost to the District in accordance with R930-7 to allow the District to operate, maintain, and replace its Utilities.

9. BETTERMENT WORK

If the District desires to include betterment work in the Project at any specific location UDOT may agree to the betterment providing the difference in costs between the functionally equivalent required Utility Work and the District's desired betterment work that is not required by the Project shall be at the sole cost of the District and the betterment work can be accommodated without delaying UDOT's Project. The betterment work will be addressed by separate supplemental agreement between UDOT and the District.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

10. SUPPLEMENTAL AGREEMENTS

UDOT and the District shall enter into supplemental agreements to cover Utility Work at specific Project locations. As part of the supplemental agreement, UDOT will provide design plans and Utility Work schedules for review and approval by the District prior to start of the Utility Work.

Should it become necessary for the District to schedule internal over-time inspection hours or to procure outside services to perform preliminary engineering, plan review, observation, or inspection, to accommodate UDOT's Utility Work and Project schedule, the District shall include an estimate of cost, to include in the supplemental agreement.

A copy of the format of the proposed supplemental agreement is marked EXHIBIT "B" that is incorporated by reference.

The District will require a 2 week review and approval period prior to its submission for Board approval for any final supplemental agreement submitted to the District by UDOT. District Board of Directors meets regularly on the 3rd Tuesday of each month, with the exception of holidays.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental agreement approved in writing by the Parties is required prior to the start of Utility Work on the changes or additions.

11. UDOT TO NOTIFY DISTRICT BEFORE BEGINNING UTILITY WORK

UDOT shall not perform any Utility Work until the supplemental agreement for the Utility Work is signed by the District and received by UDOT. UDOT will review and approve the supplemental agreement and will issue an authorization to proceed to the District for each specific Utility Work location.

UDOT will notify the District at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreement hereto, to allow the District to schedule an inspector to be present during the Utility Work.

12. DISTRICT TO PERFORM DESIGN REVIEW AND INSPECTION

District's personnel shall notify UDOT's Field Representative upon arriving and leaving the Project site for verification of inspecting Utility Work for reimbursement purposes. District's personnel will comply with all applicable OSHA and Project safety requirements while within the Project limits.

The District shall provide on-call engineering support by District's engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during Utility Work, and to perform the necessary inspection on the District's facilities installed by UDOT.

a. The District's engineer and/or inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on District's facilities in accordance with the plans and specifications provided and/or approved by the District, including changes or additions to the plans and specifications, which are approved by the Parties hereto.
b. The District shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on the District's facilities. The District shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.
c. UDOT will respond to District's concerns within 24-hours of written notification.
d. The District, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns the District may have with acceptance of the facilities upon completion of the Utility Work.
e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Utility Work does not relieve the District of its duty in the performance of the Utility Work or to ensure compliance with acceptable standards.

13. DAILY RECORDKEEPING

UDOT's Field Representative will keep daily records of the inspection performed by the District. Daily inspection records will be in duplicate on a form to be prepared by the District or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance and

Certification Manager. The inspection records shall be signed by UDOT's Field Representative, and the District or its authorized representatives. Copies of the inspection records shall be retained by the parties to this Agreement.

14. REIMBURSEMENT

The District shall notify UDOT in advance should it become necessary for the District to procure outside services to perform preliminary engineering, design review, observation, or inspection to accommodate UDOT's Utility Work and Project schedule. Upon concurrence by UDOT, the District may procure outside services through appropriate solicitation.

The District and UDOT will negotiate necessary internal over-time inspection hours during the development of each supplemental agreement. Upon execution of each supplemental agreement, the District may proceed with approved internal over-time inspection hours, and the cost will be reimbursed by UDOT. Upon completion of the Utility Work, the District must submit actual labor hours for approved internal over-time inspection hours, external service invoices, and daily records signed by all Parties for reimbursement to the District as outlined in Sections 11 and 12 above.

15. SUBMITTAL OF ITEMIZED BILLS

The District shall submit itemized bills covering the actual costs incurred for outside services to perform preliminary engineering, design review, oversight, and inspection work or for preapproved internal over-time inspection hours of the Utility Work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

UDOT Contracts and Compliance Specialist
4501 South 2700 West
Construction Office, Box 148220
Salt Lake City, Utah 84114-8220

Itemized bills shall bear the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement and be submitted to UDOT within 60 days following completion of outside services or internal over-time inspection hours by the District on the Project. Otherwise, previous payments to the District may be considered final, except as agreed to between the Parties in advance.

UDOT will reimburse the District within 60 days after receipt of the billings, but only for items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the District to submit final billings within 6 months of the completion of outside services will result in UDOT's disallowance of that portion of outside services performed by the District.

16. SALVAGED MATERIALS

All materials from District's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on this Project, except for manhole rings and covers, shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties hereto.

17. RIGHT TO AUDIT

UDOT and the Federal Highway Administration shall have the right to audit all cost records and accounts of the District pertaining to this Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. § 645, subpart A. Should this audit disclose that the District has been underpaid, the District will be reimbursed by UDOT within 60 days upon submission of additional billing to cover the underpayment. Should this audit disclose that the District has been overpaid, the District will reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For purpose of audit the District is required to keep and maintain its records of outsides services covered herein for a minimum of 3 years after final payment is received by the District from UDOT.

18. ACCEPTANCE AND MAINTENANCE

UDOT will provide notification to the District for acceptance of the Utility Work upon completion of the final inspection of the District's facilities. The District will have 60 days to respond in writing to UDOT with any additional comments in regards to the Utility Work. In the event that UDOT does not receive a written response within 60 days, UDOT will designate the Utility Work accepted by the District, subject to any outstanding warranties or warranty issue.

The District will accept, own, and maintain its own facilities. The District shall be the sole owner of the facilities upon completion of the Project unless otherwise agreed to by the Parties in writing. To the extent it may lawfully do so, District further agrees to relieve UDOT from any responsibility or liability that may result from its new facilities or the operation thereof, except for any repairs necessary under any applicable warranties.

19. ACCESS

It is understood that access for maintenance and servicing of District's facilities located on the right-of-way of the Project will be allowed only by permit issued by UDOT to the District, and that the District will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

20. INDEMNIFICATION

UDOT and the District are both governmental entities subject to the Governmental Immunity Act. Each Party agrees to indemnify, defend, and save harmless the other from and against all claims, suits and costs, including attorneys' fees for injury or damage of any kind, arising out of its negligent acts, errors or omissions of its officers, agents, contractors or employees in the performance of this Agreement, and from and against all claims, suits, and costs, including attorneys' fees for injury or damage of any kind. Nothing in this paragraph is intended to create additional rights

to third parties or to waive any of the provisions of the Governmental Immunity Act. The obligation to indemnify is limited to the dollar amounts set forth in the Governmental Immunity Act, provided the Act applies to the action or omission giving rise to the protections in this paragraph. The indemnification in this paragraph shall survive the expiration or termination of this Agreement.

21. **MISCELLANEOUS**

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.

b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and District.

c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.

d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

e. If any portion of this Agreement is held to be invalid or unenforceable for any reason by a court of competent jurisdiction, such invalidity or unenforceability shall not affect any other provision hereof, and this Agreement shall be construed as if such invalid or unenforceable provision had never been contained herein.

****

BANGERTER

Project No. S-0154(12)11, Salt Lake County
4 Interchanges on Bangerter Highway
SOUTH VALLEY SEWER DISTRICT
Charge ID No. 71939 PIN 12566

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

ATTEST:

South Valley Sewer District

Annette Byrne
Title: District Clerk

Wayne K Ballard
Title: Chairman of the Board of Trustees

Date: 7-19-16

Date: 7-19-16

(IMPRESS SEAL)

Recommended For Approval:

FOR ALANA SEGNOLOVE
Title: Utility and Railroad Leader

Date: 15 Aug 2016

Utah Department of Transportation

Title: Project Director

Date: Aug 15, 2016

Approved as to Form

Renee Spencer
Title: Assistant Attorney General

Date: 8/16/2016

Comptroller Office

Cherise Young
Title: Contract Administrator

Date: 8-16-16

When Recorded Return to:
Mr. Craig L. White
South Valley Sewer District
P.O. Box 908
Draper, Utah 84020

PARCEL I.D.# _____
GRANTOR: _____

EASEMENT

A twenty (20) foot wide sanitary sewer easement located in the _____ Quarter of Section _____, Township _____, Range _____, Salt Lake Base and Meridian, U.S. Survey.

For the sum of One Dollar ($1.00) and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the undersigned as GRANTORS hereby grant, convey, sell, and set over unto South Valley Sewer District, a body politic of the State of Utah, hereinafter referred to as GRANTEE, its successors and assigns, a perpetual right-of-way and easement to construct, maintain, operate, repair, inspect, protect, install, remove and replace sewer pipelines, valves, valve boxes and other sewer transmission and distribution structures and facilities, hereinafter called the FACILITIES, said right-of-way and easement, being situate in Salt Lake County, State of Utah, over and through a parcel of the GRANTORS' land lying within a strip twenty (20) feet wide, said strip extending ten (10) feet on each side of and lying parallel and adjacent to a line of reference and projection thereof, more particularly described as follows:

Contains: _____ acres (approx. _____l.f.)

TO HAVE AND HOLD the same unto the GRANTEE, its successors and assigns, with the right of ingress and egress in the GRANTEE, its officers, employees, agents and assigns to enter upon the above-described property with such equipment as is necessary to construct, install, maintain, operate, repair, inspect, protect, remove and replace the FACILITIES. During construction periods, GRANTEE and its contractors may use such portion of GRANTORS' property along and adjacent to the right-of-way and easement as may be reasonably necessary in connection with the construction or repair of the FACILITIES. The contractor performing the work shall restore all property, through which the work traverses, to as near its original condition as is reasonably possible. GRANTORS shall have the right to use the above-described property except for the purposes for which this right-of-way and easement is granted to the GRANTEE, provided such use shall not interfere with the FACILITIES or with the discharge and conveyance of sewage through the FACILITIES, or any other rights granted to the GRANTEE hereunder.

GRANTORS shall not build or construct, or permit to be built or constructed, any building or other improvement over or across this right-of-way and easement nor change the contour thereof without the written consent of GRANTEE. This right-of-way and easement grant shall be binding upon, and inure to the benefit of, the successors and assigns of the GRANTORS and the successors and assigns of the GRANTEE, and may be assigned in whole or in part by GRANTEE.

IN WITNESS WHEREOF, the GRANTORS have executed this right-of-way and Easement this _____ day of _____, _____.

County Parcel No.	Acreage	GRANTOR(S)
_____	_____ (approx. _____l.f.)	

_____

_____

STATE OF UTAH)
:ss
COUNTY OF SALT LAKE)

On the _____ day of _____, 20_____ _____, the signers of the above instrument, personally appeared before me and duly acknowledged to me they executed the same.

_____
Notary Public

My Commission Expires:_____

Residing in:_____

SOUTH VALLEY SEWER DISTRICT
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT"), and **South Valley Sewer District**, a political subdivision of the State of Utah, ("District") each as ("Party") and jointly as ("Parties").

The parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the Master Utility Agreement remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. UDOT will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)

   b. The City/District requirements as shown in the MUA – District Requirements, are modified as follows:
      i.

   c. Anticipated duration of Utility Work:

   d. Total estimated cost of City/District's (100% reimbursable) outside services: (Detailed Estimate Attached)

2. UDOT will notify the District's Project Representative, Mike Foerster, telephone No. (801) 571-1166, email mikef@svsewer.com at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

ATTEST:

South Valley Sewer District

Title: District Clerk

Title: Chairman of the Board of Trustees

Date: _____

(IMPRESS SEAL)

. . . . . .

Recommended For Approval:

Utah Department of Transportation

Title: Utility and Railroad Leader

Title: Project Director

Date: _____

Date: _____

Approved as to Form

Comptroller Office

Title: Assistant Attorney General

Title: Contract Administrator

Date: _____

Date: _____

TELECOMMUNICATIONS FACILITY EXCHANGE AGREEMENT BETWEEN SYRINGA NETWORKS, LLC. AND THE UTAH DEPARTMENT OF TRANSPORTATION, STATE OF UTAH

THIS TELECOMMUNICATIONS FACILITY EXCHANGE AGREEMENT (hereinafter referred to as the "Agreement") is made and entered into as of the 28 day of July, 2010 (the "Effective Date"), between **SYRINGA Networks, LLC**, an Idaho limited liability company, with primary offices at 3795 S. Development Ave., Boise, ID 83705 ("SYRINGA"), and **Utah Department of Transportation, State of Utah**, located at 4501 S. 2700 W., Salt Lake City, UT 84119 ("UDOT") (hereafter referred to individually as "Party", and collectively as "Parties").

WHEREAS, each Party owns or will own telecommunication facilities within the State of Utah; and

WHEREAS, each Party owns (or will construct and own) or has (or will have upon completion of construction) ownership rights in a Conduit System and/or a Fiber System and each Party wishes to exchange the right to use certain conduit or fiber on their respective Conduit System or Fiber System for the right to use certain conduit or fiber on the other Party's Conduit System or Fiber System, and

WHEREAS, Sections 72-7-108 and 72-7-109, Utah Code Annotated, specifically authorize UDOT to enter into telecommunication facility exchange agreements with other third party telecommunication providers;

NOW, THEREFORE, for and in consideration of the mutual covenants and consideration set forth in this Agreement, the Parties do hereby agree as follows:

1. **Definitions.** The following terms, whether in the singular or in the plural, when used in this Agreement and initially capitalized, shall have the meaning specified:

   1.1 Authorizations: All governmental or municipal approvals and authorizations; all rights-of-way; and all leases, licenses, consents or other agreements necessary for the Licensor to construct, install, maintain and repair its Conduit System.

   1.2 Conduit System: A reference to a Party's conduit and associated Telecommunication Facilities.

   1.3 SYRINGA Conduit System: The Conduit System owned by SYRINGA, including the conduit to be installed as identified in Exhibit B. UDOT will be authorized to use two (2) tubes in the Conduit System as identified in Exhibit B. SYRINGA's Conduit System shall be built in conformity with UDOT's written standards and specifications entitled UDOT Standards and Specifications 2008 Edition including the 2008 Supplemental Specifications, as of the last edit on November 18, 2009. Said UDOT Standards and Specifications are incorporated herein by reference.

   1.4 Telecommunications Advisory Council: Telecommunications Advisory Council means the advisory council created pursuant to Utah Code--Title72—Chapter 07-- Section-109--Protection of Highways Act.

1.5 License: Authorization to use the Licensed Conduit for the License Term, subject to the terms and conditions of this Agreement.

1.6 License Term: The period of time for which each License is effective, as further defined in paragraph 7 of this Agreement.

1.7 Licensed Conduit: A specific portion of conduit, which is part of either the SYRINGA Conduit System or the UDOT. Conduit System, for which use of such conduit has been authorized by the owner of the Conduit System. The Licensed Conduit includes reasonable access and use of related Telecommunication Facilities necessary for the use of the Licensed Conduit.

1.8 Licensee: The Party (either UDOT or SYRINGA as the context requires) authorized to use Licensed Conduit within the other Party's Conduit System.

1.9 Licensor: SYRINGA as respects the SYRINGA Conduit System and UDOT as respects the UDOT Conduit System.

1.10 Telecommunication Facility(ies): All physical plant and data components of each party.

1.11 UDOT Conduit System: The unused portion of the Conduit System owned by UDOT, and available for use by SYRINGA, as more particularly identified on Exhibit B; provided that such Conduit System may be modified from time-to-time at UDOT's sole discretion and secured with an update to the UDOT/SYRINGA balance sheet .

1.12 UDOT Right-of-Way: UDOT Right-of-Way on any interstate or state road that UDOT has the legal right to use and manage

2. Obligations of SYRINGA. SYRINGA shall:

2.1 Construct, at its own cost and expense, the SYRINGA Conduit System identified and described in Exhibit B (hereinafter the "Planned Conduit").

2.2 Grant to UDOT, upon completion of the Planned Conduit, without further charge or fee or consideration, a License to use, for the Term of this Agreement, the exclusive use of two tubes in SYRINGA's Conduit as identified in Exhibit B in accordance with the Planned Conduit plans and specifications. SYRINGA shall issue a Conduit Use Authorization to UDOT when the conduit is available for occupancy and use by UDOT.

3. Obligations of UDOT. UDOT shall immediately:

3.1 Grant SYRINGA, without further charge or fee or consideration, a License to use, for the Term of this Agreement, the exclusive use of one tube in UDOT's Conduit System as identified in Exhibit B.

3.2 Grant SYRINGA non-exclusive access to the UDOT Right-of-Way throughout the term of this Agreement. In using said access, SYRINGA agrees to follow Utah Admin. Code R930-6 entitled Manual of Accommodation of Utility Facilities and the Control and Protection of State Highway Rights-of-Way, and Utah Admin. Code R907-1 entitled Appeal of Departmental Actions. SYRINGA may use said access for any lawful purpose without interference from UDOT or any third party.

4. Restrictions on Use.

4.1 This Agreement and each License is subject to the terms and conditions of the applicable Authorizations. Each License is for the use of the Licensed Conduit only. The Licensed Conduit will remain the sole and exclusive property of Licensor, and nothing contained

herein will give or convey to Licensee any property right, title or interest whatever in such Licensed Conduit, which will at all times be and remain Licensor's personal property **notwithstanding that** it may be or become attached to or embedded in realty. Licensee hereby grants to Licensor the right to recover all components of the Licensed Conduit from Licensee's premises upon expiration or earlier termination of this Agreement or any License.

4.2 Licensee may use the Licensed Conduit for its own business purposes. Licensor acknowledges that it has no right to use the Licensed Conduit during the applicable License Term.

4.3 Licensor shall not use its Conduit System in a way which interferes with or adversely affects the use of the Licensed Conduit by Licensee. Licensee shall not use the Licensed Conduit in a way which interferes with or adversely affects the use of Licensor's Conduit System.

5. Access and Escort.

5.1 Licensor shall provide Licensee access to the Licensed Conduit. It is the responsibility of Licensee to obtain any related governmental or other authority necessary to access and use the Licensed Conduit not available from Licensor.

5.2 Licensee shall be responsible for all cable locate services for the Licensed Conduit. All costs associated with Licensee's access to the Licensed Conduit will be borne by the Licensee.

6. Repair, Maintenance, and Continuity.

6.1 Licensor shall dispatch maintenance and repair personnel as soon as practical along the Conduit System to handle and repair problems detected by the Licensee that existed prior to the Effective Date.

a. UDOT shall coordinate all maintenance and repair activities with **SYRINGA's Network Operations Center at 1-800-454-7214.**

b. SYRINGA shall coordinate all maintenance and repair activities with UODT and follow the Utah Admin. Code R930-6 entitled Manual of Accommodation of Utility Facilities and the Control and Protection of State Highway Rights-of-Way. UDOT Permit fees for SYRINGA are waived for work with in the UDOT Right-of-Way. SYRINGA must follow all permitting processes according to the area that they are working in.

6.2 Maintenance.

a. From time to time, at the Licensor's reasonable discretion, and after adequate advance notice to the Licensee (which shall be at least ten (10) business days), the Licensor will schedule and perform specific periodic maintenance and repair checks and services on the Licensed Conduit. Licensee shall not be responsible for the repair or costs of repair for any defects in the Licensor conduit that existed prior to the Effective Date.

b. Non-emergency work that is reasonably expected to result in signal discontinuity must be coordinated between the Parties, and performed in accordance with Scheduled Maintenance Procedures. "Scheduled Maintenance Procedures" or "SMP" means a pre-arranged period of time reserved for performing certain work on Licensor's Fiber System that may impact communication services. Generally, SMP will be restricted to a Saturday or Sunday after midnight and before 6:00 a.m., local time. Major Fiber System work such as fiber rolls and hot cuts will also be scheduled utilizing SMP.

6.3 Emergency Maintenance. The Parties acknowledge that the transports on the Telecommunication Facilities are time sensitive. Each Party agrees to cooperate to bring the Telecommunication Facilities back to working order as quickly as possible.

6.4 The Licensor may hire a contractor to perform its maintenance and repair obligations.

6.5 The Licensee shall have the right, but not the obligation, to supervise and oversee any work performed by the Licensor in or to the Licensee's facilities, at Licensee's cost.

6.6 All of the Licensor's obligations under this Section shall be at the Licensor's sole cost and expense, subject to Section 13.

7. **Term.** The term of this Agreement, shall begin on the Effective Date, and shall terminate thirty (30) years later, or after either Party gives the other Party notice that it intends to terminate this agreement. ("Term"). After the initial thirty (30) year term, this Agreement shall renew automatically on its anniversary date for two (2) successive five (5) year periods, unless terminated with or without cause in writing by either Party. Upon termination of the agreement either Party will have five (5) years to arrange for removal and relocation of their telecommunication facilities.

8. **Trade-In of Occupied Conduit During Term.** Nothing in the Agreement shall preclude either party from substituting currently occupied conduit for substitute conduit at another location provided said conduit is available for use and the other party consents. The requesting party shall be solely responsible for any additional costs associate with the exchange, including any repair of the newly requested conduit or related identification and/or proofing.

9. **Express Warranty of Function-ability.**

9.1 The Parties mutually warrant that any Telecommunication Facility which either party has an obligation to furnish to the other by License or otherwise under this Agreement, shall be fully functional and fit for the intended purpose for which it was licensed.

10. **Representations Regarding Authorizations.**

10.1 Licensor represents, warrants and covenants that:

a. it has obtained, and will use commercially reasonable efforts to maintain all applicable Authorizations throughout each License Term; and

b. it has the full right and authority pursuant to the Authorizations to enter into this Agreement and perform its obligations hereunder, and will not violate the Authorizations (with or without the giving of notice or the lapse of time or both) and is not required to obtain any additional consent, approval, filing or notice under the Authorizations or under any provision of any law, rule or regulation, court order, judgment or decree applicable to the Licensor; and

c. it has no knowledge of any defect in the normal operating condition of the Conduit System that would have an adverse effect on the ability of the other Party to utilize the Licensed Conduit to provide telecommunications services to its customers; and

d. it will exercise its rights and perform its obligations hereunder only in accordance with all applicable laws, rules and regulations; and

e. it will perform all maintenance services in a professional and workmanlike manner in accordance with industry standards.

10.2 Licensee represents, warrants and covenants that:

a. Licensee's use of the Licensed Conduit will be limited to the provision of communication services in accordance with all Federal, State and local laws, rules, regulations, codes, statutes and subject to all Authorizations; and

b. Licensee has obtained all rights of way, authorizations and consents necessary to use the Licensed Conduit. Licensee will indemnify, defend and hold harmless Licensor from any claims related to its use of the Licensed Conduit; and

c. it has the full right and authority under the Authorizations to enter into this Agreement and perform its obligations hereunder, and the same will not violate the Authorizations (with or without the giving of notice or the lapse of time or both) and is not required to obtain any additional consent, approval, filing or notice under the Authorizations or under any provision of any law, rule or regulation, court order, judgment or decree applicable to the Licensee; and

d. it will perform all work related to access and use of the Licensed Conduit in a professional and workmanlike manner in accordance with industry standards.

11. Default and Termination.

11.1 Neither Party shall be in default under this Agreement unless and until such Party has received written notice of such default from the other Party, and has failed to cure the default within thirty (30) days after receipt of such notice, except for a payment default which must be cured within ten (10) days after receipt of such notice. Notwithstanding, when a default (unrelated to payment) cannot reasonably be cured within such thirty (30) day period, the time for curing such default shall be extended for a period no longer than ninety (90) days from the date of the receipt of the default notice if the Party proceeds promptly to cure the default with due diligence.

11.2 Unless otherwise provided herein, a Party shall be in default if (i) such Party breaches any term or provision of this Agreement or fails to comply with the provisions of this

License; (ii) such Party becomes insolvent; (iii) a petition under any of the bankruptcy laws is filed by or against such Party; (iv) such Party makes a general assignment for the benefit of creditors; or (v) a receiver, whether temporary or permanent, is appointed for the property of such Party or any part thereof.

11.3 Upon the failure by the defaulting Party to timely cure any default, the non-defaulting Party may (i) take such action as it determines, in its sole discretion, to be necessary to correct the default, and/or (ii) pursue any legal remedies it may have under applicable law or principles of equity relating to such breach. Notwithstanding the above, if the defaulting Party certifies to the non-defaulting Party in writing that a default has been cured, such default shall be deemed to be cured unless the non-defaulting Party notifies the defaulting Party in writing within fifteen (15) days of receipt of the defaulting Party's notice of cure.

12. Taxes.

12.1 Each Party shall be responsible for and shall timely pay any and all taxes and franchise, license and permit fees (hereinafter collectively referred to as "Taxes") based on the physical location or construction of its own Conduit System or otherwise assessed, levied or charged against such Conduit System.

12.2 If either Party wishes to contest any Taxes imposed on or assessed against it, it shall have the right to protest, by appropriate proceedings, the imposition or assessment of any such Taxes and the other Party shall provide reasonable cooperation at the challenging Party's cost, provided that the challenging Party shall indemnify and hold the other Party harmless from any expense, legal action or cost, including reasonable attorney's fees, resulting from the exercise of its rights under this paragraph. The challenging Party shall be entitled to any refund, rebate, reduction or abatement resulting from its challenge.

13. Relocation of the Facilities.

13.1 UDOT and SYRINGA, as Licensee, recognize that from time to time the Licensor may elect or be required to relocate the Conduit System, or a portion thereof. SYRINGA will relocate their facilities on UDOT Right-of-Way according to their Statewide Utility License Agreement with UDOT. UDOT will relocate any facilities on SYRINGA Right – of –Way at UDOT's expense.

14. Indemnification and Limitation of Liability.

14.1 NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES (INCLUDING BUT NOT LIMITED TO, ANY DAMAGES ARISING OUT OF ANY CLAIM FROM ANY CUSTOMER FOR LOSS OF SERVICES) ARISING UNDER THIS AGREEMENT OR FROM ANY BREACH OF THIS AGREEMENT, OR ARISING OUT OF ANY ACT OR OMISSION OF EITHER PARTY HERETO, ITS EMPLOYEES, SERVANTS, CONTRACTORS AND/OR AGENTS.

14.2 Each Party shall indemnify, defend and hold the other harmless from and against any and all liabilities, losses, costs and expenses, including reasonable attorneys' fees, which are based upon or arise out of its acts or omissions, and the acts or omissions of its employees, agents or contractors. In no event will either Party indemnify the other Party

against claims brought by an employee against their employing Party. Nothing in this paragraph is intended to create additional rights to third parties or to waive any of the provisions of the Governmental Immunity Act. The obligation of UDOT to indemnify is limited to the dollar amounts set forth in the Governmental Immunity Act, provided said Act applies to the action or omission giving rise to the protections in this paragraph.

14.3 When a Party has actual knowledge of a claim falling within the other Party's indemnification obligations, such Party shall promptly so notify the other Party and provide reasonable assistance and information appropriate to the defense of the claim(s). In no event shall the Party against whom the claim is asserted have the right to pay, settle or compromise such claim without the prior written consent of the Party who may be obligated for such indemnity. The Parties agree that they will not unreasonably withhold their consent to any such payment, settlement or compromise.

Nothing contained herein shall operate as a limitation on the right of either Party to bring an action for damages, including consequential damages, against any third party (i.e., any person other than U.D.O.T., SYRINGA, and their respective officers, directors, agents and partners) based on any acts or omissions of such third party as such acts or omissions may affect the construction, operation or use of the Licensed Conduit.

15. Insurance.

15.1 During the Agreement Term, the Parties shall maintain not less than the following insurance:

Type of Coverage	Amount of Coverage
Worker's Compensation Insurance	Statutory Amount
Employer's Liability Occupational Disease and Bodily Injury Insurance	$1 million each accident $1 million disease each employee $1 million disease-policy limit
Commercial General Liability Insurance, including premises-operations, products/completed operations, independent contractors, contractual (blanket), broad form property damage, with umbrella excess liability (collectively, "Comprehensive Coverage")	Combined single limit personal injury and property damage on an occurrence policy form with policy amounts of (i) not less than $5 million per occurrence (without a limitation on aggregate amount); or (ii) not less than $5 million per occurrence with an aggregate annual amount of not less than $5 million
Automobile Liability Insurance for owned, hired and non-owned autos	$2 million combined single limit bodily injury/property damage

15.2 The comprehensive general liability policies and umbrella excess liability policies of each Party shall contain a provision naming the other Party, its parent, subsidiaries and affiliates, and each of its respective officers, directors, employees as Additional Insured.

15.3 Prior to commencement of any work pursuant to this Agreement, each Party must furnish to the other Party applicable certificates of insurance identifying the certificate holder as Additional Insured in accordance with subsection (15.2), and stating that the insurer will endeavor to notify Licensor at least 30 days prior to cancellation of, or any material change in, the coverage provided.

15.4 The foregoing insurance requirements are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by U.D.O.T. or SYRINGA under this Agreement.

16. Force Majeure. Neither Party shall be liable to the other for any failure or delay of performance under this Agreement due to causes beyond its reasonable control (collectively, "Force Majeure Events").

17. Assignment. Except as provided below, neither Party may assign or otherwise transfer this Agreement or its rights or obligations hereunder without the prior written consent of the other Party, which consent will not be unreasonably withheld, conditioned or delayed. Notwithstanding the foregoing, both Parties shall have the right, without the other Party's consent, to assign or otherwise transfer this Agreement as collateral to any lender or to any parent or any corporation which purchases all or substantially all of its assets; provided, however, that any such assignment or transfer shall be subject to the terms and conditions of this Agreement and any assignee or transferee shall continue to perform the assigning Party's obligations pursuant to the terms and conditions of this Agreement.

18. Notice.

18.1 To be effective, notice must be in writing and delivered by pre-paid commercial overnight delivery service, or by first class mail, return receipt requested, addressed as follows:

If to SYRINGA:
SYRINGA Networks, LLC
Attn: Greg Lowe, CEO
3795 S. Development Ave.
Boise, ID 83705

If to U.D.O.T.:
U.D.O.T.
ATTN: Lynne Yocom
2060 S. 2760 W.
Salt Lake City, UT 84104

18.2 Either Party may change its notice address(es) by written notice to the other Party.

18.3 Notice shall be effective on the date of the addressee's receipt or refusal, as the case may be.

19. Dispute Resolution. Except as otherwise specifically provided in or permitted by this Agreement, all disputes, differences of opinion or controversies arising in connection with this

Agreement shall first be resolved through good faith negotiation to arrive at an agreeable resolution. If, after negotiating in good faith for a period of ninety (90) calendar days, or any agreed further period, the Parties are unable to resolve the dispute, then the Parties may seek resolution by mediation. Parties may meet together to resolve the controversy, claim, or breach or they may select a mutually acceptable mediator to do so. Parties shall bear their respective costs incurred in mediation.

20. Miscellaneous.

20.1 The relationship between the Parties shall not be that of partners, agents or joint ventures for one another, and nothing contained in this Agreement shall be deemed to constitute a partnership or agency agreement between them for any purposes, including, but not limited to federal income tax purposes. In performing any of their obligations hereunder, the Parties shall be independent contractors or independent Parties and shall discharge their contractual obligations at their own risk.

20.2 This Agreement shall be interpreted and enforced under the laws of the State of Utah without regard to its conflicts of law provisions.

20.3 If any provision of this Agreement is unenforceable, it shall be deemed stricken from this Agreement and shall have no effect on any other provision.

20.4 This Agreement shall be binding upon and inure to the benefit of Parties and their respective representatives, successors and assigns.

20.5 No waiver shall be valid unless in writing and signed by the Party against whom enforcement is sought. No waiver of any breach or obligation shall constitute a waiver of any subsequent breach or obligation.

21. ACCESS TO INTERSTATE RIGHT-OF-WAY

21.1 SYRINGA's Planned Conduit may occupy UDOT's Right-of-Way along various interstates. The value of the Right-of-Way has been assessed according to UDOT's 2004 Summary of Segment Values attached herein as Exhibit A. No additional Right-of-Way fees shall be assessed during the Term of this Agreement.

22. Entire Agreement.

22.1 This Agreement, including all Exhibits referred to herein, sets forth the entire agreement of the Parties with respect to the subject matter hereof and supersedes all prior understandings and agreements all prior or contemporaneous agreements, representations, statements, negotiations, and undertakings written or oral. The following Exhibits are attached to and incorporated into this Agreement:

EXHIBIT A: SUMMARY OF SEGMENT VALUES

EXHIBIT B: MAPS OF UDOT CONDUIT SYSTEM and SYRINGA CONDUIT SYSTEM (INCLUDING PLANNED CONSTRUCTION)

EXHIBIT C: UDOT/SYRINGA BALANCE SHEET

22.2 This Agreement and any of the provisions hereof may not be amended, altered or added to in any manner except by a written document signed by an authorized representative of each Party.

IN WITNESS WHEREOF, the Parties have caused this Conduit Exchange Agreement to be executed by their respective duly authorized representatives as of the day and year first above written.

SYRINGA NETWORKS, LLC

By: _____

Name: Greg Lowe
Title: CEO

UTAH DEPARTMENT OF TRANSPORTATION

By: _____

Name: Tracy Conti, PE
Title: Director of Operations

Approved as to Form and Compatibility with the Laws of the State of Utah

By: _____
Name: David Benard
Title: Assistant Attorney General

EXHIBIT A

Table 1 Summary of Segment Values

Segment	Miles	Adjustment to 2004	Lower Bound Value/Mile Annual ($1999)	Lower Bound Value/Mile Annual ($2004)	Lower Bound Value/Mile 30-Year Term	Upper Bound Value/Mile Annual ($1999)	Upper Bound Value/Mile Annual ($2004)	Upper Bound Value/Mile 30-Year Term	Annual Value/Mile Average ($1999)	Annual Value/Mile Average ($2004)
Interstate 15										
Idaho to Weber	49.32	14.0%	1,175	1,340	15,868	7,291	8,312	98,461	4,233	4,826
Weber to Parish Lane	29.88	7.0%	2,968	3,176	37,620	14,752	15,785	186,984	8,860	9,480
Parish Lane to Draper	35.81	13.4%	6,687	7,583	89,829	22,623	25,654	303,902	14,655	16,619
Draper to Springville	24.14	14.0%	7,290	8,311	98,447	11,065	12,614	149,426	9,178	10,462
Springville to Payson	13.31	9.2%	3,343	3,651	43,244	5,120	5,591	66,231	4,232	4,621
Payson to Arizona	248.87	0.0%	958	958	11,348	1,208	1,208	14,310	1,083	1,083
Average for I-15	401.33		2,105	2,293	27,159	5,597	6,179	73,196	3,851	4,236
Interstate 80										
Wyoming to Silver Creek	50.14	0.0%	543	543	6,432	5,508	5,508	65,248	3,026	3,026
Silver Creek to Parley's	18.36	14.0%	4,766	5,433	64,362	9,424	10,743	127,266	7,095	8,088
Parley's to Magna	16.90	13.4%	10,231	11,602	137,436	30,234	34,285	406,143	20,233	22,944
Magna to Nevada	109.59	0.0%	681	681	8,067	7,751	7,751	91,818	4,216	4,216
Averages for I-80	194.99		1,858	2,040	24,160	9,280	9,756	115,566	5,569	5,898
Interstate 215										
Total for I-215	50.14	13.4%	8,561	9,708	115,003	34,009	38,566	456,854	21,285	24,137
Interstate 84										
Echo to SR-89	32.13	14.0%	872	994	11,776	7,235	8,248	97,704	4,054	4,621
SR-89 to I-15	7.40	7.0%	1,341	1,435	16,997	8,663	9,275	109,869	5,005	5,355
Tremonton to Idaho	43.20	7.0%	186	199	2,358	4,942	5,288	62,641	2,564	2,743
Averages for I-84	82.73		556	618	7,325	6,165	6,794	80,483	3,361	3,706
Interstate 70										
Total for I-70	231.65	2.6%	364	373	4,424	1,855	1,903	22,546	1,110	1,138
Total ROW Miles	960.84									
Discount Rate	12.1%									
Inflation Rate	3.5%									
Overall Discount Rate	8.3%									
Term in Years	30									
Present Value Factor	11.84597									

EXHIBIT B

3.1 Parameters of the Swap

		Syringa Build x 2	UDOT Duct
3.2	Core Ring	26,440	63,798
3.3	South Ring	3,166	177,291
3.4	Ogden	69,424	486,389
3.5	UEN DataCenter	6,358	5,473
3.6	East Ring	-	27,984
3.7	Farr West-Tremonton	323,010	-
3.8	Logan	216,480	45,112
		644,878	806,047
		122.1	152.7

** All units are in feet unless otherwise noted

Property of Syringa Networks, LLC. Do not distribute without written permission.

EXHIBIT C

Table 1 Summary of Segment Values

Segment	Miles	Adjustment to 2004	Lower Bound Value/Mile Annual ($1999)	Lower Bound Value/Mile Annual ($2004)	Lower Bound Value/Mile 30-Year Term	Upper Bound Value/Mile Annual ($1999)	Upper Bound Value/Mile Annual ($2004)	Upper Bound Value/Mile 30-Year Term	Annual Value/Mile Average ($1999)	Annual Value/Mile Average ($2004)
Interstate 15										
Idaho to Weber	49.32	14.0%	1,175	1,340	15,868	7,291	8,312	98,461	4,233	4,826
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Draper to Springville	24.14	14.0%	7,290	8,311	98,447	11,065	12,614	149,426	9,178	10,462
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Interstate 80										
Wyoming to Silver Creek	50.14	0.0%	543	543	6,432	5,508	5,508	65,248	3,026	3,026
Silver Creek to Parley's	18.36	14.0%	4,766	5,433	64,362	9,424	10,743	127,266	7,095	8,088
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Magna to Nevada	109.59	0.0%	681	681	8,067	7,751	7,751	91,818	4,216	4,216
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Interstate 215										
Total for I-215	50.14	13.4%	8,561	9,708	115,003	34,009	38,566	456,854	21,285	24,137
Interstate 84										
Echo to SR-89	32.13	14.0%	872	994	11,776	7,235	8,248	97,704	4,054	4,621
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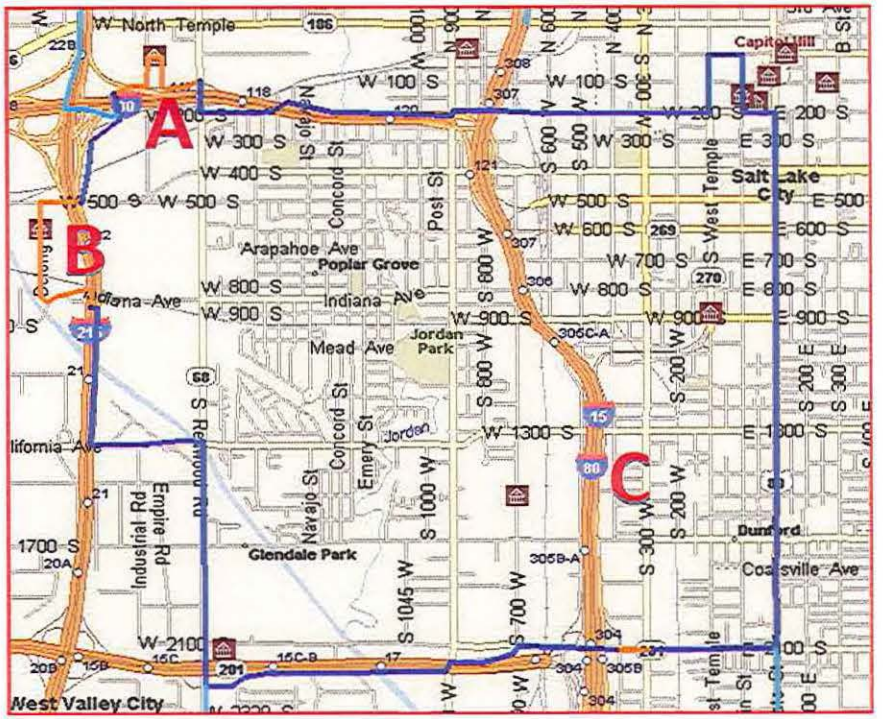
Averages for I-84	82.73		556	618	7,325	6,165	6,794	80,483	3,361	3,706
Interstate 70										
Total for I-70	231.65	2.6%	364	373	4,424	1,855	1,903	22,546	1,110	1,138
Total ROW Miles	960.84									
Discount Rate	12.1%									
Inflation Rate	3.5%									
Overall Discount Rate	8.3%									
Term in Years	30									
Present Value Factor	11.84597									

3.2 SLC Core Ring

Ring Description:

Starting at Redwood road (Orange) going east along I-80 to West Temple, then going north to South Temple, then going east to Main Street, then going south to S Temple, then east to State Street; Continuing south on state to 2100 S, then west to Redwood road, then north to California, then west to I-215 and then north to Delong and then north to Orange.



Syringa Builds

A. Sprint MSC on Orange
B. Level 3 on Delong
C. 300 W 2100 S building west to 400 W

	Syringa	UDOT	
UDOT Conduit:		63,798	
Syr Build A:	*6140*		
Syr Build B:	*6360*		
Syr Build C:	*720*		
	13,220	63,798	
	2.5	*12.1*	Miles

3.3 SLC South Ring

Ring Description:

2100 S. State going south to 12600 S, then east to
12600 S Redwood Road, then going north to 2100 S.

SYRINGA BUILDS:

A. 3600 W 5400 S to Bangerter Hwy

UDOT LATERAL:

Kerns UDOT Lateral

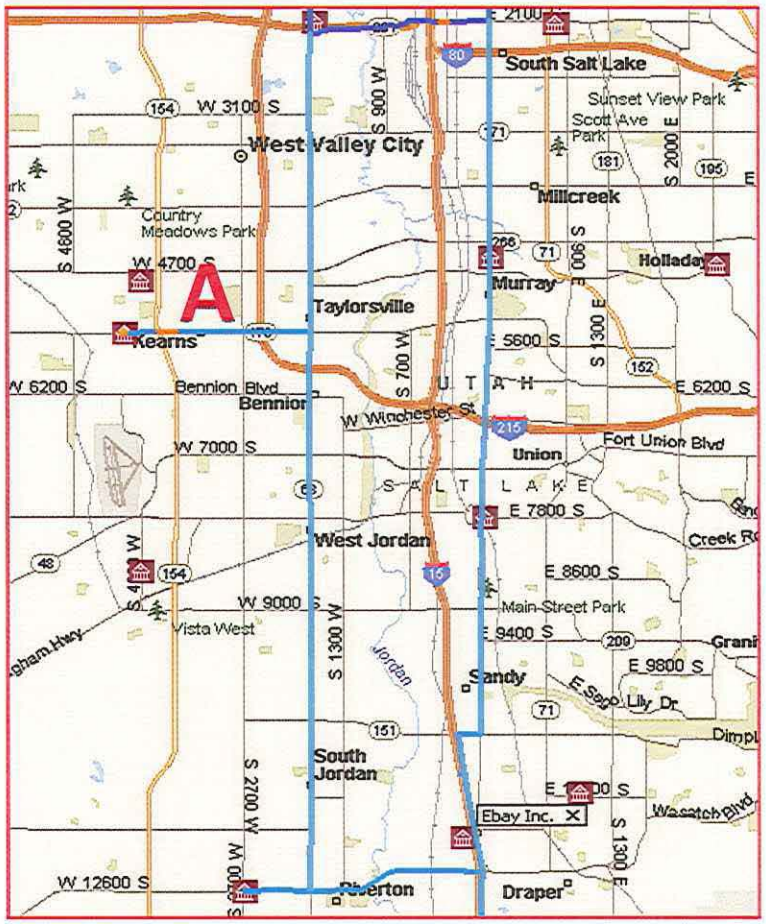
5400 S Redwood Road going west to 3600 W & 5400 S

Riverton UDOT Lateral

12600 S Redwood Road going west to 2700 W & 12600 S

Footage

	Syringa	UDOT	
UDOT South ring:		161,568	
Syr Build A:	*1,583*		
UDOT Lat Kearns:		10,560	
UDOT Lat Rvrtn:		5,163	
	1,583	*177,291*	
	0.3	33.6	Miles



3.4 Ogden Build

RING DESCRIPTION:

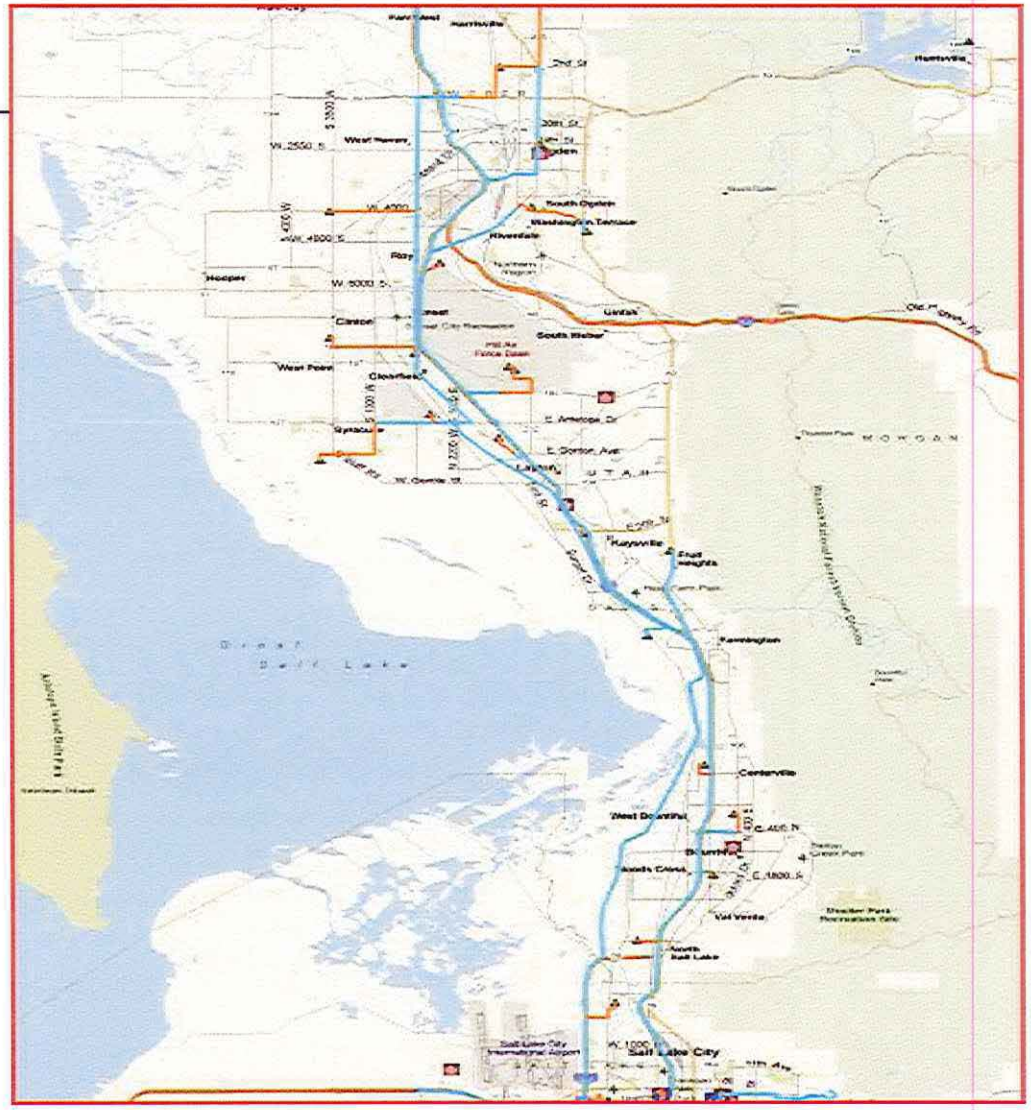
Primary Path: Starting at Core Ring at I-15 going north along I-15 on the east side, ending at Farr West intersection of 1-15 & 2700 N.
Backup Path: Starting at Core Ring at I-215 going north along Legacy parkway, and then north along the west side of I-15 and then north along Hwy 126 to instersection of I-15 & 1200 S.

SYRINGA BUILDS:

Multiple builds to carrier sites using UDOT and Syringa builds.

Footage

	Syringa	UDOT	
UDOT Conduit-East Primary		216,480	
UDOT Conduit-West backup		203,280	
Bountiful		1,441	
Bubble	3,538	5,280	
Kaysville-Downtown		570	
Ogden-Downtown		12,302	
Freeport		2,308	
Syracuse	13,042	7,392	
Fruit Heights		14,837	
Lagoon		4,182	
Layton	11,880	3,443	
Kaysville	3,712	1,674	
Newgate	2,540	13,200	
	34,712	486,389	
	6.57	92.12	Miles

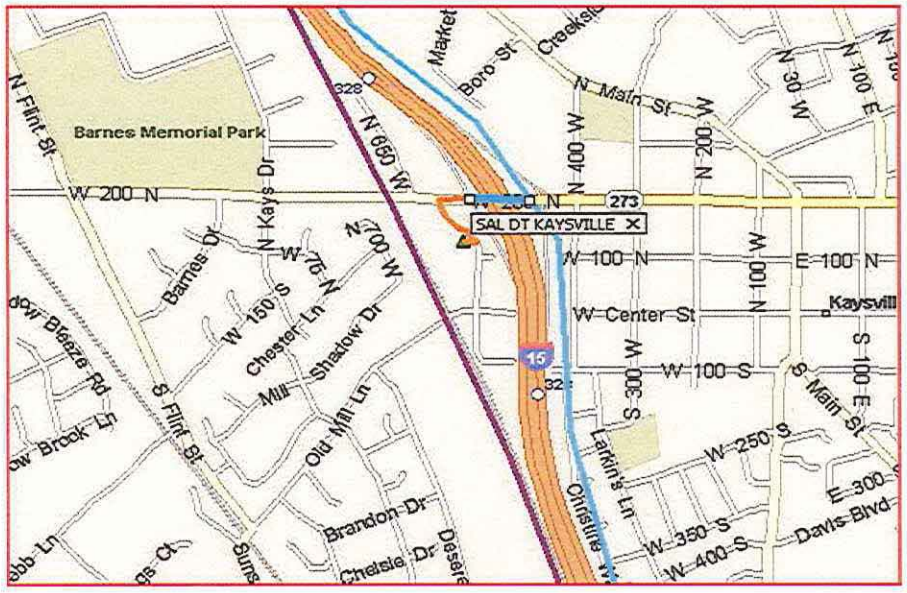


	Footage	Cost	Tower Address	Conduit Path
1. SAL BOUNTIFUL			1625 S 500 West, Bountiful, Ut	1500 South
	UDOT	Syringa		
UDOT Conduit:	1,441			
Syr Build:	849			

	Footage	Cost	Tower Address	Conduit Path
2. SAL BUBBLE			120 West 1000 North, Bountiful, UT	W. Wiley St.
UDOT Conduit:	5,280			
Syr Build:	3,538			

	Footage	Cost	Tower Address	Conduit Path
3. SAL DT KAYSVILLE			600 W 200 N, Kaysville, UT	W. 200 N

UDOT Conduit: 570
Syr Build: 1,000

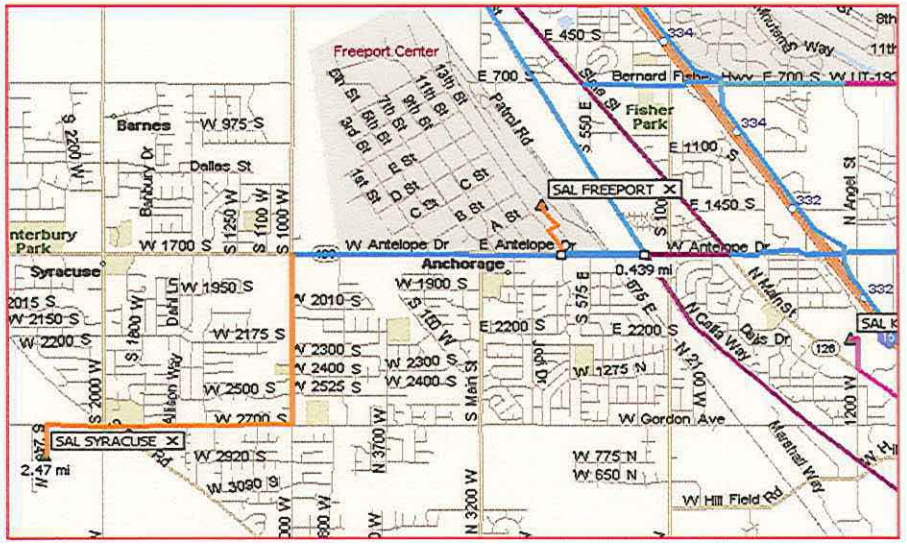


	Footage	Cost	Tower Address	Conduit Path
4. SAL DT OGDEN			2404 Washington Blvd, Ogden, Ut	31st St. & Washington Blvd.

UDOT Conduit: 12,302
Syr Build: 75

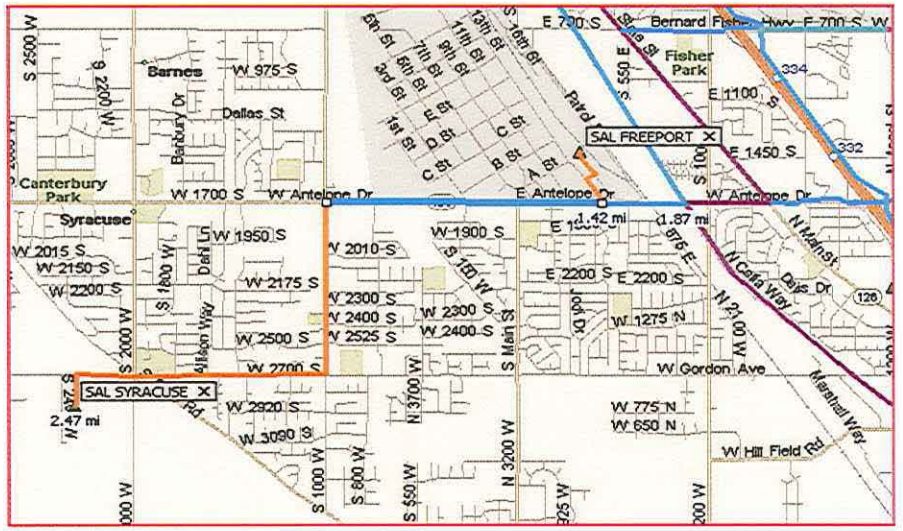
	Footage	Cost	Tower Address	Conduit Path
5. SAL FREEPORT			350 E 1700 S Freeport Ctr, Clearfield, Ut	W. Antelope Dr

UDOT Conduit: 2,308
Syr Build: 1,943



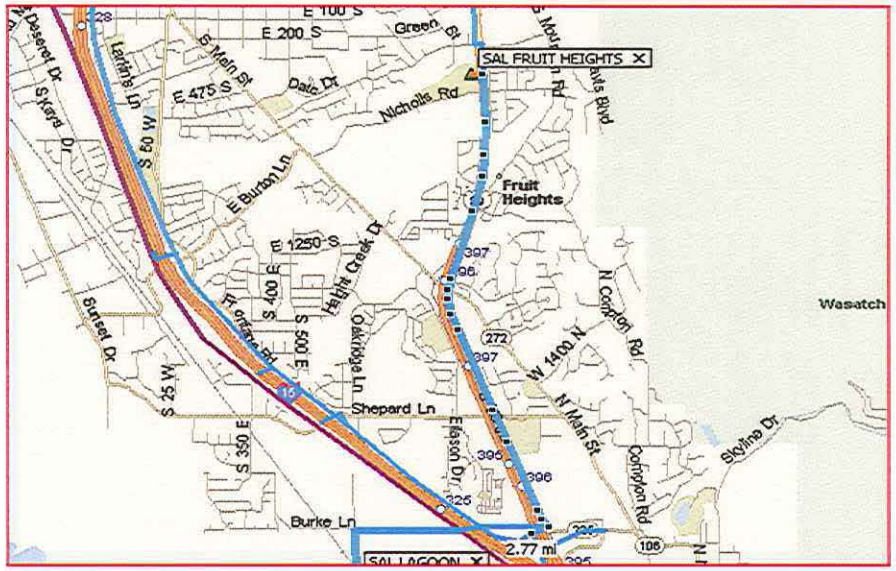
	Footage	Cost	Tower Address	Conduit Path
6. SAL SYRACUSE			2900 S 2400 W, Syracuse, Ut	W. Antelope Dr

UDOT Conduit: 7,392
Syr Build: 13,042



	Footage	Cost	Tower Address	Conduit Path
7. SAL FRUIT HEIGHTS			US HWY 89 & Nichols Rd, Fruit Heights, UT	Highway 89 - Lloyd Road

UDOT Conduit: 14,837
Syr Build: 75

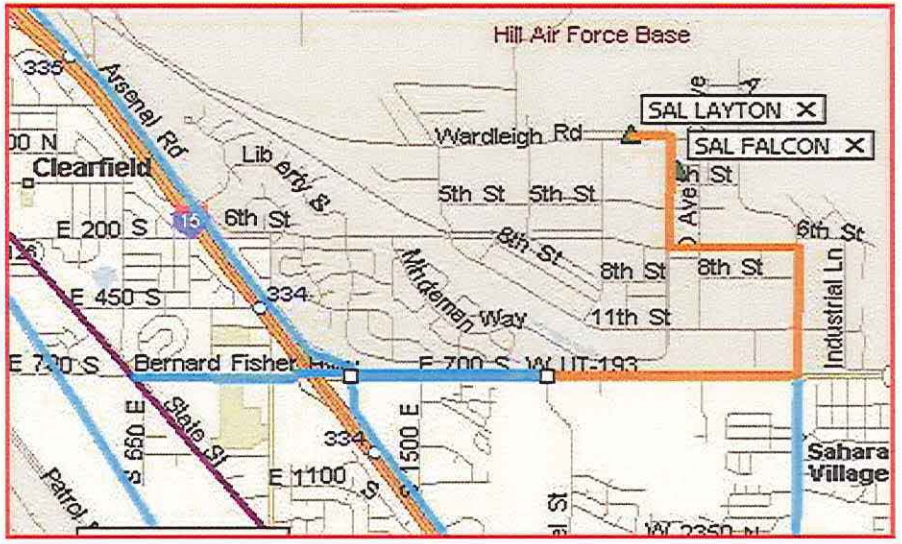


	Footage	Cost	Tower Address	Conduit Path
8. SAL LAGOON			540 N 1525 W, Farmington, Ut	Burke Ln & 1525 W

UDOT Conduit: 4,182
Syr Build: 0

	Footage	Cost	Tower Address	Conduit Path
9. SAL LAYTON			3895 N 1650 E, Layton, Ut	E 700 S

UDOT Conduit: 3,443
Syr Build: 11,880



	Footage	Cost	Tower Address	Conduit Path
10. SAL KAYSVILLE			1464 N. Main, Layton, Ut	Hill Field Rd - N. Main St.

UDOT Conduit: 1,674
Syr Build: 3,712

	Footage	Cost	Tower Address	Conduit Path
11. SAL NEWGATE			3855 Grant Ave, South Ogden, Ut	W Riverdale Rd

UDOT Conduit: 13,200
Syr Build: 2,540

3.5 UEN Datacenter Ring

Ring Description:

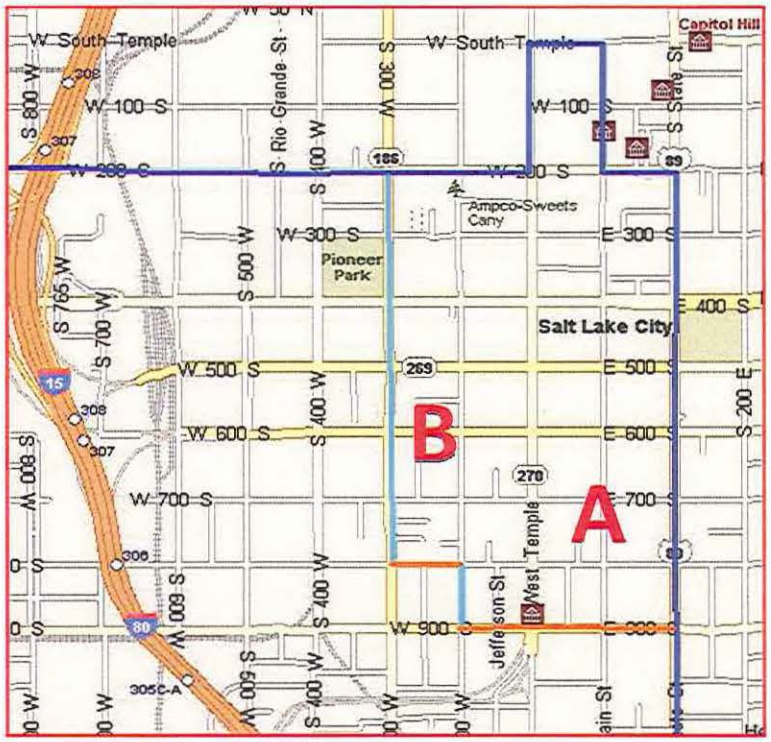
Starting at 200 S 300 W going south via UDOT conduit to 800 S. Then building west to 200 W, then using UDOT conduit south to 900 S. Then building west to 900 S State Street.

SYRINGA BUILDS:

A. 900 S State to 900 S 200 W
B. 800 S 200w to 800 S 300 W

Footage

	Sryinga	UDOT	
UDOT Conduit		*5,473*	
Syringa Build A	*2,381*		
Syringa Build B	*798*		
	3,179	*5,473*	
	0.60	1.04	Miles



3.6 SLC East Ring

Ring Description:

200 S State going north to South Temple, then east to 1000E then south to 100 S, then goint east on 100 S to 1300E, and then south on 1300 E to 500 S, then west to 300E, then south to 600 S then west to 200 E, then north to 400 S and then west to Core Ring.

SYRINGA BUILDS:

None

Footage:

	Syringa	UDOT	
UDOT Conduit		27,984	
	0	5.3	Miles

3.7 Farr West to Tremonton Build

Build Description:

Starting at Farr West heading north along I-15 to the I-15 Tremonton interchange.

SYRINGA BUILDS:

Syringa will build I-15 Farr West to Tremonton.

Footage:

	Syringa	UDOT
Syringa Build	*161,505*	
	30.6	0.0 Miles

3.8 Logan

Build Description:

Starting at Riverside at I-15 & 1520 N heading east along Hwy 30 to Logan meeting existing UDOT conduit in Logan.

SYRINGA BUILDS:

Syringa will build from I-15 to UDOT conduit in Logan.

Footage:

	Syringa	UDOT	
Syringa Build	*108,240*		
UDOT Conduit (Tremonton-Riverside)		31,680	
UDOT Conduit (Logan)		13,432	
	108,240	*45,112*	
	20.5	8.54	Miles

TAYLORSVILLE CITY
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this _____day of_____, 20_____, by and between the **Utah Department of Transportation**, ("UDOT"), and **Taylorsville City**, a Municipal Corporation of the State of Utah, ("City") each as ("Party") and jointly as ("Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, the design-build contractor will complete the design and administer construction of the Project ("Design-Builder"); and

WHEREAS, UDOT has identified City facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, the City desires for the Design-Builder to design and perform the Utility Work on the City's facilities necessitated by the Project; and

WHEREAS, the City will perform the necessary design review and inspection to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement, the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering the Utility Work to be accomplished by UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

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AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. PROJECT RESPONSIBLE FOR COST

In accordance with Utah Code § 72-6-116(3)(a)(ii), UDOT is responsible for 100% of the cost of the Utility Work of City's facilities for those costs that comply with Utah Administrative Code R930-8.

2. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

City's contact person is Wayne Harper, telephone number (801) 647-8701, and e-mail wharper@taylorsvilleut.gov.

After awarding the Project, UDOT will provide the City with the Design Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

3. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the City's facilities and requirements for inclusion in this Agreement and the Request for Proposals, UDOT gave the City authorization for preliminary design engineering on July 27, 2016.

4. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the City.

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5. PROJECT COORDINATION

The City requested that UDOT include items of Utility Work for relocating and adjusting City's facilities in the Project.

During the development of the Project design, the City and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the City's facilities can be avoided. If Utility Work for the City's facilities is required by the Project, UDOT will be responsible to identify the conflicts and to design and construct the Utility Work of the City's facilities. The City will perform the necessary design reviews prior to the start of Utility Work. UDOT's Project Representative will be responsible for coordinating with other utility companies as it relates to City's facilities.

6. CITY REQUIREMENTS

UDOT will comply with the following City Utility Work requirements**:**

a. The City will require …
b. In general, the City cannot have …
c. UDOT will supply as-constructed plans, in _____ format, upon completion of any required Utility Work.

7. UDOT TO DESIGN AND CONSTRUCT CITY'S UTILITY WORK

UDOT will schedule and meet with the City to review the design and scheduling of the Utility Work for the City's facilities at specific locations on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

a. UDOT will design the Utility Work in accordance with City's standards regularly followed by the City in its own work and not considered a betterment. In the event of a conflict between UDOT and City standards, the higher standard will be applied. A copy of the City's standards can be found at _____that is incorporated by reference.
a. UDOT will secure permits required for Utility Work of City's facilities.

8. RIGHT-OF-WAY

Any easements or replacement right-of-way required in conjunction with the Utility Work of City's facilities will be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8.

9. BETTERMENT WORK

City Aesthetics and Landscaping Betterment Work is described in attached Exhibit "A" that is incorporated by reference.

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If the City desires to include additional betterment work in the Project at any specific location UDOT may agree to the betterment providing the difference in costs between the functionally equivalent required Utility Work and the City's desired betterment work that is not required by the Project shall be at the sole cost of the City and the betterment work can be accommodated without delaying UDOT's Project. The betterment work will be addressed by separate supplemental agreement between UDOT and the City.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

10. SUPPLEMENTAL AGREEMENTS

UDOT and the City shall enter into supplemental agreements to cover Utility Work at specific Project locations. As part of the supplemental agreement, UDOT will provide design plans and Utility Work schedules for review and approval by the City prior to start of the Utility Work. A copy of the format of the proposed supplemental agreement is marked EXHIBIT "A" that is incorporated by reference.

The City will require a 2 week review and approval period for any final supplemental agreement submitted to the City by UDOT. The City does not require council review for supplemental agreement approval.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental agreement approved in writing by the Parties is required prior to the start of Utility Work on the changes or additions.

11. UDOT TO NOTIFY CITY BEFORE BEGINNING UTILITY WORK

UDOT will notify the City at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto, to allow the City time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis.

12. CITY TO NOTIFY UDOT

City's personnel shall notify UDOT's Resident Engineer upon arriving and leaving the Project site for verification of inspecting Utility Work. City's personnel will comply with all applicable OSHA and Project safety requirements while within the Project limits.

13. INSPECTION

The City shall provide on-call engineering support by City's engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during Utility Work, and to perform the necessary inspection on the City's facilities installed by UDOT.

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a. The City's engineer and/or inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on City's facilities in accordance with the plans and specifications provided and/or approved by the City, including changes or additions to the plans and specifications, which are approved by the Parties hereto.
b. The City shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on the City's facilities. The City shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.
c. UDOT will respond to City's concerns within 24-hours of written notification.
d. The City, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns the City may have with acceptance of the facilities upon completion of the Utility Work.
e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Utility Work does not relieve the City of its duty in the performance of the Utility Work or to ensure compliance with acceptable standards.

14. DAILY RECORDKEEPING

UDOT's Resident Engineer will keep daily records of the inspection performed by the City. Daily inspection records will be in duplicate on a form to be prepared by the City or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance and Certification Manager. The inspection records shall be signed by UDOT's Field Representative, and the City or its authorized representatives. Copies of the inspection records shall be retained by the parties to this Agreement.

15. REIMBURSEMENT

UDOT will not reimburse the City for costs incurred by City personnel for design review, observation, inspection, and operation of valves performed as part of their regularly assigned duties. Should it become necessary for the City to procure outside services to perform design review, observation, or inspection to accommodate UDOT's Utility Work and Project schedule, the City shall notify UDOT. Upon concurrence by UDOT, a supplemental agreement for the cost of the services will be executed at which time the City may procure outside services through appropriate solicitation.

16. SUBMITTAL OF ITEMIZED BILLS

The City shall submit itemized bills covering the actual costs incurred for outside services to perform design review, oversight, and inspection work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

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UDOT Contracts and Compliance Specialist
Utah Department of Transportation
PO Box 141510
SLC UT 84114-1510

Itemized bills shall bear the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement and be submitted to UDOT within 60 days following completion of outside services by the City on the Project. Otherwise, previous payments to the City may be considered final, except as agreed to between the Parties in advance.

UDOT will reimburse the City within 60 days after receipt of the billings, but only for items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the City to submit final billings within 6 months of the completion of outside services will result in UDOT's disallowance of that portion of outside services performed by the City.

17. **SALVAGED MATERIALS**

All materials from City's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on this Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties hereto.

18. **RIGHT TO AUDIT**

UDOT and the Federal Highway Administration shall have the right to audit all cost records and accounts of the City pertaining to this Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. § 645, subpart A. Should this audit disclose that the City has been underpaid, the City will be reimbursed by UDOT within 60 days upon submission of additional billing to cover the underpayment. Should this audit disclose that the City has been overpaid, the City will reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For purpose of audit the City is required to keep and maintain its records of outsides services covered herein for a minimum of 3 years after final payment is received by the City from UDOT.

19. **ACCEPTANCE AND MAINTENANCE**

Upon completion of the Utility Work of City facilities by UDOT, the City will accept, own, and maintain its own facilities. The City shall be the sole owner of the facilities upon completion of the Project unless otherwise agreed to by the Parties. To the extent it may lawfully do so, City further agrees to relieve UDOT from any responsibility or liability that may result from its new facilities or the operation thereof.

20. **ACCESS**

It is understood that access for maintenance and servicing of City's facilities located on the right-of-way of the Project will be allowed only by permit issued by UDOT to the City, and that the

DRAFT

City will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7. **INDEMNIFICATION**

UDOT and the City are both governmental entities subject to the Governmental Immunity Act. Each Party agrees to indemnify, defend, and save harmless the other from and against all claims, suits and costs, including attorneys' fees for injury or damage of any kind, arising out of its negligent acts, errors or omissions of its officers, agents, contractors or employees in the performance of this Agreement, and from and against all claims, suits, and costs, including attorneys' fees for injury or damage of any kind. Nothing in this paragraph is intended to create additional rights to third parties or to waive any of the provisions of the Governmental Immunity Act. The obligation to indemnify is limited to the dollar amounts set forth in the Governmental Immunity Act, provided the Act applies to the action or omission giving rise to the protections in this paragraph. The indemnification in this paragraph shall survive the expiration or termination of this Agreement.

21. **MISCELLANEOUS**

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.
b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and City.
c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.
d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

****

DRAFT

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

ATTEST:

Taylorsville City

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(IMPRESS SEAL)

. . . . . .

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

Approved as to Form

_____

Title: Assistant Attorney General

Date: _____

Comptroller Office

_____

Title: Contract Administrator

Date: _____

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TAYLORSVILLE CITY AESTHETIC AND LANDSCAPE BETTERMENTS

The City has requested the following Betterment Work be included with the Project Work:

UDOT will include the following Aesthetics and Landscaping Betterment Work items into the Project Work. UDOT will supplement up to $100,000.00 towards Aesthetics and Landscaping Betterment Work. UDOT and the City shall enter into supplemental agreements to cover Aesthetics and Landscaping Betterment Work described below. City will be responsible for paying the actual costs greater than $100,000.00 associated with the Aesthetics and Landscaping Betterment Work items, based on UDOT's actual quantities placed.

Description of Aesthetics and Landscaping Betterment Work:

Element	Desired City Betterment
Parapets:	Panel with "City of Taylorsville" raised lettering.
Retaining Walls:	Addition of a Taylorsville City logo plate onto the retaining wall or column.
Sidewalks:	1. Sidewalk on 5400 S to be at least 6-ft wide as part of a planned east-west trail system. 2. Include a sidewalk along the detention pond on parcel # 777 to connect Avalon Drive to 5400 S.
Lighting and Traffic Signal Poles:	Decorative street lights in project area similar to fixtures in front of city hall.
Park Strip, Median & Island Treatments:	1. Irrigation lines in sleeves under road to islands. 2. Rock mulch.
Landscaping:	Landscape areas, including detention ponds: Sprinklers and grass, with some trees. Trees should be tall growing evergreen and deciduous mix on 40' to 50' centers.

TAYLORSVILLE CITY
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT"), and **Taylorsville City,** a Municipal Corporation of the State of Utah, ("City") each as ("Party") and jointly as ("Parties").

The parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the Master Utility Agreement remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. UDOT will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)

   b. The City requirements as shown in the MUA – City Requirements, are modified as follows:
      i.

   c. Anticipated duration of Utility Work:

   d. Total estimated cost of City's (100% reimbursable) outside services: (Detailed Estimate Attached)

2. UDOT will notify the City's Project Representative, City's contact person is Wayne Harper, telephone number (801) 647-8701, and e-mail wharper@taylorsvilleut.gov at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

DRAFT

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

Taylorsville City

ATTEST:

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(Impress Seal)

. . . . . .

RECOMMENDED FOR APPROVAL: **UTAH DEPARTMENT OF TRANSPORTATION**

_____ _____

Title: Utility and Railroad Leader **Title:** Project Director

Date: _____ **Date:** _____

_____

UDOT Comptroller Office
Contract Administrator

. . . . . .

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United States Contract No._____
UDOT Contract No._____

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

PROJECT AGREEMENT BETWEEN THE UNITED STATES OF AMERICA AND UTAH DEPARTMENT OF TRANSPORTATION AND JORDAN VALLEY WATER CONSERVANCY DISTRICT

DRAFT

THIS PROJECT AGREEMENT, made this _____day of_____ , 2016, pursuant to the Act of Congress of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto, all of which acts are commonly known and referred to as Reclamation Laws, and particularly pursuant to Sections 10 and 14 of the Act of August 4, 1939, (53 Stat. 1187) among the UNITED STATES OF AMERICA, represented by the officer executing this Project Agreement, his duly appointed successor, or his duly authorized representative, hereinafter referred to as the "United States", UTAH DEPARTMENT OF TRANSPORTATION hereinafter referred to as "UDOT", and JORDAN VALLEY WATER CONSERVANCY DISTRICT herein referred to as "Jordan Valley."

WITNESSETH THAT:

WHEREAS, the United States has constructed and continues to own large projects for the storage and delivery of water; and

WHEREAS, the United States has contracted with various water user organizations to operate and maintain its project facilities; and

WHEREAS, as a result, the United States holds real property interests (fee title and easements), hereinafter referred to as "Land Interests of the United States", located throughout the State of Utah which are acquired through the Bureau of Reclamation (Reclamation); and

WHEREAS, the United States owns certain project facilities located on the Land Interests of the United States, including the Jordan Aqueduct, and appurtenant structures, located in the vicinity of the SR-154, Bangerter Highway corridor, hereinafter referred to as the "US Facilities"; and

WHEREAS, the Central Utah Project Completion Act (Titles II-VI of P.L. 102-575, as amended) (CUPCA) was enacted on October 30, 1992; and

WHEREAS, Section 201(e) of the CUPCA transferred Federal oversight responsibility for all phases of the Bonneville Unit of the CUP from Reclamation to the Secretary of the Interior; and

WHEREAS, the Secretary desires to use Reclamation's engineering and technical services expertise to assist in the actions described herein; and

WHEREAS, UDOT, an agency of the State of Utah , constructed and continues to construct, operate, maintain, reconstruct, and rehabilitate highways throughout the State of Utah for the purpose of providing public transportation; and

WHEREAS, the parties entered into a Memorandum of Agreement 05-LM-40-02720 September 26, 2005, attached as Exhibit A; and

WHEREAS, UDOT will award a design–build contract to a third party, hereinafter referred to as the "Design-Builder", for the highway project identified as Project No. S-0154(12)11 4 Interchanges on Bangerter Highway (PIN 12566), in Salt Lake County, Utah, hereinafter referred to as the "Highway Project"; and

WHEREAS, UDOT shall require by contract that the Design-Builder administer construction of the Highway Project, including quality control; and

WHEREAS, the Highway Project necessitates expenditures consisting of design engineering and construction for protection of, or encroachment on, or impacts, or relocation to Land Interests of the United States and/or US Facilities on the Highway Project, hereinafter referred to as "Work"; each encroachment or impact or relocation will be the subject of a separate agreement; and

WHEREAS, it is the desire of UDOT for the Design Builder to construct the Work within a tightly controlled schedule that includes completion deadlines; and

DRAFT

WHEREAS, Jordan Valley and the Metropolitan Water District of Salt Lake and Sandy ("Metropolitan Water District") are contractors for the United States and they care for operate and maintain Jordan Aqueduct Reaches 2 and 3 ("JA-2" and "JA-3"). These water districts have the right to the capacity of JA-2 and JA-3 (5/7ths Jordan Valley and 2/7ths Metropolitan Water District). The day-to-day care, operation and maintenance of JA-2 and JA-3 have been delegated to Jordan Valley for the benefit of both districts.

WHEREAS, the United States, its contractors, agents, and assigns will inspect and accept the Work as appropriate to accommodate the Highway Project; and

WHEREAS, for the purpose of expediting the Highway Project, any Work that will impact or encroach on Land Interests of the United States and/or US Facilities will require a separate encroachment or license agreement; and

WHEREAS, it is the desire of UDOT and the United States to enter into this Project Agreement with the understanding that future agreements may be entered into covering Work to be accomplished by UDOT and/or the UDOT's Design Builder at specific Highway Project locations as shown on Exhibit B (Example License Agreement), Exhibit C (Example Encroachment Agreement), and other agreements not attached; and

WHEREAS, in accordance with Utah Code § 72-6-116(3)(a)(ii), UDOT will pay the cost of relocation of US Facilities located on Land Interests of the United States in compliance with 23 C.F.R. §645, subpart A; and

WHEREAS, in accordance with 23 C.F.R. § 645, subpart A, the United States has determined, with the concurrence of UDOT, that accrued depreciation credit is not required as a result of the Work; and

WHEREAS, the US Facilities convey drinking water that serve the residents of Salt Lake County;

NOW, THEREFORE, for good and valuable consideration, the sufficiency of which is hereby acknowledged, the parties agree as follows.

1. SEVERABILITY: Each provision of this Project Agreement shall be interpreted in such a manner as to be valid under applicable law, but if any provision of this Project Agreement shall be deemed or determined by competent authority to be invalid or prohibited hereunder, such provision shall be ineffective and void only to the extent of such invalidity or prohibition, but shall not be deemed ineffective or invalid as to the remainder of such provision or any other remaining provisions, or of the Project Agreement as a whole.

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2. HOLD HARMLESS:

   a. In consideration of the United States agreeing to encroachment upon the Land Interests of the United States by UDOT, UDOT hereby agrees to indemnify and hold the United States, its officers, agents, employees, and assigns harmless from any and all claims whatsoever for personal injuries or damages to property when such injuries or damages directly or indirectly arise out of UDOT or its Design-Builder's Work concerning the Highway Project's construction, maintenance, repair, use or the presence of the Highway Project upon the Land Interests of the United States; provided, however, that nothing in this Project Agreement shall be construed as releasing the United States from responsibility for its own negligence. Nothing herein shall be deemed to increase the liability of the United States beyond the provisions of the Federal Tort Claims Act, Act of June 25, 1948, 62 Stat. 989 (28 U.S.C. §1346(b), 2671 et seq.) or other applicable law. Nothing in this Project Agreement shall be construed as a waiver by UDOT of the provisions of the Governmental Immunity Act of Utah (Utah Code Ann. §§ 63G-7-101 et seq.). UDOT's obligation to indemnify shall be limited to the negligence claims allowed by the Federal Tort Claims Act.

   b. In consideration of the United States agreeing to UDOT encroaching upon the Land Interests of the United States, UDOT agrees that the United States shall not be responsible for any damage caused to the Highway Project or related facilities of UDOT, unless such damage is caused by the negligence of the United States or by its contractors, officers, agents, employees or assigns as determined under the provisions of the Federal Tort Claims Act. UDOT hereby releases the United States, its officers, employees, agents, and assigns from liability for any and all loss or damage of every description or kind whatsoever which may result to UDOT from the construction, operation, and maintenance of the Highway Project upon Land Interests of the United States; provided that nothing in this Project Agreement shall be construed as releasing the United States from liability for its own negligence as determined under the provisions of the Federal Tort Claims Act.

   c. UDOT and Jordan Valley are both governmental entities subject to the Utah Governmental Immunity Act. Each party agrees to indemnify, defend, and save harmless the other party from and against all claims, suits and costs, including attorneys' fees, for injury or damage of any kind, arising out of its negligent acts, errors or omissions and the negligent acts, errors or omissions of its officers, agents, contractors or employees in the performance of this Project Agreement. Nothing in this Project Agreement is intended to create additional rights for third parties or to waive any of the provisions of the Utah Governmental Immunity Act. The obligation to indemnify is limited to the dollar amounts set forth in the Utah Governmental

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Immunity Act, provided the Act applies to the action or omission giving rise to indemnification under this subparagraph. The indemnification in this subparagraph shall survive the expiration or termination of this Agreement.

3. PROTECTION OF UNITED STATES INTERESTS: UDOT shall comply with all applicable laws, ordinances, rules, and regulations enacted or promulgated by any Federal, State, or local governmental body having jurisdiction over an issue applicable to the Highway Project.

4. ACCESS: The United States and Jordan Valley reserve the right of reasonable access for them and their respective contractors, officers, agents, employees, and assigns to make investigations of all kinds, dig test pits and drill test holes, and to survey for and construct, use, operate, and maintain US Facilities and other improvements related to or connected to JA-2 and JA-3. However, the United States and Jordan Valley and their respective contractors, officers, agents, employees, and assigns shall not access or perform any work on UDOT's right-of-way unless a permit is obtained from UDOT and such permit holder and its contractors, officers, agents, employees, and assigns comply with the permit requirements. The United States and Jordan Valley, and their respective contractors, officers, agents, employees, and assigns shall have the right to enter UDOT's right-of-way in the event of any emergency to make repairs required to prevent loss of life or significant damage to property. The party exercising such right of emergency access and its contractors, officers, agents, employees, and assigns must 1) provide notice to UDOT of entry onto the right-of-way via UDOT's right-of-way and permits officers as soon as practicable but in no event more than 24 hours after entering the right-of-way; and 2) follow guidelines for traffic control as outlined in the Manual of Uniform Traffic Control Devices (MUTCD), Jordan Valley will repair at its expense any damage to UDOT's right-of-way to the extent caused by Jordan Valley or its contractors, officers, agents, employees, and assigns, except as otherwise provided in the Right-of-Way Agreement Between the United States of America Department of the Interior Bureau of Reclamation and Utah Department of Transportation dated July 9, 1991.

5. PROJECT COORDINATION — FOR IMPACTS TO LAND INTERESTS OF THE UNITED STATES AND US FACILITIES
    a. During the development of the Highway Project design, UDOT will consult with Jordan Valley to determine if conflicts, encroachments, and interference with Land Interests of the United States and US Facilities can be avoided. The United States agrees that Jordan Valley will be the designated point of contact for UDOT and its Contactor to consult and coordinate with during the Highway Project. Jordan Valley will consult and coordinate with the United States and the Metropolitan Water District as necessary during the Highway Project.

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b. If conflicts, encroachments, or interference with Land Interests of the United States and US Facilities are necessary and/or cannot be reasonably avoided, UDOT will identify the extent of the conflict, encroachment, or interference and propose a solution. In the event of a relocation of US Facilities, the location to which such facilities are to be relocated must be acceptable to the United States and Jordan Valley.

c. The United States, Jordan Valley, and UDOT have determined locations of encroachment on Land Interests of the United States and US Facilities which are shown in attached Exhibit D – Bangerter Interchanges Protect-in-Place.

6. DUTIES TO BE INCORPORATED INTO DESIGN-BUILD CONTRACT

a. UDOT's Responsibilities

i. UDOT may inspect Work items as they pertain to its Highway Project, but shall be responsible for inspection, construction, relocation, or modification of US Facilities.

ii. UDOT will remove certain third-party utilities outside of the Land Interests of the United States upon completion of the 5400 South interchange Project Work as shown in Exhibit E – 5400 South and Bangerter Highway, Jordan Aqueduct Relocation and BOR Aqueduct Existing Utility Actions.

iii. If Work is required on US Facilities, UDOT shall be responsible to identify the conflicts, encroachments, or interference, provide Jordan Valley with Highway Project design plans as early as possible, and schedule and meet with Jordan Valley to review the details of design, construction, estimates of cost, and scheduling for Work at specific locations within the Highway Project.

iv. UDOT shall advise Jordan Valley of the approximate time required for completion of Work and shall diligently pursue its Work so that completion can be accomplished according to the pre-determined time schedule as negotiated by UDOT and Jordan Valley.

v. UDOT shall provide to Jordan Valley for final approval any design documents addressing any conflict, encroachment, or interference with Land Interests of the United States and US Facilities.

1. Design Preparation and Review Time: Jordan Valley requires up to one (1) week for design review after UDOT submits a relocation request and design documents.
2. Address review documents to JT Cracoft, Property Manager, Jordan Valley.

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3. UDOT shall provide facility design documents incorporating the Jordan Valley's specifications and drawings, which may be obtained from JT Cracoft.

vi. UDOT shall provide all of the supervision, labor, tools, equipment, and materials for the Work. Jordan Valley shall approve, in advance, Work on Land Interests of the United States and US Facilities. Work by UDOT may include purchasing and hauling materials; cutting asphalt; trenching, equipment installation; backfilling; compacting; clean-up; and completing US Facilities to meet the requirements of this Project Agreement. UDOT shall perform the Highway Project in stages, including facility tie-in and putting US Facilities into service, to minimize disruption to the public and to the United States and its contractors.

vii. Specifications: The specification which is of the higher standard between those of UDOT and Jordan Valley will control where duplication occurs. UDOT will provide to Jordan Valley as-constructed plans in AutoCAD and PDF format upon completion of the Work.

viii. Water Service Disruption: Jordan Valley relies upon the operation of JA-2 and JA-3, among other facilities, to provide water service to its customers. Uncoordinated or prolonged disruption to the operation of any facility may cause Jordan Valley to incur additional expense, including but not limited to the purchase of replacement water, the loss of revenues from water sales, purchase payments made by Jordan Valley on take-or-pay water contracts although Jordan Valley cannot take or use the contract water, and damages paid by Jordan Valley for breach of contract with customers for failure to provide them water. Therefore, United States facilities may be taken out of service by UDOT only pursuant to the following schedule notwithstanding any other provision of this Agreement to the contrary:

Facility	Maximum period facility may be out of service (days)	Time period when no service disruption is permitted	Minimum prior notice to Jordan Valley to request a service disruption
JA-2	15 days	March 1 – Nov. 1	30 days
JA-3	20 days	March 1 – Nov. 1	30 days

*Note: JA-2 and JA-3cannot be taken out of service at the same time.

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UDOT shall reimburse Jordan Valley for the actual damages to Jordan Valley for UDOT's breach of the terms of this subparagraph 6(a)(viii).

ix. Construction Inspection: UDOT shall not bury or conceal any portion of the Work that has not been inspected and accepted by Jordan Valley.

x. Cost Allocations: UDOT shall pay the cost of relocation of US Facilities located on Land Interests of the United States in compliance with 23 C.F.R. §645, subpart A. UDOT is 100% responsible for traffic control and surveying.

xi. Inspection of the Work by Jordan Valley shall not relieve UDOT from the obligation to perform all Work in compliance with Jordan Valley's specifications and any other obligations under this Project Agreement.

xii. UDOT shall accomplish the Work on US Facilities in accordance with the plans and specifications approved by Jordan Valley. Any changes or additions to the plans and specifications shall be approved in writing by Jordan Valley.

b. United States and Jordan Valley Responsibilities

i. The United States and Jordan Valley agree to the allocation of responsibilities, and commitments regarding UDOT specified in this Project Agreement. In case of a discrepancy or conflict between the information contained in this Project Agreement and any subsequently executed agreements, the subsequently executed agreements shall govern.

ii. The United States has allowed certain third-party utilities to remain longitudinally within the Land Interests of the United States during the Highway Project as shown in Exhibit E – 5400 South and Bangerter Highway, Jordan Aqueduct Relocation and BOR Aqueduct Existing Utility Actions. UDOT will relocate such third-party utilities outside of the Land Interests of the United States upon completion of the 5400 South interchange.

iii. Jordan Valley will perform the necessary design reviews prior to the start of Work.

iv. The United States and Jordan Valley will inspect UDOT's Work, and will provide UDOT's Project Representative and the Design-Builder's Project Representative with information covering any problems or concerns the United States and Jordan Valley may have with acceptance of the facilities.

v. The United States or Jordan Valley shall notify UDOT's Project Representative of any deficiencies in the Work on US Facilities. UDOT's Project Representative will respond to the concerns within 24 hours of notification.

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vi. In the event the United States or Jordan Valley discovers any deficiencies in the Work, including any failure to comply with plans and specifications as required above, Jordan Valley shall make recommendations to UDOT's Project Representative to stop the Work or correct the deficiencies. Jordan Valley and UDOT will immediately thereafter meet to determine a plan to bring the Work into compliance. Any such plans to cure shall be approved by Jordan Valley. Jordan Valley may notify UDOT to stop the Work immediately upon discovery of safety deficiencies during Work in progress.

7. Betterments: Should the United States or Jordan Valley desire and obtain the appropriate authorization to include betterments to its system as part of the Highway Project, the United States or Jordan Valley will be responsible for 100% of any additional costs incurred. For purposes of this Project and Supplemental Agreements, the term betterment is defined as a replacement US Facility desired by the United States which increases or upgrades the service capacity, capability, appearance, efficiency, or function of an existing US Facility. In the event the United States desires to include any betterment Work to be constructed by UDOT, the United States will negotiate with UDOT for the construction of these betterments and will pay to UDOT 100% of any additional costs incurred for the betterments.

8. NOTIFICATION BEFORE BEGINNING CONSTRUCTION WORK: The required notification periods as indicated in this section are for the commencing of any Work provided for by Supplemental Agreement to allow sufficient time for Jordan Valley to schedule an inspector during the Work.

   a. Jordan Valley maintains an 8:00 a.m. to 5:00 p.m., Monday through Friday work week, not including observed holidays. All Work schedule notifications shall be given during the identified time period to JT Cracroft, Property Manager, Jordan Valley.
   b. Jordan Valley requires a minimum of 3 working days' notification prior to beginning weekend and/or night Work.
   c. Jordan Valley requires a minimum of 2 working days' notification to schedule an inspection request.
   d. Jordan Valley requires a minimum of 14 calendar days' notification prior to beginning Work on or affecting existing US Facilities (including limitations to access to US Facilities).
   e. Jordan Valley requires a minimum of 30 calendar days' notification before Work is started on any betterments in order to schedule full-time inspection personnel.

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9. TRAFFIC CONTROL AND SURVEYING: UDOT will provide all coordination, traffic control per UDOT standards and Manual on Uniform Traffic Control Devices (MUTCD), and required surveying (line and grade), and will verify the proposed location of relocated US Facilities prior to them being placed in their final position. UDOT will coordinate with Jordan Valley for survey staking. The United States and Jordan Valley shall not be responsible for the costs of any coordination, traffic control, or surveying.

10. FORCE MAJEURE: If, as a result of force majeure, either UDOT, Jordan Valley, or the United States is wholly or partially unable to meet its respective obligations under this Project Agreement other than for payment of monies due, the non-performing party shall give the other parties reasonable notice of such situation, describing it in reasonable detail. Thereupon, the party giving the notice shall be released from its obligations under this Project Agreement to the extent that the force majeure prevents performance of obligations during the continuance of the force majeure. The party having the force majeure shall attempt to cure and mitigate the force majeure as quickly as possible, but if rectification is not possible, the parties shall negotiate an acceptable solution. The term "force majeure" means any cause or condition which is not reasonably within the control of the party claiming the suspension.

11. ACCEPTANCE OF THE WORK: The United States and Jordan Valley, as applicable, agree that upon completion and final inspection of construction, to accept, own (in the case of the United States), and maintain the relocated facilities covered herein at no further cost to UDOT and will notify UDOT of the acceptance.

12. COVENANT AGAINST CONTINGENT FEES: UDOT warrants that no person or agency has been employed or retained to solicit or secure this Project Agreement upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established agencies maintained by UDOT for the purpose of securing business. For breach or violation of this warranty, the United States and Jordan Valley shall have the right to annul this Project Agreement without liability or in their discretion to require UDOT to pay the full amount of such commission, percentage, brokerage, or contingent fee.

13. HAZARDOUS MATERIALS: UDOT shall comply with all applicable Federal, State, and local laws and regulations, and United States policies and directives and standards, existing or hereafter enacted or promulgated, concerning any hazardous material that will be used, produced, transported, stored, or disposed of on or in Federal lands, waters or facilities. Additional requirements related to specific impacts to US Facilities may be identified in Supplemental Agreements to this Project Agreement.

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14. CONTACTS:
    a. Jordan Valley Water Conservancy District: Jordan Aqueduct Reaches 2 & 3
       JT Cracroft; Property Manager; 8215 South 1300 West, West Jordan, UT 84088; 801-565-4300; jtc@jvwcd.org
    b. United States Representative: Jordan Aqueduct Reaches 2 & 3
        i. Kieth Marvin; Lands Group; 302 East 1860 South, Provo, UT 84606; 801-379-1193; kmarvin@usbr.gov
        ii. Alan Christensen, PE; Civil Engineer; 302 East 1860 South, Provo, UT 84606; 801-379-1098; achristensen@usbr.gov
    c. UDOT Project Representative:
       Alana Spendlove; Region 2 Utility and Railroad Leader; 2010 South 2760 West, SLC, UT 84104; 801-887-3462; aspendlove@utah.gov
    d. Metropolitan Water District of Salt Lake & Sandy:
       Wayne Winsor; Engineering and Maintenance Manager; 3430 East Danish Road, Cottonwood Heights, UT, 84093; 801-942-9631; winsor@mwdsls.org

15. PRIOR AGREEMENTS: To the extent any provision of this Project Agreement conflicts with Right-of-Way Agreement Between the United States of America Department of Interior, Bureau of Reclamation and Utah Department of Transportation dated July 9, 1991, Jordan Aqueduct/West Valley Highway Cooperation Agreement dated September 10, 1991, and Amendment No. 2 to the West Valley Highway Right-of-Way Agreement between the United States of America Department of Interior, Bureau of Reclamation and Utah Department of Transportation and to the Jordan Aqueduct/West Valley Highway Cooperation Agreement, this Project Agreement shall control during the Highway Project.

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IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed the day and year first written above.

UNITED STATES OF AMERICA

_____ By: _____

Approved: Regional Solicitor's Office Brent Rees

Regional Director

Date: _____

ACKNOWLEDGMENT OF THE UNITED STATES

State of)

) ss.

County of)

On this _____ day of _____, 2016, personally appeared before me _____, known to me to be the Regional Director of the Upper Colorado Region, Bureau of Reclamation, United States Department of Interior, the signer of the above instrument, who duly acknowledged to me that he executed the same on behalf of the United States of America pursuant to authority delegated to him.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

_____

(NOTARY SEAL) Notary Public

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UTAH DEPARTMENT OF
TRANSPORTATION

By: _____
Bryan Adams
Region Two Director
Date: _____

ACKNOWLEDGMENT OF UTAH DEPARTMENT OF TRANSPORTATION (UDOT)

State of UT)

) ss.

County of)

On this _____ day of _____, 2016, personally appeared before me _____, known to me to be the _____ of UDOT, the signer of the above instrument, who duly acknowledged to me that he executed the same on behalf of UDOT pursuant to authority delegated to him/her.

(NOTARY SEAL) _____
Notary Public

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JORDAN VALLEY WATER
CONSERVANCY DISTRICT

By: _____
Title: _____
Date: _____

ACKNOWLEDGMENT OF JORDAN VALLEY WATER CONSERVANCY DISTRICT (Jordan Valley)

State of UT)

) ss.

County of)

On this _____ day of _____, 2016, personally appeared before me _____, known to me to be the Chair of the Board of Trustees of Jordan Valley Water Conservancy District, the signer of the above instrument, who duly acknowledged to me that he executed the same on behalf of Jordan Valley Water Conservancy District pursuant to authority delegated to him/her.

(NOTARY SEAL)

_____
Notary Public

CONCUR:

METROPOLITAN WATER DISTRICT OF SALT LAKE AND SANDY

By:_____
Title:

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EXHIBIT A

Memorandum of Agreement 05-LM-40-02720 September 26, 2005

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EXHIBIT A

Contract No. 05-LM-40-02720

MEMORANDUM OF AGREEMENT

Between

THE UNITED STATES OF AMERICA,
DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION

And

THE UTAH DEPARTMENT OF TRANSPORTATION

REGARDING USE OF RECLAMATION LANDS FOR HIGHWAY PROJECTS

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THIS Memorandum of Agreement (Agreement), dated this 26th day of September, 2005, in pursuance of the Act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto, particularly Section 10 of the Reclamation Project Act of 1939 (53 Stat. 1196; Act of August 18, 1950; 64 Stat. 463; 43 U.S. C. § 387), between THE UNITED STATES OF AMERICA, and its assigns, hereinafter referred to as the United States, acting through the BUREAU OF RECLAMATION, hereinafter referred to as Reclamation, and the UTAH DEPARTMENT OF TRANSPORTATION, hereinafter referred to as UDOT;

WHEREAS, Reclamation, an agency of the United States Government, has constructed and continues to own large projects for the storage and delivery of water; and

WHEREAS, Reclamation, has contracted with various water user organizations to operate and maintain its project facilities; and

WHEREAS, as a result, the United States holds real property interests (fee title and easements) in real property located throughout the State of Utah which it acquired through Reclamation in connection with Reclamation's projects, and which continue to be administered by Reclamation for authorized project purposes; and

WHEREAS, UDOT, a department of the Utah State Government, constructed and continues to construct, operate, maintain, reconstruct, and rehabilitate highways throughout the State of Utah for the purpose of providing public transportation; and

WHEREAS, as a result, UDOT frequently needs to obtain easements over United States' lands administered by Reclamation for various highway construction projects; and

WHEREAS, Reclamation recognizes that UDOT's highway projects serve a public need and have public support, and such easements, if granted by the United States, would be used by UDOT for public benefit; and

WHEREAS, as a result of UDOT's highway projects, Reclamation frequently receives benefit of improved access to United States' lands and facilities which Reclamation administers; and

WHEREAS, as a result of UDOT's highway projects, Reclamation frequently receives benefit from enhanced safety on highways which are used by Reclamation, its employees and contractors, and the general public for access to United States' lands and facilities, as well as from diminished potential for claims of liability resulting from public use of said lands and facilities.

WHEREAS, as a result of UDOT's highway projects, the general public benefits from improved access and safety; and

WHEREAS, UDOT recognizes and agrees that it will be required to comply with environmental laws, including the National Environmental Policy Act, for each of its highway projects, and that it must obtain approval of said compliance by each and every required agency; and

WHEREAS, Reclamation and UDOT wish to cooperate for the best public good to facilitate each agency's respective missions; and

WHEREAS, Reclamation, acting pursuant to 43 CFR 429.6(c) has authority to waive all or part of administrative costs which may be incurred in issuing easements, as follows:

> *All* [administrative] *fees and costs may be waived or reduced at the discretion of the Regional Director, when . . . (3) the holder provides without charges, or at a reduced charge, a valuable service to the public or to the programs of the Department of the Interior.*

WHEREAS, Reclamation, acting pursuant to 43 CFR 429.4 has authority to waive all or part of fair market value compensation for issuing said easements, as follows:

> *Rights of use requested by other Federal or other governmental agencies will be granted with fair market value reimbursement unless a reasonable opportunity exists for the exchange of rights-of use privileges, and there exists an interagency agreement providing for such exchange.*

WHEREAS, Reclamation, acting pursuant to 43 CFR 429.4 has authority to waive all or part of fair market value compensation for issuing said easements, as follows:

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Rights of use requested by nonprofit organizations or nonprofit corporations may be provided with no charge being made for the value of these rights-of-use when it is determined that the use will not interfere with the authorized current or planned use of the land by Reclamation.

NOW THEREFORE, whenever UDOT desires the United States to grant an easement for a UDOT highway project across United States lands administered by Reclamation, UDOT and Reclamation agree to follow the following general procedures:

1. UDOT shall submit all request(s) for grants of easement to Reclamation following the format attached as, Exhibit "A".

2. UDOT shall provide Reclamation with an environmental compliance document covering each request. Reclamation shall review and, if appropriate, approve said environmental compliance document prior to granting any easements to UDOT.

3. Reclamation shall waive reimbursement from UDOT for both administrative costs and compensation for fair market value for the granting easements to UDOT as long as UDOT's highway project meets requirements for such a waiver.

4. UDOT and Reclamation, upon mutual agreement, may enter into a temporary contract to allow UDOT to occupy and use areas it requires immediately, prior to the execution of a final contract and grant of easement.

5. Reclamation may alter the format of said easements prior to approval and signing of final contracts and grants of easement, but the legal descriptions and nature of use (perpetual easement) shall be the responsibility of UDOT and shall remain substantially the same.

6. Both parties agree to complete and execute all final contracts and grants of easement in a timely manner.

7. UDOT will obtain concurrence of any water user organization having contractual responsibility for operation and maintenance of the Reclamation project which is affected by UDOT's highway project on all temporary or final contracts.

8. UDOT agrees to conduct all activities within the any easement to be granted to UDOT by the United States in strict accordance with the Protective Criteria contained in Exhibit B attached hereto and by this reference made a part hereof.

9. UDOT shall not remove, relocate, damage, or destroy any facility or structure of the United States without first having entered into a separate contract with the United States covering such issues as design and specifications, funding, construction, and future operation and maintenance of said facility or structure.

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10. UDOT shall notify the affected water user organization by telephone Five (5) days in advance of its intent to commence any construction operations.

11. UDOT agrees to reduce impact to soil, vegetation, wildlife and visual resources within the easement area by limiting the amount of surface disturbance.

12. All United States land areas (except portions presently covered by asphalt surfacing) where soils and surface materials are disturbed through actions incident to construction, operation, and maintenance shall be restored by the UDOT to their natural state insofar as practicable by water barring, scarifying, leveling, reseeding, or other practices as prescribed by the United States and to its satisfaction.

13. Unless authorized in writing by the United States, travel by UDOT, its agents or assigns is limited to the area covered by the easements and existing public roads.

14. Disturbance of any improvements encountered during construction, maintenance, and operation of the easements shall be kept to an absolute minimum. UDOT shall immediately restore any damaged improvements at least to their former state. Functional use of these improvements must be maintained at all times.

15. During construction, operation, and maintenance, UDOT shall be particularly alert to take all reasonable and necessary precautions to protect and preserve historic or prehistoric ruins and artifacts on or adjacent to the easements. Should sites, ruins, or artifacts be discovered during these operations, UDOT will immediately suspend work involving the area in question, and advise the United States of suspected values. UDOT shall promptly have the area inspected to determine significance of values and consult with the United States on appropriate actions to follow (recovery, etc., and resumption of work). Cost of any recovery work shall be borne by the UDOT. UDOT shall provide the United States with a copy of any cultural resources survey reports concerning sites located on the temporary easement and shall develop a mitigation plan acceptable to the State Historic Preservation Officer (SHPO) for those significant sites subject to an adverse impact. All objects of antiquity recovered from public lands are the property of the United States and shall be turned over to Reclamation. UDOT is responsible for obtaining required SHPO clearance for any additional survey and report completed.

16. Within sixty (60) days after conclusion of construction operations, all construction materials and related litter and debris, including vegetative cover accumulated through land clearing, shall be disposed of by UDOT in an appropriate manner (State of Utah approved sanitary landfill).

17. UDOT shall designate a representative for field operations who shall be the sole representative of UDOT and UDOT's contractors in dealings with the United States, and shall provide their name, address, and telephone number to the United States and the the Association prior to commencement of construction.

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18. UDOT shall comply with existing County, State, and Federal laws concerning the protection and preservation of game, and non-game wildlife species.

19. UDOT shall comply with all State and Federal regulations and laws pertaining to water quality, public health and public safety.

20. UDOT shall be responsible for prevention and suppression of all uncontrolled fires that are caused by UDOT, its agents or assigns.

21. Subject to applicable Federal and State law, UDOT agrees to indemnify and hold harmless the United States against any and all loss or damage and from any liability on account of personal injury, property damage, or claims for personal injury or death arising from its occupancy or use of United States lands or any other rights covered under any temporary or final contract and grant of easement.

22. It is acknowledged and agreed by the parties hereto that, prior to start of construction by UDOT, the United States will have inspected the land area covered by the easements and found it to be free from contamination by hazardous materials of any kind. Removal and clean-up of future contamination, including broken asphalt, resulting from UDOT's use of the easements shall be the sole responsibility of UDOT. Removal and clean-up of any such future contamination, including broken or damaged asphalt, shall be at UDOT's sole expense and shall be accomplished in compliance with all applicable Federal and State laws and regulations.

23. UDOT agrees that in all operations conducted within the easements, it shall comply with applicable State and Federal laws and regulation concerning the use of poisonous substances, including insecticides, herbicides, fungicides, rodenticides, and other similar substances. Prior to the use of such substances on or near the easements, UDOT shall obtain from the United States, approval of a written plan of such use. The plan shall state the type and quantity of material to be used, the pest to be controlled, the method of application, or such other information as may be required. All use of such substances on or near the easements shall be in accordance with the approved plan. If the use of a poison is prohibited by the Environmental Protection Agency (EPA), it shall not be used. If use of a poison is limited by the EPA, it shall be used only in accordance with that limitation.

24. Any proposed additional or subsequent uses by UDOT or others of lands or facilities not covered by the easements must be authorized in advance, in writing by the United States. Additional construction, relocation, or use of the easements that is not in accordance with temporary or final contracts shall not be initiated without prior written approval of the United States and the affected water user organization. Copies of this and other applicable contracts shall be available to construction, operation, and maintenance personnel, as well as personnel of the United States and the Association, during operations.

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25. If UDOT violates the terms and conditions of this or any temporary or final contract, the United States shall provide written notice to UDOT describing the violation. Following receipt of said written notice, UDOT shall have 45 days in which to correct said violation. In the event that UDOT fails to correct said violation to the satisfaction of the United States within that time period, title to the easements shall revert to the United States, following written notice by the United States to UDOT.

26. UDOT warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by UDOT for the purpose of securing business. For breach or violation of this warranty, the United States shall have the right to annul this Contract and grant without liability.

27. No Member of or Delegate to Congress or Resident Commissioner shall be admitted to any share or part of this Agreement or to any benefit that may arise herefrom, but this restriction shall not be construed to extend to this instrument if made with a corporation or company for its general benefit.

28. The provisions of this Agreement shall run in favor of and bind the assigns of the United States and the successors and assigns of UDOT.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed the day and year first written above.

UNITED STATES OF AMERICA

By _____
Regional Director
Upper Colorado Region
Bureau of Reclamation
Department of the Interior

Approved:

_____
Office of the Regional Solicitor

UTAH DEPARTMENT OF TRANSPORTATION

_____
for Lyle McMillan
Director of Right of Way

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EXHIBIT B

Example License Agreement

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EXHIBIT B

Contract No.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL UTAH PROJECT
BONNEVILLE UNIT

LICENSE AGREEMENT
BETWEEN THE
UNITED STATES OF AMERICA
AND

THIS LICENSE AGREEMENT, made this _____day of _____, 2016, pursuant to the Act of Congress of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto, all of which acts are commonly known and referred to as Reclamation Laws, and particularly pursuant to Section 14 of the Act of August 4, 1939, (53 Stat. 1187) among the UNITED STATES OF AMERICA, hereinafter referred to as the United States and _____ hereinafter referred to as the Licensee.

WITNESSETH THAT:

WHEREAS, the Licensee, at its sole cost and expense, proposes to utilize United States lands acquired for the _____, Central Utah Project, State of Utah, hereinafter called the Project Lands and the granting of a license to utilize a portion of the Project Lands in a manner and at the location hereinafter described will not be incompatible with Project purposes;

NOW, THEREFORE, in consideration of the mutual agreements and covenants herein contained, the United States, to the extent of its interest in the Project Lands, hereby grants to the Licensee, upon the terms hereinafter provided, a license for the following purposes and in the location described below:

A. Purpose: To construct, operate and maintain a _____.

B. Period: 25 years from date hereof.

C. Location:

D. Location (Legal Description): A strip of land _____ feet in length and ____ feet in width located in Section __, Township __ South, Range __ East, Salt Lake Base and Meridian, containing __ acres, more or less.

E. Plans, Drawing, or Maps (Attached Hereto and made a Part Hereof):

F. Land Status: Fee Title

1. The federal agency is the Department of the Interior, Bureau of Reclamation, represented by the officer executing this Agreement, his duly appointed successor, or his duly authorized representative.

2. WORK SATISFACTORY. The Licensee shall perform all work under this License Agreement in accordance with the plans, drawings, or maps attached hereto and in a manner satisfactory to the United States and the Central Utah Water Conservancy District, hereinafter referred to as the District.

3. TERM OF LICENSE – TERMINATION: The United States, at its option, may terminate this License Agreement for nonuse of the licensed lands by Licensee for a period of two (2) continuous years. In any event, this license shall expire by limitation at the end of the period recited in Article "B" on Page 1.

a. This License may be revoked by Reclamation upon thirty (30) days written notice to the Licensee if:

1. The United States determines that the Licensee's use of the land is no longer compatible with project purpose.

2. The Licensee fails to comply with the terms or conditions of this License and upon notification of the violation; The Licensee fails to adequately cure the violation within the thirty (30) day time limit. Reclamation will have the final determination regarding the adequacy of the cure.

3. The Licensee use of the land interferes with existing or proposed facilities.

4. ASSIGNMENT OR TRANSFER: This License Agreement shall not be assigned or transferred by the Licensee without the prior written consent of the United States.

5. SEVERABILITY: Each provision of this use authorization shall be interpreted in such a manner as to be valid under applicable law, but if any provision of this use authorization shall be deemed or determined by competent authority to be invalid or prohibited hereunder, such provision shall be ineffective and void only to the extent of such invalidity or prohibition, but shall not be deemed ineffective or invalid as to the remainder of such provision or any other remaining provisions, or of the use authorization as a whole.

6. HOLD HARMLESS:

(a) In consideration of the United States agreeing to encroachment upon the Project Lands of the United States by the Licensee, the Licensee hereby agrees to indemnify and hold the United States and the District, their agents, employees, and assigns, harmless from any and all claims whatsoever for personal injuries or damages to property when such injuries or damages directly or indirectly arise out of the existence, construction, maintenance, repair, condition, use or presence of the encroachment upon fee title land of the United States, regardless of the cause of said injuries or damages; provided, however, that nothing in this agreement shall be construed as releasing the United States or the District from responsibility for their own negligence. Nothing herein shall be deemed to increase the liability of the United States beyond the provisions of the Federal Tort Claims Act, Act of June 25, 1948, 62 Stat. 989 (28 U.S.C. § 1346(b), 2671 et seq.) or other applicable law.

(b) In consideration of the United States agreeing to the Licensee encroaching upon fee title land of the United States, the Licensee agrees that the United States shall not be responsible for any damage caused to facilities, equipment, structures, or other property if damaged by reason of encroachment upon fee title land of the United States by the Licensee. The Licensee hereby releases the United States and the District, their officer, employees, agents, or assigns, from liability for any and all loss or damage of every description or kind whatsoever which may result to the Licensee from the construction, operation, and maintenance of Project works upon said lands; provided that nothing in this Agreement shall be construed as releasing the United States or the District from liability for their own negligence. Nothing herein shall be deemed to increase the liability of the United States beyond the provisions of the Federal Tort Claims Act, Act of June 25, 1948, 62 Stat. 989 (28 U.S.C. § 1346(b), 2671 et seq.) or other applicable law.

(c) If the maintenance or repair of any or all structures and facilities of the United States located on the Project Lands should be made more expensive by reason of the existence of the encroachment improvements or works of the Licensee thereon, Licensee will promptly pay to the United States or the District, their agents or assigns, responsible for operation and maintenance of said structures or facilities, the full amount of such additional expense upon receipt of an itemized bill.

7. RELEASE FROM LIABILITY: The Licensee hereby releases the United States and the District their officers, employees, agents, or assigns, from liability for any and all loss or damage of every description or kind whatsoever, which may result to the Licensee from the construction, operation, and maintenance of Project Works upon said lands, provided that nothing in this License Agreement shall be construed as releasing the United States or the District, from liability for their own negligence.

8. LICENSEE TO DEFEND TITLE: The Licensee shall defend the United States and the District from and against any action which challenges the Licensee's use of Project right-of-way or facilities under this License Agreement, provided the United States or the District promptly tenders such defense prior to the time an answer is due in the proceedings.

9. INTERFERENCE PROHIBITED: The Licensee shall use, occupy, and maintain said facilities with due care to avoid damage to or obstruction of the District or other structures of the United States, or any interference in any way with the operation and maintenance of the same.

10. PROTECTION OF UNITED STATES INTERESTS: The Licensee shall comply with all applicable laws, ordinances, rules, and regulations enacted or promulgated by any Federal, state, or local governmental body having jurisdiction over the encroachment.

11. UNRESTRICTED ACCESS: The United States reserves the right of its officers, agents, and employees at all times to have unrestricted access and ingress to, passage over, and egress from all of said lands, to make investigations of all kinds, dig test pits and drill test holes, to survey for and construct reclamation and irrigation works and other structures incident to

Federal Reclamation Projects, or for any purpose whatsoever. Reclamation will make every reasonable effort to keep damages to a minimum.

12. HAZARDOUS MATERIALS:

(a) The Licensee may not allow contamination or pollution of Federal lands, waters or facilities and for which the Licensee has the responsibility for care, operation, and maintenance by its employees or agents and shall take reasonable precautions to prevent such contamination or pollution by third parties. Substances causing contamination or pollution shall include but are not limited to hazardous materials, thermal pollution, refuse, garbage, sewage effluent, industrial waste, petroleum products, mine tailings, mineral salts, misused pesticides, pesticide containers, or any other pollutants.

(b) The Licensee shall comply with all applicable Federal, State, and local laws and regulations, and Reclamation policies and directives and standards, existing or hereafter enacted or promulgated, concerning any hazardous material that will be used, produced, transported, stored, or disposed of on or in Federal lands, waters or facilities.

(c) "Hazardous material" means any substance, pollutant, or contaminant listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §9601, et seq., and the regulations promulgated pursuant to that Act.

(d) Upon discovery of any event which may or does result in contamination or pollution of Federal lands, waters or facilities, the Licensee shall initiate any necessary emergency measures to protect health, safety and the environment and shall report such discovery and full details of the actions taken to the Contracting Officer. Reporting may be within a reasonable time period. A reasonable time period means within twenty-four (24) hours of the time of discovery if it is an emergency or by the first working day if it is a non-emergency. An emergency is any situation that requires immediate action to reduce or avoid endangering public health and safety or the environment.

(e) Violation of any of the provisions of this Article, as determined by the Contracting Officer, may constitute grounds for termination of this contract. Such violations require immediate corrective action by the Licensee and shall make the Licensee liable for the cost of full and complete remediation and/or restoration of any Federal resources or facilities that are adversely affected as a result of the violation.

(f) The Licensee agrees to include the provisions contained in paragraphs (a) through (e) of this Article in any assignment, sublease, or other subcontract or third-party contract it may enter into pursuant to this Lease.

(g) Reclamation agrees to provide information necessary for the Licensee using reasonable diligence, to comply with the provisions of this Article.

13. PEST CONTROL:

(a) The Licensee shall not permit use of any pesticides on Federal lands without prior written approval by Reclamation. The Licensee shall submit to Reclamation for approval an Integrated Pest Management Plan (IPMP) thirty (30) days in advance of pesticide application.

(b) All pesticides used shall be in accordance with the current registration, label direction, or other directives regulating their use (State Department of Agriculture, Department of Ecology, OSHA, etc.) and with applicable Reclamation policy and directives and standards. Applicators will meet applicable State training or licensing requirements. Records maintenance shall be in accordance with State requirements and such records shall be furnished to Reclamation not later than five (5) working days after any application of a pesticide.

(c) Any equipment, tools, and machines used for pesticide application shall be in good repair and suitable for such use. Equipment shall be calibrated prior to the spraying season and as deemed necessary by Reclamation.

(d) Mixing, disposal, and cleaning shall be done where pesticide residues cannot enter storm drains, sewers, or other non-target areas.

(e) The Licensee shall initiate any necessary measures for containment and clean up of pesticide spills. Spills shall be reported to the Contracting Officer with full details of the actions taken. Reporting may be within a reasonable time period. A reasonable time period means within twenty-four (24) hours of the spill if it is an emergency, or by the first working day if it is a non-emergency. An emergency is any situation that requires immediate action to reduce or avoid endangering public health and safety or the environment.

(f) Aerial application of pesticides is prohibited without prior written consent by Reclamation's designated representative.

(g) The Licensee agrees to include the provisions contained in paragraph (a) through (f) of this Article in any subcontract or third-party contract it may enter into pursuant to this contract.

14. ILLEGAL USE: Any activity deemed to be illegal on Federal lands will be cause for immediate termination of the use authorization.

15. REMOVAL OF FACILITIES: The United States, its agents or assigns, will determine if the Licensee's facilities will be removed upon termination. If the United States, its agents or assigns, determines that the facility shall be removed, removal will be made within thirty (30) days after termination, and the site will be restored as nearly as practicable to its original condition. Removal of the facilities and restoration of the site will be at the sole expense of the Licensee.

16. NO WARRANTY: The United States makes no warranty, expressed or implied, as to the extent or validity of the grant contained herein.

17. COVENANT AGAINST CONTINGENT FEES: The Licensee warrants that no person or selling agency has been employed or retained to solicit or secure this License Agreement upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial agencies maintained by the Licensee for the purpose of securing business. For breach or violation of this warranty, the United States shall have the right to annul this License Agreement without liability or in its discretion to require the Licensee to pay, in addition to the License Agreement consideration, the full amount of such commission, percentage, brokerage, or contingent fee.

18. DISCOVERY OF CULTURAL RESOURCES: The Licensee shall immediately provide an oral notification to Reclamation's authorized official of the discovery of any and all antiquities or other objects of archaeological, cultural, historic, or scientific interest on Reclamation lands. The Licensee shall follow up with a written report of their finding(s) to Reclamation's authorized official within forty-eight (48) hours. Objects under consideration include, but are not limited to, historic or prehistoric ruins, human remains, funerary objects, and artifacts discovered as a result of activities under this authorization. The Licensee shall immediately cease the activity in the area of the discovery, make a reasonable effort to protect such discovery, and wait for written approval from the authorized official before resuming the activity. Protective and mitigative measures specified by Reclamation's authorized official shall be the responsibility of the Licensee.

19. ENVIRONMENTAL COMPLIANCE: The Licensee agrees to abide by all applicable Federal, State, and local laws and regulations pertaining to pollution control and environmental protection.

20. LANDSCAPE PRESERVATION AND NATURAL BEAUTY:

(a) The Licensee shall exercise care to preserve the natural landscape and shall conduct its construction operations so as to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work. Except where clearing is required for permanent works, all trees, native shrubbery, and vegetation shall be preserved and shall be protected from damage which may be caused by the Licensee's construction operations and equipment. Movement of crews and equipment within the rights-of-way and over routes provided for access to the work shall be performed in a manner to prevent damage to grazing land, crops, or property.

(b) Upon completion of the work, the construction site shall be smoothed and graded in a manner to conform to the natural topography of the landscape and shall be repaired, replanted, reseeded, or otherwise corrected as directed by the Contracting Officer at the Licensee's expense.

21. OFFICIALS NOT TO BENEFIT: No member of Congress shall be admitted to any share or part of any contract or agreement made, entered into, or accepted by or on behalf of the United States, or to any benefit to arise thereupon.

22. SUCCESSORS IN INTEREST OBLIGATED: The provisions of this Agreement shall inure to the benefit of and be binding upon the heirs, executors, administrators, personal

representatives, successors, and assigns of the parties hereto; provided, however, that no such heir, executor, administrator, personal representative, successor or assign of the Licensee shall have the right to use, alter, or modify the encroachment in a manner which will increase the burden of the encroachment of the Easement of the United States.

23. SPECIAL PROVISIONS: The Special Provisions, attached hereto, are hereby made a part of this License Agreement the same as if they had been expressly set forth herein.

See Exhibit "A"

IN WITNESS WHEREOF, the parties hereto have caused this License Agreement to be executed the day and year first above written.

UNITED STATES OF AMERICA

By: _____
Wayne G. Pullan
Manager, Provo Area Office

LICENSEE:

By: _____
Title:

CONCUR:

CENTRAL UTAH WATER CONSERVANCY DISTRICT

By: _____
Title:

EXHIBIT B

ACKNOWLEDGMENT OF THE UNITED STATES

State of UT)
) ss.
County of UT)

On this _____ day of _____, 2014, personally appeared before me _____, known to me to be the _____ of the Provo Area Office, Bureau of Reclamation, Upper Colorado Region, United States Department of Interior, the signer of the above instrument, who duly acknowledged to me that he executed the same on behalf of the United States of America pursuant to authority delegated to him.

(NOTARY SEAL) _____
Notary Public

ACKNOWLEDGMENT OF

State of UT)
) ss.
County of UT)

On this _____ day of _____, 2014, personally appeared before me _____, known to me to be the _____ of _____, the signer of the above instrument, who duly acknowledged to me that he executed the same on behalf of _____ pursuant to authority delegated to him/her.

(NOTARY SEAL) _____
Notary Public

EXHIBIT B

ACKNOWLEDGMENT OF CENTRAL UTAH WATER CONSERVANCY DISTRICT

State of UT)
) ss.
County of UT)

On this _____ day of _____, 2014, personally appeared before me _____, known to me to be the _____ of the Central Utah Water Conservancy District, the signer of the above instrument, who duly acknowledged to me that he executed the same on behalf of the Central Utah Water Conservancy District pursuant to authority delegated to him/her.

(NOTARY SEAL)

_____
Notary Public

EXHIBIT B

EXHIBIT "A"

PROTECTION CRITERIA

A. For and in consideration of the License Agreement herein granted, Licensee agrees to pay the United States the following amount:

(1) The sum of One Hundred Dollars ($100), receipt of which is hereby acknowledged, which amount represents administrative expenses incurred by the United States in issuing this License Agreement.

(2) A sum of _____ ($_____) Dollars, which represents the appraised fair market value of the rights granted herein.

B. Prior to the expiration of the term of this License Agreement, and upon application in writing by Licensee and approval by the United States and the District, this License Agreement may be renewed for such period as the parties hereto may agree upon. If so renewed, the consideration to be paid for renewal will be determined by reappraisal by the United States. Furthermore, the renewed License Agreement, will be subject to the regulations existing at the time of renewal and such other terms and conditions as may be deemed necessary by the United States and the District to protect the public interest or its projects

C. The Licensee shall notify the United States at (801) 379-1000 and the District at (801) 226-7100, five (5) days in advance of its intent to commence any construction operations associated with rights herein granted.

D. Existing gravity drainage of the United States rights-of-way must be maintained. No new concentration of surface or subsurface drainage may be directed onto or under the United States rights-of-way without adequate provision for removal of drainage water or protection of the United States rights-of-way.

E. During construction, operation, and maintenance, the Licensee shall be particularly alert to take all reasonable and necessary precautions to protect and preserve historic or prehistoric ruins and artifacts on or adjacent to the lands herein described. Should sites, ruins, or artifacts be discovered during these operations, the Licensee will immediately suspend work involving the area in question, and advise the United States of suspected values. The Licensee shall promptly have the area inspected to determine significance of values and to consult with the United States on appropriate actions to follow (recovery, etc., and resumption of work). Cost of any recovery work shall be borne by the Licensee. The Licensee shall provide the United States with a copy of any cultural resources survey reports concerning sites located on the lands described herein and shall develop a mitigation plan acceptable to the Utah State Historic Preservation officer (SHPO) for those significant sites subject to an adverse impact. All objects of antiquity recovered from public lands are the property of the United States and shall be turned over to the Bureau of Reclamation. The Licensee is responsible for obtaining required Utah SHPO clearance for any additional survey and report completed. Any person who knows or has reason

to know that he or she has inadvertently discovered possible human remains on Federal or Tribal land, must provide immediate telephone notification of the inadvertent discovery to the Bureau of Reclamation Provo Area Office archaeologist. Work will stop until the proper authorities are able to assess the situation on site. This action must promptly be followed by written confirmation to the responsible Federal Agency official with respect to Federal lands. On Tribal lands, it is to be reported to the responsible Indian Tribal official. This requirement is prescribed under the Native American Graves Protection and Repatriation Act (P.L. 101-601; 104 Stat. 3042) of November 1990.

F. Prior to construction of any structure that encroaches within United States rights-of-way, an excavation must be made to determine the location of existing United States facilities. The excavation must be made by or in the presence of the District or the United States.

G. Any contractor or individual constructing improvements in, on, or along United States rights-of-way must limit his construction to the encroachment structure previously approved and construct the improvements strictly in accordance with plans or specifications.

H. All United States land areas where soils and surface materials are disturbed through actions incident to construction, operation and maintenance shall be restored to their natural state insofar as practical by water barring, scarifying, leveling and reseeding, or other practices as prescribed by the United States and to its satisfaction.

I. The Licensee shall restore any damaged or disturbed improvements such as fences, roads, watering facilities, etc., encountered during construction, maintenance, and operation. Functional use of these improvements must be maintained at all times.

J. Within sixty (60) days after conclusion of construction operations, all construction materials and related litter and debris, including vegetative cover accumulated through land clearing, shall be disposed of in an appropriate manner (State of Utah approved sanitary landfill).

K. The owner of newly constructed facilities that encroach on United States rights-of-way shall notify the United States and/or the District upon completion of construction and shall provide the District with one copy and the United States with two copies of as-built drawings showing actual improvements in, on, or along the rights-of-way. Also, provide one copy of drawings on a 3 ½ IBM compatible floppy disk or CD in AutoCAD version 14 format or other format approved by United States, Bureau of Reclamation, within 30 days of completion.

L. Except in case of ordinary maintenance and emergency repairs, an owner of encroaching facilities shall give the District at least 10 days notice in writing before entering upon United States rights-of-way for the purpose of reconstructing, repairing, or removing the encroaching structure or performing any work on or in connection with the operation of the encroaching structure.

M. If unusual conditions are proposed for the encroaching structure or unusual field conditions within United States rights-of-way are encountered, the United States reserves the right to impose more stringent criteria than those prescribed herein.

N. All backfill material within United States rights-of-way shall be compacted to 95 percent of maximum density unless otherwise shown. Mechanical compaction shall not be allowed within 6 inches of the projects works whenever possible. In no case will mechanical compaction using heavy equipment be allowed over the project works or within 18 inches horizontally of the projects works.

O. That the backfilling of any excavation or around any structure within the United States rights-of-way shall be compacted in layers not exceeding 6 inches thick to the following requirements: (1) cohesive soils to 90 percent maximum density specified by ASTM Part 19, D-698, method A; (2) noncohesive soils to 70 percent relative density specified by ANSI/ASTM Part 19, d-2049, par. 7.1.2, wet method.

P. Any nonmetallic encroaching structure below ground level shall be accompanied with warning tape. This tape shall be located 12 inches above the structure and extend from the right-of-way to right-of-way. If the encroaching structure is nonmetallic, the warning tape must include a metallic strip.

Q. No use of United States lands or rights-of-way shall be permitted that involve the storage of hazardous material.

R. For all utility crossings, a permanent placard shall be placed at each point that the utility enters or exits the right-of-way of the United States. This placard shall identify the type of utility located below it, the name of the utility company and a telephone number where the utility company can be reached.

EXHIBIT C

Example Encroachment Agreement

DRAFT

EXHIBIT C

Contract No.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL UTAH PROJECT

EASEMENT ENCROACHMENT AGREEMENT
BETWEEN THE
UNITED STATES OF AMERICA
AND

This Easement Encroachment Agreement made this _____day of _____2016, pursuant to the Act of Congress of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto, all of which acts are commonly known and referred to as Reclamation Laws, among the UNITED STATES OF AMERICA and its assigns, hereinafter referred to as the United States, and _____, hereinafter referred to as the Landowner.

WITNESSETH THAT:

WHEREAS, the United States is the Grantee of that certain easement granted by _____, which easement is recorded in the official records of _____, State of Utah, hereinafter referred to as the Easement of the United States; and

WHEREAS, the Landowner plans to utilize its property in such a manner as to encroach upon the Easement of the United States in a manner more particularly specified hereinafter; and

WHEREAS, the United States is willing to agree to said encroachment, upon conditions more particularly specified hereinafter;

NOW, THEREFORE, the United States hereby agrees to encroachment upon the Easement of the United States by the Landowner only to the extent and for the purposes set forth below:

1. The federal agency is the Department of the Interior, Bureau of Reclamation, represented by the officer executing this Agreement, his duly appointed successor, or his duly authorized representative.

2. The United States guidelines for agreeing to such encroachment upon the Easement of the United States are shown on Exhibit "A," attached hereto and by this reference made a part hereof.

3. The Landowner or its Contractor shall perform all work within the encroachment area in accordance with the plans, drawings, guidelines, and maps attached hereto, and in a manner satisfactory to the United States and _____, hereinafter called the District.

4. SEVERABILITY: Each provision of this use authorization shall be interpreted in such a manner as to be valid under applicable law, but if any provision of this use authorization shall be deemed or determined by competent authority to be invalid or prohibited hereunder, such provision shall be ineffective and void only to the extent of such invalidity or prohibition, but shall not be deemed ineffective or invalid as to the remainder of such provision or any other remaining provisions, or of the use authorization as a whole.

5. ILLEGAL USE: Any activity deemed to be illegal on Federal lands will be cause for immediate termination of the use authorization.

6. TERMINATION OF AGREEMENT: This agreement will terminate and all rights of the Landowner hereunder will cease, and the Landowner will quietly deliver to the United States possession of the premises in like condition as when taken, reasonable wear and damage by the elements excepted, after failure of the Landowner to observe any of the conditions of this agreement, and on the tenth day following service of written notice on the Landowner of termination because of failure to observe such condition.

7. HOLD HARMLESS: The Landowner hereby agrees to indemnify and hold harmless the United States, its employees, agents, and assigns from any loss or damage and from any liability on account of personal injury, property damage, or claims for personal injury or death arising out of the Landowner activities under this agreement.

(a) In consideration of the United States agreeing to encroachment upon the Easement of the United States by the Landowner, the Landowner hereby agrees to indemnify and hold the United States and the District, their agents, employees, and assigns, harmless from any and all claims whatsoever for personal injuries or damages to property when such injuries or damages directly or indirectly arise out of the existence, construction, maintenance, repair, condition, use or presence of the encroachment upon the Easement of the United States, regardless of the cause of said injuries or damages; provided, however, that nothing in this agreement shall be construed as releasing the United States or the District from responsibility for their own negligence. Nothing herein shall be deemed to increase the liability of the United States beyond the provisions of the Federal Tort Claims Act, Act of June 25, 1948, 62 Stat. 989 (28 U.S.C. §1346(b), 2671 et seq.) or other applicable law.

(b) In consideration of the United States agreeing to the Landowner encroaching upon the Easement of the United States, the Landowner agrees that the United States shall not be responsible for any damage caused to facilities, equipment, structures, or other property if damaged by reason of encroachment upon the Easement of the United States by the Landowner. The Landowner hereby releases the United States and the District, their officers, employees, agents, or assigns, from liability for any and all loss or damage of every description or kind whatsoever which may result to the Landowner from the construction, operation, and maintenance of Project works upon said lands; provided that nothing in this Agreement shall be construed as releasing the United States or the District from liability for their own negligence. Nothing herein shall be deemed to increase the liability of the United States beyond the provisions of the Federal Tort Claims Act, Act of June 25, 1948, 62 Stat. 989 (28 U.S.C. §1346(b), 2671 et seq.) or other applicable law.

(c) If the maintenance or repair of any or all structures and facilities of the United States located on the easement area should be made more expensive by reason of the existence of the encroachment improvements or works of the Landowner or its Contractor, the Landowner and /or its Contractor will promptly pay to the United States or the District, their agents or assigns, responsible for operation and maintenance of said structures or facilities, the full amount of such additional expense upon receipt of an itemized bill.

8. PROTECTION OF UNITED STATES INTERESTS: The Landowner shall comply with all applicable laws, ordinances, rules, and regulations enacted or promulgated by any Federal, state, or local governmental body having jurisdiction over the encroachment.

9. UNRESTRICTED ACCESS: The United States reserves the right of its officers, agents, and employees at all times to have unrestricted access and ingress to, passage over, and egress from all of said lands, to make investigations of all kinds, dig test pits and drill test holes, to survey for and construct reclamation and irrigation works and other structures incident to Federal Reclamation Projects, or for any purpose whatsoever. Reclamation will make every reasonable effort to keep damages to a minimum.

10. COVENANT AGAINST CONTINGENT FEES: The Landowner warrants that no person or agency has been employed or retained to solicit or secure this agreement upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established agencies maintained by the Lessee for the purpose of securing business. For breach or violation of this warranty, the United States shall have the right to annul this agreement without liability or in its discretion to require Landowner to pay the full amount of such commission, percentage, brokerage, or contingent fee.

11. OFFICIALS NOT TO BENEFIT: No member of Congress shall be admitted to any share or part of any contract or agreement made, entered into, or accepted by or on behalf of the United States, or to any benefit to arise thereupon.

12. SUCCESSORS IN INTEREST OBLIGATED: The provisions of this Agreement shall inure to the benefit of and be binding upon the heirs, executors, administrators, personal representatives, successors, and assigns of the parties hereto; provided, however, that no such heir, executor, administrator, personal representative, successor or assign of the Landowner shall have the right to use, alter, or modify the encroachment in a manner which will increase the burden of the encroachment of the Easement of the United States.

13. This agreement makes no finding as to the right, title, or validity of the Landowner or the encroaching interest, but merely defines the conditions under which the encroachment will not be deemed unreasonable by the United States.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first above written.

UNITED STATES OF AMERICA

By: _____
Wayne G. Pullan
Manager, Provo Area Office

LANDOWNER

By: _____
Title:

CONCUR:
DISTRICT

By: _____
Title:

EXHIBIT C

ACKNOWLEDGMENT OF THE UNITED STATES

State of UT)
) ss.
County of UT)

On this _____ day of _____, 2014, personally appeared before me _____, known to me to be the _____ of the Provo Area Office, Bureau of Reclamation, Upper Colorado Region, United States Department of Interior, the signer of the above instrument, who duly acknowledged to me that he executed the same on behalf of the United States of America pursuant to authority delegated to him.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

(NOTARY SEAL) _____
Notary Public

ACKNOWLEDGMENT OF

State of)
) ss.
County of)

On this _____ day of _____, 2014, personally appeared before me _____, to be known to be the _____ of _____, the signer of the above instrument, who duly acknowledged to me that he/she executed the same on behalf of _____, pursuant to authority delegated to him/her.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

(NOTARY SEAL) _____
Notary Public

EXHIBIT C

ACKNOWLEDGMENT OF

State of UT)
) ss.
County of SL)

On this _____ day of _____, 2014, personally appeared before me _____, to be known to be the _____ of _____, the signer of the above instrument, who duly acknowledged to me that he/she executed the same on behalf of _____, pursuant to authority delegated to him/her

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

(NOTARY SEAL)

_____
Notary Public

EXHIBIT C

EXHIBIT "A"

ENCROACHMENT GUIDELINES FOR

PROTECTION CRITERIA

A. Surface structures that generally will be allowed to be constructed within United States rights-of-way include asphalt roadways, with no utilities within roadway, non reinforced parking lots, curbs, gutters and sidewalks, walkways, driveways. However, where United States system pipe has specific maximum and minimum cover designation the special requirements for roadways, parking lots and driveways crossing over the pipe shall be obtained from the United States for the maximum allowable external loading or minimum cover. **HOWEVER, IT IS UNDERSTOOD THAT ALL SURFACE STRUCTURES SHALL BE ANALYZED AND CONSIDERED ON AN INDIVIDUAL BASIS.**

B. Structures that may not be constructed in, on, or along United States rights-of-way include but are not limited to, permanent structures such as fences, retaining walls, block walls, buildings, garages, decks, carports, trailers, and swimming pools as designated by the United States.

C. No trees or vines will be allowed within the rights-of-way of the United States.

D. All temporary or permanent changes in ground surfaces within United States rights-of-way are to be considered to be encroaching structures and must be handled as such. Earthfills and cuts on adjacent property shall not encroach onto United States rights-of-way without prior approval by the United States.

E. Existing gravity drainage of the United States rights-of-way must be maintained. No new concentration of surface or subsurface drainage may be directed onto or under the United States rights-of-way without adequate provision for removal of drainage water or adequate protection of the United States rights-of-way.

F. Prior to construction of any structure that encroaches within United States rights-of-way, an excavation must be made to determine the location of existing United States facilities. The excavation must be made by or in the presence of water users or the United States.

G. Any contractor or individual constructing improvements in, on, or along United States rights-of-way must limit his construction to the encroaching structure previously approved and construct the improvements strictly in accordance with plans or specifications.

H. The ground surfaces within United States rights-of-way must be restored to a condition equal to that which existed before the encroachment work began or as shown on the approved plans or specifications.

I. The owner of newly constructed facilities that encroach on United States rights-of-way shall notify the United States and/or the District upon completion of construction and shall provide the

District with one copy and the United States with two copies of as-built drawings showing actual improvements in, on, or along the rights-of-way.

J. Except in case of ordinary maintenance and emergency repairs, an owner of encroaching facilities shall give the District at least 10 days' notice in writing before entering upon United States rights-of-way for the purpose of reconstructing, repairing, or removing the encroaching structure or performing any work on or in connection with the operation of the encroaching structure.

K. If unusual conditions are proposed for the encroaching structure or unusual field conditions within United States rights-of-way are encountered, the United States reserves the right to impose more stringent criteria than those prescribed herein.

L. All backfill material within United States rights-of-way shall be compacted to 90 percent of maximum density unless otherwise shown. Mechanical compaction shall not be allowed within 6 inches of the projects works whenever possible. In no case will mechanical compaction using heavy equipment be allowed over the project works or within 18 inches horizontally of the projects works.

M. That the backfilling of any excavation or around any structure within the United States rights-of-way shall be compacted in layers not exceeding 6 inches thick to the following requirements: (1) cohesive soils to 90 percent maximum density specified by ASTM Part 19, D-698, method A; (2) non-cohesive soils to 70 percent relative density specified by ANSI/ASTM Part 19, d-2049, par. 7.1.2, wet method.

N. Any nonmetallic encroaching structure below ground level shall be accompanied with a metallic strip within the United States rights-of-way.

O. Owners of encroaching facilities shall notify the United States at (801) 379-1000 and/or the District at _____ at least forty-eight (48) hours in advance of commencing construction to permit inspection by the United States and/or the District.

P. No use of United States lands or rights-of-way shall be permitted that involve the storage of hazardous material.

EXHIBIT D

Bangerter Interchanges Protect-in-Place

DRAFT

EXHIBIT D

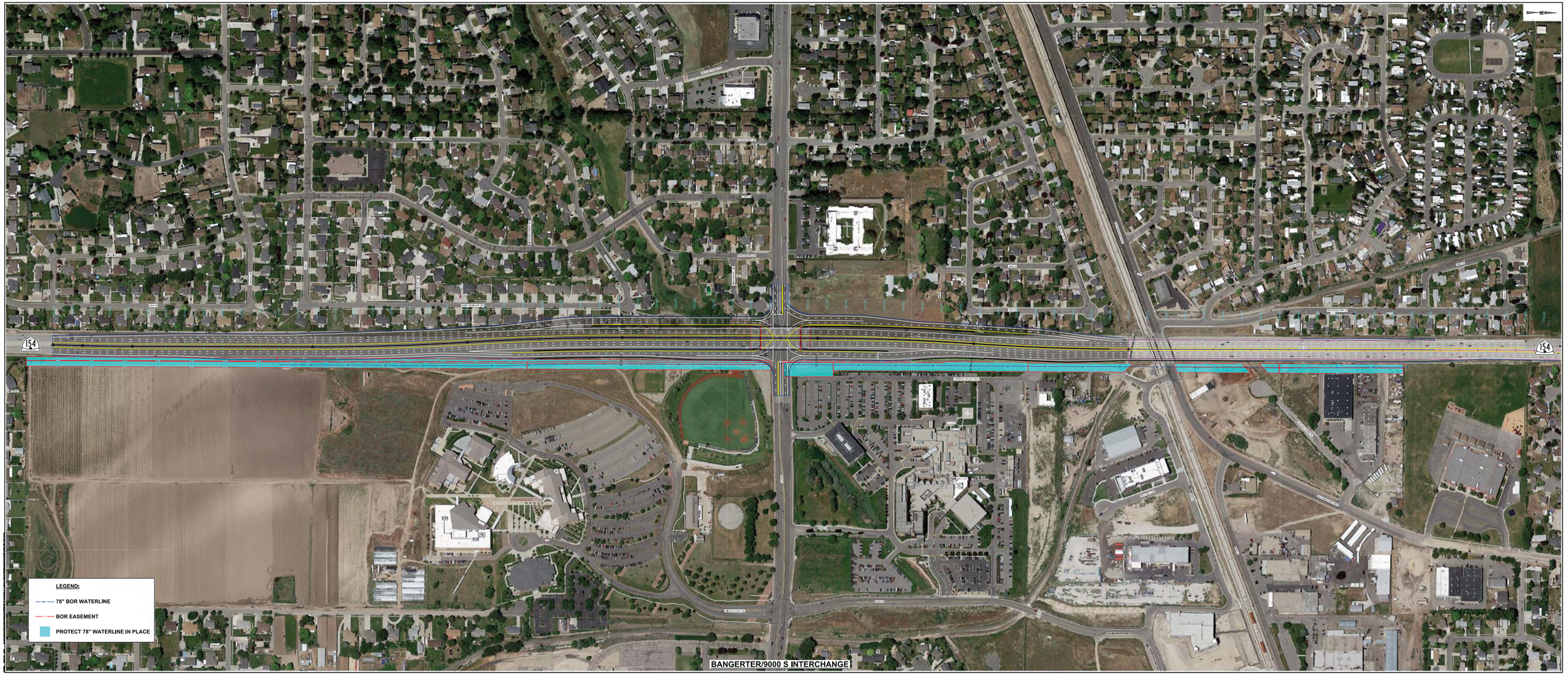

LEGEND:
78" BOR WATERLINE
BOR EASEMENT
PROTECT 78" WATERLINE IN PLACE
BANGERTER/9000 S INTERCHANGE

EXHIBIT D

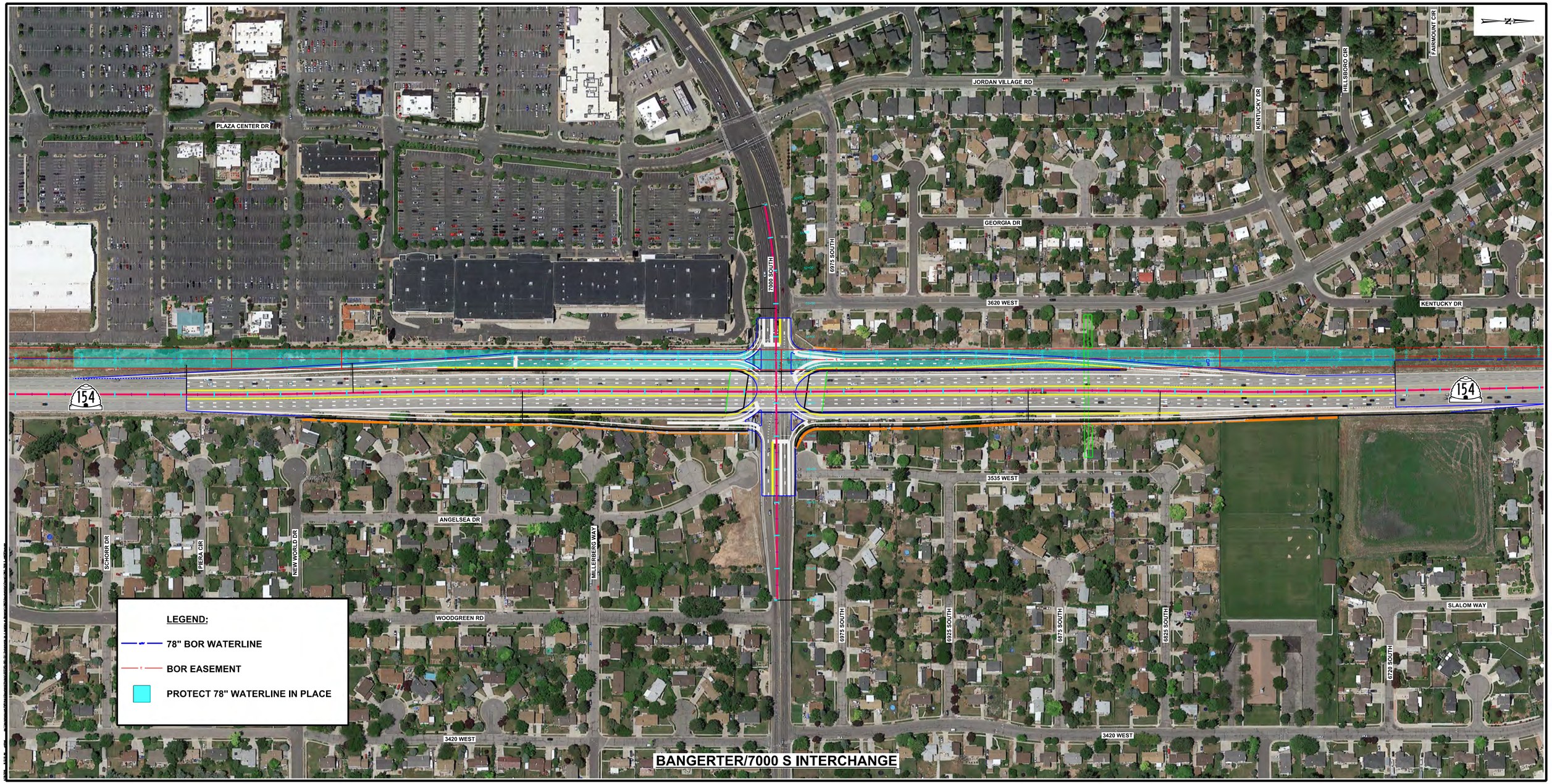

PLAZA CENTER DR
JORDAN VILLAGE RD
KENTUCKY DR
HILLSBORO CIR
FAIRMOUNT CIR
GEORGIA DR
6975 SOUTH
7000 SOUTH
3620 WEST
KENTUCKY DR
154
154
3535 WEST
ANGELSEA DR
SCHORER DR
PIERA CIR
NEW WORLD DR
MILLERBERG WAY
WOODGREEN RD
6975 SOUTH
6925 SOUTH
6875 SOUTH
6825 SOUTH
6720 SOUTH
SLALOM WAY
3420 WEST
3420 WEST
LEGEND:
78" BOR WATERLINE
BOR EASEMENT
PROTECT 78" WATERLINE IN PLACE
BANGERTER/7000 S INTERCHANGE

EXHIBIT D

4015 WEST
SR-173 (5400 SOUTH)
SR-154 (BANGERTER HWY)
LEGEND:
66" BOR Waterline
BOR Easement
PROTECT 66" WATERLINE IN PLACE
Aqueduct Easement Exhibit
BANGERTER HIGHWAY & 5400 S

EXHIBIT E

5400 South and Bangerter Highway, Jordan Aqueduct Relocation
and BOR Aqueduct Existing Utility Actions

DRAFT

SR-173 (5400 SOUTH)

SR-154 (BANGERTER HWY)

355+00

360+00

365+00

N

EXHIBIT E

LEGEND:

- Existing 66" BOR Waterline
- PROPOSED 66" BOR Waterline
- Existing BOR Easement
- PROPOSED BOR EASEMENT
- Existing Easement to Remain
- PROPOSED NEW BOR EASEMENT
- PROPOSED EASEMENT TO REMOVE

Aqueduct Easement Exhibit
BANGERTER HIGHWAY & 5400 S

EXHIBIT E

PROTECT IN PLACE
Buried Electric (UDOT)
Fiber (UDOT SYRINGIA)
Buried Electric (RMP)
Fiber (VERIZON)
12" Waterline (Taylorsville)
Telephone (Century Link)

REMOVE
Buried Electric (UDOT)

PROTECT IN PLACE
Telephone (Century Link)

PROTECT IN PLACE
8" Sewer (Taylorsville)

LOOP WATERLINE
18" waterline (Taylorsville)

PROTECT IN PLACE
Buried Electric (RMP)

PROTECT IN PLACE
Fiber (MBI ATT ZAYO)

PROTECT IN PLACE
Fiber (UDOT SYRINGIA)

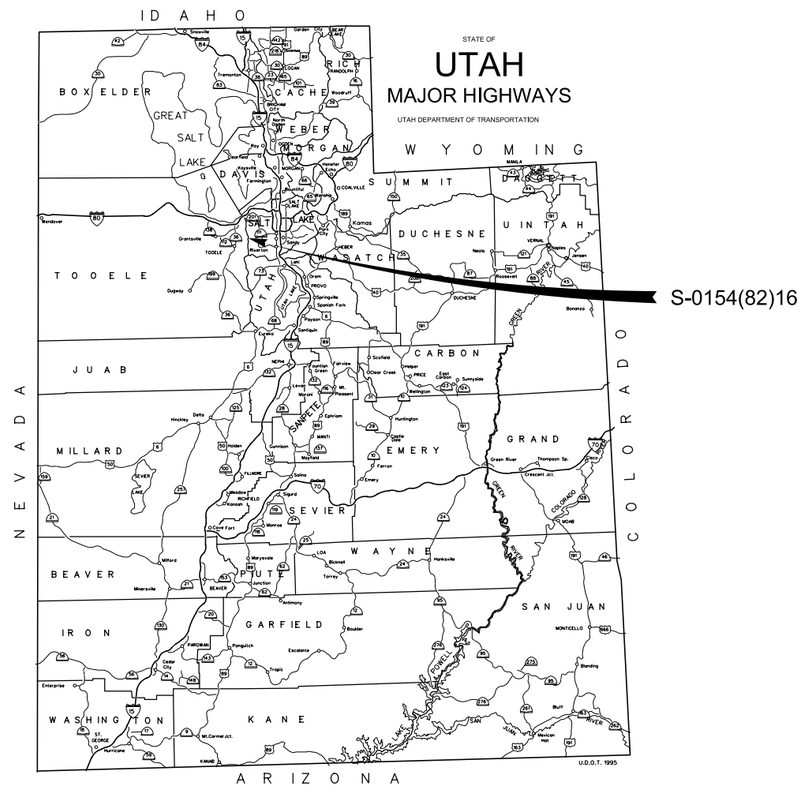
5400 S

NOTE:
UTILITIES THAT RUN LONGITUDINALLY WITH BOR EASMENT AND ARE PROTECTED IN PLACE WILL BE RELOCATED WITH BANGERTER 4 INTERCHANGES PROJECT

BOR Aqueduct Relocation existing utility actions

EXISTING BOR EASMENT

PROPOSED BOR EASMENT



UTAH
DEPARTMENT OF TRANSPORTATION

SEE SHEET 1-A FOR INDEX TO SHEETS

SHEET NO.
1

U.S. Standard Units
(Inch-Pound Units)

ALL UNITS IN FEET UNLESS OTHERWISE NOTED

PLANS OF PROPOSED STATE ROAD

STATE FUNDED

S-0154(82)16 PIN: 14785

BANGERTER HWY. @ 5400 S. AQUEDUCT RELOCATION

SR-154; MP 15.84-16.09

SALT LAKE COUNTY

LENGTH 0.25 MILES

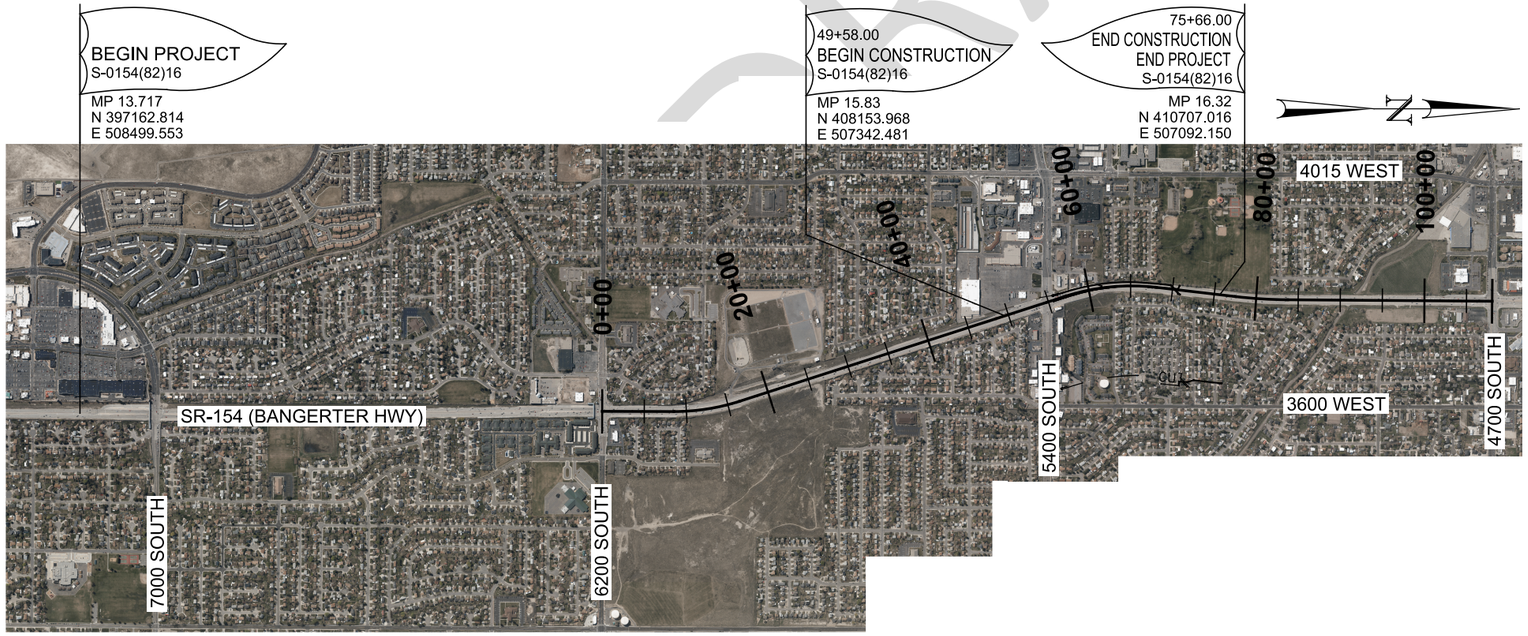
Sections 8, 17, 20 & 29; Township 2 South; Range 1 West

DRAFT

PROFESSIONAL ENGINEER
93-178887-2202
CORY
POPE
ELECTRONIC SEAL
STATE OF UTAH

07/18/2016

THIS SEAL APPLIES TO ALL SHEETS
CONTAINING THIS SIGNATURE



ACCEPTED

MANAGER, FIELD ENGINEERING DIVISION I

VERIFIED FOR SUBMISSION FOR ADVERTISEMENT

DESIGN ENGINEER

UTAH DEPARTMENT OF TRANSPORTATION

APPROVED FOR USE BY UDOT

REGION TWO PRECONSTRUCTION ENGINEER

EXHIBIT E

7/19/2016 9:51:04 AM pw:\\pw.horrocks.com\PWPrimary\Documents\Projects\2016\PIG-858-1604 Bangerter 4 Interchanges PM\14785\Sheet_Files\Cover\14785_Coversheet.dgn

SECTION IDENTIFICATION

(1) SECTION CUT SHOWN ON DRAWING AS:

SECTION LETTER — A / C-10

DRAWING NUMBER WHERE THE SECTION IS SHOWN (SEE NOTE A)

(2) THIS SECTION IS IDENTIFIED AS:

SECTION — A / M-01 — A / M-01, M-02, M-03 — SECTION LETTER

SCALE: AS DESIGNATED

DRAWING NUMBER WHERE THE SECTION CUT IS SHOWN (SEE NOTE A)

DETAIL IDENTIFICATION

(1) DETAIL IDENTIFICATION SHOWN ON DRAWING AS:

DETAIL NUMBER — 3 / C-10

DRAWING NUMBER WHERE THE DETAIL IS SHOWN

THE DETAIL NAME IS OPTIONAL AND LOCATED HERE, FOLLOWING DETAIL CALLOUT

(2) THIS DETAIL IS IDENTIFIED AS:

DETAIL — 3 / M-01 — DETAIL NUMBER

SCALE: AS DESIGNATED (SEE NOTE A)

DRAWING NUMBER WHERE THE DETAIL IS SHOWN

TYPICAL DETAIL IDENTIFICATION

DETAIL NAME — C / 2000

NOT TO SCALE

TYPICAL DETAIL NUMBER, SEE INDEX OF DRAWINGS FOR LOCATION OF GENERAL DRAWINGS

DRAWING IDENTIFICATION SYSTEM

LETTER	DISCIPLINE
G	GENERAL
C	CIVIL
CP	CATHODIC PROTECTION
GC	GENERAL CIVIL

S-2 — INDIVIDUAL DRAWING NUMBER — DISCIPLINE

NOTES:

A. IF PLAN AND SECTION (OR DETAIL CALL-OUT AND DETAIL) ARE SHOWN ON SAME DRAWING, DRAWING NUMBER IS REPLACED BY A HORIZONTAL LINE.

B. ELECTRICAL SYMBOLS SHOWN ON ELECTRICAL DRAWINGS. FOR WELDING SYMBOLS USE AMERICAN WELDING SOCIETY STANDARD SYMBOLS. SEE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL.

LEGEND

SYMBOL	DESCRIPTION
1	COORDINATE IDENTIFICATION
	ELEVATION INDICATOR
	SECTION CORNER
	BENCH MARK
	MONUMENT INDICATOR
	POTHOLE
	TEST HOLE
	BORING HOLE
	SECTION LINE
	PROPERTY LINE
	EASEMENT
	PARCEL
R/W	RIGHT-OF-WAY
	NEW ASPHALT
	EXISTING ASPHALT
	CENTERLINE
4500	CONTOUR LINE, FINISHED GRADE
4500	CONTOUR LINE, EXISTING GRADE
4500.20	FINISHED ELEVATION
(4500.20)	EXISTING ELEVATION
TOP / TOE	CUT OR FILL SLOPE TO BE CONSTRUCTED
	SILT FENCE
X	FENCE
	RAILING
	DITCH
	CULVERT
	RIPRAP
	TREE LINE/VEGETATION
	EXISTING STRUCTURE OR FACILITY
	NEW STRUCTURE OR FACILITY
	FUTURE STRUCTURE OR FACILITY
	NEW PIPELINE (CIVIL SHEETS)
	NEW PIPELINE 10" DIA AND SMALLER (CIVIL SHEETS)
	EXISTING UTILITY PIPELINE
ATMS	ATMS
CTV	CABLE
C(ug)	COMMUNICATION BURIED
COMM	COMMUNICATION OVERHEAD
P(ug)	ELECTRICAL BURIED
OHP	ELECTRICAL OVERHEAD
FO	FIBER OPTICS
GAS	GAS
HPG	HIGH PRESSURE GAS
IRR	IRRIGATION
PETRO	PETROLEUM LINE
SS	SANITARY SEWER
SD	STORM DRAIN
T(ug)	TELEPHONE BURIED
TEL	TELEPHONE OVERHEAD
W	WATERLINE
Tv	CABLE BOX
	CATCH BASIN
EB	ELECTRICAL BOX
	HYDRANT
G	GAS MANHOLE
S	SEWER MANHOLE
D	STORM DRAIN MANHOLE
T	TELEPHONE MANHOLE
W	WATER MANHOLE
WM	WATER METER
	POWER POLE
	TELEPHONE BOX
	LIGHT POLE ONE LUMINAIRE
	LIGHT POLE TWO LUMINAIRS
	LIGHT POLE
	STREET LIGHT WITH BRACKET
	MASONRY
	STEEL
	INSULATION
	GRAVEL
	CONCRETE
	EARTH
	SAND
SPAN	GRATING
	PLASTIC, RUBBER OR NEOPRENE
	WOOD (ROUGH FRAMING) OR, OPENING OR DEPRESSION IN SLAB OR WALL
	CHANGE IN PIPING MATERIAL
	REVISION WORK

GENERAL NOTES:

1. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS FROM DAMAGE WHICH ARE TO REMAIN IN PLACE. ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTORS OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED TO ORIGINAL OR BETTER CONDITION TO THE SATISFACTION OF THE OWNER AT THE EXPENSE OF THE CONTRACTOR.
2. CONTRACTOR IS SOLELY RESPONSIBLE FOR CONFORMANCE WITH LOCAL AND FEDERAL CODES GOVERNING SHORING AND BRACING OF EXCAVATIONS AND TRENCHES. CONTRACTOR IS RESPONSIBLE FOR THE SAFETY OF THE PUBLIC AND PROTECTION OF PERSONNEL AND WORKERS.
3. DEWATERING: GROUND WATER AND SURFACE WATER CONTROL SHALL BE PERFORMED AND RESPONSIBLY HANDLED BY THE CONTRACTOR ACCORDING TO, AND IN COMPLIANCE WITH, ALL LOCAL GOVERNING AUTHORITIES. GROUND WATER AND/OR SURFACE WATER PUMPING MAY BE REQUIRED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE POTENTIAL PUMPING NEEDS. CONTRACTOR SHALL OBTAIN DEWATERING PERMIT AS NECESSARY.
4. CONTRACTOR SHALL PREVENT ANY GROUND WATER OR DEBRIS FROM ENTERING NEW PIPES DURING CONSTRUCTION. THE ENDS OF THE PIPES SHALL BE SEALED AT THE END OF EACH WORKDAY.
5. PROFILE DRAWINGS ARE HORIZONTAL PROJECTIONS OF THE PIPELINE CENTERLINE, UNLESS OTHERWISE NOTED.
6. LAY PIPE TO DEPTH AND ALONG HORIZONTAL ALIGNMENT AS DEFINED IN THESE DRAWINGS. CONTRACTOR SHALL NOT DEVIATE FROM PROPOSED ALIGNMENT OR GRADE WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER. AVOID HIGH AND LOW POINTS EXCEPT WHERE DESIGNED.
7. CONTRACTOR SHALL PERFORM CHLORINATION TEST, PRESSURE TEST, AND BACTERIA TEST. ALL WATERLINES INSTALLED SHALL BE DISINFECTED IN ACCORDANCE WITH THE "AMERICAN WATER WORKS ASSOCIATION STANDARD FOR DISINFECTING WATER MAINS" (AWWA C651). ALL CHLORINATED WATER SHALL BE DISPOSED OF IN ACCORDANCE WITH THE UTAH DEPT OF ENVIRONMENTAL QUALITY RULES AND REQUIREMENTS FOR SURFACE DISCHARGE.
8. PRESSURE TEST ALL PIPELINES TO 100 PSI FOR FOUR HOURS WITH ZERO LEAKAGE. IN THE CASE OF PIPELINES THAT FAIL TO PASS THE LEAKAGE TEST, THE CONTRACTOR SHALL DETERMINE THE CAUSE OF THE EXCESSIVE LEAKAGE, SHALL TAKE CORRECTIVE MEASURES NECESSARY TO REPAIR THE LEAKS, AND SHALL AGAIN TEST THE PIPELINES, ALL AT NO COST TO THE OWNER.
9. ALL MATERIALS WHICH MAY CONTACT DRINKING WATER INCLUDING PIPES, GASKETS, LUBRICANTS, AND O-RINGS, SHALL BE ANSI-CERTIFIED AS MEETING THE REQUIREMENTS OF NSF STANDARD 61, DRINKING WATER SYSTEM COMPONENTS-HEALTH EFFECTS. TO PERMIT FIELD VERIFICATION OF THIS CERTIFICATION, ALL SUCH COMPONENTS SHALL BE APPROPRIATELY STAMPED WITH THE NSF LOGO.
10. HYDRAULIC DESIGN CRITERIA OF JA-3 RELOCATION SEGMENT – 50 PSI WORKING PRESSURE AND 100 PSI TEST PRESSURE.
11. CONTRACTOR SHALL PROTECT THE EXISTING JORDAN AQUEDUCT. DO NOT STOCKPILE MATERIALS OVER THE EXISTING PIPELINE OR OTHERWISE INCREASE OR DECREASE THE COVER ON THE EXISTING PIPELINE. CONTRACTOR SHALL CONDUCT OPERATIONS AS TO PREVENT OPERATION OF HEAVY EQUIPMENT THAT MAY POINT LOAD OR OTHERWISE NEGATIVELY IMPACT THE EXISTING AQUEDUCT. OPERATION OF CONSTRUCTION EQUIPMENT WITHIN THE AQUEDUCT EASEMENT SHALL BE SUBJECT TO BOR APPROVAL.

ABBREVIATIONS:

ANSI — AMERICAN NATIONAL STANDARDS INSTITUTE
ASME — AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM — AMERICAN SOCIETY FOR TESTING AND MATERIAL
AWWA — AMERICAN WATER WORKS ASSOCIATION

BF — BLIND FLANGE, BUTTERFLY VALVE
BHD — BULKHEAD
BO — BLOW-OFF ASSEMBLY, BLOW-OFF
BOR — U.S. BUREAU OF RECLAMATION

CCP — CONCRETE CYLINDER PIPE
CML & C — CEMENT MORTAR LINED AND COATED
COMB — COMBINED
CONC — CONCRETE, CONCENTRIC
CONN — CONNECTION
COORD — COORDINATE
CYL — CYLINDER

DI — DUCTILE IRON, DROP INLET
DIA — DIAMETER
DIP — DUCTILE IRON PIPE
DWG — DRAWING

E — EAST
EF — EACH FACE, EXHAUST FAN
EG — EXISTING GRADE
EL — ELEVATION
ELEV — ELEVATION
EW — EACH WAY, EYE WASH
EX — EXISTING
EXT — EXTERIOR, EXTENSION, EXTERNAL

F — FAHRENHEIT, FACE
FAB — FABRICATION, FABRICATE, OR FABRICATED
FF — FLAT FACE, FAR FACE, FINISH FLOOR

GALV — GALVANIZED
GI — GALVANIZED IRON
GR — GRADE
GB — GRADE BREAK, GRADE CHANGE
GRV — GROOVED

HORIZ — HORIZONTAL

ID — INSIDE DIAMETER
IE — INVERT ELEVATION
IF — INSIDE FACE
IN — INCH

JA — JORDAN AQUEDUCT
JT — JOINT
JTS — JOINTS
JVWTP — JORDAN VALLEY WATER TREATMENT PLANT

LF — LINEAR FEET

MH — MANHOLE, MONORAIL HOIST
MTL — METAL OR MATERIAL
MW — MANWAY

N — NORTH
NPT — NATIONAL PIPE THREAD
NTS — NOT TO SCALE

PC — POINT OF CURVE
PE — PLAIN END, POLYELECTROLYTE POLYMER, POLYETHYLENE
PG — PRESSURE GAUGE
PI — POINT OF INTERSECTION
POB — POINT OF BEGINNING
PSF — POUNDS PER SQUARE FOOT
PSI — POUNDS PER SQUARE INCH
PSIG — POUNDS PER SQUARE INCH GAUGE
PT — POINT OF TANGENT, PRESSURE TREATED
PVI — POINT OF VERTICAL INTERSECTION
PW — POTABLE WATER

RCP — REINFORCED CONCRETE PIPE
R/W — RIGHT OF WAY

SD — STORM DRAIN
SHT — SHEET
SIM — SIMILAR
SPEC — SPECIFIED, SPECIFICATION
SPECS — SPECIFICATIONS
SS — SANITARY SEWER, SERVICE SINK
SST — STAINLESS STEEL
STA — STATION
STD — STANDARD
STL — STEEL

T — THICKNESS, TOP, TOILET
T&B — TOP AND BOTTOM
TEL — TELEPHONE
THR'D — THREADED
TYP — TYPICAL

UG — UNDERGROUND
UNO — UNLESS OTHERWISE NOTED

VC — VERTICAL CURVE
VERT — VERTICAL
VPI — VERTICAL POINT OF INFLECTION

W — WEST
WSP — WELDED STEEL PIPE

JA – 3 RELOCATION HORIZONTAL ALIGNMENT

ELEMENT	STATION	NORTHING	EASTING	PI NORTHING	PI EASTING	DELTA	RADIUS	TANGENT	CURVE LENGTH
POB	1250+15.59	408714.63	507105.98					N09°30'42"W	
PI	1250+18.99	408717.99	507105.42					N17°54'48"W	
PI	1251+43.24	408836.21	507067.21					N16°58'20"W	
PC	1252+10.39	408900.43	507047.61	409342.27	506912.76	021°18'19"	2455.94'	N06°19'10"W	913.24'
PT	1261+23.62	409802.90	506947.66					N04°19'59"E	
PI	1263+22.42	410001.13	506962.68					N06°43'10"E	
PI	1264+45.25	410123.12	506977.05					N47°24'08"E	
PI	1266+11.59	410235.71	507099.50					N01°33'50"E	
POE	1266+18.47	410242.58	507099.69					N01°33'50"E	

DRAFT

REVISIONS | NO. | DATE | APPROVED BY | REMARKS

DRAWN | ACCEPTED BART LEEFLANG, P.E. MANAGER, FIELD ENGINEERING DIVISION | STATION: PROVO, UTAH

DRAWN BY SR | QC CHECKED BY JL

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

APPROVED | 07/14/16 DATE | PROFESSIONAL ENGINEER

PROJECT: SR-154 BANGERTER HWY — JORDAN AQUEDUCT PROTECTION AND RELOCATION

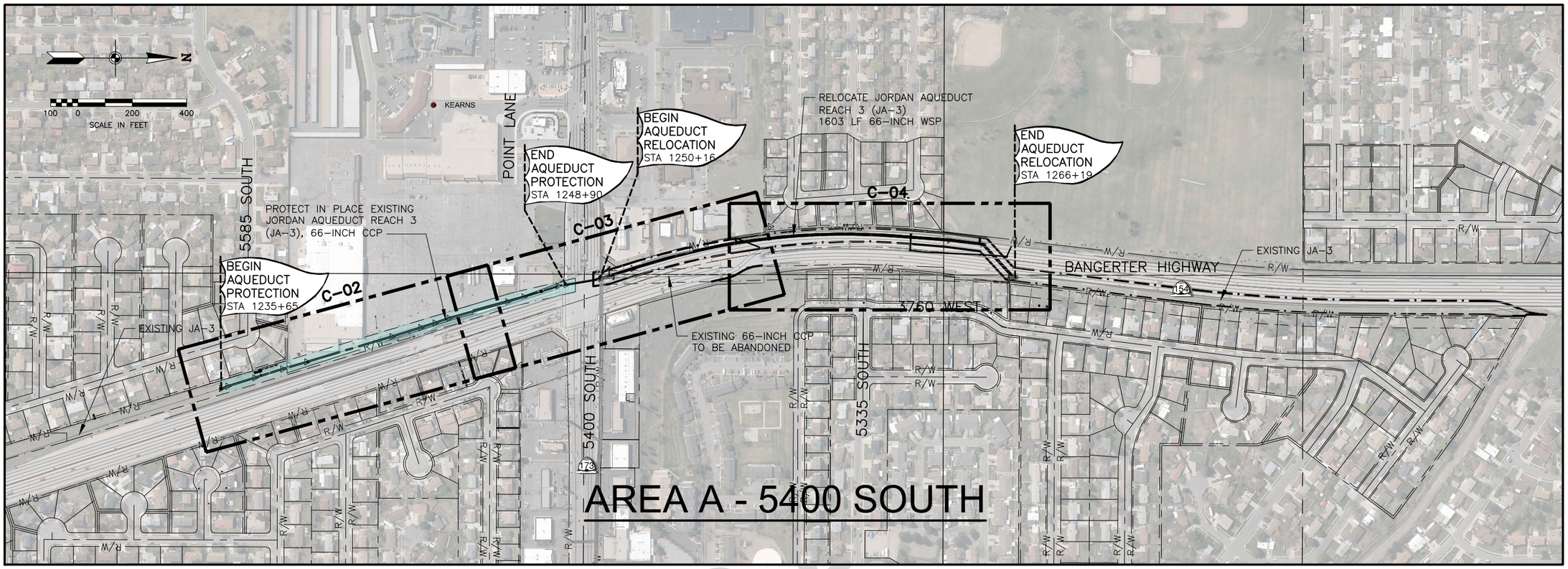
PROJECT NUMBER: S-0154(82)16 | PIN 14785

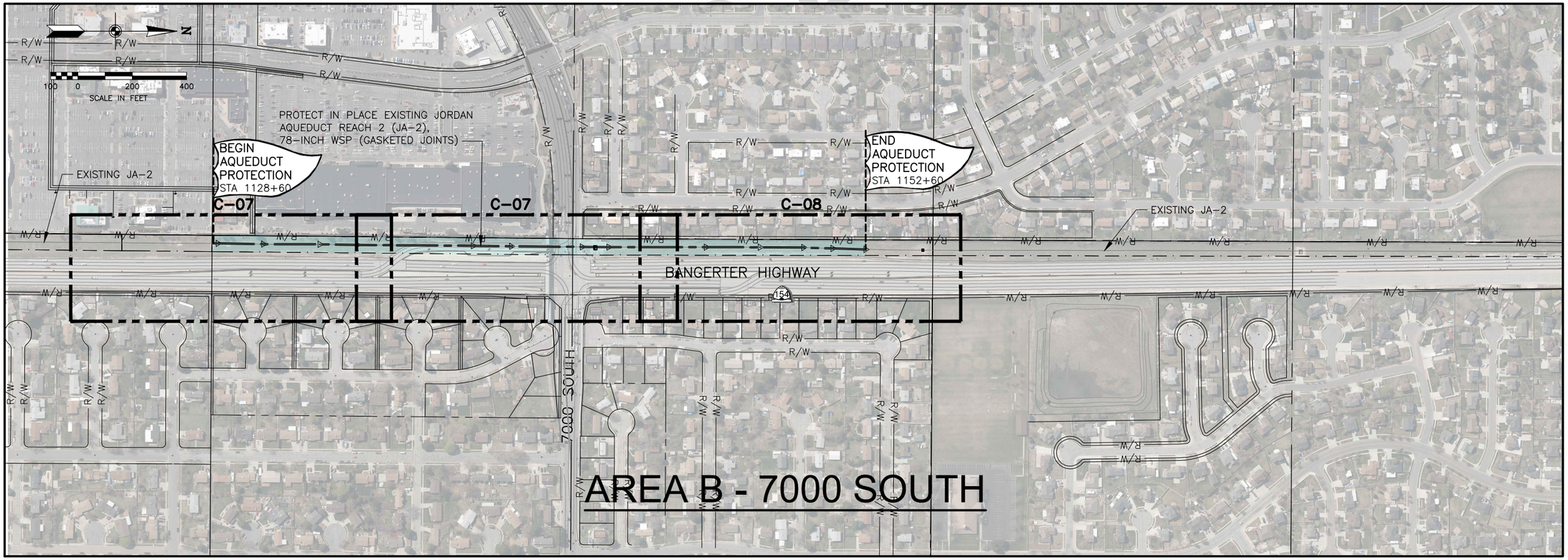
SYMBOLS, ABBREVIATIONS AND NOTES

SHEET NO. G-01

EXHIBIT E

P:\Horrocks\243-16-02_UDOT SR-154 JA Services\2.0 - Design Phase\2.7 Drawings\Sht\243160 2_G-01.dwg Plotted 7/19/2016 By Rodolfo Garcia





REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
ACCEPTED BY: P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY	SR		
QC CHECKED BY	JL		
DATE	07/14/16		

APPROVED

PROFESSIONAL ENGINEER

EXHIBIT E

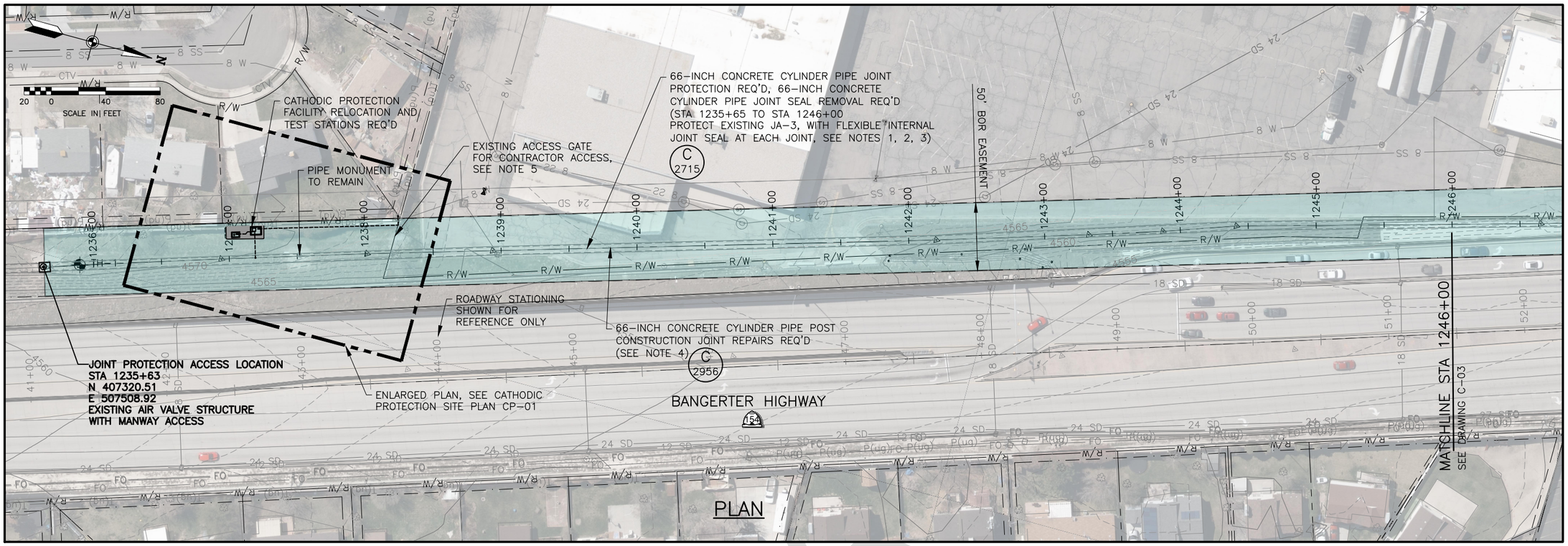
PROJECT: SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION

PROJECT NUMBER: PIN 14785
S-0154(82)16

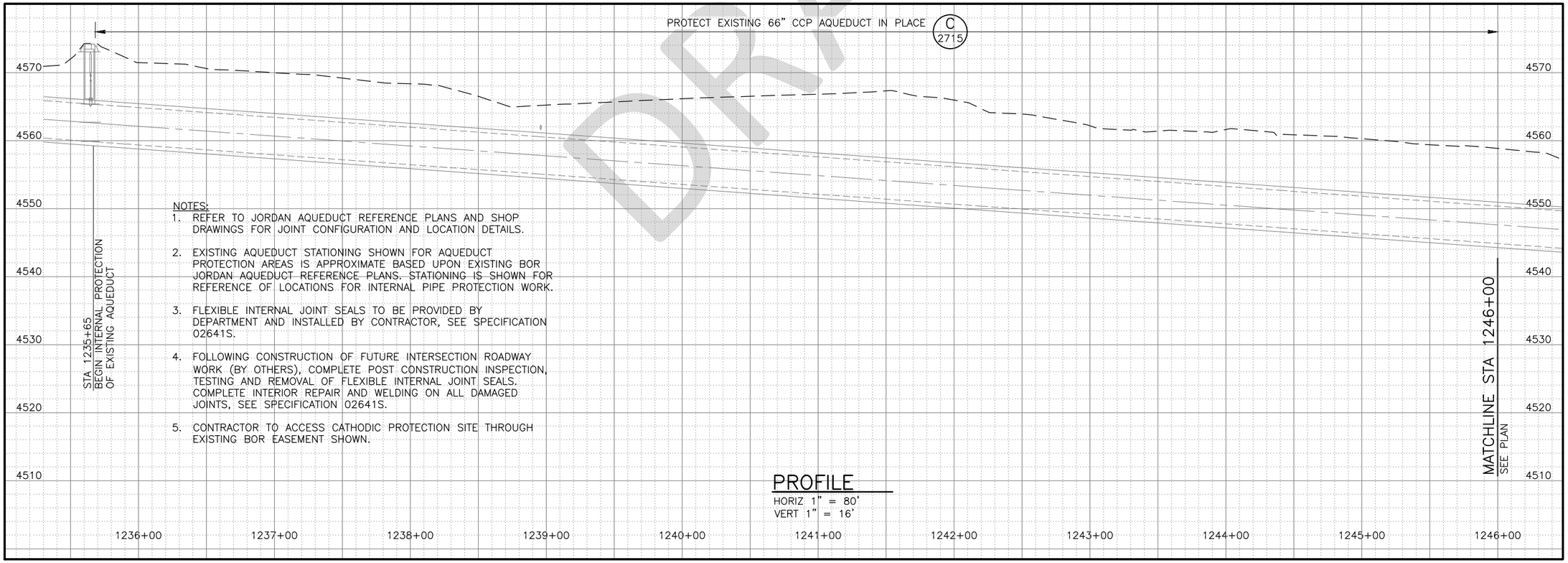
OVERALL SITE PLAN

SHEET NO. C-01

P:\Horrocks\243-16-02_UDOT SR-154 JA Services\2.0 - Design Phase\2.7 Drawings\Shr\243-1602_C-01.dwg Plotted 7/14/2016 By: Seth Riggs



PLAN



NOTES:

1. REFER TO JORDAN AQUEDUCT REFERENCE PLANS AND SHOP DRAWINGS FOR JOINT CONFIGURATION AND LOCATION DETAILS.
2. EXISTING AQUEDUCT STATIONING SHOWN FOR AQUEDUCT PROTECTION AREAS IS APPROXIMATE BASED UPON EXISTING BOR JORDAN AQUEDUCT REFERENCE PLANS. STATIONING IS SHOWN FOR REFERENCE OF LOCATIONS FOR INTERNAL PIPE PROTECTION WORK.
3. FLEXIBLE INTERNAL JOINT SEALS TO BE PROVIDED BY DEPARTMENT AND INSTALLED BY CONTRACTOR, SEE SPECIFICATION 02641S.
4. FOLLOWING CONSTRUCTION OF FUTURE INTERSECTION ROADWAY WORK (BY OTHERS), COMPLETE POST CONSTRUCTION INSPECTION, TESTING AND REMOVAL OF FLEXIBLE INTERNAL JOINT SEALS. COMPLETE INTERIOR REPAIR AND WELDING ON ALL DAMAGED JOINTS, SEE SPECIFICATION 02641S.
5. CONTRACTOR TO ACCESS CATHODIC PROTECTION SITE THROUGH EXISTING BOR EASEMENT SHOWN.

PROFILE

HORIZ 1" = 80'
VERT 1" = 16'

DRAFT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
JAMES FELDING, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY	CHECKED BY	APPROVED	DATE
SR	JL		07/14/16
QC			

PROJECT: SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION

PROJECT NUMBER: S-0154(82)16
PIN: 14785

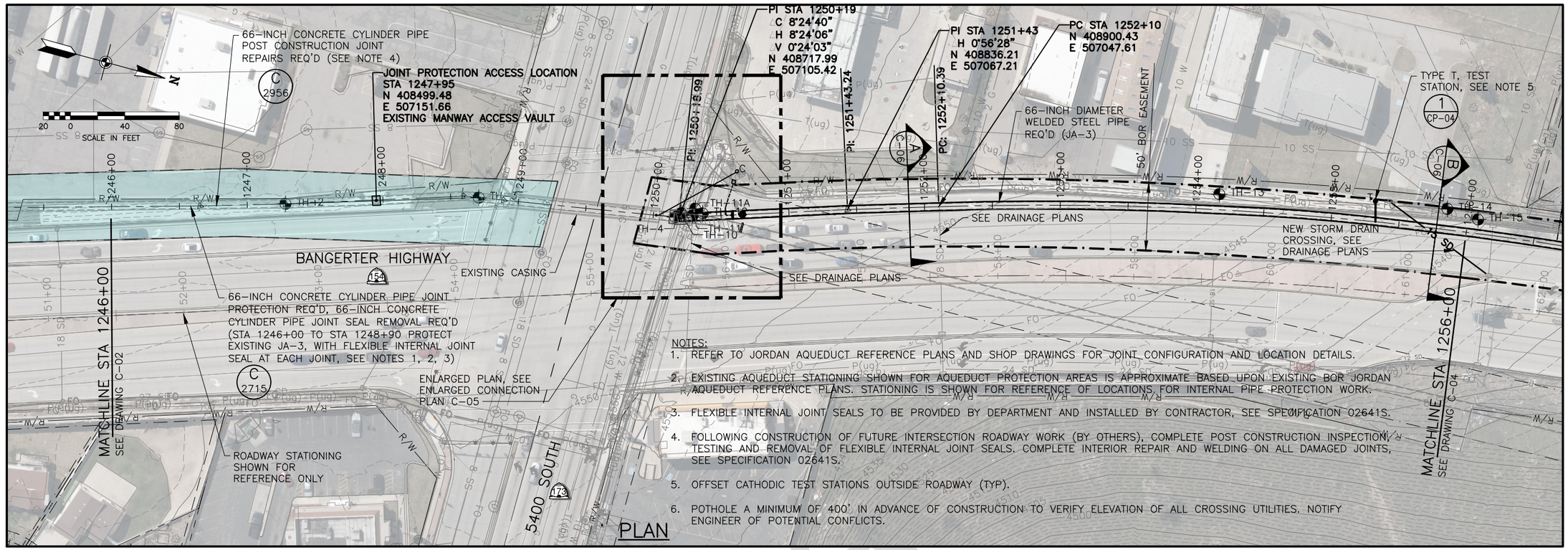
5400 SOUTH PLAN AND PROFILE

PROFESSIONAL ENGINEER

SHEET NO. C-02

EXHIBIT E

P:\Hermosa\0243-16-02_UDOT SR-154 JA Services\2.0 - Design Phase\2.7 Drawings\Shts\243160 2_C-02.dwg Plotted 7/26/2016 By: Seth Riggs



NOTES:

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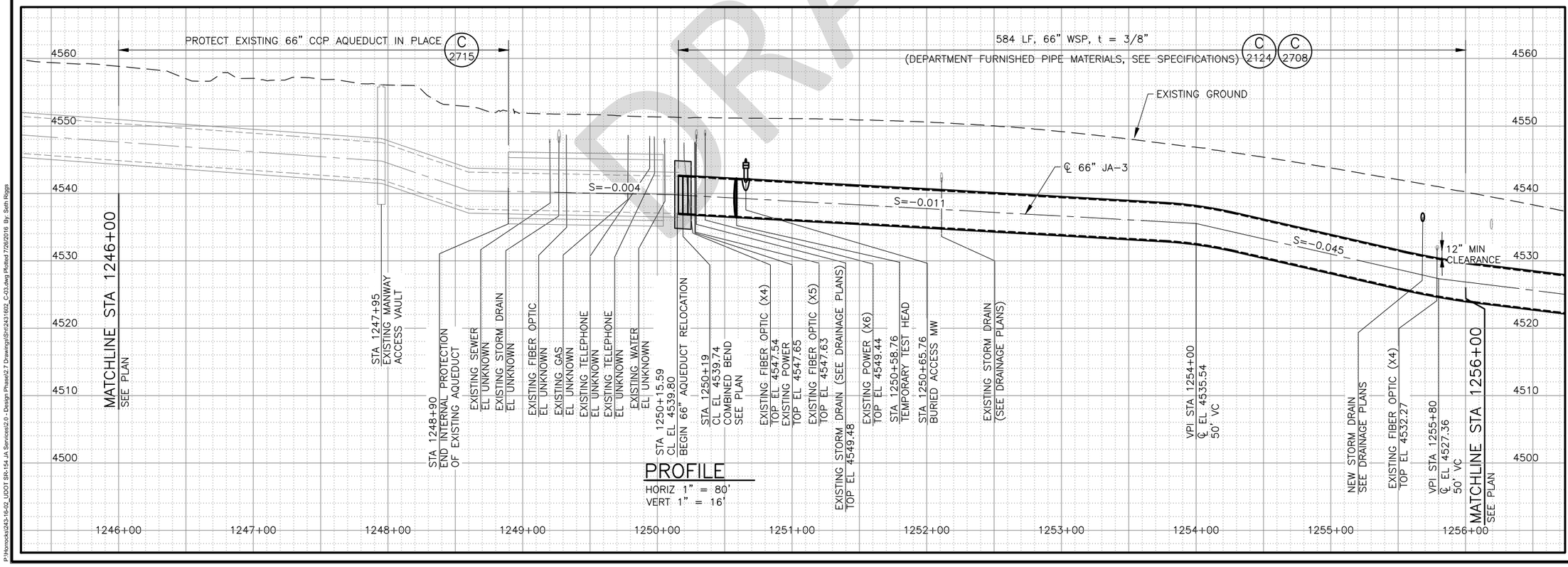
3. FLEXIBLE INTERNAL JOINT SEALS TO BE PROVIDED BY DEPARTMENT AND INSTALLED BY CONTRACTOR, SEE SPECIFICATION 02641S.
4. FOLLOWING CONSTRUCTION OF FUTURE INTERSECTION ROADWAY WORK (BY OTHERS), COMPLETE POST CONSTRUCTION INSPECTION, TESTING AND REMOVAL OF FLEXIBLE INTERNAL JOINT SEALS. COMPLETE INTERIOR REPAIR AND WELDING ON ALL DAMAGED JOINTS, SEE SPECIFICATION 02641S.
5. OFFSET CATHODIC TEST STATIONS OUTSIDE ROADWAY (TYP).
6. POTHOLE A MINIMUM OF 400' IN ADVANCE OF CONSTRUCTION TO VERIFY ELEVATION OF ALL CROSSING UTILITIES. NOTIFY ENGINEER OF POTENTIAL CONFLICTS.



REVISIONS				
NO.	DATE	APPROVED BY	REMARKS	

DRAWN

ACCEPTED
ALAN REDING, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY	SR
QC CHECKED BY	JL
DATE	07/14/16

APPROVED

PROFESSIONAL ENGINEER

PROJECT: SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION

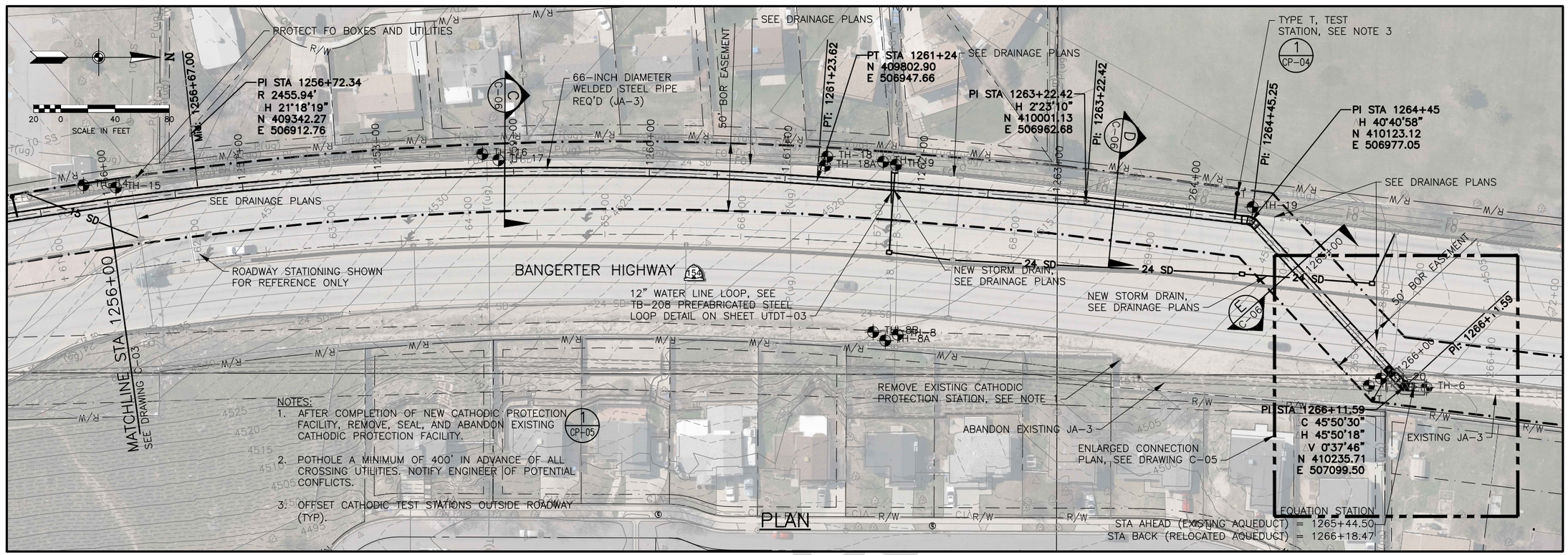
PROJECT NUMBER: S-0154(82)16 PIN 14785

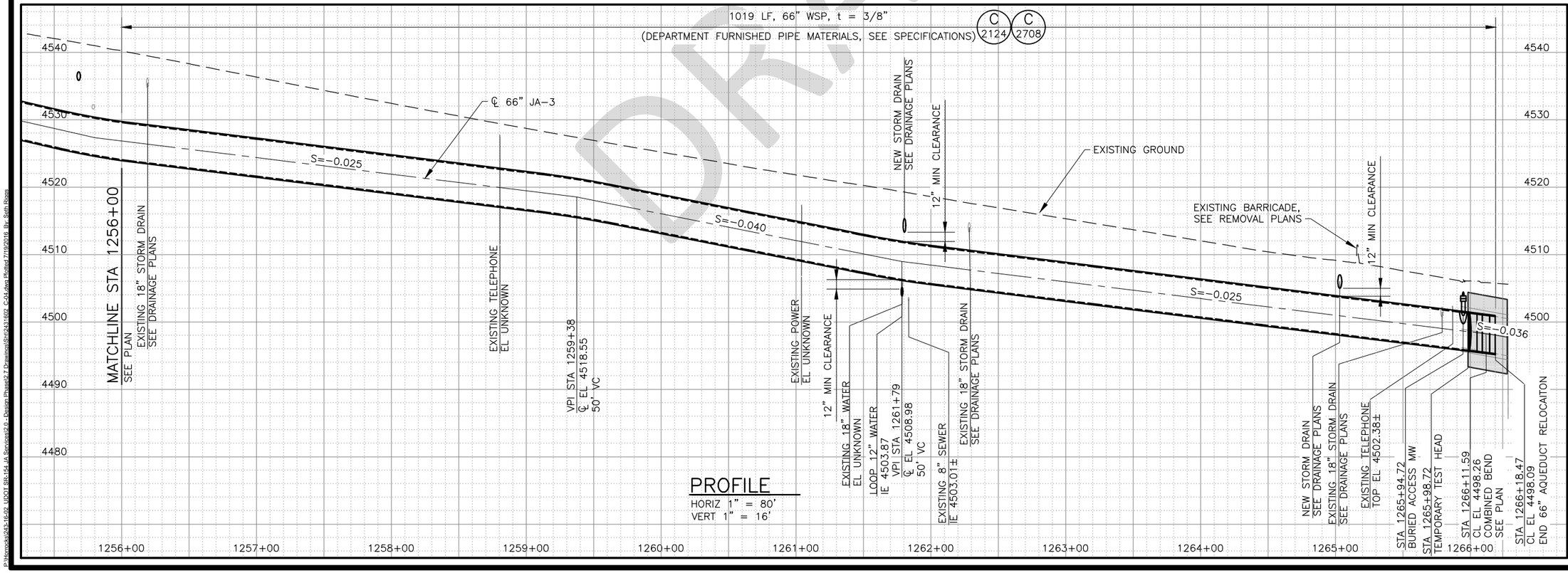
5400 SOUTH PLAN AND PROFILE

SHEET NO. C-03

EXHIBIT E

P:\Hermosk\243-16-02_UDOT SR-154 JA Services\2.0 - Design Phase\2.7 Drawings\Shts\243160 2_C-03.dwg Plotted 7/26/2016 By: Seth Riggs





DRAFT

NO.	DATE	REVISIONS	APPROVED BY	REMARKS

DRAWN

ACCEPTED
ALEX FELDMANG, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY	SR
QC CHECKED BY	JL

APPROVED

07/14/16
DATE
PROFESSIONAL ENGINEER

PROJECT: SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION

PROJECT NUMBER: S-0154(82)16 | PIN: 14785

5400 SOUTH PLAN AND PROFILE

SHEET NO. C-04

EXHIBIT E

P:\Projects\249-10-09_UDOT SR-154 JA Secured\0 Design Phase\2 Drawings\Sht\249109_CoverSheet.dwg Plotted 7/19/2016 By Sean Rona

NOTES:

1. INSTALLATION OF SPECIAL FITTINGS TO TAKE PLACE DURING AQUEDUCT SHUTDOWN PERIOD FOLLOWING FINAL TESTING AND DISINFECTION OF NEW 66" AQUEDUCT.
2. REFER TO SPECIFICATIONS FOR COORDINATION REQUIREMENTS REGARDING JORDAN AQUEDUCT SHUT-DOWN.
3. INSTALL TEMPORARY STEEL PLATE COVER AS SHOWN OVER EXISTING JA-3 DURING FINAL TIE-IN INSTALLATION. EXISTING AQUEDUCT TO BE PERMANENTLY ABANDONED BY OTHERS.
4. CONNECTION TO EXISTING AQUEDUCT SHALL NOT BE LESS THAN 4 FEET FROM AN EXISTING CCP JOINT. FIELD VERIFY JOINT LOCATION WITH ENGINEER PRIOR TO CUTTING INTO EXISTING AQUEDUCT. SPECIAL CONNECTION FITTING TO BE PROVIDED WITH ADEQUATE CUT-TO-FIT LENGTH TO ACCOMMODATE FIELD CONDITIONS AT THE TIE-IN LOCATION.
5. CONTRACTOR TO EXPOSE CONNECTION POINTS TO VERIFY GEOMETRY, DIAMETERS, EXISTING JOINT LOCATIONS, AND MATERIALS PRIOR TO BEGINNING TO LAY ANY PIPE. NOTIFY ENGINEER OF POTENTIAL CONFLICTS OR COORDINATION ITEMS OF SPECIAL CONNECTION FITTINGS.
6. EXISTING TYPE C TEST STATION. REPLACE IF DAMAGED BY AQUEDUCT CONNECTION. 2 CP-04

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
ALBERT FERLAND, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY	SR
QC	
CHECKED BY	JL
DATE	07/14/16

APPROVED

PROFESSIONAL ENGINEER

PROJECT: SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION

PROJECT NUMBER: S-0154(82)16 PIN 14785

ENLARGED PLANS AT CONNECTION POINTS

SHEET NO. C-05

EXHIBIT E

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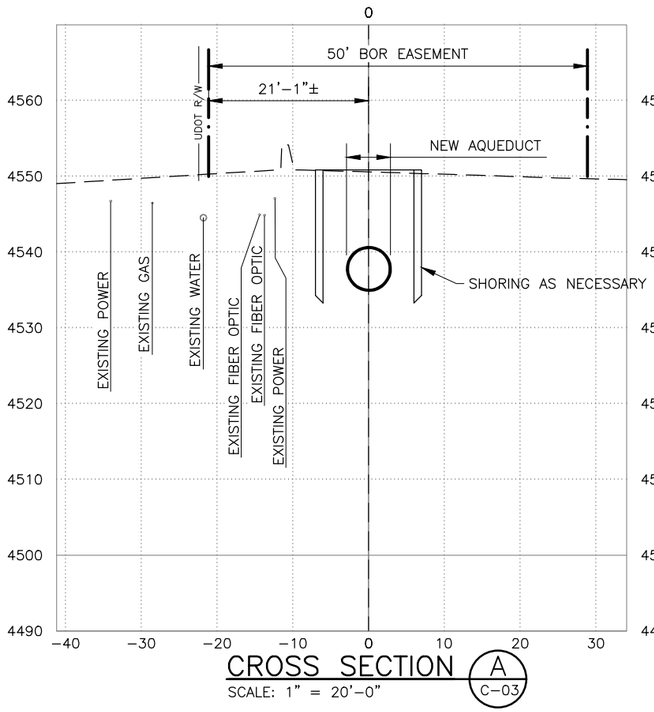

CROSS SECTION A (C-03)
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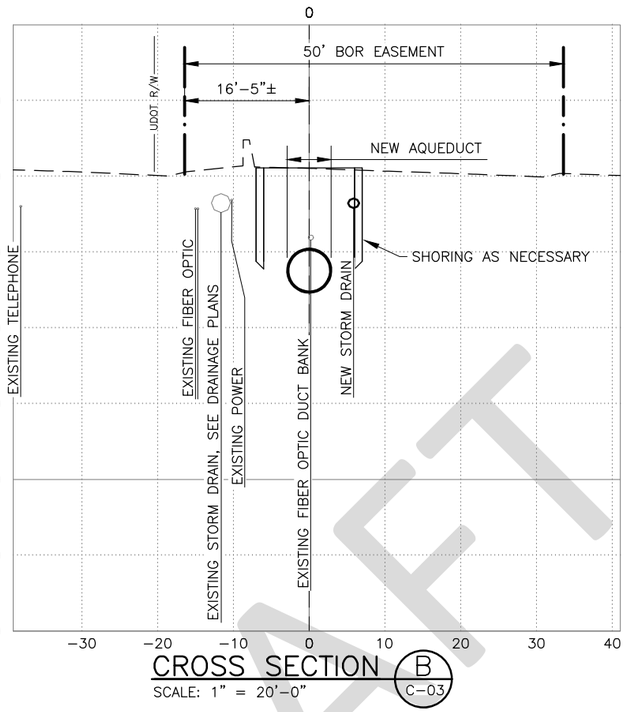

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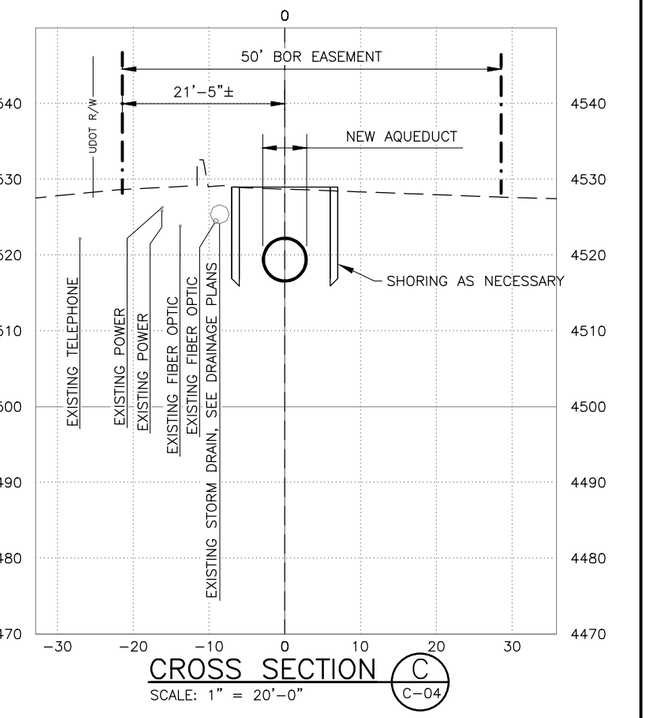

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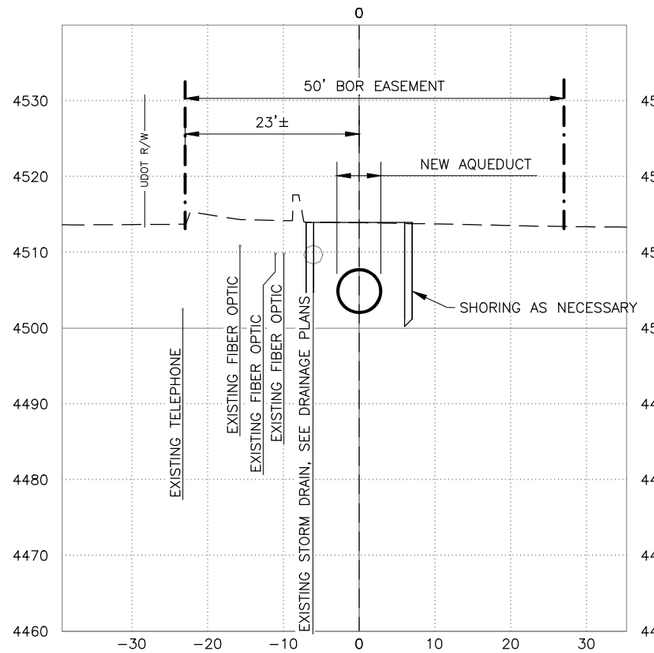

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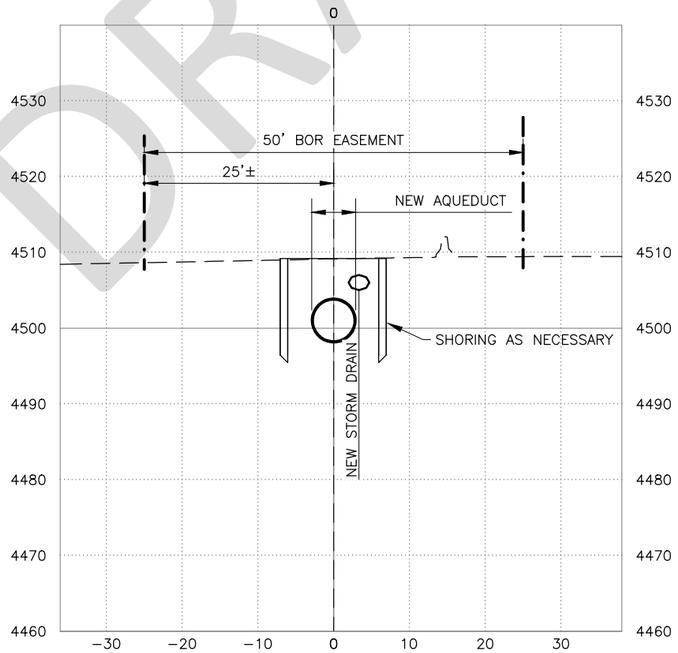

CROSS SECTION E (C-04)
SCALE: 1" = 20'-0"

DRAFT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
BART FERLANG, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY SR
QC CHECKED BY JL
APPROVED
07/14/16
DATE
PROFESSIONAL ENGINEER

PROJECT: SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION
PROJECT NUMBER: S-0154(82)16
PIN: 14785

5400 SOUTH CROSS SECTIONS

SHEET NO. C-06

EXHIBIT E

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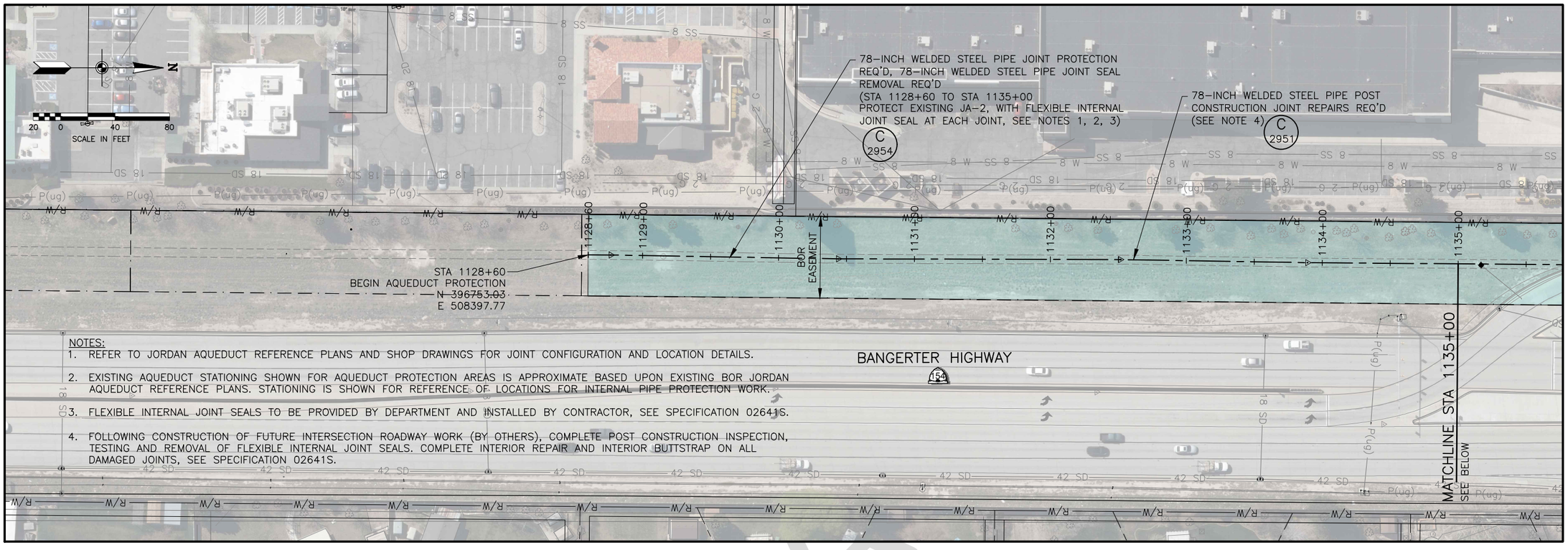

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
MATT FELDING, P.E.
ASST. ENGINEERING DIVISION MANAGER, FIELD ENGINEERING

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

APPROVED

07/14/16
DATE

PROFESSIONAL ENGINEER

DRAWN BY SR
QC CHECKED BY JL

PROJECT: SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION

PROJECT NUMBER: S-0154(82)16
PIN 14785

7000 SOUTH PLANS

SHEET NO. C-07

EXHIBIT E

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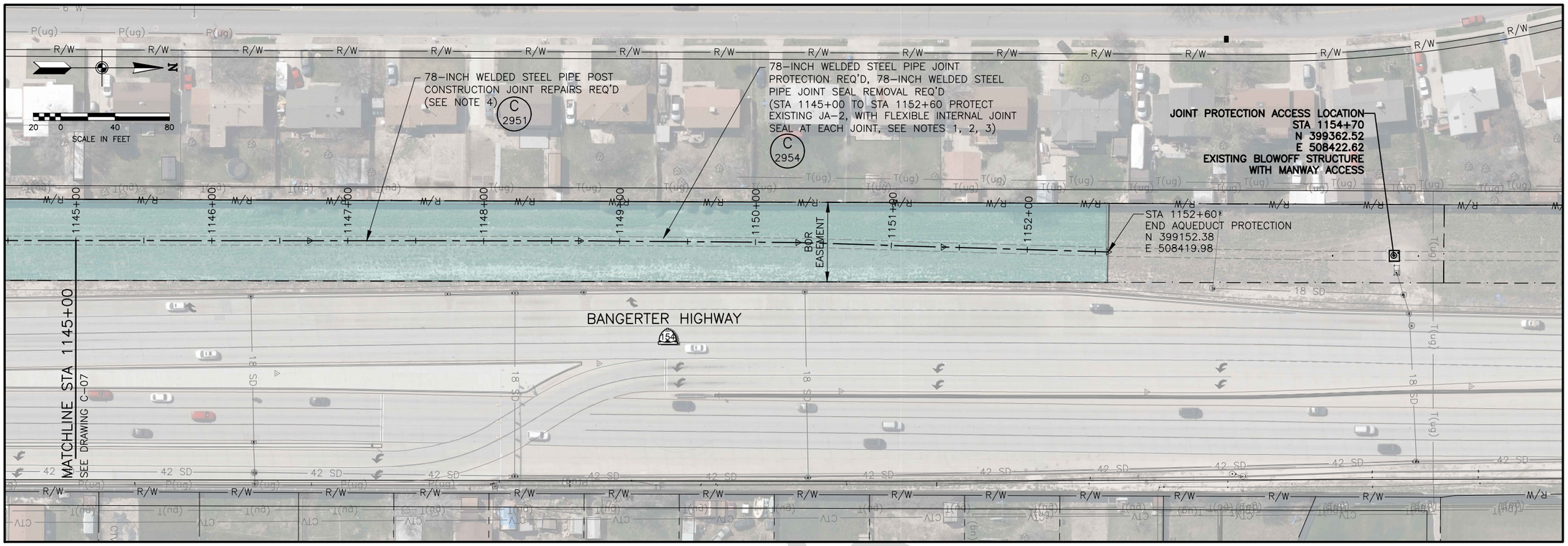

NOTES:

1. REFER TO JORDAN AQUEDUCT REFERENCE PLANS AND SHOP DRAWINGS FOR JOINT CONFIGURATION AND LOCATION DETAILS.
2. EXISTING AQUEDUCT STATIONING SHOWN FOR AQUEDUCT PROTECTION AREAS IS APPROXIMATE BASED UPON EXISTING BOR JORDAN AQUEDUCT REFERENCE PLANS. STATIONING IS SHOWN FOR REFERENCE OF LOCATIONS FOR INTERNAL PIPE PROTECTION WORK.
3. FLEXIBLE INTERNAL JOINT SEALS TO BE PROVIDED BY DEPARTMENT AND INSTALLED BY CONTRACTOR, SEE SPECIFICATION 02641S.
4. FOLLOWING CONSTRUCTION OF FUTURE INTERSECTION ROADWAY WORK (BY OTHERS). COMPLETE POST CONSTRUCTION INSPECTION, TESTING AND REMOVAL OF FLEXIBLE INTERNAL JOINT SEALS. COMPLETE INTERIOR REPAIR AND INTERIOR BUTTSTRAP ON ALL DAMAGED JOINTS, SEE SPECIFICATION 02641S.

DRAFT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
JAKE FEDERING, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY	SR
QC CHECKED BY	JL
APPROVED	
07/14/16 DATE	
PROFESSIONAL ENGINEER	

PROJECT: SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION

PROJECT NUMBER: S-0154(82)16
PIN: 14785

7000 SOUTH PLANS

SHEET NO. C-08

EXHIBIT E

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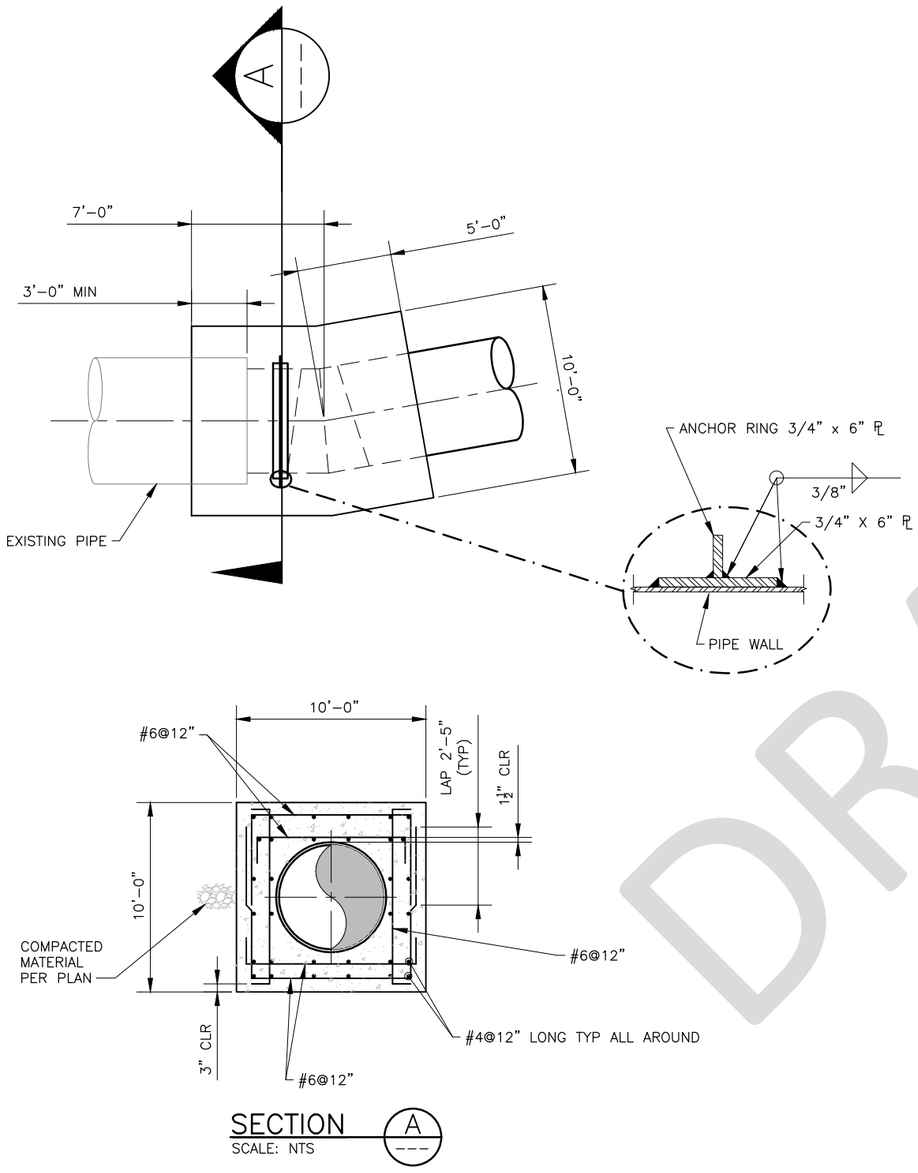

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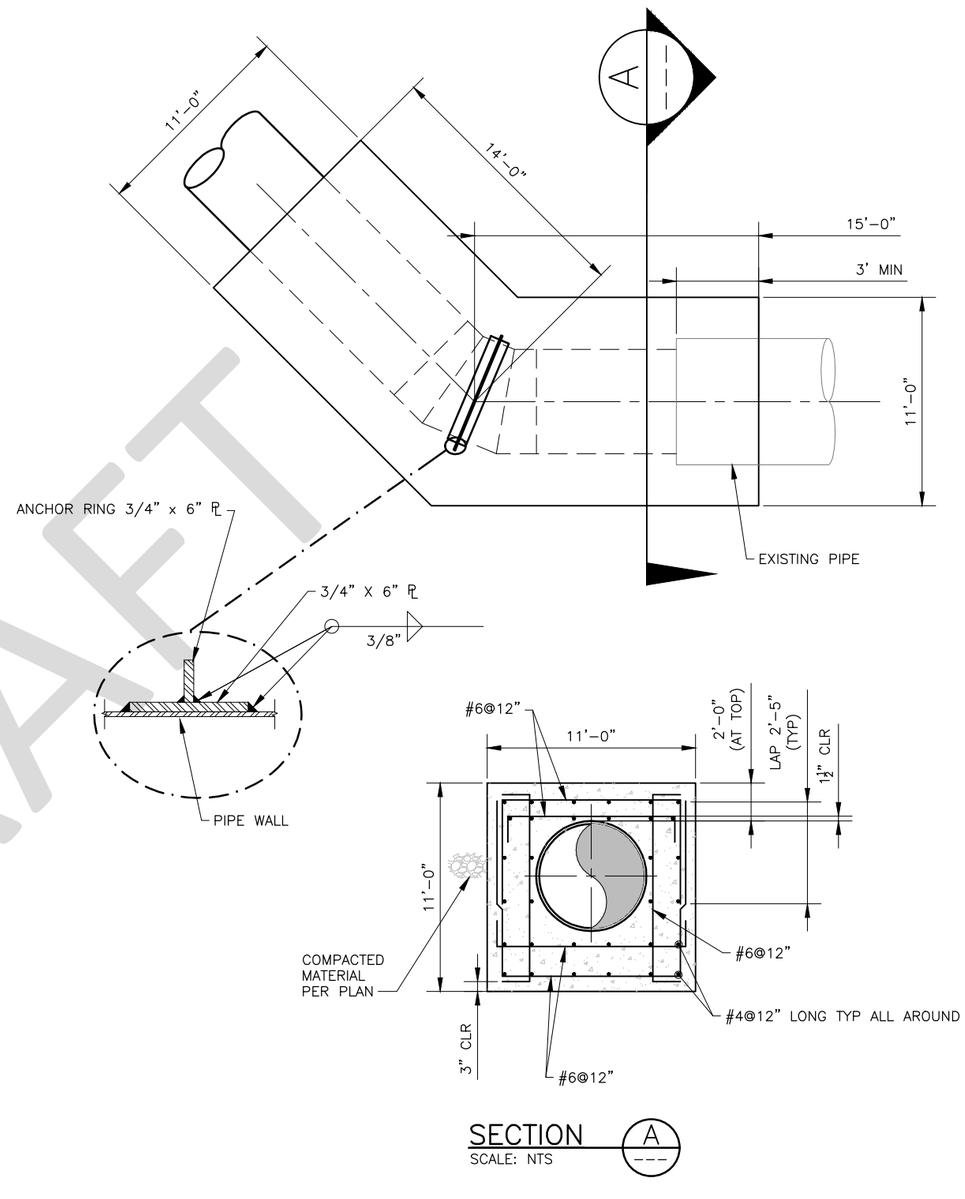
REINFORCED CONCRETE COLLAR STA 1250+19 (1 / C-05)
SCALE: NTS



SECTION A
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REINFORCED CONCRETE COLLAR STA 1266+13 (2 / C-05)
SCALE: NTS

DRAFT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
ACCEPTED FOR ENG. P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY	SR	APPROVED	
QC CHECKED BY	JL	DATE	07/14/16
PROFESSIONAL ENGINEER			

PROJECT	SR-154 BANGERTER HWY JORDAN AQUEDUCT PROTECTION AND RELOCATION	PIN	14785
PROJECT NUMBER	S-0154(82)16		

REIFORCED CONCRETE THRUST COLLARS - PLAN & SECTION

SHEET NO. C-09

EXHIBIT E

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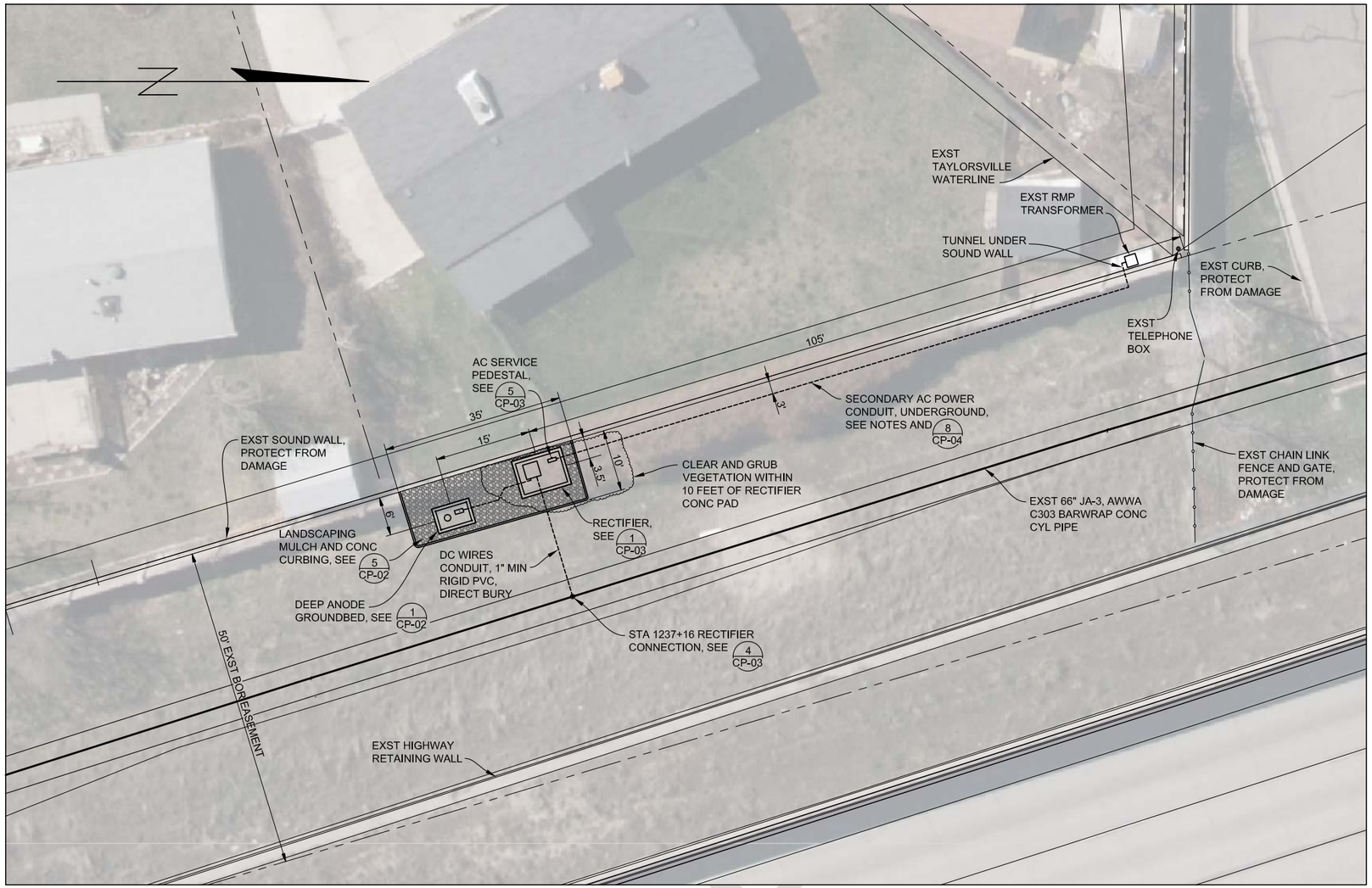


PIPE LINE PLAN AND PROFILE TEST STATION LEGEND

X — EXST TEST STATION
X=TYPE

X — NEW TEST STATION
X=TYPE

TEST STATION NOTES:

1. CONTRACTOR TO INSTALL NEW TEST STATION WHERE INDICATED ON THE PIPELINE PLAN AND PROFILE SHEETS.
2. EXISTING TEST STATION SHALL BE RELOCATED OR REPLACED WHERE INDICATED OR WHEN DAMAGED BY PIPE CONSTRUCTION WORK. .
3. ALL TEST STATIONS SHALL BE STEEL CONDUIT POST MOUNT STYLE.
4. MARK TEST STATIONS WITH JVWCD DISTRICT APPROVED LABEL WITH DISTRICT NAME, PIPELINE, AND PIPE STATIONING.
5. PROVIDE WIRE LOOP AT BASE OF TEST STATION AND AT PIPE CONNECTIONS TO MINIMIZE SETTLEMENT STRESSES ON WIRE.
6. PROVIDE SUFFICIENT WIRE TO ALLOW FOR PROPER TERMINATION IN TEST STATIONS.
7. ALL WIRES TO BE INSTALLED SPLICE FREE.
8. ALL WIRE CONNECTIONS TO PIPE SHALL BE THERMITE WELDED CONNECTIONS, EACH WIRE CONNECTION TO BE SEPARATED A MINIMUM OF 6-INCHES.
9. QUANTITY OF TERMINALS AND WIRING CONNECTIONS VARIES, SEE APPLICABLE DETAIL FOR TEST STATION TYPE.
10. ALL WIRES UNDER ROADWAY MUST BE PROTECTED BY 2" PVC COATED RIGID STEEL CONDUIT AS SHOWN IN DETAILS, SEAL ENDS OF CONDUIT WITH DUCT COMPOUND OR URETHANE FOAM.
11. DO NOT DIRECTLY CONNECT ROADWAY OFFSET CONDUIT TO TEST STATION CONDUIT.

JA-56S SITE PLAN NOTES:

ELECTRICAL SERVICE:

1. CONTRACTOR TO COORDINATE ELECTRICAL SERVICE PER WORK ORDER #621105, RMP CONTACT IS HENRY TSOSIE.
2. CONTRACTOR SHALL INSTALL NEW AC POWER SERVICE IN ACCORDANCE WITH ROCKY MOUNTAIN POWER. REQUIREMENTS, NEW UTILITY SERVICE INSTALLATION COST TO BE PAID BY DEPARTMENT.
3. UTILITY AC SERVICE TO INCLUDE CONDUIT WITHIN 1 FOOT FROM TRANSFORMER BOX, UNDERGROUND CONDUIT, AND UNDERGROUND AC SERVICE PEDESTAL.
4. CONTRACTOR TO PROVIDE ALL EXCAVATION, BACKFILL, CONDUIT AND PULL STRING FOR AC POWER SERVICE TO METER PEDESTAL, UTILITY TO PROVIDE AND INSTALL CONDUCTORS, SPLICES, AND CONNECTIONS TO METER BASE.

GROUNDBED CONSTRUCTION

1. DRILLING MUD, WATER AND CUTTINGS SHALL BE FULLY CONTAINED ON THE PROJECT SITE AND SHALL NOT BE PERMITTED TO FLOW OVER THE GROUND SURFACE,
2. ANY SPILLAGE OR LEAKAGE OF DRILLING MUD AND CUTTINGS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AND THE SITE RESTORED.
3. DIGGING OF MUD PIT WILL NOT BE PERMITTED.
4. DRILL CUTTINGS TO BE REMOVED FROM SITE AND DISPOSED AT OFFSITE LANDFILL OR OTHER APPROVED LOCATION.

RECTIFIER INSTALLATION

1. CONCRETE WORK SHALL BE AA (AE) PER UDOT STANDARDS.
2. FORMS SHALL BE SET LEVEL AND SQUARE.
3. CONCRETE FINISH SHALL BE TROWELED SURFACE AND RADIUS EDGES.
4. ALL FORM WORK SHALL BE REMOVED FROM THE CONCRETE AFTER CURING IS COMPLETED.
5. RECTIFIER SHALL BE ORIENTED AS SHOWN ON THE PLANS, ADJUSTMENT IN THE LOCATION AND ORIENTATION OF THE RECTIFIERS AND VENT PIPES SHALL BE APPROVED BY THE ENGINEER.

SITE WORK AND RESTORATION:

1. EXISTING VEGETATION TO BE CLEARED AND GRUBBED TO A DEPTH OF 12-INCHES WHERE INDICATED ON THE PLAN OR WHERE TRENCHING IS REQUIRED.
2. ALL DISTURBED AREAS TO BE RE-SEEDED FOLLOWING CONSTRUCTION PER UDOT STANDARD SPECIFICATIONS.

JA3 CATHODIC PROTECTION STATION
JA-56S SITE PLAN

0 10' 20'
1"=10'

CATHODIC PROTECTION SCHEDULE

GROUNDBED INSTALLATION	
GROUNDBED STYLE	DEEP ANODE
GROUNDBED TERMINATION	TYPE 1
SURFACE CASING LENGTH	40 FEET
INACTIVE LENGTH	130 FEET
ACTIVE LENGTH	220 FEET
TOTAL LENGTH	350 FEET
DIAMETER	10-INCH
ANODE TYPE	TA-2
QUANTITY	20 EACH
ANODE SPACING	10 FOOT OC
GROUNDBED RAIL	YES
RECTIFIER INSTALLATION	
STYLE	TYPE 1
DC VOLTS OUTPUT	50 VOLTS
DC AMPS OUTPUT	15 AMPS
AC POWER INPUT	120/240 VAC, SINGLE
AC SERVICE STYLE	UNDERGROUND
AC METER REQUIRED	YES
RECTIFIER RAIL	YES
REMOTE MONITORING	SCOUT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
BART LEEFLANG, P.E.
MANAGER, FIELD ENGINEERING DIVISION
STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY	JLM
QC CHECKED BY	JLM

APPROVED

07/14/16
DATE

PROFESSIONAL ENGINEER

SR-154 BANGERTER HWY AT
5400 SOUTH AQUEDUCT RELOCATION

PROJECT

PROJECT NUMBER: S-0154(82)16

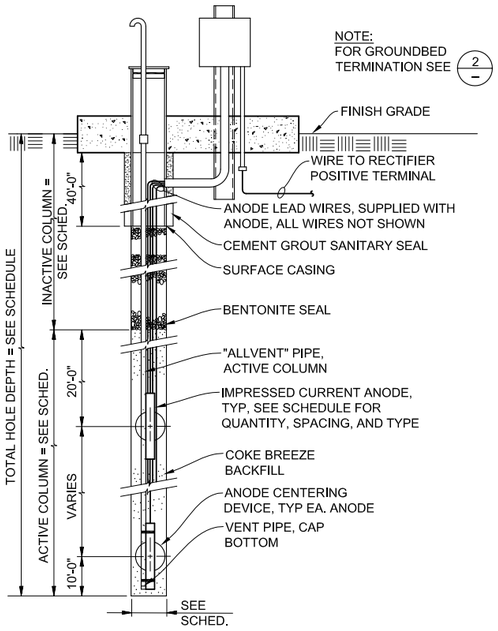
PIN: 14785

CATHODIC PROTECTION SITE PLAN

SHEET NO. CP-01

EXHIBIT E

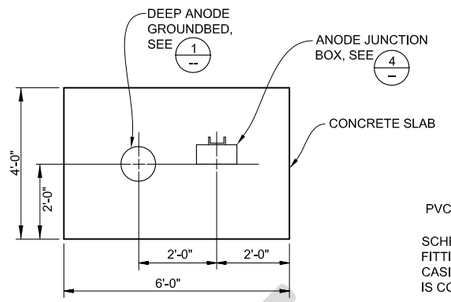
H:\BC\ABCA-034\Design\JA2 CP Relocation Site Plan.dwg Plotted 7/14/2016 By: Stacy Hilling



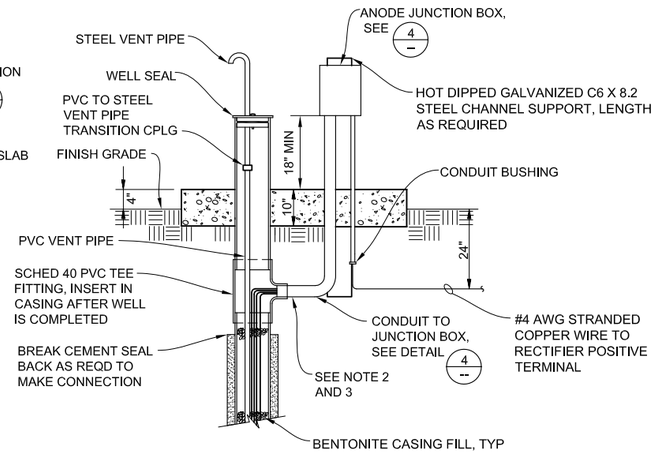
NOTES:
1. CASING LENGTH IS MINIMUM LENGTH, CONTRACTOR TO PROVIDE CASING LENGTH AS REQUIRED FOR DRILLING CONDITIONS AND AS SPECIFIED.
2. SEE CATHODIC PROTECTION SITE PLAN FOR GROUNDBED LOCATION AND SCHEDULE.
3. ALL PIPE AND CONDUIT PENETRATIONS THROUGH SURFACE CASING SHALL BE WATERTIGHT, SOLVENT WELDED, PENETRATIONS OR AN APPROVED EQUAL.

DEEP ANODE GROUND BED - TYPE 1

NOT TO SCALE — 1 / CP-01



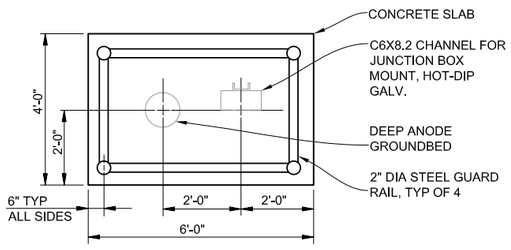
PLAN



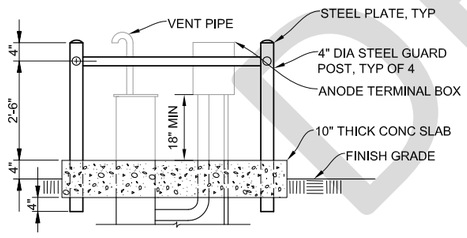
NOTES:
1. PROTECT WIRES FROM NICKS, CUTS, OR OTHER DAMAGE WHEN CUTTING CASING.
2. SEAL CONDUIT AT EACH END WITH URETHANE FOAM TO PREVENT ENTRY OF GROUNDBED GASES OR MOISTURE INTO JUNCTION BOX.
3. ALL BURIED CASING AND CONDUIT JOINTS TO BE SOLVENT WELDED FOR WATERTIGHT CONNECTIONS.
4. FINISH GRADE AWAY FROM WELL CASING.

TYPE 1 SURFACE CASING AND TERMINATION

NOT TO SCALE — 2 / --



PLAN

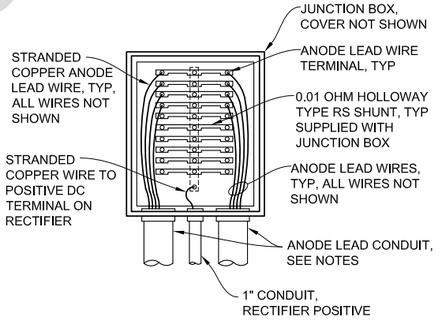


ELEVATION

NOTES:
1. BOLT TWO FRONT RAILS TO GUARD POSTS AND WELD ALL REMAINING RAILS TO GUARD POSTS.
2. ORIENTATION OF ANODE JUNCTION BOX TO BE DETERMINED IN THE FIELD.
3. HOT DIP GALVANIZE GUARD RAIL AND VENT PIPE AFTER FABRICATION.
4. ORIENT EQUIP TO ALLOW ACCESS DOORS TO FULLY OPEN WITHOUT OBSTRUCTION.

GROUNDBED GUARD RAIL

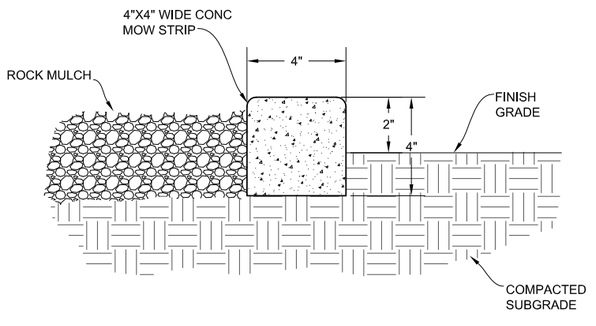
NOT TO SCALE — 3 / --



NOTES:
1. SIZE ANODE LEAD CONDUIT IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. PROVIDE ONE CONDUIT WITH UP TO 15 ANODES, TWO WITH 16 TO 30 ANODES.

ANODE JUNCTION BOX

NOT TO SCALE — 4 / --



NOTES:
1. ALL ROCK MULCH BEDS TO BE SEPARATED FROM NATIVE SEED AREAS WITH CONC CURB MOW STRIP.
2. INSTALL ROCK MULCH TO A MINIMUM 4" DEPTH OVERLYING COMPACTED SUBGRADE; ROCK MULCH TO BE SPECIFIED IN SECTION 02651S.
3. FOR LANDSCAPING PLACEMENT SEE SITE PLAN, SHT CP-01.
4. CONCRETE CURBING AND ROCK MULCH AS SPECIFIED.

ROCK MULCH LANDSCAPING

NOT TO SCALE — 5 / CP-01

DRAFT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
BART LEEFLANG, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY	JLM
QC CHECKED BY	JLM
DATE	07/14/16

APPROVED

PROFESSIONAL ENGINEER

EXHIBIT E

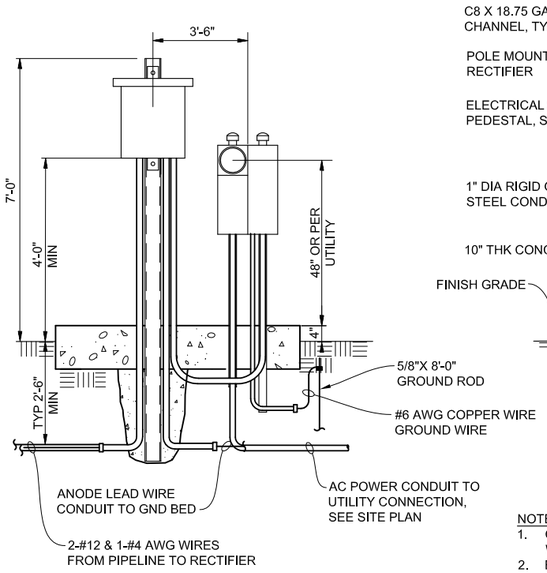
PROJECT: SR-154 BANGERTER HWY AT 5400 SOUTH AQUEDUCT RELOCATION

PROJECT NUMBER: S-0154(82)16 PIN 14785

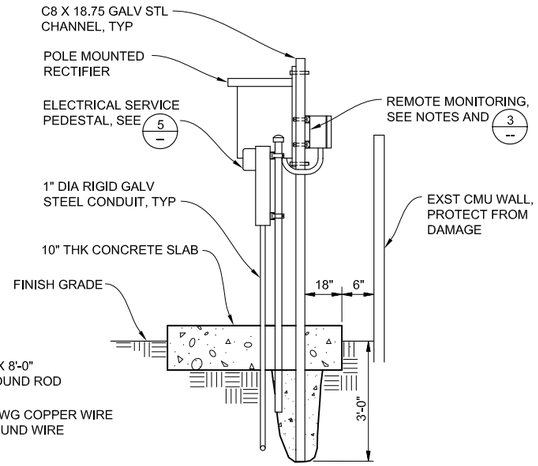
DEEP WELL GROUNDBED DETAILS

SHEET NO. CP-02

H:\BC\BCA-0304\Design\UA2 CP Relocation Details.dwg Plotted 7/14/2016 By: Stacy Hilling



FRONT

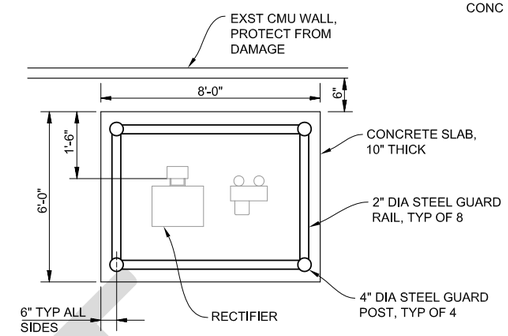


SIDE

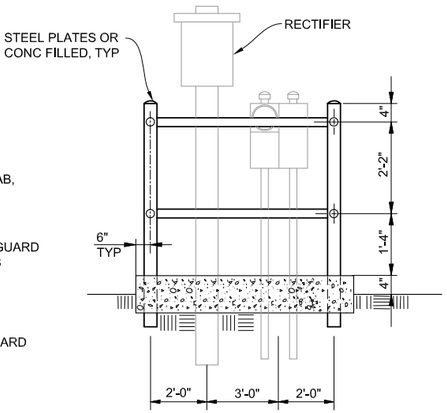
NOTES:
1. ORIENT ELECTRICAL METER TO BE READABLE FROM NEAREST ROAD WHERE POSSIBLE.
2. EQUIPMENT PLACEMENT AND HEIGHT SHALL BE AS REQUIRED TO ALLOW DOORS TO FULLY OPEN WITHOUT INTERFERENCE.
3. ALL EQUIPMENT, CONDUIT, SUPPORT POSTS, ETC. SHALL BE HOT DIPPED GALVANIZED.
4. RMU MAY BE MOUNTED ON NON-DOOR SIDE OF RECTIFIER FOR ACCESS AT CONTRACTOR'S OPTION.

TYPE 1-POLE MOUNTED RECTIFIER (1 / CP-01)

NOT TO SCALE



PLAN

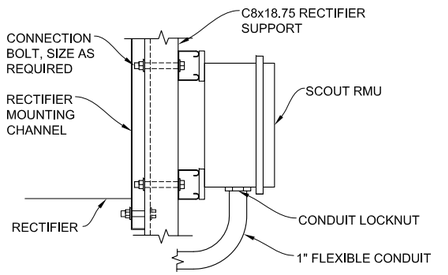


ELEVATION

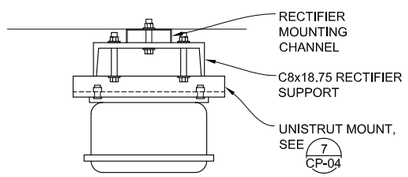
NOTES:
1. ALL RAIL TO POST CONNECTIONS SHALL BE WELDED, EXCEPT FRONT RAILS SHALL HAVE BOLTED CONNECTIONS FOR REMOVAL.
2. ORIENTATION OF RECTIFIER AND AC PEDESTAL TO BE DETERMINED IN THE FIELD.
3. ALL EQUIPMENT DOORS SHALL BE FULLY OPENABLE AND WITHOUT OBSTRUCTION
4. HOT DIP GALVANIZE RAILING AFTER FABRICATION.

TYPE 1 - RECTIFIER RAIL (2 / --)

NOT TO SCALE



SCOUT ELEVATION

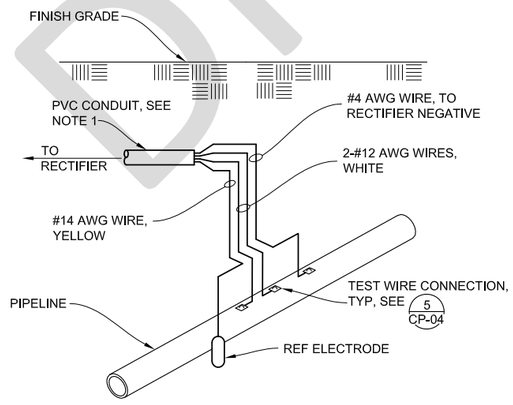


SCOUT PLAN

NOTES:
1. SCOUT MOUNTING PLATE NOT USED, REMOVE AND MOUNT TO UNISTRUT.
2. BACK OF RECTIFIER MOUNT SHOWN, MOUNTING ON NON-DOOR SIDE OF RECTIFIER ALLOWED AS OPTION.

REMOTE MONITORING UNIT MOUNT (3 / --)

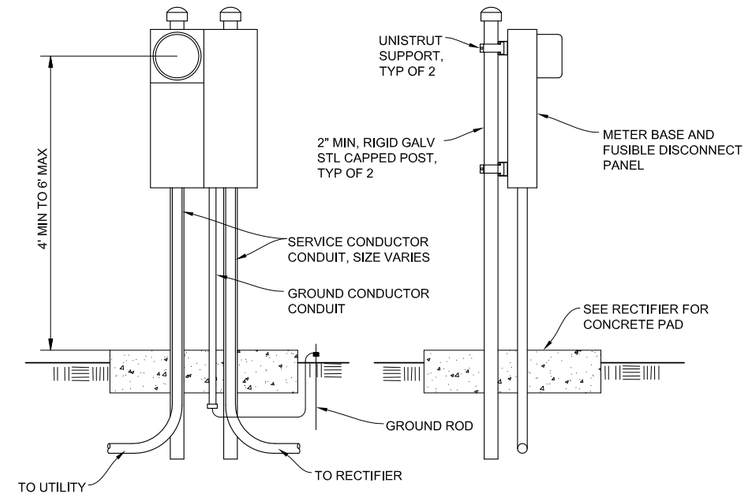
NOT TO SCALE



NOTES:
1. ALL WIRES SHALL BE PLACED IN CONDUIT FROM CENTERLINE OF PIPE TO CATHODIC PROTECTION STATIONS.
2. LOCATE REFERENCE ELECTRODE 6" FROM EDGE OF PIPE.

RECTIFIER CONNECTION (4 / CP-01)

NOT TO SCALE



NOTES:
1. METER BASE TO HAVE MANUAL LINK BYPASS SOCKETS AND CONFORM TO ELECTRICAL UTILITY REQUIREMENTS
2. SEE CATHODIC PROTECTION SCHEDULE, FOR SERVICE TYPE.

UNDERGROUND AC SERVICE PEDESTAL (5 / CP-01)

NOT TO SCALE

DRAFT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
BART LEEFLANG, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

DRAWN BY: JLM
QC CHECKED BY: JLM

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

APPROVED

07/14/16
DATE

PROFESSIONAL ENGINEER

EXHIBIT E

PROJECT: SR-154 BANGERTER HWY AT 5400 SOUTH AQUEDUCT RELOCATION
PROJECT NUMBER: S-0154(82)16
PIN: 14785

RECTIFIER PLANS AND DETAILS

SHEET NO. CP-03

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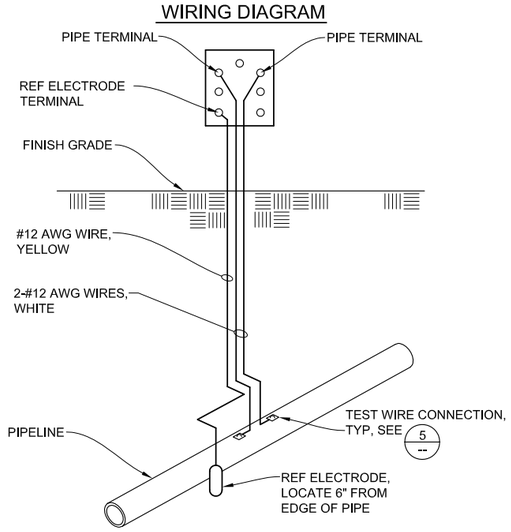
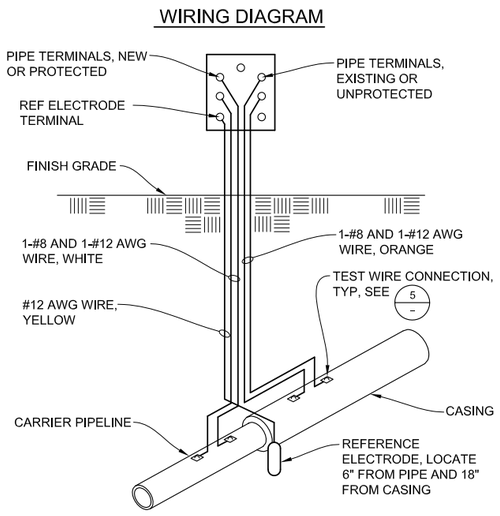


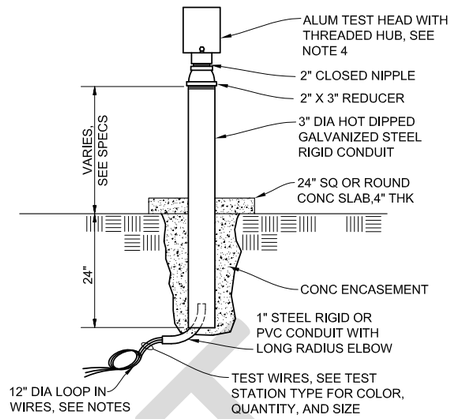
NOTES:
1. SEE TEST STATION STYLE DETAIL AS REQUIRED BY TEST STATION SCHEDULE.
2. WHERE TEST STATION OFFSET IS REQUIRED, SEE 4 --

TYPE T TEST STATION 1 --
NOT TO SCALE



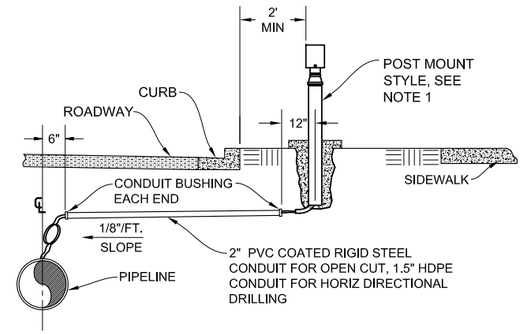
NOTES:
1. SEE TEST STATION STYLE DETAIL AS REQUIRED BY TEST STATION SCHEDULE.
2. WHERE TEST STATION OFFSET IS REQUIRED, SEE 4 --

TYPE C TEST STATION 2 --
NOT TO SCALE



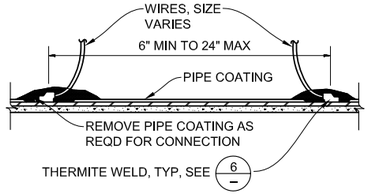
NOTES:
1. TERMINAL QUANTITY AND WIRE CONNECTIONS VARY, SEE TEST STATION TYPE DETAIL.
2. LOOP WIRE AT BASE OF POST TO MINIMIZE WIRE STRESS.
3. COAT THREADS WITH INORGANIC ZINC PRIMER OR COLD GALVANIZING REPAIR COATING.
4. TESTOX SERIES 700 TEST STATION FOR TYPE T, C, AND I TEST STATIONS OR TESTOX SERIES 2000 TEST STATION FOR TYPE F AND A TEST STATIONS WITH THREADED HUBS. SLIP FIT HUBS WILL NOT BE PERMITTED.

POST STYLE, STEEL CONDUIT 3 --
NOT TO SCALE

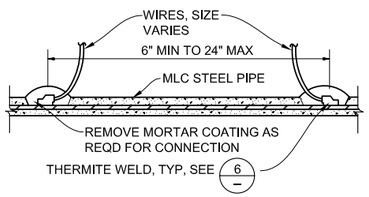


NOTES:
1. INSTALLATION SIMILAR FOR FLUSH STYLE TEST STATIONS.
2. DO NOT CONNECT CONDUIT TO POST STYLE TEST STATION.
3. SEAL BOTH ENDS OF CONDUIT WITH URETHANE FOAM.

TEST STATION ROADWAY OFFSET 4 --
NOT TO SCALE



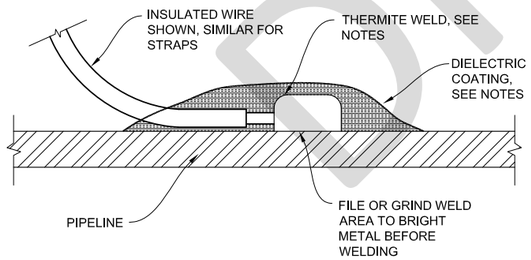
DIELECTRIC COATED STEEL



CCP OR MLC STEEL

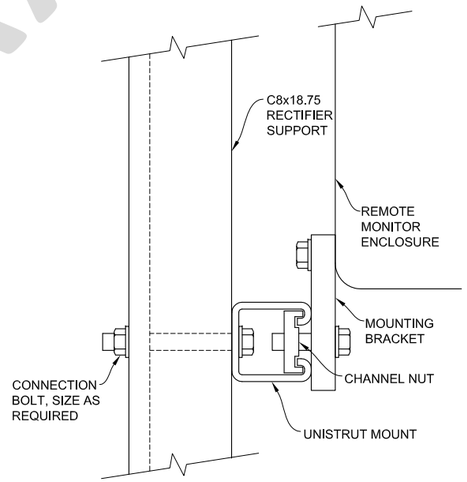
NOTES:
1. PRETENSIONED WIRES ON BARWRAP (CCP) CONCRETE CYLINDER PIPE SHALL NOT BE CUT OR DAMAGED FOR WIRE CONNECTIONS TO PIPE CYLINDER.
2. CEMENT MORTAR COAT ALL CONNECTIONS AND EXPOSED COPPER ON BARWRAP (CCP) PIPE.

TEST WIRE CONNECTION 5 --
NOT TO SCALE



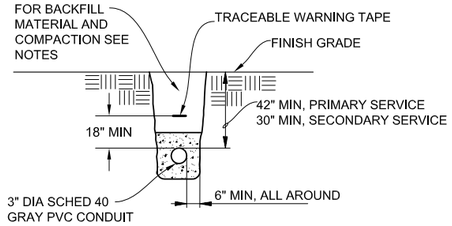
NOTES:
1. MAKE WIRE CONNECTION TO PIPE AT FIELD JOINT WHERE HOLDBACK OCCURS ON PIPELINE COATING, WHERE POSSIBLE.
2. COPPER SLEEVE REQUIRED FOR #2 AWG JOINT BONDS OR FOR #12 AWG OR SMALLER TEST WIRES.
3. WELDER AND CARTRIDGE SIZE VARIES ACCORDING TO PIPE SIZE AND PIPE MATERIAL, CONSULT WELDER MANUFACTURER FOR RECOMMENDED WELDER AND CARTRIDGE.
4. COAT COMPLETED WELDS, EXPOSED COPPER, AND EXPOSED METAL WITH DIELECTRIC COATING AS SPECIFIED FOR PIPELINE MATERIAL ALTERNATIVE.
5. AFTER COATING WELDS, OVERCOAT WITH CEMENT MORTAR WHEN PIPE HAS CEMENT MORTAR COATING OR OVERCOAT.

THERMITE WELD CONNECTION 6 --
NOT TO SCALE



NOTES:
1. UNISTRUT AND HARDWARE TO BE HOT DIPPED GALVANIZED, UNLESS OTHERWISE SPECIFIED.

UNISTRUT MOUNT 7 --
NOT TO SCALE



NOTES:
1. BACKFILL AROUND CONDUIT SHALL BE SELECT MATERIAL IN CONFORMANCE WITH ELECTRICAL UTILITY CONSTRUCTION STANDARDS OR NOTE 2.
2. SELECT MATERIAL FOR BACKFILL SHALL CONSIST OF SAND OR WELL GRADED GRANULAR MATERIAL OF THE FOLLOWING GRADATION:

NO. 200 SIEVE	5%, MAX.
NO. 4 SIEVE	50%, MAX.
3/4" SIEVE	100%

3. BACKFILL SHALL BE COMPACTED TO 90% OF MAXIMUM DENSITY, EXCEPT IN ROADWAYS OR DRIVABLE AREAS, WHERE COMPACTION SHALL BE 95% OF MAXIMUM DENSITY (MODIFIED PROCTOR).
4. CONDUIT SHALL BE LAID USING SOLVENT WELDED JOINTS AND FRP LONG RADIUS SWEEPS, WITH COMBINED BEND NOT GREATER THAN 270 DEGREES.
5. CONDUIT ENDS SHALL BE SEALED TO PREVENT ENTRY OF FOREIGN MATTER AND WATER AND SHALL BE PROVIDED WITH A FLAT 500# PULL LINE, MINIMUM.
6. ALL NON-METALLIC BURIED STRUCTURES SHALL BE PROVIDED WITH TRACEABLE WARNING TAPE FOR THE FULL LENGTH OF THE TRENCH.
7. WHERE ELECTRICAL SERVICE AS SHOWN CONFLICTS WITH ELECTRICAL UTILITY REQUIREMENTS, THE MORE STRINGENT REQUIREMENT WILL APPLY.

STANDARD ELECTRICAL TRENCH 8 CP-01
NOT TO SCALE

DRAFT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
BART LEEFLANG, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY	JLM		
QC CHECKED BY	JLM		
APPROVED		PROFESSIONAL ENGINEER	
DATE	07/14/16		

SR-154 BANGERTER HWY AT
5400 SOUTH AQUEDUCT RELOCATION

PROJECT
PROJECT NUMBER S-0154(82)16
PIN 14785

TEST STATIONS AND MISC DETAILS

SHEET NO. CP-04

EXHIBIT E

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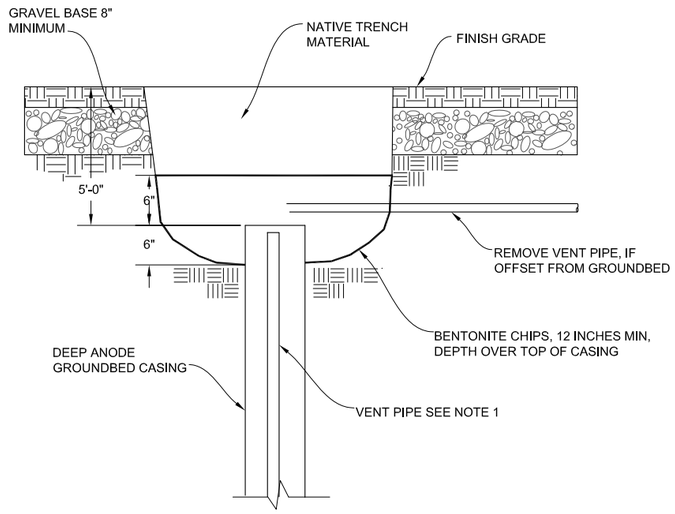

NOTES:
1. FILL VENT PIPE WITH NEAT CEMENT SLURRY, BY PUMPING THROUGH TREMIE PIPE TO BOTTOM OF VENT PIPE.
2. CUT OFF CASING, VENT PIPE, AND ALL WIRES 5-FEET BELOW FINISH GRADE AND LEAVE CASING 6 TO 8-INCHES ABOVE NATIVE SOIL.
3. COVER CASING AND VENT PIPE WITH BENTONITE CHIPS FOR A MINIMUM OF 12-INCHES OVER THE CASING AND 2 FEET RADIUS OF CASING CENTER.
4. SAW CUT ASPHALT EDGES FOR PATCHING, MATCH EXISTING ASPHALT THICKNESS.
5. TRENCH BACKFILL TO BE MECHANICALLY COMPACTED TO 95 PERCENT OF MODIFIED PROCTOR.

EXISTING CATHODIC PROTECTION SYSTEM ABANDONMENT

NOT TO SCALE

1
C-04

CPS ABANDONMENT NOTES:

1. CPS TO BE ABANDONED LOCATIONS SHOWN ON SHT CP-04.
2. SEE REFERENCE DWGS FOR ORIGINAL CONSTRUCTION DETAILS AND ORIENTATION, CATHODIC PROTECTION STATION NO. 1.
3. CATHODIC PROTECTION STATION, INCLUDING RECTIFIER, METER BASE, ANODE JUNCTION BOX, AND CONC PADS TO BE REMOVED AND DISPOSED OFFSITE BY CONTRACTOR.
4. REMOVE ELECTRIC SERVICE AND COORDINATE DISCONNECTION OF SERVICE WITH ROCKY MOUNTAIN POWER.
5. ABANDON DEEP ANODE GROUNDBED IN ACCORDANCE WITH STATE OF UTAH WATER WELL REGULATIONS AND OBTAIN ABANDONMENT PERMIT FROM STATE OF UTAH.
6. GROUNDBED TO BE ABANDONED AS SHOWN IN DETAIL 1, SHT CP-05, AND STATE OF UTAH REGULATIONS, WHICHEVER IS MORE STRINGENT.

DRAFT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
BART LEEFLANG, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY	JLM
QC CHECKED BY	JLM

APPROVED

07/14/16
DATE

PROFESSIONAL ENGINEER

PROJECT: SR-154 BANGERTER HWY AT 5400 SOUTH AQUEDUCT RELOCATION

PROJECT NUMBER: S-0154(82)16 PIN 14785

CPS ABANDONMENT DETAILS

SHEET NO. CP-05

EXHIBIT E

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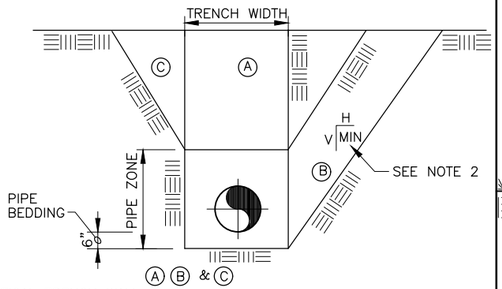


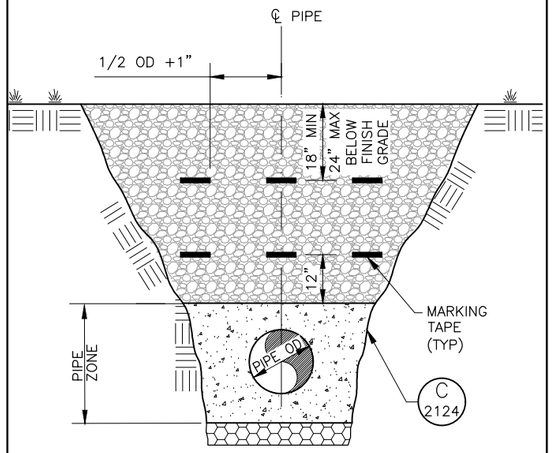
A VERTICAL TRENCH WALL
1. MAX UNSUPPORTED HEIGHT=3.5 FT.
2. FOR DEPTH OVER 3.5 FT SHORING OR SHEATHING REQUIRED.

B SLOPING TRENCH WALL
1. NOT TO BE USED WITHOUT APPROVAL OF ENGINEER.
2. REQUIRES IMPROVED PIPE ZONE BACKFILL OR INCREASE IN PIPE CLASS

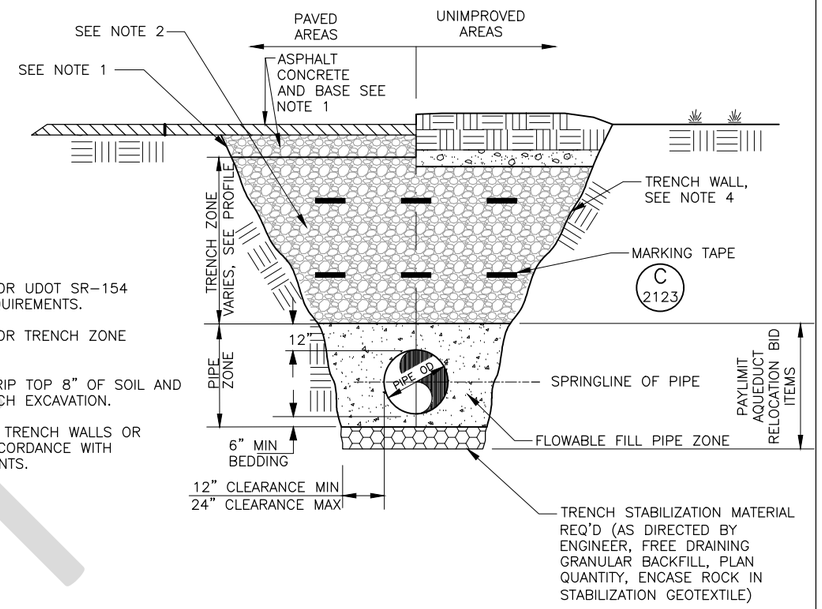
C COMBINATION VERTICAL/SLOPING TRENCH
1. TRENCH IN PIPE ZONE SHALL HAVE VERTICAL WALLS WHERE STABLE SOIL EXISTS.

NOTES:
1. TRENCH EXCAVATIONS TO BE IN ACCORDANCE WITH OSHA SAFETY AND HEALTH STANDARDS FOR CONSTRUCTION. (29 CFR 1926).
2. CONTRACTOR TO PROVIDE SHORING OR TRENCH BOX IN ROADWAY AREAS TO MINIMIZE TRENCH WIDTH.
3. CONTRACTOR TO PROVIDE ALL DEWATERING MEASURES AS REQUIRED.

TYPICAL TRENCH EXCAVATION SECTION
NOT TO SCALE — C 2122

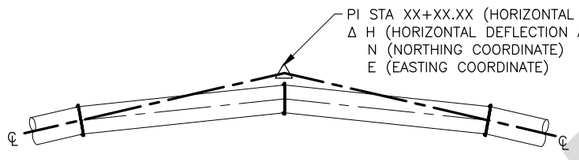


MARKING TAPE PLACEMENT
NOT TO SCALE — C 2123

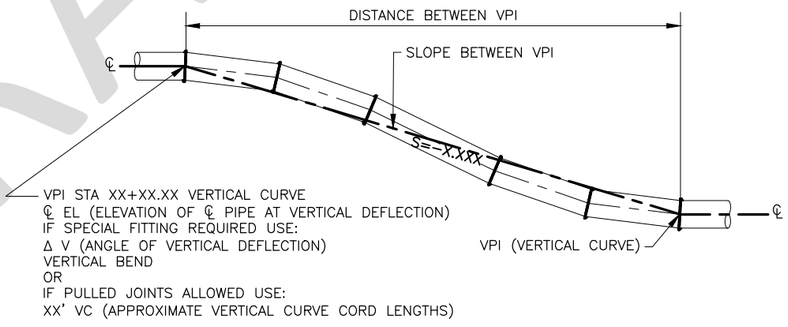


NOTES:
1. SEE ROADWAY DRAWINGS FOR UDOT SR-154 SURFACE RESTORATION REQUIREMENTS.
2. SEE ROADWAY DRAWINGS FOR TRENCH ZONE BACKFILL REQUIREMENTS.
3. IN UNIMPROVED AREAS, STRIP TOP 8" OF SOIL AND STOCKPILE PRIOR TO TRENCH EXCAVATION.
4. CONTRACTOR SHALL SLOPE TRENCH WALLS OR SHORE EXCAVATIONS IN ACCORDANCE WITH CURRENT OSHA REQUIREMENTS.

TYPICAL TRENCH BACKFILL SECTION
NOT TO SCALE — C 2124



HORIZONTAL CURVES



VERTICAL CURVES

NOTES:
1. ALL HORIZONTAL AND VERTICAL CURVES ARE CIRCULAR.
2. HORIZONTAL AND VERTICAL CURVES SHALL BE MADE USING BEVELED JOINTS AND/OR DEFLECTED JOINTS. DO NOT USE COMBINED BEVELED AND DEFLECTED JOINTS.
3. THE MAXIMUM BEVEL ANGLE FOR BEVELED PIPE ENDS SHALL BE 5 DEGREES. SEE SPECIFICATIONS FOR MAXIMUM (NON-BEVELED) JOINT DEFLECTIONS.
4. ALL BEVEL OR DEFLECTION ANGLES SHALL BE EQUALLY DIVIDED THROUGHOUT THE CURVE.
5. FOR COMBINATION VERTICAL AND HORIZONTAL CURVES THE REQUIREMENTS FOR BOTH CONDITIONS SHALL BE COMBINED.
6. REFER TO PLAN AND PROFILE DRAWINGS FOR VERTICAL AND HORIZONTAL CURVE LOCATIONS.
7. 50' PIPE LENGTHS WERE ASSUMED TO DEVELOP VERTICAL CURVE DATA SHOWN ON PLANS. COORDINATE WITH ENGINEER IF DIFFERENT.
8. ALL PROFILE ELEVATIONS ARE SHOWN TO CENTERLINE OF PIPE.
9. REDUCED PIPE SEGMENTS LENGTHS MAY BE USED IN LIEU OF BEVELED OR MITERED JOINTS THROUGH CURVES. COORDINATE SHOP DRAWINGS WITH ENGINEER.

PIPELINE CURVES
NOT TO SCALE — C 2600

DRAFT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
AGREEMENT ENGINEER, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

APPROVED
PROFESSIONAL ENGINEER
DATE 07/14/16

DRAWN BY SR
CHECKED BY JL
QC

PROJECT: SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION
PROJECT NUMBER: S-0154(82)16
PIN: 14785

GENERAL CIVIL DETAILS - 1

SHEET NO. GC-01

EXHIBIT E

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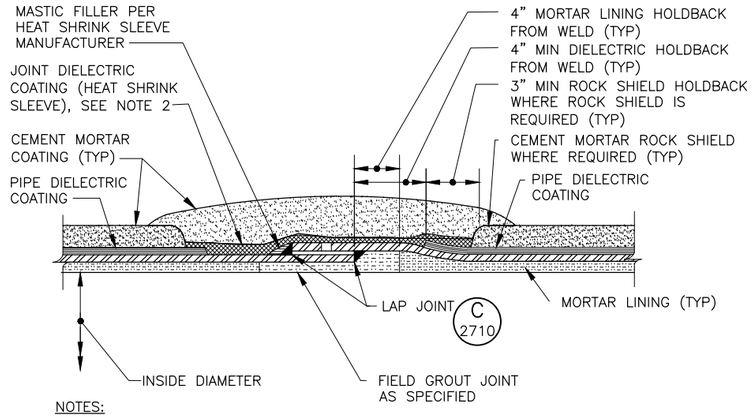
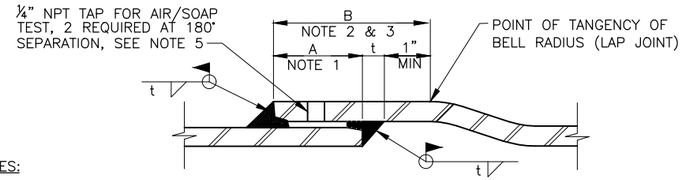


NOTES:

1. CONTRACTOR SHALL CONDUCT AN AIR/SOAP SOLUTION LEAK TEST AT 40 PSI AIR PRESSURE IN ADDITION TO DYE PENETRATE OR MAGNETIC PARTICLE TESTING AS REQUIRED BY SPECIFICATIONS. IF LEAKS ARE DETECTED, THE CONTRACTOR SHALL REPAIR AND RETEST THE WELDS UNTIL THERE ARE NO DEFECTS. PLUG TAPS WITH THREADED PLUG AND SEAL WELD PLUG AT COMPLETION OF TEST AND COAT AND LINE AS SHOWN OR SPECIFIED. TAP HOLES MAY BE ON INSIDE OR OUTSIDE OF JOINT.
2. AFTER INSTALLATION OF JOINT DIELECTRIC COATING, A HOLIDAY TEST SHALL BE COMPLETED AS SPECIFIED BY NACE CERTIFIED SPECIALIST.

LAP WELDED STEEL PIPE JOINT
NOT TO SCALE — C 2708

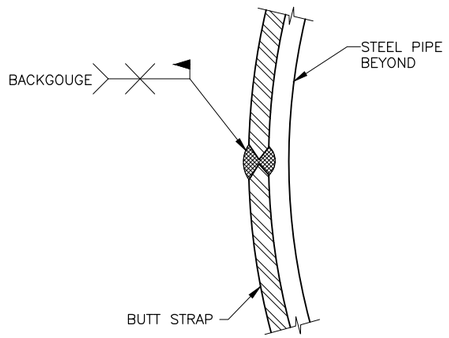
LINING AND COATING NOT SHOWN FOR CLARITY OF JOINT



NOTES:

1. DIMENSION "A" CORRESPONDS TO THE COMPLETED JOINT OVERLAP AFTER WELDING. DIMENSION "A" SHALL BE 3" MINIMUM FOR STANDARD JOINTS. FOR SPECIAL TEMPERATURE CONTROL JOINTS, THE DIMENSION "A" JOINT OVERLAP SHALL BE INCREASED BY 3 INCHES AS FURTHER DISCUSSED IN NOTE 3.
2. FOR STANDARD JOINTS THE MINIMUM DIMENSION "B" SHALL BE AS REQUIRED TO PROVIDE THE MINIMUM OVERLAP DIMENSION "A" AND MAINTAIN THE INDICATED HOLDBACK FOR THE WELD.
3. FOR SPECIAL TEMPERATURE CONTROL JOINTS, THE MINIMUM DIMENSION "B" SHALL BE INCREASED BY AT LEAST 3 INCHES. AT THE TIME OF INSTALLATION AND PRIOR TO WELDING, THE SPIGOT SHALL BE INSERTED INTO THE LENGTHENED BELL TO PROVIDE "A" +3 INCHES MINIMUM JOINT OVERLAP. SEE SPECIFICATIONS SECTION 02612S FOR SPECIAL TEMPERATURE CONTROL JOINT WELDING REQUIREMENTS.
4. FILLET WELDS FOR BELL AND SPIGOT LAP JOINTS SHOWN. FILLET WELDS ON OTHER JOINTS SIMILAR.
5. CONTRACTOR SHALL CONDUCT AN AIR/SOAP SOLUTION LEAK TEST AT 40 PSI AIR PRESSURE IN ADDITION TO DYE PENETRATE OR MAGNETIC PARTICLE TESTING AS REQUIRED BY SPECIFICATIONS. IF LEAKS ARE DETECTED, REPAIR AND RETEST UNTIL THERE ARE NO DEFECTS. PLUG TAPS WITH THREADED PLUG AND SEAL WELD PLUG AT COMPLETION OF TEST AND COAT AND LINE AS SHOWN OR SPECIFIED. TAP HOLES MAY BE ON INSIDE OR OUTSIDE OF JOINT.
6. THE JOINTS SHALL BE FABRICATED AND INSTALLED TO BE WITHIN THE TOLERANCES INDICATED. THE TOLERANCE REQUIREMENTS SHALL APPLY TO BOTH WELDS AND TO BOTH STRAIGHT AND DEFLECTED JOINTS.
7. LAP JOINTS SHALL BE DOUBLE LAP, UNLESS NOTED OTHERWISE. SINGLE LAP JOINTS SHALL BE INSIDE OR OUTSIDE AT CONTRACTORS OPTION.

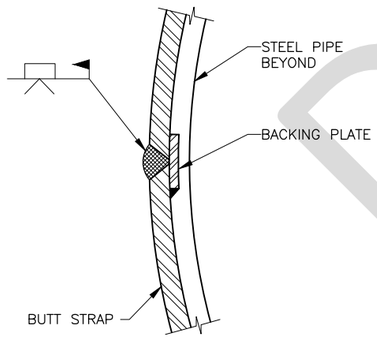
LAP JOINT WELD
NOT TO SCALE — C 2710



NOTES:

1. LININGS AND COATINGS ARE NOT SHOWN FOR CLARITY.

TYPE A
(USED FOR PIPE > 36"ø ACCESS TO BOTH INSIDE AND OUT)

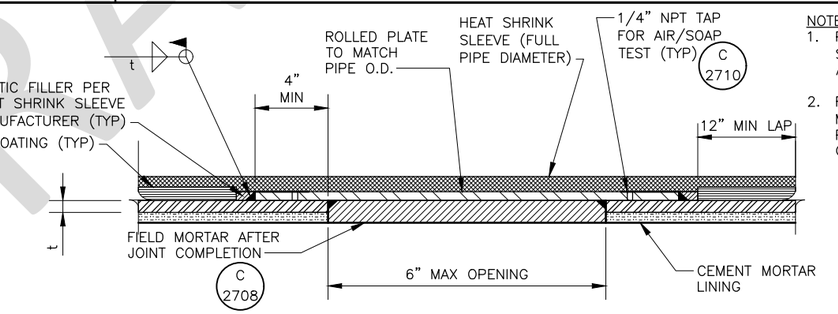


NOTES:

1. LININGS AND COATINGS ARE NOT SHOWN FOR CLARITY.

TYPE B
(USED FOR PIPE ≤ 36"ø ACCESS TO OUTSIDE ONLY)

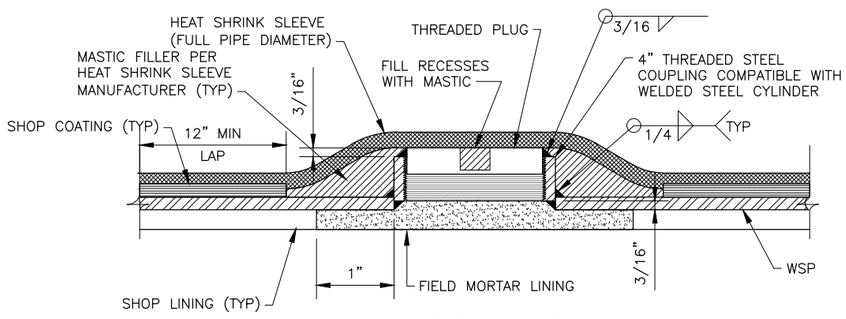
BUTT STRAP WELD
NOT TO SCALE — C 2711



NOTES:

1. PASS THROUGH FOR WELD LEADS MAY BE SPACED NO CLOSER THAN 500' FROM ACCESS MANWAY OUTLETS.
2. ROLLED PLATE THICKNESS SHALL BE MINIMUM OF 1/2" THICK OR EQUAL TO PIPE WALL THICKNESS. WHICHEVER IS GREATER.

ALT 1 (GREATER THAN 4")



ALT 2 (4" & LESS)

PASSHOLE FOR WELD LEEDS
NOT TO SCALE — C 2712

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
MATTHEW LANG, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

APPROVED

PROFESSIONAL ENGINEER — DATE 07/14/16

DRAWN BY SR — CHECKED BY JL — QC

PROJECT
SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION

PROJECT NUMBER
PIN 14785
S-0154(82)16

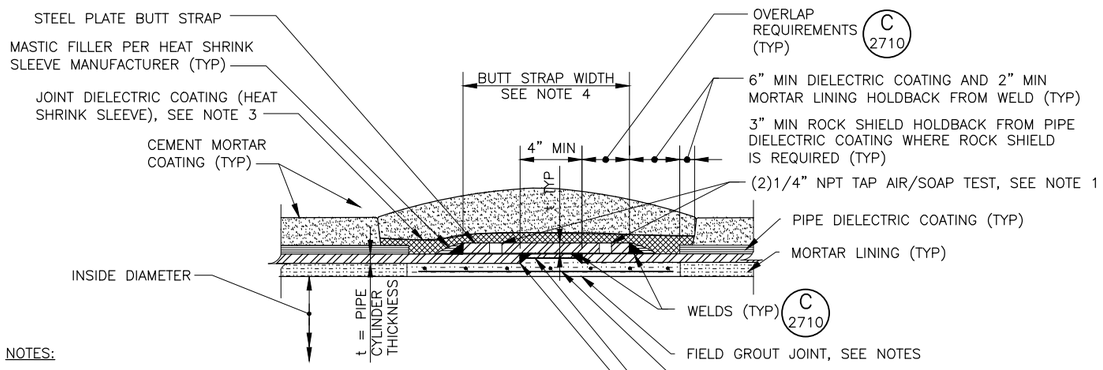
GENERAL CIVIL DETAILS - 2

SHEET NO. GC-02

EXHIBIT E

DRAFT

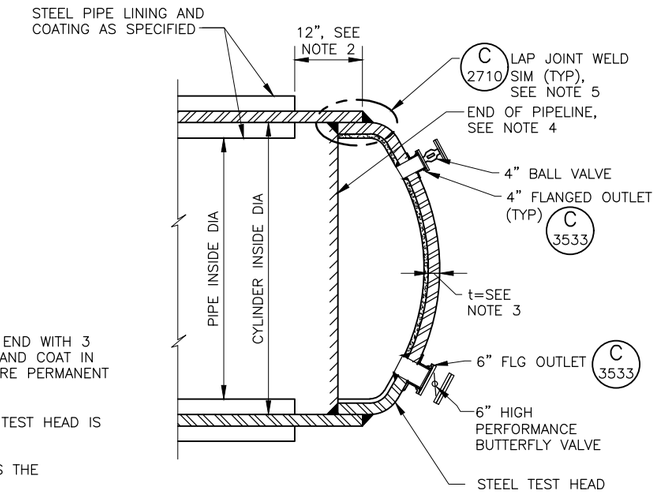
P:\Projects\024-16-02 UDOT SR-154 JA Services\20-Design Phase\2.7 Drawings\Sht\24316G2_GC02.dwg Plotted 7/13/2016 By Sean Rees



NOTES:

1. CONDUCT AN AIR/SOAP SOLUTION LEAK TEST AT 40 PSI AIR PRESSURE IN ADDITION TO DYE PENETRATE OR MAGNETIC PARTICLE TESTING AS REQ'D BY SPECIFICATIONS. IF LEAKS ARE DETECTED, THE CONTRACTOR SHALL REPAIR AND RETEST THE WELDS UNTIL THERE ARE NO DEFECTS. PLUG TAPS WITH THREADED PLUG AND SEAL WELD PLUG AT COMPLETION OF TEST AND COAT AS SHOWN OR SPECIFIED. TAP HOLES MAY BE ON INSIDE OR OUTSIDE OF JOINT.
2. FOR FIELD WELDING OF INDIVIDUAL BUTT STRAP PIECES TO EACH OTHER USING BUTT WELDS. C 2711
3. AFTER INSTALLATION OF JOINT DIELECTRIC COATING, A HOLIDAY TEST SHALL BE COMPLETED AS SPECIFIED BY NACE CERTIFIED SPECIALIST.
4. UNLESS OTHERWISE NOTED, BUTT STRAP WIDTH SHALL CONFORM TO THE LIMITATIONS SHOWN FOR PIPE END SEPARATION AND STEEL OVERLAP REQUIREMENTS.
5. GROUT FOR JOINT LINING SHALL BE ONE PART CEMENT TO TWO PARTS SAND AND SUFFICIENT WATER FOR DRY–PACK CONSISTENCY.

EXTERIOR BUTT–STRAP JOINT C 2713
NOT TO SCALE

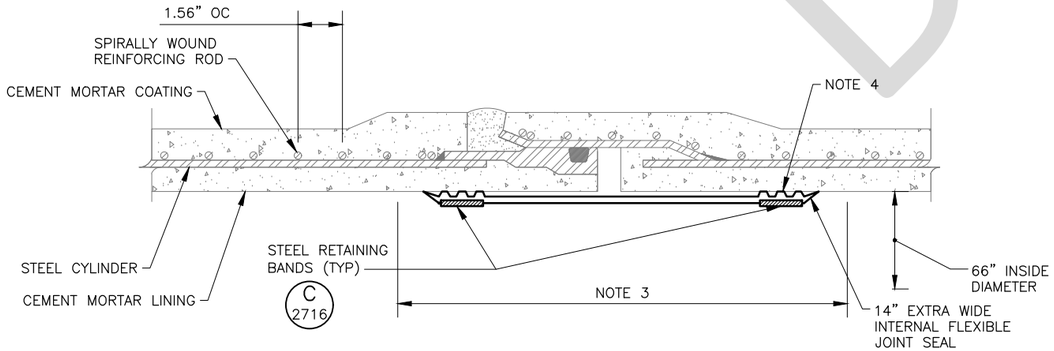


NOTES:

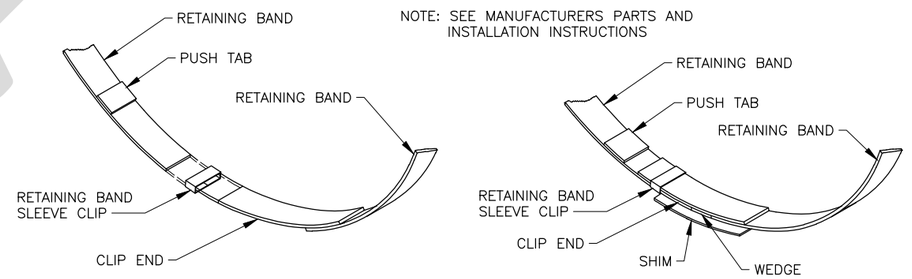
1. COAT TEMPORARY TEST HEAD AND PLAIN END WITH 3 MILS MIN RUST INHIBITING PRIMER. LINE AND COAT IN ACCORDANCE WITH SECTION 02621S WHERE PERMANENT END CAP IS SHOWN ON PLANS.
2. MINIMUM 8" HOLDBACK REQUIRED AFTER TEST HEAD IS CUT OFF.
3. WALL THICKNESS SHALL BE THE SAME AS THE ADJOINING PIPE.
4. FOR STATION AND LOCATION OF PIPELINE ENDS, SEE DRAWINGS.
5. BUTT STRAP CONNECTION, OR FULL PENETRATION BUTT WELDS MAY BE SUBSTITUTED FOR LAP JOINT SHOWN.

DISH HEAD END CAP C 2714
NOT TO SCALE

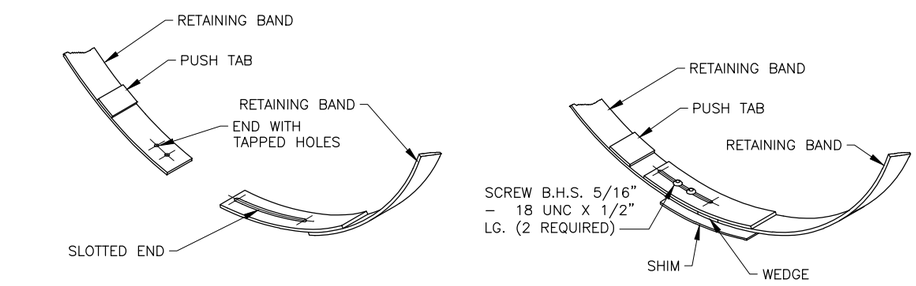
NOTES:
1. FLEXIBLE JOINT SEALS PROVIDED BY OWNER FOR INSTALLATION BY CONTRACTOR.
2. SEALS AND RETAINING BANDS BASED UPON WEKO–SEAL INTERNAL JOINT SEALS, MILLER PIPELINE CO.
3. CLEAN CONCRETE SURFACE OF DEBRIS 3" BEYOND EITHER SIDE OF THE SEAL POSITION.
4. ALL HIGH/LOW SURFACE IMPERFECTIONS RUNNING THROUGH OR PART WAY THROUGH THE SEALING SURFACE MUST BE REMOVED BEFORE INSTALLATION OF SEALS.



FLEXIBLE INTERNAL JOINT SEAL FOR CCP C 2715
NOT TO SCALE



DETAIL – RETAINING BAND SLEEVE CLIP OVERLAP RETAINER



DETAIL – RETAINING BAND MECHANICAL LOCK OVERLAP SCREW LOCK

INTERNAL JOINT REPAIR STEEL RETAINING BANDS C 2716
NOT TO SCALE

DRAFT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
AARON E. KING, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

APPROVED

PROFESSIONAL ENGINEER

07/14/16
DATE

DRAWN BY	SR
QC CHECKED BY	JL

SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION

PIN 14785

PROJECT NUMBER S-0154(82)16

GENERAL CIVIL DETAILS - 3

SHEET NO. GC-03

EXHIBIT E

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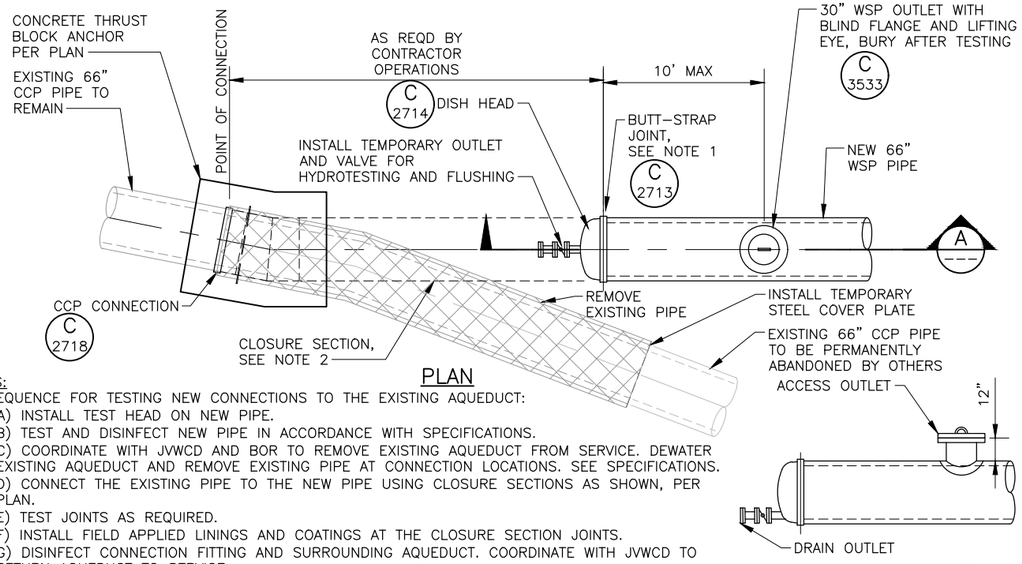
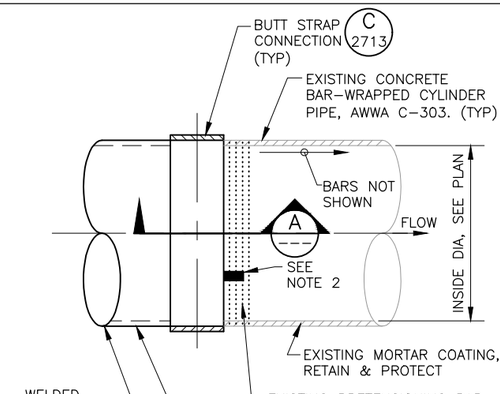


PLAN

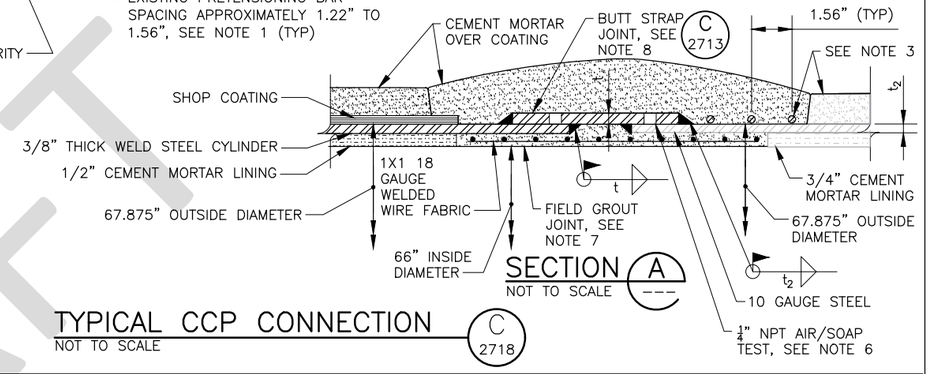
SECTION A
NOT TO SCALE

NOTES:
1. SEQUENCE FOR TESTING NEW CONNECTIONS TO THE EXISTING AQUEDUCT:
   A) INSTALL TEST HEAD ON NEW PIPE.
   B) TEST AND DISINFECT NEW PIPE IN ACCORDANCE WITH SPECIFICATIONS.
   C) COORDINATE WITH JVWCD AND BOR TO REMOVE EXISTING AQUEDUCT FROM SERVICE. DEWATER EXISTING AQUEDUCT AND REMOVE EXISTING PIPE AT CONNECTION LOCATIONS. SEE SPECIFICATIONS.
   D) CONNECT THE EXISTING PIPE TO THE NEW PIPE USING CLOSURE SECTIONS AS SHOWN, PER PLAN.
   E) TEST JOINTS AS REQUIRED.
   F) INSTALL FIELD APPLIED LININGS AND COATINGS AT THE CLOSURE SECTION JOINTS.
   G) DISINFECT CONNECTION FITTING AND SURROUNDING AQUEDUCT. COORDINATE WITH JVWCD TO RETURN AQUEDUCT TO SERVICE.
   H) CONCRETE THRUST COLLAR TO CURE MINIMUM 48 HRS PRIOR TO RETURNING AQUEDUCT TO SERVICE
2. VERIFY OD, GEOMETRY AND ALIGNMENT OF EXISTING PIPE PRIOR TO ORDERING CLOSURE PIECES.
3. FIELD LOCATION AND CONNECTION DETAILS SHALL BE INCLUDED WITH THE SHOP DRAWINGS SUBMITTALS. FOLLOWING THE INSTALLATION OF THE CLOSURE SECTION, THE CONTRACTOR SHALL BACKFILL THE NEW AND EXISTING PIPELINE AND RESTORE THE GROUND SURFACE.
4. SOUTH AQUEDUCT CONNECTION SHOWN. SIMILAR FOR NORTH AQUEDUCT CONNECTION.

FINAL TIE-IN CONNECTION TO EXISTING AQUEDUCT
NOT TO SCALE — C 2717



NOTES:
1. DO NOT CUT ANY PRETENSIONING BARS UNTIL NOTE 2 IS COMPLETED.
2. REMOVE CONCRETE COATING TO EXPOSE THREE COMPLETE COILS OF PRETENSIONING BARS, AND CAREFULLY TACK WELD A 6" STEEL BAR ACROSS THE PRETENSIONED BARS AND CAREFULLY TACK WELD PRETENSIONED BARS TO STEEL CYLINDER AT 10-INCH SPACING ALL AROUND PRIOR TO CUTTING PIPE. WHEN WELDING TAKE CARE NOT TO BURN THROUGH EXISTING PRETENSIONED BARS AND STEEL CYLINDERS.
3. REPAIR DAMAGED MORTAR LINING AND COATING TO NEW CONDITION.
4. DEWATERING OF PIPELINE TO BE SCHEDULED BY OWNER WITH DATES ESTABLISHED FOR ALLOWABLE CUT DURING TIME NOTED IN CONTRACT DOCUMENT. CONTRACTOR SHALL BE PREPARED TO MANAGE MINOR AMOUNTS OF WATER IN PIPELINE AFTER DEWATERING.
5. DISINFECT IN ACCORDANCE WITH APWA C651.
6. CONDUCT AN AIR/SOAP SOLUTION LEAK TEST AT 40 PSI AIR PRESSURE IN ADDITION TO DYE PENETRATE OR MAGNETIC PARTICLE TESTING AS REQ'D BY SPECIFICATIONS. IF LEAKS ARE DETECTED, THE CONTRACTOR SHALL REPAIR AND RETEST THE WELDS UNTIL THERE ARE NO DEFECTS. PLUG TAPS WITH THREADED PLUG AND SEAL WELD PLUG AT COMPLETION OF TEST AND COAT AND LINE AS SHOWN OR SPECIFIED. PROVIDE TWO TAP HOLES AT 180°.
7. GROUT FOR JOINT LINING SHALL BE ONE PART CEMENT TO TWO PARTS SAND AND SUFFICIENT WATER FOR DRY-PACK CONSISTENCY.
8. WHERE CONNECTING TO EXISTING CCP, BUTT STRAP TO BE $\frac{1}{4}$" THICK.

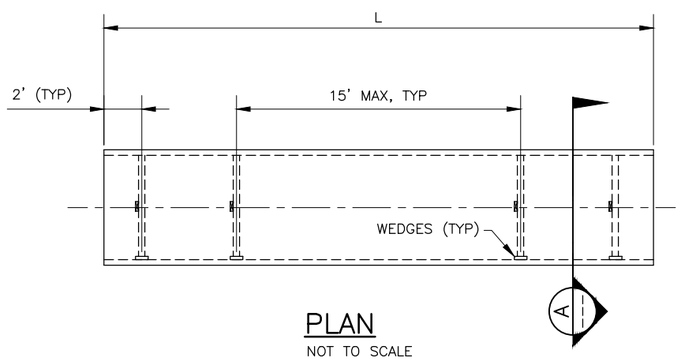


SECTION A
NOT TO SCALE

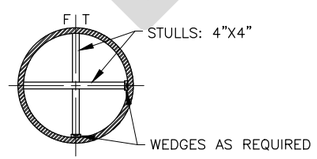
TYPICAL CCP CONNECTION
NOT TO SCALE — C 2718

NOTES:

1. STULLING IS DESIGNED FOR HAULING PURPOSE ONLY. PERFORMANCE OF PIPE BRACING USED DURING INSTALLATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

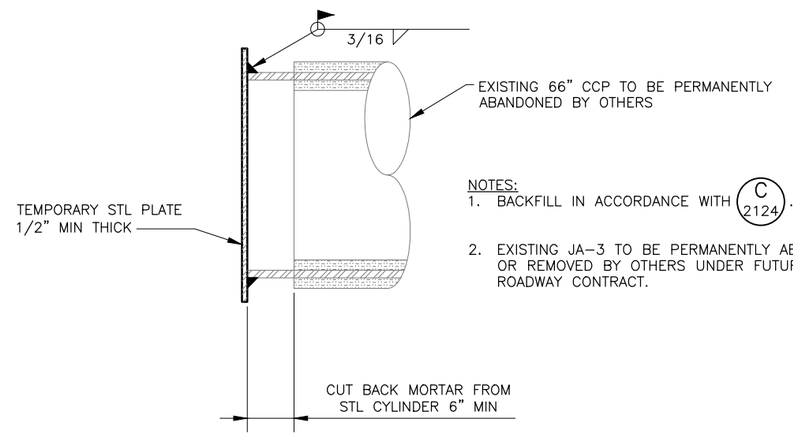


PLAN
NOT TO SCALE



SECTION A
NOT TO SCALE

WSP TEMPORARY BRACING LOCATIONS
NOT TO SCALE — C 2853



NOTES:
1. BACKFILL IN ACCORDANCE WITH C 2124.
2. EXISTING JA-3 TO BE PERMANENTLY ABANDONED OR REMOVED BY OTHERS UNDER FUTURE ROADWAY CONTRACT.

TEMPORARY STEEL COVER PLATE
NOT TO SCALE — C 2872

DRAFT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
ACCEPTED FOR JVWCD
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

DRAWN BY SR
QC CHECKED BY JL
DATE 07/14/16
APPROVED
PROFESSIONAL ENGINEER

PROJECT: SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION
PROJECT NUMBER: S-0154(82)16
PIN 14785

GENERAL CIVIL DETAILS - 4

SHEET NO. GC-04

EXHIBIT E

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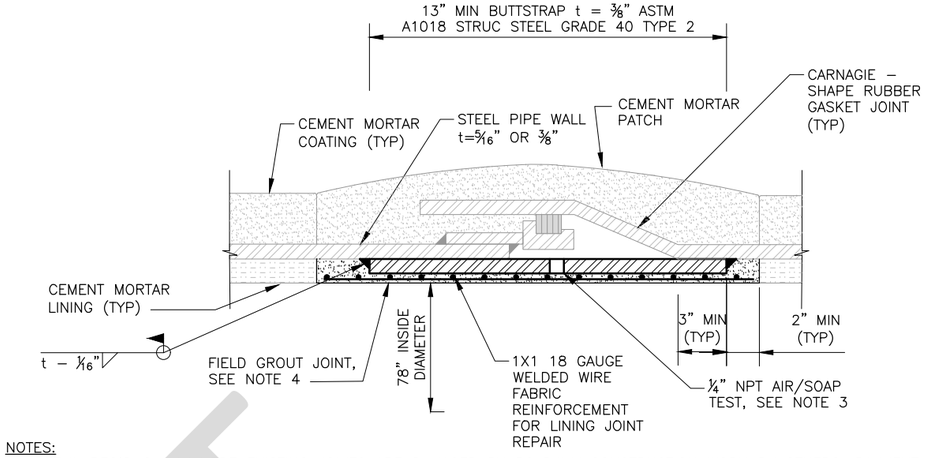
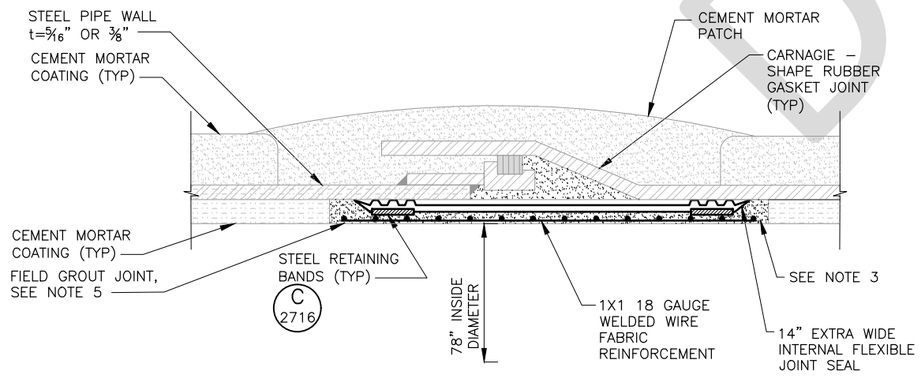


NOTES:
1. DETAIL REQ'D ONLY WHERE EXISTING JOINTS ARE DAMAGED BY ROADWAY CONSTRUCTION WORK BY OTHERS. PAYMENT ON UNIT BASIS FOLLOWING POST–CONSTRUCTION JOINT TESTING, SEE SPECIFICATIONS.
2. REMOVE CEMENT MORTAR LINING TO A NEAT LINE AND GRIND AND REPAIR ANY DAMAGE ON PIPE WALL, AND CLEAN AND PREPARE JOINT PRIOR TO INSTALLING BUTT STRAP.
3. CONDUCT AN AIR/SOAP SOLUTION LEAK TEST AT 40 PSI AIR PRESSURE IN ADDITION TO DYE PENETRATE OR MAGNETIC PARTICLE TESTING AS REQ'D BY SPECIFICATIONS. IF LEAKS ARE DETECTED, THE CONTRACTOR SHALL REPAIR AND RETEST THE WELDS UNTIL THERE ARE NO DEFECTS. PLUG TAPS WITH THREADED PLUG AND SEAL WELD PLUG AT COMPLETION OF TEST AND COAT AND LINE AS SHOWN OR SPECIFIED. PROVIDE TWO TAP HOLES AT 180°.
4. GROUT FOR JOINT LINING SHALL BE ONE PART CEMENT TO TWO PARTS SAND AND SUFFICIENT WATER FOR DRY–PACK CONSISTENCY.

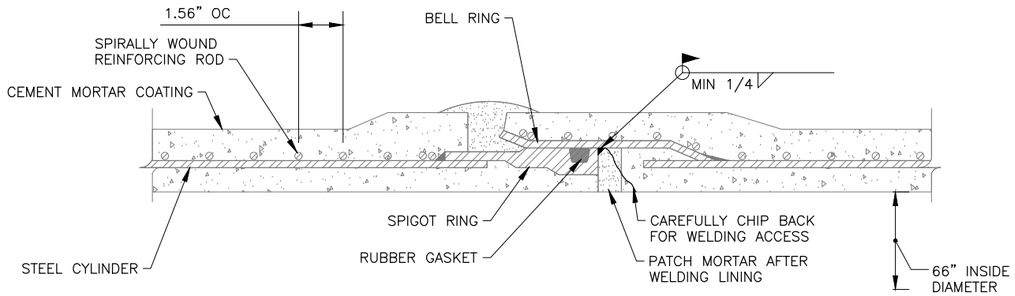
INTERIOR BUTTSTRAP JOINT FOR STEEL PIPE
NOT TO SCALE — C 2951

NOTES:
1. FLEXIBLE JOINT SEALS PROVIDED BY UDOT FOR INSTALLATION BY CONTRACTOR.
2. SEALS AND RETAINING BANDS BASED UPON WEKO–SEAL INTERNAL JOINT SEALS, MILLER PIPELINE CO.
3. REMOVE MORTAR LINING AT JOINT SEALS 3" BEYOND EITHER SIDE OF THE SEAL POSITION. REMOVE DIRT, SCALE AND DEBRIS FROM STEEL PIPE WALL WHERE THE SEALS WILL BE INSTALLED.
4. AQUAD EPOXY SHALL BE APPLIED ON EACH SIDE OF THE SPIRAL WELDS WHERE RETAINING BANDS INTERSECT TO CREATE A FEATHERED SMOOTH TRANSITION AND GOOD SEALING SURFACE.
5. AFTER REMOVAL OF THE FLEXIBLE JOINT SEAL, REPAIR MORTAR LINING USING ONE PART CEMENT TO TWO PARTS SAND AND SUFFICIENT WATER FOR DRY PACK CONSISTENCY WITH EMBEDDED WIRE REINFORCING SIMILAR TO DETAIL C 2951 .



FLEXIBLE INTERNAL JOINT SEAL FOR STEEL PIPE
NOT TO SCALE — C 2954

NOTES:
1. PREPARE JOINT FOR WELDING BY CAREFULLY CHIPPING BACK SUFFICIENT MORTAR LINING FOR WELDING ACCESS.
2. STEEL SURFACE TO BE WELDED SHALL BE DRY, CLEAN AND FREE FROM CEMENT MORTAR, GREASE, SCALE OR ANY DEBRIS THAT COULD PREVENT PROPER WELDING.
3. PROVIDE ADEQUATE VENTILATION BEFORE ATTEMPTING WELDING OF THE JOINT.
4. PLACE WELD IN TWO PASSES USING SKIP WELDING AND COOLING WITH A DAMP RAG TO PREVENT EXCESSIVE SMOKE IN THE PIPE THAT COULD BE PRODUCED FROM BURNING THE RUBBER GASKET.
5. WHEN WELDING IS COMPLETED, CLEAN INTERIOR JOINT RECESS AND REPAIR WITH CEMENT MORTAR. SIMILAR TO DETAIL C 2951 .



INTERIOR WELDED JOINT FOR CCP
NOT TO SCALE — C 2956

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN

ACCEPTED
ALAN HESS, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY SR
QC CHECKED BY JL
07/14/16 DATE

SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION

PROJECT
PROJECT NUMBER S-0154(82)16
PIN 14785

GENERAL CIVIL DETAILS - 5

SHEET NO. GC-05

EXHIBIT E

DRAFT

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DRAFT

PLAN

SECTION

NOTES:

1. ENGRAVE OR STAMP THE INFORMATION REQUIRED IN THE HEAD OF THE BRASS CAP, (0.05" MIN DEPTH).
2. MONUMENTS SHALL BE PLACED AS NOTED IN SPECIFICATIONS.
3. TOP OF BRASS CAP SHALL BE PLACED NOT LESS THAN 3" IN DEPTH FROM FINISHED GRADE.

PIPELINE MARKERS

NOT TO SCALE

C 2965

NOTES:

1. ALL PIPING AND FITTINGS ARE TO BE CEMENT MORTAR LINED, AND COATED PER SPECS, UNLESS OTHERWISE NOTED.
2. COLLAR THICKNESS AND WIDTH SHOWN ARE MINIMUM TO BE PROVIDED.

OUTLET / RISER REINFORCING COLLAR DATA

NOMINAL SIZE	SCHEDULE PIPE	t3 WALL THICKNESS (IN)	O.D. THIMBLE (IN)	COLLAR DIMENSIONS	
				W (IN)	T (IN)
4	STD	0.237	4 1/2	2 1/4	0.375
6	STD	0.280	6 5/8	3 5/16	0.375
8	STD	0.322	8 5/8	4 5/16	0.4375
12	STD	0.375	12 3/4	6 3/8	0.4375
16	STD	0.375	16	8	0.4375
24	STD	0.375	24	12	0.4375
30	STD	0.375	30	15	0.50

OUTLET DETAIL

NOT TO SCALE

C 3533

DRAWN

ACCEPTED
ANDY EFFLANDT, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

NO.	DATE	APPROVED BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

APPROVED
PROFESSIONAL ENGINEER — DATE 07/14/16

EXHIBIT E

DRAWN BY	RG		
QC CHECKED BY	JL		
DATE			

PROJECT	SR-154 BANGERTER HWY		
	JORDAN AQUEDUCT PROTECTION AND RELOCATION		
PROJECT NUMBER	S-0154(82)16	PIN	14785
	GENERAL CIVIL DETAILS - 6		

SHEET NO. GC-06

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WELBY JACOB WATER USERS COMPANY
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this _____day of_____, 20_____, by and between the **Utah Department of Transportation**, ("UDOT"), and **Welby Jacob Water Users Company**, a local special service district of the State of Utah, ("District") each as ("Party") and jointly as ("Parties").

MASTER UTILITY AGREEMENT

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, the design-build contractor will complete the design and administer construction of the Project ("Design-Builder"); and

WHEREAS, UDOT has identified District facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, the District desires for the Design-Builder to design and perform the Utility Work on the District's facilities necessitated by the Project; and

WHEREAS, the District will perform the necessary design review and inspection to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement, the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering the Utility Work to be accomplished by UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

DRAFT

AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. PROJECT RESPONSIBLE FOR COST

In accordance with Utah Code § 72-6-116(3)(a)(ii), UDOT is responsible for 100% of the cost of the Utility Work of District's facilities for those costs that comply with Utah Administrative Code R930-8.

2. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

District's contact person is Darryl Lehmitz, telephone number (801) 718-3327, and e-mail darryllehmitz@yahoo.com.

After awarding the Project, UDOT will provide the District with the Design Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

3. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the District's facilities and requirements for inclusion in this Agreement and the Request for Proposals, UDOT gave the District authorization for preliminary design engineering on August 9, 2016.

4. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the District.

DRAFT

5. PROJECT COORDINATION

The District requested that UDOT include items of Utility Work for relocating and adjusting District's facilities in the Project.

During the development of the Project design, the District and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the District's facilities can be avoided. If Utility Work for the District's facilities is required by the Project, UDOT will be responsible to identify the conflicts and to design and construct the Utility Work of the District's facilities. The District will perform the necessary design reviews prior to the start of Utility Work. UDOT's Project Representative will be responsible for coordinating with other utility companies as it relates to District's facilities.

6. DISTRICT REQUIREMENTS

UDOT will comply with the following District Utility Work requirements**:**

a. The District will require …
b. The District facilities shall remain operational between the months April through October.
c. UDOT will supply as-constructed plans, in _____ format, upon completion of any required Utility Work including betterment work.

7. UDOT TO DESIGN AND CONSTRUCT DISTRICT'S UTILITY WORK

UDOT will schedule and meet with the District to review the design and scheduling of the Utility Work for the District's facilities at specific locations on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

UDOT will design the Utility Work in accordance with District's standards regularly followed by the District in its own work and not considered a betterment. In the event of a conflict between UDOT and District standards, the higher standard will be applied.

a. The District's standards marked EXHIBIT "A" that is incorporated by reference.
b. The District's encroachment applications is marked EXHIBIT "B" that is incorporated by reference.
c. UDOT will secure permits required for Utility Work of District's facilities.

8. RIGHT-OF-WAY

Any easements or replacement right-of-way required in conjunction with the Utility Work of District's facilities will be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8.

9. BETTERMENT WORK

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If the District desires to include betterment work in the Project at any specific location UDOT may agree to the betterment providing the difference in costs between the functionally equivalent required Utility Work and the District's desired betterment work that is not required by the Project shall be at the sole cost of the District and the betterment work can be accommodated without delaying UDOT's Project. The betterment work will be addressed by separate supplemental agreement between UDOT and the District.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

10. SUPPLEMENTAL AGREEMENTS

UDOT and the District shall enter into supplemental agreements to cover Utility Work at specific Project locations. As part of the supplemental agreement, UDOT will provide design plans and Utility Work schedules for review and approval by the District prior to start of the Utility Work. A copy of the format of the proposed supplemental agreement is marked EXHIBIT "B" that is incorporated by reference.

The District will require a 2 week review and approval period for any final supplemental agreement submitted to the District by UDOT.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental agreement approved in writing by the Parties is required prior to the start of Utility Work on the changes or additions.

11. UDOT TO NOTIFY DISTRICT BEFORE BEGINNING UTILITY WORK

UDOT will notify the District at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto, to allow the District time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis.

12. DISTRICT TO NOTIFY UDOT

District's personnel shall notify UDOT's Field Representative upon arriving and leaving the Project site for verification of inspecting Utility Work. District's personnel will comply with all applicable OSHA and Project safety requirements while within the Project limits.

13. INSPECTION

The District shall provide on-call engineering support by District's engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during Utility Work, and to perform the necessary inspection on the District's facilities installed by UDOT.

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a. The District's engineer and/or inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on District's facilities in accordance with the plans and specifications provided and/or approved by the District, including changes or additions to the plans and specifications, which are approved by the Parties hereto.
b. The District shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on the District's facilities. The District shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.
c. UDOT will respond to District's concerns within 24-hours of written notification.
d. The District, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns the District may have with acceptance of the facilities upon completion of the Utility Work.
e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Utility Work does not relieve the District of its duty in the performance of the Utility Work or to ensure compliance with acceptable standards.

14. DAILY RECORDKEEPING

UDOT's Field Representative will keep daily records of the inspection performed by the District. Daily inspection records will be in duplicate on a form to be prepared by the District or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance and Certification Manager. The inspection records shall be signed by UDOT's Field Representative, and the District or its authorized representatives. Copies of the inspection records shall be retained by the parties to this Agreement.

15. REIMBURSEMENT

UDOT will not reimburse the District for costs incurred by District personnel for design review, observation, inspection, and operation of valves performed as part of their regularly assigned duties. Should it become necessary for the District to procure outside services to perform design review, observation, or inspection to accommodate UDOT's Utility Work and Project schedule, the District shall notify UDOT. Upon concurrence by UDOT, a supplemental agreement for the cost of the services will be executed at which time the District may procure outside services through appropriate solicitation.

16. SUBMITTAL OF ITEMIZED BILLS

The District shall submit itemized bills covering the actual costs incurred for outside services to perform design review, oversight, and inspection work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

UDOT Contracts and Compliance Specialist

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Utah Department of Transportation
PO Box 141510
SLC, UT 84114-1510

Itemized bills shall bear the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement and be submitted to UDOT within 60 days following completion of outside services by the District on the Project. Otherwise, previous payments to the District may be considered final, except as agreed to between the Parties in advance.

UDOT will reimburse the District within 60 days after receipt of the billings, but only for items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the District to submit final billings within 6 months of the completion of outside services will result in UDOT's disallowance of that portion of outside services performed by the District.

17. SALVAGED MATERIALS

All materials from District's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on this Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties hereto.

18. RIGHT TO AUDIT

UDOT and the Federal Highway Administration shall have the right to audit all cost records and accounts of he District pertaining to this Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. § 645, subpart A. Should this audit disclose that the District has been underpaid, the District will be reimbursed by UDOT within 60 days upon submission of additional billing to cover the underpayment. Should this audit disclose that the District has been overpaid, the District will reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For purpose of audit the District is required to keep and maintain its records of outsides services covered herein for a minimum of 3 years after final payment is received by the District from UDOT.

19. ACCEPTANCE AND MAINTENANCE

Upon completion of the Utility Work of District facilities by UDOT, the District will accept, own, and maintain its own facilities. The District shall be the sole owner of the facilities upon completion of the Project unless otherwise agreed to by the Parties. To the extent it may lawfully do so, District further agrees to relieve UDOT from any responsibility or liability that may result from its new facilities or the operation thereof.

20. ACCESS

It is understood that access for maintenance and servicing of District's facilities located on the right-of-way of the Project will be allowed only by permit issued by UDOT to the District, and that the District will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

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21. **INDEMNIFICATION**

UDOT and the District are both governmental entities subject to the Governmental Immunity Act. Each Party agrees to indemnify, defend, and save harmless the other from and against all claims, suits and costs, including attorneys' fees for injury or damage of any kind, arising out of its negligent acts, errors or omissions of its officers, agents, contractors or employees in the performance of this Agreement, and from and against all claims, suits, and costs, including attorneys' fees for injury or damage of any kind. Nothing in this paragraph is intended to create additional rights to third parties or to waive any of the provisions of the Governmental Immunity Act. The obligation to indemnify is limited to the dollar amounts set forth in the Governmental Immunity Act, provided the Act applies to the action or omission giving rise to the protections in this paragraph. The indemnification in this paragraph shall survive the expiration or termination of this Agreement.

22. **MISCELLANEOUS**

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.

b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and District.

c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.

d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

****

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IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

ATTEST:

Kearns Improvement District

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(IMPRESS SEAL)

. . . . . .

Recommended For Approval:

Utah Department of Transportation

_____ _____

Title: Utility and Railroad Leader **Title:** Project Director

Date: _____ **Date:** _____

Approved as to Form

Comptroller Office

_____ _____

Title: Assistant Attorney General **Title:** Contract Administrator

Date: _____ **Date:** _____

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WELBY JACOB WATER USERS COMPANY
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT"), and **Welby Jacob Water Users Company**, a local special service district of the State of Utah, ("District") each as ("Party") and jointly as ("Parties").

The parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the Master Utility Agreement remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. UDOT will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)
   b. The District requirements as shown in the MUA – District Requirements, are modified as follows:
      i.
   c. Anticipated duration of Utility Work:
   d. Total estimated cost of District's (100% reimbursable) outside services: (Detailed Estimate Attached)

2. UDOT will notify the District's Project Representative, Darryl Lehmitz, telephone number (801) 718-3327, and e-mail darryllehmitz@yahoo.com at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

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IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

Kearns Improvement District

ATTEST:

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(Impress Seal)

. . . . . .

RECOMMENDED FOR APPROVAL: **UTAH DEPARTMENT OF TRANSPORTATION**

_____ _____

Title: Utility and Railroad Leader **Title:** Project Director

Date: _____ **Date:** _____

_____

UDOT Comptroller Office
Contract Administrator

. . . . . .

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CITY OF WEST JORDAN
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this _____day of_____, 20_____, by and between the **Utah Department of Transportation**, ("UDOT"), and the **City of West Jordan**, a Municipal Corporation of the State of Utah, ("City") each as ("Party") and jointly as ("Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project No. S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, the design-build contractor will complete the design and administer construction of the Project ("Design-Builder"); and

WHEREAS, UDOT has identified City facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, the City desires for the Design-Builder to design and perform the Utility Work on the City's facilities necessitated by the Project; and

WHEREAS, the City will perform the necessary design review and inspection to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement, the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering the Utility Work to be accomplished by UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

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AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. PROJECT RESPONSIBLE FOR COST

In accordance with Utah Code § 72-6-116(3)(a)(ii), UDOT is responsible for 100% of the cost of the Utility Work of City's facilities for those costs that comply with Utah Administrative Code R930-8.

2. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

City's contact person is David Murphy, telephone number (801) 569-5074, and e-mail davidm@wjordan.com.

After awarding the Project, UDOT will provide the City with the Design Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

3. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the City's facilities and requirements for inclusion in this Agreement and the Request for Proposals, UDOT gave the City authorization for preliminary design engineering on April 26, 2016.

4. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the City.

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5. PROJECT COORDINATION

The City requested that UDOT include items of Utility Work for relocating and adjusting City's facilities in the Project.

During the development of the Project design, the City and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the City's facilities can be avoided. If Utility Work for the City's facilities is required by the Project, UDOT will be responsible to identify the conflicts and to design and construct the Utility Work of the City's facilities. The City will perform the necessary design reviews prior to the start of Utility Work. UDOT's Project Representative will be responsible for coordinating with other utility companies as it relates to City's facilities.

6. CITY REQUIREMENTS

UDOT will comply with the following City Utility Work requirements**:**

a. The City will require 14-day advance shut down notification for all water and sewer connections. A copy of the City's Water System Disruption of Service Approval Process is marked Exhibit "A" that is incorporated by reference.
   i. Notifications shall include, but are not limited to the following:
      1. Scope and schedule of work.
      2. City water, storm drain, and sewer system activities.
      3. City 16-inch water feed connection activities as it relates to the BOR Jordan Aqueduct Reach 2 & 3.
      4. Lateral connections to homes, businesses, and service retirements at all property takes and/or incidental work activities.
   ii. Allow 14-days for review and approval from the City.

b. UDOT will supply as-constructed plans, in AutoCAD version 16 format specified by the City, upon completion of any required Utility Work including betterment work.

c. Coordinate Project Work and Maintenance of Traffic activities/requirements for City's independent project for its 2017 Master Plan Sewer Improvements crossing Bangerter Highway at 3200 West.
   i. City shall request a permit from UDOT prior to beginning its 2017 Master Plan Sewer Improvement work.

d. Approval of plans in an executed Storm Drain Agreement(s) prior to contributing temporary and permanent Project storm drain into City system.

7. UDOT TO DESIGN AND CONSTRUCT CITY'S UTILITY WORK

UDOT will schedule and meet with the City to review the design and scheduling of the Utility Work for the City's facilities at specific locations on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

a. UDOT will design the Utility Work in accordance with City's standards regularly followed by the City in its own work and not considered a betterment. In the event of a conflict between UDOT and City standards, the higher standard will be applied.

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i. A copy of the City's standards can be found at http://www.wjordan.com/Engineering.aspx?pgID=3.7.1 that is incorporated by reference.

b. UDOT will secure permits required for Utility Work of City's facilities.
   i. A copy of the City's Encroachment Permit is marked Exhibit "B" that is incorporated by reference.
   ii. A copy of the City's Demolition Permit is marked Exhibit "C" that is incorporated by reference.

8. **RIGHT-OF-WAY**

Any easements or replacement right-of-way required in conjunction with the Utility Work of City's facilities will be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8.

9. **BETTERMENT WORK**

City Betterment Work is described in attached Exhibit "D" that is incorporated by reference.

City Aesthetics and Landscaping Betterment Work is described in attached Exhibit "E" that is incorporated by reference.

If the City desires to include additional betterment work in the Project at any specific location UDOT may agree to the betterment providing the difference in costs between the functionally equivalent required Utility Work and the City's desired betterment work that is not required by the Project shall be at the sole cost of the City and the betterment work can be accommodated without delaying UDOT's Project. The betterment work will be addressed by separate supplemental agreement between UDOT and the City.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

10. **SUPPLEMENTAL AGREEMENTS**

UDOT and the City shall enter into supplemental agreements to cover Utility Work at specific Project locations. As part of the supplemental agreement, UDOT will provide design plans and Utility Work schedules for review and approval by the City prior to start of the Utility Work. A copy of the format of the proposed supplemental agreement is marked EXHIBIT "F" that is incorporated by reference.

The City will require a 2 week review and approval period for any final supplemental agreement submitted to the City by UDOT. The City does not require council review for supplemental agreement approval.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental

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agreement approved in writing by the Parties is required prior to the start of Utility Work on the changes or additions.

11. UDOT TO NOTIFY CITY BEFORE BEGINNING UTILITY WORK

UDOT will notify the City at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto, to allow the City time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis.

12. CITY TO NOTIFY UDOT

City's personnel shall notify UDOT's Field Representative upon arriving and leaving the Project site for verification of inspecting Utility Work. City's personnel will comply with all applicable OSHA and Project safety requirements while within the Project limits.

13. INSPECTION

The City shall provide on-call engineering support by City's engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during Utility Work, and to perform the necessary inspection on the City's facilities installed by UDOT.

a. The City's engineer and/or inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on City's facilities in accordance with the plans and specifications provided and/or approved by the City, including changes or additions to the plans and specifications, which are approved by the Parties hereto.
b. The City shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on the City's facilities. The City shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.
c. UDOT will respond to City's concerns within 24-hours of written notification.
d. The City, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns the City may have with acceptance of the facilities upon completion of the Utility Work.
e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Utility Work does not relieve the City of its duty in the performance of the Utility Work or to ensure compliance with acceptable standards.

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14. DAILY RECORDKEEPING

UDOT's Resident Engineer will keep daily records of the inspection performed by the City. Daily inspection records will be in duplicate on a form to be prepared by the City or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance and Certification Manager. The inspection records shall be signed by UDOT's Field Representative, and the City or its authorized representatives. Copies of the inspection records shall be retained by the parties to this Agreement.

15. REIMBURSEMENT

UDOT will not reimburse the City for costs incurred by City personnel for design review, observation, inspection, and operation of valves performed as part of their regularly assigned duties. Should it become necessary for the City to procure outside services to perform design review, observation, or inspection to accommodate UDOT's Utility Work and Project schedule, the City shall notify UDOT. Upon concurrence by UDOT, a supplemental agreement for the cost of the services will be executed at which time the City may procure outside services through appropriate solicitation.

16. SUBMITTAL OF ITEMIZED BILLS

The City shall submit itemized bills covering the actual costs incurred for outside services to perform design review, oversight, and inspection work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

UDOT Contracts and Compliance Specialist
4501 South 2700 West
Construction Office, Box 148220
Salt Lake City, Utah 84114-8220

Itemized bills shall bear the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement and be submitted to UDOT within 60 days following completion of outside services by the City on the Project. Otherwise, previous payments to the City may be considered final, except as agreed to between the Parties in advance.

UDOT will reimburse the City within 60 days after receipt of the billings, but only for items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the City to submit final billings within 6 months of the completion of outside services will result in UDOT's disallowance of that portion of outside services performed by the City.

17. SALVAGED MATERIALS

All materials from City's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on this Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties hereto.

18. RIGHT TO AUDIT

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UDOT and the Federal Highway Administration shall have the right to audit all cost records and accounts of the City pertaining to this Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. § 645, subpart A. Should this audit disclose that the City has been underpaid, the City will be reimbursed by UDOT within 60 days upon submission of additional billing to cover the underpayment. Should this audit disclose that the City has been overpaid, the City will reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For purpose of audit the City is required to keep and maintain its records of outsides services covered herein for a minimum of 3 years after final payment is received by the City from UDOT.

19. **ACCEPTANCE AND MAINTENANCE**

Upon completion of the Utility Work of City facilities by UDOT, the City will accept, own, and maintain its own facilities. The City shall be the sole owner of the facilities upon completion of the Project unless otherwise agreed to by the Parties. To the extent it may lawfully do so, City further agrees to relieve UDOT from any responsibility or liability that may result from its new facilities or the operation thereof.

20. **ACCESS**

It is understood that access for maintenance and servicing of City's facilities located on the right-of-way of the Project will be allowed only by permit issued by UDOT to the City, and that the City will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

21. **INDEMNIFICATION**

UDOT and the City are both governmental entities subject to the Governmental Immunity Act. Each Party agrees to indemnify, defend, and save harmless the other from and against all claims, suits and costs, including attorneys' fees for injury or damage of any kind, arising out of its negligent acts, errors or omissions of its officers, agents, contractors or employees in the performance of this Agreement, and from and against all claims, suits, and costs, including attorneys' fees for injury or damage of any kind. Nothing in this paragraph is intended to create additional rights to third parties or to waive any of the provisions of the Governmental Immunity Act. The obligation to indemnify is limited to the dollar amounts set forth in the Governmental Immunity Act, provided the Act applies to the action or omission giving rise to the protections in this paragraph. The indemnification in this paragraph shall survive the expiration or termination of this Agreement.

22. **MISCELLANEOUS**

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.

b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and City.

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c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.

d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

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IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

ATTEST:

The City of West Jordan

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(IMPRESS SEAL)

. . . . . .

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

Approved as to Form

_____

Title: Assistant Attorney General

Date: _____

Comptroller Office

_____

Title: Contract Administrator

Date: _____

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EXHIBIT A

Department of Public Works

STANDARD OPERATIONAL GUIDELINE

Subject: **Water System, Disruption of Service Approval Process**		SOG No.: **WS002**
Origin Date: May 1, 2010	Revison Date: April 4, 2011	Page(s): 5

1. INTRODUCTION

A. Purpose: To allow for the planning, proper coordination, notifications and approvals required for a safe and timely disruption of water service to City water customers in cases of planned construction, due to either City capital improvement projects or private development projects. Planning for such disruptions must begin during the design phase of the project, and continue through construction and project acceptance phases of the work.

B. Scope: Affects Engineering, Construction Inspections, Water, and Streets divisions of the Public Works Department. Also affect City Capital Improvement Projects and private development projects.

C. Definitions:

D. Precautions/Safety: Trench safety and planning for safe evacuation of staff from areas where pipelines may be under construction.

E. Responsibility: The City's Project Engineer has primary responsibility for this work. Others such as the City's Water Division also have key roles in the work, and the City's or Developer's Contractor has a key role to play in the safe and timely completion of the work.

F. Equipment:

G. Notifications: The Director of Public Works is to be notified at least 24-hours in advance of the actual shut-down by email.

2. PROCEDURE

Water disruptions or outages which are a result of planned construction projects are required to be coordinated from the inception of the project through construction. This means that all of the Department divisions indicated above, will need to be continually coordinated with during all phases of the project. The paragraphs below indicate the various phases of the project, which divisions and positions are involved, and how these activities are to be carried out. Extreme carefulness must be observed in planning and carrying out these activities as

they can significantly affect City water customers and others.

A. Design Proces: As part of the design process, the City's Project Engineer and Consultant are to keep all affected parties involved and informed. This is critical to the success, safe, and timely completion of the construction and water service disruption/outage.

1) Adequate System Information: This process assumes reasonable amounts of adequate water system information is available. Existing drawings must be researched, and potholing will be required to fully answer any questions the Project Engineer and Consultant may have. Reasonable amounts of funds spent on potholing are worth the money and this area of project investiation should not be short-changed. It is understood that full information is not possible in many instances, but efforts need to be made to have as much information available if reasonably possible.
2) Existing As-built Drawings: Use existing as-bulit drawings to begin with and improve on them through additional coordination with Field Staff and through potholing. The GIS/Technical Support Division of the Department is responsible for managing the as-builts drawings with assistance for all of the other divisions in the Department.
3) Roadway Intersection Drawings: Use the existing Roadway Intersection Drawings which show all valves, water lines, other utilities, improve these as needed, and then include them in the Released for Construction Drawings. Ensure the drawings are as correct as possible before bidding. If the Project Engineer does not feel comfortable with the accuracy of these drawings, they should be noted as 'schemtic drawings' with indications that locations, sizes, etc. are for general information only and are not to be relied on.
4) Planning/research of Needs and Impacts (Preliminary): All Engineering, Inspection, O&M, and Consultant staff is to participate in this planning work for water outages. The following need to be included:
    - Identify options for providing water service.
    - Field Research of Water System: Water Division is to Identify existing valves, mark, and exercises them to make sure they operate properly.
    - Impacted Customers – Staff is to identify the water customers of the City who will be impacted by any disruption or outage of the Water System.
    - Night outage(s) – If night outages are required, coordinate with the SLVHD for work to be done between the hours of 10 p.m. and 7 a.m. O&M staff will also need to be coordinated with for actual water valve closures and only O&M staff is to open/close these valves.
5) Identification of Possible Water Outages: Project Engineer/Consultant identifies possible/required shut-downs as part of the design process. These are to be noted in the project Contract Documents and conditions indicated for water outages.
6) Engineering Inspector Review of Contract Documents: The Engineering Inspector is to review the 'Released for Construction Drawings', and coordinate with the Project Engineer and remainder of the Project Team on how to address outage(s).
    - Determine proposal for how the work might be done. Suggest or require process to contactor as part of Contract Documents.

7) Constructability Review Meeting: As part of the design process, a meeting or set of meetings as needed, with the design staff, project engineer, O&M staff, and inspection staff to identify potential outages. The Engineer, O&M staff, and Inspector are to then begin working through how to plan for these outages and the impacts of those outages.
7) PW O&M Review of Drawings – Engineering staff are to make sure O&M staff has reviewed the preliminary documents (30-50% review) and their comments have been incorporated into the final documents (80-90%), prior to putting the Documents out for bid.

B. Preconstruction/Construction Meeting Coordination: As part of the process, a mandatory preconstruction/construction meeting is to be held where water distruptions/outages are discussed. City staff is to express their concerns and present the information they have prepared and require the Contractor to develop a written water disruption/outage plan.

1) Scheduling: Schedule the meeting through Outlook at least 2 weeks in advance of the meeting.

2) Persons to Attend: The Project Engineer, Consultant, Engineering Inspector, Water Division staff and Contractor must be invited and must attend. If the Contractor's Superintendent does not show up at the meeting, the meeting is to be cancelled and rescheduled.
3) Communications: Establish City and Contractor chain of command and which persons are the point-to-point contacts on the City's, and the Contractor's sides of the work.
4) Agenda Item: Water service disruptions/outages are to be identified and discussed as part of meeting agenda. The Engineering Inspection Supervisor is responsible for this meeting and this item.
5) Contractor's Proposal and Schedule: The Contractor is to take all of the available information available and propose methods/processes/timelines for distruption/outages. Contractor is to prepare and submit a Contract Schedule for the work to the Project Inspector.
6) Approval Process: Once the Contractor has submitted a proposed plan and schedule for the disruption/outage, City staff is to meet and go over the Plan to make sure it meets all of their requirements. Corrections need to be submitted back to the Contractor in writing and a new Plan prepared. The Plan is not approved until the Water Division, Engineering Inspection, Engineering, and Contractor, signs off on the Plan.

C. Request for Water Disruption/Outage: The Contractor is to make a written request for any water disruption or outage he feels is necessary, as part of the project. The following applies to this process:

1) Request is made by the Contractor to Engineering Inspector and must include:
   - Request indicates answers to the questions of 'what, when, where, why'.
   - The request must be made in writing. A letter or email will suffice as long as it contains the correct information.

- The Water Division requires a minimum of 72-hours notice to begin customer notification of outage and implementation of the City's portion of the Plan in the Field.

2) Engineering Inspector begins coordination with Water Division through the Water Superintendent. The Water Superintendent will coordinate with his staff including the Water Operations Supervisor.
3) Notification of Utilities Manager and Public Works Director: Both the Utilities Operations Manager and the Public Works Director are to be kept up-to-date on planning and approval processes and especially as the project moves closer to the actual water service disruption/outage.

D. Planning/Research of Needs and Impacts: The purpose of this section is to take the Plan submitted by the Contractor and make sure that it will actually work. City staff is the most familiar with the Water System, and will have the final approval on whether the Plan is approved. The following steps need to be considered in doing this phase of the work.

1) Engineering inspector schedules meeting with Water Division staff/Contractor to coordinate outage.
2) Staff brings all information developed as part of the desgin process and proposals from the Contractor.
3) Project Team develops reviews the proposed plan and develops an actual written water outage plan and prepares a scope of work, or step by step plan, of what is going to be done. This will include detail such as which pipe will be cut first, which one second, which valves will we closed, how muc h time will it take, etc. Make sure everyone involved in the outage: contractor, contractor's on-site superintendent, workers, City project engineer, city inspector, and O&M staff all have copies and understand the order of the work. Deviations must be coordinated with everyone (Refer to KHP, Mid-Jordan Light Rail, Redwood PNR Waterline Tie-in plan. Includes "Overview", "Safety", "Quality", "Compliance", "Survey", and "Discussion Items").
4) Plan for Contingencies – Look at all drawings, identify the scope of work (work to be done), and identify contingency plans if things should go wrong. For instance, if we cut this pipe, do we understand how to close off all flow to the pipe and have we tried it out before hand.
5) Additional Potholing – If the Contractor feels that additional potholing is required, work out a solution for doing so and pay him, if additional compensation is warranted.
6) Obtain all Permits: Make sure all appropriate permits have been obtained as part of the planning process. This may include:
   - SLVHD Permit - for night work
   - UDOT Permit
   - City of West Jordan Encroachment Permit
   - Others as needed

E. Pre-activity Meeting/Actual Water Disruption/Outage: Just prior to the actual beginning of the outage, and work preliminary to the outage, a pre-activity meeting is to be held to discuss in detail the work to be done as part of the water disruption/outage. The following need to be discussed:

EXHIBIT A

1) Communications - Reaffirm City and Contractor's organizations, who are in charge, and who are the point-to-point contacts on the Contractor's side and who on the City's side. Make sure everyone has the correct phone numbers.
2) Implement final water outage plan – Needs to include priority of construction: which lines to cut first, second, etc. Plan needs to include a flushing plan and safety plan.
3) Contingency Plan(s) - Implement plan(s) for contingencies as required.
4) Schedule – execute work within appropriate time windows.
5) Permits: Make sure all the permits have been obtained.
6) Approval form: *(Do you want an approval form where everyone signs off on the outage, basically a permit?) (1st comment – No – cover page of plan/excavation permit is the form.)*
7) Inspections and Testing: Inspections and sampling are to be accomplished per City and AWWA standards.
8) Documentation of Work: The Engineering Inspector is responsible for taking pictures of the work with excavation open, take measurements and survey of critical points to document what is in the intersection, or other location, for future reference.
9) Questions regarding Unknown Pipelines/Conduits/Strucctures: If there are questions about what pipelines, conduits do, identify them prior to closing the excavation.
10) As-built Drawings: The Contractor is responsible for ensuring as-built drawings are prepared and meet the Engineering Inspector's requirements, and are turned over to the Inspector as the end of the project. The Engineering Inspector is responsible for collecting all as-built information from the Contractor and transferring them to the Project Engineer. The Project Engineer will work with the GIS Division is making the changes to the City's as-built drawings to keep them up-to-date.

F. Post-activity Meeting: Once the work is complete, all City and Contractor are to meet to go over the actual outage. Go over what went right and wrong and improve the process.
   1) Process for as-builty drawings – City Engineer/Supervising Inspector need to look at the requirements for as-builting drawings and make sure they are complied with.

3. REFERENCE DOCUMENTS

A. City of West Jordan, Water Design & Construction Standards.
B. City of West Jordan, Encroachment Ordinance and Permit.

Approved by:

Wendell T. Rigby, P.E.
Director of Public Works

Date 4/4/2011

EXHIBIT B

City of West Jordan Public Works
Engineering Department
8000 South Redwood Road
West Jordan, Utah 84088
801-569-5070

Public Right-of-Way Encroachment Permit Application and Agreement

Company Name:	**Permit No.:**
License No.:	**Date Issued:**
Applicant Name:	**Cost of Permit:**
Title:	**Check No.:**
Address:	**Receipt No.:**
City, State, Zip:	**Work No.:**
Contractor Performing Work:	**Cell No.:**
Nature of Work: Telephone ● Electrical ● CATV ● Gas ● Water ● Stormdrain ● Wastewater ● Secondary Water ● Other:	**Email:**

FAILURE OF THE PERMITTEE TO FOLLOW THE PROVISIONS OF THIS PERMIT SHALL RESULT IN THE RETRACTION OF THE PERMIT BY THE CITY AND LOSS OF PRIVILEGESTO WORK WITHIN THE CITY'S RIGHT-OF-WAY.

1. Standards/Location of Work
The above indicated applicant is hereby granted subject to Title 8, Chapter 8 of the City's Municipal Code, the City's Policies and Design Criteria Manuals, the Construction Specifications Manual, Standard Drawings Manual, State Occupational Safety and Health Laws, Manual on Uniform Traffic Control Devices (MUTCD), Instructions to Flaggers, the approved plans, and any special limitations set herein, permission for the purpose of:

_____within the right of way limits in the

following locations _____

2. Prior to Work
Prior to Work being performed in the public right-of-way, the Permittee will make proper provisions for protecting the public's safety and property. This permit is a binding agreement between the Permittee and the City and shall be only for the location listed on this permit.

3. Permit Fee
The City of West Jordan Encroachment Permit Fee shall apply, for an excavation in public right-of-way, as listed on the Current Uniform Schedule of Fees and Services Charges:

_____ feet long, _____ feet wide, and _____feet deep.

4. Beginning and Ending of Work
The work permitted herewith shall commence on _____ and shall be diligently prosecuted to completion. The work shall be completed and all disturbed surface or objects restored on or before _____. In the event work is commenced under this permit and the permittee fails or refuses to complete the work, the City of West Jordan may, at its election, fill in or otherwise correct any existing deficiencies at the expense of the permittee and subject to immediate payment by the permittee.

5. Performance Bond and Insurance
The Permittee shall supply to the City a Performance Bond for a period of three (3) years after completion of the work to guarantee satisfactory performance. Amount of the bond shall be determined by the encroachment department upon review of this application. The bond shall be in the name of the Permittee.

Insurance
The Permittee shall provide to the City copies of workers compensation insurance and liability insurance that names the City its elected officials, appointed officials, employees, volunteers, and agents as additionally insured (This verbiage must be a part of your Lability Insurance under Special Items.. The Permittee shall be responsible for any liability or personal injury involved through neglect. The Permit Holder agrees to indemnify the City, its elected officials, appointed officials, employees, volunteers, and agents against all claims, demands, costs, damages, attorney fees or other expenses of any kind by such neglect

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EXHIBIT B

6. Notice of Work to Begin
Before work permitted herewith is commenced, the permittee shall call in on the inspection line (801) 569-5051 before 3:00 p.m. Commencement of said work is understood to indicate that the permittee will comply with all instruction and regulations of the City of West Jordan (as listed) with respect to performance of said work and that she/he will properly control and warn the public of said work to prevent accident. The Permittee shall inform all emergency services, school districts, UDOT and UTA two (2) working days in advance of any approved road closures or detours.

7. Restoration of Right-of-Way
This permit is issued with the understanding that the Permittee will restore the right-of-way to its original or better condition. Such restoration shall take place within two (2) working days from the time of completion of the Work. If the Permittee fails to meet this obligation within the time indicated herein, the City may make all the necessary restorations at the Permittee's expense.

8. Limits of Work Area
Permittee shall not perform any work on City of West Jordan right-of-way beyond those areas of operation stipulated on this permit. This permit in no way allows the Permittee access to private properties; the individual property owners must grant access.

9. Suspension of Work
If permittee fails to comply with City of West Jordan regulations, specifications or instructions pertinent to this permit, the City Engineer or his duly authorized representative, may by verbal order, suspend the work until the violation is corrected. If permittee fails or refuses to comply promptly, the City Engineer or his authorized representative may issue a written order stopping all or any part of the work. When satisfactory corrective action is taken, an order permitting resumption of work may be issued.

10. Permit Period/Extensions
This permit is valid forty-five (45) days from issue date. The City may grant an extension of time with a written request from the Permittee to the Engineering Department. Such request must be submitted five (5) working days before the expiration date of the permit.

11. On-Site Permit Requirements
A copy of the City's current trench detail, approved plan of the Work, approved traffic control plan, a signed copy of this Permit, and a copy of the City's Public Improvement Standards, Specifications, and Plans shall be on the work site at all times. The City shall be granted access to these papers at all times.

12. Temporary Asphalt Patching
Asphalt patching to roads between October 15 and March 1 will be considered temporary only and must be replaced after March 1 following APWA standards.

Special Limitations:

- Traffic Control Plans, signs and channelizing devices shall conform to MUTCD Standards as a minimum. Traffic Control Plan to be approved by City's Traffic Engineer.
- Contact the inspection line at (801) 569-5051 48-hours prior to the time of lane or shoulder closure, with route, location and duration. Call again when the job is complete.
- This Agreement and/or permit are for City of West Jordan approval only. You are responsible to obtain clearances from UDOT, UTA, railroads, private property owners and other local jurisdictions that you are working with.
- Call for Blue Stakes and check for other utilities in the area prior to excavation.
- Saw cut and tack coat joints. Replace asphalt to the existing depth plus 1-inch, with a minimum of 4-inches, or as directed by City Engineer.
- Untreated Base Course with 97-percent compaction for the full depth of the trench with 6-inch lifts.
- Licensee is responsible for repairing and/or restoring any portion of the roadway damaged during construction.
- Licensee must restore shoulder of highway to its original or better condition to include reseeding, replacing sidewalk, fencing, pipe, culverts or signs removed or damaged during construction.
- Striping is to be replaced with the same material within 48-hours of completion of the permit. The materials must maintain City of West Jordan standard specifications for 6-months.
- No storage of backfill material or pipe will be allowed within the ASHTO Clear Zone. Excavations to be backfilled daily if possible.
- If excavation is within 350-feet of an intersection, permittee is required to contact the City Traffic Engineer for requirements.
- Permittee will comply with all applicable environmental laws.

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EXHIBIT B

- All borings shall show an approved cross section showing all other existing utilities, and clearances from such.
- Steel drum vehicles or steel tracked vehicles or equipment shall use minimum ¾ inch plywood over railroad concrete pavement to protect the concrete while crossing the railroad track area.
- For concrete paved roadways, the permittee is responsible for all panels that have 2-inch holes bored into the panel. If these panels fail in the future due to the bores, the Permittee will be required to replace the affected panels.

Accepted By:
My carrying out the activities allowed by this permit is conclusive evidence that I have accepted all provisions, limitations, and restrictions of the permit and attachments, understand and agree to all penalties for failing to comply with them and understand my ability to review a sample permit and applicable attachments at the City Engineer's office.

Permit Applicant:

Name	Title	Date

Attach the following documents: **All documents and fees must be paid before an Encroachment Permit will be issued.**

- ☐ Bond ($10,000 for one cut / $ 25,000 for multiple cuts)
- ☐ Current copy of Liability Insurance (See #5 for verbiage)
- ☐ Traffic Control Plan
- ☐ Site Plan
- ☐ Fees Paid

Processed and Approved By:

Name	Title	Date
Name	Title	Date

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Inspections

Beginning of Work: Phone call received:	Inspection Completed By/Date:
Intermediate Work: Phone call received:	Inspection Completed By/Date:
Intermediate Work: Phone call received:	Inspection Completed By/Date:
Completion of Work: Phone call received:	Inspection Completed By/Date:

Final Inspection and Release

Inspector Approval		Administrative Approval to Release	
Signature	Date	Signature	Date

EXHIBIT C

City of West Jordan
Building & Safety
8000 South Redwood Road
West Jordan, UT 84088
(801) 569-5050
Fax (801) 569-5099

BUILDING DEMOLITION(S)

A Building Permit and fee are required for each building demolition. The fee for a building demolition permit is $126.25 per building.

Follow these steps to expedite your demolition permit:

1. Fill out a building permit application, with the address, type of structure to be demolished, and contractor(s) information.
2. Submit approval letter from the State Division of Air Quality 801-536-4053. Jobs having Asbestos requires an inspection by a Utah Certified Asbestos Inspector prior to disturbing suspected asbestos. 801-536-4451.
3. Submit approval letter from the Salt Lake Valley Health Department. Ph. 801-313-6626, 788 E Woodoak Lane, Murray.
4. Notify and request disconnection from the following utilities and **provide a signature from the West Jordan Engineering department for water and sewer disconnection.**
5. If contractor/company disturbs or removes painted or coated surfaces greater than 6 sq ft in a room on the interior or 20 sq ft on the exterior of target housing or child-occupied facilities built before 1978, the company may be subject to the ***new lead based paint and/or renovation, repair and painting rule.*** 801-536-4018

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a. Rocky Mountain Power - ph. 888-221-7070
b. Questar Gas – ph. 800-323-5517
c. **West Jordan Water & Sewer Engineering Department Ph. 801-831-7172**

_____
Signature (W.J. Representative) Print Name

d. Phone, Cable, and any other service to the building.

The above items must be submitted to this office before a permit will be issued.

CITY OF WEST JORDAN BETTERMENTS

The City has requested the following Betterment Work be included with the Project Work:

7000 Betterment Work

City has provided concept layouts for proposed Betterment Work as shown and described below. Final Betterment Work plans will be memorialized through a separate supplemental agreement between UDOT and the City.

1. Upgrade existing 12-inch sewer to 24-inch sewer from sta. 1+00 to sta. 5+25 +/-.
2. Install new 24-inch secondary water pipeline casing from sta. 1+00 to sta. 6+05 +/.

9000 South Betterments

City has requested Betterment Work as listed below. Final Betterment Work plans will be memorialized through a separate supplemental agreement between UDOT and the City. City shall be responsible for permitting costs associated with Betterment Work.

1. Upgrade existing 12-inch sewer to 24-inch from Winthrope Circle to approximately 3450 West.

2. Water upgrades:
   a. Replace existing 10-inch waterline with new 12-inch DIP waterline or equivalent from Winthrope Circle to hospital connection.
   b. Replace 12-inch waterline with new 12-inch DIP waterline or equivalent from old PRV location to hospital connection.
   c. Place new 16-inch waterline in same approximate alignment as the existing 16-inch water to replace Zone 1 pipe and connect to Zone 2 transmission with 16 inch pipe. Length of pipe installation shall be based on pressure class.

3. PRV upgrades:
   a. Combine two existing PRV's vaults in 9000 South into one vault. It is anticipated that the exiting PRV vault located in 9000 South, within the south park-strip, will be a Project Work conflict resulting in Utility Work at UDOT's cost. City requests the existing PRV within 9000 South, within roadway, be placed into the PRV vault being relocated as Project Utility Work. The Utility Work to abandon the 9000 South PRV, within roadway, and to combine the two PRV vaults is pro-rated Betterment Work. Costs of the Betterment shall include, design, right-of-way, materials, and construction exceeding the Project Work conflict requirements.

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CITY OF WEST JORDAN AESTHETIC AND LANDSCAPE BETTERMENTS

The City has requested the following Betterment Work be included with the Project Work:

UDOT will include the following Aesthetics and Landscaping Betterment Work items into the Project Work. UDOT will supplement up to $100,000.00 towards each City intersection at 7000 and 9000 South for Aesthetics and Landscaping Betterment Work. UDOT and the City shall enter into supplemental agreements to cover Aesthetics and Landscaping Betterment Work described below. City will be responsible for paying the actual costs greater than $100,000.00 associated with the Aesthetics and Landscaping Betterment Work items, based on UDOT's actual quantities placed.

Description of Aesthetics and Landscaping Betterment Work:

Element	Desired City Betterment
Parapets:	1. Add the City of West Jordan logo to one or two visible locations on each bridge at 7000 and 9000 South.
Lighting and Traffic Signal Poles:	1. Matching all City affected streetlights to new LED standards, both arterial and local streetlights. Lights must match Section 16500 and current manufacturer specifications. 2. Traffic Signal Poles shall be black powder coated as minimum standard.
Landscaping Remnant Parcels:	1. Sod, trees, plants, and sprinkler systems installed according to City Parks' standards, which will be maintained by the City.

CITY OF WEST JORDAN
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT"), and **City of West Jordan** a Municipal Corporation of the State of Utah, ("City") each as ("Party") and jointly as ("Parties").

The parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the Master Utility Agreement remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. UDOT will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)

   b. The City requirements as shown in the MUA – City Requirements, are modified as follows:
      i.

   c. Anticipated duration of Utility Work:

   d. Total estimated cost of City's (100% reimbursable) outside services: (Detailed Estimate Attached)

2. UDOT will notify the City's Project Representative, David Murphy, telephone number (801 569-5074, email davidm@wjordan.com at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

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IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

City of West Jordan

ATTEST:

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(Impress Seal)

. . . . . .

RECOMMENDED FOR APPROVAL: **UTAH DEPARTMENT OF TRANSPORTATION**

_____ _____

Title: Utility and Railroad Leader **Title:** Project Director

Date: _____ **Date:** _____

_____

UDOT Comptroller Office
Contract Administrator

. . . . . .

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ZAYO GROUP, LLC
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this 30th day of August, 20 16, by and between the **Utah Department of Transportation**, ("UDOT") and **Zayo Group, LLC**, a Company of the State of Colorado, ("Company") (each as "Party" and jointly as "Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, UDOT's design-build contractor ("Design-Builder") will complete the design and administer construction of the Project; and

WHEREAS, UDOT has identified Company facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, the Company desires for the Design-Builder to design and construct the Company's Utility Work except cable/pedestal procurement, pulling, and splicing necessitated by the Project; and

WHEREAS, the Company will perform the necessary review and approval for the design and construction of its Utility Work, provide cable/pedestal procurement, pulling, splicing, and construction inspection to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering Utility Work to be accomplished by the Company and UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

Company's contact person is Michael Sullivan, telephone number (602) 354-9486 and e-mail michael.sullivan@zayo.com.

After awarding the Project, UDOT will provide the Company with the Design-Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

2. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the Company's facilities and requirements for inclusion in this Agreement and the request for proposals, UDOT gave the Company authorization for preliminary design engineering on April 26, 2016.

3. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the Company

4. PROJECT COORDINATION

Company and UDOT agree to have the Design-Builder include in the Project, items of Utility Work for the Company's facilities.

During the development of the Project design, the Company and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the Company's facilities can be avoided. If Utility Work is required, UDOT will be responsible to propose and provide a location for the facilities. UDOT will provide the Company with Project design plans as early as possible, and will schedule and meet with the Company to review the design, construction, estimates of cost, and scheduling for the Company's Utility Work at specific locations

on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

The Company shall advise UDOT's Project Representative of the approximate time required for completion of the Utility Work and shall diligently pursue its Utility Work so that completion can be accomplished according to the pre-determined time schedule negotiated by the Company and UDOT in the supplemental agreement issued hereto for a specific Project location. The Company shall immediately notify UDOT's Project Representative by phone call or email, of its discovery of any occurrence or unforeseen circumstances that would prevent the Company from completing its Utility Work according to the time schedule provided. In addition, the Company shall describe the circumstances in writing within 24-hours of the discovery to UDOT's Project Representative.

5. COMPANY REQUIREMENTS

UDOT will comply with the following Company Utility Work requirements:

1. Company splicing hours are from 12:00 p.m. to 5:00 a.m.
2. Provide minimum 12 inch separation of conduit from power in joint trench.
3. Include #14 gauge tracer wires in all conduits.
4. The Company will require a 2 week review and approval period for proposed designs, estimate review, and internal approvals after design plans and estimates are delivered to the Company.

6. UDOT TO DESIGN AND CONSTRUCT A PORTION OF UTILITY WORK

UDOT shall perform the necessary design work, cost estimating, field and office engineering, furnish all materials except cables and pedestals, and perform the Utility Work except pulling and splicing, necessitated by the Project.

UDOT will design the Utility Work in accordance with Company's standards regularly followed by the Company in its own work and not considered a betterment. In the event of a conflict between UDOT and Company standards, the higher standard will be applied.

UDOT will secure permits required for Utility Work for Company's facilities.

UDOT will supply as-constructed plans for the Utility Work it performs, in _____ format, upon completion of any required Utility Work.

7. COMPANY TO PERORM INSPECTION AND CONSTRUCT A PORTION OF THE UTILITY WORK

The Company will perform inspection of the Utility Work for the Company's facilities that will be performed by UDOT. UDOT will accomplish the Utility Work on the Company's facilities in accordance with the plans and specifications approved by the Company. Changes or additions to the plans and specifications shall be approved by the Company and UDOT through a supplemental agreement.

The Company will provide all cables, pedestals, pulling, and splicing necessary to accommodate the Utility Work of its facilities on the Project. The Company requires 2 weeks' notice to schedule splicing and fiber pulls and will determine the splicing window based on the circuit.

8. STANDARD SPECIFICATIONS AND REGULATIONS

The Company, while engaged in the preliminary design and Utility Work of its facilities, shall comply with UDOT's 2012 Standard Specifications for Road and Bridge Construction and Utah Administrative Code R930-7.

9. UNDERBUILT AND FACILITY REMOVAL REQUIREMENTS

The Company is responsible to see to the removal of all Company-owned underbuilt facilities from utility poles that will be relocated or removed due to the Project.

10. RIGHT-OF-WAY

Any easements or replacement right-of-way required in conjunction with the Utility Work of Company's facilities will be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8-7.

11. MAINTENANCE OF TRAFFIC (MOT), TRAFFIC CONTROL, CLEAR/GRUB, AND SURVEYING

UDOT will provide MOT and traffic control for Utility Work at no cost to the Company. The Company is responsible to coordinate Utility Work schedules and traffic control needs with UDOT to facilitate the Project schedule and minimize impacts to the public. Except in the case of emergencies, Company's Utility Work on the Project will be scheduled in compliance with the requirements of the Limitation of Operations contained in UDOT's Design-Builder contract with respect to lane closures, peak hour Utility Work restrictions, holiday and special event limitations, etc.

UDOT will provide, at no cost to the Company, clearing and grubbing for the Utility Work as required by the Company and in accordance with UDOT's Standard Specifications.

Surveying and staking of roadway facilities as required by the Company will be provided by UDOT in accordance with UDOT's Standard Specifications. The cost of the surveying and staking will be at UDOT's expense and the Company will have no obligation for the cost of surveying. Any of UDOT's survey control stakes or bench markers, which are removed or damaged by the Company, shall be reestablished by UDOT at Company's expense.

12. BETTERMENT WORK

If the Company desires to include betterment work in the Project at any specific location, UDOT may agree to the betterment work providing the difference in costs between the functionally equivalent required Utility Work and the Company's desired betterment work, that is not required by the Project, shall be at the sole cost of the Company and the betterment work can reasonably

be accommodated without delaying UDOT's Project. The betterment work will be addressed by a separate supplemental agreement between UDOT and the Company.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

13. SUPPLEMENTAL AGREEMENTS

UDOT and the Company shall enter into individual supplemental agreements to cover Utility Work at specific Project locations. Each supplemental agreement will include a description and location of the Utility Work to be performed, design drawings showing the original and proposed locations of the Company's facilities, Utility Work schedules, cost estimates from all Parties, participation shares for UDOT and the Company, any proposed betterment work, and any necessary right-of-way documents. The estimates do not account for increases due to unknown and unforeseen hardships in accomplishing the Utility Work. A copy of the format of the proposed supplemental agreement is marked Exhibit "A" that is incorporated by reference.

The Company will require a 2 week review and approval period for any final supplemental agreement submitted to the Company by UDOT.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental agreement approved in writing by the Parties is required prior to the start of Utility Work on the changes or additions.

14. UDOT AUTHORIZATION TO PROCEED WITH UTILITY WORK

The Company shall not perform any Utility Work until the supplemental agreement for the Utility Work is signed by the Company and received by UDOT. UDOT will review and approve the supplemental agreement and will issue an authorization to proceed to the Company for each specific Utility Work location.

15. UDOT TO NOTIFY THE COMPANY BEFORE BEGINNING UTILITY WORK

UDOT will notify the Company at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto, to allow the Company time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis. Should UDOT fail to give advance notification and Utility Work is performed without the presence of a Company inspector, UDOT will, at no cost to the Company, facilitate inspection of the Utility Work including, if necessary, uncovering the Utility Work.

16. COMPANY TO NOTIFY UDOT AND THE DESIGN-BUILDER BEFORE BEGINNING UTILITY WORK

The Company will notify UDOT's Project Representative as well as the Design-Builder Project Representative at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto. The Company will give subsequent notifications of when

and where the Company will be performing Utility Work to UDOT's Field Representative and the Design-Builder Project Representative on a day-to-day basis. Such subsequent notifications can be informal. Failure on the part of the Company to give proper notification to UDOT's Field Representative and the Design-Builder Project Representative will be cited to the Company and that portion of the Company's Utility Work performed while not under the surveillance of the UDOT Field Representative may be deducted from the reimbursement at UDOT's discretion for.

17. INSPECTION

The Company shall provide on-call engineering support by the Company's engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during the Utility Work, and to perform the necessary inspection for the Company's Utility Work installed by UDOT.

a. The Company engineer and/or inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on Company's facilities in accordance with the plans and specifications provided and/or approved by the Company, including changes or additions to the plans and specifications, which are approved by the Parties hereto.
b. The Company shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on the Company's facilities. The Company shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.
c. UDOT will respond to the Company's concerns within 24-hours of written notification.
d. The Company, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns the Company may have with acceptance of the facilities upon completion of the Utility Work.
e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Company's Utility Work does not relieve the Company of its duty in the performance of the Utility Work or to ensure compliance with acceptable standards.

18. DAILY RECORDKEEPING

The Company will keep daily records of the inspection and Utility Work performed by the Company forces. Daily records will be in duplicate on a form to be prepared by the Company or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance, and Certification Manager. The daily records shall be signed by UDOT's Field Representative and the Company or its authorized representatives.

19. REIMBURSEMENT FOR COMPANY'S UTILITY WORK

In accordance with Utah Code §72-6-116(3)(a)(ii), UDOT will reimburse the Company 50% of the cost of Utility Work of its facilities on state highways and the Company shall pay the remainder of the cost of the Utility Work. UDOT will reimburse the Company 100% of the cost of Utility Work of its facilities located on a public utility easement, on a Company-owned private easement or fee property. The Company shall provide UDOT with a copy of the public utility

easement or subdivision plat, private easement or fee title. The Utility Work and reimbursement for Company's facilities required by the Project will be in conformance with the requirements of Utah Administrative Code R930-8.

The Company shall submit itemized bills covering its actual costs incurred for performing the Utility Work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

UDOT Contracts and Compliance Specialist
Utah Department of Transportation
PO Box 141510
SLC UT 84114-1510

Itemized bills shall bear the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement, and be submitted to UDOT within 60 days following completion of the Utility Work by the Company on the Project. Otherwise, previous payments to the Company may be considered final, except as agreed to between the Parties in advance. UDOT will reimburse the Company within 60 days after receipt of the billings, but only for those items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the Company to submit final billings within 6 months of the completion of the Utility Work will result in UDOT's disallowance of that portion of Utility Work reimbursement.

If the Company owes a balance to UDOT, the Company will reimburse UDOT within 60 days after receipt of billing from UDOT.

20. SALVAGE CREDIT

In accordance with 23 C.F.R. §645.117 all materials from Company's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on this Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties hereto.

In accordance with 23 C.F.R. §645.117, all materials from the existing facilities, which are recovered in suitable condition for reuse by the Company and not reused on the Project, shall be credited to the cost of the Project at current stock prices. If the materials are not suitable for reuse, they shall be credited at such other prices as agreed upon between the Company and UDOT following inspection of the recovered material.

21. PROJECT DESIGN CHANGES

If UDOT changes the Project design after the Company has completed its design review; or if the Company has completed its portion of the Utility Work of its facilities based on previously approved design plans; the cost of the second design review and/or Utility Work is to be paid in full by UDOT. UDOT will make adjustments for any additional time that may be required for the Company to perform Utility Work on its facilities when required.

22. COMPANY'S COSTS DIFFER BY MORE THAN 10%

If the Company's actual costs incurred for its force account work differs more than 10% plus or minus per line item from the amount contained in the supplemental agreements, the Company is required to submit a letter of explanation with its billings indicating how and why the difference in costs occurred.

23. RIGHT TO AUDIT

UDOT and FHWA shall have the right to audit all cost records and accounts of the Company pertaining to this Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. §645, subpart A. Should this audit disclose that the Company has been underpaid, UDOT will reimburse the Company within 60 days upon submission of additional billing to cover the underpayment. Should this audit disclose that the Company has been overpaid, the Company will reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For the purpose of audit the Company is required to keep and maintain its records of Utility Work covered herein for a minimum of 3 years after final payment is received by the Company from UDOT.

The Company shall have the right to review UDOT's cost documentation for the Utility Work performed on behalf of the Company.

24. ACCEPTANCE

UDOT will provide notification to the Company for acceptance of the Utility Work upon completion of the final inspection. Company will have 60 days to respond in writing to UDOT with any additional comments in regards to the Utility Work. In the event that UDOT does not receive a written response within 60 days, UDOT will designate the Utility Work accepted by the Company. Upon acceptance of the Utility Work, the Company will accept, own and maintain its facilities. To the extent it may lawfully do so, Company further agrees to relieve UDOT from any responsibility or liability that may result for its new facilities or the operation thereof.

25. ACCESS & MAINTENANCE

Access for maintenance and servicing of Company's facilities located on the Project right-of-way will be allowed only by permit issued by UDOT. Company will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

26. MISCELLANEOUS

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.
b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and Company.
c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies

provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.

d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power, and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

****

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

Zayo Group, LLC

_____

Title: General Counsel

Date: 8/30/2016

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

Approved as to Form

_____

Title: Assistant Attorney General

Date: _____

UDOT Comptroller Office Contract Administrator

_____

Title:

Date: _____

ZAYO GROUP, LLC
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this 30th day of August, 2016, **Utah Department of Transportation**, ("UDOT"), and **Zayo Group, LLC**, a Company in the State of Colorado, ("Company") each as ("Party") and jointly as ("Parties").

The Parties hereto entered in to a Master Utility Agreement (MUA) dated August 30, 2016, UDOT Finance No. _____. All the terms of the MUA remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. UDOT and Company will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)

   b. The Company requirements as shown in the MUA – Company Requirements, are modified as follows:

   c. Anticipated duration of Utility Work as shown on Exhibit "B" that is incorporated by reference:

   d. Betterments included:

TOTAL ESTIMATED COST OF SUPPLEMENTAL AGREEMENT _____	**$0.00**
TOTAL ESTIMATED COST OF COMPANY PERFORMED UTILITY WORK	$0.00
TOTAL ESTIMATED COST OF UDOT PERFORMED UTILITY WORK	$0.00
COMBINED TOTAL ESTIMATED COST OF UTILITY WORK	**$0.00**
TOTAL ESTIMATED AMOUNT OF COMPANY PARTICIPATION @ 50%	$0.00
TOTAL ESTIMATED AMOUNT OF UDOT PARTICIPATION @ 50%	$0.00

2. UDOT will notify the Company's contact person, Michael Sullivan, telephone number (602) 354-9486 and e-mail michael.sullivan@zayo.com at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

Zayo Group, LLC

_____

Title: General Counsel

Date: 8/30/2016

. . . . . .

Recommended For Approval:

_____

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

_____

Title: Project Director

Date: _____

UDOT Comptroller Office Contract Administrator

_____

Title:

Date: _____

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS

PART 7:
CONTRACT DRAWINGS

Final Issued September 15, 2016

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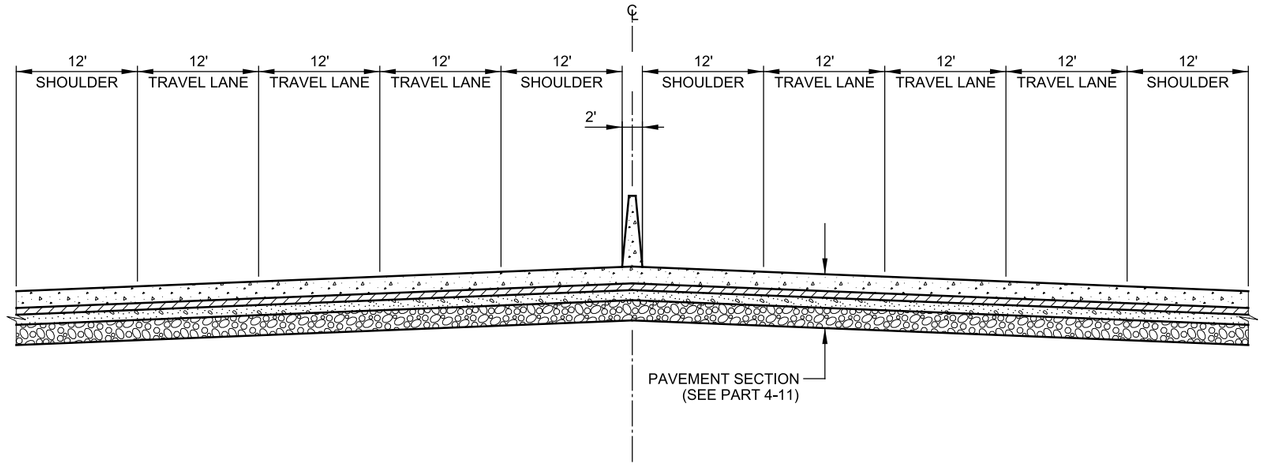
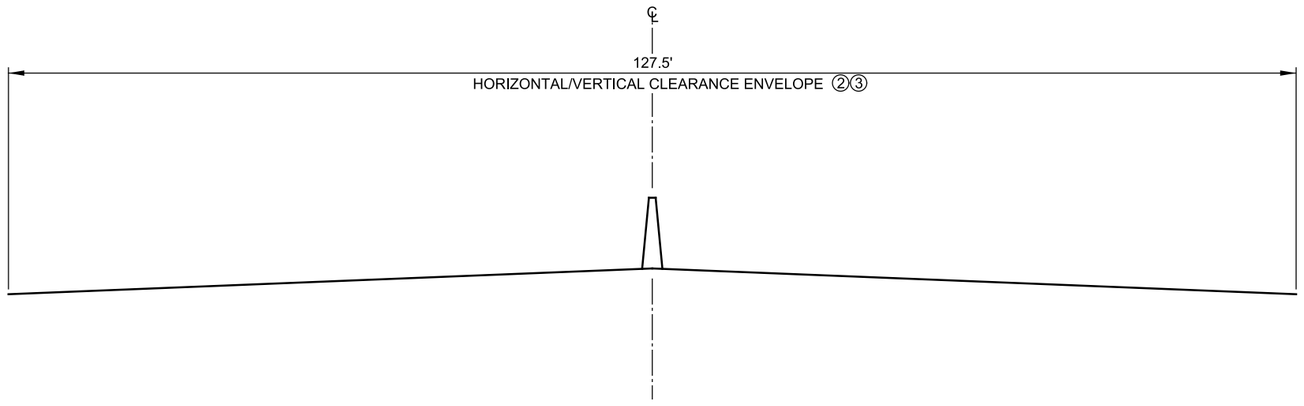
1. Typical Sections - Revised
2. Survey Control
3. Right-of-Way Drawings - Revised
4. Utility Plans - Revised
5. Utility Details - Revised
6. Utility Summaries - Revised
7. Traffic Volumes
8. Signing Details
9. Signal Details
10. ATMS Details
11. Partial Interchange Lighting Detail
12. Off Ramp Grading for Future Lane Detail
13. Pedestrian Bridge Location at 7000 South
14. USBOR Manway and Vault Details
15. USBOR O&M Guidelines



TYPICAL SECTION 1

SR-154



TYPICAL SECTION 2

SR-154

NOTES:

1. TRANSITION LANES, SHOULDER, AND MEDIAN TO MATCH EXISTING STRIPING AT OUTER CONSTRUCTION LIMITS.

②NO PART OF THE STRUCTURE ENCROACHES INTO THE VERTICAL CLEAR SPACE.

③NO FIXED OBJECTS WITHIN THE HORIZONTAL CLEAR SPACE.

4. INCREASE SHOULDER WIDTHS TO achieve REQUIRED SIGHT DISTANCE AS NECESSARY.

5. SHOULDER WIDTH VARIES FROM 12 FEET TO 10 FEET FOR HIGH MAST LIGHTING AND SIGN STRUCTURES.

6. SEE PDC FOR DESIGN SPEED AND CLEAR ZONE REQUIREMENTS.

7. SEE DESIGN EXCEPTIONS FOR LOCATIONS WHERE SHOULDER WIDTHS ARE ALLOWED TO BE REDUCED.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY DRK
DATE MM/DD/YY

APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566

TYPICAL SECTION

SHEET NO. TS-01

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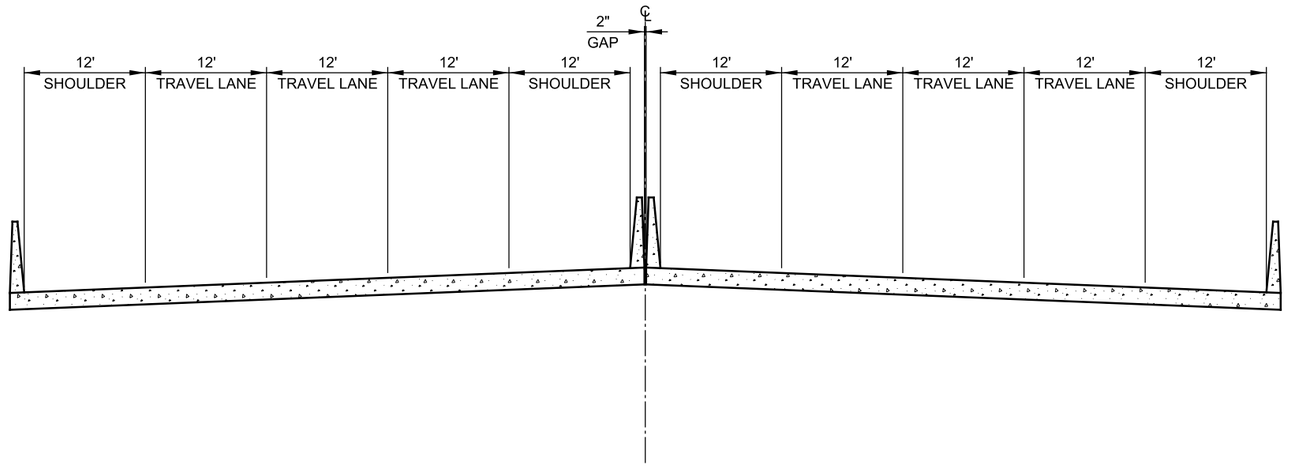
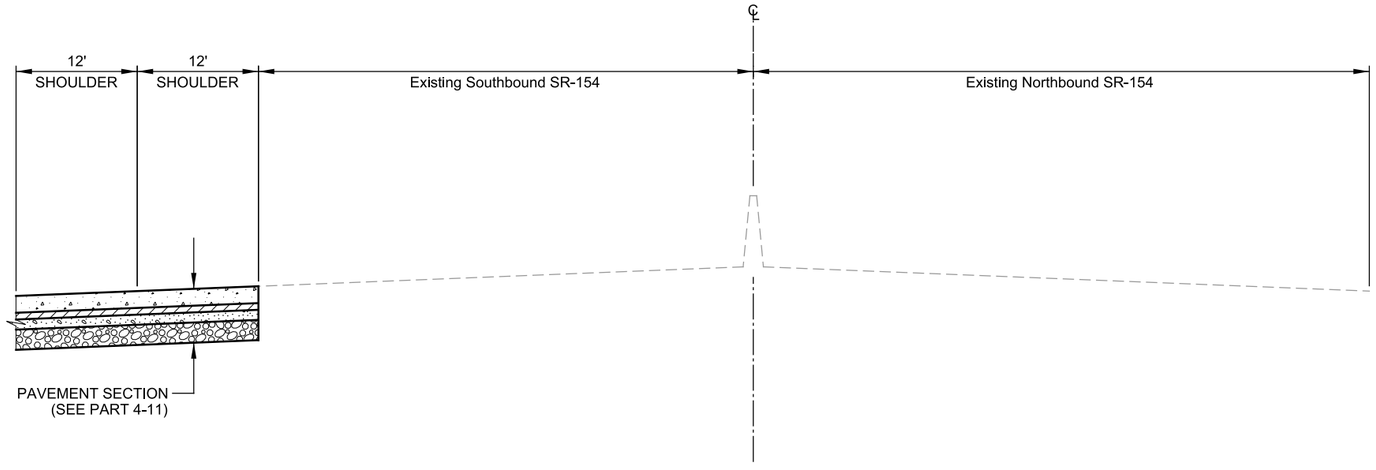


TYPICAL SECTION 3

SR-154 BRIDGE STRUCTURE (OVER CROSS STREET)



TYPICAL SECTION 4

SR-154

BETWEEN 7800 S INTERCHANGE AND 7000 S INTERCHANGE

NOTES:

1. TRANSITION LANES, SHOULDER, AND MEDIAN TO MATCH EXISTING STRIPING AT OUTER CONSTRUCTION LIMITS.

2. INCREASE SHOULDER WIDTHS TO ACHIEVE REQUIRED SIGHT DISTANCE AS NECESSARY.

3. SHOULDER WIDTH VARIES FROM 12 FEET TO 10 FEET FOR HIGH MAST LIGHTING AND SIGN STRUCTURES.

4. SEE PDC FOR DESIGN SPEED AND CLEAR ZONE REQUIREMENTS.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: DRK
DATE: MM/DD/YY
APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566
TYPICAL SECTION

SHEET NO. TS-02

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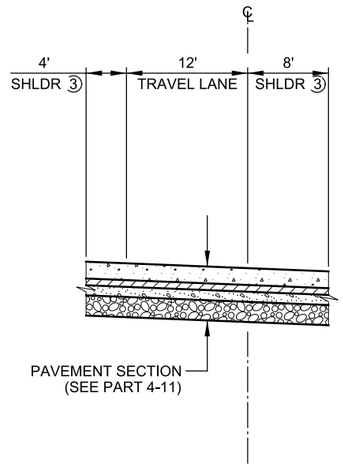
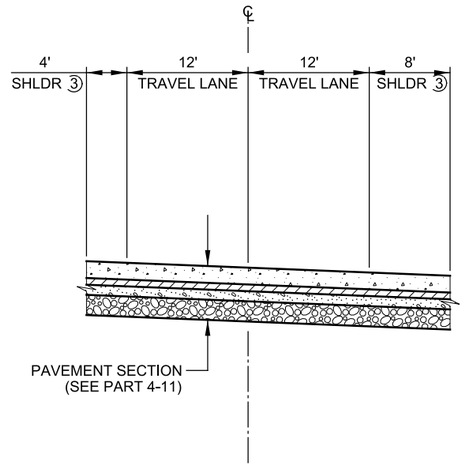


TYPICAL SECTION 5

1 LANE RAMP



TYPICAL SECTION 6

2 LANE RAMP

NOTES:

1. TRANSITION LANES, SHOULDER, AND MEDIAN TO MATCH EXISTING STRIPING AT OUTER CONSTRUCTION LIMITS.

2. INCREASE SHOULDER WIDTHS TO ACHIEVE REQUIRED SIGHT DISTANCE AS NECESSARY.

③ ADD TWO FEET OF SHOULDER WIDTH WHEN BARRIER IS USED.

4. SEE PDC FOR DESIGN SPEED AND CLEAR ZONE REQUIREMENTS.

5. SEE DESIGN EXCEPTIONS FOR LOCATIONS WHERE SHOULDER WIDTHS ARE ALLOWED TO BE REDUCED.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: DRK
DATE: MM/DD/YY

APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566

TYPICAL SECTION

SHEET NO. TS-03

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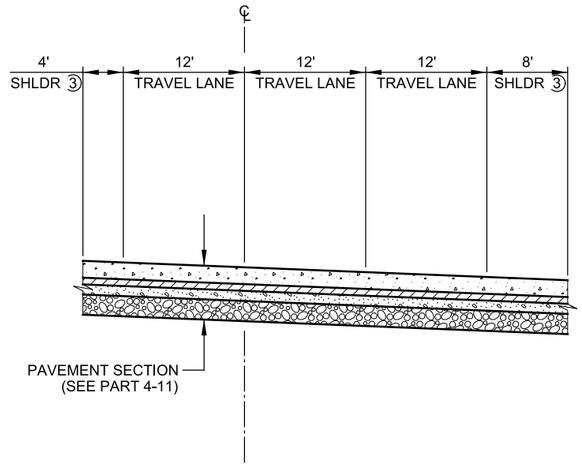
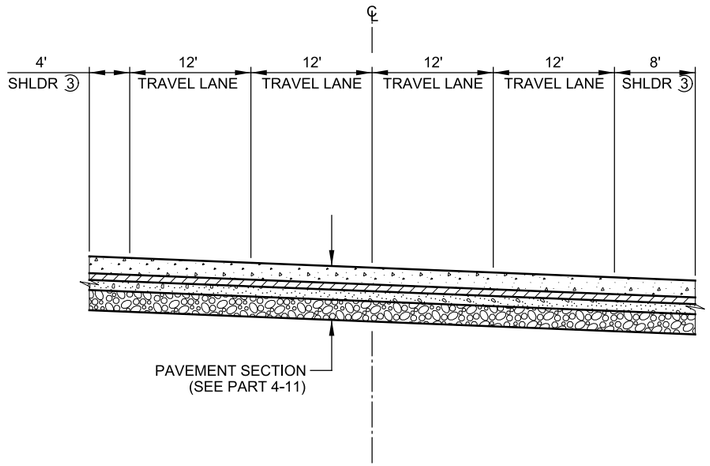


TYPICAL SECTION 7

3 LANE RAMP



TYPICAL SECTION 8

4 LANE RAMP

NOTES:

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2. INCREASE SHOULDER WIDTHS TO ACHIEVE REQUIRED SIGHT DISTANCE AS NECESSARY.

③ ADD TWO FEET OF SHOULDER WIDTH WHEN BARRIER IS USED.

4. SEE PDC FOR DESIGN SPEED AND CLEAR ZONE REQUIREMENTS.

5. SEE DESIGN EXCEPTIONS FOR LOCATIONS WHERE SHOULDER WIDTHS ARE ALLOWED TO BE REDUCED.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY DRK
DATE MM/DD/YY

APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566

TYPICAL SECTION

SHEET NO. TS-04

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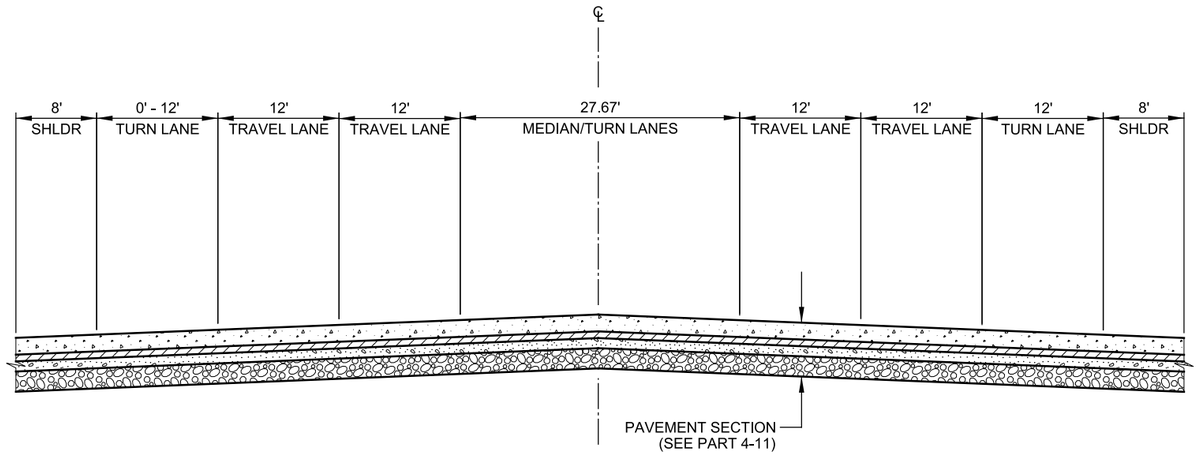
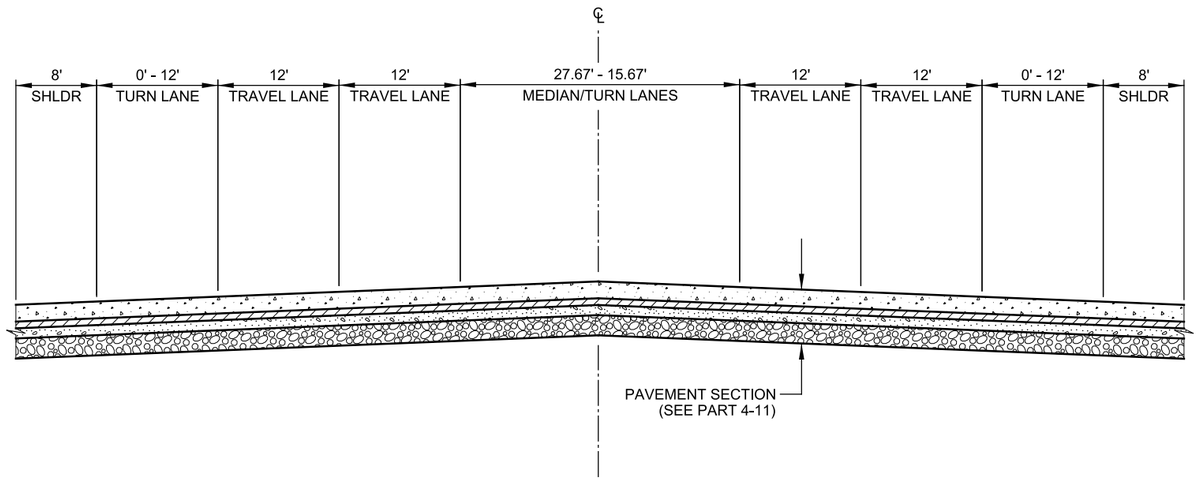


TYPICAL SECTION 9

11400 SOUTH

WEST OF SR-154



TYPICAL SECTION 10

11400 SOUTH

EAST OF SR-154

NOTES:

1. TRANSITION LANES, SHOULDER, AND MEDIAN TO MATCH EXISTING STRIPING AT OUTER CONSTRUCTION LIMITS.

2. SEE PDC FOR DESIGN SPEED AND CLEAR ZONE REQUIREMENTS.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH | QC CHECKED BY: DRK | DATE: MM/DD/YY

APPROVED

PROFESSIONAL ENGINEER

4 INTERCHANGES ON BANGERTER HIGHWAY

PROJECT

PROJECT NUMBER: S-0154(12)11 | PIN: 12566

TYPICAL SECTION

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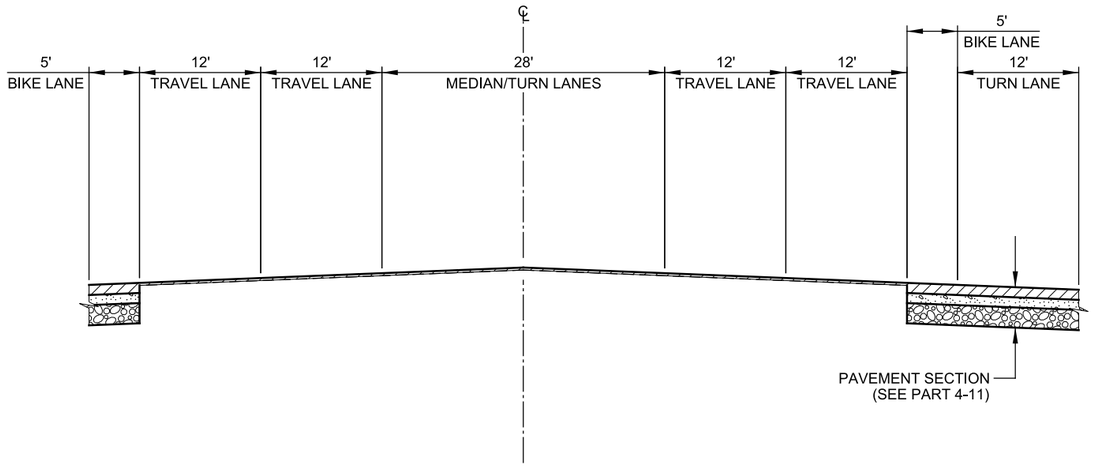
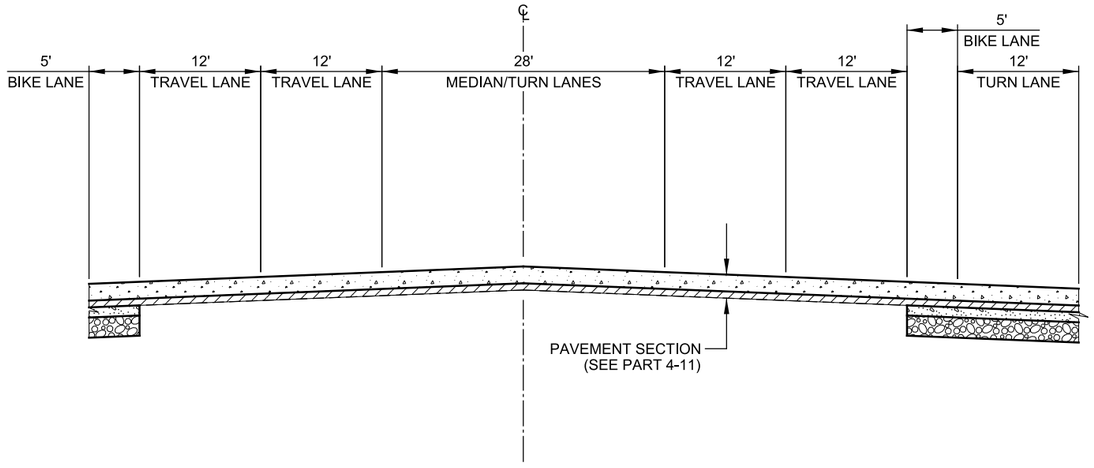


TYPICAL SECTION 11

9000 S

OUTSIDE EXISTING CONCRETE PAVEMENT LIMITS



TYPICAL SECTION 12

9000 S

INSIDE EXISTING CONCRETE PAVEMENT LIMITS

NOTES:

1. TRANSITION LANES, SHOULDER, AND MEDIAN TO MATCH EXISTING STRIPING AT OUTER CONSTRUCTION LIMITS.

2. SEE PDC FOR DESIGN SPEED AND CLEAR ZONE REQUIREMENTS.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH

QC CHECKED BY DRK

DATE MM/DD/YY

APPROVED

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY

PROJECT NUMBER: S-0154(12)11

PIN 12566

TYPICAL SECTION

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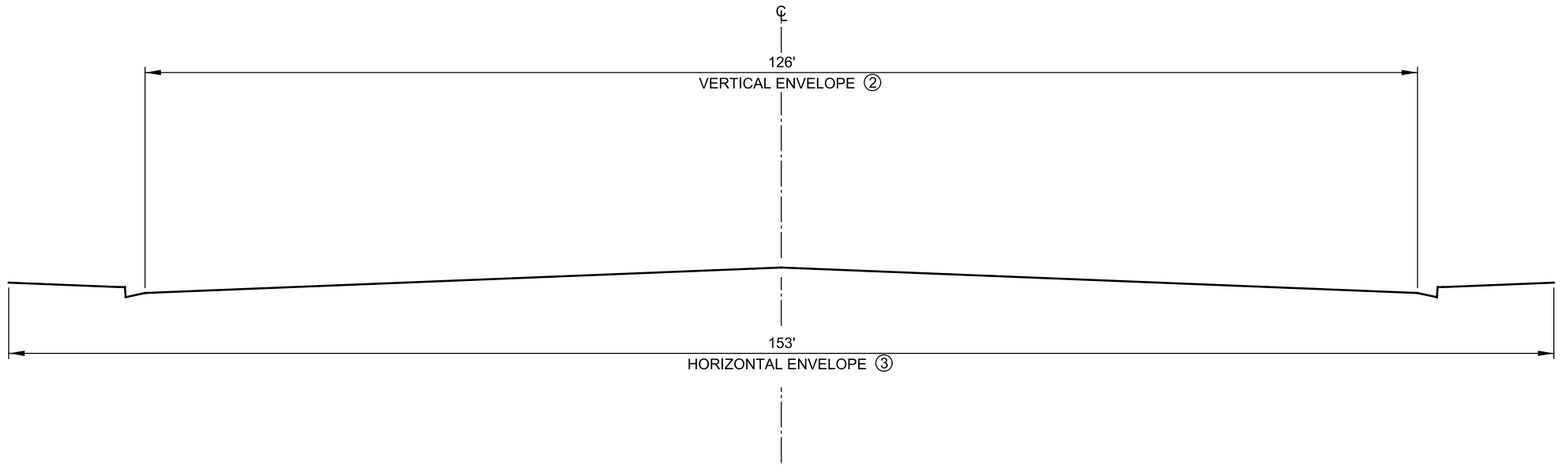
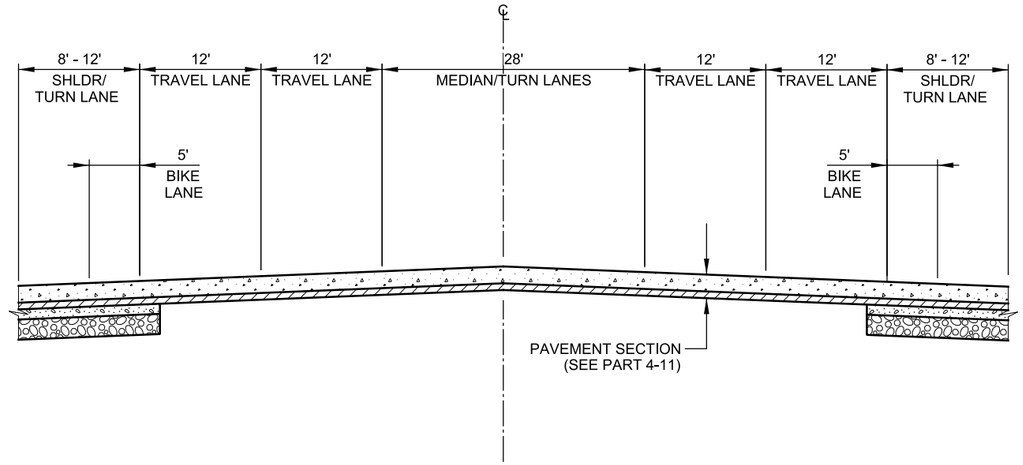


TYPICAL SECTION 13

9000 S



TYPICAL SECTION 14

7000 S

INSIDE EXISTING CONCRETE PAVEMENT LIMITS

NOTES:

1. TRANSITION LANES, SHOULDER, AND MEDIAN TO MATCH EXISTING STRIPING AT OUTER CONSTRUCTION LIMITS.

② NO PART OF THE STRUCTURE ENCROACHES INTO THE VERTICAL CLEAR SPACE.

③ NO FIXED OBJECTS WITHIN THE HORIZONTAL CLEAR SPACE.

4. ACTUAL BRIDGE WIDTH OR SPAN DEPENDS ON SPUI RAMP GEOMETRY

5. SEE PDC FOR DESIGN SPEED AND CLEAR ZONE REQUIREMENTS.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY DRK
DATE MM/DD/YY

APPROVED

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566

TYPICAL SECTION

SHEET NO. TS-07

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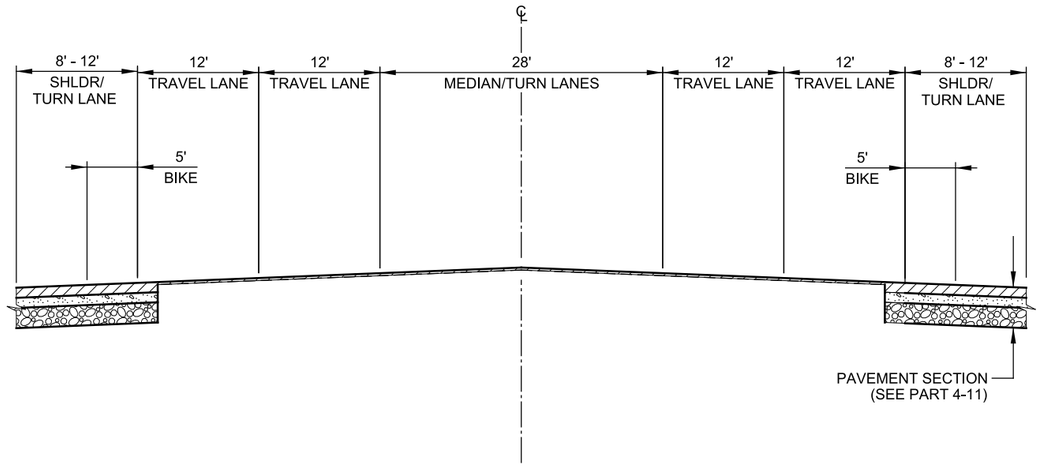
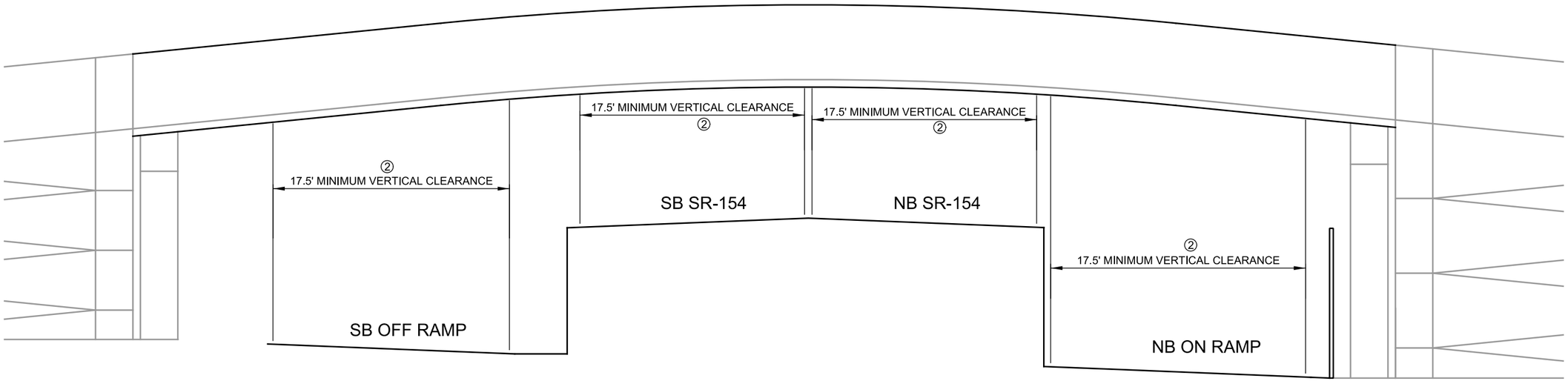


TYPICAL SECTION 15

7000 S

OUTSIDE EXISTING CONCRETE PAVEMENT LIMITS



TYPICAL SECTION 16

PEDESTRIAN BRIDGE CLEARANCE AT 7000 SOUTH INTERCHANGE

NOTES:

1. TRANSITION LANES, SHOULDER, AND MEDIAN TO MATCH EXISTING STRIPING AT OUTER CONSTRUCTION LIMITS.

② NO PART OF THE STRUCTURE ENCROACHES INTO THE VERTICAL CLEAR SPACE.

③ NO FIXED OBJECTS WITHIN THE HORIZONTAL CLEAR SPACE.

4. ACTUAL BRIDGE WIDTH OR SPAN DEPENDS ON SPUI RAMP GEOMETRY

5. SEE PDC FOR DESIGN SPEED AND CLEAR ZONE REQUIREMENTS.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED
PROFESSIONAL ENGINEER

DRAWN BY	CHECKED BY	DATE
KKH	DRK	MM/DD/YY

4 INTERCHANGES ON BANGERTER HIGHWAY

PROJECT

PROJECT NUMBER: S-0154(12)11

PIN: 12566

TYPICAL SECTION

SHEET NO. TS-08

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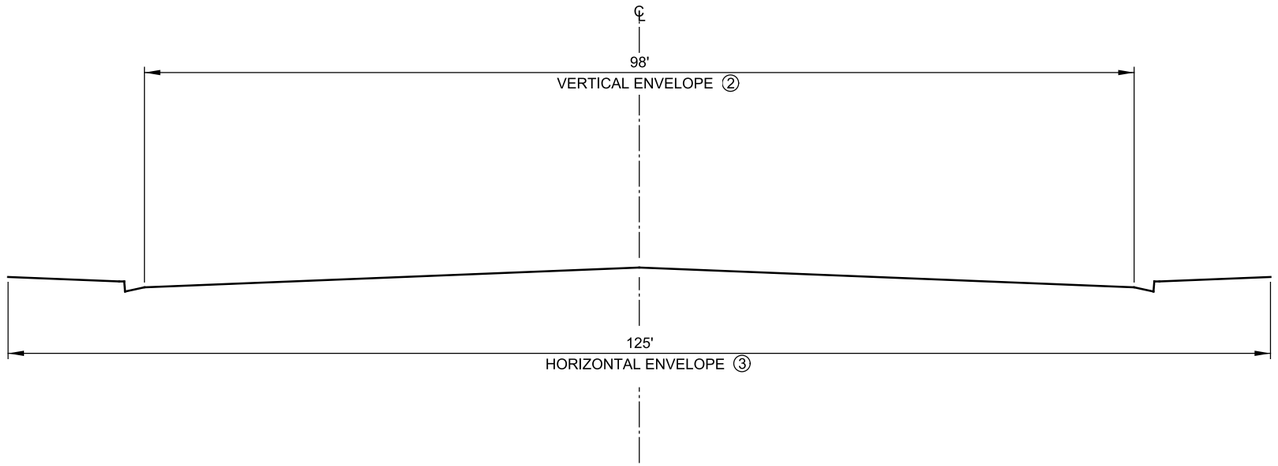
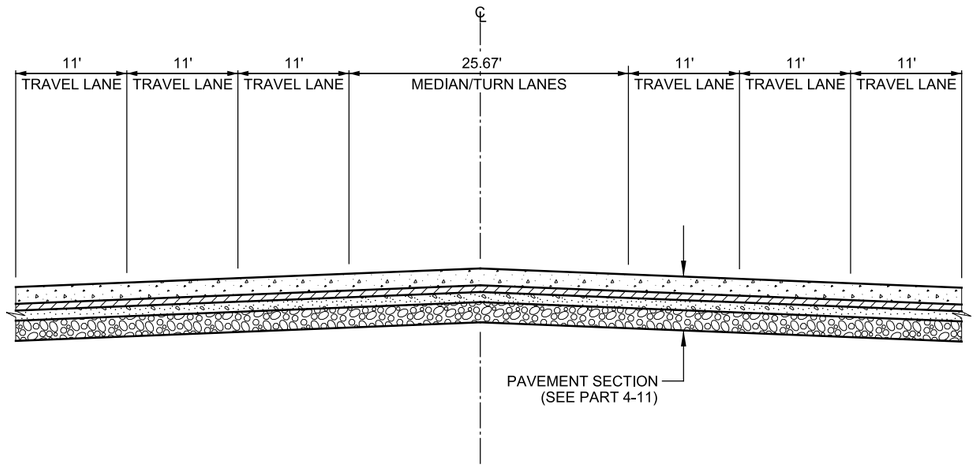


TYPICAL SECTION 17

7000 S



TYPICAL SECTION 18

SR-173 (5400 SOUTH)

NOTES:

1. TRANSITION LANES, SHOULDER, AND MEDIAN TO MATCH EXISTING STRIPING AT OUTER CONSTRUCTION LIMITS.

② NO PART OF THE STRUCTURE ENCROACHES INTO THE VERTICAL CLEAR SPACE.

③ NO FIXED OBJECTS WITHIN THE HORIZONTAL CLEAR SPACE.

4. ACTUAL BRIDGE WIDTH OR SPAN DEPENDS ON SPUI RAMP GEOMETRY.

5. SEE PDC FOR DESIGN SPEED AND CLEAR ZONE REQUIREMENTS.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH

QC CHECKED BY DRK

DATE MM/DD/YY

APPROVED

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY

PROJECT NUMBER: S-0154(12)11 PIN 12566

TYPICAL SECTION

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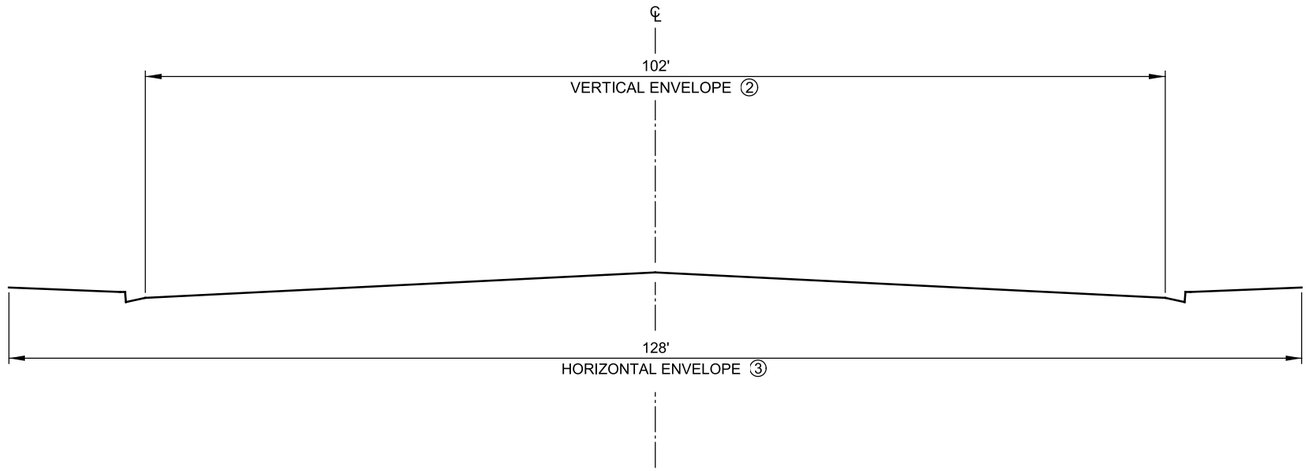

TYPICAL SECTION 19

SR-173 (5400 SOUTH)

NOTES:

1. TRANSITION LANES, SHOULDER, AND MEDIAN TO MATCH EXISTING STRIPING AT OUTER CONSTRUCTION LIMITS.

② NO PART OF THE STRUCTURE ENCROACHES INTO THE VERTICAL CLEAR SPACE.

③ NO FIXED OBJECTS WITHIN THE HORIZONTAL CLEAR SPACE.

4. ACTUAL BRIDGE WIDTH OR SPAN DEPENDS ON SPUI RAMP GEOMETRY.

5. SEE PDC FOR DESIGN SPEED AND CLEAR ZONE REQUIREMENTS.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH

QC CHECKED BY DRK

DATE MM/DD/YY

APPROVED

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY

PROJECT NUMBER: S-0154(12)11 PIN 12566

TYPICAL SECTION

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SURVEYORS CERTIFICATE

I, LONNIE MERRILL OLSON, DO HEREBY CERTIFY THAT I AM A PROFESSIONAL LAND SURVEYOR, HOLDING CERTIFICATE NUMBER 7736338, AS PRESCRIBED BY THE LAWS OF THE STATE OF UTAH. I FURTHER CERTIFY THAT I HAVE PREPARED THE SURVEY CONTROL DIAGRAM REPRESENTED HEREIN AND THAT THE SAME IS AN ACCURATE REPRESENTATION OF A CONTROL SURVEY, AND WAS CONDUCTED UNDER MY DIRECT SUPERVISION. THE FOLLOWING SURVEY CONTROL MEETS OR EXCEEDS UDOT SURVEY AND GEOMATICS STANDARDS

COORDINATE SYSTEM AND PROJECTION INFORMATION

HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83)
VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88)
COORDINATE SYSTEM: US STATE PLANE 1983, (2011) UTAH CENTRAL ZONE 4302
EPOCH DATE: 2010
PROJECT UNITS: US SURVEY FOOT
COMBINED SCALE FACTOR: 1.0002259520
SCALE LOCATION: 0,0
FALSE NORTHING: 7,000,000.00
FALSE EASTING: 1,000,000.00
PROJECT HEIGHT: 4500.00
GEOID MODEL: GEOID12A
PROJECT BM: 11400 SO. = PT# 500, 90TH SO. = PT# 548, 70TH AND 5400 SO. = PT# 544.

NOTES

*PRIMARY HORIZONTAL SURVEY CONTROL POINTS WERE OCCUPIED USING RTK OBSERVATIONS POINTS WERE OCCUPIED FOR 180 EPOCHS AND WERE OCCUPIED MULTIPLE TIMES ON DIFFERENT DAYS. THE STATE OF UTAH AGRC'S VRS NETWORK WAS USED FOR HORIZONTAL AVERAGES AND POSITIONS.

*PRIMARY VERTICAL CONTROL WAS ESTABLISHED WITH A SERIES OF DIFFERENTIAL LEVELS BEGINNING AT PT. 500 FOR THE 11400 SOUTH INTERCHANGE, PT. 548 FOR THE 90TH SOUTH INTERCHANGE, AND PT. 544 FOR THE 5400 AND 7000 SOUTH INTERCHANGES. A VERTICAL CALIBRATION WAS THEN PERFORMED USING THE PRIMARY CONTROL POINTS

*SECONDARY VERICAL CONTROL WAS ALSO INCLUDED IN THE DIFFERENTIAL LEVEL LOOPS

*PROJECT COMBINED FACTOR WAS DERRIVED FROM AN AVERAGE OF THE PRIMARY AND SECONDARY CONTROL POINTS

CONVERSIONS

STATE PLANE NORTHING = (PROJECT NORTHING + 7,000,000) / 1.0002259520
STATE PLANE EASTING = (PROJECT EASTING + 1,000,000) / 1.0002259520

POINT NUMBER	PROJECT PRIMARY GROUND COORDINATES			GEO COORDINATES			STATE PLANE COORDINATES		CONVERGENCE ANGLE	DESCRIPTION
	NORTHING	EASTING	ELEVATION	LATITUDE	LONGITUDE	ELLIPSOID HEIGHT	NORTHING	EASTING		
4	365789.101	506180.261	4652.752	40°32'07.46858"N	111°59'03.00823"W	4595.785	7364125.162	1505840.014	0°18'36.53376"N	CP - PK NAIL
5	366036.170	506182.288	4655.573	40°32'09.90956"N	111°59'02.99930"W	4598.639	7364372.175	1505842.040	0°18'36.52804"N	CP - MAG
27	368980.279	507719.947	4637.624	40°32'39.07704"N	111°58'43.29258"W	4580.679	7367315.620	1507379.351	0°18'23.90434"N	CP - PK NAIL
42	369162.696	504495.716	4702.537	40°32'40.70665"N	111°59'25.06019"W	4645.600	7367497.995	1504155.849	0°18'50.65978"N	CP - PK NAIL
78	384864.643	509872.936	4562.607	40°35'16.11474"N	111°58'16.49456"W	4505.810	7383196.395	1509531.855	0°18'06.73810"N	CP - PK NAIL
87	384891.651	506621.061	4619.263	40°35'16.21019"N	111°58'58.63607"W	4562.442	7383223.397	1506280.714	0°18'33.73305"N	CP - PK NAIL
100	412437.893	507153.590	4465.847	40°39'48.36656"N	111°58'53.65718"W	4409.383	7410763.416	1506813.122	0°18'30.54368"N	CP - PK NAIL IN CONC
116	408885.211	507104.020	4550.087	40°39'13.26764"N	111°58'54.05204"W	4493.590	7407211.537	1506763.564	0°18'30.79662"N	CP - PK NAIL IN CONC
141	403369.731	508477.536	4550.865	40°38'18.85362"N	111°58'35.85480"W	4494.314	7401697.303	1508136.770	0°18'19.13986"N	CP - PK NAIL IN CONC
167	408700.161	508873.964	4526.209	40°39'11.53310"N	111°58'31.08117"W	4469.728	7407026.529	1508533.108	0°18'16.08197"N	CP - PK NAIL IN CONC
217	398064.064	508517.404	4514.019	40°37'26.44138"N	111°58'34.97132"W	4457.390	7396392.834	1508176.628	0°18'18.57392"N	CP - PK NAIL IN CONC
232	394501.832	508413.941	4520.024	40°36'51.24470"N	111°58'36.06661"W	4463.342	7392831.406	1508073.189	0°18'19.27554"N	CP - PK NAIL IN CONC
233	397617.607	507204.406	4557.972	40°37'21.96142"N	111°58'51.96379"W	4501.323	7395946.478	1506863.927	0°18'29.45893"N	CP - PK NAIL IN ASPHALT
248	398058.600	510129.370	4480.110	40°37'26.47170"N	111°58'14.07107"W	4423.502	7396387.371	1509788.231	0°18'05.18567"N	CP - PK NAIL IN ASPHALT
500	368663.780	506286.063	4645.977	40°32'35.87403"N	111°59'01.83960"W	4589.072	7366999.191	1505945.791	0°18'35.78516"N	MON - NGS 11400 SOUTH BENCH MARK
540	398095.036	505735.161	4583.220	40°37'26.59942"N	111°59'11.04651"W	4526.566	7396423.799	1505395.014	0°18'41.68291"N	SC - SLC BRC 19/20/30/29 T2S R1W
542	403382.990	505747.792	4576.334	40°38'18.83941"N	111°59'11.25563"W	4519.755	7401710.559	1505407.642	0°18'41.81688"N	SC - 19/20/30/29 T2S R1W
544	408662.152	505761.395	4560.928	40°39'10.99228"N	111°59'11.45161"W	4504.417	7406988.528	1505421.242	0°18'41.94241"N	SC - BRC 7/8/17/18 SLC T2S R1W 54TH
546	384907.838	505661.467	4631.009	40°35'16.31873"N	111°59'11.07218"W	4574.184	7383239.580	1505321.336	0°18'41.69935"N	QC - BRC 6/5 T3S R1W
548	387531.836	508312.704	4551.365	40°35'42.38249"N	111°58'36.89723"W	4494.808	7385862.985	1507971.975	0°18'19.80761"N	QC - BRC 32/5 T2/3S R1W 90TH SOUTH BENCH MARK
551	384836.184	510966.573	4527.739	40°35'15.89027"N	111°58'02.32067"W	4470.953	7383167.942	1510625.244	0°17'57.65861"N	QC - BRC 4/5 T3S R1W
557	408653.534	508415.034	4532.107	40°39'11.04834"N	111°58'37.03073"W	4475.621	7406979.912	1508074.282	0°18'19.89313"N	QC - BRC 8/17 T2S R1W
560	403355.166	511054.226	4568.989	40°38'18.84405"N	111°58'02.43871"W	4512.476	7401682.741	1510712.877	0°17'57.73423"N	SC - BRC 17/16/20/21 T2S R1W
562	398056.367	511023.270	4471.511	40°37'26.49594"N	111°58'02.48110"W	4414.915	7396385.138	1510681.929	0°17'57.76138"N	SC - BRC S20/21/28/29 T2S R1W
585	371642.954	505614.995	4767.136	40°33'05.27012"N	111°59'10.73977"W	4710.210	7369977.692	1505274.875	0°18'41.48642"N	SC - 18/17/19/20 T3S R1W
586	366338.377	505596.775	4645.305	40°32'12.86377"N	111°59'10.60223"W	4588.343	7364674.314	1505256.659	0°18'41.39832"N	SC - 19/20/30/29 T3S R1W
589	371620.821	508264.759	4631.286	40°33'05.19241"N	111°58'36.41939"W	4574.360	7369955.565	1507924.041	0°18'19.50152"N	QC - 17/20 T3SR1W
590	366320.014	508241.113	4590.776	40°32'12.82300"N	111°58'36.35969"W	4533.811	7364655.955	1507900.400	0°18'19.46328"N	QC - 20/29 T3S R1W

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: LMO
APPROVED: MM/DD/YY (DATE)
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566
SURVEY CONTROL

SALT LAKE COUNTY

SHEET NO. SC-01

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	PROJECT SECONDARY GROUND COORDINATES			GEO COORDINATES			STATE PLANE COORDINATES			
POINT NUMBER	NORTHING	EASTING	ELEVATION	LATITUDE	LONGITUDE	ELLIPSOID HEIGHT	NORTHING	EASTING	CONVERGENCE ANGLE	DESCRIPTION
1	408858.957	507010.871	4548.999	40°39'13.00331"N	111°58'55.25845"N	4492.519	7407185.288	1506670.436	0°18'31.56942"N	CP - PK IN CONC
2	408765.383	507072.042	4551.614	40°39'12.08218"N	111°58'54.45846"N	4495.110	7407091.736	1506731.593	0°18'31.05697"N	CP - HUB
3	408717.673	506973.121	4552.732	40°39'11.60561"N	111°58'55.73823"N	4496.236	7407044.037	1506632.695	0°18'31.87675"N	CP - PK IN CONC
6	366251.871	506184.011	4656.220	40°32'12.04062"N	111°59'02.99211"N	4599.295	7364587.828	1505843.763	0°18'36.52344"N	CP - PK NAIL
7	366474.183	506184.050	4655.675	40°32'14.23691"N	111°59'03.00719"N	4598.762	7364810.089	1505843.801	0°18'36.53310"N	CP - PK NAIL
8	366695.698	506185.346	4653.646	40°32'16.42538"N	111°59'03.00593"N	4596.727	7365031.554	1505845.098	0°18'36.53229"N	CP - PK NAIL
9	366921.222	506186.410	4650.146	40°32'18.65346"N	111°59'03.00796"N	4593.206	7365257.027	1505846.161	0°18'36.53359"N	CP - PK NAIL
10	367136.722	506186.707	4645.499	40°32'20.78246"N	111°59'03.01923"N	4588.441	7365472.478	1505846.458	0°18'36.54081"N	CP - PK NAIL
11	367355.238	506189.185	4641.185	40°32'22.94138"N	111°59'03.00244"N	4584.284	7365690.945	1505848.936	0°18'36.53006"N	CP - PK NAIL
12	367586.684	506188.875	4639.440	40°32'25.22789"N	111°59'03.02268"N	4582.548	7365922.339	1505848.626	0°18'36.54302"N	CP - PK NAIL
13	367793.825	506192.043	4640.249	40°32'27.27449"N	111°59'02.99619"N	4583.348	7366129.433	1505851.793	0°18'36.52605"N	CP - PK NAIL
14	368008.653	506193.284	4642.652	40°32'29.39690"N	111°59'02.99518"N	4585.749	7366344.212	1505853.033	0°18'36.52540"N	CP - PK NAIL
15	368215.952	506192.356	4645.124	40°32'31.44480"N	111°59'03.02172"N	4588.203	7366551.465	1505852.105	0°18'36.54241"N	CP - PK NAIL
16	368402.552	506183.676	4647.168	40°32'33.28782"N	111°59'03.14721"N	4590.254	7366738.022	1505843.428	0°18'36.62279"N	CP - PK NAIL
17	368591.776	506250.997	4648.346	40°32'35.16083"N	111°59'02.28867"N	4591.449	7366927.203	1505910.733	0°18'36.07283"N	CP - PK NAIL
18	368792.799	506251.955	4650.617	40°32'37.14684"N	111°59'02.29034"N	4593.718	7367128.182	1505911.691	0°18'36.07390"N	CP - PK NAIL
19	368919.274	506261.360	4651.757	40°32'38.39680"N	111°59'02.17741"N	4594.848	7367254.628	1505921.094	0°18'36.00156"N	CP - PK NAIL
20	368947.729	506393.131	4649.532	40°32'38.68498"N	111°59'00.47294"N	4592.615	7367283.077	1506052.835	0°18'34.90971"N	CP - PK NAIL
21	368948.024	506593.242	4646.589	40°32'38.69855"N	111°58'57.88147"N	4589.662	7367283.371	1506252.901	0°18'33.24967"N	CP - PK NAIL
22	368971.165	506795.627	4645.890	40°32'38.93795"N	111°58'55.26214"N	4588.965	7367306.507	1506455.240	0°18'31.57179"N	CP - PK NAIL
23	368940.360	506950.969	4642.960	40°32'38.64188"N	111°58'53.24827"N	4586.061	7367275.709	1506610.548	0°18'30.28174"N	CP - PK NAIL
24	368866.449	507123.240	4640.109	40°32'37.92088"N	111°58'51.01218"N	4583.188	7367201.815	1506782.779	0°18'28.84935"N	CP - PK NAIL
25	368884.235	507407.539	4639.421	40°32'38.11168"N	111°58'47.33168"N	4582.472	7367219.597	1507067.014	0°18'26.49170"N	CP - PK NAIL
26	368935.814	507604.668	4637.373	40°32'38.63166"N	111°58'44.78238"N	4580.425	7367271.164	1507264.099	0°18'24.85868"N	CP - PK NAIL
28	369059.455	507457.948	4639.208	40°32'39.84536"N	111°58'46.69104"N	4582.288	7367394.778	1507117.411	0°18'26.08132"N	CP - PK NAIL
29	369093.373	507247.056	4640.533	40°32'40.16929"N	111°58'49.42452"N	4583.609	7367428.687	1506906.567	0°18'27.83233"N	CP - PK NAIL
30	369078.203	506997.499	4643.217	40°32'40.00614"N	111°58'52.65530"N	4586.254	7367413.521	1506657.067	0°18'29.90190"N	CP - PK NAIL
31	369031.303	506703.523	4645.254	40°32'39.52716"N	111°58'56.45912"N	4588.300	7367366.632	1506363.157	0°18'32.33854"N	CP - PK NAIL
32	369032.563	506503.860	4647.814	40°32'39.52896"N	111°58'59.04489"N	4590.836	7367367.891	1506163.540	0°18'33.99494"N	CP - PK NAIL
33	369042.097	506273.208	4652.272	40°32'39.61086"N	111°59'02.03257"N	4595.341	7367377.423	1505932.940	0°18'35.90878"N	CP - PK NAIL
34	368989.339	506192.961	4654.177	40°32'39.08537"N	111°59'03.06811"N	4597.223	7367324.677	1505852.710	0°18'36.57212"N	CP - PK NAIL
35	369034.516	506102.668	4656.336	40°32'39.52684"N	111°59'04.24059"N	4599.413	7367369.844	1505762.438	0°18'37.32318"N	CP - PK NAIL
36	369028.234	505903.161	4658.354	40°32'39.45408"N	111°59'06.82382"N	4601.443	7367363.564	1505562.976	0°18'38.97795"N	CP - PK NAIL
37	369046.441	505650.916	4665.768	40°32'39.62044"N	111°59'10.09175"N	4608.864	7367381.766	1505310.788	0°18'41.07132"N	CP - PK NAIL
38	369036.022	505404.754	4673.910	40°32'39.50426"N	111°59'13.27889"N	4617.011	7367371.350	1505064.681	0°18'43.11293"N	CP - PK NAIL
39	369012.845	505200.452	4682.105	40°32'39.26429"N	111°59'15.92303"N	4625.157	7367348.178	1504860.425	0°18'44.80671"N	CP - PK NAIL
40	369041.675	504993.662	4688.835	40°32'39.53796"N	111°59'18.60305"N	4631.892	7367377.001	1504653.683	0°18'46.52347"N	CP - PK NAIL
41	369078.479	504785.567	4694.797	40°32'39.89033"N	111°59'21.30055"N	4637.873	7367413.797	1504445.634	0°18'48.25143"N	CP - PK NAIL
43	369055.297	504665.746	4698.122	40°32'39.65482"N	111°59'22.85062"N	4641.117	7367390.620	1504325.841	0°18'49.24437"N	CP - PK NAIL
44	368938.146	505571.367	4669.790	40°32'38.54627"N	111°59'11.11431"N	4612.829	7367273.496	1505231.257	0°18'41.72635"N	CP - PK NAIL
45	368951.250	505800.613	4660.615	40°32'38.68804"N	111°59'08.14644"N	4603.656	7367286.597	1505460.451	0°18'39.82519"N	CP - PK NAIL
46	368947.374	505981.917	4657.129	40°32'38.65949"N	111°59'05.79824"N	4600.167	7367282.722	1505641.714	0°18'38.32098"N	CP - PK NAIL
47	368933.352	506122.576	4655.034	40°32'38.52848"N	111°59'03.97568"N	4598.101	7367268.703	1505782.341	0°18'37.15349"N	CP - PK NAIL
48	368835.505	506143.664	4652.760	40°32'37.56296"N	111°59'03.69572"N	4595.814	7367170.878	1505803.425	0°18'36.97416"N	CP - PK NAIL
49	368648.058	506140.432	4649.281	40°32'35.71094"N	111°59'03.72444"N	4592.326	7366983.473	1505800.193	0°18'36.99255"N	CP - PK NAIL
50	369154.384	506245.913	4654.083	40°32'40.71869"N	111°59'02.39393"N	4597.138	7367489.685	1505905.650	0°18'36.14026"N	CP - PK NAIL
51	369361.552	506262.320	4656.167	40°32'42.76626"N	111°59'02.19596"N	4599.210	7367696.806	1505922.054	0°18'36.01344"N	CP - PK NAIL
52	369551.055	506291.610	4658.460	40°32'44.63995"N	111°59'01.82991"N	4601.542	7367886.266	1505951.338	0°18'35.77896"N	CP - PK NAIL
53	369730.776	506288.291	4662.008	40°32'46.41529"N	111°59'01.88550"N	4605.033	7368065.946	1505948.019	0°18'35.81457"N	CP - PK NAIL
54	369926.029	506344.198	4663.227	40°32'48.34723"N	111°59'01.17514"N	4606.303	7368261.156	1506003.913	0°18'35.35953"N	CP - PK NAIL
55	370132.679	506428.370	4664.108	40°32'50.39329"N	111°59'00.09951"N	4607.184	7368467.759	1506088.066	0°18'34.67050"N	CP - PK NAIL
56	370315.193	506519.296	4664.980	40°32'52.20125"N	111°58'58.93470"N	4608.058	7368650.231	1506178.971	0°18'33.92435"N	CP - PK NAIL
57	370516.751	506641.007	4665.990	40°32'54.19900"N	111°58'57.37251"N	4609.049	7368851.744	1506300.656	0°18'32.92364"N	CP - PK NAIL
58	370679.899	506760.007	4666.959	40°32'55.81709"N	111°58'55.84272"N	4610.041	7369014.855	1506419.629	0°18'31.94369"N	CP - PK NAIL
59	370847.263	506896.412	4667.876	40°32'57.47780"N	111°58'54.08779"N	4610.950	7369182.181	1506556.003	0°18'30.81952"N	CP - PK NAIL
60	371010.030	507027.632	4668.739	40°32'59.09280"N	111°58'52.39967"N	4611.828	7369344.912	1506687.193	0°18'29.73815"N	CP - PK NAIL
61	371165.852	507154.974	4669.628	40°33'00.63896"N	111°58'50.76127"N	4612.716	7369500.698	1506814.506	0°18'28.68862"N	CP - PK NAIL
62	371317.681	507277.590	4670.461	40°33'02.14542"N	111°58'49.18377"N	4613.531	7369652.493	1506937.095	0°18'27.67811"N	CP - PK NAIL
63	371489.812	507416.505	4671.534	40°33'03.85333"N	111°58'47.39659"N	4614.604	7369824.585	1507075.978	0°18'26.53328"N	CP - PK NAIL
64	371637.492	507538.235	4672.544	40°33'05.31875"N	111°58'45.83024"N	4615.630	7369972.232	1507197.681	0°18'25.52991"N	CP - PK NAIL
65	371789.313	507655.653	4672.831	40°33'06.82484"N	111°58'44.32001"N	4615.929	7370124.018	1507315.072	0°18'24.56249"N	CP - PK NAIL

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY LMO

APPROVED

MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY

PROJECT

PROJECT NUMBER
PIN S-0154(12)11 12566

SURVEY CONTROL

SALT LAKE
COUNTY

SHEET NO. SC-02

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	PROJECT SECONDARY GROUND COORDINATES			GEO COORDINATES			STATE PLANE COORDINATES			
POINT NUMBER	NORTHING	EASTING	ELEVATION	LATITUDE	LONGITUDE	ELLIPSOID HEIGHT	NORTHING	EASTING	CONVERGENCE ANGLE	DESCRIPTION
66	371895.009	507728.638	4672.451	40°33'07.87288"N	111°58'43.38205"N	4615.526	7370229.691	1507388.041	0°18'23.96166"N	CP - PK NAIL
67	369587.109	506187.078	4663.819	40°32'44.99056"N	111°59'03.18620"N	4606.884	7367922.312	1505846.829	0°18'36.64777"N	CP - PK NAIL
68	369384.151	506150.691	4661.852	40°32'42.98356"N	111°59'03.64320"N	4604.928	7367719.400	1505810.450	0°18'36.94051"N	CP - PK NAIL
69	369210.309	506135.172	4659.849	40°32'41.26528"N	111°59'03.83198"N	4602.931	7367545.597	1505794.935	0°18'37.06144"N	CP - PK NAIL
70	384934.145	508292.352	4597.562	40°35'16.71860"N	111°58'36.98148"N	4540.933	7383265.881	1507951.627	0°18'19.86158"N	CP - PK NAIL
71	384940.916	508512.164	4592.891	40°35'16.79705"N	111°58'34.13349"N	4536.308	7383272.651	1508171.389	0°18'18.03722"N	CP - PK NAIL
72	384948.158	508692.825	4591.532	40°35'16.87808"N	111°58'31.79287"N	4534.928	7383279.891	1508352.009	0°18'16.53787"N	CP - PK NAIL
73	384946.708	508908.760	4588.471	40°35'16.87510"N	111°58'28.99456"N	4531.844	7383278.442	1508567.896	0°18'14.74533"N	CP - PK NAIL
74	384957.634	509171.012	4583.235	40°35'16.99678"N	111°58'25.59688"N	4526.637	7383289.365	1508830.089	0°18'12.56885"N	CP - PK NAIL
75	384954.267	509383.424	4576.200	40°35'16.97460"N	111°58'22.84409"N	4519.599	7383285.998	1509042.453	0°18'10.80547"N	CP - PK NAIL
76	384941.534	509579.223	4570.050	40°35'16.85904"N	111°58'20.30593"N	4513.401	7383273.269	1509238.207	0°18'09.17959"N	CP - PK NAIL
77	384929.252	509683.682	4567.103	40°35'16.74316"N	111°58'18.95145"N	4510.522	7383260.990	1509342.643	0°18'08.31194"N	CP - PK NAIL
79	384818.018	509625.084	4568.931	40°35'15.64123"N	111°58'19.70318"N	4512.321	7383149.781	1509284.059	0°18'08.79348"N	CP - PK NAIL
80	384942.576	508148.015	4599.249	40°35'16.79428"N	111°58'38.85246"N	4542.648	7383274.310	1507807.323	0°18'21.06009"N	CP - PK NAIL
81	384898.621	507919.534	4603.805	40°35'16.34798"N	111°58'41.81020"N	4547.155	7383230.365	1507578.894	0°18'22.95476"N	CP - PK NAIL
82	384897.244	507708.956	4607.141	40°35'16.32325"N	111°58'44.53890"N	4550.484	7383228.988	1507368.363	0°18'24.70270"N	CP - PK NAIL
83	384888.261	507490.203	4609.629	40°35'16.22292"N	111°58'47.37301"N	4552.981	7383220.008	1507149.659	0°18'26.51817"N	CP - PK NAIL
84	384887.431	507286.312	4611.264	40°35'16.20391"N	111°58'50.01509"N	4554.630	7383219.178	1506945.814	0°18'28.21063"N	CP - PK NAIL
85	384885.158	507082.292	4613.460	40°35'16.17061"N	111°58'52.65873"N	4556.811	7383216.905	1506741.841	0°18'29.90409"N	CP - PK NAIL
86	384888.141	506856.133	4616.786	40°35'16.18804"N	111°58'55.58963"N	4560.158	7383219.887	1506515.733	0°18'31.78157"N	CP - PK NAIL
88	384836.004	508148.617	4598.963	40°35'15.74146"N	111°58'38.83729"N	4542.323	7383167.762	1507807.924	0°18'21.05038"N	CP - PK NAIL
89	384783.568	508178.866	4598.425	40°35'15.22504"N	111°58'38.44168"N	4541.760	7383115.338	1507838.167	0°18'20.79696"N	CP - PK NAIL
90	384571.129	508179.041	4597.402	40°35'13.12634"N	111°58'38.42472"N	4540.732	7382902.947	1507838.342	0°18'20.78609"N	CP - PK NAIL
91	384369.876	508178.865	4599.850	40°35'11.13814"N	111°58'38.41308"N	4543.175	7382701.740	1507838.166	0°18'20.77864"N	CP - PK NAIL
92	384200.023	508221.637	4602.952	40°35'09.46237"N	111°58'37.84709"N	4546.298	7382531.925	1507880.928	0°18'20.41608"N	CP - PK NAIL
93	383992.942	508225.082	4605.019	40°35'07.41682"N	111°58'37.78813"N	4548.322	7382324.891	1507884.372	0°18'20.37831"N	CP - PK NAIL
94	383778.041	508222.484	4605.796	40°35'05.29364"N	111°58'37.80693"N	4549.054	7382110.039	1507881.775	0°18'20.39035"N	CP - PK NAIL
95	383554.546	508222.183	4605.251	40°35'03.08569"N	111°58'37.79539"N	4548.516	7381886.594	1507881.474	0°18'20.38296"N	CP - PK NAIL
96	383346.518	508222.678	4604.203	40°35'01.03056"N	111°58'37.77459"N	4547.533	7381678.613	1507881.969	0°18'20.36964"N	CP - PK NAIL
97	383125.565	508223.413	4603.145	40°34'58.84777"N	111°58'37.74980"N	4546.467	7381457.710	1507882.704	0°18'20.35375"N	CP - PK NAIL
98	382920.743	508220.869	4602.056	40°34'56.82418"N	111°58'37.76860"N	4545.387	7381252.934	1507880.161	0°18'20.36580"N	CP - PK NAIL
99	382654.013	508220.743	4600.758	40°34'54.18912"N	111°58'37.75180"N	4544.079	7380986.264	1507880.034	0°18'20.35503"N	CP - PK NAIL
101	412195.390	507149.767	4470.641	40°39'45.97074"N	111°58'53.68983"N	4414.270	7410520.968	1506809.300	0°18'30.56460"N	CP - PK NAIL IN CONC
102	411955.728	507150.388	4472.573	40°39'43.60320"N	111°58'53.66504"N	4416.208	7410281.360	1506809.921	0°18'30.54872"N	CP - PK NAIL IN CONC
103	411733.490	507148.736	4473.984	40°39'41.40767"N	111°58'53.67094"N	4417.602	7410059.172	1506808.270	0°18'30.55249"N	CP - PK NAIL IN CONC
104	411516.918	507147.361	4476.377	40°39'39.26812"N	111°58'53.67365"N	4420.007	7409842.649	1506806.895	0°18'30.55423"N	CP - PK NAIL IN CONC
105	411293.600	507141.770	4480.452	40°39'37.06168"N	111°58'53.73059"N	4424.070	7409619.381	1506801.305	0°18'30.59070"N	CP - PK NAIL IN CONC
106	411059.850	507125.634	4485.814	40°39'34.75166"N	111°58'53.92358"N	4429.427	7409385.685	1506785.173	0°18'30.71433"N	CP - PK NAIL IN CONC
107	410830.389	507103.248	4491.141	40°39'32.48366"N	111°58'54.19795"N	4434.773	7409156.275	1506762.791	0°18'30.89009"N	CP - PK NAIL IN CONC
108	410590.789	507074.178	4497.042	40°39'30.11515"N	111°58'54.55831"N	4440.620	7408916.729	1506733.728	0°18'31.12092"N	CP - PK NAIL IN CONC
109	410346.039	507045.617	4503.845	40°39'27.69581"N	111°58'54.91169"N	4447.448	7408672.035	1506705.174	0°18'31.34730"N	CP - PK NAIL IN CONC
110	410110.174	507018.496	4510.527	40°39'25.36430"N	111°58'55.24701"N	4454.080	7408436.223	1506678.059	0°18'31.56209"N	CP - PK NAIL IN CONC
111	409913.994	507005.409	4515.890	40°39'23.42556"N	111°58'55.40305"N	4459.427	7408240.088	1506664.975	0°18'31.66205"N	CP - PK NAIL IN CONC
112	409722.524	506993.424	4521.849	40°39'21.53344"N	111°58'55.54513"N	4465.379	7408048.661	1506652.993	0°18'31.75306"N	CP - PK NAIL IN CONC
113	409517.674	506993.388	4529.259	40°39'19.50973"N	111°58'55.53128"N	4472.778	7407843.857	1506652.957	0°18'31.74419"N	CP - PK NAIL IN CONC
114	409335.147	507013.769	4536.363	40°39'17.70768"N	111°58'55.25414"N	4479.882	7407661.371	1506673.334	0°18'31.56666"N	CP - PK NAIL IN CONC
115	409126.554	507037.716	4544.797	40°39'15.64830"N	111°58'54.92895"N	4488.299	7407452.825	1506697.274	0°18'31.35835"N	CP - PK NAIL IN CONC
118	408435.333	507255.021	4552.524	40°39'08.83138"N	111°58'52.06201"N	4496.023	7406761.760	1506914.530	0°18'29.52185"N	CP - PK NAIL IN CONC
119	408224.900	507326.272	4553.403	40°39'06.75634"N	111°58'51.12314"N	4496.904	7406551.374	1506985.766	0°18'28.92043"N	CP - PK NAIL IN CONC
120	408060.688	507375.819	4553.997	40°39'05.13677"N	111°58'50.46904"N	4497.513	7406387.200	1507035.301	0°18'28.50143"N	CP - PK NAIL IN CONC
121	407827.388	507439.429	4554.650	40°39'02.83540"N	111°58'49.62771"N	4498.162	7406153.953	1507098.897	0°18'27.96249"N	CP - PK NAIL IN CONC
122	407598.757	507511.521	4557.169	40°39'00.58061"N	111°58'48.67672"N	4500.669	7405925.373	1507170.973	0°18'27.35330"N	CP - PK NAIL IN CONC
123	407376.643	507587.511	4560.022	40°38'58.39040"N	111°58'47.67564"N	4503.520	7405703.309	1507246.946	0°18'26.71204"N	CP - PK NAIL IN CONC
124	407151.004	507658.694	4562.790	40°38'56.16510"N	111°58'46.73668"N	4506.297	7405477.721	1507318.112	0°18'26.11056"N	CP - PK NAIL IN CONC
125	406932.524	507729.703	4565.527	40°38'54.01054"N	111°58'45.80050"N	4508.996	7405259.291	1507389.105	0°18'25.51086"N	CP - PK NAIL IN CONC
126	406708.683	507802.650	4568.345	40°38'51.80312"N	111°58'44.83881"N	4511.842	7405035.500	1507462.036	0°18'24.89483"N	CP - PK NAIL IN CONC
127	406484.920	507877.795	4571.167	40°38'49.59658"N	111°58'43.84865"N	4514.626	7404811.788	1507537.164	0°18'24.26055"N	CP - PK NAIL IN CONC
128	406256.101	507951.146	4573.996	40°38'47.33995"N	111°58'42.88142"N	4517.467	7404583.020	1507610.499	0°18'23.64096"N	CP - PK NAIL IN CONC
129	406030.064	508022.523	4576.787	40°38'45.11076"N	111°58'41.94000"N	4520.254	7404357.035	1507681.859	0°18'23.03791"N	CP - PK NAIL IN CONC
130	405793.203	508099.750	4578.820	40°38'42.77490"N	111°58'40.92198"N	4522.289	7404120.227	1507759.069	0°18'22.38579"N	CP - PK NAIL IN CONC

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN BY KKH
QC CHECKED BY LMO

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11 PIN 12566

SURVEY CONTROL

SALT LAKE COUNTY

SHEET NO. SC-03

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	PROJECT SECONDARY GROUND COORDINATES			GEO COORDINATES			STATE PLANE COORDINATES			
POINT NUMBER	NORTHING	EASTING	ELEVATION	LATITUDE	LONGITUDE	ELLIPSOID HEIGHT	NORTHING	EASTING	CONVERGENCE ANGLE	DESCRIPTION
131	405555.584	508174.877	4578.152	40°38'40.43144"N	111°58'39.93116"N	4521.648	7403882.661	1507834.179	0°18'21.75109"N	CP - PK NAIL IN CONC
132	405318.164	508250.922	4576.642	40°38'38.09004"N	111°58'38.92847"N	4520.103	7403645.295	1507910.206	0°18'21.10878"N	CP - PK NAIL IN CONC
133	405083.818	508327.424	4575.130	40°38'35.77898"N	111°58'37.92008"N	4518.593	7403411.002	1507986.691	0°18'20.46284"N	CP - PK NAIL IN CONC
134	404851.478	508397.534	4573.592	40°38'33.48740"N	111°58'36.99474"N	4517.085	7403178.714	1508056.786	0°18'19.87008"N	CP - PK NAIL IN CONC
135	404607.875	508447.908	4572.080	40°38'31.08354"N	111°58'36.32461"N	4515.558	7402935.167	1508107.148	0°18'19.44081"N	CP - PK NAIL IN CONC
136	404394.066	508476.022	4570.704	40°38'28.97282"N	111°58'35.94522"N	4514.185	7402721.406	1508135.256	0°18'19.19778"N	CP - PK NAIL IN CONC
137	404180.349	508472.148	4568.158	40°38'26.86135"N	111°58'35.98070"N	4511.628	7402507.738	1508131.382	0°18'19.22051"N	CP - PK NAIL IN CONC
138	403930.974	508477.907	4563.138	40°38'24.39809"N	111°58'35.88878"N	4506.596	7402258.419	1508137.140	0°18'19.16162"N	CP - PK NAIL IN CONC
139	403688.260	508478.465	4558.110	40°38'22.00038"N	111°58'35.86476"N	4501.586	7402015.760	1508137.699	0°18'19.14624"N	CP - PK NAIL IN CONC
140	403463.419	508478.306	4552.862	40°38'19.77918"N	111°58'35.85128"N	4496.349	7401790.969	1508137.540	0°18'19.13761"N	CP - PK NAIL IN CONC
142	403275.557	508477.018	4549.074	40°38'17.92327"N	111°58'35.85501"N	4492.595	7401603.150	1508136.252	0°18'19.13999"N	CP - PK NAIL IN CONC
143	403042.865	508480.842	4544.824	40°38'15.62471"N	111°58'35.78934"N	4488.302	7401370.510	1508140.074	0°18'19.09793"N	CP - PK NAIL IN CONC
144	402798.423	508483.750	4539.638	40°38'13.21004"N	111°58'35.73474"N	4483.138	7401126.124	1508142.982	0°18'19.06295"N	CP - PK NAIL IN CONC
145	402589.816	508474.934	4534.813	40°38'11.14876"N	111°58'35.83465"N	4478.331	7400917.564	1508134.168	0°18'19.12695"N	CP - PK NAIL IN CONC
146	402462.729	508472.565	4532.103	40°38'09.89315"N	111°58'35.85659"N	4475.593	7400790.505	1508131.799	0°18'19.14101"N	CP - PK NAIL IN CONC
147	402223.031	508475.156	4527.541	40°38'07.52536"N	111°58'35.80642"N	4471.049	7400550.861	1508134.390	0°18'19.10887"N	CP - PK NAIL IN CONC
148	402002.421	508481.200	4524.998	40°38'05.34628"N	111°58'35.71280"N	4468.512	7400330.302	1508140.433	0°18'19.04890"N	CP - PK NAIL IN CONC
149	401753.436	508486.841	4523.214	40°38'02.88686"N	111°58'35.62245"N	4466.729	7400081.373	1508146.072	0°18'18.99102"N	CP - PK NAIL IN CONC
150	401512.800	508489.628	4521.507	40°38'00.50978"N	111°58'35.56969"N	4465.011	7399840.791	1508148.858	0°18'18.95722"N	CP - PK NAIL IN CONC
151	408535.876	505567.026	4565.077	40°39'09.73436"N	111°59'13.96384"N	4508.546	7406862.281	1505226.917	0°18'43.55169"N	CP - PK NAIL IN ASPHALT
152	408604.074	505907.865	4561.660	40°39'10.42643"N	111°59'09.54766"N	4505.118	7406930.463	1505567.679	0°18'40.72279"N	CP - PK NAIL IN ASPHALT
153	408602.625	506224.280	4558.586	40°39'10.42906"N	111°59'05.44336"N	4502.050	7406929.014	1505884.022	0°18'38.09366"N	CP - PK NAIL IN ASPHALT
154	408596.820	506459.377	4557.210	40°39'10.38427"N	111°59'02.39352"N	4500.696	7406923.211	1506119.067	0°18'36.13999"N	CP - PK NAIL IN ASPHALT
155	408665.396	506710.338	4555.829	40°39'11.07515"N	111°58'59.14313"N	4499.304	7406991.771	1506369.971	0°18'34.05786"N	CP - PK NAIL IN ASPHALT
156	408598.051	506878.366	4552.790	40°39'10.41880"N	111°58'56.95893"N	4496.274	7406924.441	1506537.961	0°18'32.65871"N	CP - PK NAIL IN ASPHALT
157	408573.040	507028.236	4553.531	40°39'10.17972"N	111°58'55.01323"N	4497.006	7406899.436	1506687.797	0°18'31.41234"N	CP - PK NAIL IN ASPHALT
158	408600.059	507327.730	4550.103	40°39'10.46257"N	111°58'51.13039"N	4493.607	7406926.449	1506987.223	0°18'28.92507"N	CP - PK NAIL IN CONC
159	408601.542	507494.493	4546.549	40°39'10.48604"N	111°58'48.96742"N	4490.061	7406927.931	1507153.949	0°18'27.53952"N	CP - PK NAIL IN CONC
160	408605.995	507673.845	4542.750	40°39'10.53958"N	111°58'46.64136"N	4486.262	7406932.384	1507333.260	0°18'26.04950"N	CP - PK NAIL IN CONC
161	408610.897	507819.028	4539.666	40°39'10.59566"N	111°58'44.75855"N	4483.201	7406937.285	1507478.410	0°18'24.84341"N	CP - PK NAIL IN CONC
162	408609.544	507977.552	4536.784	40°39'10.59070"N	111°58'42.70225"N	4480.322	7406935.932	1507636.898	0°18'23.52619"N	CP - PK NAIL IN CONC
163	408608.466	508213.271	4534.179	40°39'10.59250"N	111°58'39.64467"N	4477.736	7406934.854	1507872.564	0°18'21.56757"N	CP - PK NAIL IN CONC
164	408602.153	508379.152	4532.475	40°39'10.53886"N	111°58'37.49260"N	4475.997	7406928.543	1508038.407	0°18'20.18900"N	CP - PK NAIL IN CONC
165	408608.799	508516.735	4530.993	40°39'10.61176"N	111°58'35.70848"N	4474.505	7406935.188	1508175.959	0°18'19.04613"N	CP - PK NAIL IN CONC
166	408607.671	508726.643	4528.946	40°39'10.61165"N	111°58'32.98568"N	4472.475	7406934.059	1508385.821	0°18'17.30196"N	CP - PK NAIL IN CONC
168	408700.780	508656.565	4529.541	40°39'11.52778"N	111°58'33.90110"N	4473.103	7407027.148	1508315.758	0°18'17.88836"N	CP - PK NAIL IN CONC
169	408698.592	508516.647	4530.570	40°39'11.49883"N	111°58'35.71583"N	4474.087	7407024.960	1508175.871	0°18'19.05084"N	CP - PK NAIL IN CONC
170	408699.931	508277.589	4533.400	40°39'11.49944"N	111°58'38.81673"N	4476.935	7407026.299	1507936.868	0°18'21.03721"N	CP - PK NAIL IN CONC
171	408701.901	508030.319	4536.335	40°39'11.50585"N	111°58'42.02421"N	4479.838	7407028.268	1507689.654	0°18'23.09185"N	CP - PK NAIL IN CONC
172	408706.806	507931.288	4537.900	40°39'11.54909"N	111°58'43.30908"N	4481.398	7407033.172	1507590.645	0°18'23.91491"N	CP - PK NAIL IN ASPHALT
173	408712.241	507694.921	4541.759	40°39'11.59027"N	111°58'46.37538"N	4485.292	7407038.606	1507354.331	0°18'25.87911"N	CP - PK NAIL IN ASPHALT
174	408714.427	507438.522	4546.761	40°39'11.59826"N	111°58'49.70129"N	4490.297	7407040.791	1507097.990	0°18'28.00962"N	CP - PK NAIL IN ASPHALT
175	408708.901	507286.422	4549.787	40°39'11.53559"N	111°58'51.67379"N	4493.307	7407035.267	1506945.925	0°18'29.27316"N	CP - PK NAIL IN ASPHALT
176	408707.132	506610.119	4556.182	40°39'11.48209"N	111°59'00.44599"N	4499.664	7407033.498	1506269.774	0°18'34.89245"N	CP - PK NAIL IN CONC
177	408652.468	506365.248	4558.052	40°39'10.92899"N	111°59'03.61838"N	4501.517	7406978.846	1506024.958	0°18'36.92461"N	CP - PK NAIL IN ASPHALT
178	408708.749	506241.388	4558.588	40°39'11.47835"N	111°59'05.22892"N	4502.078	7407035.114	1505901.126	0°18'37.95629"N	CP - PK NAIL IN CONC
179	408709.410	506150.470	4559.161	40°39'11.48000"N	111°59'06.40825"N	4502.646	7407035.775	1505810.229	0°18'38.71175"N	CP - PK NAIL IN CONC
180	408720.578	506037.983	4559.681	40°39'11.58430"N	111°59'07.86812"N	4503.164	7407046.941	1505697.767	0°18'39.64690"N	CP - PK NAIL IN ASPHALT
181	408712.905	505930.389	4560.317	40°39'11.50276"N	111°59'09.26317"N	4503.749	7407039.270	1505590.198	0°18'40.54054"N	CP - PK NAIL IN CONC
182	408680.811	505698.770	4562.354	40°39'11.17325"N	111°59'12.26524"N	4505.857	7407007.183	1505358.631	0°18'42.46361"N	CP - PK NAIL IN ASPHALT
183	403377.866	506822.004	4564.096	40°38'18.84628"N	111°58'57.32466"N	4507.533	7401705.435	1506481.611	0°18'32.89299"N	CP - PK NAIL IN ASPHALT
184	403376.082	507001.752	4562.009	40°38'18.83825"N	111°58'54.99353"N	4505.500	7401703.652	1506661.318	0°18'31.39972"N	CP - PK NAIL IN ASPHALT
185	403374.269	507238.678	4559.345	40°38'18.83292"N	111°58'51.92090"N	4502.794	7401701.839	1506898.191	0°18'29.43145"N	CP - PK NAIL IN ASPHALT
186	403376.026	507463.701	4557.276	40°38'18.86222"N	111°58'49.00287"N	4500.735	7401703.596	1507123.163	0°18'27.56223"N	CP - PK NAIL IN ASPHALT
187	403375.559	507668.572	4555.987	40°38'18.86849"N	111°58'46.34602"N	4499.458	7401703.129	1507327.988	0°18'25.86031"N	CP - PK NAIL IN ASPHALT
188	403405.825	507745.999	4555.093	40°38'19.17157"N	111°58'45.34404"N	4498.567	7401733.389	1507405.397	0°18'25.21846"N	CP - PK NAIL IN CONC
189	403418.690	508013.913	4554.327	40°38'19.31284"N	111°58'41.87055"N	4497.801	7401746.250	1507673.252	0°18'22.99342"N	CP - PK NAIL IN CONC
190	403410.200	508191.922	4553.698	40°38'19.23835"N	111°58'39.56151"N	4497.177	7401737.763	1507851.220	0°18'21.51429"N	CP - PK NAIL IN CONC

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY LMO
APPROVED
MM/DD/YY
DATE
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN 12566
SURVEY CONTROL
SALT LAKE COUNTY
SHEET NO. SC-04

9/6/2016 3:51:49 PM pw:\\pw.horrocks.com\PWPrimary\Documents\Projects\2016\PG-858-1604 Bangerter 4 Interchanges PM\12566\Sheet Files\Cover\12566_SC-04.dgn

	PROJECT SECONDARY GROUND COORDINATES			GEO COORDINATES			STATE PLANE COORDINATES			
POINT NUMBER	NORTHING	EASTING	ELEVATION	LATITUDE	LONGITUDE	ELLIPSOID HEIGHT	NORTHING	EASTING	CONVERGENCE ANGLE	DESCRIPTION
191	403418.150	508335.583	4552.852	40°38'19.32446"N	111°58'37.69902"N	4496.292	7401745.711	1507994.848	0°18'20.32123"N	CP - PK NAIL IN CONC
192	403434.915	508759.186	4548.987	40°38'19.51238"N	111°58'32.20679"N	4492.498	7401762.472	1508418.356	0°18'16.80302"N	CP - PK NAIL IN ASPHALT
193	403365.891	509003.080	4546.527	40°38'18.84329"N	111°58'29.03916"N	4490.039	7401693.463	1508662.195	0°18'14.77390"N	CP - PK NAIL IN ASPHALT
194	403365.222	509252.960	4545.067	40°38'18.84977"N	111°58'25.79862"N	4488.555	7401692.795	1508912.018	0°18'12.69809"N	CP - PK NAIL IN ASPHALT
195	403364.213	509499.328	4544.401	40°38'18.85268"N	111°58'22.60360"N	4487.913	7401691.786	1509158.330	0°18'10.65142"N	CP - PK NAIL IN ASPHALT
196	403363.554	509685.494	4543.776	40°38'18.85589"N	111°58'20.18931"N	4487.275	7401691.127	1509344.455	0°18'09.10488"N	CP - PK NAIL IN ASPHALT
197	403362.662	509866.711	4543.145	40°38'18.85654"N	111°58'17.83918"N	4486.655	7401690.235	1509525.631	0°18'07.59944"N	CP - PK NAIL IN ASPHALT
198	403332.686	508870.470	4546.681	40°38'18.50831"N	111°58'30.75659"N	4490.214	7401660.266	1508529.615	0°18'15.87405"N	CP - PK NAIL IN ASPHALT
199	403329.666	508767.047	4548.126	40°38'18.47303"N	111°58'32.09760"N	4491.614	7401657.246	1508426.215	0°18'16.73307"N	CP - PK NAIL IN ASPHALT
200	403320.979	508323.034	4551.359	40°38'18.36388"N	111°58'37.85505"N	4494.897	7401648.562	1507982.302	0°18'20.42117"N	CP - PK NAIL IN CONC
201	403322.420	508067.389	4551.365	40°38'18.36460"N	111°58'41.17039"N	4494.836	7401650.003	1507726.715	0°18'22.54491"N	CP - PK NAIL IN ASPHALT
202	403328.254	507828.201	4553.158	40°38'18.40960"N	111°58'44.27263"N	4496.639	7401655.835	1507487.582	0°18'24.53214"N	CP - PK NAIL IN ASPHALT
203	401266.197	508493.217	4519.736	40°37'58.07381"N	111°58'35.50610"N	4463.281	7399594.244	1508152.447	0°18'18.91649"N	CP - PK NAIL IN CONC
204	401031.318	508496.436	4517.985	40°37'55.75361"N	111°58'35.44814"N	4461.540	7399359.418	1508155.665	0°18'18.87936"N	CP - PK NAIL IN CONC
205	400792.481	508500.117	4516.320	40°37'53.39435"N	111°58'35.38390"N	4459.848	7399120.635	1508159.346	0°18'18.83821"N	CP - PK NAIL IN CONC
206	400552.561	508503.317	4514.571	40°37'51.02436"N	111°58'35.32584"N	4458.115	7398880.769	1508162.545	0°18'18.80102"N	CP - PK NAIL IN CONC
207	400313.173	508506.933	4512.859	40°37'48.65966"N	111°58'35.26242"N	4456.414	7398641.435	1508166.160	0°18'18.76039"N	CP - PK NAIL IN CONC
208	400071.227	508509.164	4511.131	40°37'46.26962"N	111°58'35.21678"N	4454.676	7398399.543	1508168.390	0°18'18.73116"N	CP - PK NAIL IN CONC
209	399828.418	508513.607	4509.834	40°37'43.87116"N	111°58'35.14239"N	4453.380	7398156.790	1508172.833	0°18'18.68351"N	CP - PK NAIL IN CONC
210	399580.423	508517.215	4510.665	40°37'41.42140"N	111°58'35.07848"N	4454.218	7397908.850	1508176.440	0°18'18.64257"N	CP - PK NAIL IN CONC
211	399419.255	508518.926	4511.449	40°37'39.82933"N	111°58'35.04517"N	4454.991	7397747.719	1508178.150	0°18'18.62123"N	CP - PK NAIL IN CONC
212	399180.719	508523.044	4512.555	40°37'37.47306"N	111°58'34.97530"N	4456.101	7397509.237	1508182.267	0°18'18.57647"N	CP - PK NAIL IN CONC
213	398955.676	508522.398	4512.124	40°37'35.24984"N	111°58'34.96814"N	4455.669	7397284.245	1508181.621	0°18'18.57189"N	CP - PK NAIL IN CONC
214	398777.711	508502.099	4511.003	40°37'33.49067"N	111°58'35.21905"N	4454.520	7397106.320	1508161.327	0°18'18.73261"N	CP - PK NAIL IN CONC
215	398540.604	508509.370	4512.165	40°37'31.14869"N	111°58'35.10840"N	4455.699	7396869.267	1508168.596	0°18'18.66173"N	CP - PK NAIL IN CONC
216	398295.458	508511.979	4513.564	40°37'28.72704"N	111°58'35.05764"N	4457.092	7396624.176	1508171.204	0°18'18.62922"N	CP - PK NAIL IN CONC
218	397856.965	508514.941	4515.483	40°37'24.39534"N	111°58'34.98896"N	4459.021	7396185.782	1508174.166	0°18'18.58522"N	CP - PK NAIL IN CONC
219	397613.447	508516.173	4516.446	40°37'21.98968"N	111°58'34.95617"N	4459.950	7395942.319	1508175.398	0°18'18.56421"N	CP - PK NAIL IN CONC
220	397338.089	508522.361	4516.990	40°37'19.26977"N	111°58'34.85692"N	4460.497	7395667.023	1508181.585	0°18'18.50064"N	CP - PK NAIL IN CONC
221	397127.013	508498.705	4517.836	40°37'17.18332"N	111°58'35.14905"N	4461.366	7395455.995	1508157.934	0°18'18.68777"N	CP - PK NAIL IN CONC
222	396890.344	508495.922	4518.100	40°37'14.84512"N	111°58'35.16878"N	4461.588	7395219.379	1508155.152	0°18'18.70041"N	CP - PK NAIL IN CONC
223	396666.152	508498.031	4517.306	40°37'12.63043"N	111°58'35.12596"N	4460.806	7394995.238	1508157.260	0°18'18.67298"N	CP - PK NAIL IN CONC
224	396417.107	508501.346	4516.339	40°37'10.17030"N	111°58'35.06578"N	4459.842	7394746.249	1508160.574	0°18'18.63443"N	CP - PK NAIL IN CONC
225	396165.884	508498.420	4515.419	40°37'07.68832"N	111°58'35.08636"N	4458.927	7394495.083	1508157.649	0°18'18.64761"N	CP - PK NAIL IN CONC
226	395923.623	508495.955	4515.540	40°37'05.29489"N	111°58'35.10159"N	4459.040	7394252.876	1508155.185	0°18'18.65737"N	CP - PK NAIL IN CONC
227	395683.528	508493.717	4516.434	40°37'02.92289"N	111°58'35.11403"N	4459.942	7394012.836	1508152.947	0°18'18.66534"N	CP - PK NAIL IN CONC
228	395441.258	508491.258	4517.454	40°37'00.52936"N	111°58'35.12918"N	4460.927	7393770.620	1508150.489	0°18'18.67504"N	CP - PK NAIL IN CONC
229	395204.331	508489.319	4518.426	40°36'58.18867"N	111°58'35.13795"N	4461.928	7393533.747	1508148.550	0°18'18.68066"N	CP - PK NAIL IN CONC
230	394967.109	508486.772	4519.385	40°36'55.84500"N	111°58'35.15459"N	4462.917	7393296.578	1508146.003	0°18'18.69132"N	CP - PK NAIL IN CONC
231	394723.862	508475.818	4520.169	40°36'53.44139"N	111°58'35.27980"N	4463.679	7393053.387	1508135.052	0°18'18.77152"N	CP - PK NAIL IN CONC
234	397850.062	507403.790	4553.409	40°37'24.26844"N	111°58'49.39492"N	4496.828	7396178.880	1507063.266	0°18'27.81337"N	CP - PK NAIL IN CONC
235	397896.400	507583.693	4548.146	40°37'24.73572"N	111°58'47.06565"N	4491.600	7396225.208	1507243.128	0°18'26.32128"N	CP - PK NAIL IN ASPHALT
236	397965.899	507713.575	4542.308	40°37'25.42919"N	111°58'45.38650"N	4485.798	7396294.691	1507372.981	0°18'25.24566"N	CP - PK NAIL IN ASPHALT
237	397965.569	507882.222	4534.609	40°37'25.43484"N	111°58'43.19990"N	4478.095	7396294.361	1507541.590	0°18'23.84497"N	CP - PK NAIL IN ASPHALT
238	398056.631	508032.498	4529.350	40°37'26.34240"N	111°58'41.25782"N	4472.845	7396385.403	1507691.832	0°18'22.60092"N	CP - PK NAIL IN CONC
239	398071.208	508244.487	4521.310	40°37'26.49760"N	111°58'38.51030"N	4464.812	7396399.976	1507903.773	0°18'20.84092"N	CP - PK NAIL IN CONC
240	398008.511	508399.565	4515.980	40°37'25.88639"N	111°58'36.49531"N	4459.490	7396337.293	1508058.817	0°18'19.55016"N	CP - PK NAIL IN CONC
241	398047.321	508661.878	4510.357	40°37'26.28358"N	111°58'33.09699"N	4453.851	7396376.095	1508321.070	0°18'17.37327"N	CP - PK NAIL IN CONC
242	398047.710	508903.871	4504.355	40°37'26.30014"N	111°58'29.95948"N	4447.884	7396376.484	1508563.008	0°18'15.36344"N	CP - PK NAIL IN CONC
243	398066.251	509178.555	4498.202	40°37'26.49767"N	111°58'26.39935"N	4441.727	7396395.020	1508837.630	0°18'13.08290"N	CP - PK NAIL IN CONC
244	398064.823	509384.715	4492.525	40°37'26.49436"N	111°58'23.72629"N	4436.060	7396393.593	1509043.744	0°18'11.37060"N	CP - PK NAIL IN ASPHALT
245	398063.242	509553.383	4488.594	40°37'26.48755"N	111°58'21.53932"N	4432.135	7396392.012	1509212.374	0°18'09.96967"N	CP - PK NAIL IN ASPHALT
246	398060.927	509766.274	4485.088	40°37'26.47578"N	111°58'18.77894"N	4428.647	7396389.698	1509425.217	0°18'08.20143"N	CP - PK NAIL IN ASPHALT
247	398059.996	509921.667	4482.851	40°37'26.47470"N	111°58'16.76413"N	4426.405	7396388.767	1509580.575	0°18'06.91078"N	CP - PK NAIL IN ASPHALT
249	388265.390	508235.413	4548.096	40°35'49.62527"N	111°58'37.94964"N	4491.546	7386596.374	1507894.701	0°18'20.48177"N	CP - PK NAIL IN CONC
250	388025.914	508234.907	4549.327	40°35'47.25942"N	111°58'37.93963"N	4492.729	7386356.952	1507894.195	0°18'20.47536"N	CP - PK NAIL IN CONC
251	387787.115	508234.304	4548.471	40°35'44.90030"N	111°58'37.93093"N	4491.869	7386118.207	1507893.593	0°18'20.46978"N	CP - PK NAIL IN CONC
252	387537.814	508233.832	4544.485	40°35'42.43740"N	111°58'37.91982"N	4487.897	7385868.962	1507893.120	0°18'20.46267"N	CP - PK NAIL IN CONC

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY LMO

APPROVED

MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY

PROJECT NUMBER: S-0154(12)11 PIN 12566

SURVEY CONTROL

SALT LAKE COUNTY

SHEET NO. SC-05

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POINT NUMBER	PROJECT SECONDARY GROUND COORDINATES			GEO COORDINATES			STATE PLANE COORDINATES		CONVERGENCE ANGLE	DESCRIPTION
	NORTHING	EASTING	ELEVATION	LATITUDE	LONGITUDE	ELLIPSOID HEIGHT	NORTHING	EASTING		
253	387292.272	508233.024	4538.596	40°35'40.01161"N	111°58'37.91331"N	4481.997	7385623.476	1507892.312	0°18'20.45850"N	CP - PK NAIL IN CONC
254	387045.090	508232.206	4534.373	40°35'37.56966"N	111°58'37.90682"N	4477.767	7385376.349	1507891.495	0°18'20.45434"N	CP - PK NAIL IN CONC
255	386797.511	508229.687	4535.631	40°35'35.12368"N	111°58'37.92234"N	4479.073	7385128.826	1507888.977	0°18'20.46428"N	CP - PK NAIL IN CONC
256	386559.217	508231.893	4542.345	40°35'32.76967"N	111°58'37.87728"N	4485.781	7384890.587	1507891.182	0°18'20.43541"N	CP - PK NAIL IN CONC
257	386309.254	508230.836	4554.099	40°35'30.30018"N	111°58'37.87370"N	4497.516	7384640.679	1507890.125	0°18'20.43312"N	CP - PK NAIL IN CONC
258	386070.498	508229.950	4566.064	40°35'27.94146"N	111°58'37.86867"N	4509.455	7384401.977	1507889.239	0°18'20.42990"N	CP - PK NAIL IN CONC
259	385821.057	508230.019	4578.376	40°35'25.47719"N	111°58'37.85053"N	4521.744	7384152.593	1507889.308	0°18'20.41828"N	CP - PK NAIL IN CONC
260	385601.082	508232.498	4587.281	40°35'23.30419"N	111°58'37.80320"N	4530.624	7383932.668	1507891.787	0°18'20.38796"N	CP - PK NAIL IN CONC
261	385388.742	508239.568	4593.174	40°35'21.20683"N	111°58'37.69690"N	4536.538	7383720.376	1507898.855	0°18'20.31987"N	CP - PK NAIL IN CONC
262	385149.803	508167.889	4596.731	40°35'18.84253"N	111°58'38.60925"N	4540.070	7383481.491	1507827.193	0°18'20.90430"N	CP - PK NAIL IN CONC
263	384982.983	508166.864	4599.103	40°35'17.19445"N	111°58'38.61100"N	4542.448	7383314.708	1507826.167	0°18'20.90542"N	CP - PK NAIL IN CONC
264	385016.142	508294.409	4596.919	40°35'17.52875"N	111°58'36.96048"N	4540.257	7383347.859	1507953.684	0°18'19.84813"N	CP - PK NAIL IN CONC
265	385262.424	508295.105	4594.882	40°35'19.96184"N	111°58'36.96848"N	4538.238	7383594.086	1507954.379	0°18'19.85326"N	CP - PK NAIL IN CONC
266	384835.819	508311.991	4596.135	40°35'15.74826"N	111°58'36.72018"N	4539.324	7383167.577	1507971.262	0°18'19.69420"N	CP - PK IN CONC
267	381594.613	508229.552	4601.477	40°34'43.72363"N	111°58'37.56443"N	4544.773	7379927.104	1507888.841	0°18'20.23501"N	CP - PK NAIL IN CONC
268	381396.302	508214.221	4603.448	40°34'41.76368"N	111°58'37.74936"N	4546.669	7379728.837	1507873.514	0°18'20.35347"N	CP - PK NAIL IN CONC
269	381196.098	508224.594	4605.443	40°34'39.78638"N	111°58'37.60112"N	4548.663	7379528.679	1507883.885	0°18'20.25851"N	CP - PK NAIL IN CONC
270	380986.339	508204.509	4607.506	40°34'37.71307"N	111°58'37.84686"N	4550.780	7379318.967	1507863.805	0°18'20.41593"N	CP - PK NAIL IN CONC
271	380775.168	508214.086	4609.602	40°34'35.62738"N	111°58'37.70818"N	4552.895	7379107.843	1507873.379	0°18'20.32709"N	CP - PK NAIL IN CONC
272	380544.297	508197.707	4611.914	40°34'33.34573"N	111°58'37.90444"N	4555.226	7378877.025	1507857.003	0°18'20.45282"N	CP - PK NAIL IN CONC
273	380314.718	508203.522	4614.315	40°34'31.07798"N	111°58'37.81323"N	4557.657	7378647.498	1507862.817	0°18'20.39439"N	CP - PK NAIL IN CONC
274	388470.010	508246.216	4547.005	40°35'51.64728"N	111°58'37.82377"N	4490.482	7386800.948	1507905.502	0°18'20.40114"N	CP - PK NAIL IN CONC
275	388665.982	508235.529	4545.841	40°35'53.58275"N	111°58'37.97583"N	4489.334	7386996.875	1507894.817	0°18'20.49855"N	CP - PK NAIL IN CONC
276	388860.807	508248.315	4544.795	40°35'55.50810"N	111°58'37.82359"N	4488.282	7387191.657	1507907.600	0°18'20.40102"N	CP - PK NAIL IN CONC
277	389068.678	508237.335	4543.585	40°35'57.56111"N	111°58'37.98027"N	4487.058	7387399.480	1507896.623	0°18'20.50139"N	CP - PK NAIL IN CONC
278	389282.202	508249.305	4542.476	40°35'59.67114"N	111°58'37.83989"N	4485.966	7387612.956	1507908.590	0°18'20.41147"N	CP - PK NAIL IN CONC
279	389489.647	508238.880	4541.259	40°36'01.71997"N	111°58'37.98936"N	4484.743	7387820.354	1507898.168	0°18'20.50721"N	CP - PK NAIL IN CONC
280	389700.044	508250.550	4540.166	40°36'03.79912"N	111°58'37.85265"N	4483.685	7388030.704	1507909.835	0°18'20.41964"N	CP - PK NAIL IN CONC
281	389912.898	508239.883	4539.214	40°36'05.90134"N	111°58'38.00563"N	4482.689	7388243.509	1507899.170	0°18'20.51763"N	CP - PK NAIL IN CONC
283	384081.115	508008.346	4612.181	40°35'08.27642"N	111°58'40.60272"N	4555.450	7382413.044	1507667.685	0°18'22.18127"N	MON - CL
284	383826.172	508000.523	4612.882	40°35'05.75740"N	111°58'40.68644"N	4556.141	7382158.158	1507659.864	0°18'22.23490"N	NAIL - SET
285	383571.422	508000.605	4613.677	40°35'03.24071"N	111°58'40.66774"N	4556.934	7381903.466	1507659.946	0°18'22.22292"N	NAIL - SET
286	383325.346	508000.376	4612.703	40°35'00.80966"N	111°58'40.65366"N	4555.998	7381657.445	1507659.717	0°18'22.21390"N	NAIL - SET
287	383071.864	507999.660	4610.936	40°34'58.30547"N	111°58'40.64538"N	4554.228	7381404.020	1507659.002	0°18'22.20861"N	NAIL - SET
288	382818.004	507999.196	4607.347	40°34'55.79753"N	111°58'40.63382"N	4550.637	7381150.218	1507658.538	0°18'22.20120"N	NAIL - SET
289	382579.318	507999.177	4604.004	40°34'53.43953"N	111°58'40.61754"N	4547.283	7380911.586	1507658.519	0°18'22.19077"N	NAIL - SET
290	382371.624	508006.526	4605.132	40°34'51.38807"N	111°58'40.50794"N	4548.410	7380703.939	1507665.866	0°18'22.12056"N	MON - CL
300	382439.075	508219.178	4599.629	40°34'52.06562"N	111°58'37.75722"N	4542.960	7380771.375	1507878.470	0°18'20.35851"N	CP - PK NAIL
301	382231.502	508219.276	4598.625	40°34'50.01499"N	111°58'37.74160"N	4541.963	7380563.849	1507878.567	0°18'20.34850"N	CP - PK NAIL
302	382015.655	508217.787	4598.068	40°34'47.88253"N	111°58'37.74598"N	4541.380	7380348.051	1507877.079	0°18'20.35130"N	CP - PK NAIL
303	381802.499	508216.779	4599.405	40°34'45.77668"N	111°58'37.74430"N	4542.716	7380134.943	1507876.071	0°18'20.35023"N	CP - PK NAIL
304	384385.161	508291.844	4599.517	40°35'11.29510"N	111°58'36.95012"N	4542.829	7382717.021	1507951.119	0°18'19.84150"N	CP - PK NAIL
305	384585.375	508292.359	4597.019	40°35'13.27304"N	111°58'36.95727"N	4540.380	7382917.189	1507951.635	0°18'19.84608"N	CP - PK NAIL
306	384753.983	508294.477	4596.877	40°35'14.93887"N	111°58'36.94149"N	4540.249	7383085.760	1507953.751	0°18'19.83597"N	CP - PK NAIL
308	368990.813	505606.032	4667.838	40°32'39.06845"N	111°59'10.66910"N	4610.917	7367326.151	1505265.914	0°18'41.44115"N	QC - BRC 19/20 T3S R1W
309	409054.875	506804.632	4543.798	40°39'14.92776"N	111°58'57.94731"N	4487.281	7407381.162	1506464.243	0°18'33.29185"N	CP - MAG
310	409241.208	506829.492	4539.101	40°39'16.76984"N	111°58'57.63788"N	4482.599	7407567.453	1506489.098	0°18'33.09364"N	CP - MAG
311	408903.281	506524.079	4549.733	40°39'13.41522"N	111°59'01.57578"N	4493.225	7407229.603	1506183.754	0°18'35.61617"N	CP - MAG
312	408921.537	506809.412	4546.235	40°39'13.61081"N	111°58'57.87598"N	4489.746	7407247.854	1506469.022	0°18'33.24615"N	CP - MAG
322	403615.482	508871.651	4551.652	40°38'21.30209"N	111°58'30.76076"N	4495.147	7401942.998	1508530.795	0°18'15.87673"N	CP - MAG
323	403580.624	508699.682	4550.557	40°38'20.94868"N	111°58'32.98850"N	4494.037	7401908.147	1508358.866	0°18'17.30377"N	CP - MAG
326	397924.208	507947.463	4540.137	40°37'25.02970"N	111°58'42.35116"N	4483.587	7396253.009	1507606.816	0°18'23.30129"N	CP - MAG
327	397907.364	508072.708	4538.063	40°37'24.86993"N	111°58'40.72615"N	4481.556	7396236.169	1507732.033	0°18'22.26034"N	CP - MAG
328	397938.692	508205.847	4538.521	40°37'25.18644"N	111°58'39.00211"N	4482.009	7396267.491	1507865.142	0°18'21.15596"N	CP - MAG
329	397939.174	508343.961	4538.332	40°37'25.19846"N	111°58'37.21144"N	4481.827	7396267.973	1508003.225	0°18'20.00890"N	CP - MAG
330	397811.662	508328.562	4538.452	40°37'23.93796"N	111°58'37.40228"N	4481.949	7396140.489	1507987.829	0°18'20.13114"N	CP - MAG
331	397562.340	508318.441	4536.835	40°37'21.47437"N	111°58'37.51627"N	4480.268	7395891.223	1507977.710	0°18'20.20416"N	CP - MAG
336	366308.071	506092.949	4633.159	40°32'12.59099"N	111°59'04.17520"N	4576.258	7364644.015	1505752.721	0°18'37.28130"N	P/K SET IN LIP

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: LMO
APPROVED: MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566
SURVEY CONTROL

SALT LAKE COUNTY

SHEET NO. SC-06

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POINT NUMBER	PROJECT SECONDARY GROUND COORDINATES			GEO COORDINATES			STATE PLANE COORDINATES		CONVERGENCE ANGLE	DESCRIPTION
	NORTHING	EASTING	ELEVATION	LATITUDE	LONGITUDE	ELLIPSOID HEIGHT	NORTHING	EASTING		
337	366304.835	506256.978	4629.803	40°32'12.56777"N	111°59'02.05098"N	4573.164	7364640.780	1505916.713	0°18'35.92057"N	P/K SET IN TBC
338	366363.981	506261.091	4629.902	40°32'13.15234"N	111°59'02.00186"N	4573.035	7364699.912	1505920.825	0°18'35.88911"N	P/K SET IN TBC
339	366363.854	506104.872	4633.253	40°32'13.14272"N	111°59'04.02472"N	4576.354	7364699.785	1505764.641	0°18'37.18491"N	P/K SET IN TBC
408	408567.972	505617.759	4564.558	40°39'10.05419"N	111°59'13.30806"N	4507.972	7406894.369	1505277.638	0°18'43.13161"N	CP - PK IN ASPHALT
409	408579.539	505490.276	4565.204	40°39'10.16158"N	111°59'14.96245"N	4508.646	7406905.934	1505150.184	0°18'44.19138"N	CP - PK IN CONC
410	408551.882	505292.678	4566.635	40°39'09.87772"N	111°59'17.52351"N	4510.124	7406878.283	1504952.631	0°18'45.83195"N	CP - PK IN CONC
411	408552.062	505044.560	4568.041	40°39'09.86609"N	111°59'20.74185"N	4511.477	7406878.463	1504704.569	0°18'47.89354"N	CP - PK IN CONC
412	408564.273	504873.063	4569.227	40°39'09.97747"N	111°59'22.96718"N	4512.679	7406890.671	1504533.111	0°18'49.31904"N	CP - PK IN CONC
413	408562.127	504671.034	4570.478	40°39'09.94532"N	111°59'25.58754"N	4513.928	7406888.526	1504331.127	0°18'50.99758"N	CP - PK IN ASPHALT
414	408602.547	504344.498	4572.958	40°39'10.32692"N	111°59'29.82588"N	4516.361	7406928.937	1504004.666	0°18'53.71258"N	CP - PK IN ASPHALT
415	408518.645	504345.819	4573.347	40°39'09.49813"N	111°59'29.80276"N	4516.738	7406845.054	1504005.986	0°18'53.69777"N	CP - PK IN ASPHALT
416	408516.431	504163.334	4574.807	40°39'09.46634"N	111°59'32.16960"N	4518.251	7406842.840	1503823.542	0°18'55.21391"N	CP - PK IN CONC
417	408352.975	504961.414	4572.025	40°39'07.89487"N	111°59'21.80619"N	4515.470	7406679.421	1504621.442	0°18'48.57534"N	CP - PK IN ASPHALT
418	408406.077	505646.360	4568.244	40°39'08.45640"N	111°59'12.92564"N	4511.746	7406732.511	1505306.233	0°18'42.88665"N	CP - PK IN CONC
419	408197.099	505645.170	4572.000	40°39'06.39184"N	111°59'12.92632"N	4515.463	7406523.580	1505305.043	0°18'42.88708"N	CP - PK IN CONC
420	407977.859	505643.496	4576.631	40°39'04.22593"N	111°59'12.93256"N	4520.096	7406304.390	1505303.369	0°18'42.89108"N	CP - PK IN CONC
421	407790.359	505641.934	4580.263	40°39'02.37355"N	111°59'12.93958"N	4523.728	7406116.932	1505301.808	0°18'42.89557"N	CP - PK IN CONC
422	407521.828	505673.407	4584.480	40°38'59.72248"N	111°59'12.51240"N	4527.995	7405848.461	1505333.274	0°18'42.62193"N	CP - PK IN ASPHALT
423	407811.606	505842.184	4576.169	40°39'02.59420"N	111°59'10.34373"N	4519.637	7406138.174	1505502.012	0°18'41.23273"N	CP - PK IN ASPHALT
424	408811.833	505649.006	4560.465	40°39'12.46493"N	111°59'12.91997"N	4503.871	7407138.175	1505308.879	0°18'42.88301"N	CP - PK IN CONC
425	409010.847	505650.537	4556.758	40°39'14.43103"N	111°59'12.91417"N	4500.208	7407337.144	1505310.409	0°18'42.87930"N	CP - PK IN CONC
426	409275.781	505659.585	4551.053	40°39'17.04874"N	111°59'12.81551"N	4494.477	7407602.019	1505319.455	0°18'42.81610"N	CP - PK IN CONC
427	409450.801	505670.713	4546.997	40°39'18.77836"N	111°59'12.68352"N	4490.436	7407776.999	1505330.581	0°18'42.73155"N	CP - PK IN ASPHALT
428	409652.377	505659.529	4542.753	40°39'20.76908"N	111°59'12.84283"N	4486.235	7407978.529	1505319.400	0°18'42.83360"N	CP - PK IN ASPHALT
429	408938.032	505610.914	4557.075	40°39'13.70956"N	111°59'13.42298"N	4500.585	7407264.345	1505270.795	0°18'43.20523"N	CP - PLUG MERIDIAN
430	408307.191	507513.546	4543.300	40°39'07.57922"N	111°58'48.69978"N	4486.804	7406633.647	1507172.998	0°18'27.36808"N	CP - PK IN ASPHALT
431	408112.281	507567.081	4545.831	40°39'05.65657"N	111°58'47.99183"N	4489.313	7406438.781	1507226.520	0°18'26.91458"N	CP - PK IN ASPHALT
432	407978.693	507609.989	4550.444	40°39'04.33915"N	111°58'47.42599"N	4493.942	7406305.224	1507269.418	0°18'26.55212"N	CP - PK IN ASPHALT
433	407780.380	507675.664	4551.449	40°39'02.38352"N	111°58'46.56036"N	4494.943	7406106.955	1507335.078	0°18'25.99761"N	CP - PK IN ASPHALT
434	407641.088	507718.534	4553.364	40°39'01.00976"N	111°58'45.99462"N	4496.845	7405967.695	1507377.939	0°18'25.63521"N	CP - PK IN ASPHALT
435	407527.737	507753.540	4554.115	40°38'59.89182"N	111°58'45.53269"N	4497.591	7405854.370	1507412.938	0°18'25.33931"N	CP - PK IN ASPHALT
436	407259.176	507986.649	4553.205	40°38'57.25108"N	111°58'42.49054"N	4496.701	7405585.869	1507645.994	0°18'23.39057"N	CP - PK IN ASPHALT
437	407266.304	507840.252	4556.796	40°38'57.31375"N	111°58'44.38984"N	4500.266	7405592.995	1507499.630	0°18'24.60722"N	CP - PK IN ASPHALT
438	409378.837	507427.358	4480.901	40°39'18.16128"N	111°58'49.89239"N	4424.511	7407705.051	1507086.829	0°18'28.13204"N	CP - MAG
439	409250.803	507425.401	4481.482	40°39'16.89635"N	111°58'49.90885"N	4425.088	7407577.046	1507084.872	0°18'28.14258"N	CP - MAG
440	409466.695	507208.678	4493.520	40°39'19.01758"N	111°58'52.73511"N	4437.117	7407792.889	1506868.198	0°18'29.95302"N	CP - MAG
441	409588.774	507210.728	4495.893	40°39'20.22368"N	111°58'52.71703"N	4439.507	7407914.940	1506870.248	0°18'29.94144"N	CP - MAG
442	409690.802	507218.486	4495.139	40°39'21.23201"N	111°58'52.62352"N	4438.701	7408016.946	1506878.004	0°18'29.88154"N	CP - MAG
443	409821.832	507220.920	4496.057	40°39'22.52657"N	111°58'52.60109"N	4439.642	7408147.946	1506880.437	0°18'29.86717"N	CP - MAG
444	409953.547	507221.834	4496.855	40°39'23.82782"N	111°58'52.59842"N	4440.381	7408279.631	1506881.352	0°18'29.86547"N	CP - MAG
445	410086.796	507227.373	4498.563	40°39'25.14445"N	111°58'52.53587"N	4442.164	7408412.851	1506886.889	0°18'29.82540"N	CP - MAG
446	410214.331	507286.394	4501.035	40°39'26.40748"N	111°58'51.77918"N	4444.596	7408540.357	1506945.896	0°18'29.34067"N	CP - MAG
447	410352.710	507302.618	4497.911	40°39'27.77537"N	111°58'51.57837"N	4441.461	7408678.704	1506962.117	0°18'29.21205"N	CP - MAG

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

DRAWN BY: KKH
QC CHECKED BY: LMO

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566

SURVEY CONTROL

SALT LAKE
COUNTY

SHEET NO. SC-07

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POINT NUMBER	PROJECT SUPPLEMENTAL GROUND COORDINATES			GEO COORDINATES			STATE PLANE COORDINATES		CONVERGENCE ANGLE	DESCRIPTION
	NORTHING	EASTING	ELEVATION	LATITUDE	LONGITUDE	ELLIPSOID HEIGHT	NORTHING	EASTING		
307	382224.027	508298.830	4598.687	40°34'49.94533"N	111°58'36.71040"N	4541.976	7380556.375	1507958.104	0°18'19.68787"N	QC - BRC 5/8 T3S R1W
400	397843.587	507717.890	4545.882	40°37'24.22110"N	111°58'45.32196"N	4489.334	7396172.407	1507377.295	0°18'25.20438"N	RWC - MCNEIL ENG
401	370819.730	506962.892	4662.131	40°32'57.20932"N	111°58'53.22504"N	4605.285	7369154.655	1506622.468	0°18'30.26676"N	RWC - BENCHMARK ENG
402	369150.463	505172.888	4679.109	40°32'40.62239"N	111°59'16.28988"N	4622.186	7367485.765	1504832.868	0°18'45.04159"N	RWC - WARD ENG
403	369153.479	505149.779	4680.539	40°32'40.65094"N	111°59'16.58904"N	4623.616	7367488.780	1504809.765	0°18'45.23343"N	RWC - WARD ENG
404	369196.889	505182.568	4681.530	40°32'41.08157"N	111°59'16.16748"N	4624.608	7367532.180	1504842.546	0°18'44.96339"N	RWC - WARD ENG
405	386201.814	508309.183	4569.079	40°35'29.24290"N	111°58'36.85080"N	4512.410	7384533.264	1507968.454	0°18'19.77798"N	RWC - B&G LS127636
406	368734.038	506116.800	4651.810	40°32'36.55907"N	111°59'04.03656"N	4594.919	7367069.434	1505776.567	0°18'37.19245"N	RWC - MCNEIL
407	406691.560	507745.121	4567.913	40°38'51.63090"N	111°58'45.58368"N	4511.483	7405018.381	1507404.520	0°18'25.37203"N	RWC - UDOT ALM CP 105
408	403188.742	508551.941	4547.562	40°38'17.06957"N	111°58'34.87728"N	4491.009	7401516.355	1508211.157	0°18'18.51376"N	RWC - MCNEIL
501	369084.503	506268.518	4653.156	40°32'40.02954"N	111°59'02.09616"N	4596.273	7367419.820	1505928.250	0°18'35.94960"N	RM - CL22.86 STA20746 ELV1418.1 1998 SEI
502	371626.094	507617.796	4669.952	40°33'05.21035"N	111°58'44.79888"N	4613.137	7369960.836	1507277.223	0°18'24.86933"N	RM - CL22.86 STA19831 1998 SEI
503	370308.557	506595.214	4661.223	40°32'52.13972"N	111°58'57.95112"N	4604.360	7368643.597	1506254.873	0°18'33.29423"N	RM - BRC CL22.86 STA20344 ELV1420.6 1998 SEI
504	370667.568	506838.951	4662.908	40°32'55.69948"N	111°58'54.81948"N	4606.056	7369002.527	1506498.554	0°18'31.28820"N	RM - BRC CL22.86 STA20208 ELV1421.1 1998 SEI
505	371618.827	507612.027	4669.949	40°33'05.13824"N	111°58'44.87304"N	4613.134	7369953.571	1507271.456	0°18'24.91686"N	RM - CL22.86 STA19834 ELV1423.3 1998 SEI
506	384937.119	507437.276	4609.344	40°35'16.70276"N	111°58'48.06228"N	4552.620	7383268.854	1507096.745	0°18'26.95969"N	RM - CL53 STA20641
507	384936.614	507843.915	4603.669	40°35'16.71932"N	111°58'42.79260"N	4546.964	7383268.349	1507503.292	0°18'23.58416"N	RM - CL53 STA61290
508	384938.276	508007.401	4601.151	40°35'16.74438"N	111°58'40.67436"N	4544.454	7383270.011	1507666.741	0°18'22.22714"N	RM - CL53 STA77810
509	384979.340	508155.797	4599.595	40°35'17.15788"N	111°58'38.75412"N	4542.905	7383311.066	1507815.104	0°18'20.99712"N	RM - CL75 STA51612.75
510	384942.793	508120.456	4600.386	40°35'16.79496"N	111°58'39.20952"N	4543.694	7383274.527	1507779.770	0°18'21.28887"N	RM - CL55 STA89133
511	385591.684	508307.627	4586.276	40°35'23.21527"N	111°58'36.82884"N	4529.600	7383923.271	1507966.898	0°18'19.76389"N	RM - CL75 STA5100
512	385065.539	508305.970	4596.820	40°35'18.01738"N	111°58'36.81408"N	4540.138	7383397.245	1507965.242	0°18'19.75435"N	RM - BROKE
513	371713.250	507495.580	4669.299	40°33'06.06492"N	111°58'46.38792"N	4612.480	7370047.973	1507155.036	0°18'25.88717"N	RM - 1998
514	368934.052	506086.104	4656.064	40°32'38.53345"N	111°59'04.44804"N	4599.173	7367269.403	1505745.878	0°18'37.45608"N	RM - 1998
515	366295.231	506050.806	4635.061	40°32'12.46186"N	111°59'04.71984"N	4578.153	7364631.178	1505710.588	0°18'37.63029"N	RM - 1998
516	367660.827	506103.878	4640.258	40°32'25.95584"N	111°59'04.12872"N	4583.358	7365996.465	1505763.648	0°18'37.25142"N	RM - 1998
517	367860.145	506112.298	4642.387	40°32'27.92540"N	111°59'04.03368"N	4585.489	7366195.739	1505772.065	0°18'37.19054"N	RM - 1998
518	400575.063	508458.194	4513.809	40°37'51.24428"N	111°58'35.91264"N	4457.339	7398903.265	1508117.432	0°18'19.17682"N	RFM - 36000
519	400754.914	508425.636	4517.096	40°37'53.01934"N	111°58'36.34716"N	4460.626	7399083.077	1508084.881	0°18'19.45522"N	MON - BUR REC BRC STA116668.14 ELV4513.722 2S1W 205A
520	384102.283	508180.901	4603.231	40°35'08.49466"N	111°58'38.36820"N	4546.534	7382434.208	1507840.201	0°18'20.74988"N	RM - 16000
521	382618.941	508177.275	4599.780	40°34'53.84035"N	111°58'38.31276"N	4543.067	7380951.200	1507836.576	0°18'20.71427"N	RM - 16450
522	383770.260	508302.418	4604.692	40°35'05.22096"N	111°58'36.77052"N	4547.997	7382102.259	1507961.692	0°18'19.72651"N	RM - 1998
523	384594.473	508290.557	4596.607	40°35'13.36283"N	111°58'36.98112"N	4539.920	7382926.286	1507949.833	0°18'19.86144"N	RM - 15850
524	408580.150	507115.265	4552.965	40°39'10.25460"N	111°58'53.88492"N	4496.523	7406906.545	1506774.806	0°18'30.68954"N	RM - BRC
525	406014.682	507952.791	4577.502	40°38'44.95510"N	111°58'42.84336"N	4521.075	7404341.656	1507612.143	0°18'23.61656"N	RM - BRC CL75 STA30473.1 ELV4574.07 1994
526	405844.736	508164.916	4582.541	40°38'43.28743"N	111°58'40.08036"N	4526.123	7404171.749	1507824.220	0°18'21.84668"N	RM - 1994
527	368932.073	506311.653	4651.652	40°32'38.52593"N	111°59'01.52700"N	4594.770	7367267.424	1505971.376	0°18'35.58491"N	RM
528	369035.263	506727.239	4646.241	40°32'39.56755"N	111°58'56.15220"N	4589.376	7367370.590	1506386.867	0°18'32.14198"N	RM
529	408564.139	507132.884	4557.541	40°39'10.09735"N	111°58'53.65524"N	4501.101	7406890.537	1506792.421	0°18'30.54243"N	MON - CUWCD JORDAN AQUEDUCT STA124860 ELV 4554.2 PI
530	407500.085	507451.045	4572.366	40°38'59.60263"N	111°58'49.45440"N	4515.930	7405826.723	1507110.510	0°18'27.85137"N	MON - CUWCD STA123752 ELV4569
531	406105.754	507899.216	4586.360	40°38'45.85196"N	111°58'43.54464"N	4529.931	7404432.708	1507558.580	0°18'24.06572"N	MON - CUWCD JORDAN AQUEDUCT STA122289
532	403929.068	508411.543	4561.939	40°38'24.37577"N	111°58'36.74928"N	4505.510	7402256.513	1508070.791	0°18'19.71284"N	MON - JVWCD BRC STA20075? SEE PIC
533	401648.429	508427.548	4527.276	40°38'01.84639"N	111°58'36.38424"N	4470.819	7399976.390	1508086.792	0°18'19.47890"N	MON - CUWCD BRC JORDAN AQUEDUCT STA117762.5
534	406470.732	507832.996	4570.045	40°38'49.45402"N	111°58'44.42880"N	4513.617	7404797.603	1507492.375	0°18'24.63211"N	RFM - UDOT STA30000
535	408476.152	506849.489	4557.297	40°39'09.21305"N	111°58'57.32508"N	4500.842	7406802.570	1506509.090	0°18'32.89318"N	CP - MERIDIAN NAIL/WASH
536	408589.582	506982.273	4552.827	40°39'10.34068"N	111°58'55.61040"N	4496.380	7406915.974	1506641.845	0°18'31.79498"N	NAIL
537	408706.756	508367.289	4532.304	40°39'11.57159"N	111°58'37.65360"N	4475.926	7407033.122	1508026.547	0°18'20.29220"N	RM - FLINT NO MARKING
538	408714.484	507647.346	4542.108	40°39'11.60989"N	111°58'46.99272"N	4485.695	7407040.849	1507306.767	0°18'26.27452"N	RM - NO MARKING
539	403315.240	508082.727	4551.972	40°38'18.29450"N	111°58'40.97100"N	4495.518	7401642.824	1507742.050	0°18'22.41718"N	RWC - ENSIGN
541	400741.323	505741.391	4562.580	40°37'52.74228"N	111°59'11.15232"N	4505.976	7399069.488	1505401.242	0°18'41.75070"N	QC - BRC 19/20 T2S R1W
543	408655.269	506053.365	4559.800	40°39'10.93997"N	111°59'07.66392"N	4503.308	7406981.647	1505713.146	0°18'39.51615"N	MON - MERIDIAN ENG
545	382257.080	505652.491	4679.408	40°34'50.13109"N	111°59'11.00184"N	4622.581	7380589.421	1505312.363	0°18'41.65421"N	SC - BRC 6/5/7/8 T3S R1W 1988
547	387559.904	505670.177	4603.141	40°35'42.51919"N	111°59'11.14620"N	4546.367	7385891.047	1505330.044	0°18'41.74678"N	SC - BRC 31/32/6/5 T2/3S R1W
549	387566.586	508333.264	4552.063	40°35'42.72688"N	111°58'36.63300"N	4495.411	7385897.728	1507992.530	0°18'19.63846"N	MON - BUREAU OF REC STA103680.08 ELV4548.592 BRC
550	387502.949	510976.595	4515.658	40°35'42.23602"N	111°58'02.37144"N	4459.138	7385834.105	1510635.264	0°17'57.69108"N	SC - BRC 32/32/V/4 T2/3S R1W
552	382190.626	510955.436	4552.025	40°34'49.75388"N	111°58'02.28576"N	4495.444	7380522.982	1510614.110	0°17'57.63632"N	SC - BRC 5/4/8/9 T3S R1W 1987
554	384872.072	508305.692	4596.453	40°35'16.10606"N	111°58'36.80436"N	4539.777	7383203.822	1507964.965	0°18'19.74809"N	QC - BRC CENTER SECTION 5 T3S R1W
555	411304.763	505764.668	4497.825	40°39'37.09832"N	111°59'11.59548"N	4441.344	7409630.542	1505424.514	0°18'42.03467"N	QC - BRC 7/8 T2S R1W
556	411292.341	511074.236	4427.708	40°39'37.25536"N	111°58'02.71704"N	4371.492	7409618.123	1510732.883	0°17'57.91257"N	QC - 9/8 T2S R1W
558	408721.723	508382.309	4531.259	40°39'11.72023"N	111°58'37.45992"N	4474.883	7407048.086	1508041.564	0°18'20.16806"N	RM - FLINT
559	406003.864	511061.048	4544.860	40°38'45.01061"N	111°58'02.52984"N	4488.597	7404330.840	1510719.698	0°17'57.79253"N	QC - BRC 17/16 T2S R1W

REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

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MM/DD/YY
DATE
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566
SURVEY CONTROL

SALT LAKE
COUNTY

SHEET NO. SC-08

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POINT NUMBER	PROJECT SUPPLEMENTAL GROUND COORDINATES			GEO COORDINATES			STATE PLANE COORDINATES		CONVERGENCE ANGLE	DESCRIPTION
	NORTHING	EASTING	ELEVATION	LATITUDE	LONGITUDE	ELLIPSOID HEIGHT	NORTHING	EASTING		
561	400706.251	511038.687	4486.787	40°37'52.67482"N	111°58'02.46072"N	4430.459	7399034.425	1510697.342	0°17'57.74833"N	QC - BRC 20/21 T2S R1W
563	395406.275	510997.012	4477.503	40°37'00.31436"N	111°58'02.64216"N	4421.091	7393735.645	1510655.676	0°17'57.86445"N	QC - BRC 28/29 T2S R1W
564	398075.469	508379.990	4516.698	40°37'26.54681"N	111°58'36.75360"N	4460.187	7396404.236	1508039.245	0°18'19.71570"N	QC - COPPER PLUG SEC20/29 T2S R1W
565	398111.404	508380.300	4517.217	40°37'26.90184"N	111°58'36.75216"N	4460.706	7396440.164	1508039.555	0°18'19.71472"N	RM
566	403368.617	508401.292	4551.251	40°38'18.83861"N	111°58'36.84360"N	4494.814	7401696.189	1508060.543	0°18'19.77318"N	QC - COPPER PLUG SEC17/20 T2S R1W
567	408652.309	506873.386	4553.524	40°39'10.95455"N	111°58'57.02736"N	4497.071	7406978.688	1506532.982	0°18'32.70252"N	MON - MERIDIAN
568	363652.510	508235.536	4594.929	40°31'46.46957"N	111°58'36.24780"N	4538.093	7361989.054	1507894.824	0°18'19.39161"N	QC - BRC CENTER SECTION 29 T3S R1W
569	363665.297	505593.438	4643.002	40°31'46.45538"N	111°59'10.45716"N	4586.068	7362001.838	1505253.323	0°18'41.30546"N	QC - BRC 30/29 T3S R1W
570	374295.470	505624.458	4714.342	40°33'31.47545"N	111°59'10.80384"N	4657.460	7372629.609	1505284.336	0°18'41.52757"N	QC - BRC 17/18 T3S R1W
571	374267.116	508273.224	4658.373	40°33'31.33624"N	111°58'36.49260"N	4601.599	7372601.262	1507932.504	0°18'19.54833"N	QC - BRC CENTER SECTION 17 T3S R1W
572	379543.517	510943.823	4574.784	40°34'23.60208"N	111°58'02.25732"N	4518.176	7377876.471	1510602.500	0°17'57.61792"N	QC - BRC 8/9 T3S R1W
573	379569.376	508290.277	4620.691	40°34'23.71919"N	111°58'36.63768"N	4563.955	7377902.324	1507949.553	0°18'19.64139"N	QC - COPPER PLUG CENTER SECTION 8 T3S R1W
574	379595.766	505643.084	4675.126	40°34'23.83907"N	111°59'10.93596"N	4618.278	7377928.708	1505302.958	0°18'41.61217"N	QC - BRC 7/8 T3S R1W
575	408691.202	500460.514	4644.092	40°39'10.98882"N	112°00'20.21112"N	4587.351	7407017.571	1500121.558	0°19'25.98835"N	SC - BRC T2S R1/2W SEC12/7/13/18
576	392765.934	508331.650	4530.745	40°36'34.09142"N	111°58'37.01352"N	4474.159	7391095.901	1507990.916	0°18'19.88204"N	QC - COPPER PLUG T2S R1W SEC29
577	390167.236	505696.216	4589.184	40°36'08.27860"N	111°59'10.99248"N	4532.440	7388497.790	1505356.078	0°18'41.64831"N	QC - BRC 31/32 T2S R1W
578	390146.104	510973.849	4488.329	40°36'08.34782"N	111°58'02.58600"N	4431.842	7388476.663	1510632.518	0°17'57.82854"N	QC - BRC 32/33 T2S R1W
579	408644.531	511067.599	4469.121	40°39'11.09772"N	111°58'02.62380"N	4412.884	7406970.911	1510726.248	0°17'57.85275"N	SC - BRC 8/9/17/18 T2S R1W
580	408721.722	508382.292	4531.273	40°39'11.72023"N	111°58'37.46028"N	4474.896	7407048.085	1508041.547	0°18'20.16820"N	RM - FLINT
581	413949.099	505767.990	4454.068	40°40'03.22136"N	111°59'11.73912"N	4397.610	7412274.281	1505427.836	0°18'42.12660"N	SC - BRC NW8 T2SR1W 2003
582	413938.605	508426.535	4423.088	40°40'03.25916"N	111°58'37.24716"N	4366.755	7412263.789	1508085.780	0°18'20.03177"N	QC - BRC 5/8 T2SR1W
583	392776.990	505722.539	4576.459	40°36'34.06183"N	111°59'10.83516"N	4519.750	7391106.955	1505382.395	0°18'41.54758"N	SC - BRC SW29 T2SR1W
584	392757.048	510970.702	4490.197	40°36'34.14128"N	111°58'02.80344"N	4433.745	7391087.017	1510629.372	0°17'57.96796"N	SC - BRC SE29 T2SR1W
587	371642.895	505615.006	4645.335	40°33'05.26954"N	111°59'10.73976"N	4588.408	7369977.634	1505274.886	0°18'41.48633"N	MON
588	368969.938	508252.896	4636.127	40°32'39.00300"N	111°58'36.39000"N	4579.323	7367305.280	1507912.180	0°18'19.48271"N	QC - CENTER SECTION 20 T3SR1W
591	408700.568	508873.567	4526.139	40°39'11.53710"N	111°58'31.08648"N	4469.787	7407026.935	1508532.711	0°18'16.08529"N	PLUG - PROP COR
592	398069.624	509190.711	4496.592	40°37'26.53165"N	111°58'26.24196"N	4440.123	7396398.393	1508849.783	0°18'12.98209"N	MON - CL 3480W/7000S BRC
593	390021.131	508463.286	4533.596	40°36'06.98234"N	111°58'35.11740"N	4476.935	7388351.718	1508122.523	0°18'18.66758"N	MON - CL
594	395465.888	508386.547	4519.599	40°37'00.76717"N	111°58'36.48828"N	4463.015	7393795.245	1508045.801	0°18'19.54571"N	MON - SC
595	369338.648	505987.991	4667.594	40°32'42.52531"N	111°59'05.74692"N	4610.736	7367673.907	1505647.787	0°18'38.28819"N	MON - CL
596	369855.039	506086.394	4666.361	40°32'47.63213"N	111°59'04.50888"N	4609.506	7368190.181	1505746.167	0°18'37.49507"N	MON - CL
597	370856.400	506610.040	4671.998	40°32'57.55283"N	111°58'57.79740"N	4615.149	7369191.317	1506269.695	0°18'33.19576"N	MON - CL
598	371501.959	507158.806	4676.639	40°33'03.95964"N	111°58'50.73492"N	4619.794	7369836.729	1506818.337	0°18'28.67182"N	MON - CL
599	380391.197	507978.536	4614.477	40°34'31.82167"N	111°58'40.73340"N	4557.700	7378723.960	1507637.883	0°18'22.26504"N	MON - CL
600	381035.319	508009.469	4609.289	40°34'38.18665"N	111°58'40.37736"N	4552.518	7379367.936	1507668.808	0°18'22.03687"N	MON - CL
601	382077.594	508012.859	4603.294	40°34'48.48362"N	111°58'40.40544"N	4546.534	7380409.976	1507672.198	0°18'22.05495"N	MON - CL
602	382371.616	508006.487	4605.139	40°34'51.38800"N	111°58'40.50840"N	4548.382	7380703.931	1507665.827	0°18'22.12088"N	MON - CL
603	382966.778	508007.223	4609.565	40°34'57.26770"N	111°58'40.54008"N	4552.814	7381298.959	1507666.563	0°18'22.14117"N	MON - CL
604	384081.092	508008.275	4612.173	40°35'08.27621"N	111°58'40.60380"N	4555.434	7382413.021	1507667.615	0°18'22.18186"N	MON - CL
605	385886.935	508036.707	4580.363	40°35'26.11781"N	111°58'40.36008"N	4523.645	7384218.456	1507696.040	0°18'22.02594"N	MON - CL
606	386531.620	508039.337	4568.851	40°35'32.48686"N	111°58'40.37088"N	4512.142	7384862.995	1507698.669	0°18'22.03271"N	MON - CL
607	409428.947	506811.680	4533.785	40°39'18.62356"N	111°58'57.88200"N	4477.375	7407755.150	1506471.290	0°18'33.25006"N	MON - CL
608	409869.130	506778.939	4519.535	40°39'22.97030"N	111°58'58.33776"N	4463.129	7408195.233	1506438.556	0°18'33.54186"N	MON - CL
609	396034.074	508730.302	4511.539	40°37'06.39836"N	111°58'32.07108"N	4454.967	7394363.303	1508389.478	0°18'16.71607"N	MON - CL
610	395435.994	505728.820	4581.453	40°37'00.33049"N	111°59'10.94136"N	4524.846	7393765.358	1505388.674	0°18'41.61549"N	QC - W1/4 S29

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: LMO
APPROVED: MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566

SURVEY CONTROL

SALT LAKE
COUNTY

SHEET NO. SC-09

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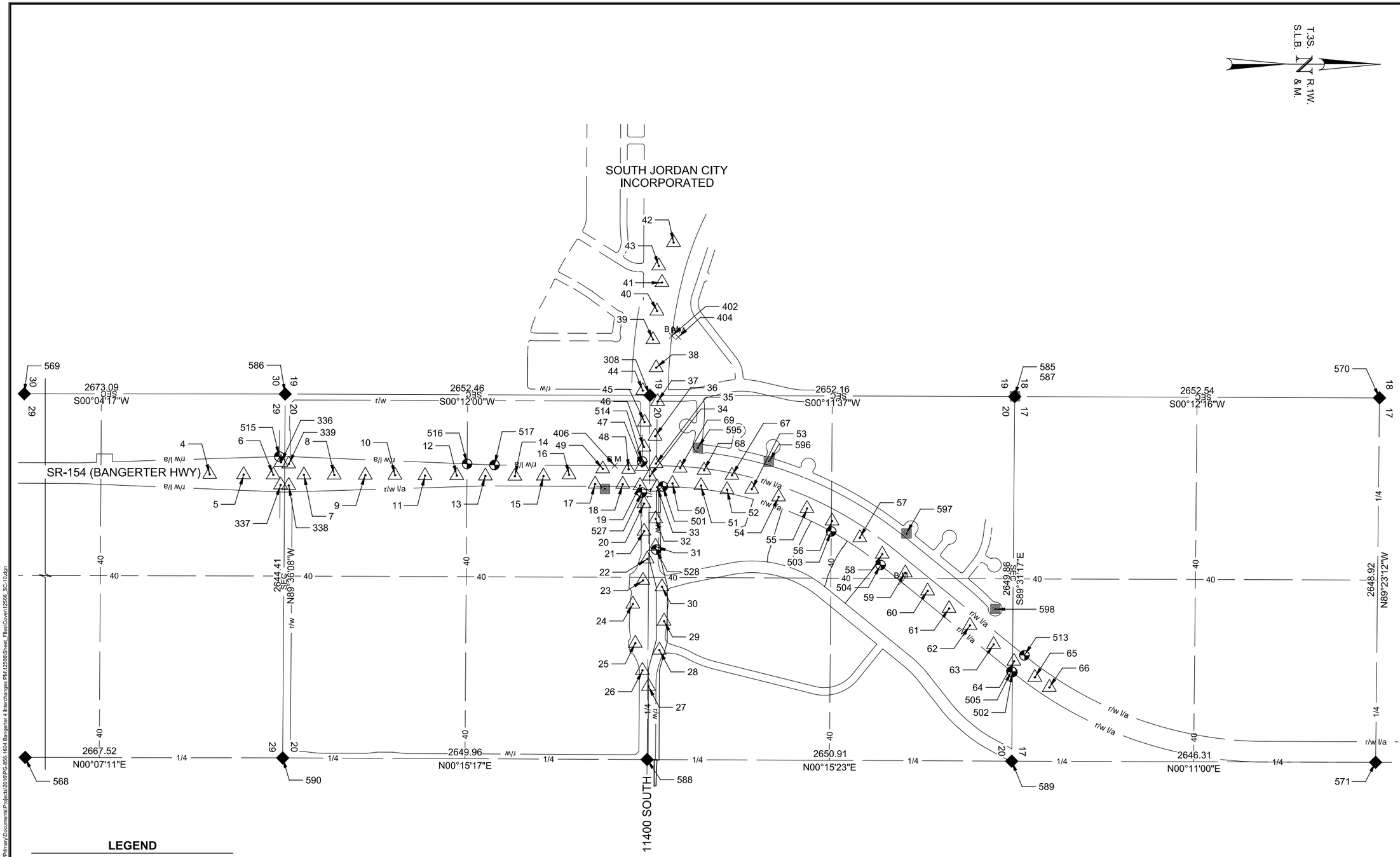

LEGEND

- FOUND SECTION MONUMENT
- SECTION MONUMENT NOT FOUND
- MONUMENT
- CONTROL POINT
- RIGHT OF WAY MARKER
- B.M — BENCH MARK
- NAIL OR RWC (REBAR WITH CAP)

NOT TO SCALE

REVISIONS				
NO.	DATE	APPROVED BY		REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL LAND SURVEYOR

DRAWN BY: KKH
QC CHECKED BY: LMO
MM/DD/YY
DATE

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566

SURVEY CONTROL

SALT LAKE COUNTY

SHEET NO. SC-10

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WEST JORDAN CITY
INCORPORATED

SR-154 (BANGERTER HWY)

9000 SOUTH

T. 3S. R.1W.

T. 2S. R.1W.

2661.34 SEC N00°12'09"E

2650.78 SEC N00°11'38"E

2652.09 SEC N00°11'17"E

2607.47 SEC S00°34'20"W

2647.33 S89°25'44"E

2646.55 S89°17'04"E

2644.47 N89°13'30"W

2642.89 S89°26'23"E

2654.67 N00°11'05"E

2555.00 N00°08'43"E

2653.68 S89°26'30"E

2656.82 S89°16'47"E

2661.13 S89°13'38"E

2664.05 S89°22'43"E

2647.14 S00°15'05"W

2645.59 N00°14'28"E

2666.79 N00°12'55"E

2643.16 N00°03'34"W

NOT TO SCALE

LEGEND

- FOUND SECTION MONUMENT
- SECTION MONUMENT NOT FOUND
- MONUMENT
- CONTROL POINT
- RIGHT OF WAY MARKER
- BENCH MARK
- NAIL OR RWC (REBAR WITH CAP)

REVISIONS				
NO.	DATE	APPROVED BY	REMARKS	

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: LMO
DATE: MM/DD/YY

APPROVED

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566

SURVEY CONTROL

SALT LAKE COUNTY

SHEET NO. SC-11

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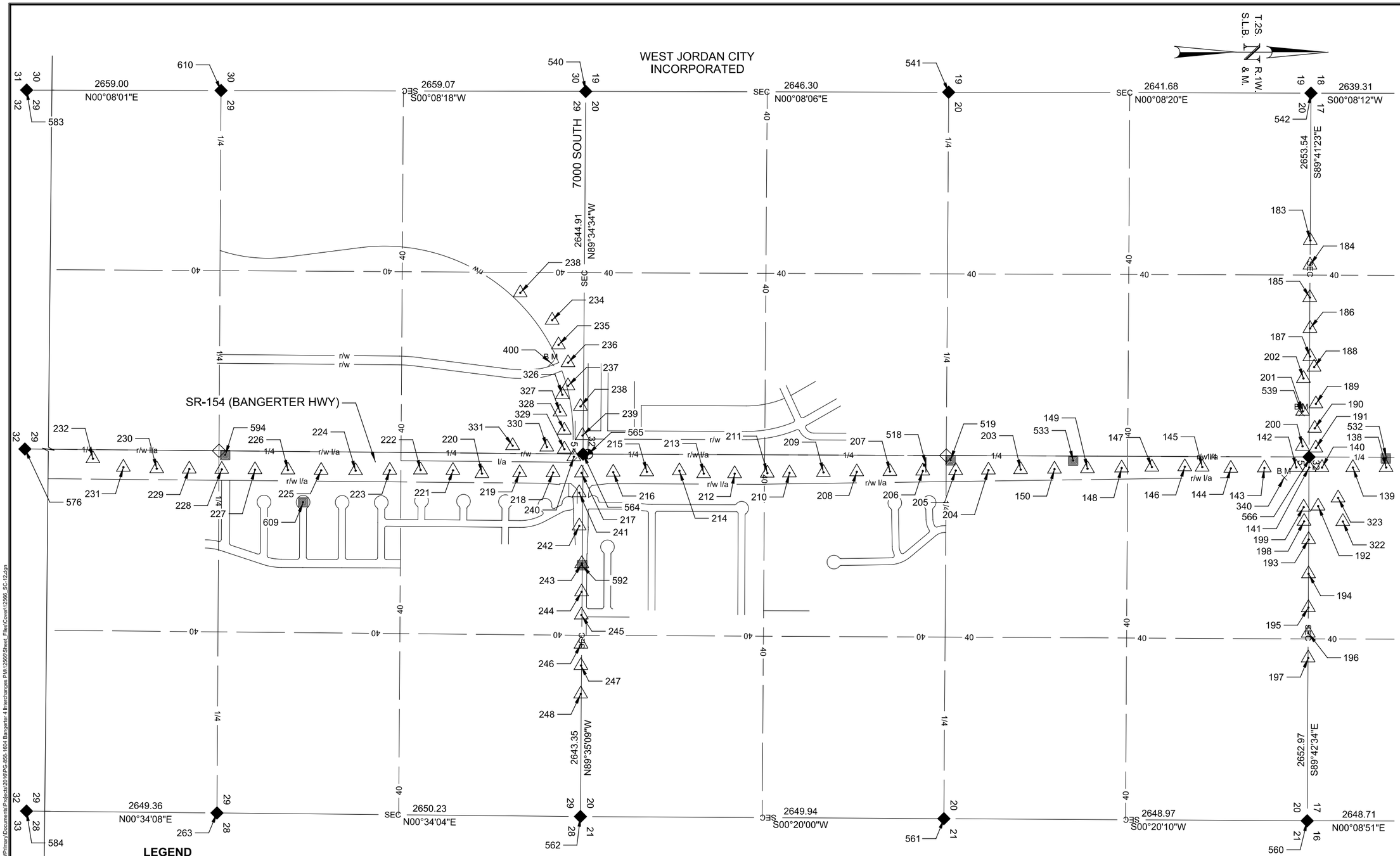

LEGEND

- FOUND SECTION MONUMENT
- SECTION MONUMENT NOT FOUND
- MONUMENT
- CONTROL POINT
- RIGHT OF WAY MARKER
- B.M. BENCH MARK
- NAIL OR RWC (REBAR WITH CAP)

REVISIONS	NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL LAND SURVEYOR

DRAWN BY	CHECKED BY	DATE
KKH	LMO	MM/DD/YY

PROJECT	PIN	PROJECT NUMBER
4 INTERCHANGES ON BANGERTER HIGHWAY	12566	S-0154(12)11

SURVEY CONTROL

SALT LAKE COUNTY

SHEET NO. SC-12

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T.2S.
S.L.B. & M.
R.1W.

R.1W.
R.2W.

5400 SOUTH

TAYLORSVILLE
INCORPORATED

SR-154 (BANGERTER HWY)

SEC 2642.62 N00°04'15"E

SEC 2644.34 N00°04'19"E

SEC 2658.57 S89°46'26"E

SEC 2652.59 S89°48'20"E

SEC 5300.97 N89°41'10"W

r/w l/a

NOT TO SCALE

LEGEND

- FOUND SECTION MONUMENT
- SECTION MONUMENT NOT FOUND
- MONUMENT
- CONTROL POINT
- RIGHT OF WAY MARKER
- BENCH MARK
- NAIL OR RWC (REBAR WITH CAP)

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: LMO
DATE: MM/DD/YY

APPROVED

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566

SURVEY CONTROL

SALT LAKE COUNTY

SHEET NO. SC-13

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T.3S.
S.L.B. & M.
R.1W.

1000+00.00
BEGIN PROJECT
S-0154(12)11

MP 7.71
N 366034.334
E 506177.889

POB 1000+00.00

1000+00.00
LT 118.95

1002+99.89
LT 130.00

CONSTRUCTION LIMIT

ROW CONTROL LINE

N00°17'45"E

SEE 114 RW-02

1000+00.00
RT 118.95

1002+99.89
RT 130.00

CONSTRUCTION LIMIT

11800 SOUTH ST.

1000+00 1002+00 1004+00 1006+00

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
MM/DD/YY
DATE

APPROVED
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 114RW-01

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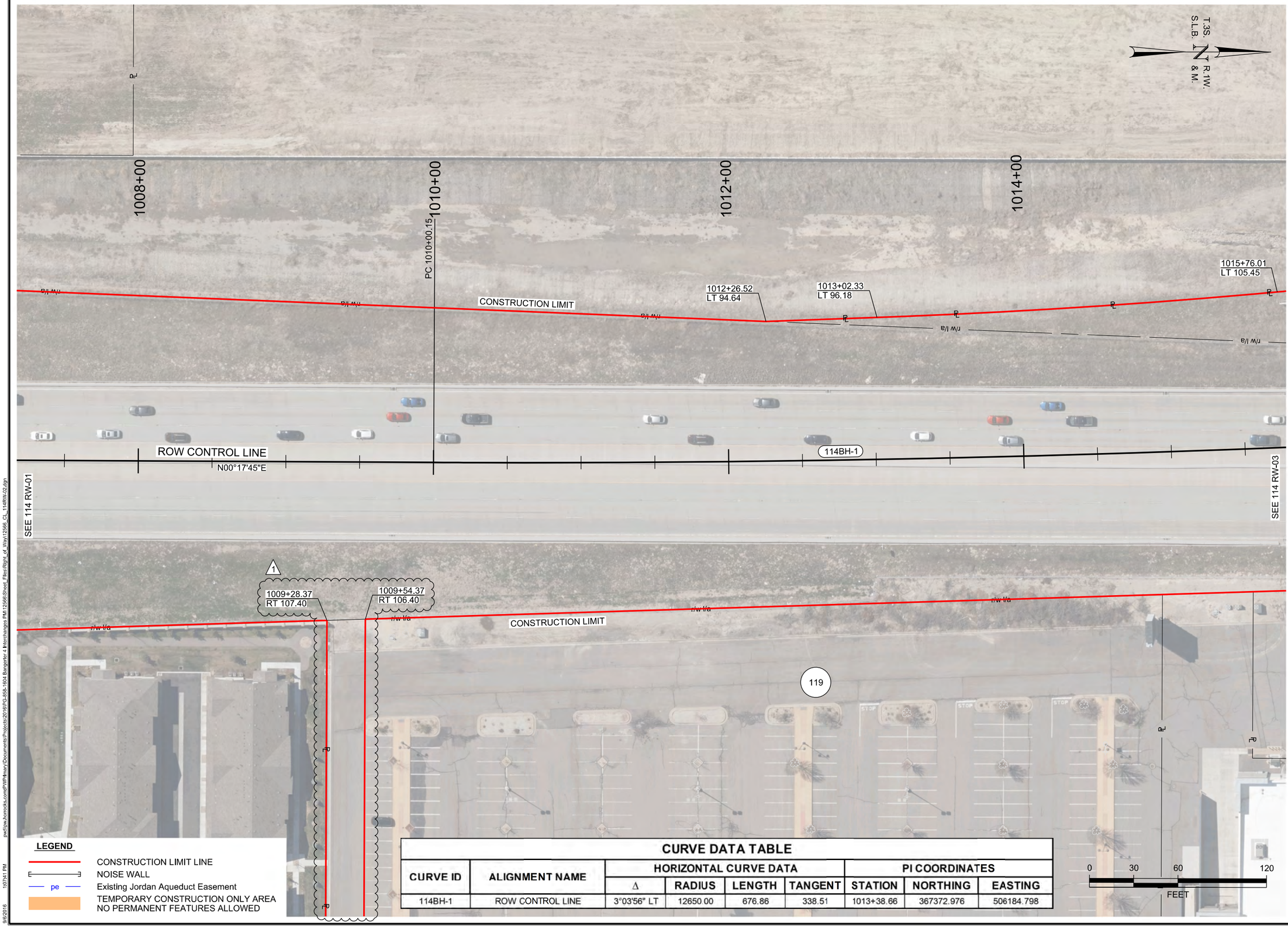

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
114BH-1	ROW CONTROL LINE	3°03'56" LT	12650.00	676.86	338.51	1013+38.66	367372.976	506184.798

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	WIDENED FOR TCE.

DRAWN BY KKH
QC CHECKED BY CSB

APPROVED

MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT NUMBER: S-0154(12)11 PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 114RW-02

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1016+00
1018+00
1020+00
1022+00
T.3S., R.1W., S.L.B. & M.
1015+76.01
LT 105.45
PRC 1016+77.01
1017+40.75
LT 109.66
CONSTRUCTION LIMIT
1019+94.26
LT 115.99
1022+44.07
LT 111.32
1023+53.25
LT 110.84
40
r/w l/a
114BH-1
ROW CONTROL LINE
114BH-2
SEE 114 RW-02
SEE 114 RW-04
1017+57.22
RT 99.55
CONSTRUCTION LIMIT
PT 1023+42.99
0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
114BH-1	ROW CONTROL LINE	3°03'56" LT	12650.00	676.86	338.51	1013+38.66	367372.976	506184.798
114BH-2	ROW CONTROL LINE	3°00'59" RT	12650.00	665.98	333.07	1020+10.07	368043.767	506152.343

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB

APPROVED
MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

SALT LAKE COUNTY

CONTRACT RIGHT-OF-WAY

SHEET NO. 114RW-03

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CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
114BH-2	ROW CONTROL LINE	3°00'59" RT	12650.00	665.98	333.07	1020+10.07	368043.767	506152.343
114BH-3	ROW CONTROL LINE	38°50'25" RT	2460.00	1667.62	867.28	1039+16.68	369950.507	506160.545

SEE 114 RW-09

T.3S. R.1W. S.L.B. & M.

ROW CONTROL LINE

N00°14'47"E

114BH-2

114BH-3

SEE 114 RW-03

SEE 114 RW-05

SEE 114 RW-10

1024+00

1026+00

1028+00

1030+00

11400 SOUTH

1/4

125B

126B

127B

138B

121B

138

135

136

128

123B

123D

142B

1024+32.00
RT 113.00

1024+32.00
RT 118.00

1024+61.81
RT 118.00

1025+17.98
LT 112.16

1024+96.09
LT 110.71

1025+82.87
LT 121.44

1023+53.25
LT 110.84

1024+71.98
LT 110.73

1025+99.70
RT 128.49

1026+91.29
RT 132.31

1026+75.93
LT 127.56

1027+20.18
LT 127.53

1027+52.82
LT 127.49

1027+82.84
RT 138.00

1028+67.20
RT 138.00

1028+91.57
RT 158.12

1028+81.72
LT 172.26

1028+75.85
LT 150.20

1028+36.73
LT 131.99

1030+70.68
LT 188.63

1030+51.62 LT 179.09
ANGLE POINT

1030+72.85 LT 154.71
ANGLE POINT

1031+39.60 LT 156.65
ANGLE POINT

1030+49.40
PC

1030+79.35
RT 135.98

1030+31.55
RT 163.54

PT 1023+42.99

CONSTRUCTION LIMIT

12' NOISE WALL

r/w l/a

PL

1

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS				
NO.	DATE	APPROVED BY	REMARKS	
1	08/16	CSB	UPDATED NOISE WALL ANGLE POINT.	

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
DATE: MM/DD/YY

APPROVED

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 114RW-04

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9/6/2016

TIPPECANOE WAY (3940 WEST)

1032+00 | 1034+00 | 1036+00 | 1038+00

1032+52.99 LT 196.91
1032+57.32 LT 182.05
1033+48.41 LT 153.30 BEGIN 12' NOISE WALL
1035+34.19 LT 155.30 ANGLE POINT
1035+34.09 LT 184.68
1036+51.18 LT 157.07 END 12' NOISE WALL
1036+50.74 LT 186.45
1036+50.93 LT 173.57
1037+76.48 LT 175.90
1037+66.27 LT 175.70
1037+08.61 LT 174.59
1038+81.49 LT 178.20
1038+23.89 LT 176.90

CONSTRUCTION LIMIT
12' NOISE WALL

12' NOISE WALL
1031+39.60 LT 156.65 ANGLE POINT
1033+73.86 LT 146.22 END 12' NOISE WALL
1036+09.01 LT 146.55 BEGIN 12' NOISE WALL
12' NOISE WALL
1038+74.32 LT 126.76 ANGLE POINT

136 | 137 | 154 | 157 | 158 | 159 | 160 | 161

r/w l/a

ROW CONTROL LINE
114BH-3

SEE 114 RW-04
SEE 114 RW-06

r/w l/a
CONSTRUCTION LIMIT
1032+44.46 RT 129.82
1033+50.15 RT 126.00
1037+14.94 RT 127.50
1030+79.35 RT 135.98
PC 1030+49.40

142 | 155

T.3S. R.1W. S.L.B. & M.

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
114BH-3	ROW CONTROL LINE	38°50'25" RT	2460.00	1667.62	867.28	1039+16.68	369950.507	506160.545

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATED NOISE WALL ANGLE POINTS.

DRAWN BY: KKH
QC CHECKED BY: CSB
APPROVED: MM/DD/YY
PROFESSIONAL LAND SURVEYOR DATE

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT NUMBER: S-0154(12)11 | PIN: 12566

CONTRACT RIGHT-OF-WAY

PROJECT

SALT LAKE COUNTY

SHEET NO. 114RW-05

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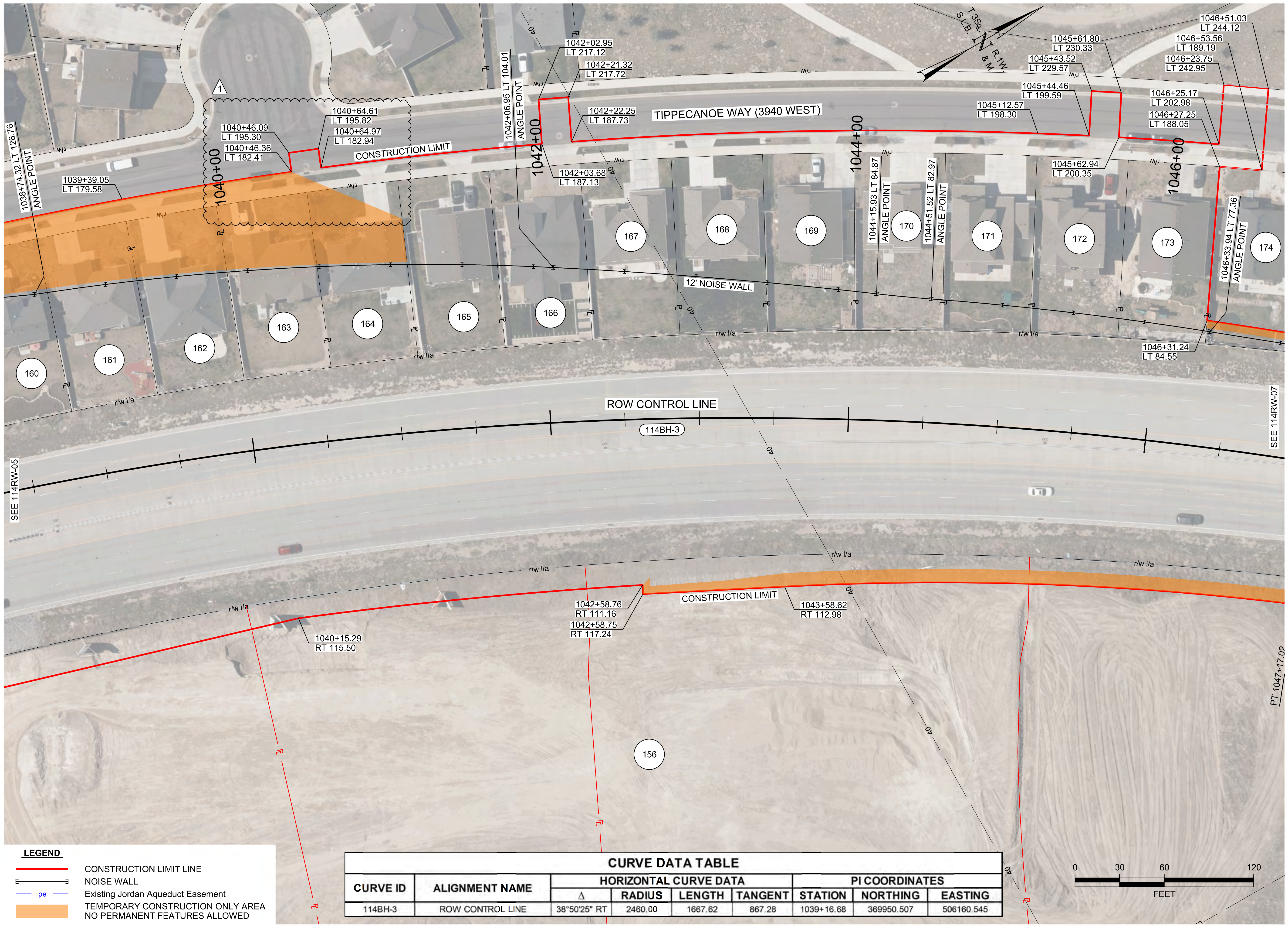

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA: Δ	RADIUS	LENGTH	TANGENT	PI COORDINATES: STATION	NORTHING	EASTING
114BH-3	ROW CONTROL LINE	38°50'25" RT	2460.00	1667.62	867.28	1039+16.68	369950.507	506160.545

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATED CONSTRUCTION LIMITS AND SHADING.

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
DATE: MM/DD/YY

APPROVED

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PIN: 12566

PROJECT NUMBER: S-0154(12)11

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

TEMP 14P

SHEET NO. 114RW-06

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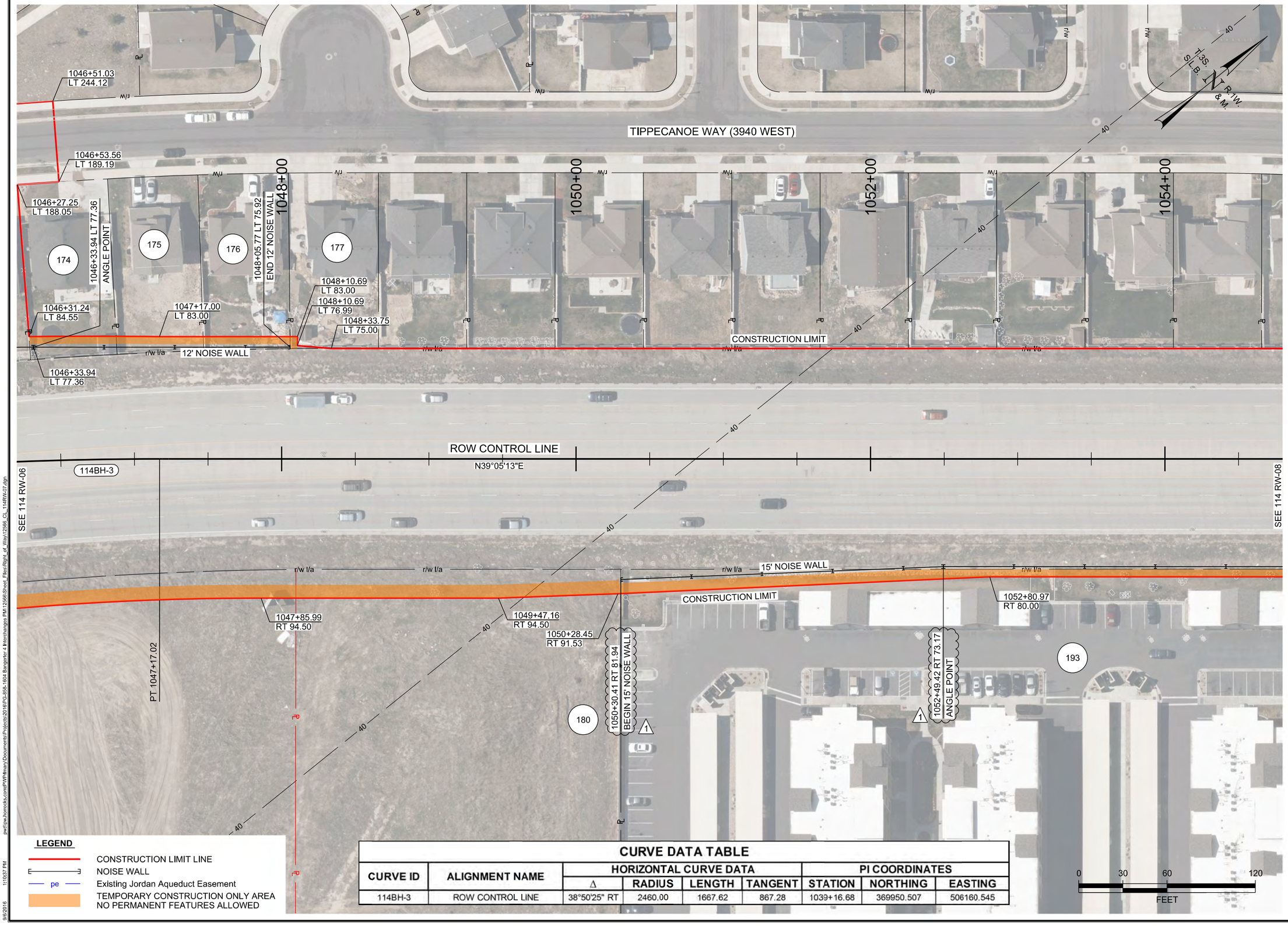

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
114BH-3	ROW CONTROL LINE	38°50'25" RT	2460.00	1667.62	867.28	1039+16.68	369950.507	506160.545

REVISIONS				
NO.	DATE	APPROVED BY	REMARKS	
1	08/16	CSB	UPDATED NOISE WALL ANGLE POINTS.	

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
APPROVED: MM/DD/YY (DATE)
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 114RW-07

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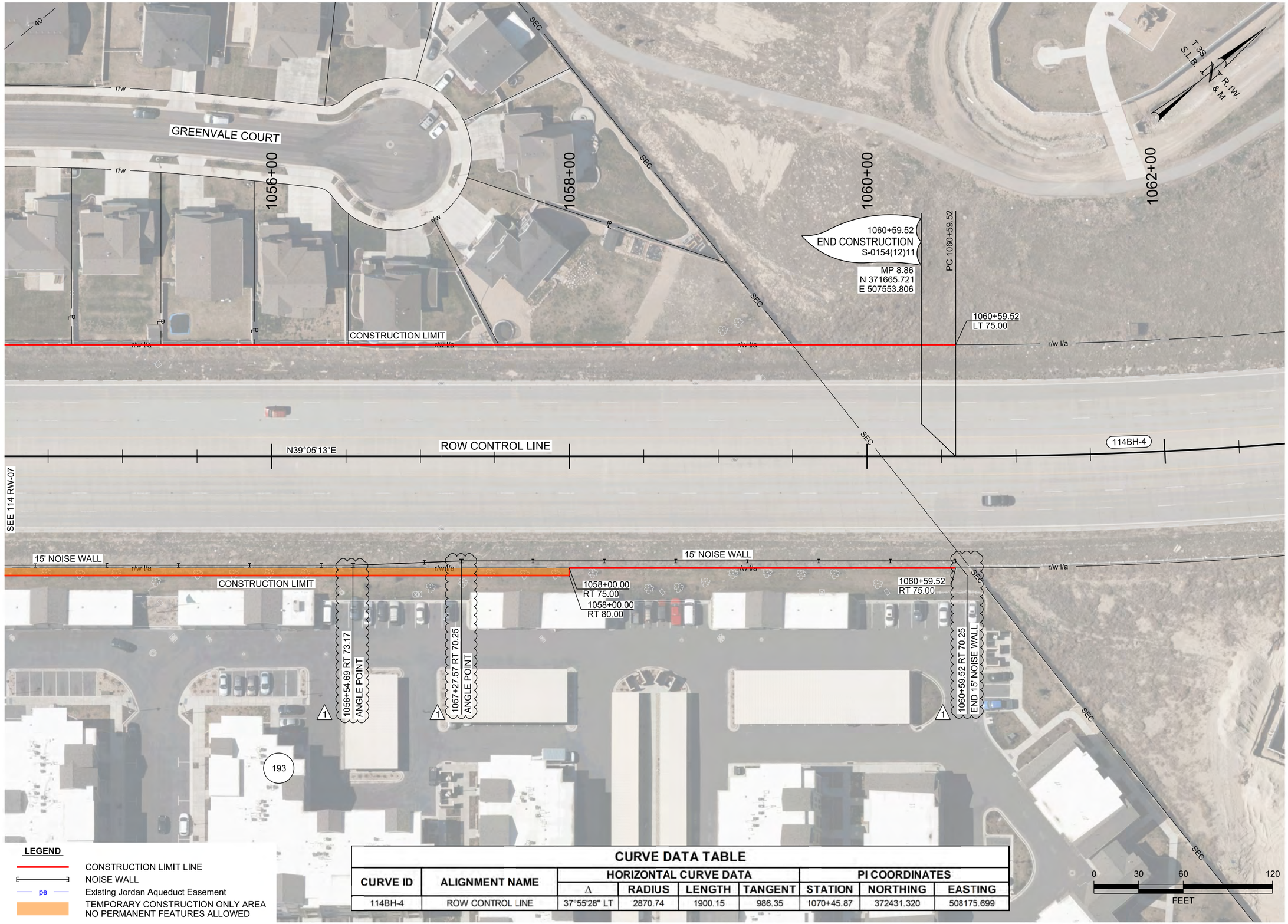

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
114BH-4	ROW CONTROL LINE	37°55'28" LT	2870.74	1900.15	986.35	1070+45.87	372431.320	508175.699

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATED NOISE WALL ANGLE/END POINTS.

DRAWN BY KKH
QC CHECKED BY CSB
MM/DD/YY DATE

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 114RW-08

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500+00.00
BEGIN CONSTRUCTION
S-0154(12)11

N 368990.811
E 505606.285

POB 500+00.00

500+00

500+41.72
LT 119.00

500+70.69 LT 98.50
1030+52.29 LT 479.09
BEGIN 12' NOISE WALL

503+61.17
LT 119.00

CONSTRUCTION LIMIT

502+00

12' NOISE WALL

11400 SOUTH ROW CONTROL LINE
S89°32'53"E

SEE 114 RW-10

T.3S.
S.L.B.
R.1W.
& M.

137
136
135
128
138B
138D

500+42.61
RT 90.78

500+64.93
RT 71.54

500+42.64
RT 98.60

r/w
SEC
R

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB
MM/DD/YY
DATE

APPROVED

PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER PIN 12566
S-0154(12)11

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 114RW-09

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SEE 114 RW-05

137

136

CONSTRUCTION LIMIT

NOISE WALL

503+61.17
LT 119.00

504+00

506+00

508+00

510+00

r/w l/a

506+85.84
LT 125.55

142

144

507+13.38
LT 79.50

509+40.00
LT 104.00

509+40.00
LT 79.50

509+77.00
LT 104.00

CONSTRUCTION LIMIT

509+84.00
LT 78.72

r/w

T.3S. R.1W.
S.L.B. & M.

11400 SOUTH ROW CONTROL LINE
S89°32'53"E

SEE 114 RW-09

SEE 114 RW-11

503+78.12
RT 71.53

CONSTRUCTION LIMIT

504+00.20
RT 77.32

504+18.55
RT 116.38

138B

138

504+23.35
RT 200.30

SR-154 (BANGERTER HWY)

507+08.49
RT 60.50

506+88.44
RT 84.93

506+88.74
RT 169.30

140

141

143

145

508+86.89
RT 60.50

509+12.26
RT 57.33

510+64.83
RT 67.50

0 30 60 120
FEET

SEE 114 RW-04

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

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REVISIONS				
NO.	DATE	APPROVED BY		REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED
PROFESSIONAL LAND SURVEYOR

DRAWN BY KKH
QC CHECKED BY CSB
MM/DD/YY
DATE

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 114RW-10

SEE 114 RW-14

512+33.60
LT 288.03

512+65.54
LT 292.60

512+52.91
LT 288.18

512+34.07
LT 228.82

512+65.49
LT 229.07

512+80.46
LT 216.18

512+87.75
LT 93.85

512+27.72
LT 72.34

512+68.97
LT 83.22

CONSTRUCTION LIMIT

RIVER HEIGHTS DRIVE

144

150

151

153

512+00

514+00

516+00

518+00

513+62.80
LT 288.09

513+98.01
LT 161.11

514+36.03
LT 136.60

515+06.70
LT 145.07

515+85.20
LT 136.55

515+97.18
LT 136.54

516+04.92
LT 136.45

517+45.65
LT 124.22

517+90.89
LT 137.95

518+29.24
LT 285.65

518+25.79
LT 278.58

518+20.33
LT 266.75

518+05.37
LT 272.78

517+92.31
LT 252.49

518+02.79
LT 232.96

SEE 114 RW-15

SUMMER HEIGHTS DRIVE

519+00.41
LT 244.50

519+02.97
LT 233.41

518+96.41
LT 236.06

519+05.44
LT 208.93

518+88.70
LT 198.20

518+82.71
LT 149.49

518+82.53
LT 114.58

519+08.45
LT 96.53

519+63.34
LT 78.86

CONSTRUCTION LIMIT

T.3S. R.1W. S.L.B. & M.

11400 SOUTH ROW CONTROL LINE
S89°32'53"E

SEE 114 RW-10

511+95.70
RT 67.50

512+44.93
RT 83.23

512+98.71
RT 129.04

512+98.42
RT 188.28

512+85.52
RT 253.89

513+89.15
RT 241.86

145

147

152

514+40.05
RT 123.70

514+02.37
RT 141.51

513+89.65
RT 140.78

515+54.74
RT 133.94

516+80.44
RT 137.79

517+47.72
RT 128.94

517+87.74
RT 144.98

518+01.32
RT 142.46

518+03.63
RT 202.19

518+22.22
RT 258.10

518+68.21
RT 271.09

518+30.26
RT 282.29

519+69.00
RT 67.50

518+94.93
RT 97.88

518+83.43
RT 107.09

518+83.06
RT 182.41

518+93.76
RT 255.09

519+08.18
RT 274.44

SEE 114 RW-13

SEE 114 RW-15

SEE 114 RW-12

CONSTRUCTION LIMIT

40

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

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REVISIONS					
NO.	DATE	APPROVED BY	REMARKS		

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
DATE: MM/DD/YY

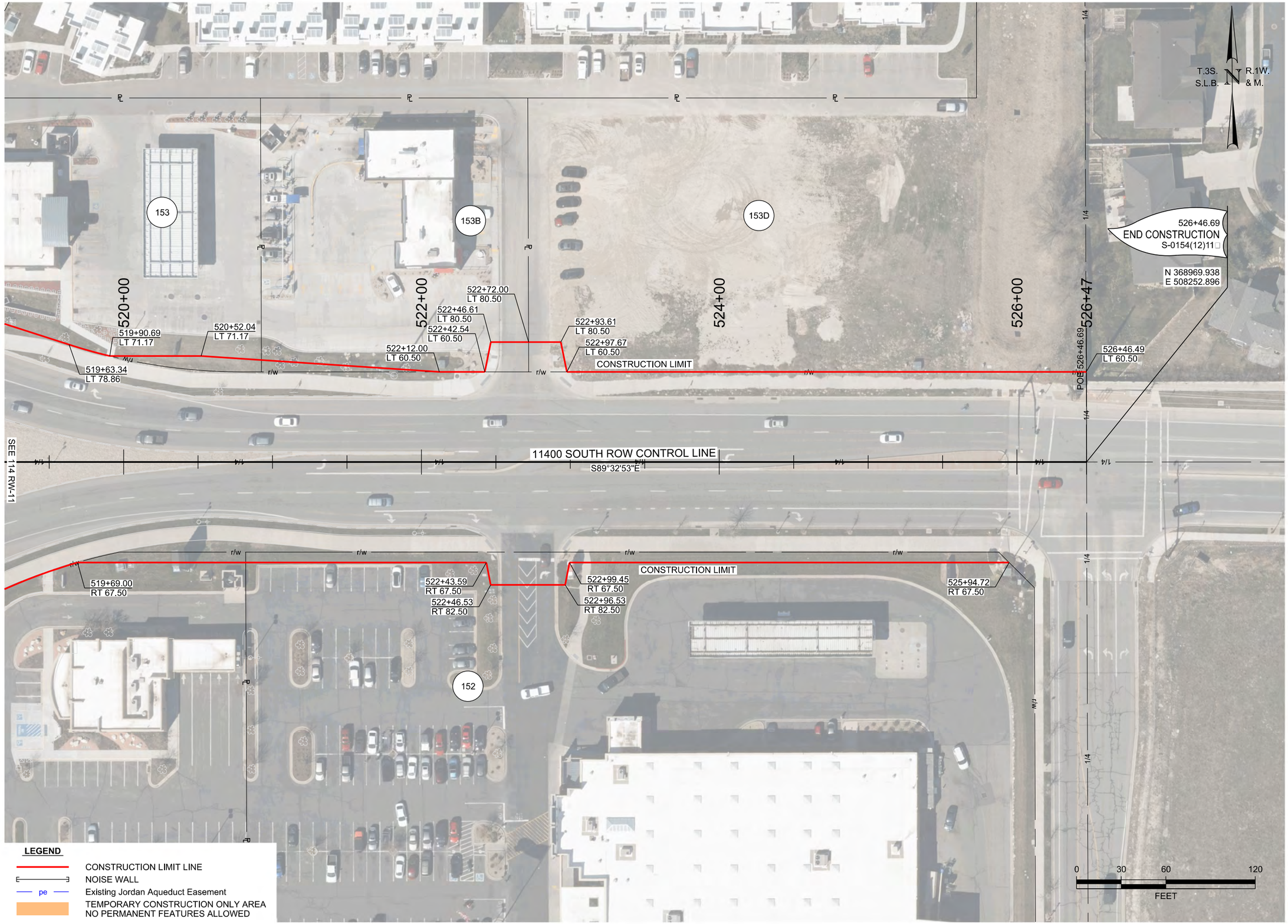
APPROVED
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 114RW-11



LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS				
NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
APPROVED: MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 114RW-12

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SEE 114 RW-10

143

510+64.83
RT 67.50

CONSTRUCTION LIMIT

511+95.70
RT 67.50

145

512+44.93
RT 83.23

512+68.31
RT 291.89

512+85.52
RT 253.89

512+98.42
RT 188.28

512+98.71
RT 129.04

513+36.60
RT 321.59

513+89.15
RT 241.86

513+89.65
RT 140.78

514+02.37
RT 141.51

514+40.05
RT 123.70

147

515+54.74
RT 133.94

CONSTRUCTION LIMIT

11400 SOUTH ROW CONTROL LINE

S89°32'53"E

SEE 114 RW-14

SEE 114 RW-10

T.3S. R.1W.
S.L.B. & M.

N

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB
DATE MM/DD/YY

APPROVED

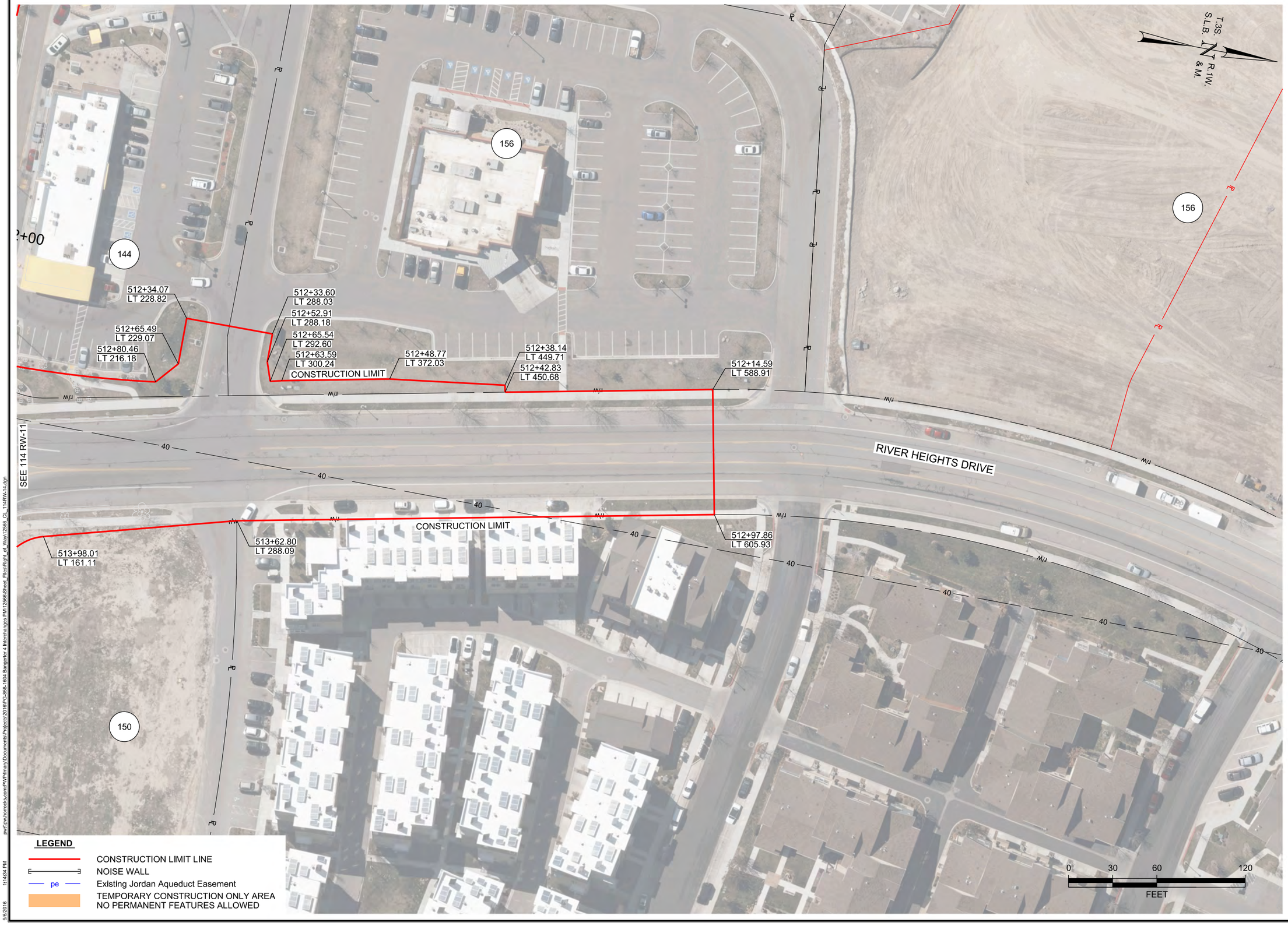
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PROJECT NUMBER: S-0154(12)11 PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 114RW-13



REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB

APPROVED

MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT NUMBER: S-0154(12)11 PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 114RW-14

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SEE 114 RW-11

11400 SOUTH ROW CONTROL LINE

S89°32'53"E

CONSTRUCTION LIMIT

516+00

515+85.20
LT 136.55

515+97.18
LT 136.54

516+04.92
LT 136.45

516+80.44
RT 137.79

147

517+47.72
RT 128.94

517+87.74
RT 144.98

518+03.63
RT 202.19

518+22.22
RT 258.10

518+30.26
RT 282.29

518+01.32
RT 142.46

518+68.21
RT 271.09

518+76.94
RT 345.44

518+83.06
RT 182.41

518+83.43
RT 107.09

518+93.76
RT 255.09

518+94.93
RT 97.88

519+07.80
RT 345.61

519+08.18
RT 274.44

CONSTRUCTION LIMIT

152

519+69.00
RT 67.50

150

151

CONSTRUCTION LIMIT

518+00

517+45.65
LT 124.22

517+90.89
LT 137.95

518+02.79
LT 232.96

517+92.31
LT 252.49

518+05.37
LT 272.78

518+20.33
LT 266.75

518+25.79
LT 278.58

518+29.24
LT 285.65

T.3S.
S.L.B. & M.
R.1W.

518+82.71
LT 149.49

518+82.53
LT 114.58

518+88.70
LT 198.20

519+05.44
LT 208.93

519+08.45
LT 96.53

153

519+00.41
LT 244.50

518+96.41
LT 236.06

519+02.97
LT 233.41

SUMMER HEIGHTS DRIVE

519+63.34
LT 78.86

520+00
519+90.69
LT 71.17

153B

520+52.04
LT 71.17

153D

SEE 114 RW-12

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
APPROVED
MM/DD/YY
DATE
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 114RW-15

T._. R._.
S.L.B. & M.

119

118

1

1009+54.81
RT 726.16

1009+47.87
RT 806.40

CONSTRUCTION LIMIT

CONSTRUCTION LIMIT

1009+28.81
RT 725.04

1009+21.87
RT 805.28

SEE 114 RW-02

SEE 114 RW-17

40

40

40

40

40

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	WIDENED FOR TCE.

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB
MM/DD/YY
DATE

APPROVED

PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT

PROJECT NUMBER S-0154(12)11

PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 114RW-16

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T._. R._.
S.L.B. & M.

1

CONSTRUCTION LIMIT

CONSTRUCTION LIMIT

SEE 114 RW-16

SEE 114 RW-18

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

0 30 60 120

FEET

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	WIDENED FOR TCE.

DRAWN BY KKH

QC CHECKED BY CSB

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

APPROVED MM/DD/YY

DATE

PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT

PROJECT NUMBER S-0154(12)11

PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 114RW-17

CONSTRUCTION LIMIT

1009+08.55
RT 2323.14

1009+22.80
RT 2308.54

1003+34.54
RT 2323.59

T. R. S.L.B. & M.

1

1009+22.66
RT 2108.51

1009+48.79
RT 2094.97

1008+82.77
RT 2095.01

1003+35.00
RT 2095.37

CONSTRUCTION LIMIT

1/4

r/w

1009+22.73
RT 2010.41

CONSTRUCTION LIMIT

CONSTRUCTION LIMIT

SEE 114 RW-17

SEC

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

0 30 60 120
FEET

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS
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UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB

APPROVED
MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

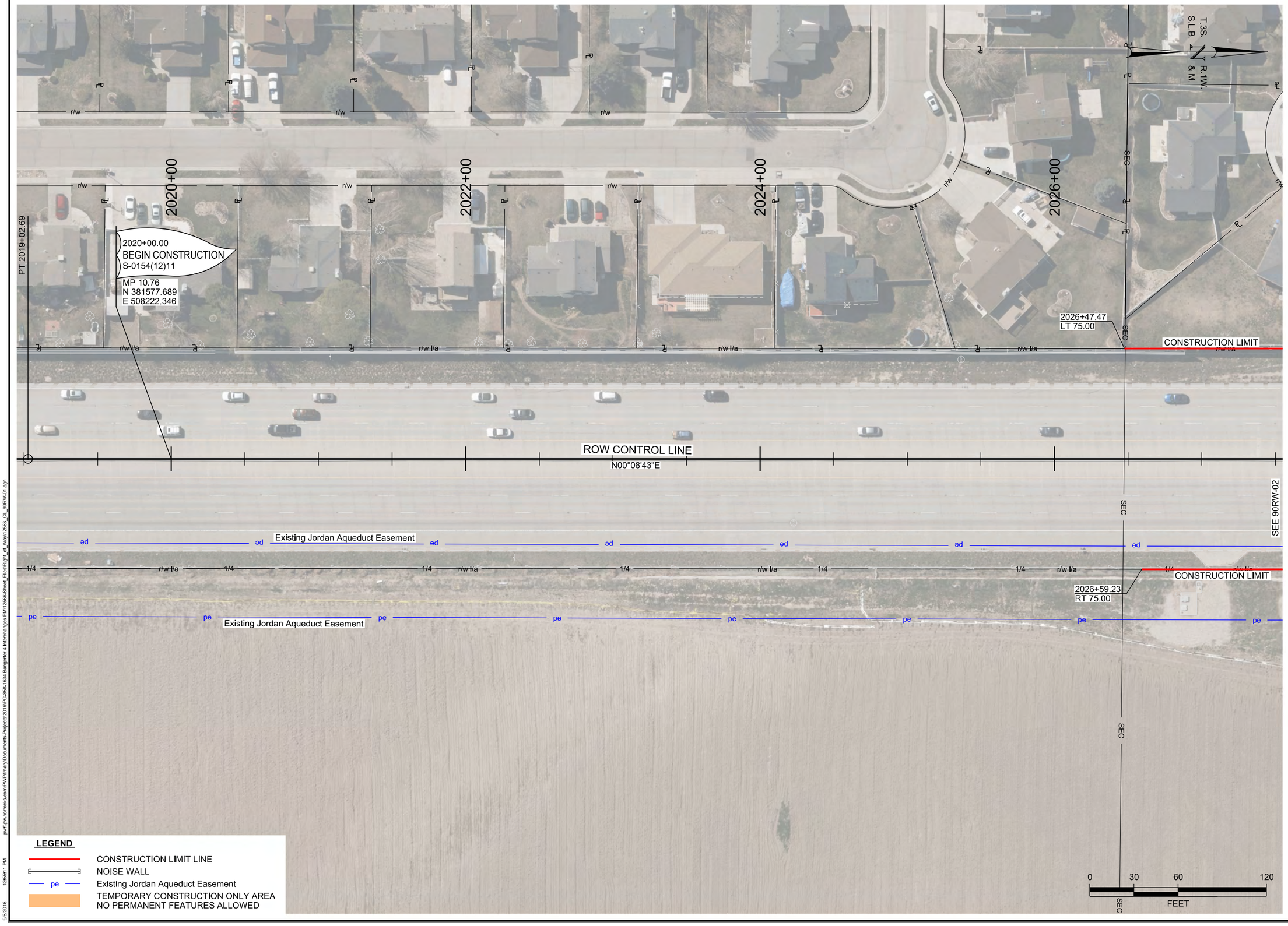
PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT NUMBER: PIN 12566 S-0154(12)11

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 114RW-18



LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

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REVISIONS			
NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL LAND SURVEYOR

MM/DD/YY
DATE

DRAWN BY KKH
QC CHECKED BY CSB

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 90RW-01

NEW HERITAGE DR

T.S3. S.L.B. & M. R.1W.

2028+00
2030+00
2032+00
2034+00

PC 2027+85.32

2028+22.88 LT 75.86
BEGIN 12' NOISE WALL

2029+00.06 LT 81.50
ANGLE POINT

2032+00.01 LT 81.50
ANGLE POINT

2033+40.08 LT 84.50
ANGLE POINT

2026+47.47
LT 75.00

2028+99.67
LT 91.00

2031+99.94
LT 91.00

2033+38.11
LT 93.97

2033+41.95
LT 180.35

2034+33.47
LT 222.99

2034+31.39
LT 176.15

2034+28.07
LT 176.32

2034+53.80
LT 222.10

2034+52.79
LT 200.08

CONSTRUCTION LIMIT

12' NOISE WALL

2028+06.51
LT 84.13

2028+04.95
LT 74.98

331 332 333 334 335 336 337 338 339

r/w r/w l/a

ROW CONTROL LINE

90BH-3

N00°08'43"E

SEE 90RW-01

SEE 90RW-03

Existing Jordan Aqueduct Easement

2026+59.23
RT 75.00

CONSTRUCTION LIMIT

Existing Jordan Aqueduct Easement

ad pe 1/4

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
90BH-3	ROW CONTROL LINE	4°32'33" LT	12650.00	1002.93	501.73	2032+87.05	382864.734	508225.607

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

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FEET

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL LAND SURVEYOR

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QC CHECKED BY CSB
DATE MM/DD/YY

4 INTERCHANGES ON
BANGERTER HIGHWAY - 9000 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 90RW-02

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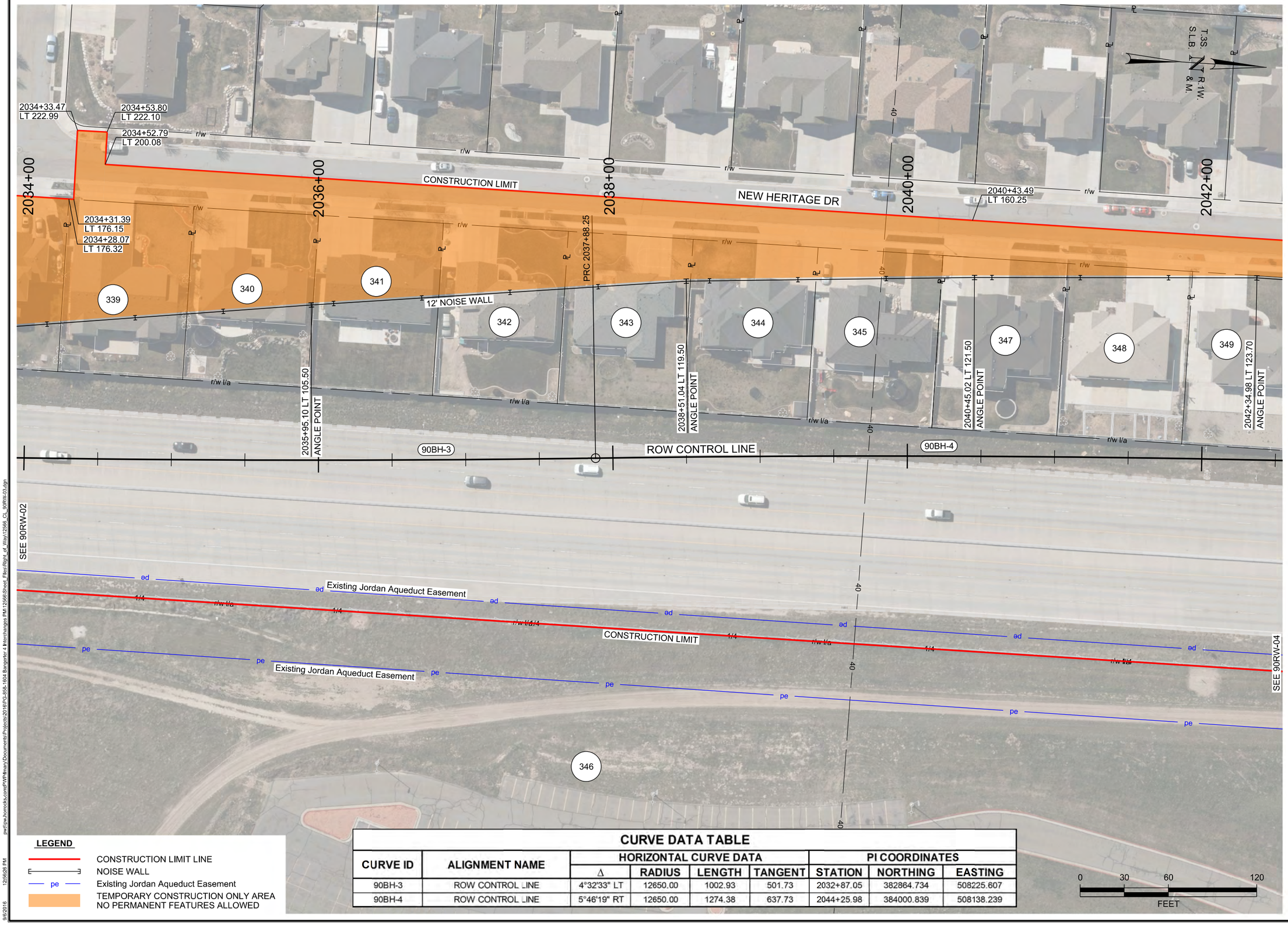

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
90BH-3	ROW CONTROL LINE	4°32'33" LT	12650.00	1002.93	501.73	2032+87.05	382864.734	508225.607
90BH-4	ROW CONTROL LINE	5°46'19" RT	12650.00	1274.38	637.73	2044+25.98	384000.839	508138.239

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL LAND SURVEYOR

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MM/DD/YY
DATE

4 INTERCHANGES ON
BANGERTER HIGHWAY - 9000 SOUTH

PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

PROJECT

SALT LAKE
COUNTY

SHEET NO. 90RW-03

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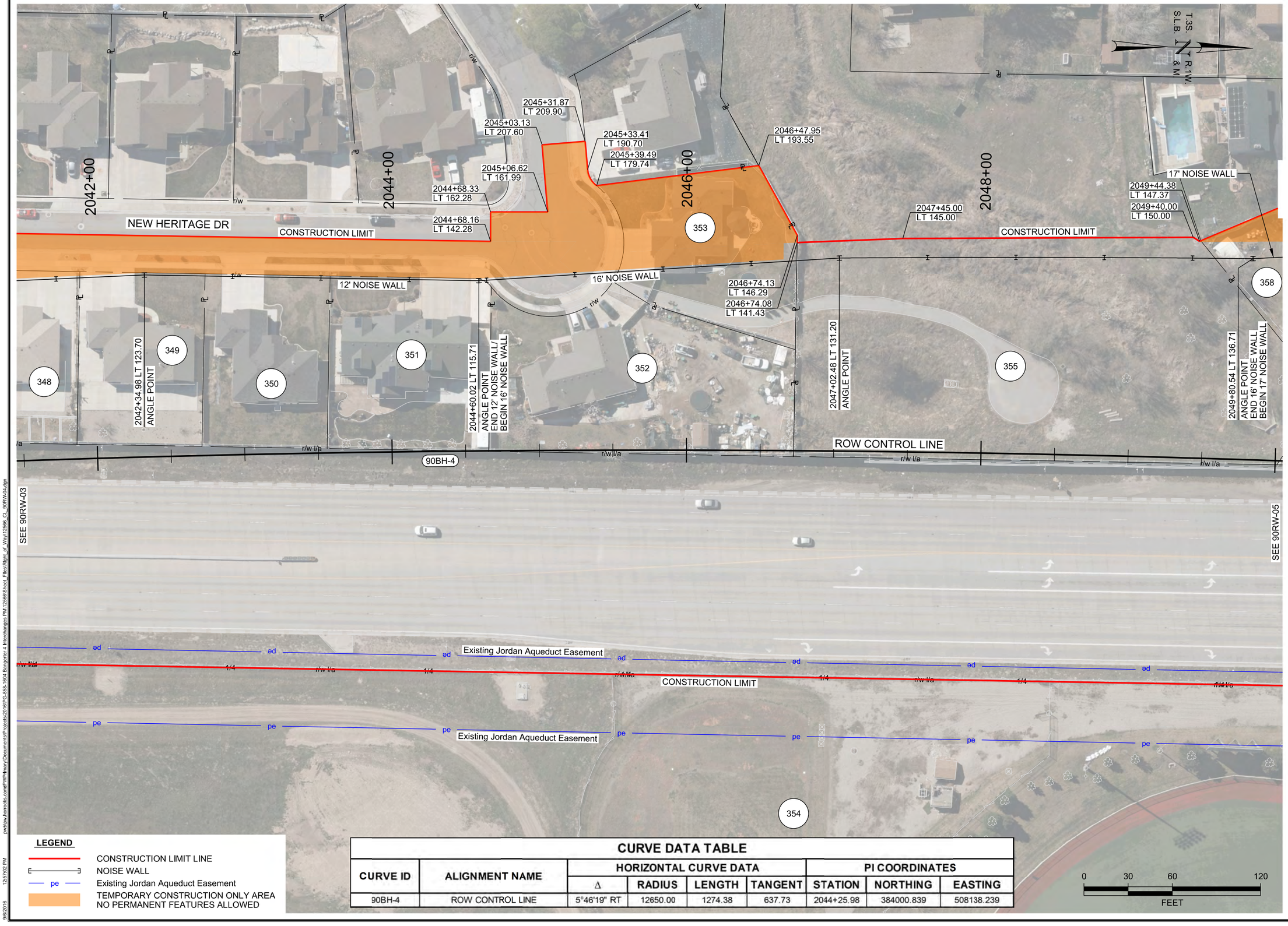

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
90BH-4	ROW CONTROL LINE	5°46'19" RT	12650.00	1274.38	637.73	2044+25.98	384000.839	508138.239

0 30 60 120
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REVISIONS				
NO.	DATE	APPROVED BY	REMARKS	

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

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DATE MM/DD/YY

APPROVED

PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 9000 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 90RW-04

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CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
90BH-4	ROW CONTROL LINE	5°46'19" RT	12650.00	1274.38	637.73	2044+25.98	384000.839	508138.239
90BH-5	ROW CONTROL LINE	3°00'14" RT	12650.00	663.18	331.67	2058+94.45	385469.959	508173.493

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

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DATE

PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH

PROJECT

PROJECT NUMBER PIN 12566 S-0154(12)11

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 90RW-05

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2059+50.22
LT 203.12

2059+51.66
LT 167.00

2058+00

2060+00

2060+32.00
LT 163.00

CONSTRUCTION LIMIT

2061+74.39
LT 178.19

2061+76.22
LT 146.80

2062+00

2061+76.31 LT 145.28
BEGIN 12' NOISE WALL

12' NOISE WALL

2062+66.69
LT 183.85

2063+00.54
LT 168.01

2063+90.96 LT 122.49
ANGLE POINT

2064+00

3645 WEST

T.3S. R.1W. S.L.B. & M.

380 386 387 388 389 390

r/w l/a

90BH-5

ROW CONTROL LINE

90BH-6

SEE 90RW-05

SEE 90RW-07

Existing Jordan Aqueduct Easement

PRC 2062+25.96

pe ad 1/4 PL

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
90BH-5	ROW CONTROL LINE	3°00'14" RT	12650.00	663.18	331.67	2058+94.45	385469.959	508173.493
90BH-6	ROW CONTROL LINE	4°13'29" LT	12650.00	932.72	466.57	2066+92.53	386265.869	508234.433

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

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MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 9000 SOUTH

PROJECT

PROJECT NUMBER: S-0154(12)11 PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 90RW-06

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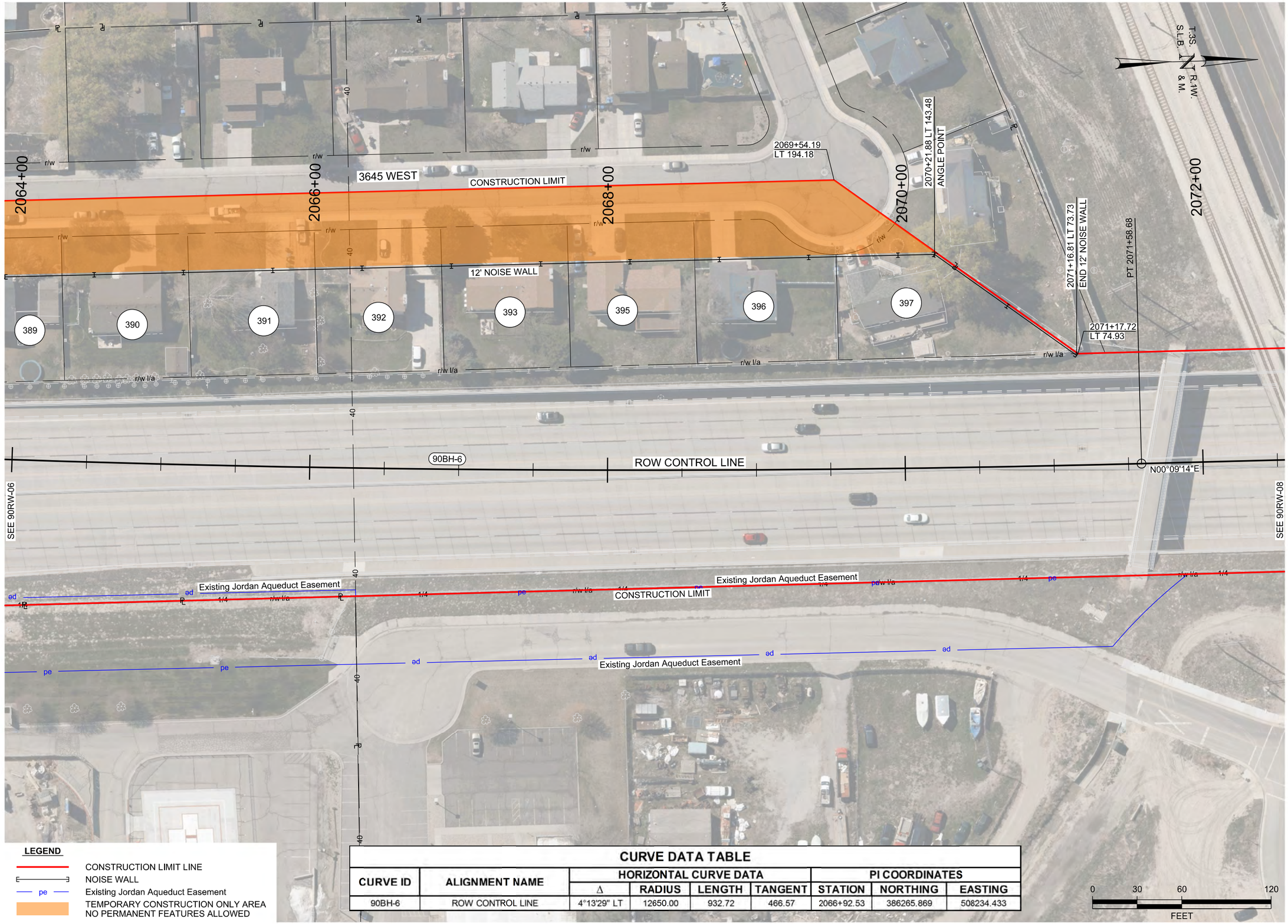

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
90BH-6	ROW CONTROL LINE	4°13'29" LT	12650.00	932.72	466.57	2066+92.53	386265.869	508234.433

0 30 60 120
FEET

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

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CHECKED BY QC CSB
DATE MM/DD/YY

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 90RW-07

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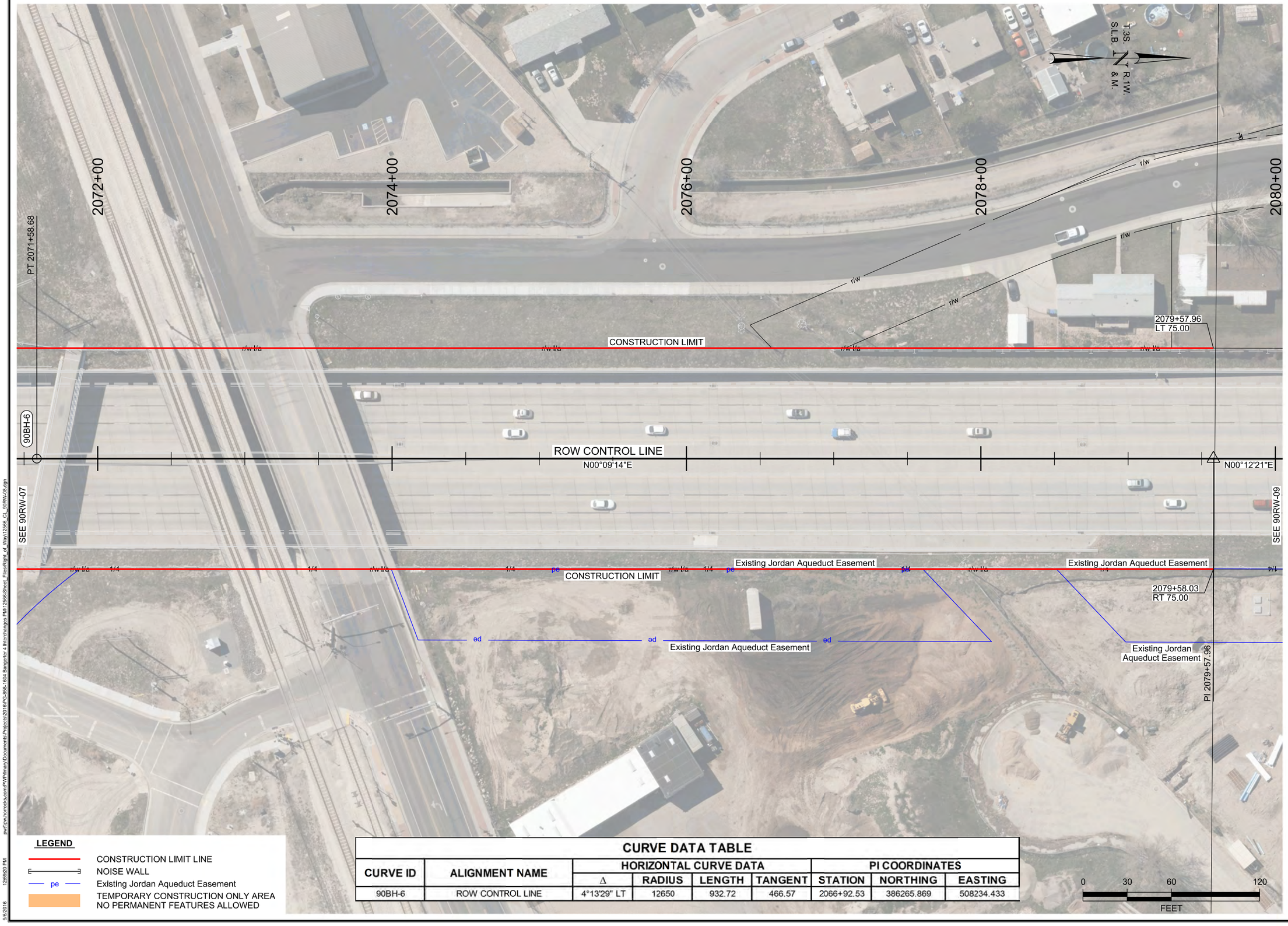

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
90BH-6	ROW CONTROL LINE	4°13'29" LT	12650	932.72	466.57	2066+92.53	386265.869	508234.433

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

DRAWN BY KKH
QC CHECKED BY CSB

MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 9000 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 90RW-08

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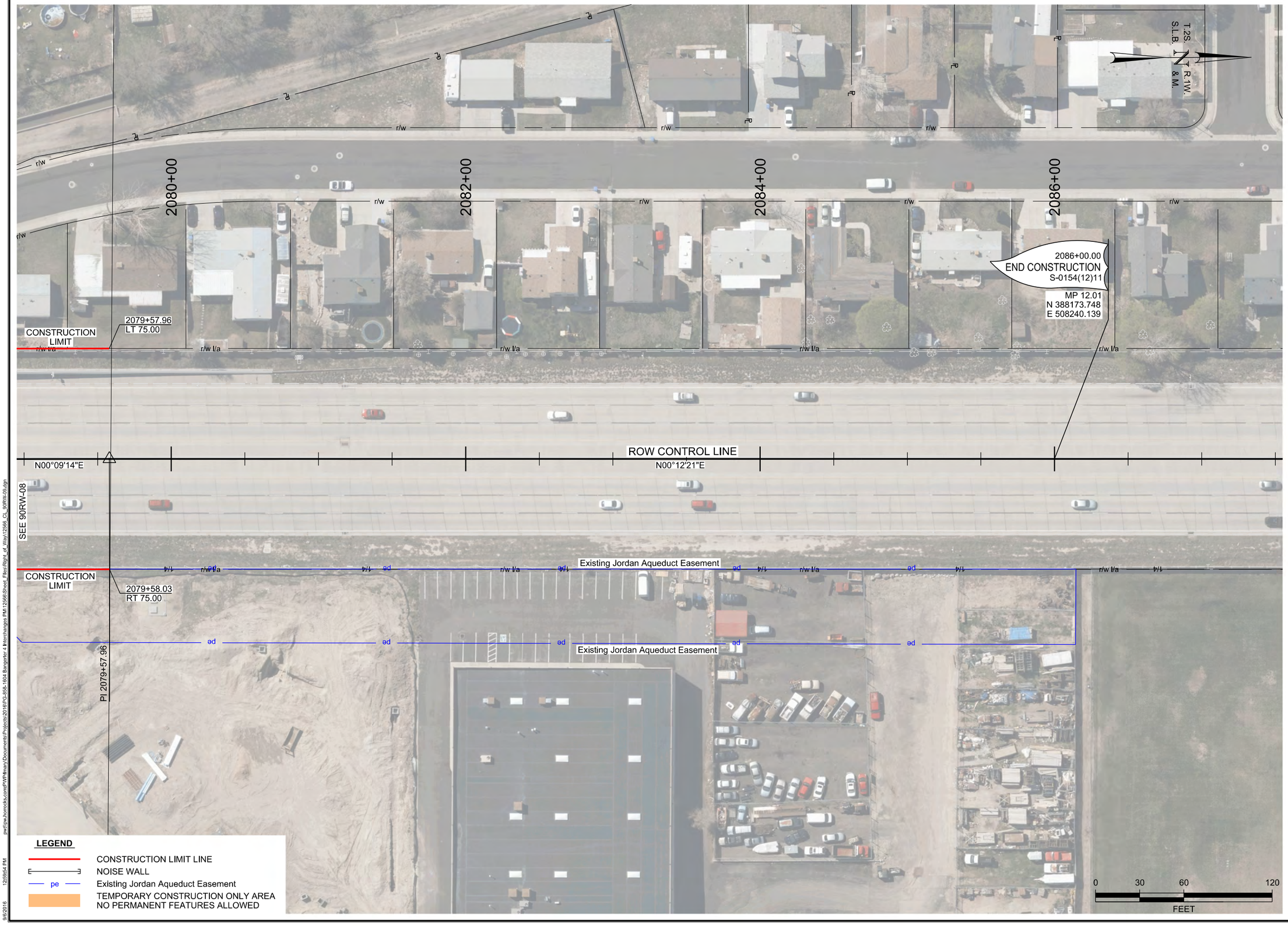

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL LAND SURVEYOR

DRAWN BY	KKH
QC CHECKED BY	CSB
DATE	MM/DD/YY

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH

PROJECT NUMBER: S-0154(12)11

PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 90RW-09

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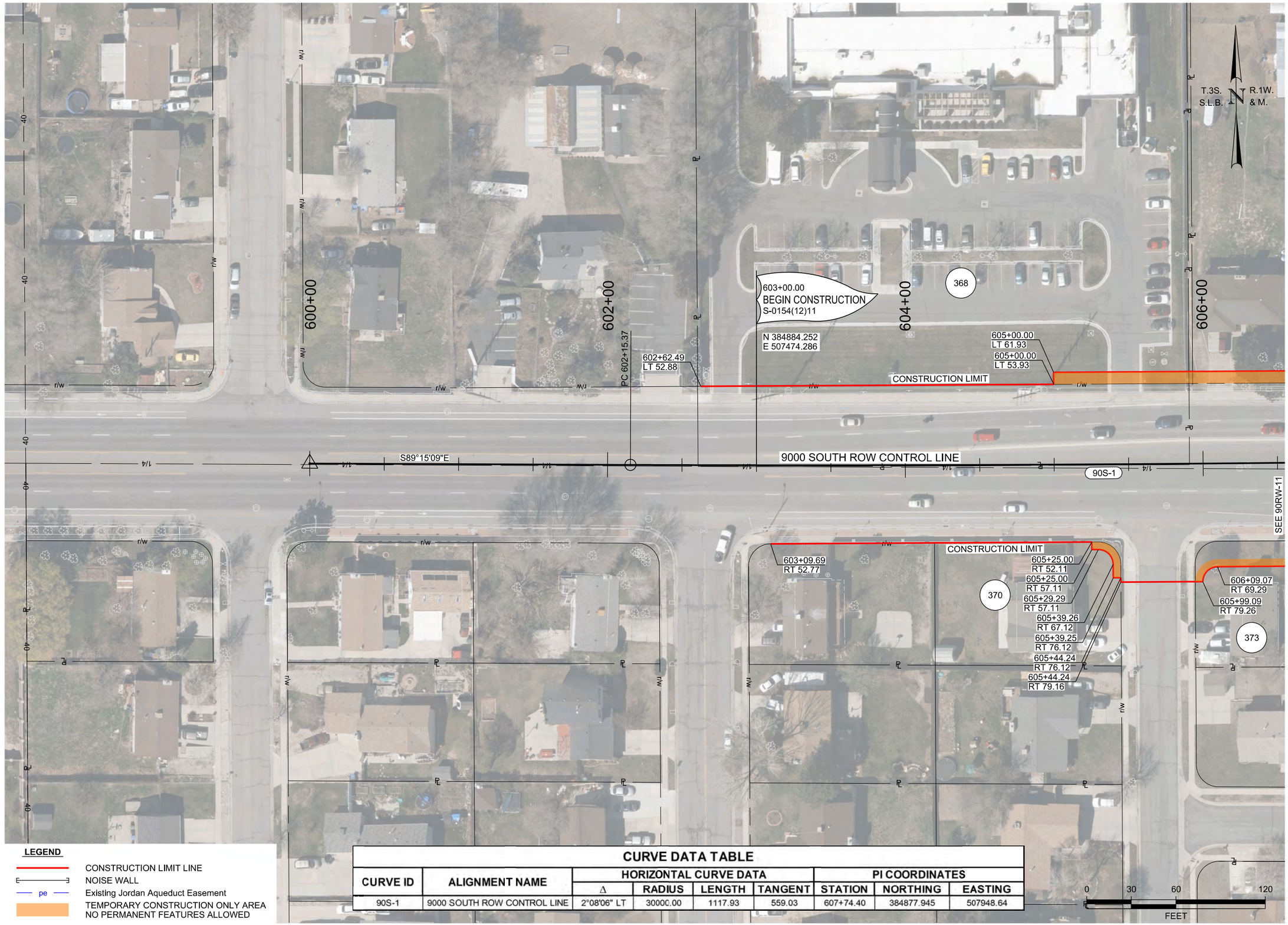

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
90S-1	9000 SOUTH ROW CONTROL LINE	2°08'06" LT	30000.00	1117.93	559.03	607+74.40	384877.945	507948.64

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN BY KKH
QC CHECKED BY CSB

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 90RW-10

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CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
90S-1	9000 SOUTH ROW CONTROL LINE	2°08'06" LT	30000.00	1117.93	559.03	607+74.40	384877.945	507948.640

T.3S. S.L.B. & M. R.1W.

9000 SOUTH ROW CONTROL LINE

N88°36'44"E

90S-1

606+00

608+00

610+00

612+00

614+00

607+83.28
LT 107.37

607+54.63
LT 60.97

CONSTRUCTION LIMIT

611+33.52
LT 100.88

611+34.61
LT 93.80

611+41.75
LT 82.07

611+74.84
LT 74.18

612+06.45
LT 72.23

PT 613+33.29

614+03.52
LT 72.50

Existing Jordan Aqueduct Easement

381

607+77.12 RT 64.50
END 17' NOISE WALL

608+26.03 RT 113.38
ANGLE POINT

606+09.07
RT 69.29

605+99.09
RT 79.26

607+18.83
RT 69.50

607+18.38
RT 137.74

607+17.84
RT 218.73

607+83.19
RT 258.78

373

376

377

378

356

358

354

17' NOISE WALL

WINTHROPE DR

WINTHROPE CIR

SEE 90RW-10

SEE 90RW-12

611+27.60
RT 194.77

613+12.60
RT 53.00

613+56.58
RT 53.00

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
APPROVED: MM/DD/YY
DATE
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 90RW-11

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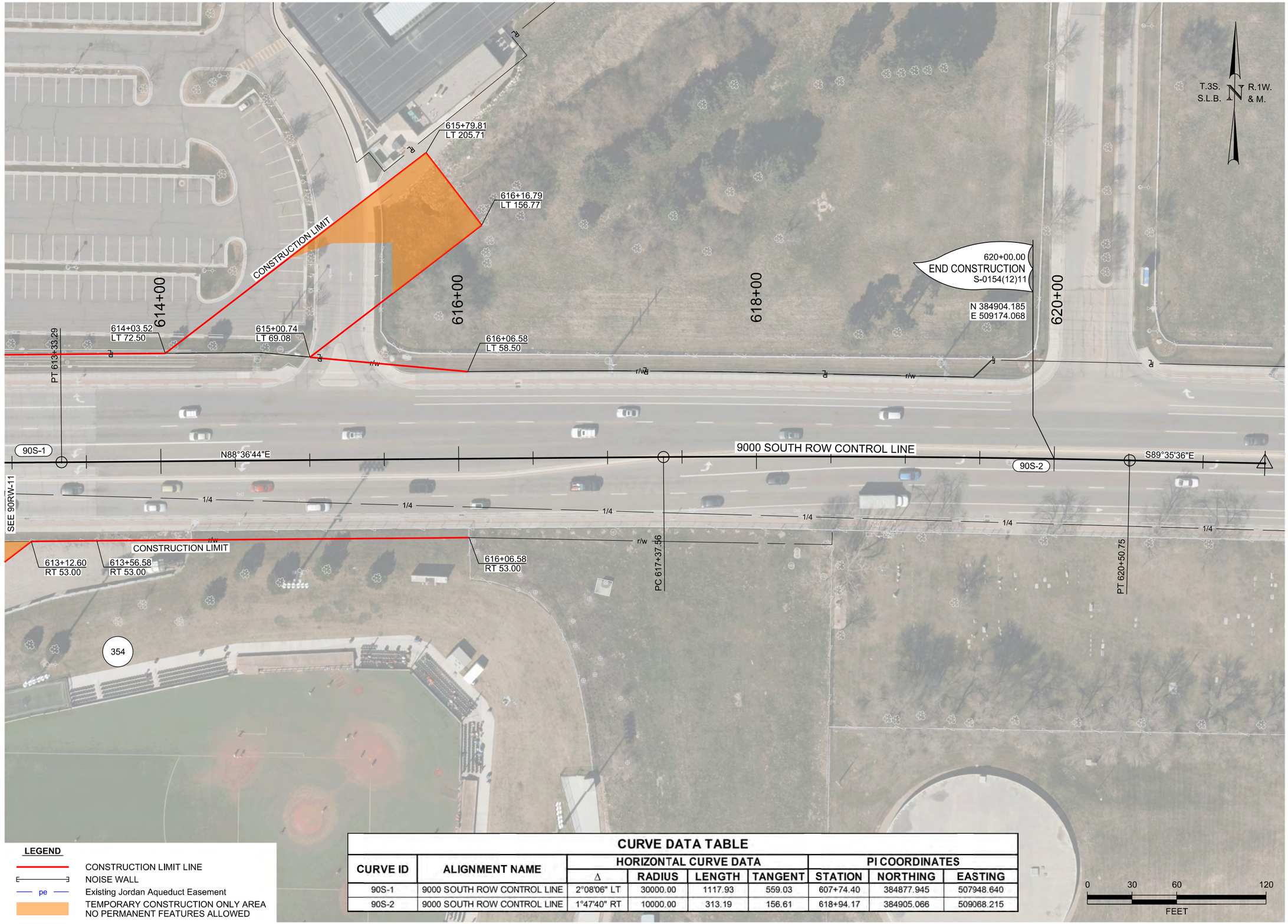

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
90S-1	9000 SOUTH ROW CONTROL LINE	2°08'06" LT	30000.00	1117.93	559.03	607+74.40	384877.945	507948.640
90S-2	9000 SOUTH ROW CONTROL LINE	1°47'40" RT	10000.00	313.19	156.61	618+94.17	384905.066	509068.215

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB

APPROVED

MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 90RW-12

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T.2S. R.1W. S.L.B. & M.

3000+00

3002+00

3004+00

CONSTRUCTION LIMIT

Existing Jordan Aqueduct Easement

3000+00.00
BEGIN CONSTRUCTION
S-0154(12)11
MP 13.32
N 395062.892
E 508492.619

Existing Jordan Aqueduct Easement

140.06

ROW CONTROL LINE
N00°31'23"E

75.00

SEE 70RW-02

CONSTRUCTION LIMIT

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
APPROVED
DATE: MM/DD/YY

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 70RW-01

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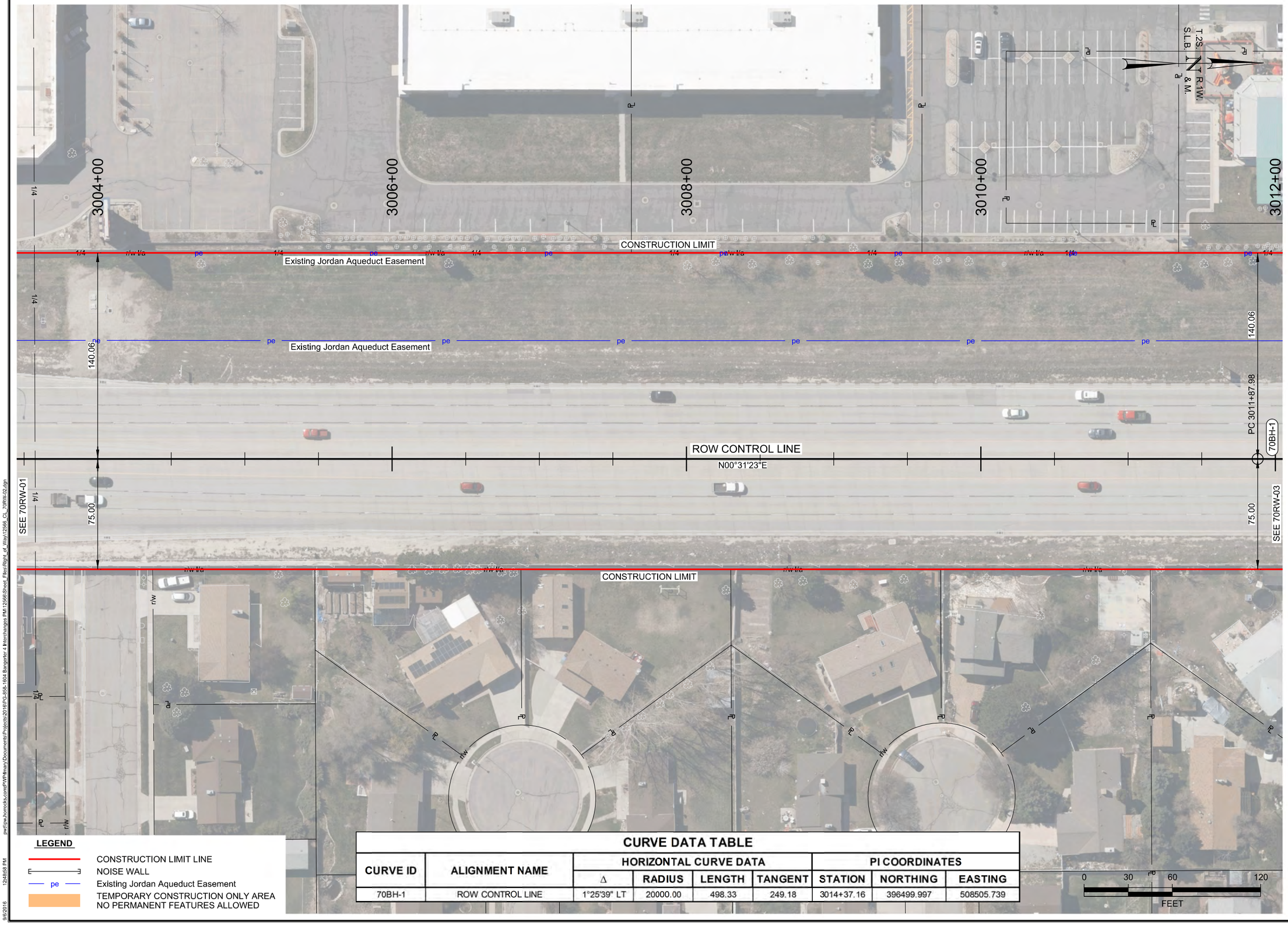

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
70BH-1	ROW CONTROL LINE	1°25'39" LT	20000.00	498.33	249.18	3014+37.16	396499.997	508505.739

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB

APPROVED

MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 70RW-02

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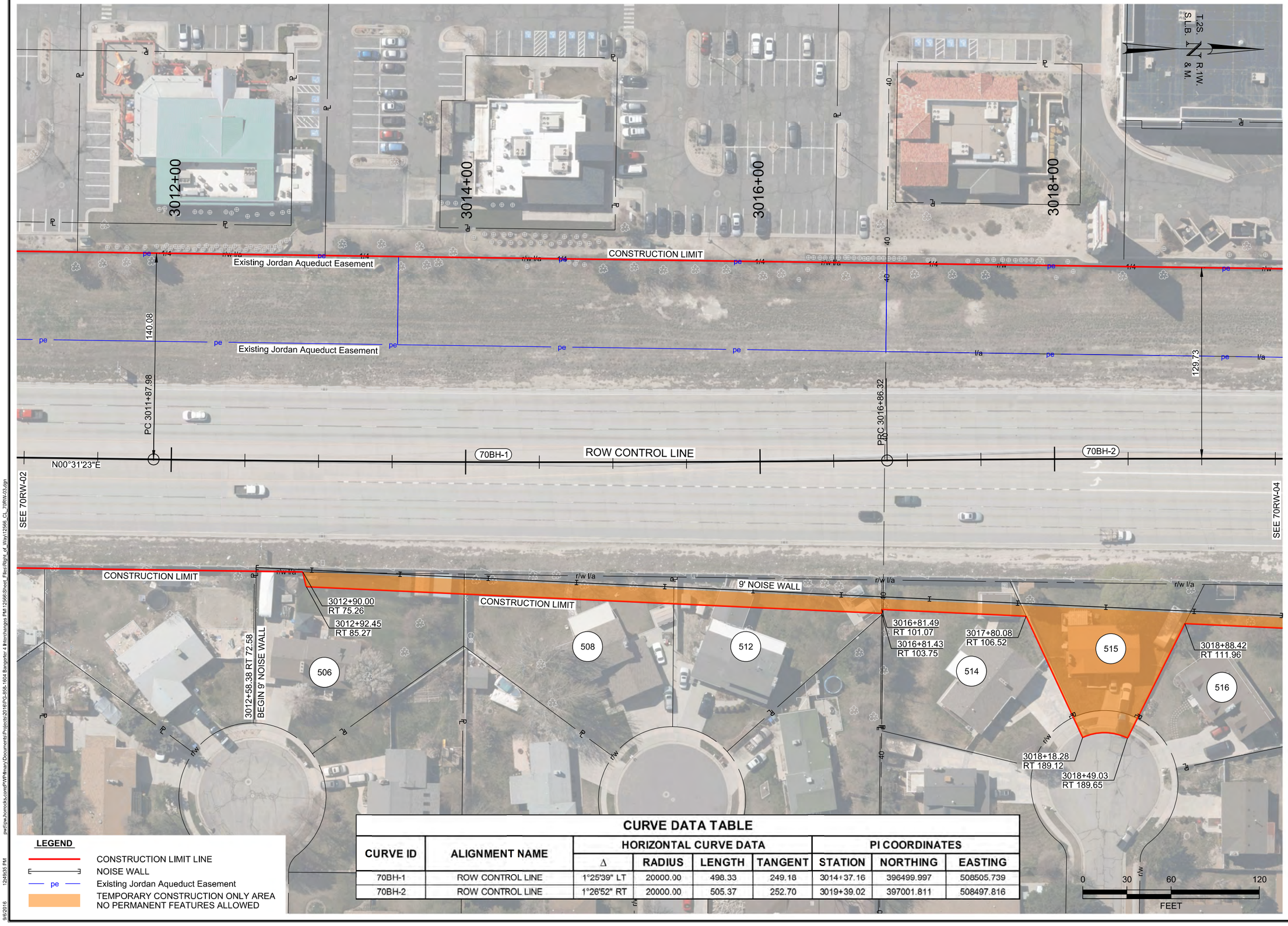

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
70BH-1	ROW CONTROL LINE	1°25'39" LT	20000.00	498.33	249.18	3014+37.16	396499.997	508505.739
70BH-2	ROW CONTROL LINE	1°26'52" RT	20000.00	505.37	252.70	3019+39.02	397001.811	508497.816

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB
APPROVED
DATE MM/DD/YY
PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 7000 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 70RW-03

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CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
70BH-2	ROW CONTROL LINE	1°26'52" RT	20000.00	505.37	252.70	3019+39.02	397001.811	508497.816

T.2S. R.1W. S.L.B. & M.

3020+00 3022+00 3024+00 3026+00

523

CONSTRUCTION LIMIT

Existing Jordan Aqueduct Easement

Existing Jordan Aqueduct Easement

ROW CONTROL LINE

70BH-2

N00°32'36"E

SEE 70RW-03

3019+55.06 RT 106.50 ANGLE POINT

PT 3021+91.69

3024+45.10 RT 118.50 ANGLE POINT

3026+25.09 RT 138.50 ANGLE POINT

SEE 70RW-05

9' NOISE WALL

CONSTRUCTION LIMIT

3018+88.42 RT 111.96

3019+54.73 RT 114.99

3020+91.88 RT 119.10

3018+49.03 RT 189.65

3021+27.23 RT 192.48

3021+77.08 RT 216.42

3022+96.07 RT 189.76

3024+14.93 RT 216.44

3024+83.24 RT 216.43

3026+02.07 RT 189.76

3026+02.07 RT 144.49

3026+29.27 RT 147.52

3026+53.08 RT 147.61

515 516 518 519 520 521 522 524 526 527

0 30 60 120 FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL LAND SURVEYOR

MM/DD/YY DATE

DRAWN BY KKH

QC CHECKED BY CSB

PROJECT 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH

PROJECT NUMBER S-0154(12)11

PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 70RW-04

T 2S.
S.L.B. & M.
R 1W.

3026+00
3028+00
3030+00
3032+00
3034+00

3029+15.21
LT 176.52
3029+15.42
LT 146.52
3029+00.43
LT 146.42
3029+00.55
LT 127.96
3030+62.07
LT 238.26
3031+24.24
LT 238.60
3031+24.84
LT 128.62

523
536

CONSTRUCTION LIMIT
CONSTRUCTION LIMIT
9' NOISE WALL
CONSTRUCTION LIMIT

Existing Jordan Aqueduct Easement
Existing Jordan Aqueduct Easement

3031+21.74 LT 238.59
BEGIN 9' NOISE WALL
3031+22.35 LT 125.93
END 9' NOISE WALL

r/w
r/w l/a
l/a
pe
1/4
SEC

ROW CONTROL LINE
N00°32'36"E

SEE 70RW-04
SEE 70RW-06

3026+25.09 RT 138.50
ANGLE POINT
3028+70.57 RT 139.50
ANGLE POINT
3029+40.44 RT 201.82
END 9' NOISE WALL
3030+52.20 RT 232.18
BEGIN 9' NOISE WALL
3030+66.41 RT 181.57
ANGLE POINT
3031+19.42 RT 136.53
ANGLE POINT
3032+44.93 RT 130.50
ANGLE POINT
3033+34.95 RT 126.50
ANGLE POINT
3034+32.96 RT 124.50
ANGLE POINT

3026+29.27
RT 147.52
3026+53.08
RT 147.61
9' NOISE WALL
3026+02.07
RT 144.49
3026+02.07
RT 189.76
3027+14.39
RT 220.15
3027+44.52
RT 212.67
3027+54.52
RT 148.03
3028+67.13
RT 148.49
3029+05.58
RT 182.79
3029+16.54
RT 182.52
3029+41.75
RT 205.00
3030+76.54
RT 188.06
3030+63.11
RT 235.87
3030+63.31
RT 271.86
3030+60.27
RT 271.88
3030+53.32
RT 273.63
3031+23.88
RT 147.83
3032+45.46
RT 141.99
3033+35.32
RT 138.00

526
527
528
537
554
556
558
560

CONSTRUCTION LIMIT
9' NOISE WALL
CONSTRUCTION LIMIT

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB
APPROVED
MM/DD/YY
DATE
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 70RW-05

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3035+44.15
LT 255.90

3036+14.15
LT 256.28

3035+44.83
LT 130.91

3036+14.83
LT 131.29

565

3034+00

3036+00

3038+00

3040+00

3042+00

r/w

pe

1/4

r/w l/a

CONSTRUCTION LIMIT

Existing Jordan Aqueduct Easement

T.2S.
S.L.B. & M.
R.1W.

N

ROW CONTROL LINE

N00°32'36"E

SEE 70RW-05

3034+32.96 RT 124.50
ANGLE POINT

3037+32.97 RT 113.50
ANGLE POINT

3038+69.99 RT 113.50
ANGLE POINT

3040+34.92 RT 110.50
ANGLE POINT

SEE 70RW-07

9' NOISE WALL

3034+33.29
RT 136.00

3034+95.17
RT 133.73

3035+65.16
RT 131.16

3037+33.18
RT 125.00

3038+70.09
RT 125.00

3040+35.51
RT 121.99

558

560

562

564

566

568

570

572

574

576

578

580

3035+17.42
RT 249.39

3034+95.77
RT 248.99

3035+65.77
RT 249.14

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

0 30 60 120
FEET

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

DRAWN BY KKH
QC CHECKED BY CSB

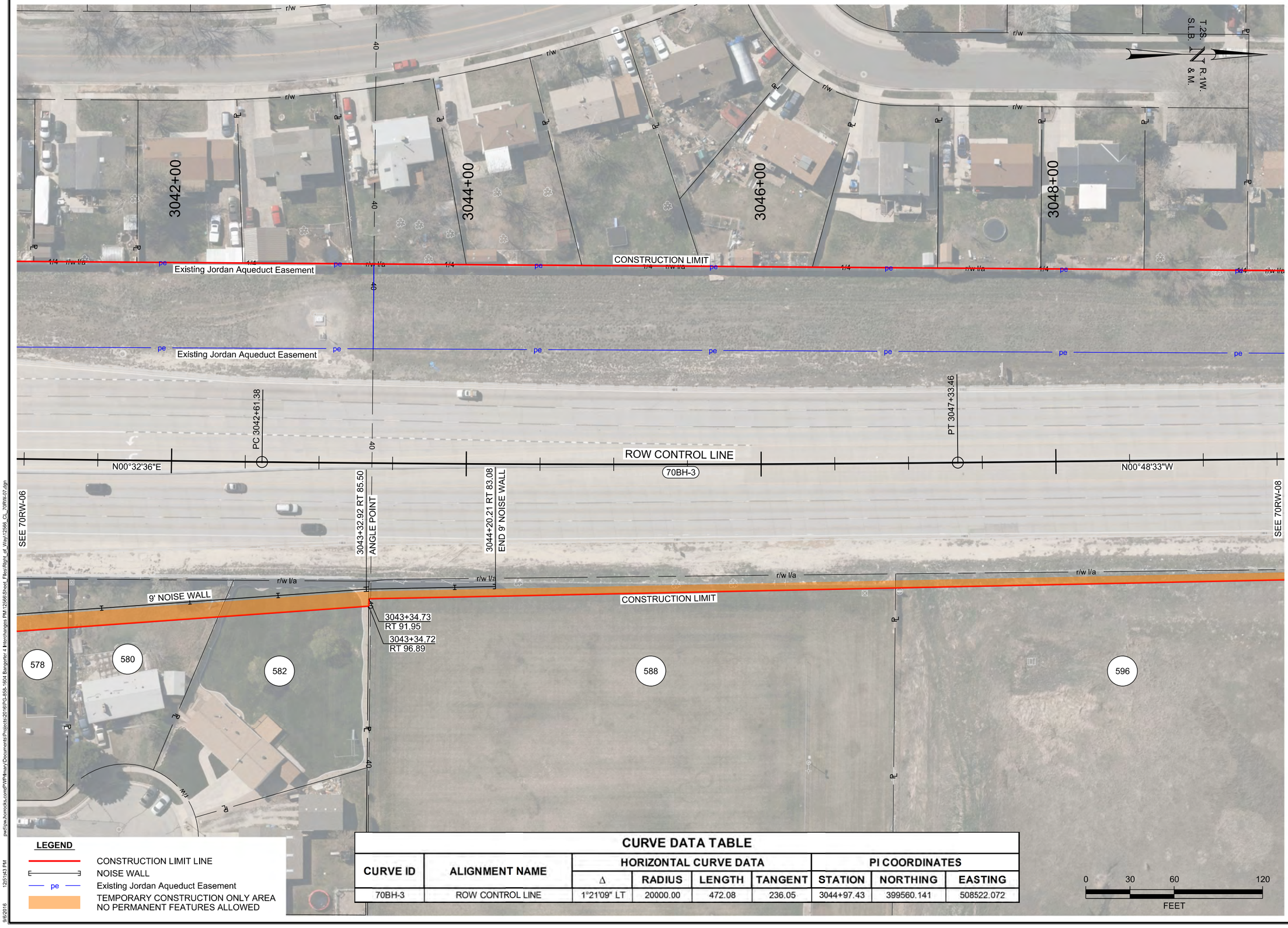
PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH

PROJECT NUMBER: PIN 12566 S-0154(12)11

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 70RW-06



LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
70BH-3	ROW CONTROL LINE	1°21'09" LT	20000.00	472.08	236.05	3044+97.43	399560.141	508522.072

0 30 60 120
FEET

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

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DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 70RW-07

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3050+00
3052+00
3054+00
3056+00
T.2S. R.1W. S.L.B. & M.
3056+00.00
END CONSTRUCTION
S-0154(12)11
MP 14.38
N 400662.620
E 508506.501
CONSTRUCTION LIMIT
Existing Jordan Aqueduct Easement
Existing Jordan Aqueduct Easement
ROW CONTROL LINE
N00°48'33"W
116.14
75.00
SEE 70RW-07
596
3051+55.44
RT 75.00
3051+55.44
RT 79.95
r/w l/a
pe
1/4
PL
RW
0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB
APPROVED
MM/DD/YY
DATE
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 70RW-08

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700+00.00
BEGIN CONSTRUCTION
S-0154(12)11
N 397956.253
E 507703.727

700+00
702+00
704+00
706+00

7000 SOUTH ROW CONTROL LINE
70S-1

T.2S.
S.L.B. & M.
R.1W.

S89°51'30"E

CONSTRUCTION LIMIT

703+85.12
LT 61.57

705+21.03
LT 60.70

705+06.92
LT 50.95

705+79.29
LT 67.28

705+79.39
LT 129.45

700+53.79
RT 63.00

701+40.00
RT 63.00

701+90.00
RT 75.00

704+35.00
RT 75.00

705+10.00
RT 90.00

PT 705+64.48

706+40.00
RT 80.00

706+70.00
RT 80.00

706+70.00
RT 95.00

706+88.46
RT 95.00

PC 700+00.00

SEE 70RW-10

536

523

Existing Jordan Aqueduct Easement

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
70S-1	7000 SOUTH ROW CONTROL LINE	21°33'41" RT	1500.00	564.48	285.62	702+85.62	398060.560	507969.616

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB

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PROFESSIONAL LAND SURVEYOR
MM/DD/YY
DATE

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 70RW-09

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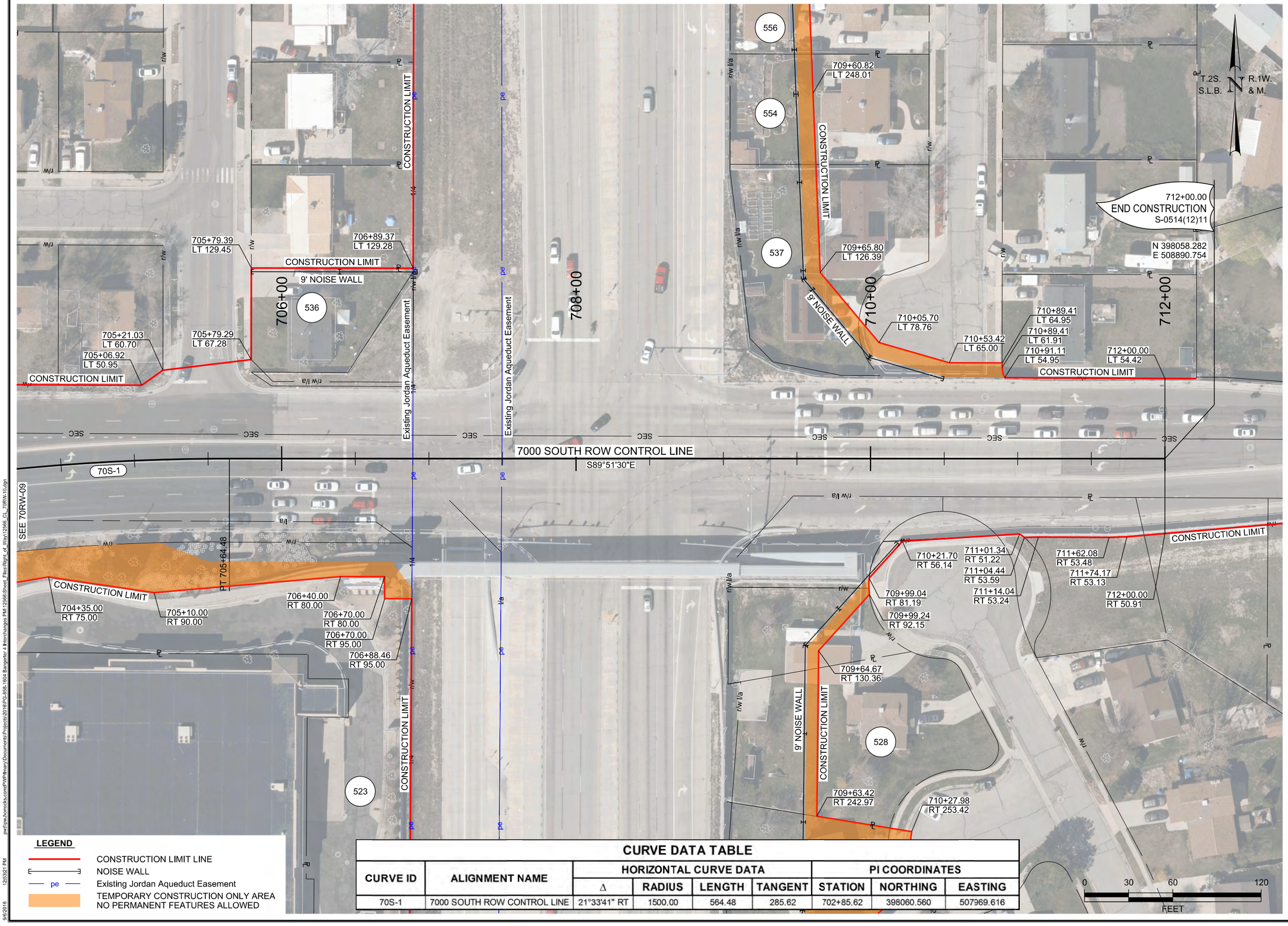

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
70S-1	7000 SOUTH ROW CONTROL LINE	21°33'41" RT	1500.00	564.48	285.62	702+85.62	398060.560	507969.616

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
APPROVED
MM/DD/YY
DATE
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 70RW-10

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4000+00

4002+00

4004+00

4006+00

4000+00.00
BEGIN CONSTRUCTION
S-0154(12)11
MP 15.35
N 405719.137
E 508126.676

4003+59.57
LT 151.39

4003+34.67
LT 75.00

CONSTRUCTION LIMIT

Existing Jordan Aqueduct Easement

ROW CONTROL LINE
N17°51'09"W

54BH-1

PC 4005+63.45

SEE 54RW-02

75.00

75.00

T2S R1W S.L.B. & M.

0 30 60 120
FEET

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
54BH-1	ROW CONTROL LINE	3°24'42" RT	12649.00	753.18	376.70	4009+40.15	406614.017	507838.459

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	UPDATED CURVE DATA TABLE
1	08/16	CSB	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB

APPROVED

MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH

PROJECT NUMBER: S-0154(12)11

PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 54RW-01

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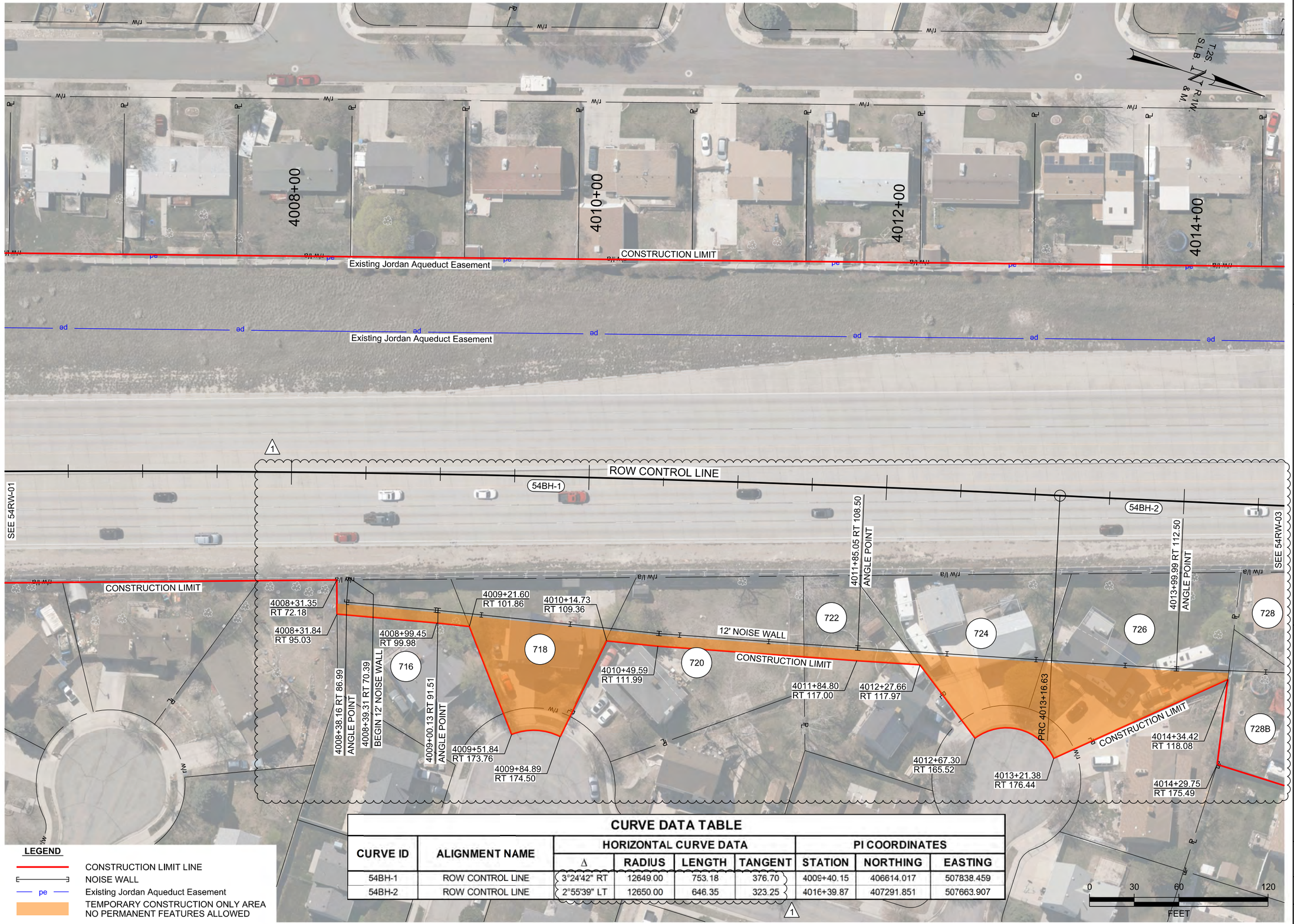

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
54BH-1	ROW CONTROL LINE	3°24'42" RT	12649.00	753.18	376.70	4009+40.15	406614.017	507838.459
54BH-2	ROW CONTROL LINE	2°55'39" LT	12650.00	646.35	323.25	4016+39.87	407291.851	507663.907

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATED CURVE DATA, LIMITS & NOISE WALL

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
CHECKED BY QC CSB
DATE MM/DD/YY
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
SALT LAKE COUNTY
SHEET NO. 54RW-02

CONTRACT RIGHT-OF-WAY

T2S, R1W, S.L.B. & M.

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CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
54BH-1	ROW CONTROL LINE	3°24'42" RT	12649.00	753.18	376.70	4009+40.15	406614.017	507838.459
54BH-2	ROW CONTROL LINE	2°55'39" LT	12650.00	646.35	323.25	4016+39.87	407291.851	507663.907

4014+00
4016+00
4018+00
4020+00
4016+94.53 LT 165.23
CONSTRUCTION LIMIT
4019+76.79 LT 165.26
PT 4019+62.98
4019+69.20 LT 141.48
Existing Jordan Aqueduct Easement
Existing Jordan Aqueduct Easement
743
SEE 54RW-02
SEE 54RW-04
54BH-1
54BH-2
ROW CONTROL LINE
N17°22'06"W
4013+99.99 RT 112.50 ANGLE POINT
4016+00.00 RT 112.50 ANGLE POINT
4017+75.00 RT 112.50 ANGLE POINT
4018+82.26 RT 112.15 ANGLE POINT
4019+24.90 RT 115.02 END 12' NOISE WALL
724
726
728
728B
730
732
734
736
738
740
744
745
PRC 4013+16.63
CONSTRUCTION LIMIT
4012+67.30 RT 165.52
4013+21.38 RT 176.44
4014+29.75 RT 175.49
4014+34.42 RT 118.08
4015+38.45 RT 185.88
4015+39.94 RT 206.20
4016+15.19 RT 191.52
4016+01.64 RT 185.53
4016+19.08 RT 166.77
4017+15.86 RT 157.81
4017+15.93 RT 160.41
12' NOISE WALL
4018+02.46 RT 186.59
4018+03.00 RT 196.76
4018+17.14 RT 201.11
4018+22.79 RT 182.18
4018+39.65 RT 157.30
4018+74.19 RT 129.71 BEGIN 12' NOISE WALL
4018+38.91 RT 128.87 ANGLE POINT
4019+63.29 RT 112.49 ANGLE POINT
4020+55.05 RT 112.50 ANGLE POINT
12' NOISE WALL
CONSTRUCTION LIMIT

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

0 30 60 120
FEET

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATED CURVE DATA, LIMITS & NOISE WALL.

DRAWN BY KKH
QC CHECKED BY CSB
DATE MM/DD/YY

PROFESSIONAL LAND SURVEYOR

APPROVED

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 54RW-03

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
54BH-2	ROW CONTROL LINE	2°55'39" LT	12650.00	646.35	323.25	4016+39.87	407291.851	507663.907

4019+76.79
LT 165.26

4019+69.20
LT 141.48

PT 4019+62.98

4020+00

4022+00

4024+00

4026+00

Existing Jordan Aqueduct Easement

CONSTRUCTION LIMIT

4026+25.60
LT 147.03

4026+86.65
LT 143.50

4026+85.22
LT 139.08

Existing Jordan Aqueduct Easement

743

753

T2S R1W S.L.B. & M.

SEE 54RW-03

SEE 54RW-05

54BH-2

ROW CONTROL LINE
N17°22'06"W

4019+24.90 RT 115.02
END 12' NOISE WALL

740 744 745 746 747 748 749 750 751 752 754 754B

12' NOISE WALL

4019+38.91 RT 128.87
ANGLE POINT

4019+63.29 RT 112.49
ANGLE POINT

4020+55.05 RT 112.50
ANGLE POINT

4022+29.13
RT 153.40

4023+00.10 RT 128.50
ANGLE POINT

4024+15.05 RT 132.50
ANGLE POINT

4024+80.00 RT 132.50
ANGLE POINT

4026+27.11
RT 150.06

4026+48.82
RT 204.14

4026+74.03
RT 201.48

4026+90.88
RT 184.67

4026+67.49
RT 209.80

4027+60.71
RT 206.71

4027+65.23
RT 192.41

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATED CURVE DATA, LIMITS & NOISE WALL.

DRAWN BY KKH
CHECKED BY QC CSB
DATE MM/DD/YY

PROFESSIONAL LAND SURVEYOR

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

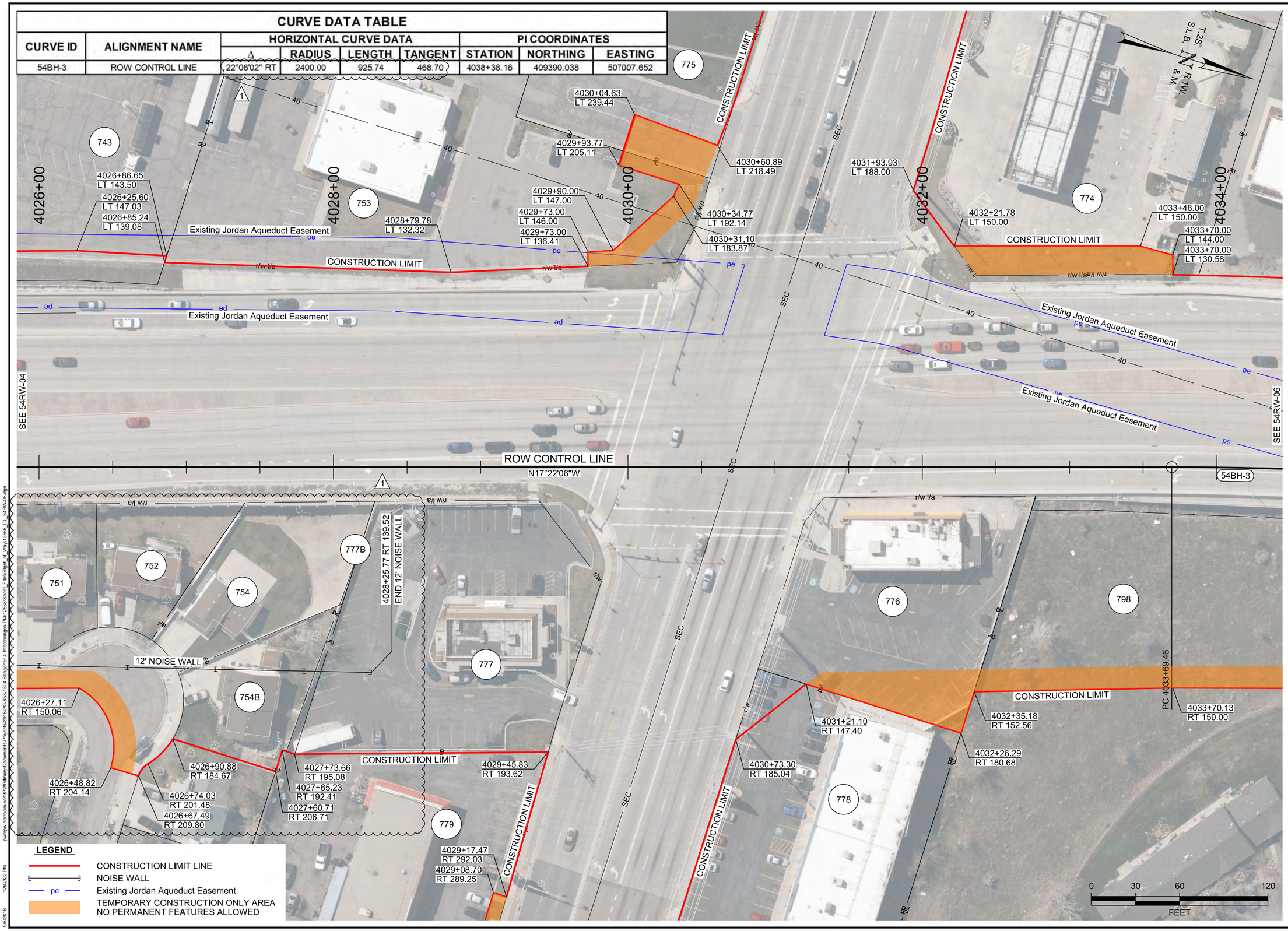
CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 54RW-04

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
54BH-3	ROW CONTROL LINE	22°06'02" RT	2400.00	925.74	468.70	4038+38.16	409390.038	507007.652



LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATED CURVE DATA, LIMITS & NOISE WALL.

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
APPROVED
MM/DD/YY
DATE
PROFESSIONAL LAND SURVEYOR

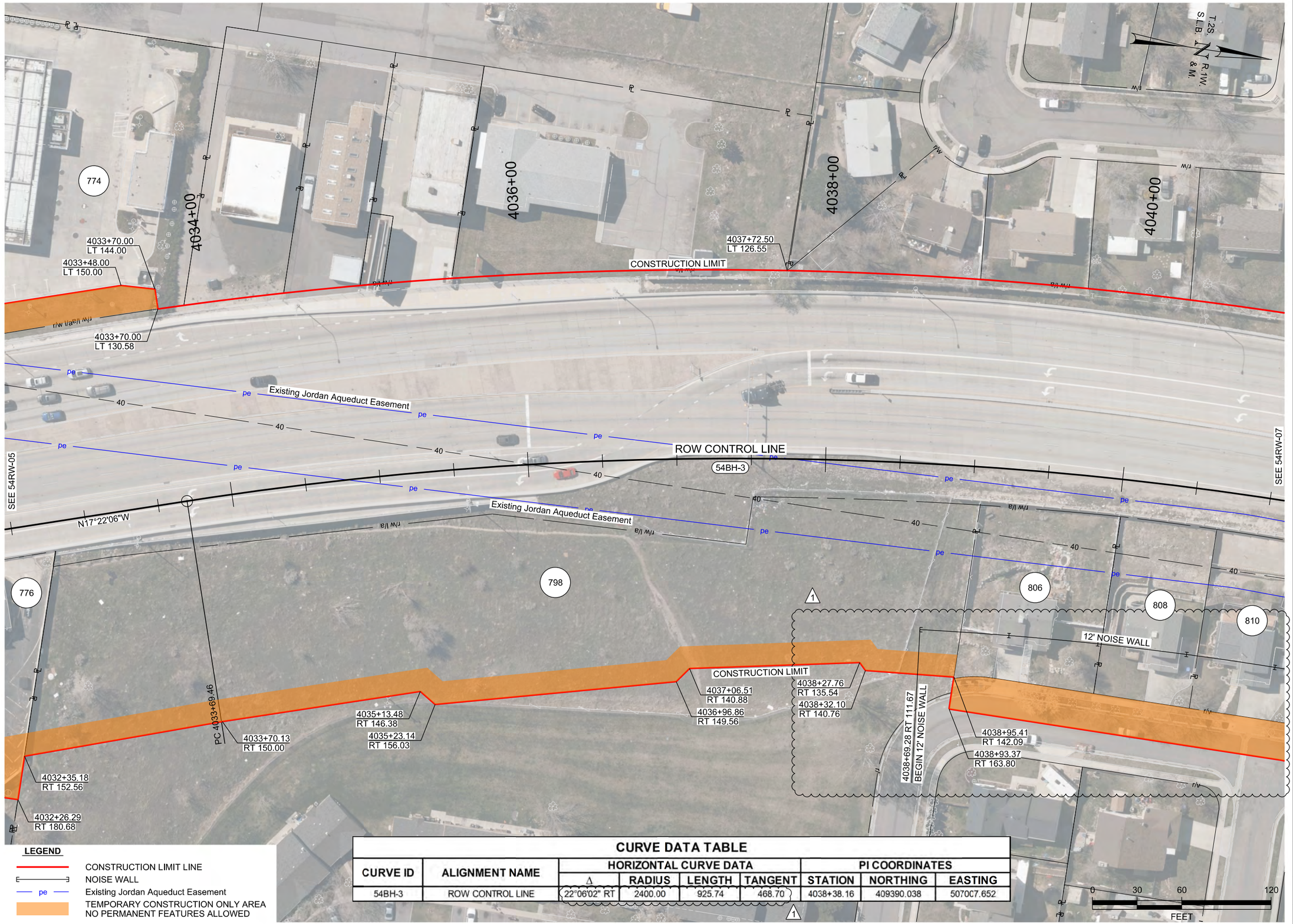
4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER
PIN 12566
S-0154(12)11

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 54RW-05



LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
54BH-3	ROW CONTROL LINE	22°06'02" RT	2400.00	925.74	468.70	4038+38.16	409390.038	5070C7.652

0 30 60 120
FEET

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATED CURVE DATA, LIMITS & NOISE WALL.

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB
APPROVED
MM/DD/YY
DATE
PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 54RW-06

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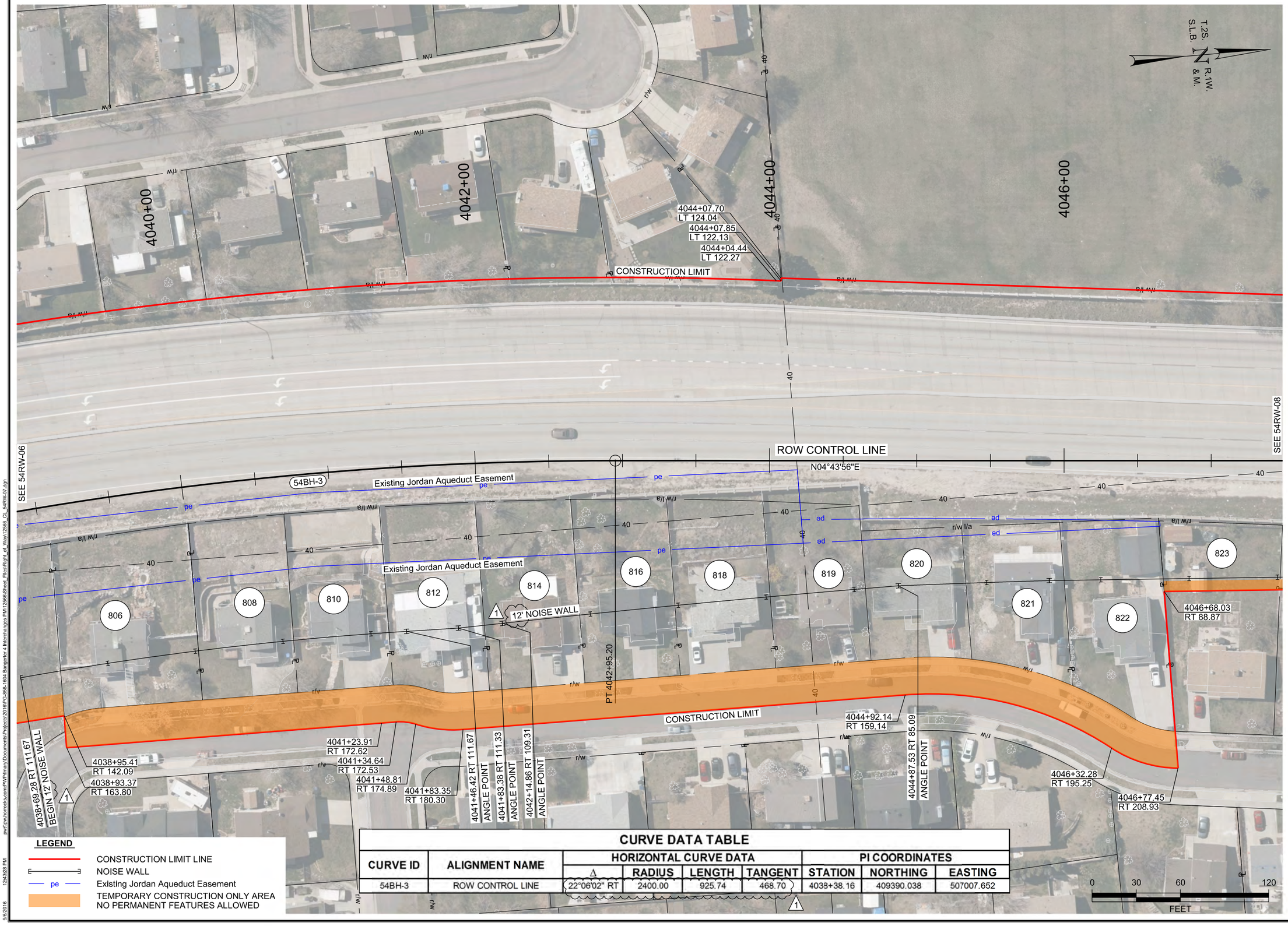

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
54BH-3	ROW CONTROL LINE	22°06'02" RT	2400.00	925.74	468.70	4038+38.16	409390.038	507007.652

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATED CURVE DATA & NOISE WALL.

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB
APPROVED MM/DD/YY
DATE
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 54RW-07

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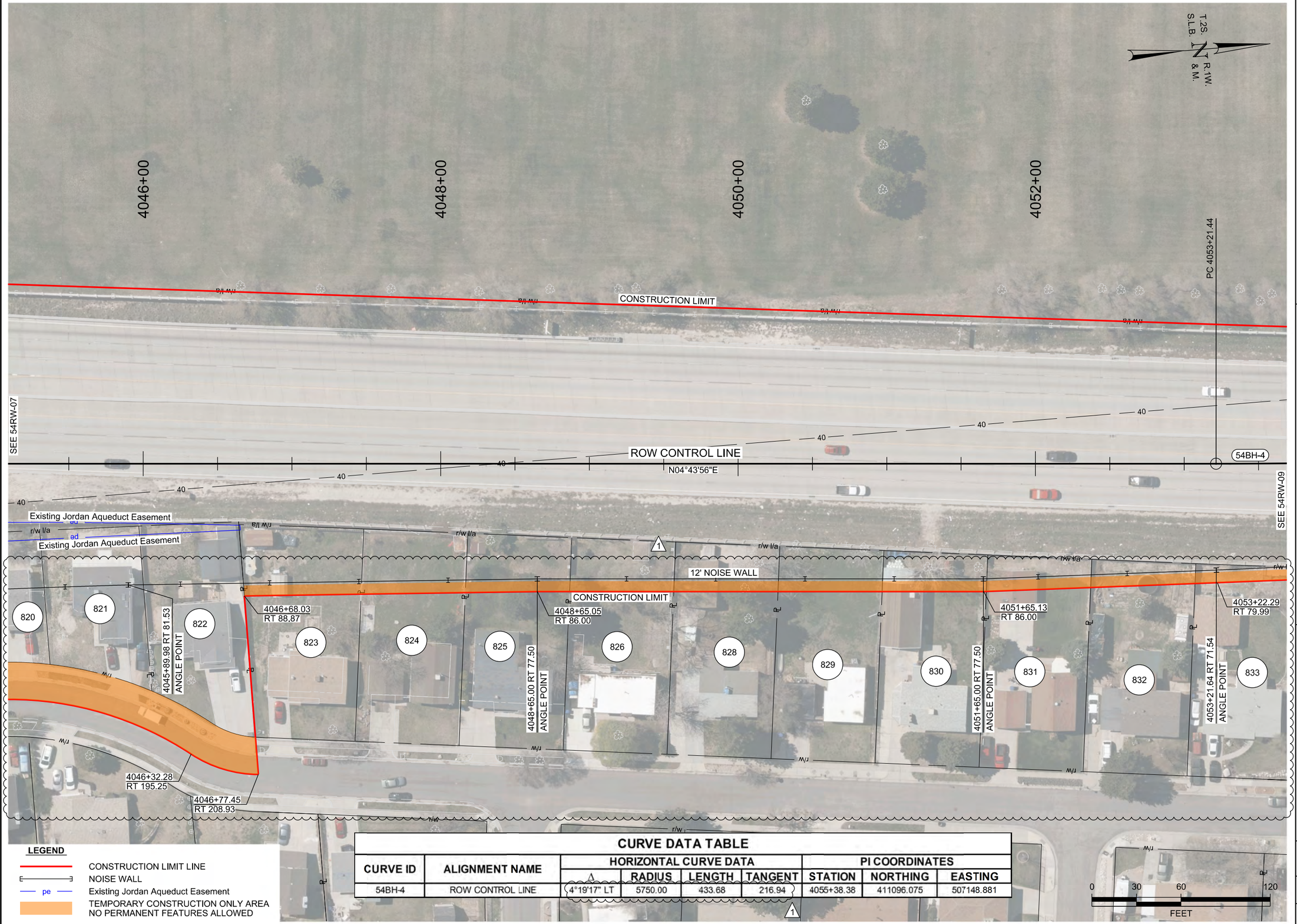

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
54BH-4	ROW CONTROL LINE	4°19'17" LT	5750.00	433.68	216.94	4055+38.38	411096.075	507148.881

1

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATED CURVE DATA, LIMITS & NOISE WALL.

DRAWN BY KKH
QC CHECKED BY CSB

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED
MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 54RW-08

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CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
54BH-4	ROW CONTROL LINE	4°19'17" LT	5750.00	433.68	216.94	4055+38.38	411096.075	507148.881

4052+00
4054+00
4056+00
4058+00
4060+00
PC 4053+21.44
4053+34.28
LT 93.21
CONSTRUCTION LIMIT
4059+54.74
LT 75.00
PT 4057+55.11
4060+00.00
END PROJECT
S-0154(12)11
MP 16.49
N 411557.892
E 507152.193
T.2S. R.1W. S.L.B. & M.
SEE 54RW-08
N04°43'56"E
54BH-4
ROW CONTROL LINE
N00°24'39"E
12' NOISE WALL
4053+95.00
RT 70.54
4053+95.00
RT 77.55
4053+22.29
RT 79.99
4053+21.64 RT 71.54
ANGLE POINT
4054+03.22 RT 68.09
END 12' NOISE WALL
832
833
834
4059+89.31
RT 88.25
r/w l/a
r/w
1/4
40
0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATED CURVE DATA & NOISE WALL.

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
APPROVED: MM/DD/YY
DATE
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 54RW-09

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805+00.00
BEGIN CONSTRUCTION
S-0154(12)11
MP 4.84
N 408660.528
E 506261.392

806+00
808+00
810+00
812+00

CONSTRUCTION LIMIT
805+50.00
LT 53.00

809+24.95
LT 53.00

CONSTRUCTION LIMIT

812+60.58
LT 246.22
812+47.78
LT 242.17
812+48.71
LT 219.36

CONSTRUCTION LIMIT

Existing Jordan Aqueduct Easement

812+86.78
LT 99.02

774

811+98.95
LT 60.31
812+58.95
LT 61.00

812+24.95
LT 61.00

T.2S. S.L.B. & M. R.1W.

53.00

5400 SOUTH ROW CONTROL LINE
S89°48'50"E

SEE 54RW-11

805+50.00
RT 62.19
CONSTRUCTION LIMIT

807+79.97
RT 64.09

CONSTRUCTION LIMIT
809+79.72
RT 64.15

811+18.95
RT 73.00
812+37.82
RT 73.00
812+70.00
RT 75.04

775

813+12.00
RT 93.00
813+03.00
RT 92.00

812+67.00
RT 135.00
813+03.00
RT 135.00

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB
APPROVED
MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 54RW-10

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812+60.58
LT 246.22
812+47.78
LT 242.17
812+48.71
LT 219.36
CONSTRUCTION LIMIT
r/w l/a
Existing Jordan Aqueduct Easement
pe
ad
40
774
812+00
812+86.78
LT 99.02
811+98.95
LT 60.31
812+58.95
LT 61.00
CONSTRUCTION LIMIT
812+24.95
LT 61.00
814+00
798
CONSTRUCTION LIMIT
815+71.21
LT 203.05
816+00.69
LT 203.05
776
r/w
816+00
816+00.69
LT 92.73
778
816+51.00
LT 58.50
CONSTRUCTION LIMIT
818+00
818+85.95
LT 58.50
T.2S.
S.L.B.
R.1W.
& M.
5400 SOUTH ROW CONTROL LINE
S89°48'50"E
SEE 54RW-10
SEE 54RW-12
813+12.00
RT 93.00
813+03.00
RT 92.00
r/w l/a
CONSTRUCTION LIMIT
812+37.82
RT 73.00
812+70.00
RT 75.04
775
812+67.00
RT 135.00
813+03.00
RT 135.00
813+59.54
RT 121.07
813+65.62
RT 136.97
753
814+06.78
RT 221.73
CONSTRUCTION LIMIT
816+97.63
RT 60.44
777
779
781
CONSTRUCTION LIMIT
818+00.00
RT 57.80
818+00.00
RT 67.00
777B
12' NOISE WALL
754B
754
817+50.94
RT 224.15
817+50.94
RT 232.98
817+65.94
RT 233.00
817+65.98
RT 306.22
0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB
APPROVED
DATE MM/DD/YY
PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 54RW-11

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LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

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REVISIONS			
NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATED END CONSTRUCTION EASTING.

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
MM/DD/YY
DATE

APPROVED

PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 54RW-12

10+00

12+00

14+00

16+00

18+00

T.2S. R.1W. S.L.B. & M.

10+00.00
BEGIN CONSTRUCTION
S-0154(12)11

N 406742.443
E 505634.624

5615 SOUTH

5580 SOUTH

CONSTRUCTION LIMIT
18+00.00
LT 33.54

4015 WEST ROW CONTROL LINE
N00°24'01"E

SEE 40RW-02

18+00.00
RT 46.46
CONSTRUCTION LIMIT

0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

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REVISIONS				
NO.	DATE	APPROVED BY	REMARKS	

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CSB
MM/DD/YY
DATE

APPROVED
PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 4015 WEST

PROJECT

PROJECT NUMBER: S-0154(12)11
PIN: 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 40RW-01

18+00
20+00
22+00
24+00
26+00

T.2S. S.L.B. & M. R.1W.

5540 SOUTH
5500 SOUTH

19+58.53
LT 53.56
20+08.53
LT 53.57
18+00.00
LT 33.54
19+38.53
LT 33.56
20+28.53
LT 33.57

CONSTRUCTION LIMIT
CONSTRUCTION LIMIT

4015 WEST ROW CONTROL LINE
N00°24'01"E

SEE 40RW-01
SEE 40RW-03

18+00.00
RT 46.46
19+09.16
RT 46.44
21+16.16
RT 46.42

CONSTRUCTION LIMIT
CONSTRUCTION LIMIT

20+67.01
RT 175.71
20+74.84
RT 206.91
20+76.35
RT 219.04
20+76.39
RT 250.00
21+16.38
RT 250.00

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

0 30 60 120
FEET

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN BY: KKH
QC CHECKED BY: CSB

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED
MM/DD/YY
DATE

PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 4015 WEST

PROJECT
PROJECT NUMBER
PIN 12566
S-0154(12)11

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 40RW-02

SEE 40RW-05

795+40.00
LT 64.00

795+50.88
RT 61.35

796+00

796+30.00
LT 68.00

796+30.00
LT 62.00

797+10.00
LT 62.00

797+17.70
RT 67.01

797+88.71
RT 89.84

27+50.53
LT 33.66

798+00.00
LT 62.00

PRC 797+85.84

798+09.10
LT 92.14

798+55.94
LT 77.59

30+30.31
LT 47.45

31+95.31
LT 38.97

CONSTRUCTION LIMIT

CONSTRUCTION LIMIT

CONSTRUCTION LIMIT

CONSTRUCTION LIMIT

CONSTRUCTION LIMIT

5400 SOUTH ROW CONTROL LINE

40-1

1

756B

756

758

758B

26+00

28+00

30+00

32+00

34+00

798+00

800+00

T.2S.
S.L.B. & M.
R.1W.

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
40-1	5400 SOUTH ROW CONTROL LINE	18°30'47" LT	1083.00	349.93	176.50	796+12.42	408552.997	505385.197
40-2	5400 SOUTH ROW CONTROL LINE	18°19'14" RT	1083.00	346.29	174.64	799+60.48	408662.290	505718.897

4015 WEST ROW CONTROL LINE
N00°24'01"E

SEE 40RW-02

SEE 40RW-04

CONSTRUCTION LIMIT

28+08.05
RT 46.33

799+59.25
RT 55.22

800+89.88
RT 52.22

PT 801+32.14

SEE 40RW-06

799+49.95
LT 103.28

799+78.66
LT 75.84

800+31.18
LT 74.89

800+31.15
LT 79.89

800+40.09
LT 80.00

800+64.05
LT 79.58

800+64.02
LT 74.58

801+00.56
LT 75.02

801+12.01
LT 78.32

801+11.37
LT 73.37

801+45.71
LT 68.92

801+46.30
LT 73.88

32+01.80
RT 42.53

31+87.80
RT 44.54

31+73.80
RT 46.54

CONSTRUCTION LIMIT

CONSTRUCTION LIMIT

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

0 30 60 120
FEET

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATE CURVE NUMBERING.

DRAWN BY KKH
QC CHECKED BY CSB
MM/DD/YY
DATE

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 4015 WEST

PROJECT

PROJECT NUMBER
S-0154(12)11
PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 40RW-03

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34+00
36+00
38+00
40+00
42+00
SAMS BLVD
T.2S.
S.L.B. & M.
R.1W.
42+00.00
END CONSTRUCTION
S-0154(12)11
N 409942.365
E 505656.973
36+05.52
LT 89.02
36+85.52
LT 94.03
35+80.53
LT 39.01
37+25.53
LT 39.03
38+50.00
LT 39.05
CONSTRUCTION LIMIT
CONSTRUCTION LIMIT
4015 WEST ROW CONTROL LINE
N00°24'01"E
SEE 40RW-03
CONSTRUCTION LIMIT
38+50.00
RT 41.15
SQUIRE CREST DRIVE
0
30
60
120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB

APPROVED
PROFESSIONAL LAND SURVEYOR
MM/DD/YY
DATE

4 INTERCHANGES ON
BANGERTER HIGHWAY - 4015 WEST

PROJECT

PROJECT NUMBER
S-0154(12)11
PIN 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 40RW-04

788+00
790+00
792+00
794+00
796+00

T.2S. S.L.B. N R.1W. & M.

788+00
BEGIN CONSTRUCTION
S-0154(12)11
MP 4.49
N 408558.331
E 504572.799

788+50.00
LT 54.00

CONSTRUCTION LIMIT

PC 794+35.91

755B

794+28.00
LT 67.00
794+28.00
LT 54.00

CONSTRUCTION LIMIT

756B

795+40.00
LT 64.00

756

796+30.00
LT 68.00
796+30.00
LT 62.00

5400 SOUTH ROW CONTROL LINE
S89°37'17"E

40-1

SEE 40RW-03

CONSTRUCTION LIMIT
788+50.00
RT 50.00

790+11.22
RT 48.50
790+11.22
RT 50.00

790+93.47
RT 46.00
790+93.47
RT 48.50

791+58.30
RT 46.00

791+78.30
RT 66.00

791+78.28
RT 118.15

4120 WEST

CONSTRUCTION LIMIT

792+59.29
RT 83.18

792+38.28
RT 118.17

793+72.90
RT 49.12
793+61.96
RT 50.29

794+28.53
RT 49.42
794+12.39
RT 48.15
794+93.37
RT 56.36

795+50.88
RT 61.35

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
40-1	5400 SOUTH ROW CONTROL LINE	18°30'47" LT	1083.00	349.93	176.50	796+12.42	408552.997	505385.197

0 30 60 120
FEET

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB
DATE MM/DD/YY

APPROVED
PROFESSIONAL LAND SURVEYOR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 4015 WEST

PROJECT
PROJECT NUMBER PIN S-0154(12)11 12566

CONTRACT RIGHT-OF-WAY

SALT LAKE
COUNTY

SHEET NO. 40RW-05

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800+00
802+00
804+00
806+00
808+00
758
758B
760
T.2S. S.L.B. & M.
R.1W.
800+31.15 LT 79.89
800+31.18 LT 74.89
799+78.66 LT 75.84
800+40.09 LT 80.00
800+64.05 LT 79.58
800+64.02 LT 74.58
801+00.56 LT 75.02
801+12.01 LT 78.32
801+11.37 LT 73.37
801+46.30 LT 73.88
801+45.71 LT 68.92
801+95.00 LT 53.00
CONSTRUCTION LIMIT
805+50.00 LT 53.00
808+00.00 END CONSTRUCTION S-0154(12)11
MP 4.93
N 408659.554
E 506561.393
1
5400 SOUTH ROW CONTROL LINE
S89°48'50"E
40-2
SEE 40RW-03
799+59.25 RT 55.22
800+89.88 RT 52.22
801+94.18 RT 53.00
CONSTRUCTION LIMIT
805+50.00 RT 62.19
807+79.97 RT 64.09
PT 801+32.14
0 30 60 120
FEET

LEGEND

- CONSTRUCTION LIMIT LINE
- NOISE WALL
- pe — Existing Jordan Aqueduct Easement
- TEMPORARY CONSTRUCTION ONLY AREA NO PERMANENT FEATURES ALLOWED

CURVE DATA TABLE

CURVE ID	ALIGNMENT NAME	HORIZONTAL CURVE DATA				PI COORDINATES		
		Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING
40-2	5400 SOUTH ROW CONTROL LINE	18°19'14" RT	1083.00	346.29	174.64	799+60.48	408662.290	505718.897

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	08/16	CSB	UPDATE END CONSTRUCTION EASTING.

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY CSB
APPROVED MM/DD/YY
DATE
PROFESSIONAL LAND SURVEYOR

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 4015 WEST
PROJECT NUMBER: S-0154(12)11
PIN: 12566
CONTRACT RIGHT-OF-WAY

SALT LAKE COUNTY

SHEET NO. 40RW-06

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9/6/2016 11:26:20 AM

ctv-1002-03
e-1002-12
sd-1006-13
sd-1008-13
15" sd
sdi-553-17
sd-1005-13
msd-531-17
sd-1012-13
ss-1000-14
g-1000-11
btel-1000-02
11800 SOUTH ST
1002+00
1004+00
1006+00
sdi-555-13
sdi-554-13
sd-1007-13
sd-1013-13
sdi-559-17
irr-1001-10
irr-1002-10
be-1001-12
wtr-1001-13
sd-1016-17
sd-1000-17
msd-0043-17
bctv-1001-03
sd-1001-17
sd-1010-17
sd-1011-17
msd-507-17
msd-547-17
sdi-0373-17
sdi-0200-17
bfo-1002-17
bfo-1000-17
SR-154 (BANGERTER HWY)
sdi-0199-17
MATCH LINE SR-154 1007+50
SEE 114UT-02
sd-1002-17
sdi-0152-17
sd-1009-17
sdi-0153-17
sd-1014-17
sdi-0154-17
irr-1000-10
ms-587-14
bduct-1000-09
sdi-556-13
sd-1003-13
e-1000-12
btel-1000-02
sd-1004-13
bfo-1001-02
btel-1001-02
g-1002-11
ctv-1000-03
11800 SOUTH ST

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HDR

DRAWN BY GS

QC CHECKED BY BDW

9/15/2016 DATE

APPROVED

PROFESSIONAL ENGINEER

4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT

PROJECT NUMBER S-0154(12)11

PIN 12566

UTILITIES

SHEET NO. 114UT-01

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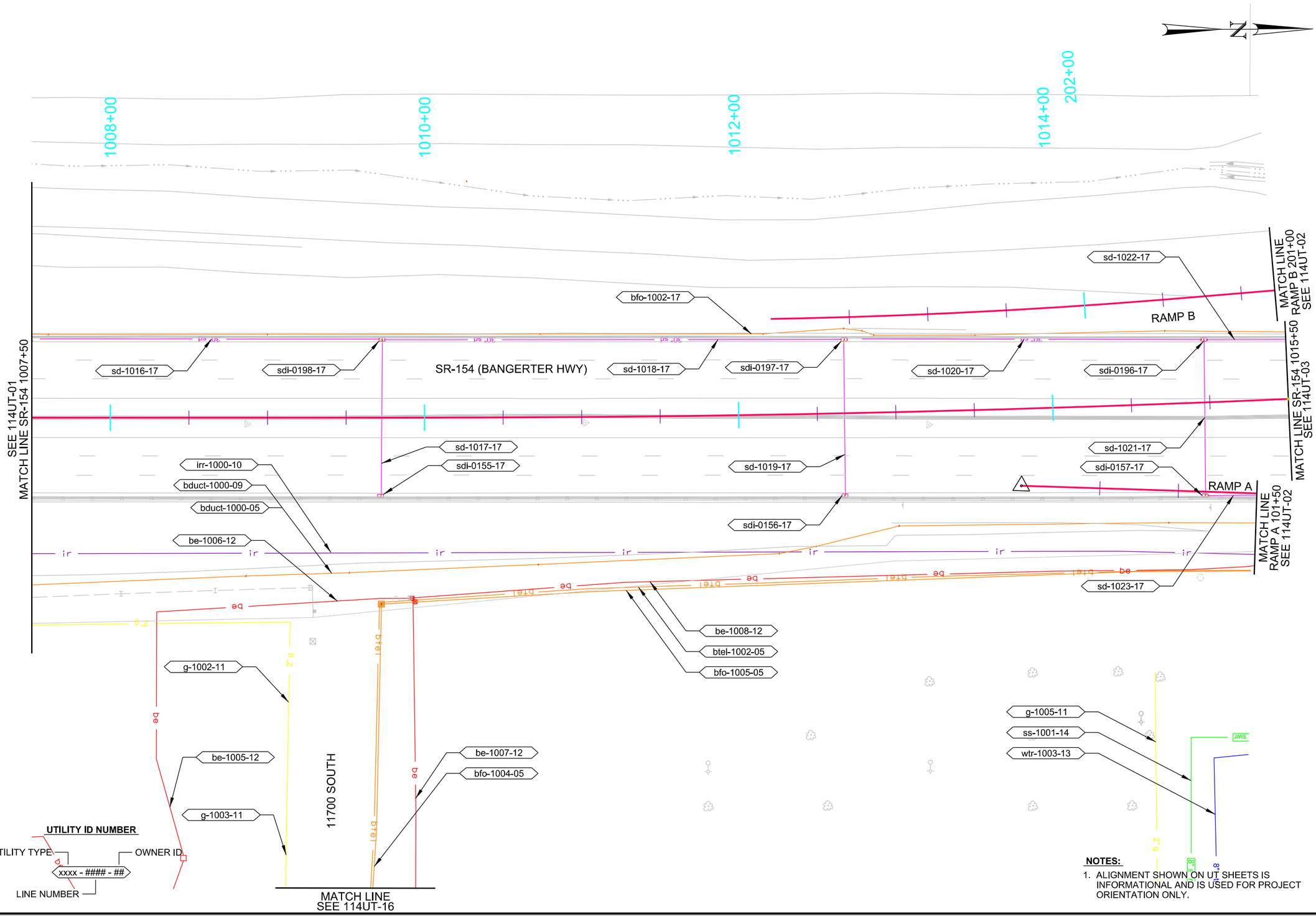

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY	GS
QC CHECKED BY	BDW
DATE	9/15/2016

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT

PROJECT NUMBER	S-0154(12)11
PIN	12566

UTILITIES

SHEET NO. 114UT-02

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9/7/2016

g-1006-11
sd-1029-17
bctv-1004-03
btel-1004-02
wtr-1004-13
ss-1002-14
sdi-560-13
sd-1027-13
sd-1035-13
sd-1034-13
be-1012-12
sd-1036-13
wtr-1006-13
bctv-1005-03
ss-1003-14
sd-1039-13
sd-1040-13
g-1010-11
wtr-1011-13
wtr-1010-13
1016+00
1018+00
1020+00
1022+00
204+00
206+00
208+00
210+00
12" sd
24" sd
8" wtr
21" swr
be
btel
bctv
SEE 114UT-02
MATCH LINE
RAMP B 201+00
RAMP B
sd-1022-17
MATCH LINE
RAMP A 209+00
SEE 114UT-03
SEE 114UT-03
MATCH LINE
SR-154 1015+50
SR-154 (BANGERTER HWY)
sdi-0194-17
sd-1026-17
sdi-0195-17
sd-1028-17
sdi-0193-17
sd-1033-17
bfo-1002-17
sdi-0192-17
sd-1038-17
MATCH LINE SR-154 1023+50
SEE 114UT-04
SEE 114UT-02
MATCH LINE
RAMP A 101+50
sd-1024-17
sd-1023-17
sdi-0158-17
sd-1025-17
sdi-0159-17
RAMP A
sd-1032-17
bduct-1000-05
bduct-1000-09
sdi-0160-17
sd-1037-17
sdi-0161-17
bfo-1011-05
btel-1007-05
be-1010-12
TH114-01
MATCH LINE
RAMP B 109+50
SEE 114UT-04
be-1008-12
be-1009-12
sdi-0372-17
sd-1031-10
btel-1003-05
bfo-1007-05
be-1010-12
irr-1000-10
wtr-1005-13
msd-504-17
be-1015-12
btel-1005-05
btel-1006-05
be-1017-12
bfo-1009-05
bfo-1010-05
be-1016-12
irr-1000-10
wtr-1007-13
wtr-1008-13
ss-1006-14
be-1011-12
bfo-1008-05
wtr-1003-13
ss-1001-14
be-1010-12
102+00
104+00
106+00
108+00
8" swr
8" wtr
ir
be
btel

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HDR

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY

QC CHECKED BY

9/15/2016 DATE

4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PIN 12566

S-0154(12)11

PROJECT

PROJECT NUMBER

UTILITIES

SHEET NO. 114UT-03

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MATCH LINE
RAMP A 209+00
SEE 114UT-03

MATCH LINE
SEE 114UT-03
MATCH LINE SR-154 1023+50

MATCH LINE
RAMP B 110+00
SEE 114UT-03

MATCH LINE
SEE 114UT-05
RAMP C 303+50

MATCH LINE SR-154 1031+50
SEE 114UT-05

MATCH LINE
SEE 114UT-05
RAMP D 403+00

SR-154 (BANGERTER HWY)

SR-175 (11400 SOUTH)

be-1012-12
sd-1040-13
ss-1003-14
be-1020-12
bctv-1007-03
sd-1048-13
wtr-1027-13
wtr-1030-13
irr-1007-10
bfo-1040-17
e-1003-12
be-1092-12
irr-1020-13
irr-1001-04
wtr-1016-13
sdi-0239-17
g-1020-11
sd-1055-17
be-1048-12
irr-1000-04
sd-1080-17
irr-1006-10
irr-1022-13
g-1010-11
g-1016-11
msd-0059-17
sd-1102-13
be-1090-12
sd-1114-13
irr-1014-13
g-1011-11
wtr-1006-13
wtr-1013-13
bctv-1006-03
wtr-1017-13
msd-0040-13
sd-1103-13
msd-0058-13
sd-1094-13
sdi-0237-13
irr-1013-13
sdi-0238-17
sd-1109-17
be-1086-17
bfo-1044-17
bfo-1045-15
bfo-1034-15
g-1015-11
sd-1044-13
wtr-1026-13
bctv-1008-03
irr-1003-10
be-1062-13
sd-1081-13
sdi-0236-17
bfo-1002-17
TH114-02
sdi-0191-17
sd-1038-17
sd-1041-17
sd-1042-17
sdi-0190-17
irr-1003-10
sd-1078-17
sd-1093-17
sdi-0162-17
sd-1052-17
bduct-1000-05
bduct-1000-09
be-1017-12
be-1016-12
btel-1009-05
be-1019-12
bfo-1014-05
bfo-1011-05
btel-1007-05
sdi-0163-17
sd-1053-17
TH114-03
sdi-0164-17
be-1066-13
irr-1000-10
be-1021-12
ms-519-06
btel-1016-02
be-1088-12
btel-1024-02
sd-1110-17
sdi-0216-17
irr-1016-13
irr-1017-13
be-1087-12
g-1012-11
ss-1011-06
ms-515-14
ms-517-99
sdi-0251-17
be-1018-12
ms-520-06
ms-518-99
ss-1021-99
ss-1020-99
irr-1015-13
bctv-1010-03
btel-1023-05
be-1084-12
e-1003-12
g-1013-11
be-1039-12
irr-1003-10
g-1030-11
wtr-1008-13
sd-1049-17
sdi-0252-17
btel-1015-05
bfo-1029-15
bfo-1028-17
be-1067-13
g-1030-11
be-1089-12
sd-1111-17
btel-1008-05
be-1061-12
bfo-1030-02
be-1059-12
bfo-1013-05
wtr-1012-13
ss-1019-14
wtr-1022-13

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

DRAWN BY
QC CHECKED BY
APPROVED
9/15/2016
DATE
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITIES

SHEET NO. 114UT-04

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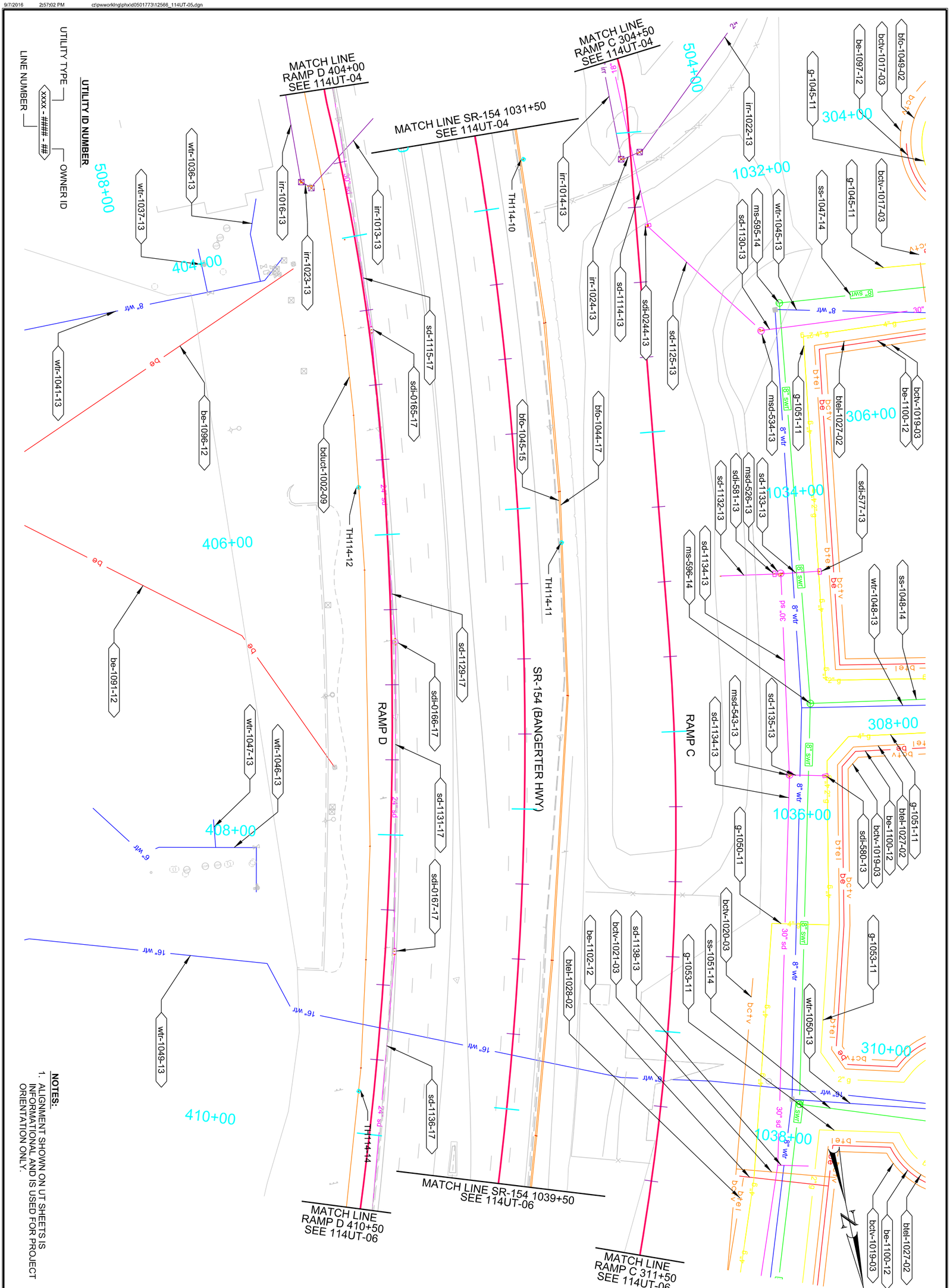

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

SHEET NO. 114UT-05	PROJECT	4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH	UTAH DEPARTMENT OF TRANSPORTATION REGION 2 - HDR			REVISIONS	
	PROJECT NUMBER	S-0154(12)11 PIN 12566	APPROVED	DRAWN BY	GS	NO.	DATE / APPROVED BY / REMARKS
	UTILITIES		PROFESSIONAL ENGINEER 9/15/2016 DATE	QC CHECKED BY	BDW		

ms-599-14
ss-1052-14
ms-598-14
wtr-1051-13
g-1053-11
btel-1027-02
be-1100-12
bctv-1019-03
sd-1141-13
bctv-1020-03
g-1050-11
btel-1028-02
ss-1047-14
wtr-1045-13
ms-600-14
sd-1134-13
g-1049-11
be-1103-12
btel-1029-02
bctv-1022-03
sd-1145-13
MATCH LINE RAMP C 311+50 SEE 114UT-05
RAMP C
bfo-1044-17
bfo-1045-15
SR-154 (BANGERTER HWY)
TH114-15
sdi-0187-17
sdi-512-17
sdi-0186-17
sdi-511-17
sd-1137-17
sdi-0188-17
sdi-513-17
sd-1142-17
sdi-0169-17
sd-1143-17
sdi-0170-17
sd-1147-17
MATCH LINE SR-154 1039+50 SEE 114UT-05
MATCH LINE SR-154 1046+50 SEE 114UT-07
sd-1139-17
sdi-0168-17
sd-1140-17
RAMP D
TH114-16
sdi-576-13
sd-1148-17
MATCH LINE RAMP D 410+50 SEE 114UT-05
MATCH LINE RAMP D 417+50 SEE 114UT-07
bduct-1002-09
bduct-1002-05
sd-1144-13
sd-1146-13
sd-1136-17
412+00
414+00
416+00

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HDR

DRAWN BY: GS
CHECKED BY: BDW
QC
DATE: 9/15/2016
APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITIES

SHEET NO. 114UT-06

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g-1056-11
btel-1030-02
be-1103-12
bctv-1023-03
ss-1047-14
wtr-1045-13
sd-1134-13
ms-602-14
ss-1053-14
wtr-1052-13
g-1057-11
bctv-1023-03
wtr-1053-13
ss-1054-14
g-1057-11
bctv-1023-03
bctv-1026-03
sd-1134-13
ss-1055-14
wtr-1054-13
ms-604-14
ms-601-14
ms-603-14
sd-1154-13
g-1049-11
sd-1151-13
bctv-1024-03
be-1104-12
bctv-1023-03
g-1059-11
bctv-1025-03
g-1049-11
btel-1029-02
be-1103-12
bctv-1022-03
1048+00
1050+00
1052+00
1054+00
8" swr
8" wtr
30" sd
4" g
2" g
btel
be
bctv
bfo-1044-17
bfo-1045-15
sdi-0185-17
sdi-585-17
sdi-0171-17
sd-1149-17
sd-1150-17
sdi-0172-17
sd-1152-17
sd-1153-17
sdi-0184-17
sdi-0183-17
sd-1156-17
sd-1155-17
sdi-0173-17
sd-1148-17
bduct-1002-09
g-1055-11
18" sd
24" sd
2" g
SR-154 (BANGERTER HWY)
RAMP D
MATCH LINE SR-154 1046+50
SEE 114UT-06
MATCH LINE SR-154 1054+50
SEE 114UT-08
MATCH LINE
RAMP D 418+50
SEE 114UT-06

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HDR

DRAWN BY: GS
CHECKED BY: BDW
QC

APPROVED

9/15/2016
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT NUMBER: S-0154(12)11

PIN: 12566

UTILITIES

SHEET NO. 114UT-07

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bctv-1025-03
g-1059-11
ss-1047-14
bctv-1024-03
ms-605-14
bctv
2" g
8" swr
8" wtr
be
bctv-1024-03
be-1104-12
g-1059-11
wtr-1045-13
1056+00
1058+00
1060+00
1062+00
XXX+XX.XX
END CONSTRUCTION
MP XXX.XX
N 371665.721
E 507553.806
bfo-1044-17
bfo-1045-15
sd-1156-17
sdi-0182-17
sd-1158-17
sdi-0180-17
sd-1159-17
SR-154 (BANGERTER HWY)
sdi-0181-17
MATCH LINE
SEE 114UT-07 SR-154 1054+50
sd-1157-17
sdi-0174-17
bduct-1002-09
bduct-1002-05
g-1055-11
2" g

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HDR

APPROVED

9/15/2016 DATE

PROFESSIONAL ENGINEER

DRAWN BY GS

CHECKED BY BDW

QC

4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT

PROJECT NUMBER S-0154(12)11

PIN 12566

UTILITIES

SHEET NO. 114UT-08

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be-1093-12
bctv-1017-03
btel-1026-02
ss-1029-14
g-1045-11
wtr-1038-13
ss-1041-14
ms-594-14
bctv-1017-03
be-1097-12
bfo-1049-02
g-1040-11
g-1039-11
irr-1021-13
irr-1022-13
be-1092-12
irr-1020-13
g-1038-11
be-1036-12
btel-1022-02
be-1078-13
ms-0116-14
sdi-0243-13
be-1082-13
bfo-1033-17
sdi-582-13
msd-546-13
sd-1100-13
be-1040-13
sd-1099-13
msd-0062-13
sd-1102-13
bfo-1043-17
be-1081-17
sd-1098-13
msd-0061-13
bfo-1040-17
sd-1080-17
ms-605-14
irr-1002-04
SR-175 (11400 SOUTH)
sd-1096-13
sdi-519-13
msd-502-13
sd-1082-13
sd-1095-13
irr-1001-04
sdi-583-13
irr-1000-04
ss-1024-14
be-1065-17
sdi-0242-13
g-1023-11
msd-0059-17
be-1048-12
irr-1008-10
g-1028-11
g-1025-11
ms-0117-14
be-1041-12
g-1029-11
be-1063-13
irr-1007-10
ss-1023-14
sd-1055-17
btel-1014-02
sdi-0239-17
g-1010-11
g-1026-11
ms-514-14
g-1024-11
wtr-1030-13
wtr-1027-13
sd-1040-13
g-1020-11
sdi-574-13
be-1020-12
e-1003-12
be-1013-12
g-1008-11
btel-1010-02
sd-1051-13
sdi-573-13
sd-1047-13
wtr-1018-13
ss-1010-14
g-1001-11
wtr-1026-13
wtr-1006-13
be-1020-12
bctv-1008-03
sd-1044-13
bctv-1006-03
sd-1048-13
bctv-1007-03
btel-1010-02

MATCH LINE SR-175 503+50
SEE 114UT-10

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HDR

DRAWN BY GS

QC CHECKED BY BDW

DATE 9/15/2016

APPROVED

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT NUMBER: S-0154(12)11

PIN 12566

UTILITIES

SHEET NO. 114UT-09

9/7/2016 3:26:27 PM c:\pwworking\dgn\x\d0501773\12566_114UT-09.dgn

sd-1125-13
sdi-0244-13
irr-1024-13
irr-1022-13
be-1092-12
irr-1014-13
sd-1114-13
be-1090-12
sdi-0238-17
msd-0040-13
sd-1109-17
sd-1103-13
sd-1102-13
msd-0058-13
bfo-1040-17
e-1003-12
sd-1094-13
sdi-0237-13
sd-1081-13
sd-1080-17
sdi-0236-17
irr-1000-04
be-1048-12
irr-1006-10
irr-1007-10
bctv-1008-03
g-1020-11
wtr-1026-13
sd-1044-13
bfo-1045-15
bfo-1044-17
sd-1115-17
TH114-10
irr-1013-13
irr-1023-13
irr-1016-13
sdi-0164-17
be-1086-17
bfo-1034-15
btel-1024-02
sd-1093-17
be-1066-13
be-1062-13
bduct-1001-09
sd-1053-17
bfo-1002-17
btel-1016-02
sd-1052-17
sdi-0190-17
sdi-0163-17
sd-1042-17
TH114-04
bduct-1000-05
bduct-1000-09
TH114-02
TH114-03
bduct-1002-09
be-1096-12
wtr-1041-13
wtr-1037-13
wtr-1036-13
be-1088-12
sd-1110-17
sdi-0216-17
sd-1111-17
be-1087-12
bctv-1010-03
sdi-0217-17
be-1089-12
g-1037-11
btel-1023-05
irr-1017-13
g-1030-11
msd-0051-17
sd-1078-17
bfo-1029-15
bfo-1028-17
be-1067-13
irr-1003-10
g-1031-11
g-1032-11
bfo-1035-02
g-1030-11
btel-1015-05
be-1061-12
bfo-1030-02
be-1059-12
be-1019-12
btel-1015-05
be-1017-12
be-1016-12
bfo-1030-02
be-1039-12
irr-1000-10
ms-517-99
sdi-0251-17
ss-1021-99
ms-518-99
ss-1020-99
sd-1049-17
btel-1009-05
bfo-1014-05
sdi-0252-17
ms-515-14
ss-1011-06
ss-1038-14
ss-1037-14
ms-611-14
be-1091-12
be-1085-12
be-1083-13
bctv-1011-03
bctv-1012-03
be-1084-12
be-1080-13
g-1036-11
irr-1015-13
be-1079-13
e-1003-12
sdi-0214-17
sd-1079-17
sd-1077-17
sdi-0215-17
sd-1075-17
be-1077-13
be-1071-13
be-1069-13
be-1068-13
be-1045-13
be-1030-12
g-1021-11
btel-1012-05
be-1054-12
bfo-1032-02
be-1049-12
btel-1018-05
be-1037-12
btel-1021-05
ms-516-14
wtr-1022-13
ss-1019-14
wtr-1021-13
RAMP C
RAMP D
504+00
506+00
508+00
510+00
502+00
404+00
1032+00
1030+00
1028+00
SEE 114UT-09
MATCH LINE SR-175 503+50
MATCH LINE SR-175 511+50
SEE 114UT-10
8" wtr
8" swr
18" irr
24" irr
48" sd
30" sd
18" sd
12" sd
10" sd
18" fd
bctv
btel
be
ir
e
g
ps
UTILITY ID NUMBER
UTILITY TYPE
OWNER ID
xxxx - #### - ##
LINE NUMBER
NOTES:
1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS
NO. | DATE | APPROVED BY | REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR
DRAWN BY GS
QC CHECKED BY BDW
APPROVED
9/15/2016 DATE
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH
PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566
UTILITIES
SHEET NO. 114UT-10

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SEE 114UT-14
MATCH LINE 607+20

RIVER HEIGHTS DR

SUMMER HEIGHTS DR

NB SR-175 (11400 SOUTH)

SB SR-175 (11400 SOUTH)

DISTRICT DR

PKWY PLAZA DR

SEE 114UT-10
MATCH LINE SR-175 511+50

MATCH LINE SR-175 519+50
SEE 114UT-12

MATCH LINE SR-175 602+00
SEE 114UT-13

512+00 | 514+00 | 516+00 | 518+00 | 520+00 | 602+00 | 604+00 | 702+00 | 704+00 | 706+00

g-1043-11
bfo-1050-05
be-1094-12
irr-1015-13
bctv-1015-03
bfo-1048-05
sd-1117-13
ss-1030-14
g-1046-11
bctv-1016-03
bfo-1047-03
bfo-1046-05
btel-1025-02
bctv-1014-03
sd-1113-13
irr-1019-13
sd-1116-17
sdi-0211-17
g-1036-11
be-1085-12
btel-1023-05
be-1084-12
bctv-1011-03
bctv-1010-03
be-1083-13
bctv-1013-03
msd-0050-17
sdi-518-17
ms-0003-14
msd-0049-17
ss-1022-14
sdi-0212-17
e-1003-12
be-1071-13
be-1070-12
irr-1003-10
be-1060-13
sd-1076-17
sdi-0213-17
sd-1071-17
bfo-1029-15
bfo-1028-17
be-1045-13
sd-1075-17
be-1030-12
bfo-1032-02
bfo-1031-02
be-1049-12
g-1021-11
be-1046-12
be-1044-12
be-1042-17
btel-1012-05
sdi-0218-17
be-1026-12
be-1028-12
be-1023-12
be-1024-12
sdi-0221-17
sd-1073-17
msd-0053-17
sd-1065-17
wtr-1031-13
sd-1059-17
sdi-0219-17
msd-0052-17
sd-1060-17
sd-1061-17
sdi-0220-17
sd-1057-17
ms-0004-14
g-1009-11
ss-1017-14
irr-1004-10
wtr-1015-13
bfo-1017-05
be-1022-17
wtr-1020-13
wtr-1019-13
g-1034-11
bctv-1009-03
bfo-1042-03
btel-1019-05
bfo-1039-02
irr-1018-13
sd-1112-17
sd-1118-17
sd-1106-17
sd-1104-17
msd-0048-17
sdi-0208-17
sdi-0210-17
sdi-0209-17
bfo-1017-05
btel-1013-02
bfo-1019-05
sd-1067-17
sdi-0222-17
sd-1056-17
sdi-0204-17
sdi-0075-17
be-1027-12
be-1035-12
be-1029-12
be-1034-17
bfo-1023-02
bfo-1026-02
bfo-1020-05
bfo-1027-05
bfo-1025-02
sd-1122-13
ss-1035-14
g-1047-11
wtr-1039-13
g-1042-11
sd-1123-13
wtr-1040-13
wtr-1033-13
g-1041-11
sdi-0207-17
msd-0047-17
be-1074-12
sd-1108-17
sd-1105-17
sd-1107-17
irr-1012-13
sdi-520-17
sdi-517-17
sd-1086-17
msd-0045-17
sd-1083-17
sd-1084-17
sdi-516-17
sd-1074-17
msd-0046-17
sd-1066-17
sdi-0206-17
be-1043-12
sdi-0205-17
be-1043-12
wtr-1028-13
be-1031-12
be-1032-12
sd-1054-17
g-1014-11
ss-1008-14
bfo-1015-05
bfo-1016-05

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HDR

DRAWN BY: GS | CHECKED BY: BDW | QC | DATE: 9/15/2016

APPROVED

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT NUMBER: S-0154(12)11 | PIN: 12566

UTILITIES

SHEET NO. 114UT-11

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ss-1035-14
8" swr
18" sd
be
sd-1122-13
520+00
522+00
524+00
526+00
12" swr
irr-1012-13
g-1034-11
btel-1019-05
bfo-1039-02
be-1074-12
sdi-0226-17
sd-1101-17
sd-1097-17
sd-1091-17
wtr-1032-13
sdi-0225-17
wtr-1035-13
g-1027-11
g-1035-11
bfo-1041-03
irr-1010-13
sd-1089-17
sd-1088-17
msd-0055-17
sd-1092-17
wtr-1034-13
ss-1027-14
ms-0010-14
bfo-1038-03
be-1076-17
be-1075-13
irr-1009-13
be-1072-17
18" irr
4" g
btel
e
bctv-1009-03
bfo-1042-03
wtr-1033-13
sd-1084-17
e-1003-12
sdi-0224-17
msd-0054-17
sdi-0227-17
irr-1011-13
sdi-0228-17
sd-1090-17
sdi-0229-17
sd-1087-17
ss-1026-14
bfo-1036-15
bfo-1037-17
be-1073-17
20" wtr
SR-175 (11400 SOUTH)
SEE 114UT-11
MATCH LINE SR-175 519+50
be-1070-12
24" sd
sdi-0230-17
sd-1070-17
sd-1085-17
be-1058-12
ms-0009-14
ss-1025-14
msd-0056-17
be-1050-17
ir
irr-1003-10
wtr-1031-13
sd-1072-17
sdi-0223-17
sdi-0232-17
sdi-0231-17
sd-1068-17
sdi-0233-17
btel-1011-05
bfo-1018-02
10" wtr
be-1057-13
be-1047-12
be-1053-12
btel-1020-05
btel-1017-05
be-1055-12
g-1021-11
be-1031-12
bfo-1029-15
bfo-1028-17
sd-1069-17
bfo-1024-03
be-1056-17
be-1051-17
be-1038-12
be-1025-12
g-1022-11
be-1052-17
sdi-0235-17
g-1018-11
sd-1063-13
sd-1064-17
msd-0057-17
sd-1062-13
sdi-0234-17
wtr-1024-13
wtr-1025-13
sd-1043-13
ss-1015-14
g-1017-11
wtr-1002-13
wtr-1000-13
g-1004-11
bfo-1025-02
be-1043-12
be-1032-12
bfo-1027-05
bfo-1016-05
irr-1005-10
8" wtr
wtr-1029-13
wtr-1023-13
be-1025-12
bfo-1022-17
sdi-571-13
bfo-1021-15
sd-1050-13
g-1019-11
sdi-578-13
bfo-1006-05
be-1014-17
bfo-1003-15
sd-1046-13
bfo-1012-05
15" swr
6" g

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HDR

DRAWN BY: GS

CHECKED BY: BDW

QC

DATE: 9/15/2016

APPROVED

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT NUMBER: S-0154(12)11

PIN: 12566

UTILITIES

SHEET NO. 114UT-12

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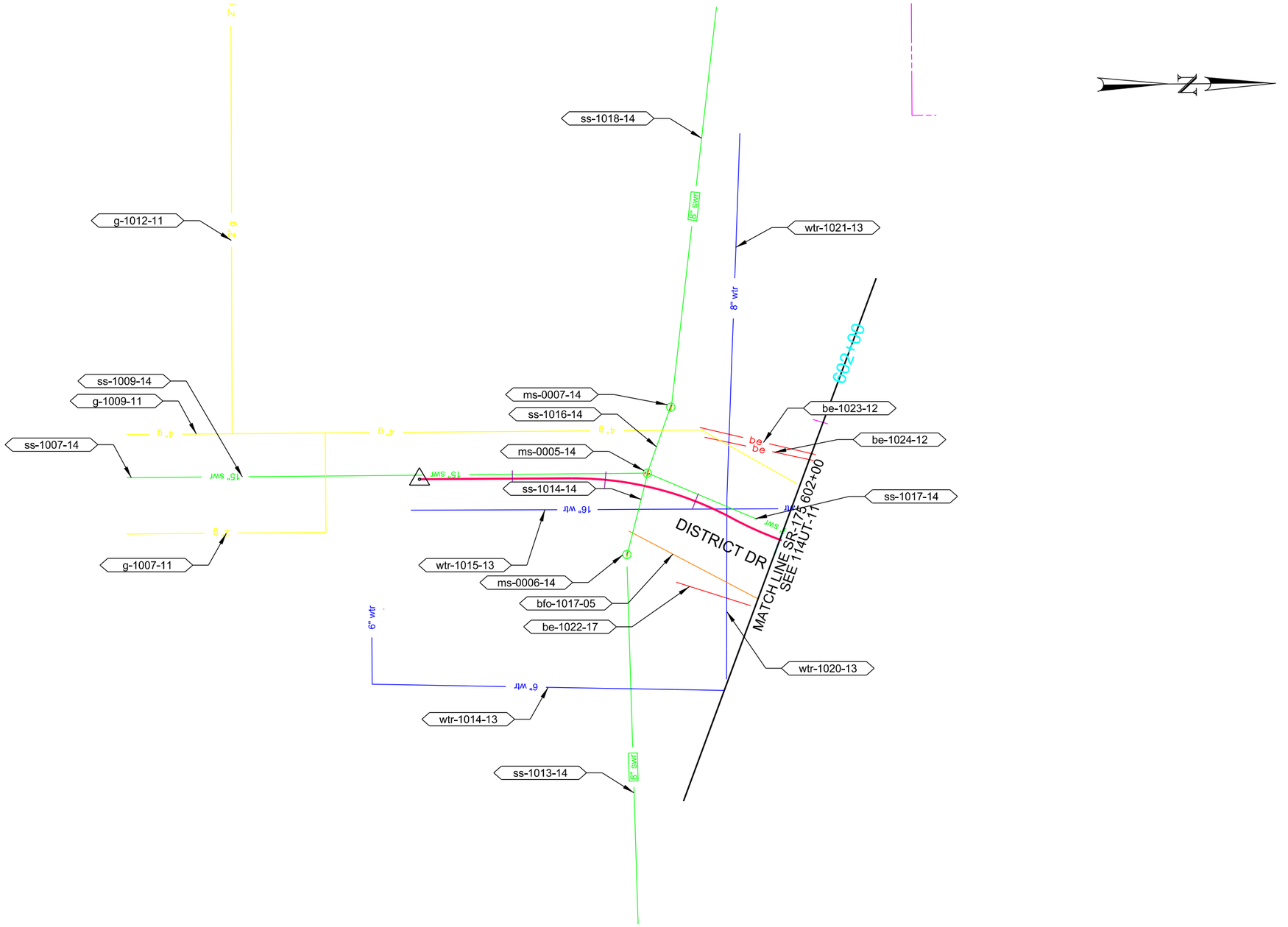

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN BY: GS
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QC

9/15/2016
DATE

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

APPROVED

PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITIES

SHEET NO. 114UT-13

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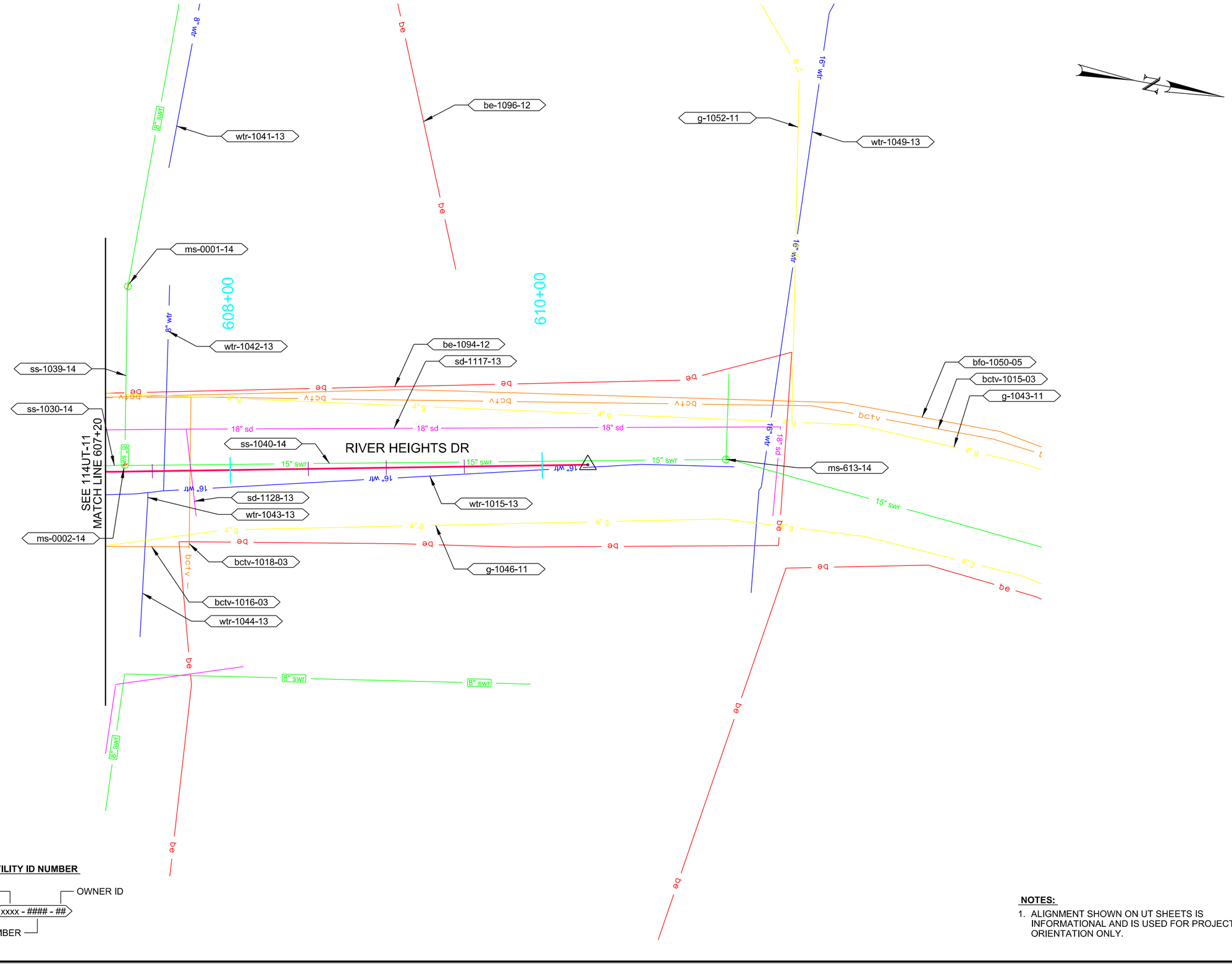

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HDR

APPROVED

PROFESSIONAL ENGINEER

4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PIN 12566

PROJECT S-0154(12)11

PROJECT NUMBER

UTILITIES

SHEET NO. 114UT-14

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sd-1057-17
be-1029-12
be-1034-17
be-1029-12
be-1027-12
be-1035-12
bfo-1023-02
be-1030-12
g-1021-11
bfo-1017-05
bfo-1028-17
bfo-1029-15
sd-1056-17
wtr-1031-13
be-1060-13
bfo-1020-05
sdi-0075-17
sdi-0222-17
sd-1067-17
sdi-0209-17
sdi-0208-17
sd-1112-17
sd-1106-17
msd-0048-17
sd-1118-17
irr-1018-13
sd-1104-17
be-1084-12
bctv-1009-03
bfo-1042-03
ss-1013-14
8" swr
8" sdr
10" wtr
18" sd
18" irr
20" wtr
702+00
704+00
706+00
516+00
518+00
520+00
sdi-0204-17
sd-1058-17
be-1070-12
sdi-0207-17
sd-1122-13
ss-1035-14
ms-608-14
bfo-1015-05
sdi-0205-17
sdi-0206-17
sdi-516-17
msd-0045-17
sd-1086-17
be-1074-12
sd-1108-17
g-1042-11
wtr-1039-13
g-1047-11
sd-1123-13
g-1014-11
ss-1012-14
ss-1008-14
be-1031-12
bfo-1016-05
ms-610-14
wtr-1028-13
be-1032-12
sd-1066-17
sd-1074-17
irr-1003-10
sd-1083-17
msd-0046-17
sd-1084-17
sd-1054-17
bfo-1027-05
be-1043-12
bfo-1025-02
btel-1020-05
irr-1005-10
be-1053-12
btel-1017-05
be-1057-13
be-1047-12
be-1055-12
g-1034-11
msd-0047-17
sdi-517-17
sdi-520-17
sd-1107-17
sd-1105-17
g-1041-11
sd-1127-13
wtr-1040-13
g-1048-11
btel-1019-05
bfo-1039-02
irr-1012-13
e-1003-12
wtr-1033-13
8" wtr
4" g
6" g

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HDR

APPROVED

9/15/2016
DATE

PROFESSIONAL ENGINEER

DRAWN BY	GS
QC CHECKED BY	BDW

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT NUMBER: S-0154(12)11

PIN: 12566

UTILITIES

SHEET NO. 114UT-15

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SEE SHEET 114UT-02

11700 SOUTH

SEE SHEET 114UT-17

wtr-1201-13
ss-1207-14
sd-1259-13
sd-1234-13
be-1007-12
be-1211-12
ss-1205-14
be-1211-12
be-1209-12
bfo-1004-05
sd-1258-13
wtr-1208-13
g-1211-11
sd-1252-13
btel-1002-05
wtr-1202-13
sd-1253-13
sdi-546-13
g-1003-11
sd-1248-13
sd-1245-13
msd-520-13
sd-1251-13
sd-1238-13
bctv-1203-03
msd-521-13
ss-1203-14
bctv-1202-03
sd-1233-13
sd-1236-13
be-1207-12
btel-1208-02
btel-1204-02
ss-1202-14
g-1208-11
sdi-552-13
bfo-1003-15
sd-1235-13
msd-517-13
msd-533-13
g-1204-11
sd-1231-13
sd-1232-13
msd-518-13
msd-519-13
be-1206-12
g-1206-11
sd-1230-13
g-1202-11
be-1203-12
ss-1201-14
bctv-1201-03
bfo-1202-05
be-1204-12
btel-1203-02
g-1207-11
be-1201-12

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HDR

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY	CHECKED BY	QC
GS	BDW	

9/15/2016 DATE

4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PIN 12566

PROJECT S-0154(12)11

PROJECT NUMBER

UTILITIES

SHEET NO. 114UT-16

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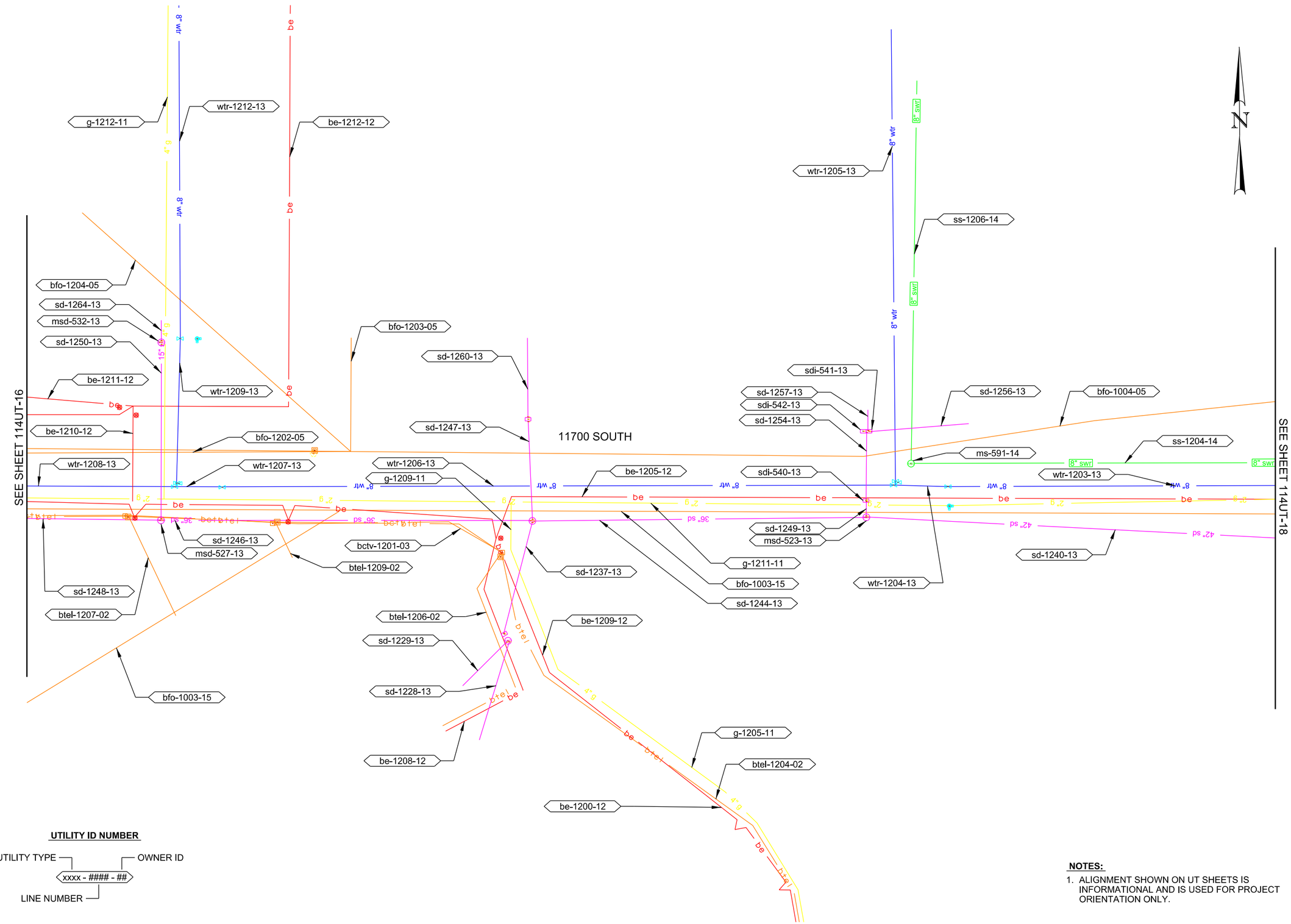
9/7/2016 4:18:01 PM



UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

NO.	DATE	REVISIONS	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HDR

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY GS

QC CHECKED BY BDW

DATE 9/15/2016

4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT

PROJECT NUMBER S-0154(12)11

PIN 12566

UTILITIES

SHEET NO. 114UT-17

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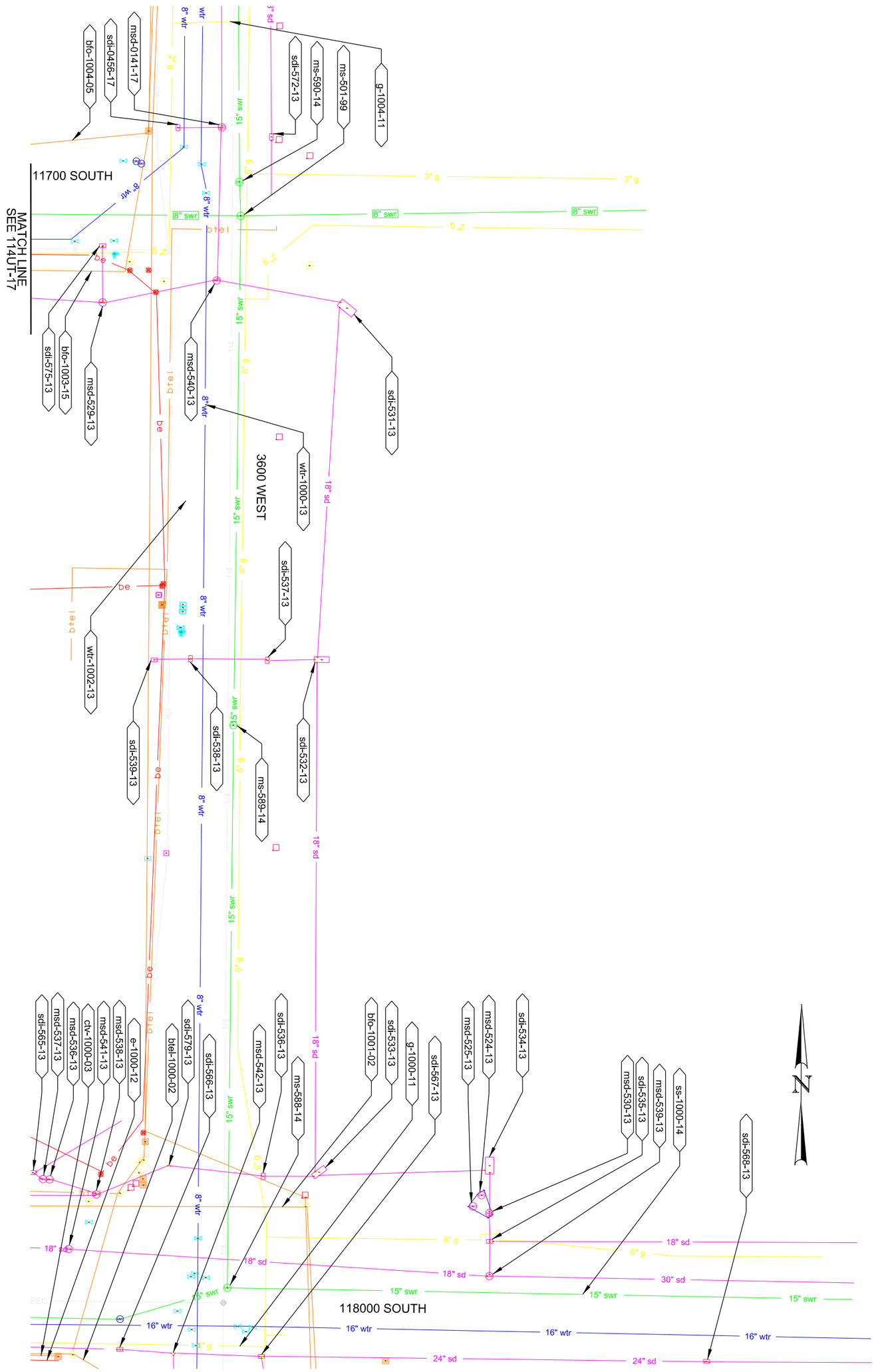

SHEET NO. 114UT-18	PROJECT	4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH		UTAH DEPARTMENT OF TRANSPORTATION REGION 2 - HDR			REVISIONS	
	PROJECT NUMBER	S-0154(12)11	PIN 12566	APPROVED	DRAWN BY	GS	NO.	DATE / APPROVED BY / REMARKS
	UTILITIES			PROFESSIONAL ENGINEER — 9/15/2016 DATE	QC CHECKED BY	BDW		

2020+00
2022+00
2024+00
2026+00

be
be - 9048 - 12
2020+00.00
BEGIN CONSTRUCTION
S-0154(12)11
MP 10.76
N 381577.689
E 508222.346
bduct - 9004 - 05
bduct - 9004 - 09
bfo - 9011 - 17
bfo - 9031 - 15
sd - 9064 - 17
sdi - 0349 - 17
sd - 9060 - 17
sd - 9065 - 17
sdi - 0348 - 17
sd - 9066 - 17
ms - 0090 - 19
ss - 9019 - 19
12" swr
sdi - 0355 - 19
24" sd
sd - 9077 - 19
msd - 0095 - 17
sd - 9076 - 17
sd - 9033 - 17
sdi - 0347 - 17
sd - 9121 - 17
sdi - 0279 - 17
duct
bfo
42" sd
30" sd
SR-154 (BANGERTER HWY)
MATCH LINE SR-154 2027+00
SEE 90UT-02
sdi - 0277 - 17
sd - 9067 - 17
sdi - 0278 - 17
ms - 0089 - 19
wtr - 9001 - 01
78" wtr
sdi - 0280 - 17
sd - 9059 - 17
sdi - 0281 - 17
sd - 9058 - 17
sdi - 0282 - 17
wtr - 9044 - 01
sd - 9034 - 17
ss - 9020 - 19
54" sd

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY VR
MM/DD/YY DATE

APPROVED
PROFESSIONAL ENGINEER

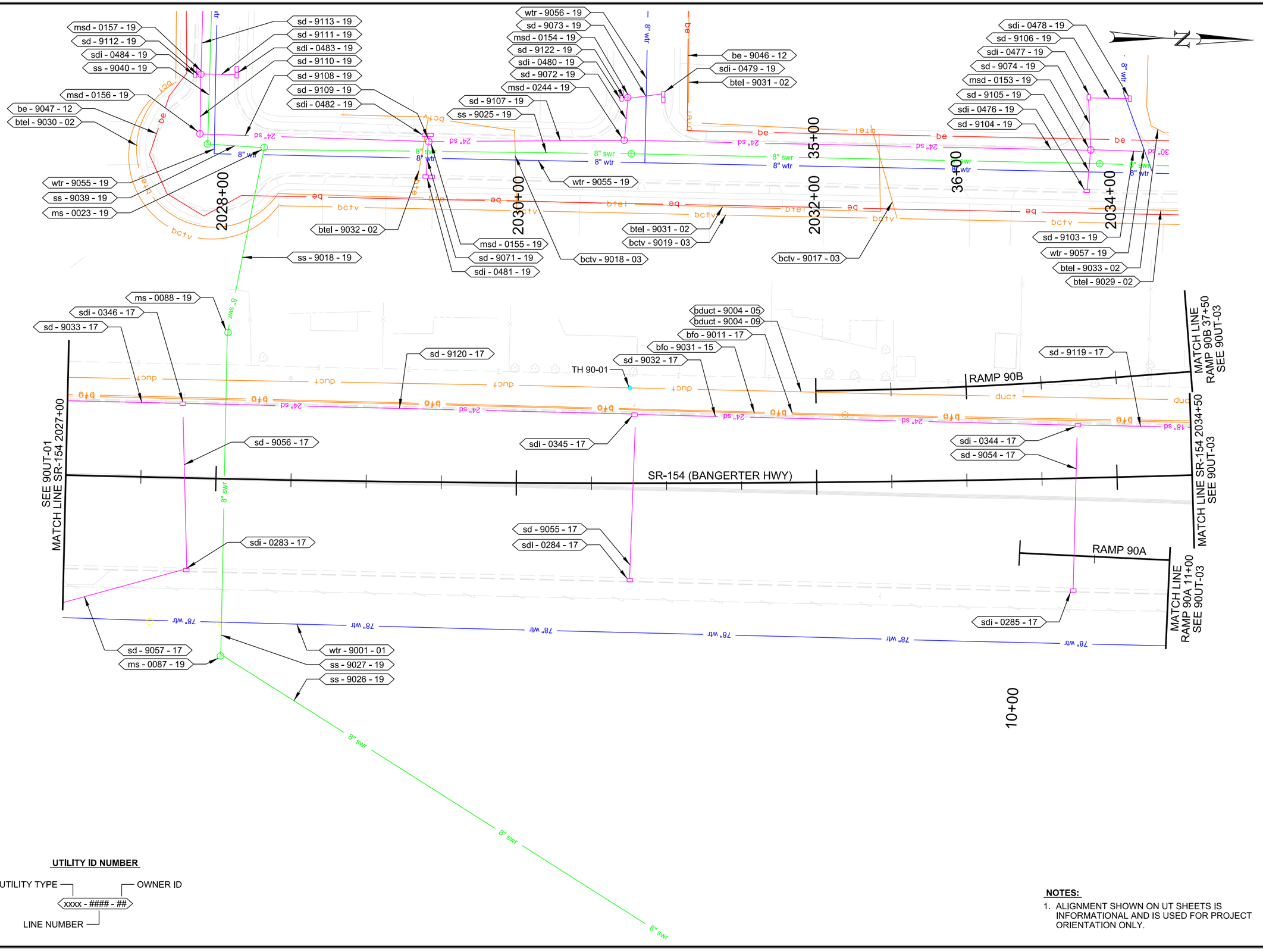
4 INTERCHANGES ON
BANGERTER HIGHWAY - 9000 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY

SHEET NO. 90UT-01

9/6/2016 2:07:51 PM pw://ow.horrocks.com:PWPrimary/Documents/Projects/2016/PG-565-1604 Bangerter 4 Interchanges PM-12566/Sheet_Files/Utilities/12566_90UT-01.dgn



UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH

QC CHECKED BY VR

APPROVED

MM/DD/YY

DATE

PROFESSIONAL ENGINEER

4 INTERCHANGES ON

BANGERTER HIGHWAY - 9000 SOUTH

PROJECT

PROJECT NUMBER S-0154(12)11

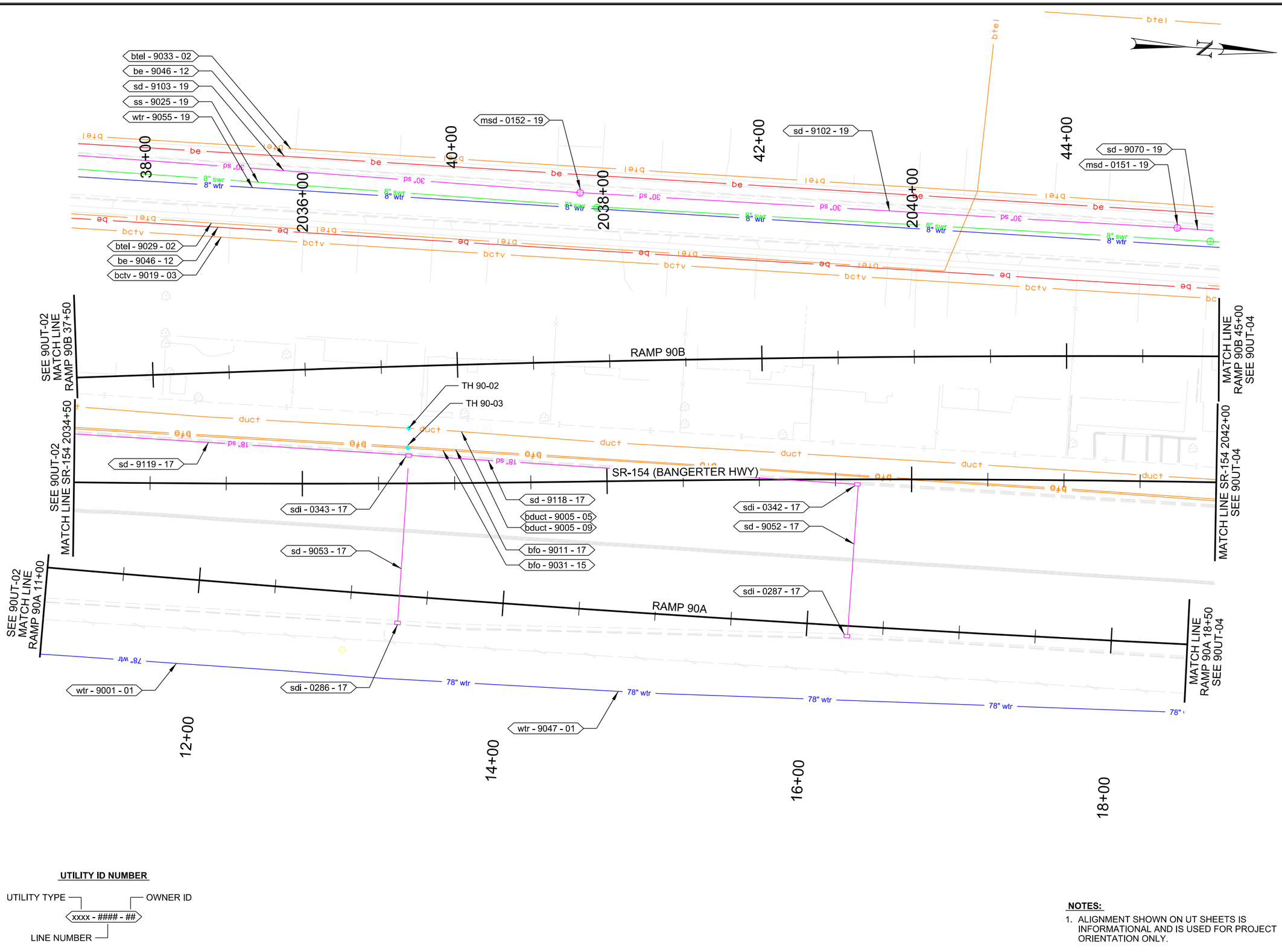
PIN 12566

UTILITY

SHEET NO. 90UT-02

pw:\\pw.horrocks.com\PWPrimary\Documents\Projects\2016\PG-665-1604 Bangerter 4 Interchanges PM\12566\Sheet_Files\Utilities\12566_90UT-02.dgn

9/6/2016 2:07:54 PM



UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY KKH

QC CHECKED BY VR

DATE MM/DD/YY

4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH

PROJECT

PROJECT NUMBER S-0154(12)11

PIN 12566

UTILITY

SHEET NO. 90UT-03

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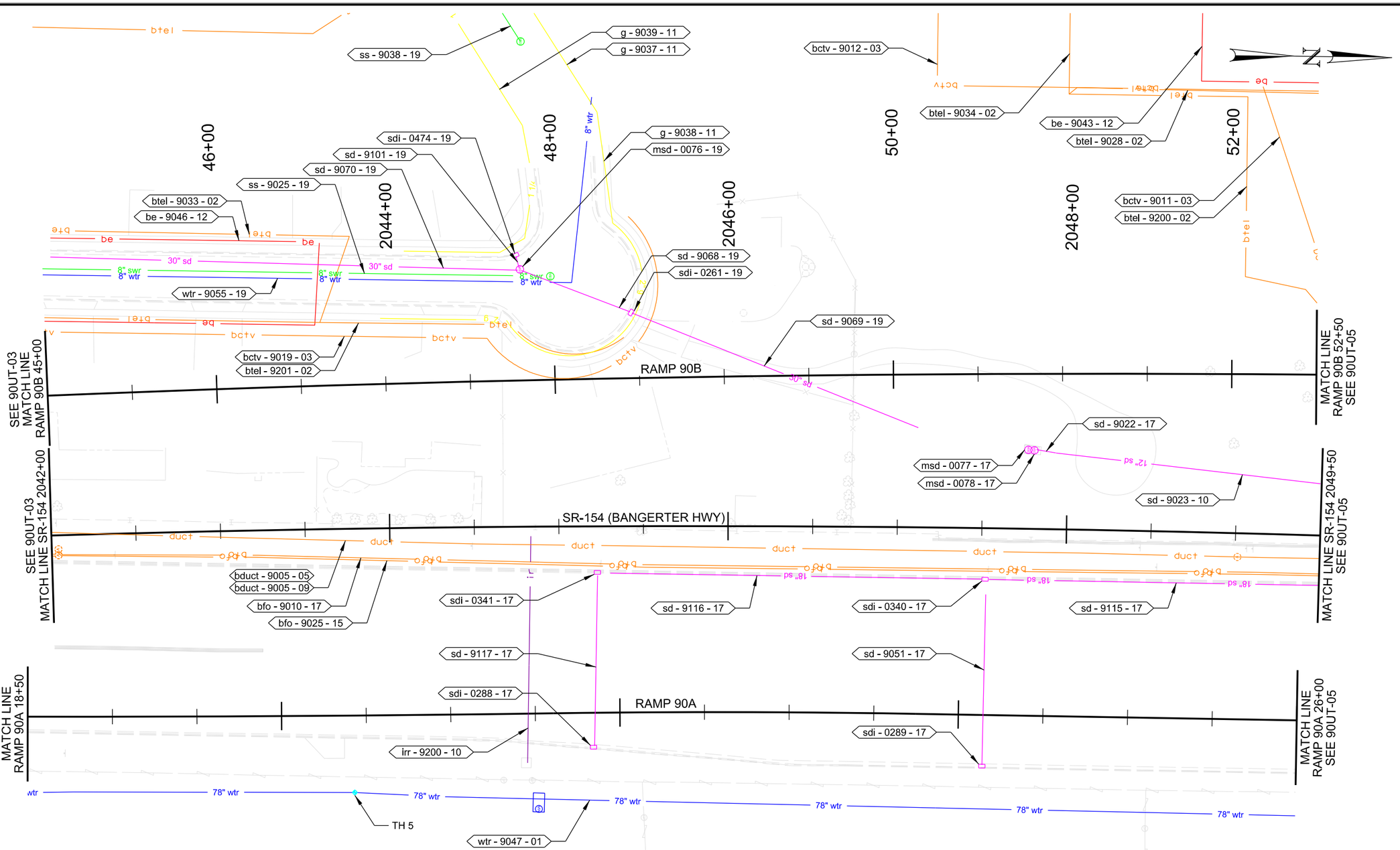

UTILITY ID NUMBER

UTILITY TYPE — xxxx - #### - ## — OWNER ID

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: VR
DATE: MM/DD/YY

APPROVED

PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 9000 SOUTH

PROJECT
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITY

SHEET NO. 90UT-04

9/6/2016 2:08:00 PM pw://ow.horrocks.com/PWPrimary/Documents/Projects/2016/PG-565-1604 Bangerter 4 Interchanges PM-12566/Sheet_Files/Utilities/12566_90UT-04.dgn

g - 9007 - 11
bfo - 9026 - 15
TH 90-09
bfo - 9000 - 17
TH 90-08
TH 90-06
sd - 9017 - 19
wtr - 9012 - 19
msd - 0073 - 19
TH 90-07
sd - 9018 - 19
ss - 9000 - 19
bfo - 9001 - 02
btel - 9028 - 02
wtr - 9054 - 19
msd - 0074 - 19
sd - 9019 - 19
ms - 0022 - 19
ss - 9014 - 19
msd - 0075 - 19
bctv - 9011 - 03
btel - 9200 - 02
be - 9043 - 12
g - 9036 - 11
sd - 9091 - 19
mw - 0002 - 19
bfo - 9024 - 15
bduct - 9005 - 05
bduct - 9005 - 09
bduct - 9001 - 05
bduct - 9001 - 09
bfo - 9010 - 17
bfo - 9025 - 15
sd - 9130 - 17
ms - 0073 - 19
g - 9005 - 11
sdi - 0293 - 19
be - 9014 - 17
be - 9015 - 17
sd - 9020 - 19
sd - 9024 - 17
sd - 9115 - 17
sdi - 0339 - 17
TH 90-04
sdi - 0338 - 17
sd - 9048 - 17
be - 9013 - 17
ss - 9007 - 19
sd - 9025 - 17
sdi - 0291 - 17
sd - 9001 - 17
ms - 0074 - 19
ss - 9015 - 19
g - 9013 - 11
sd - 9050 - 17
sdi - 0290 - 17
wtr - 9047 - 01
sd - 9049 - 17
TH 90-28
TH 90-29
TH 90-29A
TH 90-15
be - 9016 - 17
ms - 0075 - 19
wtr - 9006 - 19
ss - 9009 - 19
wtr - 9004 - 01
sdi - 0292 - 17
g - 9004 - 11
ms - 0076 - 19
bfo - 9009 - 17
wtr - 9009 - 19
ss - 9008 - 19
bfo - 9019 - 02
wtr - 9007 - 19
btel-9038-02
btel-9014-02
btel-9015-02
sd - 9092 - 10
sd - 9094 - 10
msd - 0085 - 19
sd - 9093 - 10
wtr - 9011 - 19
bfo - 9003 - 03
bctv - 9005 - 03
msd - 0086 - 19
sd - 9095 - 10
btel - 9012 - 02
sd - 9079 - 10
msd - 0087 - 19
sd - 9096 - 10
msd - 0088 - 19
sd - 9080 - 10
sd - 9097 - 10
sd - 9081 - 10
msd - 0089 - 19
sd - 9098 - 10
TH 90-12
sd - 9099 - 10
msd - 0090 - 19
sd - 9100 - 10
sdi - 0273 - 19
sd - 9021 - 19
bfo - 9016 - 15
be - 9011 - 17
bfo - 9015 - 17
bfo - 9014 - 15
be - 9012 - 17
bduct - 9003 - 05
bduct - 9003 - 09
TH 90-13
bduct - 9001 - 05
bduct - 9001 - 09
sd - 9123 - 17
sdi - 0336 - 17
sd - 9047 - 17
TH - 6
btel - 9000 - 02
bctv - 9006 - 03
bfo - 9004 - 03
wtr - 9005 - 19
g - 9002 - 11
e - 9000 - 12
be - 9017 - 17
btel-9013-02
be-9006-12
bfo-9017-03
bfo-9018-03
btel-9027-02
bfo-9005-02
bctv-9007-03
wtr - 9000 - 01
sdi - 0294 - 17
bfo - 9015 - 17
bfo - 9014 - 15
be - 9029 - 12
bfo - 9032 - 03
bfo - 9028 - 02
g - 9001 - 11
wtr - 9021 - 19
sdi - 0336 - 17
sd - 9047 - 17

54+00
2050+00
2052+00
9000 SOUTH
2054+00
64+00
2056+00
80+00
62+00
56+00
60+00
28+00
82+00
30+00
84+00

SEE 90UT-04
MATCH LINE
RAMP 90B 52+50

RAMP 90B

SEE 90UT-04
MATCH LINE SR-154 2049+50

SR-154 (BANGERTER HWY)

MATCH LINE SR-154 2057+00
SEE 90UT-06

RAMP 90C

MATCH LINE
RAMP 90C 66+00
SEE 90UT-06

SEE 90UT-04
MATCH LINE
RAMP 90A 26+00

RAMP 90A

RAMP 90D

MATCH LINE
RAMP 90D 85+00
SEE 90UT-06

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	ADDED TESTHOLES AND UPDATED UTILITIES.

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH

QC CHECKED BY VR

DATE MM/DD/YY

APPROVED

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH

PROJECT NUMBER: S-0154(12)11

PIN: 12566

UTILITY

SHEET NO. 90UT-05

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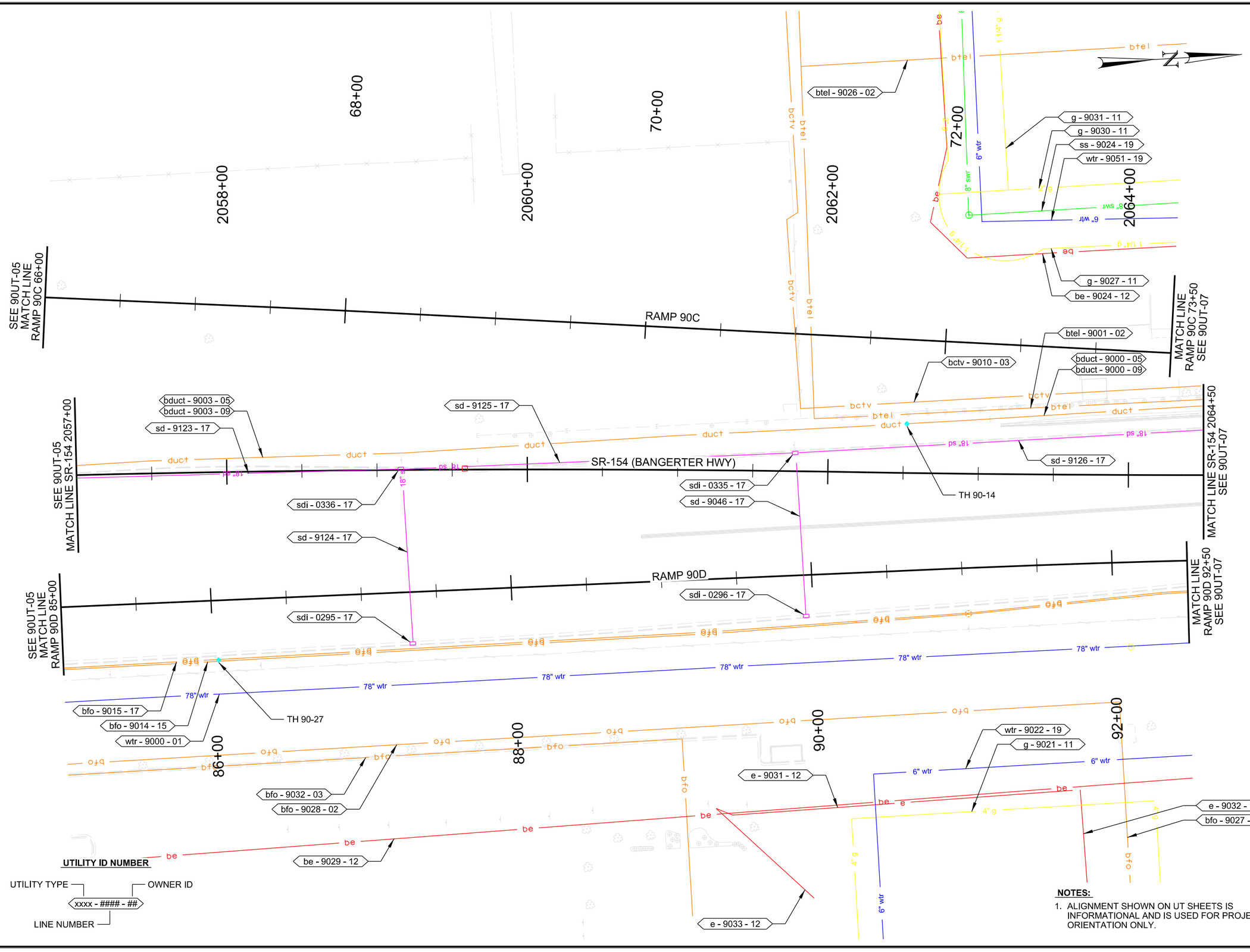

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: VR
DATE: MM/DD/YY

APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITY

SHEET NO. 90UT-06

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74+00
76+00
2066+00
2068+00
78+00
2070+00
btel
bte
btel - 9026 - 02
g - 9030 - 11
ss - 9024 - 19
wtr - 9051 - 19
g - 9027 - 11
be - 9024 - 12
wtr - 9050 - 19
ss - 9037 - 19
sd - 9088 - 19
ss - 9024 - 19
wtr - 9046 - 08
e - 9002 - 12
sd - 9087 - 19
ss - 9024 - 19
ss - 9023 - 19
sd - 9086 - 19
sd - 9000 - 19
bctv - 9010 - 03
btel - 9001 - 02
bduct - 9000 - 05
bduct - 9000 - 09
SEE 90UT-06
MATCH LINE
RAMP 90C 73+50
RAMP 90C
SEE 90UT-06
MATCH LINE SR-154 2064+50
sd - 9127 - 17
sdi - 0334 - 17
sd - 9126 - 17
sdi - 0333 - 17
sd - 9004 - 17
sdi - 0332 - 17
sd - 9083 - 17
sdi - 0331 - 17
SR-154 (BANGERTER HWY)
MATCH LINE SR-154 2072+00
SEE 90UT-08
sd - 9082 - 17
sd - 9128 - 17
sdi - 0298 - 17
sd - 9129 - 17
sd - 9003 - 17
sdi - 0299 - 17
SEE 90UT-06
MATCH LINE
RAMP 90D 92+50
RAMP 90D
TH 90-18
TH 90-19
TH 90-20
TH 90-21
TH 90-22
TH 90-23
sdi - 0297 - 17
bfo - 9014 - 15
bfo - 9015 - 17
78" wtr
btel - 9020 - 02
wtr - 9000 - 01
wtr - 9046 - 08
wtr - 9036 - 19
wtr - 9007 - 99
btel - 9021 - 02
wtr - 9035 - 19
btel - 9008 - 02
be - 9029 - 12
wtr - 9022 - 19
6" wtr
8" wtr
12" wtr
20" wtr
18" sd
48" sd

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY	CHECKED BY	QC	DATE
KKH	VR		MM/DD/YY

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH

PIN: 12566

PROJECT NUMBER: S-0154(12)11

UTILITY

SHEET NO. 90UT-07

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wtr - 9049 - 19
ss - 9035 - 19
btel - 9005 - 02
ss - 9036 - 19
ctv - 9009 - 03
wtr - 9042 - 19
wtr - 9037 - 19
wtr - 9038 - 19
e - 9003 - 12
btel - 9040 - 02
btel - 9024 - 02
btel - 9003 - 02
ss - 9034 - 19
g - 9026 - 11
btel - 9039 - 02
ss - 9033 - 19
2074+00
2076+00
2078+00
sd - 9086 - 19
wtr - 9040 - 19
ss - 9023 - 19
wtr - 9039 - 19
wtr - 9006 - 99
sd - 9086 - 19
wtr - 9036 - 19
ss - 9034 - 19
sd - 9085 - 19
btel - 9004 - 02
sd - 9086 - 19
bctv - 9001 - 03
bduct - 9002 - 05
bduct - 9002 - 09
bduct - 9000 - 05
bduct - 9000 - 09
sd - 9129 - 17
sdi - 0330 - 17
sd - 9084 - 17
sdi - 0329 - 17
sd - 9009 - 17
sdi - 0326 - 17
sd - 9043 - 17
msd - 0094 - 17
sd - 9008 - 17
sdi - 0325 - 17
sd - 9041 - 17
msd - 0093 - 17
SEE 90UT-07
MATCH LINE SR-154 2072+00
SR-154 (BANGERTER HWY)
MATCH LINE SR-154 2079+50
SEE 90UT-09
sd - 9045 - 17
sdi - 0300 - 17
sd - 9044 - 17
sdi - 0301 - 17
sd - 9007 - 17
sd - 9042 - 17
sdi - 0302 - 17
TH 90-24
bfo - 9015 - 17
bfo - 9014 - 15
wtr - 9002 - 01
btel - 9020 - 02
wtr - 9000 - 01
btel - 9021 - 02
btel - 9002 - 02
wtr - 9046 - 08
wtr - 9032 - 19
e - 9002 - 12
btel - 9022 - 02
wtr - 9036 - 19
wtr - 9033 - 19
wtr - 9031 - 19
be - 9018 - 12
sd - 9089 - 19
g - 9020 - 11
ctv - 9004 - 03
wtr - 9034 - 19
g - 9018 - 11
ss - 9022 - 19
btel - 9040 - 02
btel - 9023 - 02

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY	CHECKED BY
KKH	VR
QC	
MM/DD/YY	
DATE	

4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH

PIN 12566

S-0154(12)11

UTILITY

PROJECT

PROJECT NUMBER

SHEET NO. 90UT-08

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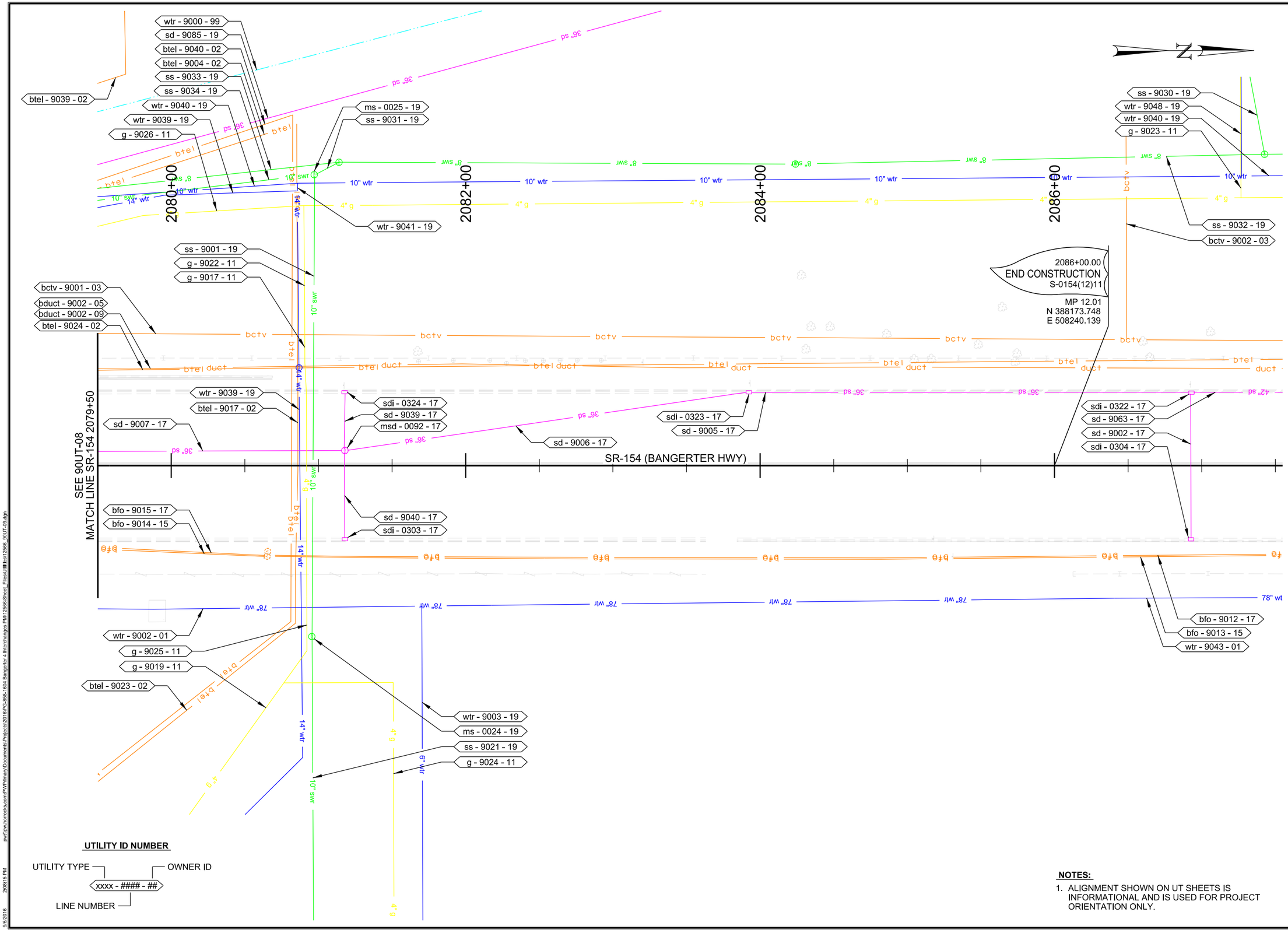

NOTES:

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UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

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PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
UTILITY

SHEET NO. 90UT-09

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600+00
602+00
604+00
603+00.00
BEGIN CONSTRUCTION
S-0154(12)11
N 384884.252
E 507474.286
9000 SOUTH
MATCH LINE 9000 S 606+00
SEE 90UT-11
wtr - 9052 - 19
ss - 9029 - 19
wtr - 9018 - 19
btel - 9007 - 02
be - 9040 - 12
be - 9037 - 12
btel - 9037 - 02
fo - 9002 - 03
e - 9000 - 12
sd - 9061 - 19
msd - 0080 - 19
sd - 9011 - 19
sd - 9010 - 19
wtr - 9011 - 19
wtr - 9006 - 19
bfo - 9019 - 02
ss - 9004 - 19
sd - 9013 - 19
ms - 0015 - 19
ss - 9002 - 19
ss - 9003 - 19
be - 9004 - 12
wtr - 9010 - 19
bctv - 9008 - 03
g - 9008 - 11
g - 9006 - 11
g - 9032 - 11
e - 9044 - 12
msd - 0068 - 19
msd - 0069 - 19
sd - 9014 - 19
g - 9009 - 11
wtr - 9019 - 19
ms - 0017 - 19
ss - 9012 - 19
g - 9010 - 11
g - 9034 - 11
be - 9038 - 12
btel - 9006 - 02
bctv - 9016 - 03
sd - 9012 - 19
msd - 0079 - 19
sd - 9038 - 19
btel - 9009 - 02
wtr - 9016 - 19
wtr - 9017 - 19
bfo - 9020 - 02
msd - 0070 - 19
g - 9007 - 11
ss - 9005 - 19
sd - 9015 - 19
wtr - 9020 - 19
btel - 9037 - 02
bctv - 9015 - 03
e - 9045 - 12
ss - 9006 - 19
sd - 9078 - 19
btel - 9018 - 02
ms - 0019 - 19
msd - 0071 - 19
sd - 9016 - 19
bctv - 9014 - 03
btel - 9010 - 02
btel - 9011 - 02
wtr - 9009 - 19
bfo - 9026 - 15
bfo - 9000 - 17
g - 9033 - 11
ss - 9028 - 19
bfo - 9030 - 02
btel - 9035 - 02
btel - 9036 - 02
g - 9035 - 11
be - 9001 - 12
be - 9005 - 12
bfo - 9003 - 03
bctv - 9005 - 03
bctv - 9000 - 03
g - 9012 - 11
wtr - 9014 - 19
g - 9002 - 11
sd - 9017 - 19
msd - 0072 - 19
bctv - 9000 - 03
wtr - 9015 - 19
ms - 0020 - 19
ss - 9000 - 19
g - 9011 - 11
ss - 9013 - 19
bctv - 9013 - 03
wtr - 9054 - 19
g - 9036 - 11
btel - 9034 - 02

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
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APPROVED
PROFESSIONAL ENGINEER
MM/DD/YY
DATE

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
UTILITY

SHEET NO. 90UT-10

9/6/2016 2:08:18 PM
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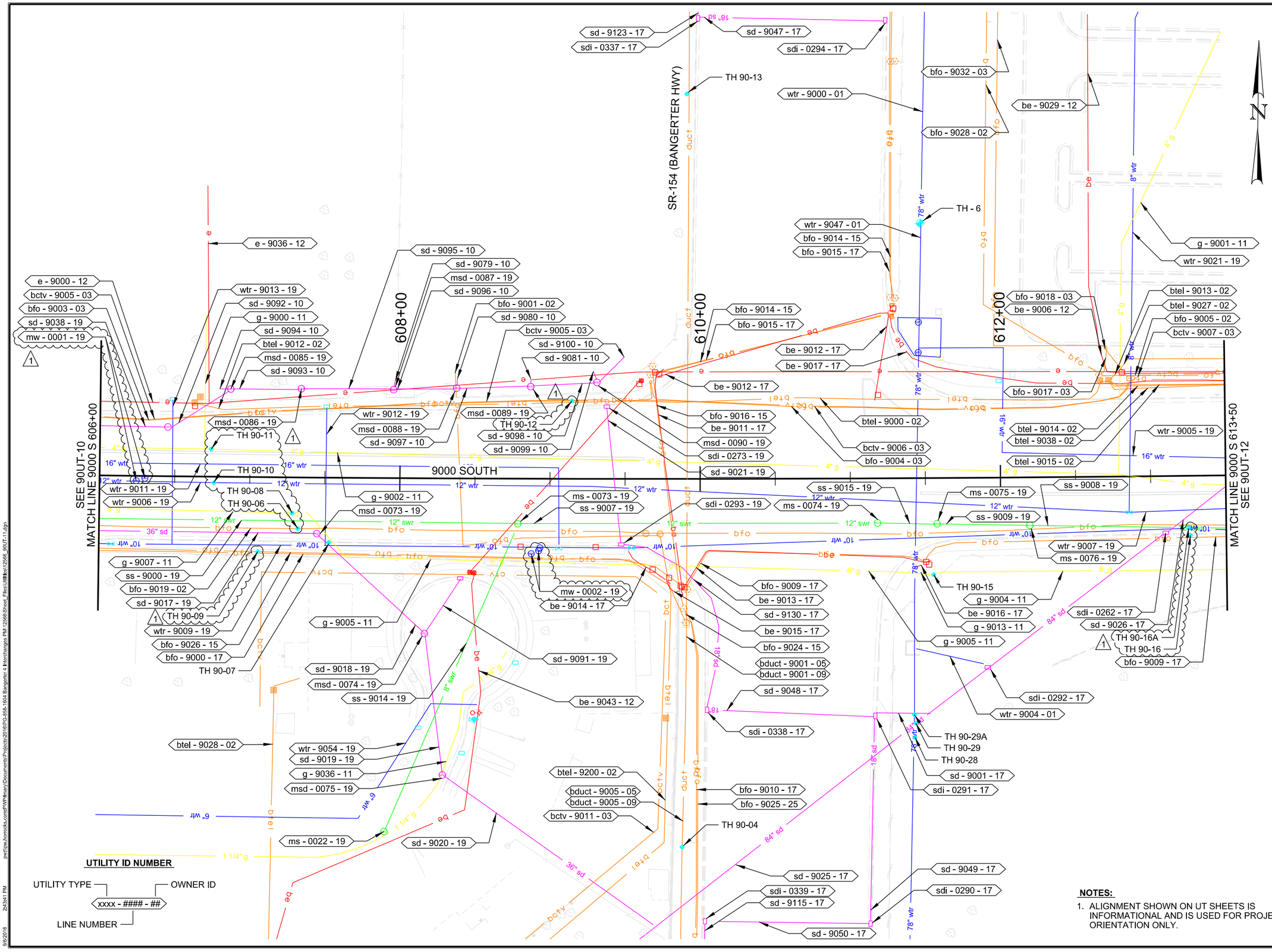


REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	ADDED TESTHOLES AND UPDATED UTILITIES.

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY KKH
QC CHECKED BY VR
MM/DD/YY
DATE

4 INTERCHANGES ON
BANGERTER HIGHWAY - 9000 SOUTH

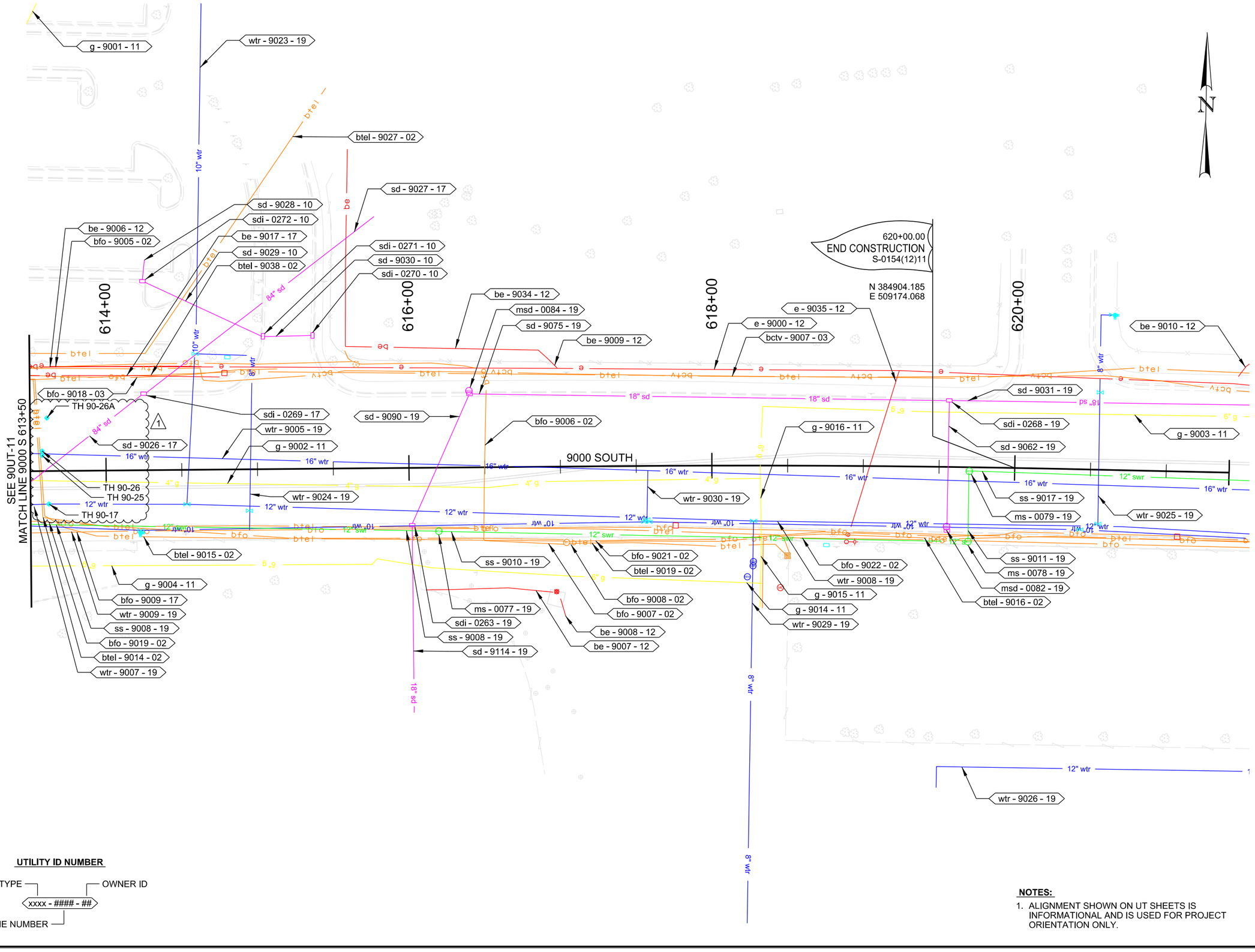
PROJECT

PROJECT NUMBER S-0154(12)111
PIN 12566

UTILITY

SHEET NO. 90UT-11

9/6/2016 2:43:41 PM pw:\\pw.horrocks.com\PWPrimary\Documents\Projects\2016\PG-858-1604 Bangerter 4 Interchanges PM\12566\Sheet_Files\UtilMaps\12566_90UT-11.dgn



UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	ADDED TESTHOLES.

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH | CHECKED BY VR | QC

APPROVED

PROFESSIONAL ENGINEER

MM/DD/YY
DATE

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH

PROJECT NUMBER: S-0154(12)11 | PIN 12566

UTILITY

SHEET NO. 90UT-12

9/6/2016 2:08:28 PM pw:\\ow.horrocks.com\PWPrimary\Documents\Projects\2016\PG-858-1604 Bangerter 4 Interchanges PM:12566\Sheet_Files\Utilities\12566_90UT-12.dgn

3000+00

3000+00.00
BEGIN CONSTRUCTION
S-0154(12)11
MP 13.32
N 395062.892
E 508492.619

3002+00

be - 7029 - 12
be - 7016 - 17
wtr - 7005 - 01
be - 7030 - 12
ss - 7030 - 19
ss - 7001 - 19
sd - 7009 - 19
msd - 0128 - 19
sd - 7036 - 19
sd - 7093 - 19
sd - 7010 - 19
12" sd
21" swr
be
78" wtr
sdi - 0408 - 19
sdi - 0409 - 17
SR-154 (BANGERTER HWY)
MATCH LINE SR-154 3004+00
SEE 70UT-02
sd - 7101 - 17
18" sd
msd - 0124 - 17
sd - 7102 - 17
sdi - 0410 - 17
42" sd
sd - 7040 - 17
bfo
duct
24" sd
sd - 7106 - 19
g - 7009 - 11
3" g
bduct - 7001 - 05
bduct - 7001 - 09
sd - 7033 - 17
bfo - 7012 - 15
bfo - 7006 - 17
sd - 7011 - 17
bfo - 7013 - 17
bduct - 7000 - 05
bduct - 7000 - 09
1 1/4" g
be - 7039 - 12
g - 7030 - 11
wtr - 7034 - 19
6" wtr
g - 7029 - 11
wtr - 7035 - 19
be - 7038 - 12
be - 7037 - 12
be - 7038 - 12

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEET IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY	QC CHECKED BY
KKH	WLS

MM/DD/YY
DATE

4 INTERCHANGES ON
BANGERTER HIGHWAY - 7000 SOUTH

PROJECT

PROJECT NUMBER: S-0154(12)11

PIN: 12566

UTILITY

SHEET NO. 70UT-01

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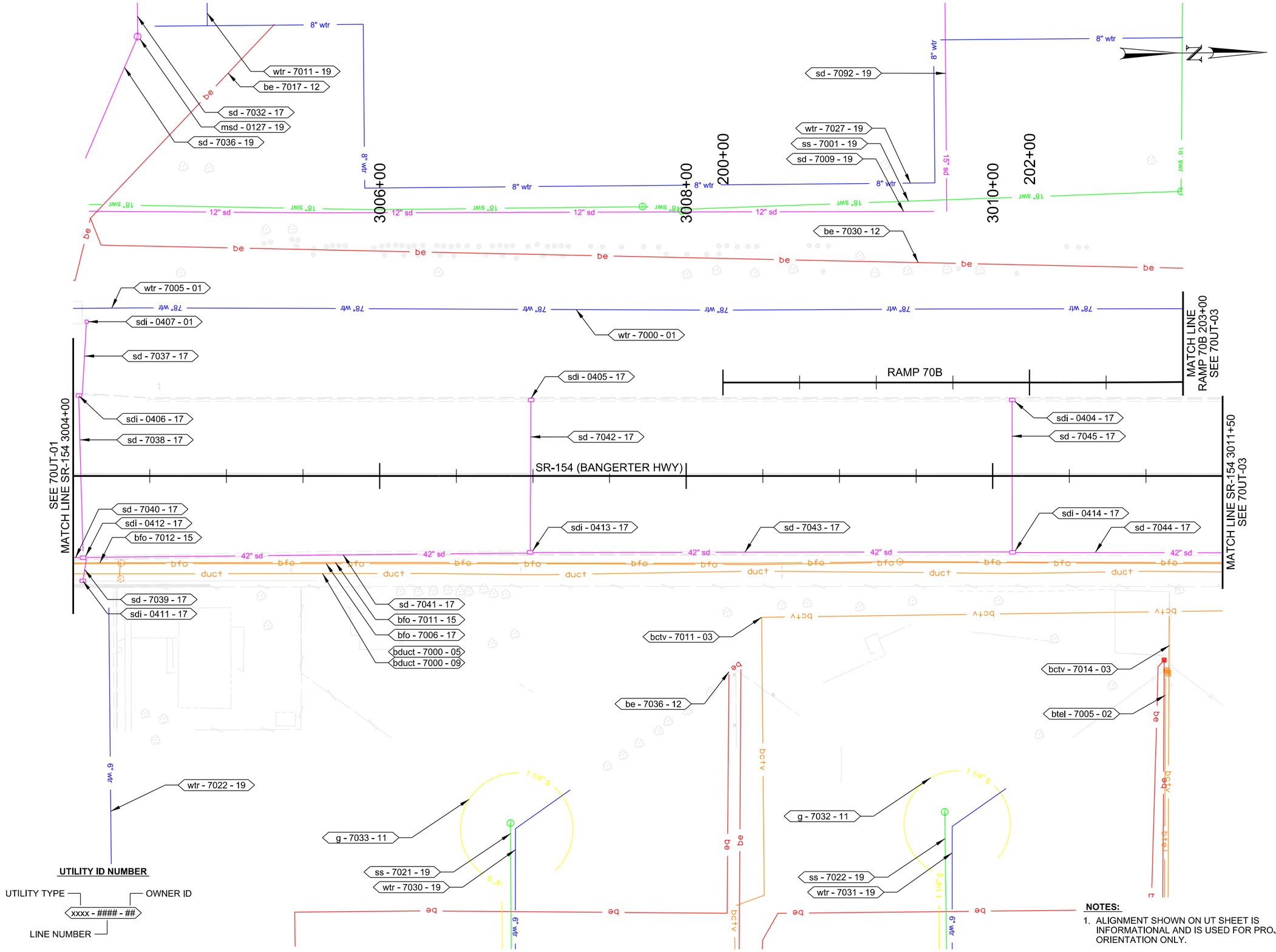

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL ENGINEER

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QC CHECKED BY: WLS
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DATE

4 INTERCHANGES ON
BANGERTER HIGHWAY - 7000 SOUTH

PROJECT

PIN 12566
S-0154(12)11
PROJECT NUMBER

UTILITY

SHEET NO. 70UT-02

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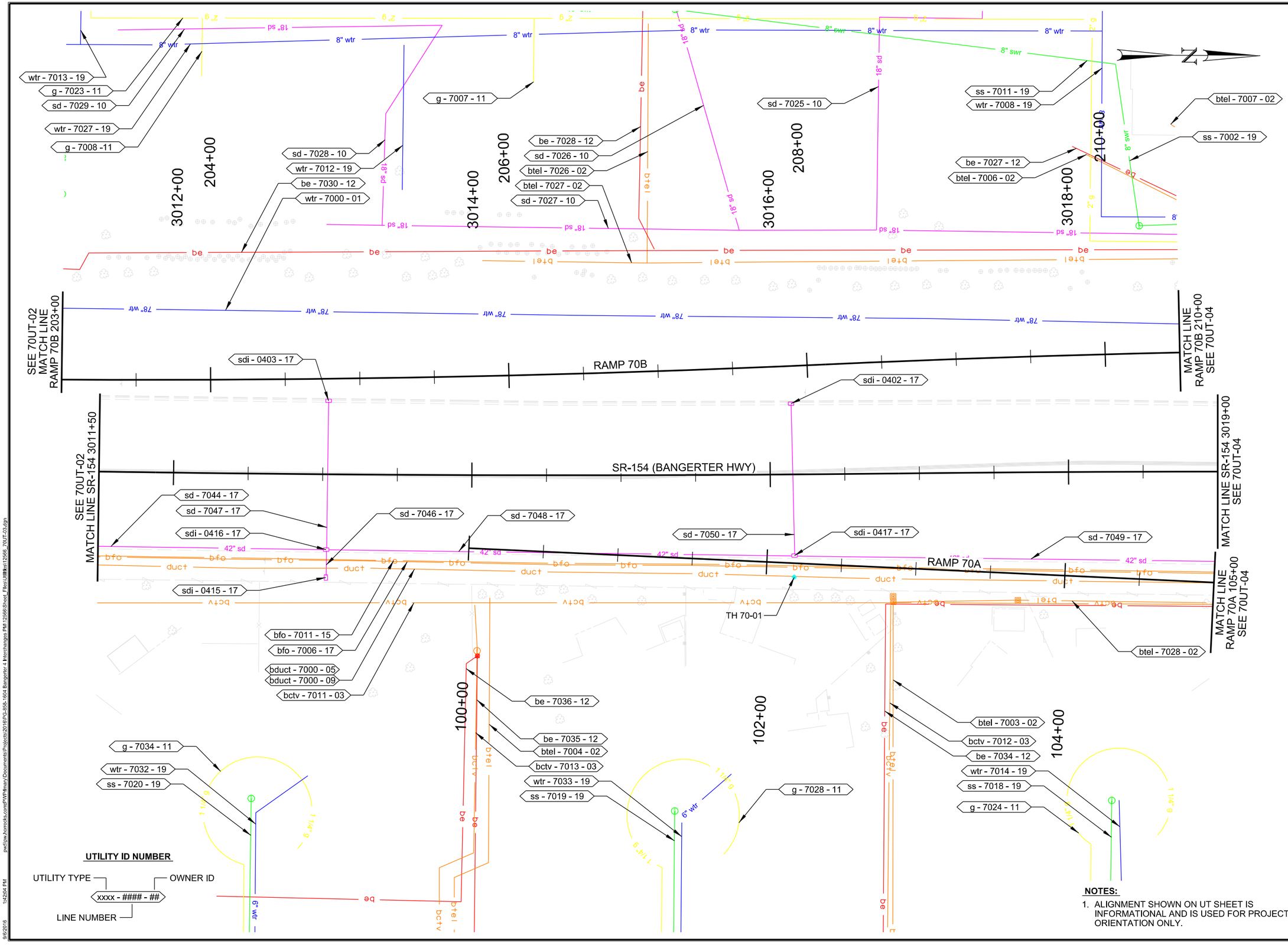

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY KKH
QC CHECKED BY WLS
MM/DD/YY
DATE

4 INTERCHANGES ON
BANGERTER HIGHWAY - 7000 SOUTH

PIN 12566
S-0154(12)11

UTILITY

PROJECT
PROJECT NUMBER

SHEET NO. 70UT-03

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9/6/2016 1:42:04 PM

btel - 7007 - 02
be - 7027 - 12
btel - 7006 - 02
ss - 7002 - 19
sd - 7025 - 10
g - 7023 - 11
be - 7030 - 12
wtr - 7008 - 19
btel - 7027 - 02

3020+00
212+00
btel - 7008 - 02
3022+00
214+00
btel - 7200 - 02
btel - 7025 - 02
g - 7000 - 11
btel - 7029 - 02
3024+00
216+00
g - 7001 - 11
3026+00

SEE 70UT-03
MATCH LINE
RAMP 70B 210+00

wtr - 7001 - 01

TH 3

RAMP 70B

MATCH LINE
RAMP 70B 218+00
SEE 70UT-05

sdi - 0401 - 17
sd - 7100 - 17
sdi - 0399 - 17
sdi - 0400 - 17
be - 7013 - 17

SEE 70UT-03
MATCH LINE SR-154 3019+00

SR-154 (BANGERTER HWY)

MATCH LINE SR-154 3026+50
SEE 70UT-05

sd - 7049 - 17
sdi - 0418 - 17
bfo - 7011 - 15
sd - 7105 - 17
sdi - 0419 - 17
sd - 7054 - 17
sdi - 0421 - 17
sdi - 0420 - 17
sd - 7053 - 17
sd - 7052 - 17
sd - 7055 - 17

TH 70-16

SEE 70UT-03
MATCH LINE
RAMP 70A 105+00

RAMP 70A

MATCH LINE
RAMP 70A 112+50
SEE 70UT-05

sd - 7051 - 17
bfo - 7008 - 15
bfo - 7006 - 17
bduct - 7000 - 05
bduct - 7000 - 09
bctv - 7011 - 03
btel - 7028 - 02
be - 7034 - 12

be - 7200 - 12
be - 7040 - 12
btel - 7001 - 02
bctv - 7004 - 03
be - 7033 - 12
be - 7031 - 12
be - 7032 - 12
bctv - 7003 - 03

106+00
108+00
110+00
112+00

g - 7025 - 11
ss - 7017 - 19
wtr - 7015 - 19
bctv - 7005 - 03
btel - 7002 - 02

g - 7026 - 11
ss - 7016 - 19
wtr - 7016 - 19

btel - 7000 - 02
be - 7034 - 12

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: WLS
DATE: MM/DD/YY

APPROVED

PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 7000 SOUTH

PIN: 12566
S-0154(12)11

UTILITY

PROJECT
PROJECT NUMBER

SHEET NO. 70UT-04

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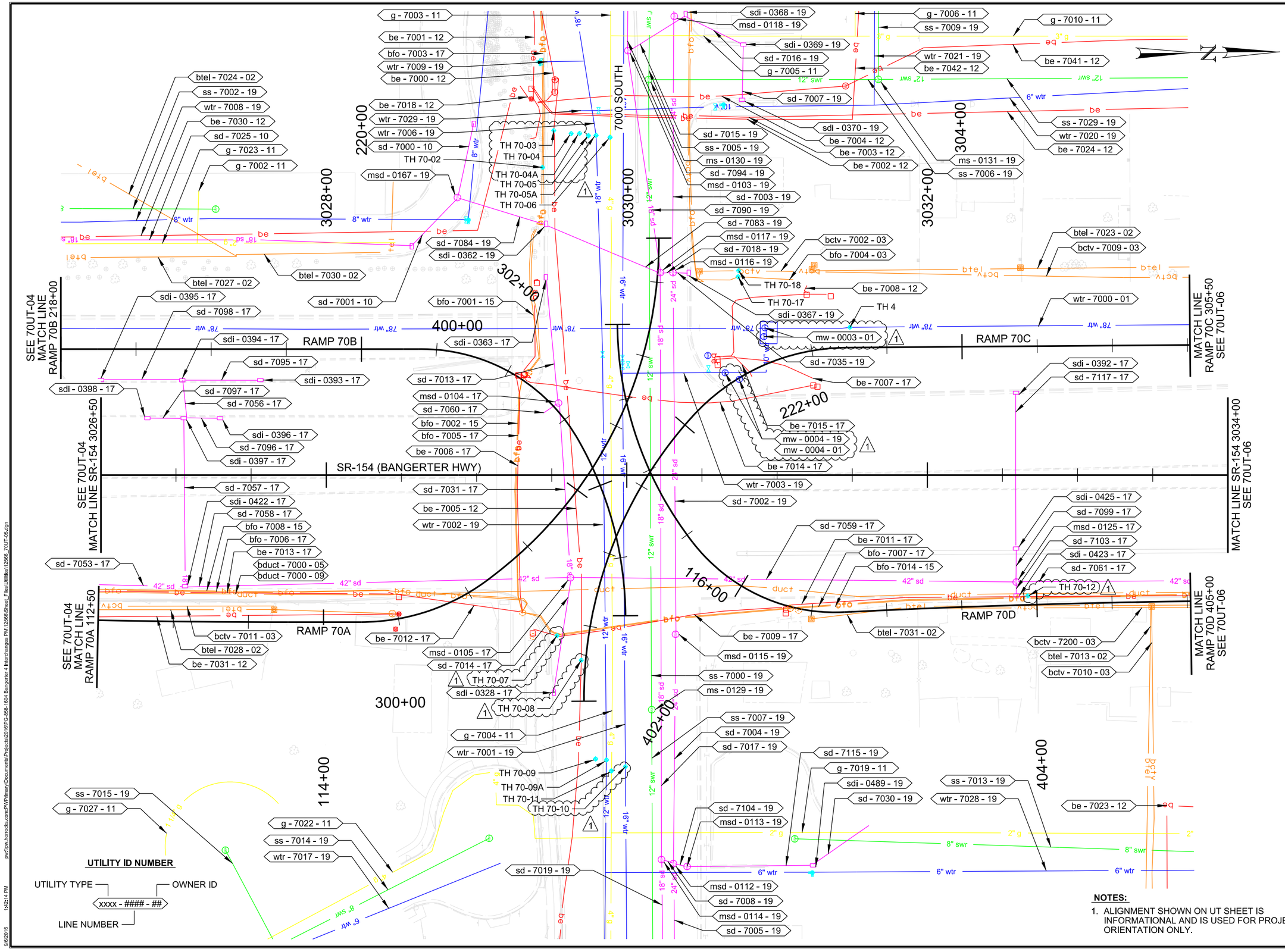

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	ADDED TESTHOLES, UPDATED UTILITIES

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
CHECKED BY WLS
QC
DATE MM/DD/YY

APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 7000 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY

SHEET NO. 70UT-05

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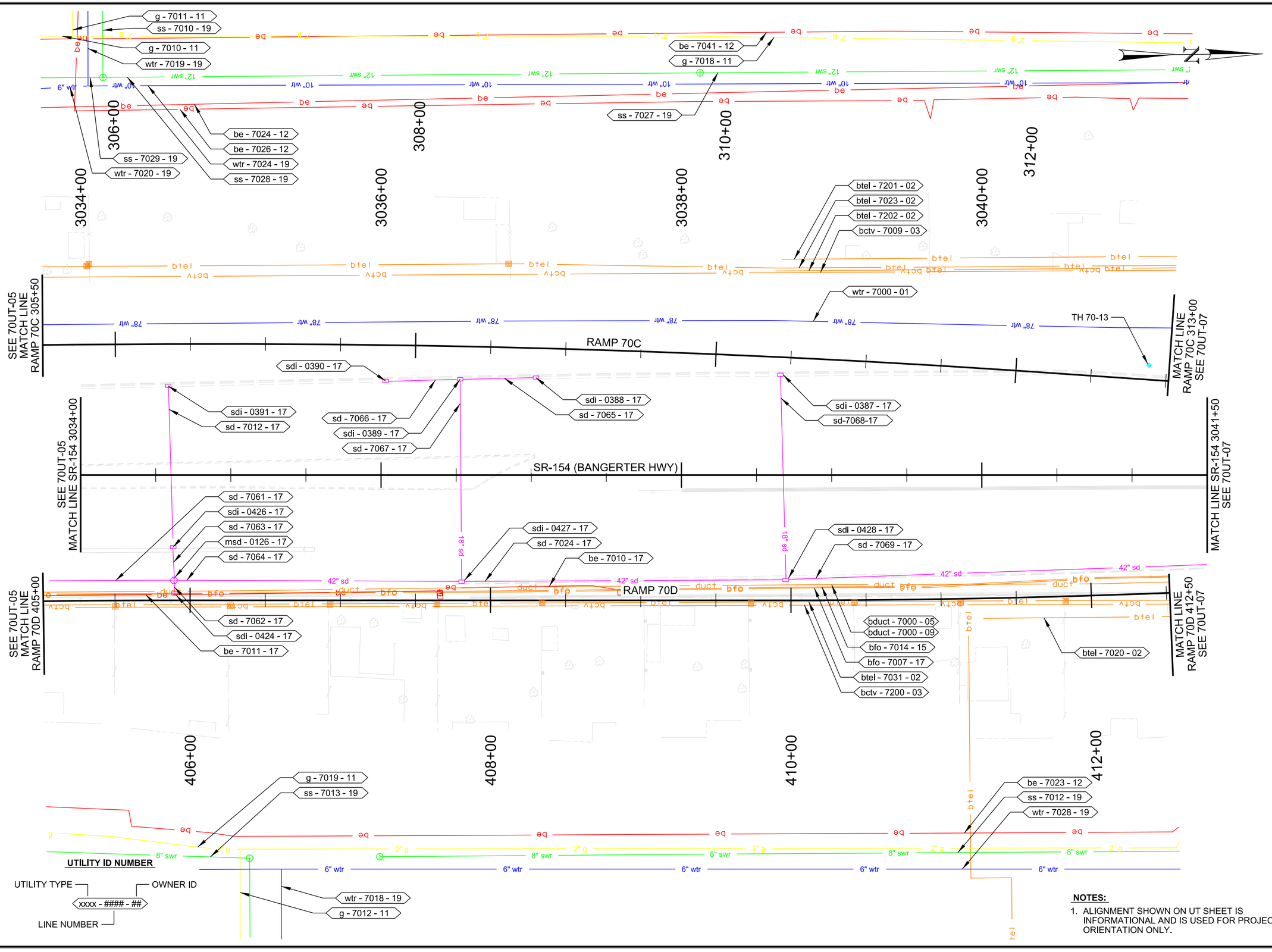

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: WLS
DATE: MM/DD/YY

APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 7000 SOUTH

PROJECT
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITY

SHEET NO. 70UT-06

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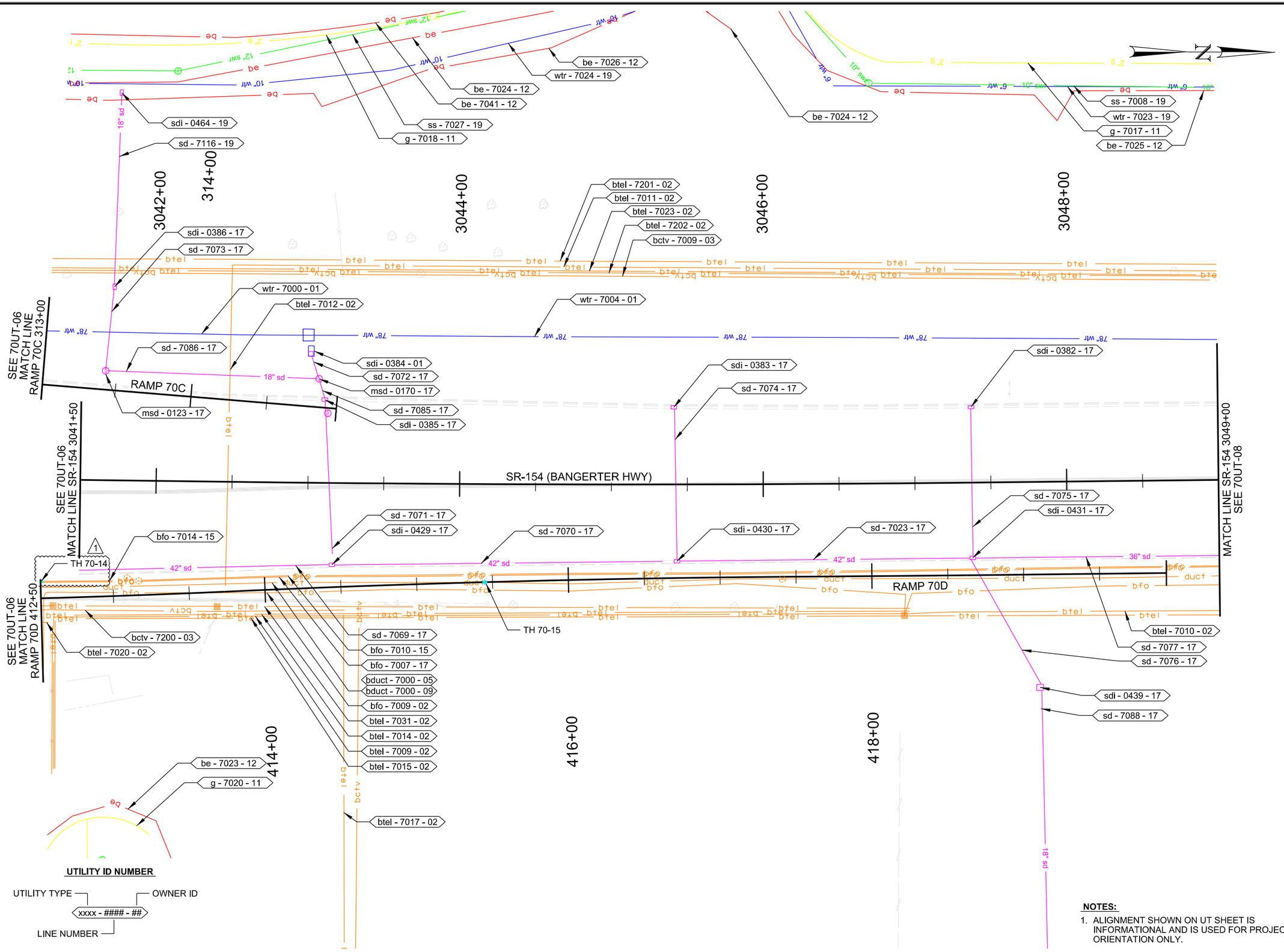

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	ADDED TESTHOLE

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL ENGINEER

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CHECKED BY WLS
QC
DATE MM/DD/YY

4 INTERCHANGES ON
BANGERTER HIGHWAY - 7000 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY

SHEET NO. 70UT-07

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g - 7017 - 11
wtr - 7023 - 19
ss - 7026 - 19
g - 7016 - 11
be - 7022 - 12
g - 7015 - 11
be - 7021 - 12
ss - 7025 - 19
sdi - 0486 - 19
sd - 7110 - 19
ss - 7008 - 19
be - 7025 - 12
sdi - 0487 - 19
sd - 7111 - 19
3050+00
3052+00
3054+00
3056+00
btel - 7201 - 07
btel - 7011 - 02
btel - 7023 - 02
bctv - 7009 - 03
3056+00.00
END CONSTRUCTION
S-0154(12)11
MP 14.38
N 400662.620
E 508506.501
msd - 0166 - 19
wtr - 7004 - 01
msd - 0165 - 19
msd - 0164 - 19
sd - 7114 - 19
sdi - 0381 - 17
sd - 7078 - 17
sdi - 0380 - 17
sd - 7080 - 17
sdi - 0379 - 17
sd - 7079 - 17
sd - 7113 - 19
sd - 7112 - 19
sd - 7082 - 19
sdi - 0378 - 17
sd - 7081 - 17
SEE 70UT-07
MATCH LINE SR-154 3049+00
SR-154 (BANGERTER HWY)
sdi - 0432 - 17
sdi - 0433 - 17
sd - 7108 - 17
sdi - 0434 - 17
sd - 7109 - 17
sd - 7077 - 17
sd - 7107 - 17
bfo - 7010 - 15
bfo - 7007 - 17
bduct - 7000 - 05
bduct - 7000 - 09
bfo - 7009 - 02
btel - 7010 - 02
btel - 7015 - 02
be - 7020 - 12
btel - 7021 - 02
bctv - 7008 - 03
g - 7014 - 11
wtr - 7026 - 19
btel - 7022 - 02
bctv - 7007 - 03
g - 7013 - 11
wtr - 7025 - 19
be - 7019 - 12
ms - 0141 - 16
ss - 7024 - 16
ss - 7023 - 16

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY	CHECKED BY	QC	DATE
KKH	WLS		MM/DD/YY

PROJECT	PROJECT NUMBER	PIN
4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH	S-0154(12)11	12566

UTILITY

SHEET NO. 70UT-08

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700+00.00
BEGIN CONSTRUCTION
S-0154(12)11
N 397956.253
E 507703.727

700+00
702+00
704+00

7000 SOUTH

MATCH LINE 7000 S 705+00 NE
SEE 70UT-10 E

wtr - 7255 - 19
g - 7255 - 11
sd - 7271 - 19
g - 7253 - 11
wtr - 7254 - 19
g - 7254 - 11
btel - 7019 - 02
be - 7255 - 12
ss - 7252 - 19
bfo - 7254 - 03
bfo - 7250 - 02
sd - 7252 - 19
bctv - 7250 - 03
ss - 7009 - 19
wtr - 7021 - 19
be - 7042 - 12
g - 7006 - 11
sd - 7260 - 19
msd - 0121 - 19
msd - 0120 - 19
sd - 7259 - 19
sd - 7261 - 19
be - 7250 - 19
bctv - 7001 - 03
btel - 7018 - 02
be - 7254 - 17
sdi - 0371 - 19
msd - 0102 - 19
sd - 7266 - 19
sdi - 0361 - 17
bfo - 7000 - 03
ms - 0128 - 19
sd - 7091 - 19
ss - 7005 - 19
sd - 7094 - 19
g - 7003 - 11
wtr - 7001 - 19
ss - 7251 - 19
g - 7250 - 11
g - 7256 - 11
sd - 7256 - 19
sd - 7253 - 19
sd - 7254 - 19
msd - 0100 - 19
sd - 7258 - 19
msd - 0119 - 19
sd - 7265 - 19
msd - 0122 - 19
sd - 7257 - 19
sd - 7272 - 19
msd - 0101 - 19
ms - 0126 - 19
ss - 7250 - 19
be - 7251 - 17
g - 7251 - 11
sd - 7250 - 19
msd - 0171 - 19
sd - 7269 - 19
ms - 0125 - 19
be - 7252 - 17
g - 7252 - 11
wtr - 7253 - 19
bfo - 7252 - 03
bctv - 7251 - 03
sd - 7272 - 19
ss - 7003 - 19
ss - 7004 - 19
ms - 0127 - 19
bctv - 7252 - 03
wtr - 7250 - 19
bfo - 7253 - 17
be - 7253 - 17
sd - 7251 - 19
wtr - 7251 - 19
sd - 7255 - 19
wtr - 7252 - 19
bfo - 7255 - 03
wtr - 7006 - 19
bfo - 7003 - 17
bfo - 7001 - 15
be - 7001 - 12
wtr - 7008 - 19
be - 7000 - 12
sd - 7268 - 19
sd - 7270 - 19
btel - 7250 - 02
be - 7256 - 12
btel - 7251 - 02
wtr - 7256 - 19

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID
xxxx - #### - ##
LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
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QC
DATE: MM/DD/YY

APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 7000 SOUTH

PROJECT
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITY

SHEET NO. 70UT-09

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SEE 70UT-09
MATCH LINE 7000 S 705+00

706+00
708+00
710+00
712+00

SR-154 (BANGERTER HWY)

7000 SOUTH

N

712+00.00
END CONSTRUCTION
S-0514(12)11
N 398058.282
E 508890.754

TH 4
TH 70-02
TH 70-03
TH 70-04
TH 70-04A
TH 70-05
TH 70-05A
TH 70-06
TH 70-07
TH 70-08
TH 70-09
TH 70-09A
TH 70-10
TH 70-11
TH 70-12
TH 70-17
TH 70-18

g - 7010 - 11
be - 7041 - 12
ss - 7029 - 19
btel - 7023 - 02
bctv - 7009 - 03
wtr - 7000 - 01
be - 7024 - 12
wtr - 7020 - 19
ss - 7006 - 19
ss - 7009 - 19
wtr - 7021 - 19
be - 7042 - 12
g - 7006 - 11
sdi - 0369 - 19
sd - 7016 - 19
ss - 7005 - 19
g - 7005 - 11
sdi - 0368 - 19
msd - 0118 - 19
bfo - 7000 - 03
sd - 7091 - 19
bctv - 7001 - 03
ms - 0131 - 19
be - 7008 - 12
wtr - 7029 - 19
sd - 7007 - 19
sdi - 0370 - 19
bfo - 7004 - 03
bctv - 7002 - 03
sdi - 0367 - 19
sd - 7035 - 19
msd - 0116 - 19
sd - 7018 - 19
msd - 0117 - 19
sd - 7090 - 19
sd - 7003 - 19
be - 7004 - 12
ms - 0130 - 19
sdi - 0392 - 17
sd - 7117 - 17
sd - 7061 - 17
sdi - 0425 - 17
sd - 7099 - 17
msd - 0125 - 17
sd - 7103 - 17
sdi - 0423 - 17
bctv - 7200 - 03
bduct - 7000 - 05
bduct - 7000 - 09
be - 7011 - 17
bfo - 7014 - 15
bfo - 7007 - 17
btel - 7031 - 02
mw - 0003 - 01
be - 7007 - 17
be - 7014 - 17
sd - 7059 - 17
be - 7015 - 17
mw - 0004 - 19
mw - 0004 - 01
wtr - 7003 - 19
sd - 7002 - 19
sd - 7017 - 19
ss - 7000 - 19
wtr - 7001 - 19
wtr - 7006 - 19
sd - 7083 - 19
g - 7004 - 11
sd - 7014 - 17
sdi - 0328 - 17
msd - 0105 - 17
wtr - 7002 - 19
be - 7005 - 12
sd - 7031 - 17
sd - 7013 - 17
sdi - 0363 - 17
bfo - 7003 - 17
bfo - 7001 - 15
sdi - 0362 - 19
sd - 7060 - 17
msd - 0104 - 17
be - 7006 - 17
bfo - 7005 - 17
bfo - 7002 - 15
bfo - 7006 - 17
be - 7012 - 17
be - 7009 - 17
msd - 0115 - 19
sd - 7004 - 19
g - 7019 - 11
ms - 0549 - 19
sd - 7104 - 19
sd - 7008 - 19
msd - 0114 - 19
ms - 0129 - 19
ss - 7007 - 19
sd - 7019 - 19
g - 7206 - 11
ss - 7013 - 19
wtr - 7028 - 19
bctv - 7000 - 03
btel - 7013 - 02
sd - 7030 - 19
sdi - 0489 - 19
sd - 7115 - 19
sd - 7006 - 19
sdi - 0366 - 19
sd - 7020 - 19
msd - 0111 - 19
msd - 0113 - 19
msd - 0112 - 19
sd - 7021 - 19
sd - 7005 - 19
msd - 0110 - 19
sd - 7022 - 19
wtr - 7010 - 19
ms - 0551 - 19
msd - 0108 - 19
sd - 7262 - 19
msd - 0109 - 19
sd - 7263 - 19
sdi - 0365 - 19
sd - 7264 - 19
sdi - 0364 - 19
sd - 7267 - 19
g - 7003 - 11
be - 7001 - 12
sd - 7015 - 19
sd - 7094 - 19
msd - 0103 - 19
wtr - 7009 - 19
be - 7000 - 12
be - 7003 - 12
be - 7002 - 12
be - 7018 - 12
sd - 7000 - 10
sd - 7084 - 19
msd - 0167 - 19
sd - 7001 - 10
btel - 7030 - 02
be - 7030 - 12
wtr - 7008 - 19
sd - 7025 - 10
g - 7023 - 11
ms - 0543 - 19
ss - 7002 - 19
g - 7002 - 11
btel - 7024 - 02
btel - 7027 - 02
sdi - 0393 - 17
sd - 7095 - 17
sdi - 0394 - 17
sdi - 0396 - 17
sd - 7056 - 17
sd - 7096 - 17
sdi - 0397 - 17
sd - 7097 - 17
sd - 7057 - 17
sd - 7098 - 17
sd - 7058 - 17
bfo - 7008 - 15
be - 7013 - 17
bctv - 7011 - 03
sdi - 0422 - 17
sd - 7053 - 17
btel - 7028 - 02
be - 7031 - 12
bctv - 7006 - 03
wtr - 7017 - 19
ss - 7014 - 19
g - 7022 - 11
ms - 0552 - 19
g - 7027 - 11
ss - 7015 - 19
ms - 0553 - 19

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID
xxxx - #### - ##
LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEET IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS				
NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	ADDED TESTHOLES, UPDATED UTILITIES.

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
CHECKED BY: WLS
QC
APPROVED
DATE: MM/DD/YY
PROFESSIONAL ENGINEER

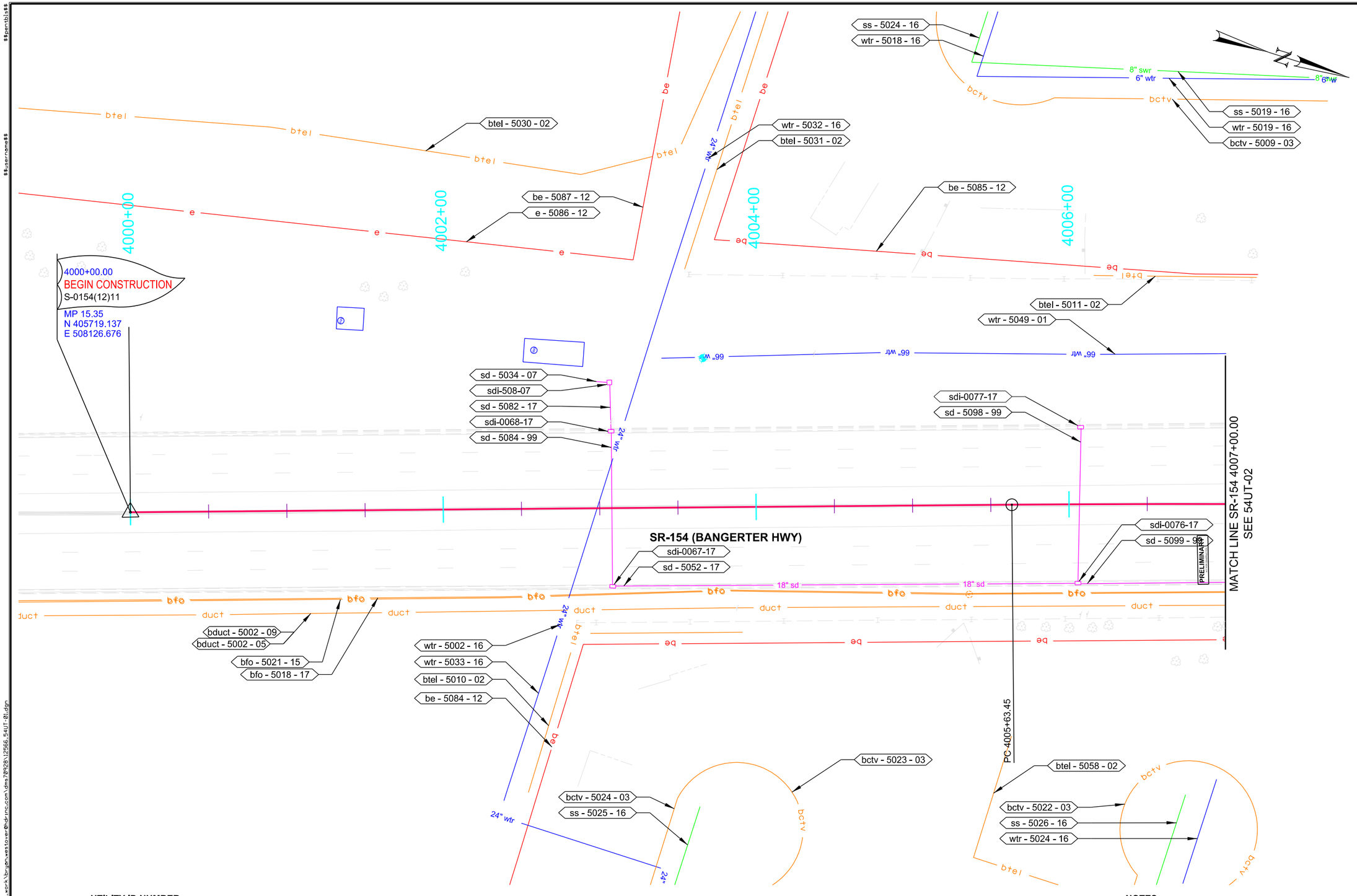
4 INTERCHANGES ON
BANGERTER HIGHWAY - 7000 SOUTH

PROJECT
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITY

SHEET NO. 70UT-10

9/6/2016 1:42:44 PM
pw:\\ww.horrocks.com:pwWPdmsv\Documents\Projects\2016\PG-858-1604 Bangerter 4 Interchanges PM\12566\Sheet_Files\Utilities\12566_70UT-10.dgn



UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
2. XXXX
3. XXXX

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY	XXX
QC CHECKED BY	XXX

DATE

PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT

PROJECT NUMBER: S-0154(12)11

PIN: 12566

UTILITY

SHEET NO. 54UT-01

$$pentblis$$
$$username$$
c:\pw_work\bryan.westover@hdrinc.com\dms78928\12566_54UT-01.dgn
9/8/2016

ss - 5023 - 16
wtr - 5019 - 16
wtr - 5045 - 16
ss - 5022 - 16
ss - 5019 - 16
ss - 5021 - 16
8" swr
6" wtr
8" wtr
bctv
bctv - 5009 - 03
4008+00
4010+00
4012+00
4014+00
be - 5085 - 12
btel - 5011 - 02
be
btel
wtr - 5049 - 01
66" wtr
sdi-0081-17
sd - 5102 - 99
18" pp
sdi-0079-17
sd - 5100 - 99
SEE 54UT-01
MATCH LINE SR-154 4007+00.00
MATCH LINE SR-154 4014+00.00
SEE 54UT-03
SR-154 (BANGERTER HWY)
btel - 5056 - 02
sdi-0080-17
sd - 5103 - 99
sd - 5099 - 99
bfo - 5018 - 17
bfo - 5021 - 15
sdi-0078-17
sd - 5101 - 99
18" sd
bfo
duct
bduct - 5002 - 09
bduct - 5002 - 05
btel - 5032 - 02
be - 5084 - 12
PRC 4013+16.63
be - 5084 - 12
btel - 5009 - 02
btel - 5033 - 02
ms-534-16
wtr - 5022 - 16
ss - 5028 - 16
g - 5031 - 11
bctv - 5022 - 03
ss - 5026 - 16
wtr - 5024 - 16
bctv - 5022 - 03
wtr - 5023 - 16
g - 5040 - 11
ss - 5027 - 16
wtr - 5028 - 16
bctv - 5022 - 03
8" swr

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - CONSULTANT NAME

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY XXX

QC CHECKED BY XXX

DATE MM/DD/YY

4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH

PROJECT

PROJECT NUMBER S-0154(12)11

PIN 12566

UTILITY

SHEET NO. 54UT-02

c:\ow_work\bryan.uvestover@hntinc.com\dms7092\612566_54UT-02.dgn

9/8/2016 4:35:13 PM

ss - 5020 - 16
ss - 5021 - 16
ss - 5019 - 16
8" swr
8" wtr
bctv
wtr - 5045 - 16
bctv - 5009 - 03
4014+00
4016+00
4018+00
4020+00
be
btel
be - 5085 - 12
btel - 5011 - 02
sd - 5119 - 99
wtr - 5049 - 01
wtr - 5045 - 16
ss - 5019 - 16
66" wtr
sd - 5051 - 17
sdi-0085-17
sdi-0094-17
TH54-01
PT 4019+62.98
sd - 5105 - 99
sdi-0083-17
sd - 5104 - 99
sd - 5103 - 99
sdi-0082-17
sd-5030-17
bfo - 5018 - 17
bfo - 5021 - 15
bduct - 5002 - 05
bduct - 5002 - 09
btel - 5056 - 02
be - 5084 - 12
sdi-0086-17
sd - 5106 - 99
sd - 5124 - 99
sdi-0084-17
sd - 5079 - 17
sd - 5028 - 17
SR-154 (BANGERTER HWY)
SEE 54UT-02
MATCH LINE SR-154 4014+00.00
MATCH LINE SR-154 4020+00.00
SEE 54UT-04
18" sd
24" sd
12" sd
bfo
duct
btel
be
btel-5009-02
be - 5084 - 12
bctv - 5022 - 03
g - 5031 - 11
wtr - 5022 - 16
ss - 5028 - 16
ms-533-16
bctv - 5021 - 03
g - 5030 - 11
ss - 5029 - 16
wtr - 5020 - 16
btel - 5008 - 02
be - 5084 - 12
btel - 5034 - 02
be - 5062 - 12
ms-532-16
bctv - 5021 - 03
g - 5039 - 11
ss - 5030 - 16
wtr - 5037 - 16
bctv - 5007 - 03
ms-531-16
ss - 5032 - 16
g - 5032 - 11
bctv - 5008 - 03
ss - 5031 - 16
bctv - 5008 - 03
wtr - 5036 - 16
bct
bctv
8" wtr

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - CONSULTANT NAME

PROFESSIONAL ENGINEER

APPROVED

MM/DD/YY
DATE

DRAWN BY	GS
QC CHECKED BY	BDW

4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH

PROJECT

PROJECT NUMBER: S-0154(12)11

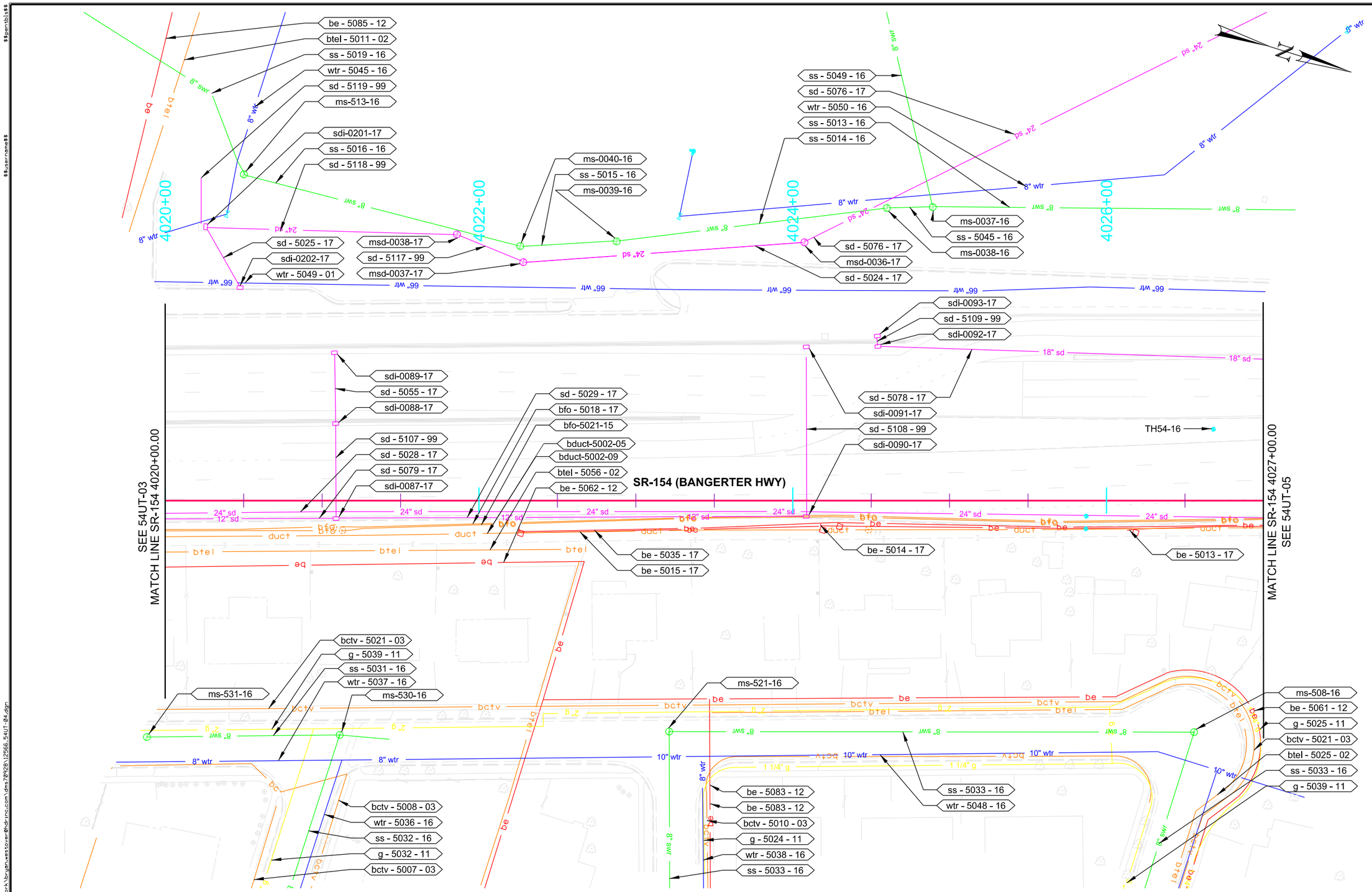
PIN: 12566

UTILITY

SHEET NO. 54UT-03

c:\pw_work\bryan.westover@hdrinc.com\dms7092\b12566_54UT-03.dgn

9/8/2016 4:43:01 PM



UTILITY ID NUMBER

UTILITY TYPE — xxxx - #### - ## — OWNER ID

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

APPROVED

PROFESSIONAL ENGINEER — DATE

DRAWN BY GS
QC CHECKED BY BDW

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PIN 12566

S-0154(12)11

UTILITY

PROJECT

PROJECT NUMBER

SHEET NO. 54UT-04

$$penblis$$
$$username$$
c:\pw_work\bryan.westover@hdr-inc.com\dms78928\12566_54UT-04.dgn
9/8/2016

SEE 54UT-04
MATCH LINE SR-154 (BANGERTER HWY) 4027+00.00

MATCH LINE SR-154 (BANGERTER HWY) 4033+75.00
SEE 54UT-06
PC 4033+69.46

SR-154 (BANGERTER HWY)

SR-173 (5400 S)

4028+00
4030+00
4032+00
812+00
814+00
816+00

TH54-02
TH54-03
TH54-04
TH54-10
TH54-11
TH54-11A
TH54-12

sd - 5076 - 17
wtr - 5050 - 16
be - 5050 - 12
g - 5002 - 11
btel - 5024 - 02
ss - 5013 - 16
ms-0036-16
ss - 5012 - 16

g - 5001 - 11
g - 5000 - 11
ss - 5004 - 16
ms-0034-16
ss - 5011 - 16
ms-0035-16

sd - 5023 - 17
sd - 5057 - 17
ss - 5003 - 16
be - 5010 - 12
sd - 5020 - 17
be - 5024 - 17
msd-0022-17
sd - 5021 - 17
ms-0033-16
sdi-0052-17
msd-501-17

btel - 5017 - 02
sdi-0054-17
sd - 5026 - 17
sd - 5027 - 17
sdi-0053-17
sd - 5069 - 17
msd-0023-17

wtr - 5049 - 01
sdi-0096-17
sd - 5077 - 17
sdi-0095-17
sd - 5110 - 99
sdi-0097-17

bfo - 5001 - 02
sd - 5022 - 17
sdi-0144-17
msd-0024-17
sd - 5091 - 99
ss - 5044 - 16
ms-0041-16
ss - 5005 - 16
sd - 5049 - 17

sd - 5050 - 17
msd-0025-17

btel - 5039 - 02
wtr - 5005 - 16
bfo - 5012 - 17
bfo - 5013 - 15

ss - 5034 - 16
wtr - 5041 - 16
g - 5004 - 11
ms-502-16
be - 5075 - 12
btel - 5051 - 02
be - 5026 - 17
g - 5027 - 11
wtr - 5054 - 16
bfo - 5014 - 17
sdi-0143-17
bfo - 5015 - 15
be - 5027 - 17

g - 5022 - 11
btel - 5023 - 02
btel - 5013 - 02
wtr - 5003 - 16
bfo - 5011 - 18
e - 5023 - 12
be - 5028 - 12
bfo - 5016 - 17
bfo - 5017 - 15
be - 5012 - 17
sd - 5001 - 17
sdi-0103-17
sd - 5112 - 99
sdi-0101-17

sd - 5014 - 17
sd - 5111 - 99
be - 5029 - 12
wtr - 5000 - 01
bduct - 5001 - 09
sdi-0253-17
sd - 5015 - 17
sdi-0100-17
sd - 5000 - 17
sd - 5013 - 17

bfo - 5018 - 17
sd - 5031 - 17
bfo - 5021 - 15
be - 5035 - 17
be - 5013 - 17
bduct - 5002 - 09
bduct - 5002 - 05

sdi-0055-17
sd - 5032 - 17
bduct - 5002 - 09
be - 5009 - 17
be - 5035 - 17
bfo - 5019 - 17
bfo - 5020 - 15
be - 5030 - 17
msd-0026-17
sd - 5054 - 17
sd - 5033 - 17
msd-503-17
ms-512-16
ms-511-16
ss - 5000 - 16
ms-510-16
g - 5010 - 11
sd - 5053 - 17
bfo - 5001 - 02
bfo-5003-02
be - 5036 - 12
btel - 5019 - 02
wtr - 5048 - 16
wtr - 5044 - 16
g - 5011 - 11
bfo - 5027 - 02

g - 5005 - 11
be - 5012 - 17
be - 5034 - 17
bfo - 5016 - 17
bfo - 5017 - 15
be - 5030 - 17
sdi-0102-17
bfo - 5011 - 18
bfo - 5029 - 15
bfo - 5022 - 17
be - 5028 - 12
e - 5023 - 12
be - 5031 - 17
be - 5032 - 12
be - 5033 - 17
be - 5056 - 12
bctv - 5012 - 03
btel - 5014 - 02
btel - 5012 - 02
g - 5007 - 11
g - 5006 - 11
wtr - 5048 - 16
e - 5000 - 12

ms-0137-16
ss - 5047 - 16
ms-503-16

bctv - 5004 - 03
g - 5033 - 11

btel - 5025 - 02
bctv - 5021 - 03
be - 5061 - 12
g - 5025 - 11
ss - 5033 - 16
g - 5039 - 11

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

APPROVED

DRAWN BY GS
QC CHECKED BY BDW
DATE

PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT

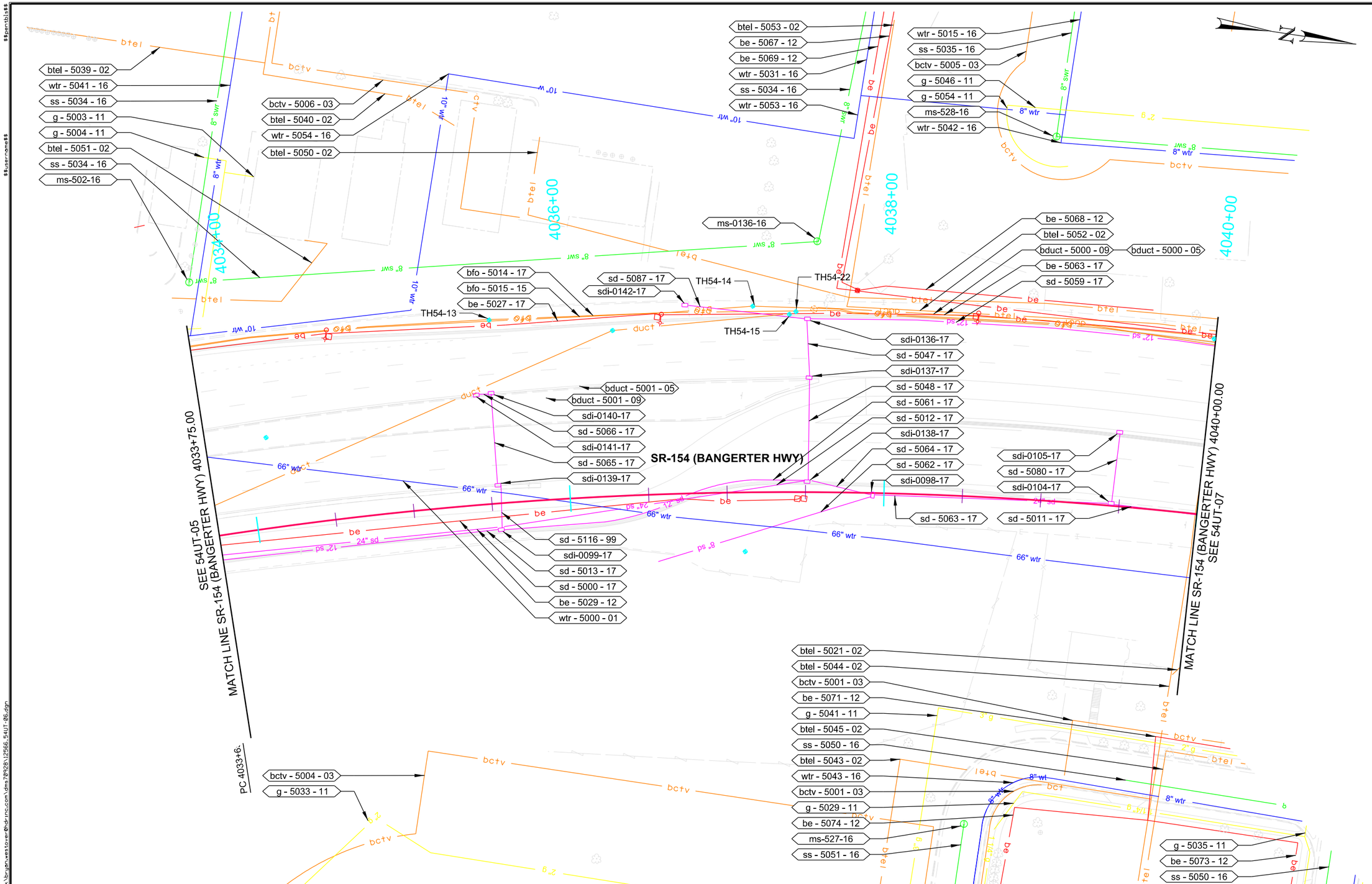
PIN 12566
S-0154(12)11

PROJECT NUMBER

UTILITY

SHEET NO. 54UT-05

$$pentblis$$
$$username$$
c:\pw_work\bryan.westover@hdr-inc.com\dms78928\12566_54UT-05.dgn
9/8/2016



UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - AVENUE CONSULTANTS

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APPROVED

DATE

PROFESSIONAL ENGINEER

4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH

PIN 12566

S-0154(12)11

PROJECT

PROJECT NUMBER

UTILITY

SHEET NO. 54UT-06

$$pentblis$$

$$username$$

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9/8/2016

btel - 5047 - 02
wtr - 5016 - 16
g - 5046 - 11
ms-529-16
ss - 5035 - 16
wtr - 5042 - 16
bctv - 5005 - 03

ss - 5039 - 16
wtr - 5042 - 16
ms-0134-16
g - 5048 - 11
bctv - 5005 - 03
ss - 5046 - 16
wtr - 5046 - 16
ms-0135-16
sd - 5120 - 99
ss - 5018 - 16

sd - 5121 - 99
g - 5047 - 11
sdi-561-16
sdi-563-16
sdi-562-16

4040+00
4042+00
4044+00
4046+00

btel - 5053 - 02
be - 5065 - 12
btel - 5055 - 02
be - 5069 - 12
btel - 5057 - 02
bduct - 5000 - 09
bduct - 5000 - 05

wtr - 5047 - 16
sdi-0134-17
sd - 5059 - 17
TH54-17
TH54-21
TH54-18A
TH54-07
TH54-09
sd-5122-99
sd-5088-17
TH54-19

bfo - 5014 - 17
bfo - 5015 - 15
sd - 5086 - 99
sdi-0132-17
sd - 5044 - 17
sdi-0133-17
sd - 5045 - 17
sdi-0107-17

sdi-0131-17
sd - 5085 - 99
btel - 5027 - 02
sd - 5113 - 99
sdi-0108-17

sdi-0135-17
sd - 5046 - 17
sd - 5010 - 17
sdi-0106-17
sd - 5011 - 17

SEE 54UT-06
MATCH LINE SR-154 4040+00.00

SR-154 (BANGERTER HWY)

TH54-08A
TH54-08B
TH54-08
be - 5064 - 12
wtr - 5030 - 16
wtr - 5000 - 01

TH54-20
TH54-05

MATCH LINE SR-154 4046+75.00
SEE 54UT-08

wtr - 5001 - 01
ss - 5018 - 16
ms-615-16
ms-500-16
ms-525-16
ss - 5038 - 16
ms-524-16
ms-614-99
ss - 5037 - 16
wtr - 5030 - 16

PT 4042+95.20

bctv - 5001 - 03
be - 5071 - 12
ms-526-16
g - 5035 - 11
g - 5034 - 11
btel - 5045 - 02

btel - 5054 - 02
btel - 5049 - 02
ss - 5040 - 16
wtr - 5052 - 16
e - 5072 - 12
g - 5036 - 11
btel - 5048 - 02

btel - 5044 - 02
ss - 5050 - 16
wtr - 5043 - 16
btel - 5043 - 02
g - 5029 - 11
be - 5074 - 12
bctv - 5001 - 03

ms-523-16

ms-527-16
be - 5073 - 12

bctv - 5003 - 03
g - 5045 - 11
wtr - 5025 - 16
ss - 5050 - 16

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID
xxxx - #### - ##
LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW
APPROVED
DATE
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
S-0154(12)11
PIN 12566
PROJECT NUMBER

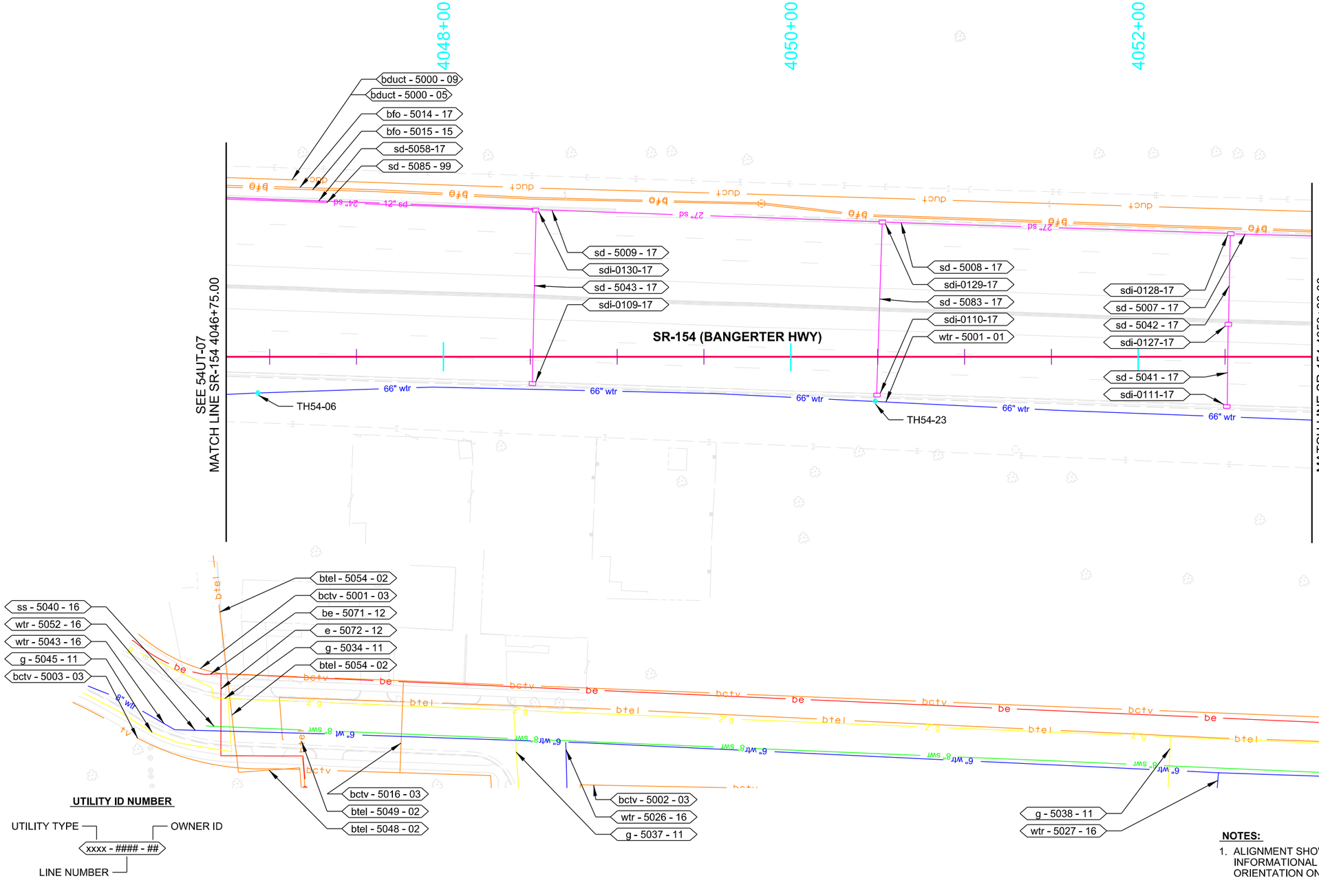
UTILITY

SHEET NO. 54UT-07

$$pentblis$$
$$username$$
c:\pw_work\bryan.weston@hdr-inc.com\dm=7892811256_54UT-07.dgn
9/8/2016

$$pentbls$$

$$username$$



UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS

QC CHECKED BY BDW

APPROVED

DATE

PROFESSIONAL ENGINEER

4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH

PROJECT S-0154(12)111

PIN 12566

PROJECT NUMBER

UTILITY

SHEET NO. 54UT-08

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9/8/2016

$$penblis$$

$$username$$

ss - 5043 - 16
wtr - 5040 - 16
g - 5043 - 11
g - 5042 - 11
wtr - 5039 - 16
ss - 5042 - 16
ms-522-16
ctv - 5015 - 03
e - 5070 - 12
btel - 5000 - 02
ctv - 5015 - 03

8" wtr
8" swr
4" g
ctv
e
btel

4054+00
4056+00
4058+00
4060+00

PC 4053+21.44
PT 4057+55.11

bduct - 5000 - 05
bduct - 5000 - 09

duct
bfg
27" sd

sd - 5007 - 17
sdi-0125-17
sd - 5040 - 17
sdi-0126-17
sd - 5006 - 17
sdi-0124-17
sd - 5039 - 17
sdi-0123-17
sd - 5005 - 17
sdi-0121-17
sd - 5038 - 17
sdi-0122-17
sd - 5004 - 17
sdi-0120-17
sd - 5003 - 17
sd - 5037 - 17
sdi-0119-17

SR-154 (BANGERTER HWY)

SEE 54UT-08
MATCH LINE SR-154 4053+00.00

66" wtr
wtr - 5001 - 01

bctv - 5001 - 03
be - 5071 - 12
btel - 5049 - 02
g - 5034 - 11

e
bctv
be
btel
2" g

N

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW
APPROVED
DATE

PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER
S-0154(12)11
PIN 12566

UTILITY

SHEET NO. 54UT-09

9/8/2016

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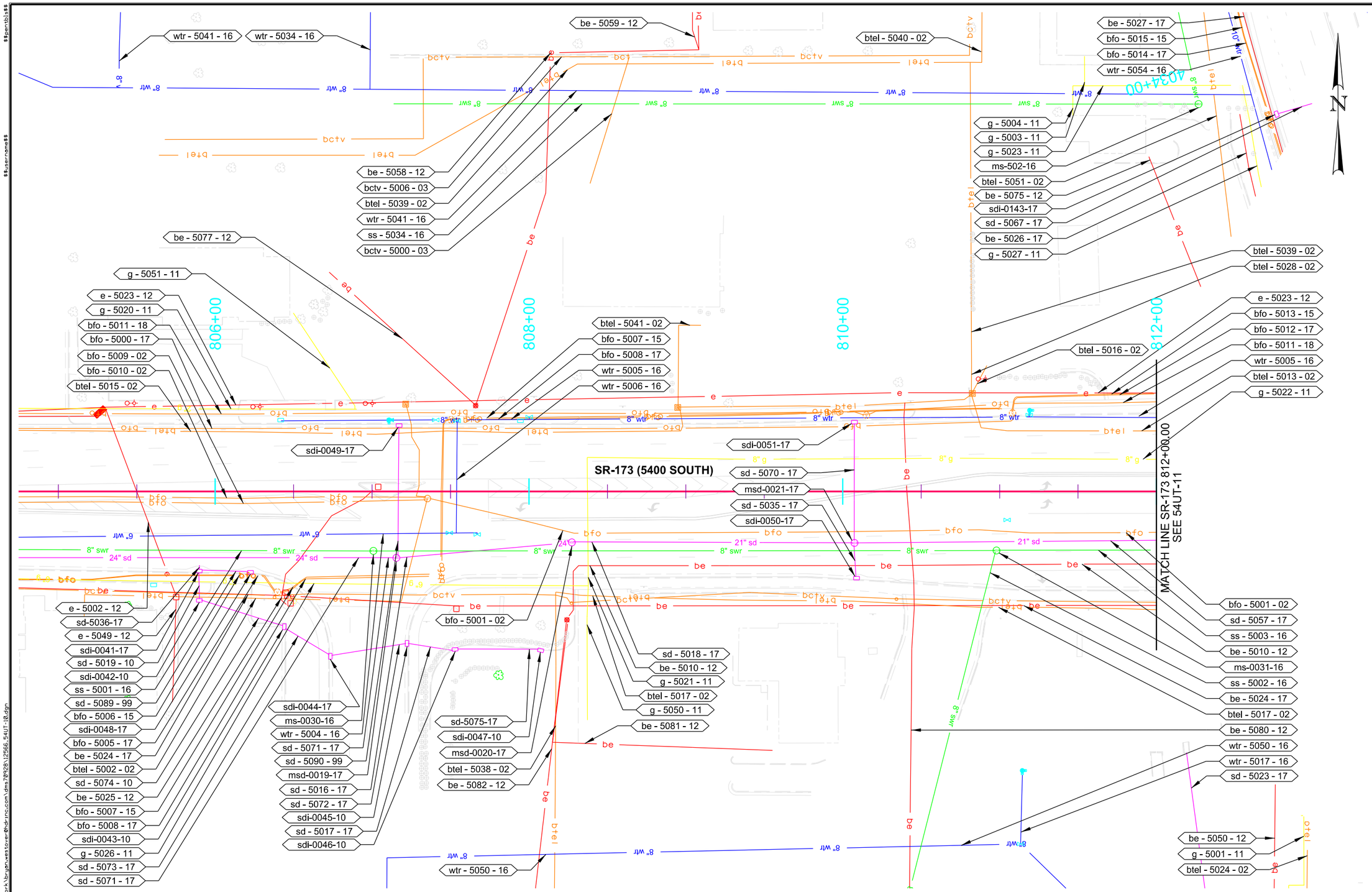

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY	GS
QC CHECKED BY	BDW
PROFESSIONAL ENGINEER	DATE

APPROVED

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PIN 12566

PROJECT S-0154(12)11

PROJECT NUMBER

UTILITY

SHEET NO. 54UT-10

$$penblis$$
$$username$$
c:\pw_work\bryan.westover@hdrinc.com\dms78928\12566_54UT-10.dgn
9/8/2016

SR-154 (BANGERTER HWY)

SR-173 (5400 SOUTH)

SEE 54UT-10
MATCH LINE SR-173 812+00.00

MATCH LINE SR-173 818+40.00
SEE 54UT-12

812+00 | 814+00 | 816+00 | 818+00

ss - 5034 - 16
btel - 5051 - 02
g - 5023 - 11
g - 5003 - 11
be - 5027 - 17
bfo - 5015 - 15
bfo - 5014 - 17
wtr - 5054 - 16
sd - 5067 - 17
sdi-0143-17
ms-502-16
wtr - 5041 - 16
g - 5004 - 11
be - 5026 - 17
g - 5027 - 11
be - 5075 - 12
sd - 5000 - 17
sd - 5013 - 17
sdi-0100-17
sd - 5015 - 17
sdi-0253-17
sd - 5111 - 99
sd - 5014 - 17
be - 5029 - 12
bduct - 5001 - 09
bduct - 5001 - 05
ss - 5047 - 16
ms-503-16
ss - 5047 - 16
ms-0137-16
8" swr
8" swr
sd - 5001 - 17
sdi-0103-17
sd - 5112 - 99
sdi-0101-17
g - 5008 - 11
be - 5055 - 12
be - 5057 - 12
bfo - 5013 - 15
bfo - 5012 - 17
e - 5023 - 12
bfo - 5011 - 18
wtr - 5049 - 01
bctv - 5012 - 03
btel - 5014 - 02
be - 5032 - 12
be - 5033 - 17
g - 5005 - 11
be - 5031 - 17
bfo - 5029 - 15
bfo - 5022 - 17
g - 5028 - 11
sdi-0070-17
bfo - 5002 - 18
wtr - 5003 - 16
wtr - 5005 - 16
btel - 5013 - 02
g - 5022 - 11
btel - 5023 - 02
be - 5012 - 17
bfo - 5017 - 15
bfo - 5016 - 17
be - 5028 - 12
sdi-0102-17
sd - 5054 - 17
bfo - 5019 - 17
bfo - 5020 - 15
be - 5030 - 17
wtr - 5048 - 16
btel - 5012 - 02
bfo - 5030 - 15
bfo - 5023 - 17
g - 5000 - 11
sd - 5057 - 17
bfo - 5001 - 02
be - 5006 - 17
ms-0033-16
msd-0022-17
sdi-0052-17
msd-0024-17
msd-0026-17
sd - 5050 - 17
sd - 5021 - 17
sd - 5091 - 99
msd-503-17
sd - 5093 - 99
e - 5000 - 12
sd - 5068 - 17
ms-0042-16
msd-0027-17
sd - 5033 - 17
sd - 5092 - 99
ss - 5005 - 16
sd - 5053 - 17
bfo - 5027 - 02
ss - 5006 - 16
btel - 5019 - 02
sd - 5123 - 99
sd - 5022 - 17
ss - 5044 - 16
msd-0023-17
sd - 5069 - 17
ms-0041-16
msd-0025-17
ss - 5000 - 16
sdi-0056-17
be - 5037 - 12
wtr - 5044 - 16
bfo - 5003 - 02
g - 5011 - 11
be - 5036 - 12
sd - 5020 - 17
ss - 5003 - 16
be - 5010 - 12
be - 5024 - 17
btel - 5017 - 02
sd - 5026 - 17
be -5008 - 17
sdi-0053-17
sd - 5027 - 17
msd-501-17
sd - 5026 - 17
sdi-0054-17
sd - 5032 - 17
sdi-0144-17
sd - 5049 - 17
sdi-0055-17
ms-510-16
ms-511-16
ms-512-16
g - 5010 - 11
sd - 5031 - 17
bfo - 5018 - 17
bfo - 5021 - 15
be - 5009 - 17
be - 5035 - 17
bduct - 5002 - 09
bduct - 5002 - 05
e - 5076 - 12
sd - 5023 - 17
ss - 5004 - 16
g - 5001 - 11
btel - 5024 - 02
g - 5002 - 11
ms-0034-16
ms-0035-16
ss - 5011 - 16
ss - 5012 - 16
be - 5013 - 17
wtr - 5050 - 16

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID
xxxx - #### - ##
LINE NUMBER

NOTES:

1. ALIGNMENT SHOWN ON UT SHEETS IS INFORMATIONAL AND IS USED FOR PROJECT ORIENTATION ONLY.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW
APPROVED
DATE
PROFESSIONAL ENGINEER
DATE

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY

SHEET NO. 54UT-11

9/8/2016
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$$pentblis$$
$$username$$

$$penbias$$
$$username$$

ms-507-16
8" swr
ss - 5047 - 16
ms-0138-16
ms-504-16
ss - 5048 - 16
ms-506-16
8" swr
8" swr
8" swr
ms-505-16

be - 5055 - 12
g - 5009 - 11
g - 5013 - 11
be - 5053 - 12
be - 5054 - 12
be - 5017 - 12
be - 5018 - 12
be - 5019 - 12
g - 5028 - 11
btel - 5018 - 02
bctv - 5012 - 03
be - 5016 - 12
bfo - 5002 - 18
820+00
g - 5015 - 11
g - 5014 - 11
be - 5052 - 12
be - 5048 - 17
822+00
be - 5047 - 12
be - 5020 - 12
wtr - 5048 - 16
e - 5001 - 12
824+00
g - 5016 - 11
be - 5046 - 17
826+00
wtr - 5008 - 16
g - 5052 - 11
btel - 5029 - 02
be - 5043 - 17
sdi-0072-17
sdi-510-17
POE 826+54.00
SEE 54UT-11
MATCH LINE SR-173 818+40.00
bfo - 5030 - 15
e - 5023 - 12
bfo - 5003 - 02
bfo - 5023 - 17
bte - 5012 - 02
bfo - 5025 - 17
sdi-0071-17
g - 5022 - 11
bfo - 5026 - 15
bfo - 5024 - 17
ctv - 5018 - 03
ctv - 5018 - 03
ctv - 5018 - 03
sd - 5097 - 99
be - 5041 - 17
msd-0029-17
e - 5004 - 12
sd - 5114 - 99
btel - 5004 - 02
btel - 5005 - 02
btel - 5006 - 02
bfo - 5004 - 02
sd - 5115 - 99
sd - 5096 - 99
SR-173 (5400 SOUTH)
sd - 5095 - 99
msd-0028-17
sd-5094-99
ctv - 5017 - 03
e - 5003 - 12
btel - 5026 - 02
ms-0044-16
be - 5039 - 17
be - 5078 - 12
be - 5038 - 12
g - 5019 - 11
sdi-0057-17
30" sd
sd - 5068 - 17
ms-0043-16
bfo - 5027 - 02
ss-5007-16
ss - 5006 - 16
8" swr
btel - 5019 - 02
be - 5037 - 12
bctv - 5013 - 03
wtr - 5044 - 16
be - 5060 - 12
sdi-509-17
g - 5017 - 11
ctv-5020-03
e - 5079 - 12
sdi-0058-17
btel - 5007 - 02
be - 5042 - 12
be - 5022 - 17
ms-0045-16
sd - 5081 - 17
msd-0030-17
btel - 5037 - 02
g - 5053 - 11
ss - 5010 - 16
wtr - 5007 - 16
12" wtr
g - 5012 - 11
e - 5076 - 12
g - 5018 - 11

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

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QC CHECKED BY BDW
APPROVED
DATE
PROFESSIONAL ENGINEER
DATE

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
S-0154(12)11
PIN 12566
PROJECT NUMBER

UTILITY

SHEET NO. 54UT-12

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9/8/2016

$$pentblis$$
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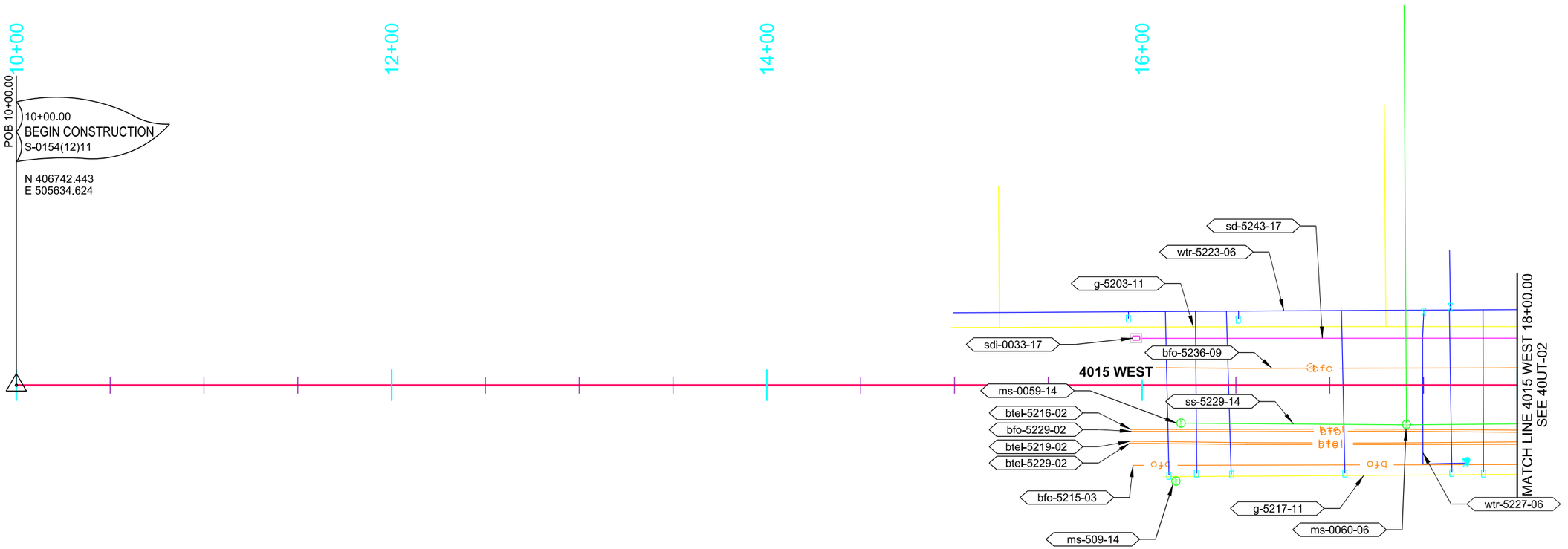

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW
DATE

APPROVED

PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITIES

SHEET NO. 40UT-01

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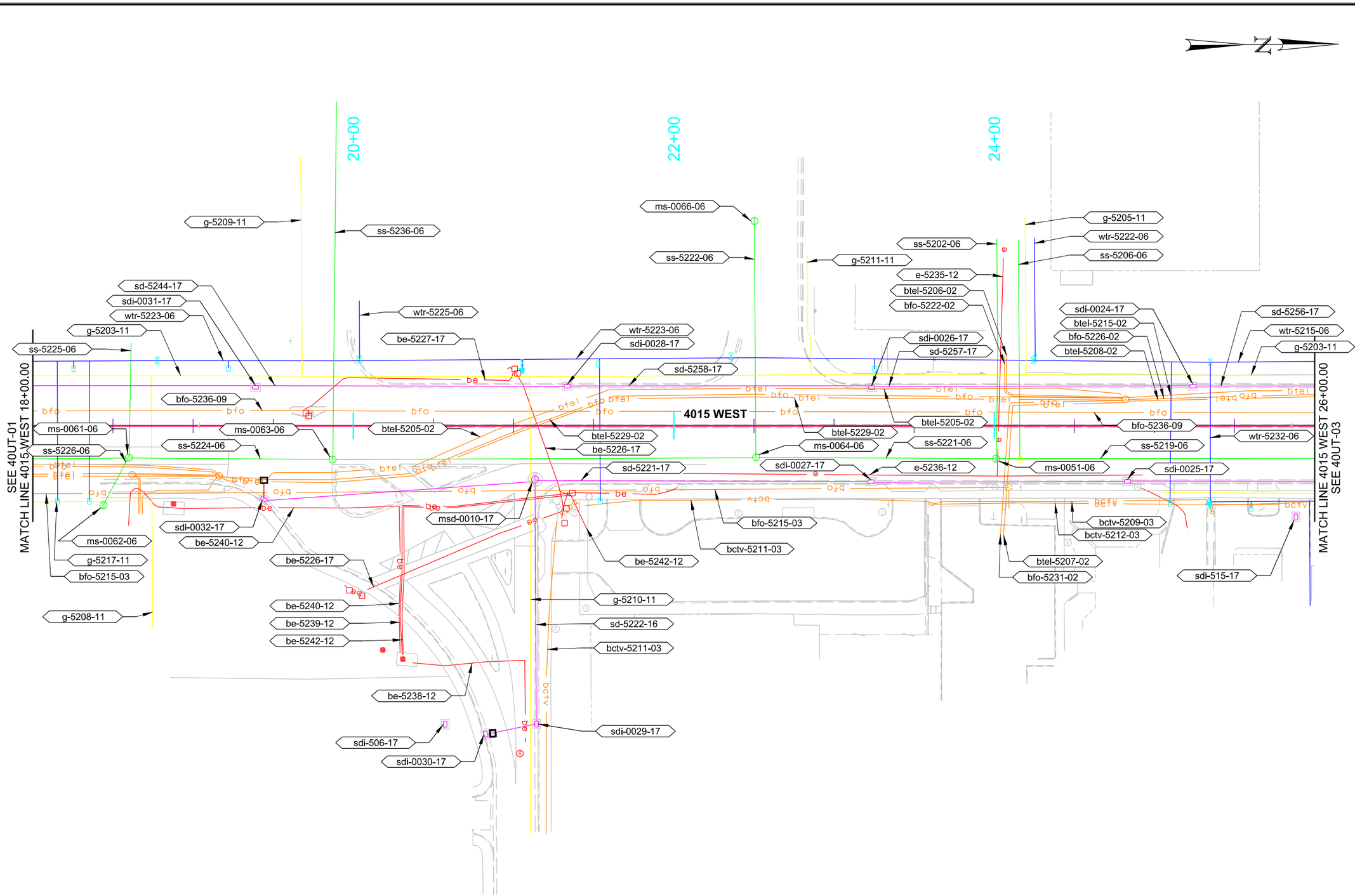
9/8/2016



UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

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DATE
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PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITIES

SHEET NO. 40UT-02

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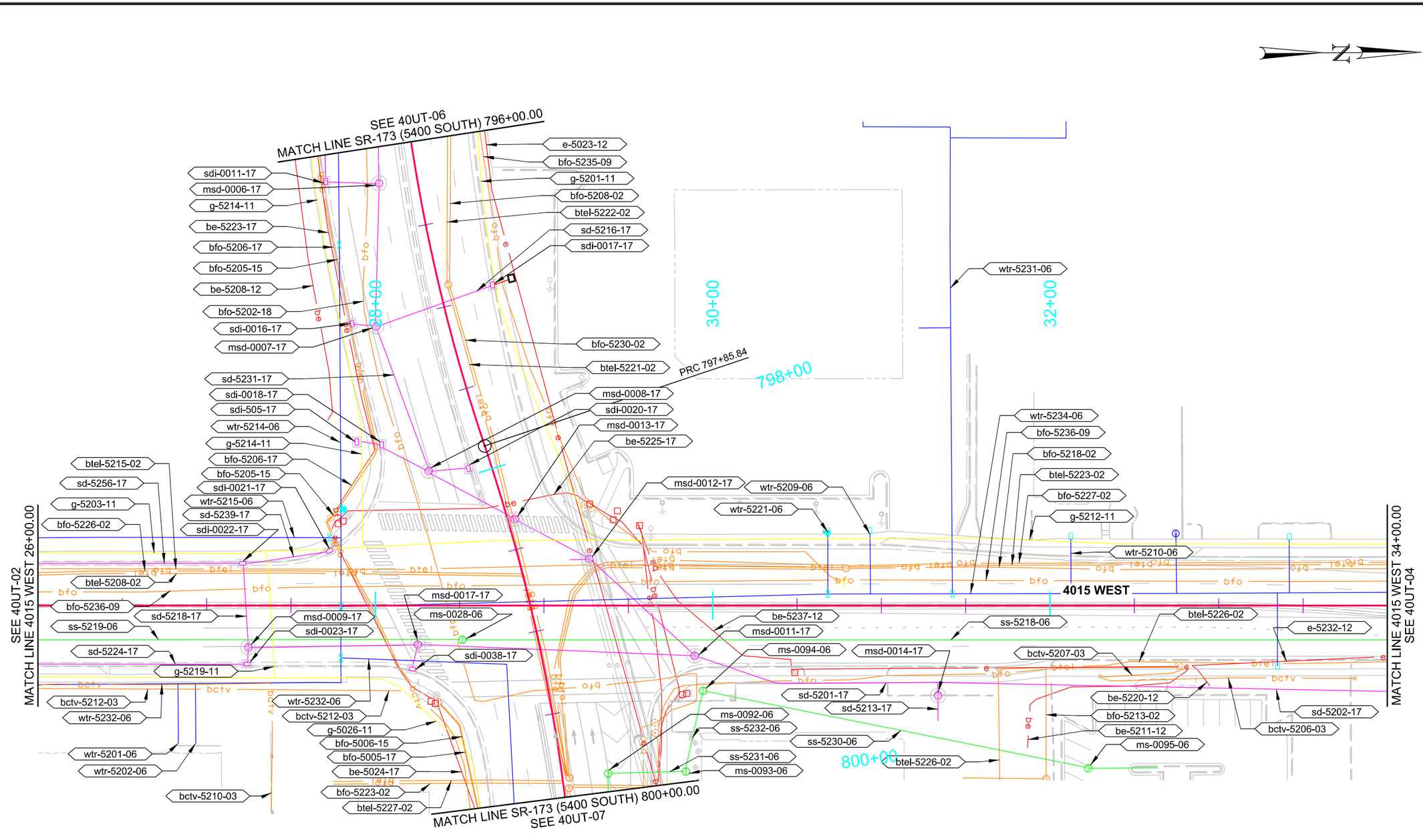
9/8/2016



UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

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UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

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APPROVED
DATE
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITIES

SHEET NO. 40UT-03

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9/8/2016

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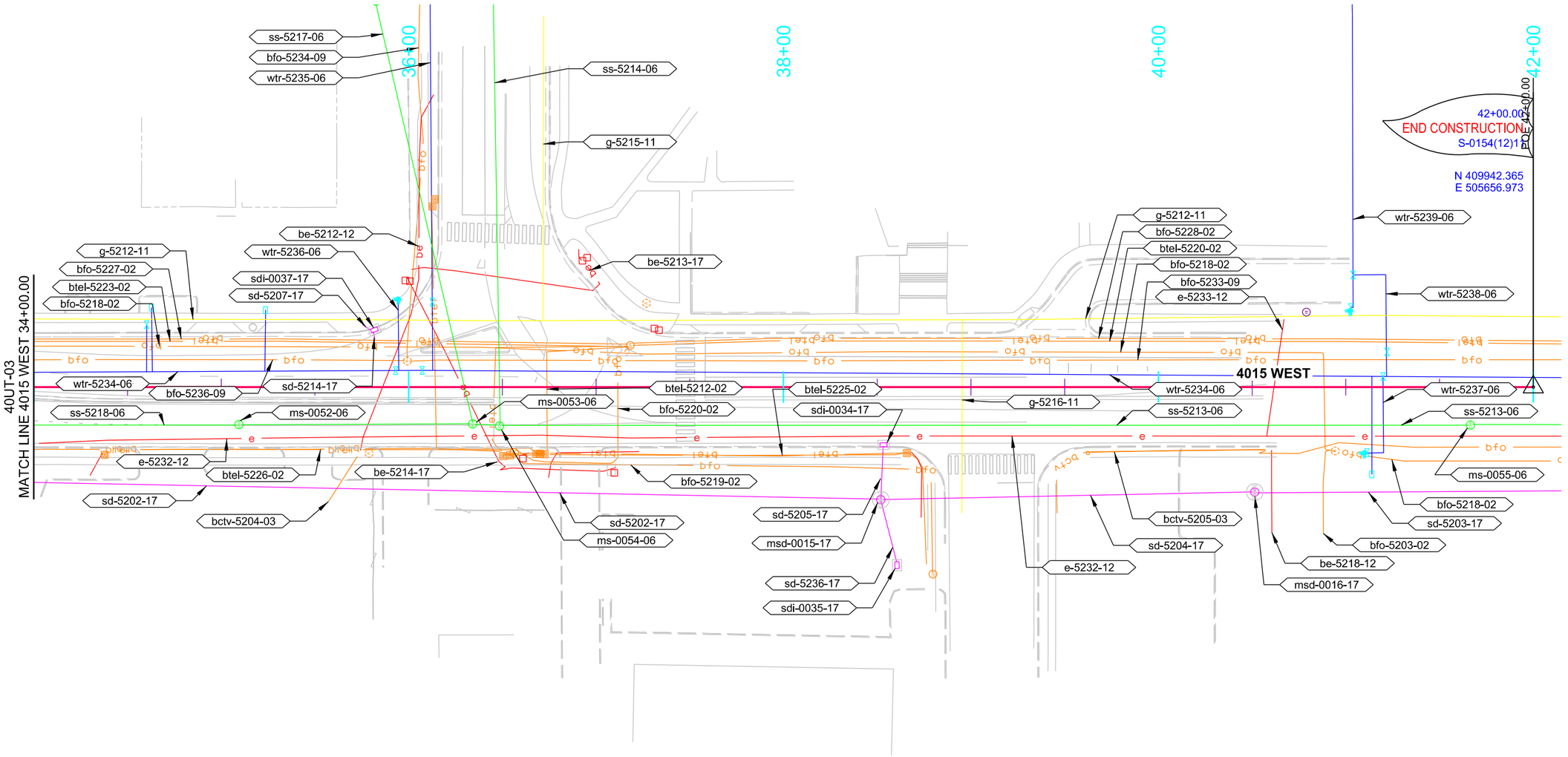

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS | QC CHECKED BY BDW | DATE | APPROVED | PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILTIES

SHEET NO. 40UT-04

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9/8/2016

788+00
BEGIN CONSTRUCTION
S-0154(12)11
MP 4.49
N 408558.331
E 504572.799

790+00
792+00
794+00

PC 794+35.91

SR-173 (5400 SOUTH)

MATCH LINE SR-173 (5400 SOUTH) 796+00.00
SEE 40UT-02

ss-5204-06
wtr-5231-06
wtr-5229-06
bctv-5201-03
sdi-0009-17
ms-0122-06
bctv-5200-03
ss-5203-06
bctv-5201-03
wtr-5219-06
bfo-5235-09
e-5023-12
ss-5205-06
bfo-5208-02
bfo-5235-09
e-5023-12
be-5205-17
bctv-5202-03
be-5206-12
g-5201-11
bctv-5203-03
sd-5251-17
bfo-5209-02
btel-5209-02
bfo-5208-02
btel-5222-02
ms-0069-06
ss-5209-06
msd-0004-17
ms-0068-06
ss-5210-06
btel-5222-02
sdi-0010-17
sd-5245-17
msd-0005-17
be-5207-12
sd-5233-17
ss-5207-06
sd-5235-17
bfo-5210-02
sdi-0008-17
sd-5223-17
ss-5208-06
sd-5234-17
bfo-5216-18
wtr-5214-06
sd-5247-17
bfo-5202-18
be-5207-12
wtr-5228-06
wtr-5213-06
bfo-5216-18
be-5222-17
sdi-0012-17
bfo-5205-15
bfo-5206-17
wtr-5211-06
sdi-0007-17
sdi-0006-17
sd-5252-17
g-5213-11
g-5214-11
be-5223-17
sdi-0013-17
be-5209-12
be-5224-12
be-5208-12
g-5213-11
ms-0072-06
wtr-5231-06
sdi-0015-17
g-5200-11
sd-5250-17
sdi-0014-17
ss-5201-06
bfo-5205-15
bfo-5206-17
sd-5249-17
wtr-5217-06
ss-5211-06

UTILITY ID NUMBER

UTILITY TYPE — OWNER ID
xxxx - #### - ##
LINE NUMBER

NOTES:

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

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QC CHECKED BY BDW
APPROVED
PROFESSIONAL ENGINEER
DATE

4 INTERCHANGES ON BANGERTER
HIGHWAY - BUILD ALTERNATIVE
PROJECT S-0154(12)11
PIN 12566
UTILITIES
PROJECT NUMBER
SHEET NO. 40UT-05

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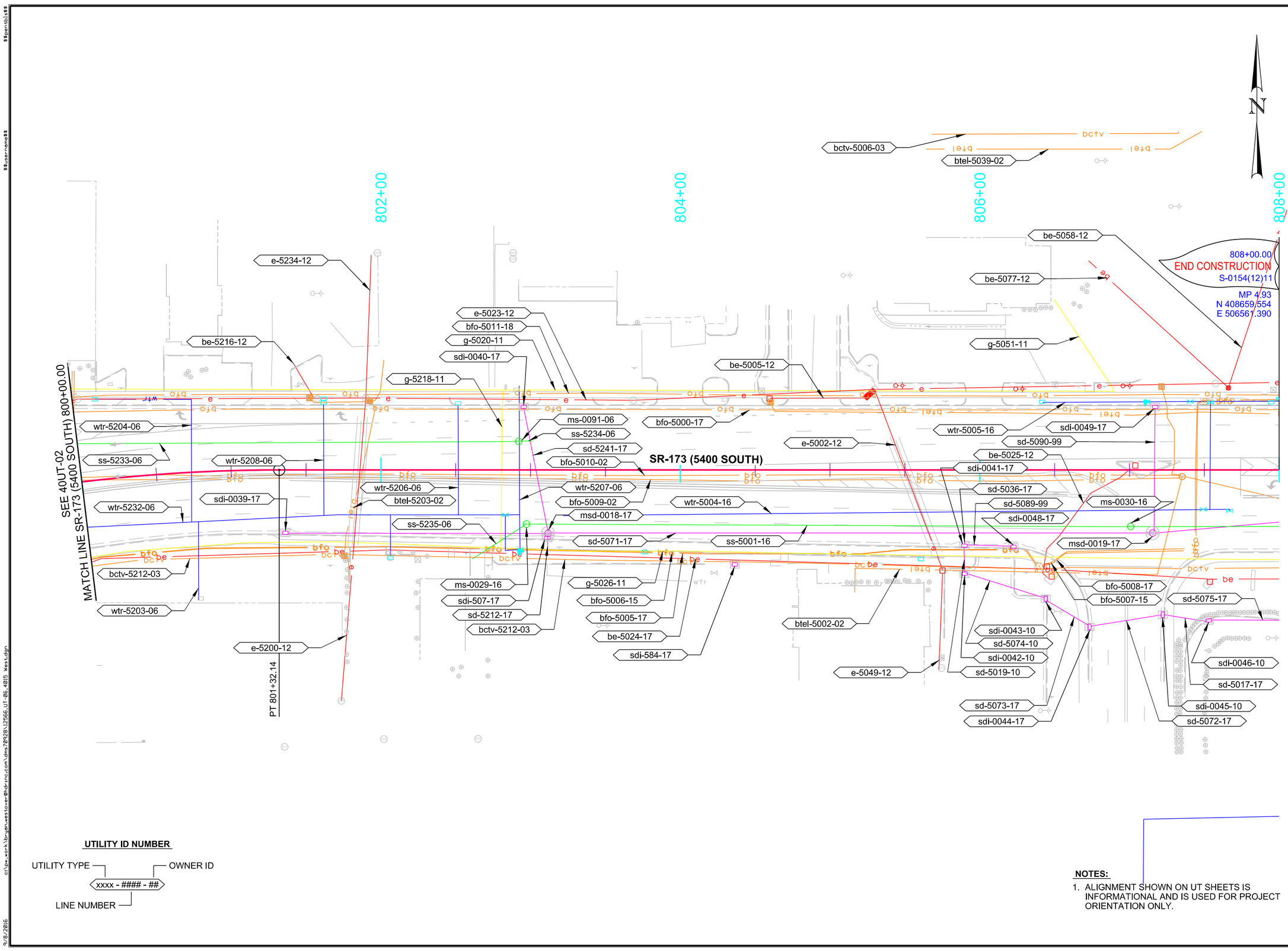
9/8/2016



UTILITY ID NUMBER

UTILITY TYPE — OWNER ID

xxxx - #### - ##

LINE NUMBER

NOTES:

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REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

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QC CHECKED BY BDW
DATE
PROFESSIONAL ENGINEER

4 INTERCHANGES ON BANGERTER
HIGHWAY - BUILD ALTERNATIVE

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

APPROVED

UTILITIES

SHEET NO. 40UT-06

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$$username$$
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9/8/2016

UTILITY CONTACTS

ID Number	Company Name	Contact	Phone Number	Cell Number	E-mail
1	United States Department of the Interior Bureau of Reclamation	Alan Christensen, Kieth Marvin		(801) 379-1098, (801) 379-1193	achristensen@usbr.gov, kmarvin@usbr.gov
2	CenturyLink (with a cc: to Terra Technologies, Koby Dutson)	Darren Keller	(801) 356-6975	(385) 312-6525	darren.keller@centurylink.com, kdutson@terratechllc.com
3	Comcast Cable (with a cc: to Jay Koenig)	David Mascarenas		(801) 831-6622	david_mascarenas@cable.comcast.com jay_koenig@cable.comcast.com
4	Day Break Secondary Water DC	Keith Hanson		(801) 278-9660	keith@canyonwater.com
5	First Digital Telecom	Ryan Finch		(801) 636-5350	rfinch@firstdigital.com
6	Kearns Improvement District	Greg Anderson		(801) 912-0282	ganderson@kearnsid.org
7	Jordan Valley Water Conservancy District	J T Cracroft		(801) 565-4390	jtc@jvwcd.org
8	Kennecott				
9	AT&T	Rob Williamson	(208) 338-2816	(208) 850-7448	rlwilliamson@att.com, duanew@clearwaterconsulting.net
9	Manuel Bros., Inc. (Quanta Power)	Tony Cole, Tony Spagnola	(303) 459-8368	(303) 419-2629, (303) 459-8355	tcole@quantapower.net, tspagnola@quantaservices.com
9	Zayo Group LLC. Fiber Solutions	Kenneth Carter	(720) 334-9505		kenneth.carter@zayo.com
10	Private				
11	Questar Gas Company	Jason McGee, Kyle Secretan	(801) 324-360 (801) 324-3389		Jason.McGee@Questar.com Kyle.secretan@questar.com
12	Rocky Mountain Power	Suzan Jensen		(801) 220-2444	suzan.jensen@rockymountainpower.com
13	South Jordan City Public Works	Raymond Garrison		(801) 253-5230	rgarrison@sjc.utah.gov
14	South Valley Sewer District	Mike Foerster	(801) 571-1166		mikef@svsewer.com
15	Syringa Networks, LLC.	Brandon Wilson	(385) 235-0800	(385) 235-0800	bwilson@syringanetworks.net
16	Taylorsville Bennion Improvement District	Kevin Fenn		(801) 968-9081	kevin@tbid.org
17	UDOT				
18	MCI (Verizon Business)	David McAllister	(303) 214-7115	(801) 301-0937	david.mcallister@verizon.com
19	West Jordan City	David Murphy		(801) 569-5074	davidm@wjordan.com
20	Granger Hunter Improvement District	Brad Paxman		(801) 955-2203	brad@ghid.org
21	Riverton City	Trace Robinson, Scott Hill		(801) 208-3137 (801) 254-0704	trobinson@rivertoncity.com, kshill@rivertoncity.com
22	Salt Lake County Operations Division	Jodi Ballif		(385) 468-6124	jballif@slco.org
23	X O Communications (with a cc: to Jeff McKay, RMWT)	John Davies		(801) 983-2662	john.davies@xo.com, jmckay@rmwt.com
24	Welby Jacob Canal Company	Darryl Lehmitz	(801) 718-3327		darryllehmitz@yahoo.com
99	Unknown				

QUALITY LEVEL	DEFINITION
A	ONLY AT LOCATION WHERE UTILITY IS EXPOSED AND SURVEYED FOR VERTICAL DEPTH
B	LOCATION OBTAINED THROUGH SURFACE GEOPHSYSICAL METHODS
C	LOCATION BASED ON OBSERVANCE OF ABOVE GROUND FEATURES
D	LOCATION BASED ON EXISTING RECORDS AND/OR RECOLLECTIONS

LEGEND

EXISTING FIBER DUCT
EXISTING SEWER LINE
EXISTING BURIED ELECTRIC
EXISTING OVERHEAD ELECTRIC
EXISTING OVERHEAD FIBER OPTIC LINE
EXISTING BURIED FIBER OPTIC LINE
EXISTING GAS LINE
EXISTING PRESS./PIPED IRRIG.
EXISTING STORM DRAIN
EXISTING OVERHEAD TELEPHONE
EXISTING BURIED TELEPHONE
EXISTING WATER LINE
EXISTING DUCT BANK CONDUIT
EXISTING TAIL CIRCUIT CONDUIT
OPEN DITCH
EXISTING EMPTY CONDUIT
PROPOSED BURIED ELECTRIC
PROPOSED OVERHEAD ELECTRIC
PROPOSED FIBER OPTIC LINE
PROPOSED GAS LINE
PROPOSED IRRIGATION LINE
PROPOSED STORM DRAIN LINE
PROPOSED BURIED TELEPHONE LINE
PROPOSED SEWER LINE
PROPOSED WATER LINE
PROPOSED ATMS

ACP	ASBESTOS CEMENT PIPE	MSS	SANITARY SEWER MANHOLE
DIP	DUCTILE IRON PIPE	MSD	STORM DRAIN MANHOLE
	CATCH BASIN / JUNCTION BOX		WATER MH
	FIRE HYDRANT		WATER/IRRIG VALVE
	JUNCTION BOX		PROPOSED CATCH BASIN
	POWER POLE		PROPOSED POWER POLE
	SANITARY SEWER MANHOLE	PB	PULL BOX
	STREET LIGHT		IRRIGATION MH
	STORM DRAIN MANHOLE	PUE	PUBLIC UTILITY EASEMENT
	TELCOM MH	PVC	POLY VINYL CHORIDE
	TELEPHONE PEDESTAL/ CABLE TV BOX		TEST HOLE
TH XX	TESTHOLE I.D.	IDB	IRRIGATION DIVERSION BOX
	WATER METER	CPP	CORRUGATED PLASTIC PIPE

REVISIONS | NO. | DATE | APPROVED BY | REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

DRAWN BY GS | CHECKED BY BDW | QC

9/15/2016 DATE

APPROVED

PROFESSIONAL ENGINEER

4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH

PROJECT

PROJECT NUMBER S-0154(12)11 | PIN 12566

UTILITY LEGEND AND NOTES

SHEET NO. 114UTDT-01

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TEST HOLE	DATE	STREET	UTILITY TYPE	STATION	OFFSET	GROUND ELEVATION	DEPTH TOP OF UTILITY	TOP OF UTILITY ELEVATION	BOTTOM OF UTILITY ELEVATION	OWNER	SIZE (IN.)	MATERIAL	NOTES
TH 114-01	8/16/2016	Bangerter Hwy	Fiber	1019+68.48	98.2 RT	4642.008	5.26	4636.748	N/A	MBI, ATT, Zayo, First Digital	Duct	Poly	Offset facing North
TH 114-02	8/12/2016	Bangerter Hwy	Fiber	1026+76.57	16.8 LT	4650.339	2.71	4647.629	4647.379	UDOT	(1) 2 In (1) 3 In	PVC	Offset facing North. Had to locate no blue stakes, location of dig site said "no power and no fiber"
TH 114-03	8/12/2016	Bangerter Hwy	Fiber	1026+72.51	106.3 RT	4649.460	5.63	4643.830	N/A	First Digital	Duct	Poly	Offset facing North
TH 114-04	8/12/2016	Bangerter Hwy	Power / Fiber	1027+31.22	114.6 RT	4649.563	3.78	4645.783	4644.950	RMP / First Digital	(1) 6 In (1) 4 In	PVC	Offset facing North
TH 114-10	8/10/2016	Bangerter Hwy	Fiber	1031+70.42	29.4 LT	4659.719	3.70	4656.019	4655.769	UDOT/Syringa	(1) 3 In, (1) 2 In	PVC	Offset facing North
TH 114-11	8/10/2016	Bangerter Hwy	Fiber	1034+24.04	27.9 LT	4663.058	3.62	4659.438	4659.188	UDOT/Syringa	(1) 3 In, (1) 2 In	PVC	Offset facing North
TH 114-12	8/18/2016	Bangerter Hwy	Fiber	1033+78.16	104.7 RT	4657.492	5.62	4651.872	N/A	First Digital	Duct	Poly	Offset facing North
TH 114-13	8/10/2016	Bangerter Hwy	Fiber	1038+95.87	24.1 LT	4666.012	2.71	4663.302	4663.052	UDOT/Syringa	3 Inches	PVC	Offset facing North
TH 114-14	8/17/2016	Bangerter Hwy	Fiber	1037+97.98	99.1 RT	4661.325	3.85	4657.475	N/A	MBI, ATT, Zayo, First Digital	Duct	Poly	Offset facing North
TH 114-15	8/10/2016	Bangerter Hwy	Fiber	1045+19.00	45.1 LT	4667.724	2.37	4665.354	4665.104	UDOT/Syringa	3 Inches	PVC	Offset facing North
TH 114-16	8/16/2016	Bangerter Hwy	Fiber	1043+04.85	86.7 RT	4660.069	5.12	4654.949	N/A	MBI, ATT, Zayo, First Digital	Duct	Poly	Offset facing North

REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

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APPROVED
9/15/2016
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY TEST HOLE DATA

SHEET NO. 114UTDT-02

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UTILITY CONTACTS

ID Number	Company Name	Contact	Phone Number	Cell Number	E-mail
1	United States Department of the Interior Bureau of Reclamation	Alan Christensen, Kieth Marvin		(801) 379-1098, (801) 379-1193	achristensen@usbr.gov, kmarvin@usbr.gov
2	CenturyLink (with a cc: to Terra Technologies, Koby Dutson)	Darren Keller	(801) 356-6975	(385) 312-6525	darren.keller@centurylink.com, kdutson@terratechllc.com
3	Comcast Cable (with a cc: to Jay Koenig)	David Mascarenas		(801) 831-6622	david_mascarenas@cable.comcast.com jay_koenig@cable.comcast.com
4	Day Break Secondary Water DC	Keith Hanson		(801) 278-9660	keith@canyonwater.com
5	First Digital Telecom	Ryan Finch		(801) 636-5350	rfinch@firstdigital.com
6	Kearns Improvement District	Greg Anderson		(801) 912-0282	ganderson@kearnsid.org
7	Jordan Valley Water Conservancy District	J T Cracroft		(801) 565-4390	jtc@jvwcd.org
8	Kennecott				
9	AT&T	Rob Williamson	(208) 338-2816	(208) 850-7448	rlwilliamson@att.com, duanew@clearwaterconsulting.net
9	Manuel Bros., Inc. (Quanta Power)	Tony Cole, Tony Spagnola	(303) 459-8368	(303) 419-2629, (303) 459-8355	tcole@quantapower.net, tspagnola@quantaservices.com
9	Zayo Group LLC. Fiber Solutions	Kenneth Carter	(720) 334-9505		kenneth.carter@zayo.com
10	Private				
11	Questar Gas Company	Jason McGee, Kyle Secretan	(801) 324-360 (801) 324-3389		Jason.McGee@Questar.com Kyle.secretan@questar.com
12	Rocky Mountain Power	Suzan Jensen		(801) 220-2444	suzan.jensen@rockymountainpower.com
13	South Jordan City Public Works	Raymond Garrison		(801) 253-5230	rgarrison@sjc.utah.gov
14	South Valley Sewer District	Mike Foerster	(801) 571-1166		mikef@svsewer.com
15	Syringa Networks, LLC.	Brandon Wilson	(385) 235-0800	(385) 235-0800	bwilson@syringanetworks.net
16	Taylorsville Bennion Improvement District	Kevin Fenn		(801) 968-9081	kevin@tbid.org
17	UDOT				
18	MCI (Verizon Business)	David McAllister	(303) 214-7115	(801) 301-0937	david.mcallister@verizon.com
19	West Jordan City	David Murphy		(801) 569-5074	davidm@wjordan.com
20	Granger Hunter Improvement District	Brad Paxman		(801) 955-2203	brad@ghid.org
21	Riverton City	Trace Robinson, Scott Hill		(801) 208-3137 (801) 254-0704	trobinson@rivertoncity.com, kshill@rivertoncity.com
22	Salt Lake County Operations Division	Jodi Ballif		(385) 468-6124	jballif@slco.org
23	X O Communications (with a cc: to Jeff McKay, RMWT)	John Davies		(801) 983-2662	john.davies@xo.com, jmckay@rmwt.com
24	Welby Jacob Canal Company	Darryl Lehmitz	(801) 718-3327		darryllehmitz@yahoo.com
99	Unknown				

QUALITY LEVEL	DEFINITION
A	ONLY AT LOCATION WHERE UTILITY IS EXPOSED AND SURVEYED FOR VERTICAL DEPTH
B	LOCATION OBTAINED THROUGH SURFACE GEOPHYSICAL METHODS
C	LOCATION BASED ON OBSERVANCE OF ABOVE GROUND FEATURES
D	LOCATION BASED ON EXISTING RECORDS AND/OR RECOLLECTIONS

LEGEND

duct	EXISTING FIBER DUCT
swr	EXISTING SEWER LINE
be	EXISTING BURIED ELECTRIC
e	EXISTING OVERHEAD ELECTRIC
fo	EXISTING OVERHEAD FIBER OPTIC LINE
bfo	EXISTING BURIED FIBER OPTIC LINE
g	EXISTING GAS LINE
ir	EXISTING PRESS./PIPED IRRIG.
sd	EXISTING STORM DRAIN
tel	EXISTING OVERHEAD TELEPHONE
btel	EXISTING BURIED TELEPHONE
wtr	EXISTING WATER LINE
id	EXISTING DUCT BANK CONDUIT
tail3	EXISTING TAIL CIRCUIT CONDUIT
	OPEN DITCH
xc	EXISTING EMPTY CONDUIT
BE	PROPOSED BURIED ELECTRIC
E	PROPOSED OVERHEAD ELECTRIC
FO	PROPOSED FIBER OPTIC LINE
G	PROPOSED GAS LINE
IR	PROPOSED IRRIGATION LINE
SD	PROPOSED STORM DRAIN LINE
BTEL	PROPOSED BURIED TELEPHONE LINE
SWR	PROPOSED SEWER LINE
WTR	PROPOSED WATER LINE
1D	PROPOSED ATMS

ACP	ASBESTOS CEMENT PIPE	MSS	SANITARY SEWER MANHOLE
DIP	DUCTILE IRON PIPE	MDS	STORM DRAIN MANHOLE
	CATCH BASIN / JUNCTION BOX	WM	WATER MH
	FIRE HYDRANT		WATER/IRRIG VALVE
	JUNCTION BOX		PROPOSED CATCH BASIN
PP	POWER POLE		PROPOSED POWER POLE
SS	SANITARY SEWER MANHOLE	PB	PULL BOX
	STREET LIGHT	IM	IRRIGATION MH
SD	STORM DRAIN MANHOLE	PUE	PUBLIC UTILITY EASEMENT
TC	TELCOM MH	PVC	POLY VINYL CHLORIDE
	TELEPHONE PEDESTAL/ CABLE TV BOX		TEST HOLE
TH XX	TESTHOLE I.D.	IDB	IRRIGATION DIVERSION BOX
	WATER METER	CPP	CORRUGATED PLASTIC PIPE

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN BY: HAB
QC CHECKED BY: VR
DATE: MM/DD/YY

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS
APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
UTILITY DETAILS

SHEET NO. 90UTDT-01

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TEST HOLE	DATE	STREET	UTILITY TYPE	STATION	OFFSET	GROUND ELEVATION	DEPTH TOP OF UTILITY	TOP OF UTILITY ELEVATION	BOTTOM OF UTILITY ELEVATION	OWNER	SIZE (IN.)	MATERIAL	NOTES
TH-5	2/8/2016	Bangerter Hwy	Water	2043+76.98	156.0 RT	4606.064	4.26	4601.804	4601.804	JVWA	66 inches	Concrete lined steel pipe	
TH-6	2/3/2016	Bangerter Hwy	Water	2054+85.47	154.9 RT	4596.206	5.19	4591.016	4591.016	JVWA	78 inches	RCP	Offset facing north
TH 90-01	6/8/2016	Bangerter Hwy	Comm	2030+75.65	63.4 LT	4600.535	5.33	4595.205	N/A	AT&T/MBI	Duct	Poly	Offset facing North
TH 90-02	6/8/2016	Bangerter Hwy	Comm	2036+70.01	36.2 LT	4605.519	5.28	4600.239	N/A	AT&T/MBI	Duct	Poly	Offset facing North
TH 90-03	6/8/2016	Bangerter Hwy	Comm	2036+69.32	23.3 LT	4603.444	3.04	4600.404	4600.154	UDOT/Syringa	3 Inches	Concrete cap PVC	Offset facing North
1 TH 90-04	6/7/2016	Bangerter Hwy	Comm	2050+64.43	11.7 RT	4598.294	8.35	4589.944	N/A	AT&T/MBI	Duct	Poly	Offset facing North
TH 90-06	8/10/2016	9000 South	Fiber	2052+67.10	251.7 LT	4603.215	3.25	4599.965	N/A	Century Link	24 In x 24 In	Concretee duct bank	Offset facing East
1 TH 90-07	8/2/2016	9000 South	Water	2052+58.52	230.8 LT	4602.775	3.75	4599.025	4598.942	West Jordan	1 Inches	Plastic	Offset facing East
TH 90-08	8/10/2016	9000 South	Gas	2052+77.37	255.9 LT	4603.423	3.76	4599.663	4599.163	Questar	6 Inches	Plastic	Offset facing East
TH 90-09	8/9/2016	9000 South	Fiber	2052+50.84	277.9 LT	4604.069	7.26	4596.809	4596.142	UDOT/Syringa	(4) 2 Inches	Poly	Offset facing East
TH 90-10	8/15/2016	9000 South	Water	2052+95.66	308.8 LT	4604.518	4.45	4600.068	4599.068	West Jordan	12 Inches	Ductile Iron	Offset facing East
TH 90-11	8/15/2016	9000 South	Gas	2053+18.00	311.3 LT	4604.375	3.35	4601.025	4600.692	Questar	4 Inches	Poly	Offset facing East
TH 90-12	8/9/2016	9000 South	Fiber/CATV	2053+58.77	72.4 LT	4600.090	3.29	4596.800	4596.467	Comcast	(3) 2 In (1) 4 In	PVC	Offset facing East
TH 90-13	6/13/2016	Bangerter Hwy	Comm	2055+65.92	3.3 LT	4596.946	N/A	N/A	N/A	AT&T/MBI	N/A	N/A	Offset facing North. Dug 11' x 4' wide, dry hole. Found unknown 1 "2" PVC HM 1'. Had utility located, he said +20' in this location
TH 90-14	6/13/2016	Bangerter Hwy	Comm	2062+52.13	32.7 LT	4579.703	5.19	4574.513	N/A	AT&T/MBI	Duct	Poly	Offset facing North
TH 90-15	8/2/2016	9000 South	Gas	2052+51.82	172.6 RT	4596.458	4.41	4592.048	4590.715	Questar	10 In Casing 6 In Gas	Steel	Offset facing NorthOffset facing North. Concrete side wall 1st measure down is 1.90', 2nd measure down is 3.80', 3rd measure down is 4.90'.
1 TH 90-16	8/16/2016	9000 South	Water	2052+84.22	342.5 RT	4593.146	N/A	N/A	N/A	West Jordan	N/A	N/A	offset facing NorthOffset facing North. Concrete side wall 1st measure down is 2.0', 2nd measure down is 3.95', 3rd measure down is 4.70'.
TH 90-16A	8/17/2016	9000 South	Water	2052+88.84	341.1 RT	4593.032	6.15	4586.882	4585.632	West Jordan	15 Inches	Ductile Iron	Offset facing NorthOffset facing North. Concrete side wall 1st measure down is 2.10', 2nd measure down is 4.10', 3rd measure down is 5.0'.
TH 90-17	8/16/2016	9000 South	Water	2053+03.78	377.6 RT	4593.042	5.27	4587.772	4586.772	West Jordan	12 Inches	Ductile Iron	Offset facing North. Lots of debris and garbageOffset facing North. Lots of debris and garbage. Concrete side wall 1st measure down is 2.70', 2nd measure down is 4.70', 3rd measure down is 5.50'.
TH 90-18	6/28/2016	Bangerter Hwy	Wall Footing	2066+77.51	66.8 RT	4557.244	N/A	N/A	N/A	N/A	N/A	Concrete	Offset facing North
TH 90-19	6/28/2016	Bangerter Hwy	Wall Footing	2067+97.69	62.3 RT	4551.274	N/A	N/A	N/A	N/A	N/A	Concrete	offset facing North
TH 90-20	6/29/2016	Bangerter Hwy	Wall Footing	2069+15.86	59.2 RT	4545.519	N/A	N/A	N/A	N/A	N/A	Concrete	Offset facing North
TH 90-21	6/21/2016	Bangerter Hwy	Wall Footing	2069+96.61	57.8 RT	4542.104	N/A	N/A	N/A	N/A	N/A	Concrete	Offset facing North. Lots of debris and garbage
TH 90-22	6/29/2016	Bangerter Hwy	Wall Footing	2070+67.40	56.2 RT	4539.455	N/A	N/A	N/A	N/A	N/A	Concrete	Offset facing North
TH 90-23	6/30/2016	Bangerter Hwy	Wall Footing	2071+64.99	56.8 RT	4536.700	N/A	N/A	N/A	N/A	N/A	Concrete	Offset facing North. 3 - 1" poly lines, HM 2.55
TH 90-24	6/30/2016	Bangerter Hwy	Wall Footing	2072+21.38	55.7 RT	4535.406	N/A	N/A	N/A	N/A	N/A	Concrete	Offset facing North
1 TH 90-25	8/15/2016	9000 South	Gas	2053+35.63	371.8 RT	4593.551	N/A	N/A	N/A	Questar	18 Inches	N/A	Offset facing East. Dry Hole - dug 8' deep x 4' wide. Dug on Blue Stakes
TH 90-26	8/15/2016	9000 South	Water	2053+38.55	371.7 RT	4593.495	N/A	N/A	N/A	West Jordan	N/A	N/A	Offset facing East. Dry Hole - dug 8' deep x 4' wide. Dug on Blue Stakes
TH 90-26A	8/17/2016	9000 South	Water	2053+60.47	374.0 RT	4593.087	N/A	N/A	N/A	West Jordan	N/A	N/A	Offset facing East. Dry Hole - dug 8' deep x 4.5' wide.
TH 90-27	6/13/2016	Bangerter Hwy	Comm	2057+92.51	125.0 RT	4592.719	4.98	4587.739	4587.239	UDOT/Syringa	(4) 1 1/2 Inches	PVC	Offset facing North
TH 90-28	7/29/2016	Bangerter Hwy	Water	2051+43.15	164.1 RT	4597.025	19.26	4577.765	4571.265	Bureau of Reclamation	78 inches	MLSP	Offset Facing North
TH 90-29	8/1/2016	Bangerter Hwy	Storm Drain	2051+52.51	164.3 RT	4596.876	N/A	N/A	N/A	Salt Lake County Flood Control	84 Inches	Metal	Offset facing North. No water line. Found 84" storm drain. Hand Measure - 7.60' running east-west
TH 90-29A	8/1/2016	Bangerter Hwy	Water	2051+58.20	163.1 RT	4596.752	19.63	4577.122	4570.622	Bureau of Reclamation	78 inches	CMP	Offset facing North

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	ADDED TESTHOLES.

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
CHECKED BY WLS
QC
DATE MM/DD/YY
APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 9000 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY DETAILS

SHEET NO. 90UTDT-02

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UTILITY CONTACTS

ID Number	Company Name	Contact	Phone Number	Cell Number	E-mail
1	United States Department of the Interior Bureau of Reclamation	Alan Christensen, Kieth Marvin		(801) 379-1098, (801) 379-1193	achristensen@usbr.gov, kmarvin@usbr.gov
2	CenturyLink (with a cc: to Terra Technologies, Koby Dutson)	Darren Keller	(801) 356-6975	(385) 312-6525	darren.keller@centurylink.com, kdutson@terratechllc.com
3	Comcast Cable (with a cc: to Jay Koenig)	David Mascarenas		(801) 831-6622	david_mascarenas@cable.comcast.com jay_koenig@cable.comcast.com
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5	First Digital Telecom	Ryan Finch		(801) 636-5350	rfinch@firstdigital.com
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9	AT&T	Rob Williamson	(208) 338-2816	(208) 850-7448	rlwilliamson@att.com, duanew@clearwaterconsulting.net
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12	Rocky Mountain Power	Suzan Jensen		(801) 220-2444	suzan.jensen@rockymountainpower.com
13	South Jordan City Public Works	Raymond Garrison		(801) 253-5230	rgarrison@sjc.utah.gov
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24	Welby Jacob Canal Company	Darryl Lehmitz	(801) 718-3327		darryllehmitz@yahoo.com
99	Unknown				

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SWR	PROPOSED SEWER LINE
WTR	PROPOSED WATER LINE
1D	PROPOSED ATMS

ACP	ASBESTOS CEMENT PIPE	MSS	SANITARY SEWER MANHOLE
DIP	DUCTILE IRON PIPE	MSD	STORM DRAIN MANHOLE
	CATCH BASIN / JUNCTION BOX		WATER MH
	FIRE HYDRANT		WATER/IRRIG VALVE
	JUNCTION BOX		PROPOSED CATCH BASIN
	POWER POLE		PROPOSED POWER POLE
	SANITARY SEWER MANHOLE	PB	PULL BOX
	STREET LIGHT		IRRIGATION MH
	STORM DRAIN MANHOLE	PUE	PUBLIC UTILITY EASEMENT
	TELCOM MH	PVC	POLY VINYL CHLORIDE
	TELEPHONE PEDESTAL/ CABLE TV BOX		TEST HOLE
TH XX	TESTHOLE I.D.	IDB	IRRIGATION DIVERSION BOX
	WATER METER	CPP	CORRUGATED PLASTIC PIPE

REVISIONS | NO. | DATE | APPROVED BY | REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

HAB | WLS | DRAWN BY | QC CHECKED BY | MM/DD/YY DATE

APPROVED

PROFESSIONAL ENGINEER

4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH

PROJECT | PROJECT NUMBER S-0154(12)11 | PIN 12566

UTILITY DETAILS

SHEET NO. 70UTDT-01

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	TEST HOLE	DATE	STREET	UTILITY TYPE	STATION	OFFSET	GROUND ELEVATION	DEPTH TOP OF UTILITY	TOP OF UTILITY ELEVATION	BOTTOM OF UTILITY ELEVATION	OWNER	SIZE (IN.)	MATERIAL	NOTES
	TH-3	2/3/2016	Bangerter Hwy	Water	3023+46.19	96.4 LT	4517.599	6.98	4510.619	4510.619	JVWA	78 inches	RCP	Offset facing north
	TH-4	2/2/2016	Bangerter Hwy	Water	3031+48.43	98.4 LT	4517.665	8.59	4509.075	4509.075	JVWA	78 inches	RCP	Offset facing north
	TH 70-01	6/6/2016	Bangerter Hwy	Comm	3016+15.54	68.8 RT	4515.974	8.12	4507.854	N/A	AT&T/MBI	Duct	Poly	Offset facing North
1	TH 70-02	6/14/2016	Bangerter Hwy	Comm	3029+43.90	204.8 LT	4518.909	1.18	4517.729	4517.146	UDOT/Syringa	(1) 1 Inch (4) 1 1/2 Inches	Plastic/PVC	Offset facing East
	TH 70-03	7/17/2016	Bangerter Hwy	Power	3029+51.37	229.4 LT	4518.992	2.96	4516.032	4515.532	West Jordan	6 IN	PVC	Offset facing East
	TH 70-04	7/18/2016	Bangerter Hwy	Water	3029+68.57	227.4 LT	4519.504	N/A	N/A	N/A	West Jordan	N/A	N/A	Offset facing East Dry Hole Dug 2 1/2' Deep X 4' Wide Big Rocks
	TH 70-04A	7/19/2016	Bangerter Hwy	Water	3029+62.98	227.4 LT	4519.293	N/A	N/A	N/A	West Jordan	N/A	N/A	Offset facing East No water line - dug 8'x4' - Found 3, 2" Plastic- No blue stakse- Hand Mesure 3.40
	TH 70-05	7/7/2016	7000 South	Water	3029+74.40	226.0 LT	4519.671	N/A	N/A	N/A	West Jordan	N/A	N/A	Offset facing East
	TH 70-05A	7/8/2016	7000 South	Water	3029+79.56	226.0 LT	4519.769	3.45	4516.319	4514.986	West Jordan	16 Inches	Ductile Iron	Offset facing East
1	TH 70-06	7/8/2016	7000 South	Gas	3029+88.83	224.8 LT	4519.927	3.50	4516.427	4516.094	Questar	4 Inches	Steel	Offset facing East
	TH 70-07	7/18/2016	Bangerter Hwy	Comm	3029+53.65	106.8 RT	4511.600	4.70	4506.900	N/A	UDOT	Duct Bank	Poly	Offset facing East
	TH 70-08	7/18/2016	Bangerter Hwy	Power	3029+69.69	123.2 RT	4511.212	5.14	4506.072	4505.572	Rocky Mountain Power	6 Inches	PVC	Offset facing East
	TH 70-09	7/7/2016	7000 South	Water	3029+79.25	188.9 RT	4509.036	N/A	N/A	N/A	West Jordan	N/A	N/A	Offset facing East. Dug on Blue Stakes, Dug 9' deep 4' wide dry hole. Found 2 - 1' steel cables at 3.0, HM
1	TH 70-09A	7/8/2016	7000 South	Water	3029+86.47	189.6 RT	4509.094	6.14	4502.954	4501.954	West Jordan	12 Inches	Ductile Iron	Offset facing East
	TH 70-10	7/17/2016	Bangerter Hwy	Water	3029+99.10	194.0 RT	4509.066	3.82	4505.246	4503.913	West Jordan	16 Inches	Ductile Iron	Offset facing East
1	TH 70-11	7/8/2016	7000 South	Gas	3029+89.60	196.9 RT	4508.878	3.92	4504.958	4504.625	Questar	4 Inches	Steel	Offset facing East
	TH 70-12	7/17/2016	Bangerter Hwy	Comm	3032+66.86	80.3 RT	4511.553	3.71	4507.843	N/A	UDOT/Syringa	Duct Bank	PVC/ Poly	Offset facing North
1	TH 70-13	6/14/2016	Bangerter Hwy	Comm	3041+11.34	73.0 LT	4511.887	N/A	N/A	N/A	Century Link	N/A	N/A	Dug 10' deep x 4' wide dry hole
	TH 70-14	7/19/2016	Bangerter Hwy	Comm	3041+25.15	67.1 RT	4511.855	N/A	N/A	N/A	AT&T	N/A	N/A	Offset Facing North- No Crossing- Found Comm lines running North/South - Hand Mesure 10.51
	TH 70-15	6/6/2016	Bangerter Hwy	Comm	3044+16.85	64.7 RT	4510.491	7.70	4502.791	N/A	AT&T/MBI	Duct	Poly	Offset facing North
	TH 70-16	6/6/2016	Bangerter Hwy	Comm	3020+31.43	68.5 RT	4516.736	4.33	4512.406	4512.281	UDOT/Syringa	(3) .5 Inches	Poly	Offset facing North
	TH 70-17	7/27/2016	Bangerter Hwy	Fiber	3030+74.09	132.1 LT	4518.522	2.77	4515.752	4515.335	Comcast	(2) 2.5 Inches	PVC/Plastic	Offset Facing East
	TH 70-18	7/27/2016	Bangerter Hwy	Cable TV	3030+74.38	136.0 LT	4518.445	2.86	4515.585	4515.543	Comcast	1/2 Inch	Direct Buried Cable	Offset Facing East

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	ADDED TESTHOLES

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
CHECKED BY WLS
QC
DATE MM/DD/YY

APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 7000 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY DETAILS

SHEET NO. 70UTDT-02

9/6/2016 1:40:29 PM pw:\\ow.horrocks.com:PWPrimaryDocuments:Projects\2016\PG-858-1604 Bangerter 4 Interchanges PM:12566\Sheet_Files\Utilities\12566_70UTDT_02.dgn

UTILITY CONTACTS

ID Number	Company Name	Contact	Phone Number	Cell Number	E-mail
1	United States Department of the Interior Bureau of Reclamation	Alan Christensen, Kieth Marvin		(801) 379-1098, (801) 379-1193	achristensen@usbr.gov, kmarvin@usbr.gov
2	CenturyLink (with a cc: to Terra Technologies, Koby Dutson)	Darren Keller	(801) 356-6975	(385) 312-6525	darren.keller@centurylink.com, kdutson@terratechllc.com
3	Comcast Cable (with a cc: to Jay Koenig)	David Mascarenas		(801) 831-6622	david_mascarenas@cable.comcast.com jay_koenig@cable.comcast.com
4	Day Break Secondary Water DC	Keith Hanson		(801) 278-9660	keith@canyonwater.com
5	First Digital Telecom	Ryan Finch		(801) 636-5350	rfinch@firstdigital.com
6	Kearns Improvement District	Greg Anderson		(801) 912-0282	ganderson@kearnsid.org
7	Jordan Valley Water Conservancy District	J T Cracroft		(801) 565-4390	jtc@jvwcd.org
8	Kennecott				
9	AT&T	Rob Williamson	(208) 338-2816	(208) 850-7448	rlwilliamson@att.com, duanew@clearwaterconsulting.net
9	Manuel Bros., Inc. (Quanta Power)	Tony Cole, Tony Spagnola	(303) 459-8368	(303) 419-2629, (303) 459-8355	tcole@quantapower.net, tspagnola@quantaservices.com
9	Zayo Group LLC. Fiber Solutions	Kenneth Carter	(720) 334-9505		kenneth.carter@zayo.com
10	Private				
11	Questar Gas Company	Jason McGee, Kyle Secretan	(801) 324-360 (801) 324-3389		Jason.McGee@Questar.com Kyle.secretan@questar.com
12	Rocky Mountain Power	Suzan Jensen		(801) 220-2444	suzan.jensen@rockymountainpower.com
13	South Jordan City Public Works	Raymond Garrison		(801) 253-5230	rgarrison@sjc.utah.gov
14	South Valley Sewer District	Mike Foerster	(801) 571-1166		mikef@svsewer.com
15	Syringa Networks, LLC.	Brandon Wilson	(385) 235-0800	(385) 235-0800	bwilson@syringanetworks.net
16	Taylorsville Bennion Improvement District	Kevin Fenn		(801) 968-9081	kevin@tbid.org
17	UDOT				
18	MCI (Verizon Business)	David McAllister	(303) 214-7115	(801) 301-0937	david.mcallister@verizon.com
19	West Jordan City	David Murphy		(801) 569-5074	davidm@wjordan.com
20	Granger Hunter Improvement District	Brad Paxman		(801) 955-2203	brad@ghid.org
21	Riverton City	Trace Robinson, Scott Hill		(801) 208-3137 (801) 254-0704	trobinson@rivertoncity.com, kshill@rivertoncity.com
22	Salt Lake County Operations Division	Jodi Ballif		(385) 468-6124	jballif@slco.org
23	X O Communications (with a cc: to Jeff McKay, RMWT)	John Davies		(801) 983-2662	john.davies@xo.com, jmckay@rmwt.com
24	Welby Jacob Canal Company	Darryl Lehmitz	(801) 718-3327		darryllehmitz@yahoo.com
99	Unknown				

QUALITY LEVEL	DEFINITION
A	ONLY AT LOCATION WHERE UTILITY IS EXPOSED AND SURVEYED FOR VERTICAL DEPTH
B	LOCATION OBTAINED THROUGH SURFACE GEOPHSYSICAL METHODS
C	LOCATION BASED ON OBSERVANCE OF ABOVE GROUND FEATURES
D	LOCATION BASED ON EXISTING RECORDS AND/OR RECOLLECTIONS

LEGEND

duct	EXISTING FIBER DUCT
swr	EXISTING SEWER LINE
be	EXISTING BURIED ELECTRIC
e	EXISTING OVERHEAD ELECTRIC
fo	EXISTING OVERHEAD FIBER OPTIC LINE
bfo	EXISTING BURIED FIBER OPTIC LINE
g	EXISTING GAS LINE
ir	EXISTING PRESS./PIPED IRRIG.
sd	EXISTING STORM DRAIN
tel	EXISTING OVERHEAD TELEPHONE
btel	EXISTING BURIED TELEPHONE
wtr	EXISTING WATER LINE
td	EXISTING DUCT BANK CONDUIT
tail3	EXISTING TAIL CIRCUIT CONDUIT
	OPEN DITCH
xc	EXISTING EMPTY CONDUIT
BE	PROPOSED BURIED ELECTRIC
E	PROPOSED OVERHEAD ELECTRIC
FO	PROPOSED FIBER OPTIC LINE
G	PROPOSED GAS LINE
IR	PROPOSED IRRIGATION LINE
SD	PROPOSED STORM DRAIN LINE
BTEL	PROPOSED BURIED TELEPHONE LINE
SWR	PROPOSED SEWER LINE
WTR	PROPOSED WATER LINE
1D	PROPOSED ATMS

ACP	ASBESTOS CEMENT PIPE	MSS	SANITARY SEWER MANHOLE
DIP	DUCTILE IRON PIPE	MSD	STORM DRAIN MANHOLE
	CATCH BASIN / JUNCTION BOX		WATER MH
	FIRE HYDRANT		WATER/IRRIG VALVE
	JUNCTION BOX		PROPOSED CATCH BASIN
	POWER POLE		PROPOSED POWER POLE
	SANITARY SEWER MANHOLE	PB	PULL BOX
	STREET LIGHT		IRRIGATION MH
	STORM DRAIN MANHOLE	PUE	PUBLIC UTILITY EASEMENT
	TELCOM MH	PVC	POLY VINYL CHORIDE
	TELEPHONE PEDESTAL/ CABLE TV BOX		TEST HOLE
TH XX	TESTHOLE I.D.	IDB	IRRIGATION DIVERSION BOX
	WATER METER	CPP	CORRUGATED PLASTIC PIPE

REVISIONS | NO. | DATE | APPROVED BY | REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - CONSULTANT NAME

APPROVED
PROFESSIONAL ENGINEER

DRAWN BY | HAB
QC CHECKED BY | DCO
DATE | MM/DD/YY

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER | S-0154(12)11
PIN | 12566

UTILITY DETAILS

SHEET NO. 54UTDT-01

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TEST HOLE	DATE	STREET	UTILITY TYPE	STATION	OFFSET	GROUND ELEVATION	DEPTH TOP OF UTILITY	TOP OF UTILITY ELEVATION	BOTTOM OF UTILITY ELEVATION	OWNER	SIZE (IN.)	MATERIAL	NOTES
TH-2	2/2/2016	Bangerter Hwy	Water	0+00.00	0.00	4510.535	4.78	4505.755	4505.755	JVWA	78 inches	RCP	Offset facing north
TH 54-01	5/26/2016	Bangerter Hwy	Water	4017+37.72	137.8 LT	4572.329	6.72	4565.609	4560.109	Bureau of Reclamation	66 Inches	MLSP	Offset facing North
TH 54-02	5/26/2016	Bangerter Hwy	Water	4028+80.14	128.4 LT	4557.411	8.30	4549.111	4543.611	Bureau of Reclamation	66 Inches	MLSP	Offset facing North
TH 54-03	5/25/2016	Bangerter Hwy	Water	4030+22.76	127.6 LT	4552.821	9.11	4543.711	4538.211	Bureau of Reclamation	66 Inches	MLSP	Offset facing North
TH 54-04	5/26/2016	Bangerter Hwy	Water	4031+66.90	107.7 LT	4551.221	8.09	4543.131	4537.631	Bureau of Reclamation	66 Inches	MLSP	Offset facing North
TH 54-05	5/25/2016	Bangerter Hwy	Water	4046+48.26	23.2 RT	4506.884	4.57	4502.314	4496.814	Bureau of Reclamation	66 Inches	MLSP	Offset facing North
TH 54-06	5/25/2016	Bangerter Hwy	Water	4046+90.80	20.9 RT	4505.841	4.76	4501.081	4495.581	Bureau of Reclamation	66 Inches	MLSP	Offset facing North
TH 54-07	6/15/2016	Bangerter Hwy	Water	4042+81.11	111.8 LT	4520.253	N/A	N/A	N/A	TBID	N/A	N/A	Offset facing North, Dug 18' x 6' wide were probiing to 12'. Dug on blue stakes, Hand Measure on Comm 6.90
TH 54-08	6/7/2016	Bangerter Hwy	Water	4043+01.74	14.2 RT	4515.498	N/A	N/A	N/A	TBID	N/A	N/A	Offset facing North Dug 10' x 8' wide on cities Blue Stake. Will need to re-evaluate & dig again
TH 54-08A	6/9/2016	Bangerter Hwy	Water	4042+92.87	19.3 RT	4514.037	N/A	N/A	N/A	TBID	N/A	N/A	Offset facing North. Dug 10.5' deep x 5' wide Dry hole
TH 54-08B	6/9/2016	Bangerter Hwy	Water	4042+83.45	13.8 RT	4515.836	N/A	N/A	N/A	TBID	N/A	N/A	Offset facing North
TH 54-09	6/15/2016	Bangerter Hwy	Sewer	4042+90.24	110.4 LT	4519.937	N/A	N/A	N/A	West Jordan	N/A	N/A	Offset facing North, Dug on cities blue stakes 11' deep x 6' wide, probing 15'. Found storm drain pipe 18" CMP. Hand Measure - 5', filled vac tank
TH 54-10	6/22/2016	Bangerter Hwy	Comm	4031.69.54	110.4 LT	4551.206	3.67	4547.536	4547.036	1/0/1900	(4) 1.5 Inches	Poly	Offset facing North
TH 54-11	6/22/2016	Bangerter Hwy	Comm	4031.77.63	108.5 LT	4551.167	N/A	N/A	N/A	1/0/1900	N/A	N/A	Found storm drain (top) HM 1.7' in the way (18" storm drain)
TH 54-11A	6/23/2016	Bangerter Hwy	Comm	4031+79.74	113.3 LT	4551.183	3.55	4547.633	4546.883	UDOT/Syringa	(1) 3 (4) 1.5 Inches	Poly/PVC	Offset facing North
TH 54-12	6/23/2016	Bangerter Hwy	Power	4031.85.153	109.7 LT	4551.133	2.44	4548.693	4547.818	1/0/1900	(3) 1.5 (3) 2 Inches	PVC	Offset facing North
TH 54-13	6/23/2016	Bangerter Hwy	Comm	4035+57.06	117.0 LT	4544.419	5.63	4538.789	4538.289	UDOT/Syringa	(4) 1.5 Inches	Poly	Offseet facing North
TH 54-14	6/21/2016	Bangerter Hwy	Comm	4037+17.54	118.7 LT	4540.235	4.38	4535.855	4535.355	UDOT	(3) 2 Inches	Slurry Casing Poly	Offset facing North
TH 54-15	6/21/2016	Bangerter Hwy	Comm	4037+39.74	113.3 LT	4540.165	7.76	4532.405	4531.738	AT&T	(4) 2 Inches	Poly	Offset facing North
TH 54-16	6/21/2016	Bangerter Hwy	Comm	4039+98.90	112.2 LT	4530.316	N/A	N/A	N/A	Century Link	N/A	N/A	Offset facing North. Found the duct running north to south HM 6'. Dug 11' deep x 4' wide no Century Link - Dry Hole
TH 54-17	6/22/2016	Bangerter Hwy	Comm	4040+10.09	107.4 LT	4529.394	4.95	4524.444	4523.944	UDOT/Syringa	(4) 1.5 Inches	Poly	Offset facing North
TH 54-18	6/15/2016	Bangerter Hwy	Comm	4042+41.71	112.8 LT	4521.001	7.85	4513.151	N/A	UDOT/Syringa	Duct	Poly	Offset facing North
TH 54-18A	6/20/2016	Bangerter Hwy	Comm	4042+40.40	106.0 LT	4521.240	4.03	4517.210	4516.543	UDOT/Syringa	(4) 2 Inch	Poly	Offset facing North. Slurry casing, 1' storm drain. Hand Measure - 13", 3 layers of gomat (1st gomat - 12", 2nd - 24", 3rd - 3.60')
TH 54-19	6/20/2016	Bangerter Hwy	Comm	4045+54.50	100.9 LT	4510.628	4.29	4506.338	4505.671	UDOT/Syringa	(4) 2 Inch	Poly	Offset facing North. Slurry casing.
TH 54-20	6/17/2016	Bangerter Hwy	Comm	4046+59.23	17.1 RT	4506.353	4.39	4501.963	4501.546	Century Link	(1) 1 inch (1) 4 Inch	Plastic/PVC	Offset facing North
TH 54-21	7/28/2016	Bangerter Hwy	Power	4042+24.52	109.5 LT	4521.760	N/A	N/A	N/A	West Jordan	N/A	N/A	Offset facing north dry hole. No blue stakes. Dug 9.5 ft depth x 4 ft wide
TH 54-24	7/28/2016	Bangerter Hwy	Fiber	4036+31.72	105.6 LT	4543.903	13.92	4529.983	4529.483	Manul Bro	(3) 2 Inches	Poly	Offset facing North

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - CONSULTANT NAME

HAB | DCO
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DATE

APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT

PROJECT NUMBER
S-0154(12)11

PIN 12566

UTILITY TEST HOLE DATA

SHEET NO. 54UTDT-02

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
bctv-1001-03	1	COMCAST	CABLE TV			D	BURIED		
bduct-1000-09	1, 2, 3, 4, 10	MBI, ATT, ZAYO	FIBER DUCT			B	BURIED	TH 114-01, 114-03	
bduct-1000-05	1, 2, 3, 4, 10	FIRST DIGITAL	FIBER DUCT			B	BURIED		
be-1001-12	1	RMP	POWER			D	BURIED		
be-1004-12	1, 2, 16	RMP	POWER			D	BURIED		
bfo-1000-17	1	UDOT	FIBER			B	BURIED		
bfo-1001-02	1, 18	CENTURY LINK	FIBER			D	BURIED		
bfo-1002-17	1, 2, 3, 4, 10	UDOT	FIBER			B	BURIED	TH 114-02	
btel-1000-02	1, 18	CENTURY LINK	TELEPHONE			D	BURIED		
btel-1001-02	1	CENTURY LINK	TELEPHONE			D	BURIED		
ctv-1000-03	1, 18	COMCAST	CABLE TV			D	AERIAL		
ctv-1002-03	1	COMCAST	CABLE TV			D	AERIAL		
e-1000-12	1, 18	RMP	POWER			D	AERIAL		
e-1002-12	1	RMP	POWER			D	AERIAL		
g-1000-11	1, 18	QUESTAR	GAS	6 IN		D			
g-1002-11	1, 2	QUESTAR	GAS	2 IN		D			
irr-1000-10	1, 2, 3, 4, 10	PRIVATE	IRRIGATION			D			
irr-1001-10	1	PRIVATE	IRRIGATION	18 IN		C			
irr-1002-10	1	PRIVATE	IRRIGATION	18 IN		C			
ms-0587-14	1	SVSD	SANITARY SEWER			B			
msd-0043-17	1	UDOT	STORM DRAIN			B			
msd-0507-17	1	UDOT	STORM DRAIN			B			
msd-0531-17	1	UDOT	STORM DRAIN			B			
msd-0547-17	1	UDOT	STORM DRAIN			B			
sd-1000-17	1	UDOT	STORM DRAIN	36 IN		C			
sd-1001-17	1	UDOT	STORM DRAIN	36 IN		C			
sd-1002-17	1	UDOT	STORM DRAIN	12 IN		D			
sd-1003-13	1	SOUTH JORDAN	STORM DRAIN	15 IN		C			
sd-1004-13	1	SOUTH JORDAN	STORM DRAIN	15 IN		C			
sd-1005-13	1	SOUTH JORDAN	STORM DRAIN	30 IN		C			
sd-1006-13	1	SOUTH JORDAN	STORM DRAIN	30 IN		C			
sd-1007-13	1	SOUTH JORDAN	STORM DRAIN	30 IN		C			
sd-1008-13	1	SOUTH JORDAN	STORM DRAIN	15 IN		D			
sd-1009-17	1	UDOT	STORM DRAIN	12 IN		D			
sd-1010-17	1	UDOT	STORM DRAIN	12 IN		D			
sd-1011-17	1	UDOT	STORM DRAIN	36 IN		C			
sd-1012-13	1	SOUTH JORDAN	STORM DRAIN	6 IN		C			
sd-1013-13	1	SOUTH JORDAN	STORM DRAIN	8 IN		D			
sd-1014-17	1	UDOT	STORM DRAIN	18 IN		C			
sd-1015-17	1	UDOT	STORM DRAIN	36 IN		C			
sd-1016-17	1, 2	UDOT	STORM DRAIN	30 IN		C			
sdi-0152-17	1	UDOT	STORM DRAIN			B			
sdi-0153-17	1	UDOT	STORM DRAIN			B			
sdi-0154-17	1	UDOT	STORM DRAIN			B			
sdi-0199-17	1	UDOT	STORM DRAIN			B			
sdi-0200-17	1	UDOT	STORM DRAIN			B			
sdi-0373-17	1	UDOT	STORM DRAIN			B			
sdi-0553-17	1	UDOT	STORM DRAIN			B			
sdi-0554-13	1	SOUTH JORDAN	STORM DRAIN			B			
sdi-0555-13	1	SOUTH JORDAN	STORM DRAIN			B			
sdi-0556-13	1	SOUTH JORDAN	STORM DRAIN			B			
sdi-0559-17	1	UDOT	STORM DRAIN			B			
ss-1000-14	1, 18	SVSD	SANITARY SEWER	15 IN		D			
wtr-1001-13	1, 18	SOUTH JORDAN	WATER	16 IN		D			
be-1005-12	2	RMP	POWER			D	BURIED		
be-1006-12	2	RMP	POWER			D	BURIED		
be-1007-12	2, 16	RMP	POWER			D	BURIED		
be-1008-12	2, 3	RMP	POWER			D	BURIED		
be-1009-12	2, 3	RMP	POWER			D	BURIED		

REVISIONS

NO. | DATE | APPROVED BY | REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

DRAWN BY GS
QC CHECKED BY BDW
9/15/2016 DATE

APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PIN 12566
PROJECT NUMBER: S-0154(12)11
UTILITIES

SHEET NO. 114UTSM-01

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
be-1010-12	2, 3	RMP	POWER			D	BURIED		
be-1011-12	2, 3	RMP	POWER			D	BURIED		
bfo-1004-05	2, 16, 17, 18	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1005-05	2, 3	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1007-05	2, 3	FIRST DIGITAL	FIBER			B	BURIED		
btel-1002-05	2, 3, 16	FIRST DIGITAL	TELEPHONE			D	BURIED		
btel-1003-05	2, 3	FIRST DIGITAL	TELEPHONE			B	BURIED		
g-1003-11	2, 16	QUESTAR	GAS	2 IN		D			
g-1005-11	2	QUESTAR	GAS	2 IN		D			
sd-1017-17	2	UDOT	STORM DRAIN	18 IN		C			
sd-1018-17	2	UDOT	STORM DRAIN	30 IN		C			
sd-1019-17	2	UDOT	STORM DRAIN	18 IN		C			
sd-1020-17	2	UDOT	STORM DRAIN	30 IN		C			
sd-1021-17	2	UDOT	STORM DRAIN	18 IN		C			
sd-1022-17	2, 3	UDOT	STORM DRAIN	30 IN		C			
sd-1023-17	2, 3	UDOT	STORM DRAIN	18 IN		C			
sd-1024-17	2, 3	UDOT	STORM DRAIN	18 IN		C			
sdi-0155-17	2	UDOT	STORM DRAIN			B			
sdi-0156-17	2	UDOT	STORM DRAIN			B			
sdi-0157-17	2	UDOT	STORM DRAIN			B			
sdi-0158-17	2, 3	UDOT	STORM DRAIN			B			
sdi-0195-17	2, 3	UDOT	STORM DRAIN			B			
sdi-0196-17	2	UDOT	STORM DRAIN			B			
sdi-0197-17	2	UDOT	STORM DRAIN			B			
sdi-0198-17	2	UDOT	STORM DRAIN			B			
ss-1001-14	2, 3	SVSD	SANITARY SEWER	8 IN		D			
wtr-1003-13	2, 3	SOUTH JORDAN	WATER	8 IN		D			
bctv-1004-03	3	COMCAST	CABLE TV			D	BURIED		
bctv-1005-03	3	COMCAST	CABLE TV			D	BURIED		
be-1012-12	3, 4	RMP	POWER			D	BURIED		
be-1015-12	3	RMP	POWER			D	BURIED		
be-1016-12	3, 4, 10	RMP	POWER			D	BURIED		
be-1017-12	3, 4, 10	RMP	POWER			D	BURIED	TH 114-04	
bfo-1008-05	3	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1009-05	3	FIRST DIGITAL	FIBER			B	BURIED		
bfo-1010-05	3	FIRST DIGITAL	FIBER			B	BURIED		
bfo-1011-05	3, 4	FIRST DIGITAL	FIBER			B	BURIED		
btel-1004-02	3	CENTURY LINK	TELEPHONE			D	BURIED		
btel-1005-05	3	FIRST DIGITAL	TELEPHONE			B	BURIED		
btel-1006-05	3	FIRST DIGITAL	TELEPHONE			B	BURIED		
btel-1007-05	3, 4	FIRST DIGITAL	TELEPHONE			B	BURIED		
g-1006-11	3	QUESTAR	GAS	2 IN		D			
g-1010-11	3, 4, 9	QUESTAR	GAS	4 IN		D			
g-1011-11	3, 4	QUESTAR	GAS	2 IN		D			
msd-0504-17	3	UDOT	STORM DRAIN			B			
sd-1025-17	3	UDOT	STORM DRAIN	18 IN		C			
sd-1026-17	3	UDOT	STORM DRAIN	30 IN		C			
sd-1027-13	3	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1028-17	3	UDOT	STORM DRAIN	30 IN		C			
sd-1029-17	3	UDOT	STORM DRAIN	12 IN		D			
sd-1030-13	3	SOUTH JORDAN	STORM DRAIN	24 IN		D			
sd-1031-10	3	PRIVATE	STORM DRAIN	12 IN		D			
sd-1032-17	3	UDOT	STORM DRAIN	18 IN		C			
sd-1033-17	3	UDOT	STORM DRAIN	30 IN		C			
sd-1034-13	3	SOUTH JORDAN	STORM DRAIN	24 IN		D			
sd-1035-13	3	SOUTH JORDAN	STORM DRAIN	24 IN		D			
sd-1036-13	3	SOUTH JORDAN	STORM DRAIN	24 IN		D			
sd-1037-17	3	UDOT	STORM DRAIN	18 IN		C			
sd-1038-17	3, 4	UDOT	STORM DRAIN	30 IN		C			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

DRAWN BY GS
QC CHECKED BY BDW
9/15/2016 DATE

APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITIES

SHEET NO. 114UTSM-02

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9/9/2016

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sd-1039-13	3	SOUTH JORDAN	STORM DRAIN	24 IN		D			
sd-1040-13	3, 4, 9	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sdi-0159-17	3	UDOT	STORM DRAIN			B			
sdi-0160-17	3	UDOT	STORM DRAIN			B			
sdi-0161-17	3	UDOT	STORM DRAIN			B			
sdi-0192-17	3	UDOT	STORM DRAIN			B			
sdi-0193-17	3	UDOT	STORM DRAIN			B			
sdi-0194-17	3	UDOT	STORM DRAIN			B			
sdi-0372-17	3	UDOT	STORM DRAIN			B			
sdi-0560-13	3	SOUTH JORDAN	STORM DRAIN			B			
ss-1002-14	3	SVSD	SANITARY SEWER	21 IN		D			
ss-1003-14	3, 4, 9	SVSD	SANITARY SEWER	8 IN		D			
ss-1006-14	3, 13	SVSD	SANITARY SEWER	8 IN		D			
wtr-1004-13	3	SOUTH JORDAN	WATER	8 IN		D			
wtr-1005-13	3	SOUTH JORDAN	WATER	8 IN		D			
wtr-1006-13	3, 4, 9, 10	SOUTH JORDAN	WATER	8 IN		D			
wtr-1007-13	3, 13	SOUTH JORDAN	WATER	8 IN		D			
wtr-1008-13	3, 4	SOUTH JORDAN	WATER	8 IN		D			
wtr-1009-13	3	SOUTH JORDAN	WATER	6 IN		D			
wtr-1010-13	3	SOUTH JORDAN	WATER	6 IN		D			
wtr-1011-13	3	SOUTH JORDAN	WATER	6 IN		D			
bctv-1006-03	4, 9, 10	COMCAST	CABLE TV			D	BURIED		
bctv-1007-03	4, 9, 10	COMCAST	CABLE TV			D	BURIED		
bctv-1008-03	4, 9, 10	COMCAST	CABLE TV			D	BURIED		
bctv-1010-03	4, 5, 10, 11	COMCAST	CABLE TV			D	BURIED		
bduct-1001-09	4, 5, 10	MBI, ATT, ZAYO	FIBER DUCT			D	BURIED		
bduct-1001-05	4, 5, 10	FIRST DIGITAL	FIBER DUCT			D	BURIED		
be-1018-12	4	RMP	POWER			D	BURIED		
be-1019-12	4, 10	RMP	POWER			D	BURIED		
be-1020-12	4, 9	RMP	POWER			D	BURIED		
be-1021-12	4	RMP	POWER			D	BURIED		
be-1039-12	4, 10	RMP	POWER			D	BURIED		
be-1048-12	4, 9, 10	RMP	POWER			D	BURIED		
be-1059-12	4, 10	RMP	POWER			D	BURIED		
be-1061-12	4, 10	RMP	POWER			D	BURIED		
be-1062-13	4, 10	SOUTH JORDAN	POWER			D	BURIED		
be-1066-13	4, 10	SOUTH JORDAN	POWER			D	BURIED		
be-1067-13	4, 10	SOUTH JORDAN	POWER			D	BURIED		
be-1084-12	4, 5, 10, 11, 15	RMP	POWER			D	BURIED		
be-1086-17	4, 10	UDOT	POWER			D	BURIED		

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

DRAWN BY: GS
QC CHECKED BY: BDW

APPROVED
9/15/2016
DATE

PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PIN 12566
S-0154(12)11

UTILITIES

PROJECT
PROJECT NUMBER

SHEET NO. 114UTSM-03

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
be-1087-12	4, 5, 10	RMP	POWER			D	BURIED		
be-1088-12	4, 10	RMP	POWER			D	BURIED		
be-1089-12	4, 5, 10	RMP	POWER			D	BURIED		
be-1090-12	4, 5, 10	RMP	POWER			D	BURIED		
be-1092-12	4, 9, 10	RMP	POWER			D	BURIED		
bfo-1013-05	4	FIRST DIGITAL	FIBER			B	BURIED		
bfo-1014-05	4, 10	FIRST DIGITAL	FIBER			B	BURIED		
bfo-1028-17	4, 10, 11, 12, 13, 15	UDOT	FIBER			B	BURIED		
bfo-1029-15	4, 10, 11, 12, 13, 15	SYRINGA	FIBER			B	BURIED		
bfo-1030-02	4, 10	CENTURY LINK	FIBER			B	BURIED		
bfo-1034-15	4, 10	SYRINGA	FIBER			B	BURIED		
bfo-1040-17	4, 9, 10	UDOT	FIBER			B	BURIED		
bfo-1044-17	4, 5, 6, 7, 8, 10	UDOT	FIBER			B	BURIED	TH 114-10, -11, -12, -13, -15	
bfo-1045-18	4, 5, 6, 7, 8, 10	VERIZON	FIBER			B	BURIED		
btel-1008-05	4	FIRST DIGITAL	TELEPHONE			B	BURIED		
btel-1009-05	4, 10	FIRST DIGITAL	TELEPHONE			B	BURIED		
btel-1015-05	4, 10	FIRST DIGITAL	TELEPHONE			B	BURIED		
btel-1016-02	4, 10	CENTURY LINK	TELEPHONE			B	BURIED		
btel-1023-05	4, 5, 10, 11, 14	FIRST DIGITAL	TELEPHONE			B	BURIED		
btel-1024-02	4, 5, 10	CENTURY LINK	TELEPHONE			B	BURIED		
e-1003-12	4, 9, 10, 11, 12, 15	RMP	POWER			D	AERIAL		
g-1012-11	4, 13	QUESTAR	GAS	2 IN		D			
g-1013-11	4	QUESTAR	GAS	2 IN		D			
g-1015-11	4	QUESTAR	GAS	2 IN		D			
g-1016-11	4	QUESTAR	GAS	2 IN		D			
g-1020-11	4, 9, 10	QUESTAR	GAS	2 IN		D			
g-1030-11	4, 5, 10	QUESTAR	GAS	4 IN		B			
irr-1000-04	4, 9, 10	DAYBREAK	IRRIGATION PRESSURIZED	6 IN		D			
irr-1001-04	4, 9	DAYBREAK	IRRIGATION PRESSURIZED	6 IN		D			
irr-1003-10	4, 10, 11, 12, 13, 15	PRIVATE	IRRIGATION			D			
irr-1006-10	4, 9, 10	PRIVATE	IRRIGATION	18 IN		D			
irr-1007-10	4, 9, 10	PRIVATE	IRRIGATION	18 IN		C			
irr-1013-13	4, 5, 10	SOUTH JORDAN	IRRIGATION	24 IN		C			
irr-1014-13	4, 5, 10	SOUTH JORDAN	IRRIGATION	18 IN		C			
irr-1015-13	4, 5, 10, 11, 14	SOUTH JORDAN	IRRIGATION	18 IN		C			
irr-1016-13	4, 5, 10	SOUTH JORDAN	IRRIGATION	18 IN		C			
irr-1017-13	4, 10	SOUTH JORDAN	IRRIGATION	18 IN		C			
irr-1020-13	4, 9, 10	SOUTH JORDAN	IRRIGATION	24 IN		C			
irr-1022-13	4, 5, 9, 10	SOUTH JORDAN	IRRIGATION	24 IN		C			
ms-0515-14	4, 10	SVSD	SANITARY SEWER			B			
ms-0517-99	4, 10	UNKNOWN	SANITARY SEWER			B			
ms-0518-99	4, 10	UNKNOWN	SANITARY SEWER			B			
ms-0519-06	4	KEARNS	SANITARY SEWER			B			
ms-0520-06	4	KEARNS	SANITARY SEWER			B			
msd-0040-13	4, 10	SOUTH JORDAN	STORM DRAIN			B			
msd-0058-13	4, 10	SOUTH JORDAN	STORM DRAIN			B			
msd-0059-17	4, 9	UDOT	STORM DRAIN			B			
sd-1041-17	4	UDOT	STORM DRAIN	18 IN		C			
sd-1042-17	4, 10	UDOT	STORM DRAIN	30 IN		C			
sd-1044-13	4, 9, 10	SOUTH JORDAN	STORM DRAIN	24 IN		D			
sd-1048-13	4, 9	SOUTH JORDAN	STORM DRAIN	24 IN		D			
sd-1049-17	4, 10	UDOT	STORM DRAIN	12 IN		C			
sd-1052-17	4, 10	UDOT	STORM DRAIN	30 IN		C			
sd-1053-17	4, 5, 10	UDOT	STORM DRAIN	30 IN		C			
sd-1055-17	4, 9	UDOT	STORM DRAIN	8 IN		C			
sd-1078-17	4, 10	UDOT	STORM DRAIN	48 IN		C			
sd-1080-17	4, 9, 10	UDOT	STORM DRAIN	48 IN		C			
sd-1081-13	4, 10	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1093-17	4, 5, 10	UDOT	STORM DRAIN	18 IN		C			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

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QC CHECKED BY BDW
9/15/2016 DATE
APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITIES

SHEET NO. 114UTSM-04

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sd-1094-13	4, 10	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1102-13	4, 9, 10	SOUTH JORDAN	STORM DRAIN	48 IN		C			
sd-1103-13	4, 10	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1109-17	4, 10	UDOT	STORM DRAIN	8 IN		C			
sd-1110-17	4, 5, 10	UDOT	STORM DRAIN	10 IN		C			
sd-1111-17	4, 5, 10	UDOT	STORM DRAIN	10 IN		C			
sd-1114-13	4, 5, 10	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1115-17	4, 5, 10	UDOT	STORM DRAIN	30 IN		C			
sdi-0162-17	4	UDOT	STORM DRAIN			B			
sdi-0163-17	4, 10	UDOT	STORM DRAIN			B			
sdi-0164-17	4, 5, 10	UDOT	STORM DRAIN			B			
sdi-0190-17	4, 10	UDOT	STORM DRAIN			B			
sdi-0191-17	4	UDOT	STORM DRAIN			B			
sdi-0216-17	4, 5, 10	UDOT	STORM DRAIN			B			
sdi-0236-17	4, 10	UDOT	STORM DRAIN			B			
sdi-0237-13	4, 10	SOUTH JORDAN	STORM DRAIN			B			
sdi-0238-17	4, 10	UDOT	STORM DRAIN			B			
sdi-0239-17	4, 9	UDOT	STORM DRAIN			B			
sdi-0240-10	4, 9, 10	PRIVATE	IRRIGATION			B			
sdi-0251-17	4, 10	UDOT	STORM DRAIN			B			
sdi-0252-17	4, 10	UDOT	STORM DRAIN			B			
ss-1011-06	4, 10	KEARNS	SANITARY SEWER	8 IN		C			
ss-1019-14	4, 10, 13	SVSD	SANITARY SEWER	8 IN		C			
ss-1020-99	4, 10	UNKNOWN	SANITARY SEWER	6 IN		C			
ss-1021-99	4, 10	UNKNOWN	SANITARY SEWER	6 IN		C			
wtr-1012-13	4, 13	SOUTH JORDAN	WATER	8 IN		D			
wtr-1013-13	4	SOUTH JORDAN	WATER	6 IN		D			
wtr-1016-13	4	SOUTH JORDAN	WATER	6 IN		D			
wtr-1017-13	4	SOUTH JORDAN	WATER	6 IN		D			
wtr-1022-13	4, 10, 13	SOUTH JORDAN	WATER	8 IN		D			
wtr-1026-13	4, 9, 10	SOUTH JORDAN	WATER	6 IN		D			
wtr-1027-13	4, 9, 10	SOUTH JORDAN	WATER	8 IN		D			
wtr-1030-13	4, 9	SOUTH JORDAN	WATER	6 IN		D			
bctv-1017-03	5, 9	COMCAST	CABLE TV			D	BURIED		
bctv-1019-03	5, 6	COMCAST	CABLE TV			D	BURIED		
bctv-1020-03	5, 6	COMCAST	CABLE TV			D	BURIED		
bctv-1021-03	5	COMCAST	CABLE TV			D	BURIED		
bduct-1002-09	5, 6, 7, 8, 10	MBI, ATT, ZAYO	FIBER DUCT			B	BURIED	TH 114-14, 114-16	
bduct-1002-05	5, 6, 7, 8, 10	FIRST DIGITAL	FIBER DUCT			B	BURIED		
be-1091-12	5, 10	RMP	POWER			D	BURIED		
be-1096-12	5, 10, 14	RMP	POWER			D	BURIED		
be-1097-12	5, 9	RMP	POWER			D	BURIED		
be-1100-12	5, 6	RMP	POWER			D	BURIED		
be-1102-12	5	RMP	POWER			D	BURIED		
bfo-1049-02	5, 9	CENTURY LINK	FIBER			D	BURIED		
btel-1027-02	5, 6	CENTURY LINK	TELEPHONE			D	BURIED		
btel-1028-02	5, 6	CENTURY LINK	TELEPHONE			D	BURIED		
g-1044-11	5, 9	QUESTAR	GAS	2 IN		D			
g-1049-11	5, 6, 7	QUESTAR	GAS	4 IN		D			
g-1050-11	5, 6	QUESTAR	GAS	4 IN		D			
g-1051-11	5	QUESTAR	GAS	2 IN		D			
g-1052-11	5, 14	QUESTAR	GAS	2 IN		D			
g-1053-11	5, 6	QUESTAR	GAS	2 IN		D			
irr-1023-13	5, 10	SOUTH JORDAN	IRRIGATION	18 IN		C			
irr-1024-13	5, 10	SOUTH JORDAN	IRRIGATION	18 IN		C			
ms-0595-14	5	SVSD	SANITARY SEWER			D			
ms-0596-14	5	SVSD	SANITARY SEWER			D			
ms-0597-14	5	SVSD	SANITARY SEWER			D			
msd-0526-13	5	SOUTH JORDAN	STORM DRAIN			B			
msd-0534-13	5	SOUTH JORDAN	STORM DRAIN			B			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

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9/15/2016 DATE

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PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITIES

114UTSM-05
SHEET NO.

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
msd-0543-13	5	SOUTH JORDAN	STORM DRAIN			B			
sd-1125-13	5, 10	SOUTH JORDAN	STORM DRAIN	30 IN		C			
sd-1129-17	5	UDOT	STORM DRAIN	24 IN		C			
sd-1130-13	5	SOUTH JORDAN	STORM DRAIN	30 IN		C			
sd-1131-17	5	UDOT	STORM DRAIN	24 IN		C			
sd-1132-13	5	SOUTH JORDAN	STORM DRAIN	30 IN		C			
sd-1133-13	5	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1134-13	5, 6, 7	SOUTH JORDAN	STORM DRAIN	30 IN		D			
sd-1135-13	5	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1136-17	5, 6	UDOT	STORM DRAIN	24 IN		C			
sd-1137-17	5, 6	UDOT	STORM DRAIN	18 IN		C			
sd-1138-13	5	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1139-17	5, 6	UDOT	STORM DRAIN	18 IN		C			
sd-1140-17	5, 6	UDOT	STORM DRAIN	24 IN		C			
sd-1272-13	5	SOUTH JORDAN	STORM DRAIN	30 IN		C			
sdi-0165-17	5	UDOT	STORM DRAIN			B			
sdi-0166-17	5	UDOT	STORM DRAIN			B			
sdi-0167-17	5	UDOT	STORM DRAIN			B			
sdi-0168-17	5, 6	UDOT	STORM DRAIN			B			
sdi-0189-17	5, 6	UDOT	STORM DRAIN			B			
sdi-0244-13	5, 10	SOUTH JORDAN	STORM DRAIN			B			
sdi-0514-17	5, 6	UDOT	STORM DRAIN			B			
sdi-0577-13	5	SOUTH JORDAN	STORM DRAIN			B			
sdi-0580-13	5	SOUTH JORDAN	STORM DRAIN			B			
sdi-0581-13	5	SOUTH JORDAN	STORM DRAIN			B			
ss-1047-14	5, 6, 7, 8	SVSD	SANITARY SEWER	8 IN		D			
ss-1048-14	5	SVSD	SANITARY SEWER	8 IN		D			
ss-1051-14	5	SVSD	SANITARY SEWER	8 IN		D			
wtr-1036-13	5, 10	SOUTH JORDAN	WATER	8 IN		D			
wtr-1037-13	5, 10	SOUTH JORDAN	WATER	6 IN		D			
wtr-1041-13	5, 10, 11, 14	SOUTH JORDAN	WATER	8 IN		D			
wtr-1045-13	5, 6, 7, 8	SOUTH JORDAN	WATER	8 IN		D			
wtr-1046-13	5	SOUTH JORDAN	WATER	6 IN		D			
wtr-1047-13	5	SOUTH JORDAN	WATER	6 IN		D			
wtr-1048-13	5	SOUTH JORDAN	WATER	8 IN		D			
wtr-1049-13	5, 14	SOUTH JORDAN	WATER	16 IN		D			
wtr-1050-13	5	SOUTH JORDAN	WATER	8 IN		D			
bctv-1022-03	6, 7	COMCAST	CABLE TV			D	BURIED		
be-1103-12	6, 7	RMP	POWER			D	BURIED		
btel-1029-02	6, 7	CENTURY LINK	TELEPHONE			D	BURIED		
ms-0598-14	6	SVSD	SANITARY SEWER			D			
ms-0599-14	6	SVSD	SANITARY SEWER			D			
ms-0600-14	6	SVSD	SANITARY SEWER			D			
sd-1141-13	6	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1142-17	6	UDOT	STORM DRAIN	18 IN		C			
sd-1143-17	6	UDOT	STORM DRAIN	24 IN		C			
sd-1144-13	6	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1145-13	6	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1146-13	6	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1147-17	6	UDOT	STORM DRAIN	18 IN		C			
sd-1148-17	6, 7	UDOT	STORM DRAIN	24 IN		C			
sdi-0169-17	6	UDOT	STORM DRAIN			B			
sdi-0170-17	6	UDOT	STORM DRAIN			B			
sdi-0186-17	6	UDOT	STORM DRAIN			B			
sdi-0187-17	6	UDOT	STORM DRAIN			B			
sdi-0188-17	6	UDOT	STORM DRAIN			B			
sdi-0511-17	6	UDOT	STORM DRAIN			B			
sdi-0512-17	6	UDOT	STORM DRAIN			B			
sdi-0513-17	6	UDOT	STORM DRAIN			B			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

DRAWN BY: GS
QC CHECKED BY: BDW
APPROVED: 9/15/2016 DATE
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITIES

SHEET NO. 114UTSM-06

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sdi-0576-13	6	SOUTH JORDAN	STORM DRAIN			B			
ss-1052-14	6	SVSD	SANITARY SEWER	8 IN		D			
wtr-1051-13	6	SOUTH JORDAN	WATER	8 IN		D			
bctv-1023-03	7	COMCAST	CABLE TV			D	BURIED		
bctv-1024-03	7, 8	COMCAST	CABLE TV			D	BURIED		
bctv-1025-03	7, 8	COMCAST	CABLE TV			D	BURIED		
bctv-1026-03	7	COMCAST	CABLE TV			D	BURIED		
be-1104-12	7, 8	RMP	POWER			D	BURIED		
btel-1030-02	7	CENTURY LINK	TELEPHONE			D	BURIED		
g-1055-11	7, 8	QUESTAR	GAS	2 IN		D			
g-1056-11	7	QUESTAR	GAS	2 IN		D			
g-1057-11	7	QUESTAR	GAS	2 IN		D			
g-1058-11	7	QUESTAR	GAS	2 IN		D			
g-1059-11	7, 8	QUESTAR	GAS	2 IN		D			
ms-0601-14	7	SVSD	SANITARY SEWER			D			
ms-0602-14	7	SVSD	SANITARY SEWER			D			
ms-0603-14	7	SVSD	SANITARY SEWER			D			
ms-0604-14	7	SVSD	SANITARY SEWER			D			
sd-1149-17	7	UDOT	STORM DRAIN	18 IN		C			
sd-1150-17	7	UDOT	STORM DRAIN	24 IN		C			
sd-1151-13	7	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1152-17	7	UDOT	STORM DRAIN	24 IN		C			
sd-1153-17	7	UDOT	STORM DRAIN	18 IN		C			
sd-1154-13	7	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1155-17	7	UDOT	STORM DRAIN	18 IN		C			
sd-1156-17	7, 8	UDOT	STORM DRAIN	18 IN		C			
sdi-0171-17	7	UDOT	STORM DRAIN			B			
sdi-0172-17	7	UDOT	STORM DRAIN			B			
sdi-0173-17	7	UDOT	STORM DRAIN			B			
sdi-0183-17	7	UDOT	STORM DRAIN			B			
sdi-0184-17	7	UDOT	STORM DRAIN			B			
sdi-0185-17	7	UDOT	STORM DRAIN			B			
sdi-0585-17	7	UDOT	STORM DRAIN			B			
ss-1053-14	7	SVSD	SANITARY SEWER	8 IN		D			
ss-1054-14	7	SVSD	SANITARY SEWER	8 IN		D			
ss-1055-14	7	SVSD	SANITARY SEWER	8 IN		D			
wtr-1052-13	7	SOUTH JORDAN	WATER	8 IN		D			
wtr-1053-13	7	SOUTH JORDAN	WATER	8 IN		D			
wtr-1054-13	7	SOUTH JORDAN	WATER	8 IN		D			
ms-0605-14	8	SVSD	SANITARY SEWER			D			
sd-1157-17	8	UDOT	STORM DRAIN	18 IN		C			
sd-1158-17	8	UDOT	STORM DRAIN	18 IN		C			
sd-1159-17	8	UDOT	STORM DRAIN	18 IN		C			
sdi-0174-17	8	UDOT	STORM DRAIN			B			
sdi-0180-17	8	UDOT	STORM DRAIN			B			
sdi-0181-17	8	UDOT	STORM DRAIN			B			
sdi-0182-17	8	UDOT	STORM DRAIN			B			
bctv-1003-03	9	COMCAST	CABLE TV			D	BURIED		
be-1013-12	9	RMP	POWER			D	BURIED		
be-1036-12	9	RMP	POWER			D	BURIED		
be-1040-13	9	SOUTH JORDAN	POWER			D	BURIED		
be-1041-12	9	RMP	POWER			D	BURIED		
be-1063-13	9	SOUTH JORDAN	POWER			D	BURIED		
be-1064-17	9	UDOT	POWER			D	BURIED		
be-1065-17	9	UDOT	POWER			D	BURIED		
be-1078-13	9	SOUTH JORDAN	POWER			D	BURIED		
be-1081-17	9	UDOT	POWER			D	BURIED		
be-1082-13	9	SOUTH JORDAN	POWER			D	BURIED		
be-1093-12	9	RMP	POWER			D	BURIED		

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY	CHECKED BY	QC
GS	BDW	

DATE 9/15/2016

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT

PROJECT NUMBER S-0154(12)11

PIN 12566

UTILITIES

SHEET NO. 114UTSM-07

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
bfo-1033-17	9	UDOT	FIBER			B	BURIED		
bfo-1043-17	9	UDOT	FIBER			B	BURIED		
bfo-1051-02	9	CENTURY LINK	FIBER			D	BURIED		
btel-1010-02	9	CENTURY LINK	TELEPHONE			D	BURIED		
btel-1014-02	9	CENTURY LINK	TELEPHONE			B	BURIED		
btel-1022-02	9	CENTURY LINK	TELEPHONE			B	BURIED		
btel-1026-02	9	CENTURY LINK	TELEPHONE			D	BURIED		
g-1001-11	9	QUESTAR	GAS	6 IN		D			
g-1008-11	9	QUESTAR	GAS	4 IN		D			
g-1023-11	9	QUESTAR	GAS	6 IN		B			
g-1024-11	9	QUESTAR	GAS	4 IN		D			
g-1025-11	9	QUESTAR	GAS	4 IN		B			
g-1026-11	9	QUESTAR	GAS	4 IN		B			
g-1028-11	9	QUESTAR	GAS	4 IN		D			
g-1029-11	9	QUESTAR	GAS	6 IN		D			
g-1038-11	9	QUESTAR	GAS	6 IN		D			HIGH PRESSURE
g-1039-11	9	QUESTAR	GAS	4 IN		D			
g-1040-11	9	QUESTAR	GAS	6 IN		D			
irr-1002-04	9	DAYBREAK	IRRIGATION PRESSURIZED	6 IN		D			
irr-1008-10	9	PRIVATE	IRRIGATION			D			
irr-1021-13	9	SOUTH JORDAN	IRRIGATION	18 IN		C			
irr-1200-13	9	SOUTH JORDAN	IRRIGATION	18 IN		C			
ms-0116-14	9	SVSD	SANITARY SEWER			B			
ms-0117-14	9	SVSD	SANITARY SEWER			B			
ms-0514-14	9	SVSD	SANITARY SEWER			B			
ms-0594-14	9	SVSD	SANITARY SEWER			D			
msd-0061-13	9	SOUTH JORDAN	STORM DRAIN			B			
msd-0062-13	9	SOUTH JORDAN	STORM DRAIN			B			
msd-0502-13	9	SOUTH JORDAN	STORM DRAIN			B			
msd-0544-13	9	SOUTH JORDAN	STORM DRAIN			B			
msd-0546-13	9	SOUTH JORDAN	STORM DRAIN			B			
sd-1045-13	9	SOUTH JORDAN	STORM DRAIN	12 IN		D			
sd-1047-13	9	SOUTH JORDAN	STORM DRAIN	12 IN		C			
sd-1051-13	9	SOUTH JORDAN	STORM DRAIN	12 IN		C			
sd-1082-13	9	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1095-13	9	SOUTH JORDAN	STORM DRAIN	60 IN		C			
sd-1096-13	9	SOUTH JORDAN	STORM DRAIN	24 IN		D			
sd-1098-13	9	SOUTH JORDAN	STORM DRAIN	48 IN		C			
sd-1099-13	9	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1100-13	9	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1268-13	9	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1269-13	9	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1270-13	9	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1271-13	9	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sdi-0241-10	9	PRIVATE	IRRIGATION			B			
sdi-0242-13	9	SOUTH JORDAN	STORM DRAIN			B			
sdi-0243-13	9	SOUTH JORDAN	STORM DRAIN			B			
sdi-0519-13	9	SOUTH JORDAN	STORM DRAIN			B			
sdi-0573-13	9	SOUTH JORDAN	STORM DRAIN			B			
sdi-0574-13	9	SOUTH JORDAN	STORM DRAIN			B			
sdi-0582-13	9	SOUTH JORDAN	STORM DRAIN			B			
sdi-0583-13	9	SOUTH JORDAN	STORM DRAIN			B			
ss-1010-14	9	SVSD	SANITARY SEWER	18 IN		C			
ss-1023-14	9	SVSD	SANITARY SEWER	18 IN		C			
ss-1024-14	9	SVSD	SANITARY SEWER	15 IN		C			
ss-1029-14	9	SVSD	SANITARY SEWER	18 IN		C			
ss-1041-14	9	SVSD	SANITARY SEWER	8 IN		D			
wtr-1018-13	9	SOUTH JORDAN	WATER	16 IN		D			
wtr-1038-13	9	SOUTH JORDAN	WATER	8 IN		D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

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PROFESSIONAL ENGINEER

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QC CHECKED BY BDW
DATE 9/15/2016

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITIES

SHEET NO. 114UTSM-08

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
bctv-1011-03	10, 11	COMCAST	CABLE TV			D	BURIED		
bctv-1012-03	10, 11, 14	COMCAST	CABLE TV			D	BURIED		
be-1030-12	10, 11, 13, 15	RMP	POWER			D	BURIED		
be-1037-12	10	RMP	POWER			D	BURIED		
be-1045-13	10, 11, 13	SOUTH JORDAN	POWER			D	BURIED		
be-1049-12	10, 11, 13	RMP	POWER			D	BURIED		
be-1054-12	10, 11, 13	RMP	POWER			D	BURIED		
be-1068-13	10, 11, 13	SOUTH JORDAN	POWER			D	BURIED		
be-1069-13	10	SOUTH JORDAN	POWER			D	BURIED		
be-1071-13	10, 11, 13	SOUTH JORDAN	POWER			D	BURIED		
be-1077-13	10, 11	SOUTH JORDAN	POWER			D	BURIED		
be-1079-13	10, 11	SOUTH JORDAN	POWER			D	BURIED		
be-1080-13	10, 11	SOUTH JORDAN	POWER			D	BURIED		
be-1083-13	10, 11	SOUTH JORDAN	POWER			D	BURIED		
be-1085-12	10, 11, 14	RMP	POWER			D	BURIED		
bfo-1032-02	10, 11, 13	CENTURY LINK	FIBER			B	BURIED		
bfo-1035-02	10	CENTURY LINK	FIBER			B	BURIED		
btel-1012-05	10, 11, 13	FIRST DIGITAL	TELEPHONE			B	BURIED		
btel-1018-05	10, 13	FIRST DIGITAL	TELEPHONE			B	BURIED		
btel-1021-05	10	FIRST DIGITAL	TELEPHONE			B	BURIED		
g-1021-11	10, 11, 12, 13, 15	QUESTAR	GAS	4 IN		B			
g-1031-11	10	QUESTAR	GAS	4 IN		D			
g-1032-11	10	QUESTAR	GAS	4 IN		D			
g-1036-11	10, 11, 14	QUESTAR	GAS	4 IN		B			
g-1037-11	10	QUESTAR	GAS	4 IN		D			
ms-0516-14	10, 13	SVSD	SANITARY SEWER			B			
ms-0611-14	10	SVSD	SANITARY SEWER			D			
msd-0051-17	10	UDOT	STORM DRAIN			B			
sd-1071-17	10, 11, 13	UDOT	STORM DRAIN	18 IN		C			
sd-1075-17	10, 11, 13	UDOT	STORM DRAIN	18 IN		C			
sd-1076-17	10, 11, 13	UDOT	STORM DRAIN	18 IN		C			
sd-1077-17	10	UDOT	STORM DRAIN	8 IN		C			
sd-1079-17	10	UDOT	STORM DRAIN	18 IN		C			
sdi-0212-17	10, 11	UDOT	STORM DRAIN			B			
sdi-0213-17	10, 11, 13	UDOT	STORM DRAIN			B			
sdi-0214-17	10	UDOT	STORM DRAIN			B			
sdi-0215-17	10	UDOT	STORM DRAIN			B			
sdi-0217-17	10	UDOT	STORM DRAIN			B			
ss-1018-14	10, 11, 13	SVSD	SANITARY SEWER	8 IN		C			
ss-1037-14	10, 11, 14	SVSD	SANITARY SEWER	8 IN		D			
ss-1038-14	10	SVSD	SANITARY SEWER	8 IN		D			
wtr-1021-13	10, 11, 13	SOUTH JORDAN	WATER	8 IN		D			
bctv-1009-03	11, 12, 15	COMCAST	CABLE TV			D	BURIED		
bctv-1013-03	11, 14	COMCAST	CABLE TV			D	BURIED		
bctv-1014-03	11, 14	COMCAST	CABLE TV			D	BURIED		
bctv-1015-03	11, 14	COMCAST	CABLE TV			D	BURIED		
bctv-1016-03	11, 14	COMCAST	CABLE TV			D	BURIED		
bctv-1018-03	11, 14	COMCAST	CABLE TV			D	BURIED		
be-1022-17	11, 13	UDOT	POWER			D	BURIED		
be-1023-12	11, 13	RMP	POWER			D	BURIED		
be-1024-12	11, 13	RMP	POWER			D	BURIED		
be-1026-12	11, 13	RMP	POWER			D	BURIED		
be-1027-12	11, 13, 15	RMP	POWER			D	BURIED		
be-1028-12	11, 13	RMP	POWER			D	BURIED		
be-1029-12	11, 13, 15	RMP	POWER			D	BURIED		
be-1031-12	11, 12, 15	RMP	POWER			D	BURIED		
be-1032-12	11, 12, 15	RMP	POWER			D	BURIED		
be-1033-12	11, 13, 15	RMP	POWER			D	BURIED		
be-1034-17	11, 13, 15	UDOT	POWER			D	BURIED		

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

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9/15/2016
DATE
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PIN 12566
S-0154(12)11

PROJECT
PROJECT NUMBER

UTILITIES

114UTSM-09
SHEET NO.

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
be-1035-12	11, 13, 15	RMP	POWER			D	BURIED		
be-1042-17	11, 13	UDOT	POWER			D	BURIED		
be-1043-12	11, 12, 15	RMP	POWER			D	BURIED		
be-1044-12	11, 13	RMP	POWER			D	BURIED		
be-1046-12	11, 13	RMP	POWER			D	BURIED		
be-1060-13	11, 13, 15	SOUTH JORDAN	POWER			D	BURIED		
be-1070-12	11, 12, 13, 15	RMP	POWER			D	BURIED		
be-1074-12	11, 12, 15	RMP	POWER			D	BURIED		
be-1094-12	11, 14	RMP	POWER			D	BURIED		
be-1095-12	11, 12, 15	RMP	POWER			D	BURIED		
bfo-1015-05	11, 15	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1016-05	11, 12, 15	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1017-05	11, 13, 15	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1019-05	11, 13	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1020-05	11, 15	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1023-02	11, 13, 15	CENTURY LINK	FIBER			B	BURIED		
bfo-1025-02	11, 12, 15	CENTURY LINK	FIBER			B	BURIED		
bfo-1026-02	11, 15	CENTURY LINK	FIBER			B	BURIED		
bfo-1027-05	11, 12, 15	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1031-02	11, 13	CENTURY LINK	FIBER			B	BURIED		
bfo-1039-02	11, 12, 15	CENTURY LINK	FIBER			B	BURIED		
bfo-1042-03	11, 12, 15	COMCAST	FIBER			B	BURIED		
bfo-1046-05	11, 14	FIRST DIGITAL	FIBER			B	BURIED		
bfo-1047-03	11, 14	COMCAST	FIBER			B	BURIED		
bfo-1048-05	11, 14	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1050-05	11, 14	FIRST DIGITAL	FIBER			D	BURIED		
btel-1013-02	11, 13	CENTURY LINK	TELEPHONE			B	BURIED		
btel-1019-05	11, 12, 15	FIRST DIGITAL	TELEPHONE			B	BURIED		
btel-1025-02	11, 14	CENTURY LINK	TELEPHONE			B	BURIED		
g-1009-11	11, 13	QUESTAR	GAS	4 IN		D			
g-1014-11	11, 15	QUESTAR	GAS	4 IN		D			
g-1034-11	11, 12, 15	QUESTAR	GAS	4 IN		B			
g-1041-11	11, 12, 15	QUESTAR	GAS	4 IN		D			
g-1042-11	11, 15	QUESTAR	GAS	4 IN		D			
g-1043-11	11, 14	QUESTAR	GAS	4 IN		D			
g-1046-11	11, 14	QUESTAR	GAS	4 IN		D			
g-1047-11	11, 15	QUESTAR	GAS	2 IN		D			
irr-1004-10	11, 13	PRIVATE	IRRIGATION			D			
irr-1012-13	11, 12, 15	SOUTH JORDAN	IRRIGATION	18 IN		C			
irr-1018-13	11, 15	SOUTH JORDAN	IRRIGATION	18 IN		C			
irr-1019-13	11	SOUTH JORDAN	IRRIGATION	18 IN		C			
ms-0001-14	11, 14	SVSD	SANITARY SEWER			B			
ms-0002-14	11, 14	SVSD	SANITARY SEWER			B			
ms-0003-14	11	SVSD	SANITARY SEWER			B			
ms-0004-14	11, 13	SVSD	SANITARY SEWER			B			
ms-0610-14	11, 15	SVSD	SANITARY SEWER			D			
msd-0045-17	11, 15	UDOT	STORM DRAIN			B			
msd-0046-17	11, 15	UDOT	STORM DRAIN			B			
msd-0047-17	11, 15	UDOT	STORM DRAIN			B			
msd-0048-17	11, 15	UDOT	STORM DRAIN			B			
msd-0049-17	11	UDOT	STORM DRAIN			B			
msd-0050-17	11	UDOT	STORM DRAIN			B			
msd-0052-17	11, 13	UDOT	STORM DRAIN			B			
msd-0053-17	11, 13	UDOT	STORM DRAIN			B			
sd-1054-17	11, 15	UDOT	STORM DRAIN	18 IN		D			
sd-1056-17	11, 13, 15	UDOT	STORM DRAIN	18 IN		C			
sd-1057-17	11, 13, 15	UDOT	STORM DRAIN	18 IN		C			
sd-1058-17	11, 15	UDOT	STORM DRAIN	18 IN		C			
sd-1059-17	11, 13	UDOT	STORM DRAIN	18 IN		C			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

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4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITIES

SHEET NO. 114UTSM-10

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sd-1060-17	11, 13	UDOT	STORM DRAIN	18 IN		C			
sd-1061-17	11, 13	UDOT	STORM DRAIN	18 IN		C			
sd-1065-17	11, 13	UDOT	STORM DRAIN	18 IN		C			
sd-1066-17	11, 15	UDOT	STORM DRAIN	18 IN		C			
sd-1067-17	11, 13, 15	UDOT	STORM DRAIN	18 IN		C			
sd-1073-17	11, 13	UDOT	STORM DRAIN	18 IN		C			
sd-1074-17	11, 15	UDOT	STORM DRAIN	18 IN		C			
sd-1083-17	11, 15	UDOT	STORM DRAIN	18 IN		C			
sd-1084-17	11, 12, 15	UDOT	STORM DRAIN	24 IN		C			
sd-1086-17	11, 15	UDOT	STORM DRAIN	18 IN		C			
sd-1104-17	11, 15	UDOT	STORM DRAIN	18 IN		C			
sd-1105-17	11, 15	UDOT	STORM DRAIN	18 IN		C			
sd-1106-17	11, 15	UDOT	STORM DRAIN	18 IN		C			
sd-1107-17	11, 15	UDOT	STORM DRAIN	8 IN		C			
sd-1108-17	11, 15	UDOT	STORM DRAIN	18 IN		C			
sd-1112-17	11, 15	UDOT	STORM DRAIN	24 IN		C			
sd-1113-13	11	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1116-17	11	UDOT	STORM DRAIN	18 IN		C			
sd-1117-13	11, 14	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1118-17	11, 15	UDOT	STORM DRAIN	24 IN		C			
sd-1122-13	11, 12, 15	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1123-13	11, 15	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1124-13	11, 14, 15	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1126-13	11, 14	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1127-13	11, 15	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1128-13	11, 14	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sdi-0075-17	11, 13, 15	UDOT	STORM DRAIN			B			
sdi-0204-17	11, 15	UDOT	STORM DRAIN			B			
sdi-0205-17	11, 15	UDOT	STORM DRAIN			B			
sdi-0206-17	11, 15	UDOT	STORM DRAIN			B			
sdi-0207-17	11, 15	UDOT	STORM DRAIN			B			
sdi-0208-17	11, 15	UDOT	STORM DRAIN			B			
sdi-0209-17	11, 15	UDOT	STORM DRAIN			B			
sdi-0210-17	11	UDOT	STORM DRAIN			B			
sdi-0211-17	11	UDOT	STORM DRAIN			B			
sdi-0218-17	11, 13	UDOT	STORM DRAIN			B			
sdi-0219-17	11, 13	UDOT	STORM DRAIN			B			
sdi-0220-17	11, 13	UDOT	STORM DRAIN			B			
sdi-0221-17	11, 13	UDOT	STORM DRAIN			B			
sdi-0222-17	11, 13, 15	UDOT	STORM DRAIN			B			
sdi-0516-17	11, 15	UDOT	STORM DRAIN			B			
sdi-0517-17	11, 15	UDOT	STORM DRAIN			B			
sdi-0518-17	11	UDOT	STORM DRAIN			B			
sdi-0520-17	11, 12, 15	UDOT	STORM DRAIN			B			
ss-1008-14	11, 15	SVSD	SANITARY SEWER	8 IN		D			
ss-1017-14	11, 13	SVSD	SANITARY SEWER	15 IN		C			
ss-1022-14	11, 13	SVSD	SANITARY SEWER	15 IN		C			
ss-1030-14	11, 14	SVSD	SANITARY SEWER	15 IN		C			
ss-1035-14	11, 12, 15	SVSD	SANITARY SEWER	8 IN		D			
ss-1039-14	11, 14	SVSD	SANITARY SEWER	8 IN		C			
ss-1040-14	11, 14	SVSD	SANITARY SEWER	15 IN		D			
ss-1043-14	11, 15	SVSD	SANITARY SEWER	8 IN		D			
ss-1044-14	11, 14, 15	SVSD	SANITARY SEWER	8 IN		D			
ss-1045-14	11, 14, 15	SVSD	SANITARY SEWER	8 IN		D			
ss-1046-14	11, 14	SVSD	SANITARY SEWER	8 IN		D			
wtr-1014-13	11, 13	SOUTH JORDAN	WATER	6 IN		D			
wtr-1015-13	11, 13, 14	SOUTH JORDAN	WATER	16 IN		D			
wtr-1019-13	11, 13	SOUTH JORDAN	WATER	8 IN		D			
wtr-1020-13	11, 13	SOUTH JORDAN	WATER	8 IN		D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

DRAWN BY GS
QC CHECKED BY BDW

APPROVED 9/15/2016 DATE

PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT NUMBER S-0154(12)11 PIN 12566

PROJECT

UTILITIES

SHEET NO. 114UTSM-11

c:\dewox\kinghoka\d0501773\12566_114UTSM-11.dgn
3x4250 PM
9/8/2016

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
wtr-1028-13	11, 15	SOUTH JORDAN	WATER	8 IN		D			
wtr-1031-13	11, 12, 13, 15	SOUTH JORDAN	WATER	10 IN		D			
wtr-1033-13	11, 12, 15	SOUTH JORDAN	WATER	20 IN		D			
wtr-1039-13	11, 12, 15	SOUTH JORDAN	WATER	8 IN		D			
wtr-1040-13	11, 15	SOUTH JORDAN	WATER	8 IN		D			
wtr-1042-13	11, 14	SOUTH JORDAN	WATER	8 IN		D			
wtr-1043-13	11, 14	SOUTH JORDAN	WATER	8 IN		D			
wtr-1044-13	11, 14	SOUTH JORDAN	WATER	8 IN		D			
be-1014-17	12	UDOT	POWER			D	BURIED		
be-1025-12	12	RMP	POWER			D	BURIED		
be-1038-12	12	RMP	POWER			D	BURIED		
be-1047-12	12, 15	RMP	POWER			D	BURIED		
be-1050-17	12	UDOT	POWER			D	BURIED		
be-1051-17	12	UDOT	POWER			D	BURIED		
be-1052-17	12	UDOT	POWER			D	BURIED		
be-1053-12	12, 15	RMP	POWER			D	BURIED		
be-1055-12	12, 15	RMP	POWER			D	BURIED		
be-1056-17	12	UDOT	POWER			D	BURIED		
be-1057-13	12, 15	SOUTH JORDAN	POWER			D	BURIED		
be-1058-12	12	RMP	POWER			D	BURIED		
be-1072-17	12	UDOT	POWER			D	BURIED		
be-1073-17	12	UDOT	POWER			D	BURIED		
be-1075-13	12	SOUTH JORDAN	POWER			D	BURIED		
be-1076-17	12	UDOT	POWER			D	BURIED		
be-1098-12	12	RMP	POWER			D	BURIED		
bfo-1003-15	12, 16, 17, 18	SYRINGA	FIBER			D	BURIED		
bfo-1006-05	12	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1012-05	12	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1018-02	12	CENTURY LINK	FIBER			B	BURIED		
bfo-1021-15	12	SYRINGA	FIBER			B	BURIED		
bfo-1022-17	12	UDOT	FIBER			B	BURIED		
bfo-1024-03	12	COMCAST	FIBER			B	BURIED		
bfo-1036-15	12	SYRINGA	FIBER			B	BURIED		
bfo-1037-17	12	UDOT	FIBER			B	BURIED		
bfo-1038-03	12	COMCAST	FIBER			B	BURIED		
bfo-1041-03	12	COMCAST	FIBER			B	BURIED		
btel-1011-05	12	FIRST DIGITAL	TELEPHONE			B	BURIED		
btel-1017-05	12, 15	FIRST DIGITAL	TELEPHONE			B	BURIED		
btel-1020-05	12, 15	FIRST DIGITAL	TELEPHONE			B	BURIED		
g-1004-11	12, 18	QUESTAR	GAS	6 IN		D			
g-1017-11	12	QUESTAR	GAS	4 IN		D			
g-1018-11	12	QUESTAR	GAS	4 IN		B			
g-1019-11	12	QUESTAR	GAS	4 IN		D			
g-1022-11	12	QUESTAR	GAS	4 IN		D			
g-1027-11	12	QUESTAR	GAS	4 IN		B			
g-1033-11	12	QUESTAR	GAS	4 IN		D			
g-1035-11	12	QUESTAR	GAS	4 IN		D			
irr-1005-10	12, 15	PRIVATE	IRRIGATION			D			
irr-1009-13	12	SOUTH JORDAN	IRRIGATION	15 IN		C			
irr-1010-13	12	SOUTH JORDAN	IRRIGATION	18 IN		C			
irr-1011-13	12	SOUTH JORDAN	IRRIGATION	18 IN		C			
ms-0009-14	12	SVSD	SANITARY SEWER			B			
ms-0010-14	12	SVSD	SANITARY SEWER			B			
msd-0054-17	12	UDOT	STORM DRAIN			B			
msd-0055-17	12	UDOT	STORM DRAIN			B			
msd-0056-17	12	UDOT	STORM DRAIN			B			
msd-0057-17	12	UDOT	STORM DRAIN			B			
sd-1043-13	12	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1046-13	12	SOUTH JORDAN	STORM DRAIN	15 IN		C			

REVISIONS

NO. | DATE | APPROVED BY | REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

DRAWN BY GS
QC CHECKED BY BDW
9/15/2016 DATE

APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
UTILITIES

SHEET NO. 114UTSM-12

9/8/2016 3:44:45 PM

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sd-1050-13	12	SOUTH JORDAN	STORM DRAIN	15 IN		C			
sd-1062-13	12	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1063-13	12	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1064-17	12	UDOT	STORM DRAIN	18 IN		C			
sd-1068-17	12	UDOT	STORM DRAIN	18 IN		C			
sd-1069-17	12	UDOT	STORM DRAIN	18 IN		C			
sd-1070-17	12	UDOT	STORM DRAIN	18 IN		C			
sd-1072-17	12	UDOT	STORM DRAIN	18 IN		C			
sd-1085-17	12	UDOT	STORM DRAIN	24 IN		C			
sd-1087-17	12	UDOT	STORM DRAIN	18 IN		C			
sd-1088-17	12	UDOT	STORM DRAIN	18 IN		C			
sd-1089-17	12	UDOT	STORM DRAIN	18 IN		C			
sd-1090-17	12	UDOT	STORM DRAIN	12 IN		C			
sd-1091-17	12	UDOT	STORM DRAIN	18 IN		C			
sd-1092-17	12	UDOT	STORM DRAIN	12 IN		C			
sd-1097-17	12	UDOT	STORM DRAIN	8 IN		C			
sd-1101-17	12	UDOT	STORM DRAIN	8 IN		C			
sd-1119-13	12	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1120-13	12	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1121-13	12, 15	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sdi-0223-17	12	UDOT	STORM DRAIN			B			
sdi-0224-17	12	UDOT	STORM DRAIN			B			
sdi-0225-17	12	UDOT	STORM DRAIN			B			
sdi-0226-17	12	UDOT	STORM DRAIN			B			
sdi-0227-17	12	UDOT	STORM DRAIN			B			
sdi-0228-17	12	UDOT	STORM DRAIN			B			
sdi-0229-17	12	UDOT	STORM DRAIN			B			
sdi-0230-17	12	UDOT	STORM DRAIN			B			
sdi-0231-17	12	UDOT	STORM DRAIN			B			
sdi-0232-17	12	UDOT	STORM DRAIN			B			
sdi-0233-17	12	UDOT	STORM DRAIN			B			
sdi-0234-17	12	UDOT	STORM DRAIN			B			
sdi-0235-17	12	UDOT	STORM DRAIN			B			
sdi-0571-13	12	SOUTH JORDAN	STORM DRAIN			B			
sdi-0578-13	12	SOUTH JORDAN	STORM DRAIN			B			
ss-1015-14	12	SVSD	SANITARY SEWER	15 IN		C			
ss-1025-14	12	SVSD	SANITARY SEWER	12 IN		C			
ss-1026-14	12	SVSD	SANITARY SEWER	12 IN		C			
ss-1027-14	12	SVSD	SANITARY SEWER	12 IN		D			
ss-1028-14	12	SVSD	SANITARY SEWER	12 IN		D			
ss-1031-14	12	SVSD	SANITARY SEWER	12 IN		D			
ss-1032-14	12	SVSD	SANITARY SEWER	8 IN		D			
ss-1033-14	12	SVSD	SANITARY SEWER	8 IN		D			
ss-1034-14	12, 15	SVSD	SANITARY SEWER	8 IN		D			
ss-1036-14	12, 15	SVSD	SANITARY SEWER	8 IN		D			
ss-1042-14	12, 15	SVSD	SANITARY SEWER	8 IN		D			
wtr-1000-13	12, 18	SOUTH JORDAN	WATER	8 IN		D			
wtr-1002-13	12, 18	SOUTH JORDAN	WATER	8 IN		D			
wtr-1023-13	12	SOUTH JORDAN	WATER	8 IN		D			
wtr-1024-13	12	SOUTH JORDAN	WATER	8 IN		D			
wtr-1025-13	12	SOUTH JORDAN	WATER	8 IN		D			
wtr-1029-13	12	SOUTH JORDAN	WATER	8 IN		D			
wtr-1032-13	12	SOUTH JORDAN	WATER	8 IN		D			
wtr-1034-13	12	SOUTH JORDAN	WATER	12 IN		D			
wtr-1035-13	12	SOUTH JORDAN	WATER	6 IN		D			
g-1007-11	13	QUESTAR	GAS	2 IN		D			
ms-0005-14	13	SVSD	SANITARY SEWER			B			
ms-0006-14	13	SVSD	SANITARY SEWER			B			
ms-0007-14	13	SVSD	SANITARY SEWER			B			

REVISIONS
NO. DATE APPROVED BY REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

DRAWN BY GS
QC CHECKED BY BDW
DATE 9/15/2016
APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PIN 12566
PROJECT NUMBER S-0154(12)11
UTILITIES

SHEET NO. 114UTSM-13

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
ms-0606-14	13	SVSD	SANITARY SEWER			D			
ms-0607-14	13	SVSD	SANITARY SEWER			D			
ms-0609-14	13, 15	SVSD	SANITARY SEWER			D			
ss-1004-14	13	SVSD	SANITARY SEWER	15 IN		D			
ss-1005-14	13	SVSD	SANITARY SEWER	8 IN		D			
ss-1007-14	13	SVSD	SANITARY SEWER	15 IN		D			
ss-1009-14	13	SVSD	SANITARY SEWER	15 IN		D			
ss-1013-14	13, 15	SVSD	SANITARY SEWER	8 IN		D			
ss-1014-14	13	SVSD	SANITARY SEWER	8 IN		C			
ss-1016-14	13	SVSD	SANITARY SEWER	8 IN		C			
be-1099-12	14, 15	RMP	POWER			D	BURIED		
be-1101-12	14	RMP	POWER			D	BURIED		
g-1054-11	14	QUESTAR	GAS	4 IN		D			
ms-0613-14	14	SVSD	SANITARY SEWER			D			
ss-1049-14	14	SVSD	SANITARY SEWER	8 IN		D			
ss-1050-14	14	SVSD	SANITARY SEWER	15 IN		D			
g-1048-11	15	QUESTAR	GAS	4 IN		D			
ms-0608-14	15	SVSD	SANITARY SEWER			D			
ss-1012-14	15	SVSD	SANITARY SEWER	8 IN		D			
bctv-1201-03	16, 17	COMCAST	CABLE TV			D	BURIED		
bctv-1202-03	16	COMCAST	CABLE TV			D	BURIED		
bctv-1203-03	16	COMCAST	CABLE TV			D	BURIED		
be-1201-12	16	RMP	POWER			D	BURIED		
be-1203-12	16	RMP	POWER			D	BURIED		
be-1204-12	16	RMP	POWER			D	BURIED		
be-1206-12	16	RMP	POWER			D	BURIED		
be-1207-12	16	RMP	POWER			D	BURIED		
be-1209-12	16, 17	RMP	POWER			D	BURIED		
be-1211-12	16, 17	RMP	POWER			D	BURIED		
bfo-1202-05	16, 17	FIRST DIGITAL	FIBER			D	BURIED		
btel-1203-02	16	CENTURY LINK	TELEPHONE			D	BURIED		
btel-1204-02	16, 17	CENTURY LINK	TELEPHONE			D	BURIED		
btel-1208-02	16	CENTURY LINK	TELEPHONE			D	BURIED		
g-1202-11	16	QUESTAR	GAS	3 IN		D			
g-1204-11	16	QUESTAR	GAS	4 IN		D			
g-1206-11	16	QUESTAR	GAS	2 IN		D			
g-1207-11	16	QUESTAR	GAS	2 IN		D			
g-1208-11	16	QUESTAR	GAS	2 IN		D			
g-1211-11	16, 17, 18	QUESTAR	GAS	2 IN		D			
ms-0592-14	16	SVSD	SANITARY SEWER			B			
ms-0593-14	16	SVSD	SANITARY SEWER			B			
msd-0517-13	16	SOUTH JORDAN	STORM DRAIN			B			
msd-0518-13	16	SOUTH JORDAN	STORM DRAIN			B			
msd-0519-13	16	SOUTH JORDAN	STORM DRAIN			B			
msd-0520-13	16	SOUTH JORDAN	STORM DRAIN			B			
msd-0521-13	16	SOUTH JORDAN	STORM DRAIN			B			
msd-0533-13	16	SOUTH JORDAN	STORM DRAIN			B			
sd-1230-13	16	SOUTH JORDAN	STORM DRAIN	36 IN		C			
sd-1231-13	16	SOUTH JORDAN	STORM DRAIN	36 IN		C			
sd-1232-13	16	SOUTH JORDAN	STORM DRAIN	36 IN		C			
sd-1233-13	16	SOUTH JORDAN	STORM DRAIN	10 IN		C			
sd-1234-13	16	SOUTH JORDAN	STORM DRAIN	36 IN		C			
sd-1235-13	16	SOUTH JORDAN	STORM DRAIN	15 IN		C			
sd-1236-13	16	SOUTH JORDAN	STORM DRAIN	36 IN		D			
sd-1238-13	16	SOUTH JORDAN	STORM DRAIN	12 IN		C			
sd-1245-13	16	SOUTH JORDAN	STORM DRAIN	4 IN		D			
sd-1248-13	16, 17	SOUTH JORDAN	STORM DRAIN	36 IN		C			
sd-1251-13	16	SOUTH JORDAN	STORM DRAIN	36 IN		D			
sd-1252-13	16	SOUTH JORDAN	STORM DRAIN	12 IN		C			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

DRAWN BY GS
QC CHECKED BY BDW
DATE 9/15/2016

APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITIES

SHEET NO. 114UTSM-14

9/9/2016 3x49x26 PM c:\dgwork\kingjalu\d0501773\12566_114UTSM-14.dgn

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sd-1253-13	16	SOUTH JORDAN	STORM DRAIN	8 IN		D			
sd-1258-13	16	SOUTH JORDAN	STORM DRAIN	12 IN		D			
sd-1259-13	16	SOUTH JORDAN	STORM DRAIN	12 IN		D			
sdi-0545-13	16	SOUTH JORDAN	STORM DRAIN			B			
sdi-0546-13	16	SOUTH JORDAN	STORM DRAIN			B			
sdi-0547-13	16	SOUTH JORDAN	STORM DRAIN			B			
sdi-0548-13	16	SOUTH JORDAN	STORM DRAIN			B			
sdi-0549-13	16	SOUTH JORDAN	STORM DRAIN			B			
sdi-0550-13	16	SOUTH JORDAN	STORM DRAIN			B			
sdi-0551-13	16	SOUTH JORDAN	STORM DRAIN			B			
sdi-0552-13	16	SOUTH JORDAN	STORM DRAIN			B			
ss-1201-14	16	SVSD	SANITARY SEWER	15 IN		D			
ss-1202-14	16	SVSD	SANITARY SEWER	8 IN		D			
ss-1203-14	16	SVSD	SANITARY SEWER	15 IN		D			
ss-1205-14	16	SVSD	SANITARY SEWER	8 IN		D			
ss-1207-14	16	SVSD	SANITARY SEWER	15 IN		D			
wtr-1201-13	16	SOUTH JORDAN	WATER	8 IN		D			
wtr-1202-13	16	SOUTH JORDAN	WATER			D			
wtr-1208-13	16, 17	SOUTH JORDAN	WATER	8 IN		D			
be-1200-12	17	RMP	POWER			D	BURIED		
be-1205-12	17, 18	RMP	POWER			D	BURIED		
be-1208-12	17	RMP	POWER			D	BURIED		
be-1210-12	17	RMP	POWER			D	BURIED		
be-1212-12	17	RMP	POWER			D	BURIED		
bfo-1203-05	17	FIRST DIGITAL	FIBER			D	BURIED		
bfo-1204-05	17	FIRST DIGITAL	FIBER			D	BURIED		
btel-1206-02	17	CENTURY LINK	TELEPHONE			D	BURIED		
btel-1207-02	17	CENTURY LINK	TELEPHONE			D	BURIED		
btel-1209-02	17	CENTURY LINK	TELEPHONE			D	BURIED		
g-1205-11	17	QUESTAR	GAS	4 IN		D			
g-1209-11	17	QUESTAR	GAS	2 IN		D			
g-1212-11	17	QUESTAR	GAS	4 IN		D			
ms-0591-14	17	SVSD	SANITARY SEWER			B			
msd-0522-13	17	SOUTH JORDAN	STORM DRAIN			B			
msd-0523-13	17	SOUTH JORDAN	STORM DRAIN			B			
msd-0527-13	17	SOUTH JORDAN	STORM DRAIN			B			
msd-0528-13	17	SOUTH JORDAN	STORM DRAIN			B			
msd-0532-13	17	SOUTH JORDAN	STORM DRAIN			B			
sd-1228-13	17	SOUTH JORDAN	STORM DRAIN	12 IN		D			
sd-1229-13	17	SOUTH JORDAN	STORM DRAIN	12 IN		D			
sd-1237-13	17	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1240-13	17, 18	SOUTH JORDAN	STORM DRAIN	42 IN		C			
sd-1244-13	17	SOUTH JORDAN	STORM DRAIN	36 IN		C			
sd-1246-13	17	SOUTH JORDAN	STORM DRAIN	36 IN		C			
sd-1247-13	17	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1249-13	17	SOUTH JORDAN	STORM DRAIN	30 IN		C			
sd-1250-13	17	SOUTH JORDAN	STORM DRAIN	15 IN		C			
sd-1254-13	17	SOUTH JORDAN	STORM DRAIN	30 IN		C			
sd-1256-13	17	SOUTH JORDAN	STORM DRAIN	6 IN		D			
sd-1257-13	17	SOUTH JORDAN	STORM DRAIN	30 IN		D			
sd-1260-13	17	SOUTH JORDAN	STORM DRAIN	24 IN		D			
sd-1264-13	17	SOUTH JORDAN	STORM DRAIN	15 IN		D			
sdi-0540-13	17	SOUTH JORDAN	STORM DRAIN			B			
sdi-0541-13	17	SOUTH JORDAN	STORM DRAIN			B			
sdi-0542-13	17	SOUTH JORDAN	STORM DRAIN			B			
sdi-0543-13	17	SOUTH JORDAN	STORM DRAIN			B			
sdi-0544-13	17	SOUTH JORDAN	STORM DRAIN			B			
ss-1204-14	17, 18	SVSD	SANITARY SEWER	8 IN		D			
ss-1206-14	17	SVSD	SANITARY SEWER	8 IN		D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

DRAWN BY GS
QC CHECKED BY BDW
9/15/2016 DATE

APPROVED

PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITIES

114UTSM-15
SHEET NO.

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
wtr-1203-13	17, 18	SOUTH JORDAN	WATER	8 IN		D			
wtr-1204-13	17	SOUTH JORDAN	WATER	8 IN		D			
wtr-1205-13	17	SOUTH JORDAN	WATER	8 IN		D			
wtr-1206-13	17	SOUTH JORDAN	WATER	8 IN		D			
wtr-1207-13	17	SOUTH JORDAN	WATER	8 IN		D			
wtr-1209-13	17	SOUTH JORDAN	WATER	8 IN		D			
wtr-1212-13	17	SOUTH JORDAN	WATER	8 IN		D			
be-1202-12	18	RMP	POWER			D	BURIED		
bfo-1200-02	18	CENTURY LINK	FIBER			D	BURIED		
bfo-1201-05	18	FIRST DIGITAL	FIBER			D	BURIED		
btel-1200-02	18	CENTURY LINK	TELEPHONE			D	BURIED		
btel-1201-02	18	CENTURY LINK	TELEPHONE			D	BURIED		
btel-1202-02	18	CENTURY LINK	TELEPHONE			D	BURIED		
btel-1205-02	18	CENTURY LINK	TELEPHONE			D	BURIED		
g-1200-11	18	QUESTAR	GAS	6 IN		D			
g-1201-11	18	QUESTAR	GAS	6 IN		D			
g-1203-11	18	QUESTAR	GAS	6 IN		D			
g-1210-11	18	QUESTAR	GAS	2 IN		D			
g-1213-11	18	QUESTAR	GAS	3 IN		D			
g-1214-11	18	QUESTAR	GAS	2 IN		D			
ms-0501-99	18	UNKNOWN	SANITARY SEWER			D			
ms-0588-14	18	SVSD	SANITARY SEWER			B			
ms-0589-14	18	SVSD	SANITARY SEWER			B			
ms-0590-14	18	SVSD	SANITARY SEWER			B			
msd-0141-17	18	UDOT	STORM DRAIN			B			
msd-0524-13	18	SOUTH JORDAN	STORM DRAIN			B			
msd-0525-13	18	SOUTH JORDAN	STORM DRAIN			B			
msd-0529-13	18	SOUTH JORDAN	STORM DRAIN			B			
msd-0530-13	18	SOUTH JORDAN	STORM DRAIN			B			
msd-0536-13	18	SOUTH JORDAN	STORM DRAIN			B			
msd-0537-13	18	SOUTH JORDAN	STORM DRAIN			B			
msd-0538-13	18	SOUTH JORDAN	STORM DRAIN			B			
msd-0539-13	18	SOUTH JORDAN	STORM DRAIN			B			
msd-0540-13	18	SOUTH JORDAN	STORM DRAIN			B			
msd-0541-13	18	SOUTH JORDAN	STORM DRAIN			B			
msd-0542-13	18	SOUTH JORDAN	STORM DRAIN			B			
sd-1200-13	18	SOUTH JORDAN	STORM DRAIN	15 IN		C			
sd-1201-13	18	SOUTH JORDAN	STORM DRAIN	15 IN		C			
sd-1202-13	18	SOUTH JORDAN	STORM DRAIN	24 IN		D			
sd-1203-13	18	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1204-13	18	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1205-13	18	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1206-13	18	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1207-13	18	SOUTH JORDAN	STORM DRAIN	30 IN		D			
sd-1208-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1209-13	18	SOUTH JORDAN	STORM DRAIN	30 IN		C			
sd-1210-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1211-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1212-13	18	SOUTH JORDAN	STORM DRAIN	30 IN		C			
sd-1213-13	18	SOUTH JORDAN	STORM DRAIN	30 IN		C			
sd-1214-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1215-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1216-13	18	SOUTH JORDAN	STORM DRAIN	12 IN		C			
sd-1217-13	18	SOUTH JORDAN	STORM DRAIN	6 IN		C			
sd-1218-13	18	SOUTH JORDAN	STORM DRAIN	12 IN		C			
sd-1219-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1220-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1221-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1222-13	18	SOUTH JORDAN	STORM DRAIN	8 IN		D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN BY GS
CHECKED BY BDW
QC

9/15/2016
DATE

APPROVED

PROFESSIONAL ENGINEER

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

4 INTERCHANGES ON
BANGERTER HIGHWAY - 11400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITIES

SHEET NO. 114UTSM-16

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sd-1223-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1224-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1225-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1226-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1227-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1239-13	18	SOUTH JORDAN	STORM DRAIN	42 IN		C			
sd-1241-13	18	SOUTH JORDAN	STORM DRAIN	42 IN		C			
sd-1242-13	18	SOUTH JORDAN	STORM DRAIN	15 IN		C			
sd-1243-13	18	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1255-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		D			
sd-1261-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1262-13	18	SOUTH JORDAN	STORM DRAIN	18 IN		C			
sd-1263-13	18	SOUTH JORDAN	STORM DRAIN	24 IN		C			
sd-1265-13	18	SOUTH JORDAN	STORM DRAIN	12 IN		C			
sdi-0456-17	18	UDOT	STORM DRAIN			B			
sdi-0531-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0532-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0533-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0534-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0535-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0536-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0537-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0538-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0539-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0565-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0566-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0567-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0568-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0569-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0572-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0575-13	18	SOUTH JORDAN	STORM DRAIN			B			
sdi-0579-13	18	SOUTH JORDAN	STORM DRAIN			B			
ss-1200-14	18	SVSD	SANITARY SEWER	15 IN		D			
wtr-1200-13	18	SOUTH JORDAN	WATER	16 IN		D			
wtr-1210-13	18	SOUTH JORDAN	WATER			D			
wtr-1211-13	18	SOUTH JORDAN	WATER			D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HDR

DRAWN BY GS
QC CHECKED BY BDW
DATE 9/15/2016

APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 11400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITIES

SHEET NO. 114UTSM-17

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
bduct-9004-05	1, 2	FIRST DIGITAL	FIBER DUCT			B	BURIED		
bduct-9004-09	1, 2	MBI, ATT, ZAYO	FIBER DUCT			B	BURIED	TH 90-01	
be-9048-12	1	RMP	POWER			D	BURIED		
bfo-9011-17	1, 2, 3, 4	UDOT	FIBER			B	BURIED	TH 90-03	
bfo-9031-15	1, 2, 3, 4	SYRINGA	FIBER			B	BURIED	TH 90-03	
ms-0089-19	1	WEST JORDAN	SANITARY SEWER			B			
ms-0090-19	1	WEST JORDAN	SANITARY SEWER			B			
msd-0095-17	1	UDOT	STORM DRAIN			B			
sd-9033-17	1, 2	UDOT	STORM DRAIN	30 IN	CPP	C			
sd-9034-17	1	UDOT	STORM DRAIN	54 IN	RCP	C			
sd-9057-17	1, 2	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9058-17	1	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9059-17	1	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9060-17	1	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9064-17	1	UDOT	STORM DRAIN	42 IN	CPP	C			
sd-9065-17	1	UDOT	STORM DRAIN	42 IN	RCP	C			
sd-9066-17	1	UDOT	STORM DRAIN	36 IN	CPP	C			
sd-9067-17	1	UDOT	STORM DRAIN	42 IN	CPP	C			
sd-9076-17	1	UDOT	STORM DRAIN	24 IN	CPP	C			
sd-9077-19	1	WEST JORDAN	STORM DRAIN	24 IN	CPP	C			
sd-9121-17	1	UDOT	STORM DRAIN	30 IN	CPP	C			
sdi-0277-17	1	UDOT	STORM DRAIN			B			
sdi-0278-17	1	UDOT	STORM DRAIN			B			
sdi-0280-17	1	UDOT	STORM DRAIN			B			
sdi-0281-17	1	UDOT	STORM DRAIN			B			
sdi-0282-17	1	UDOT	STORM DRAIN			B			
sdi-0347-17	1	UDOT	STORM DRAIN			B			
sdi-0348-17	1	UDOT	STORM DRAIN			B			
sdi-0349-17	1	UDOT	STORM DRAIN			B			
sdi-0355-19	1	WEST JORDAN	STORM DRAIN			B			
sdi-0530-17	1	UDOT	STORM DRAIN			B			
ss-9019-19	1	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
ss-9020-19	1	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
wtr-9001-01	1, 2, 3	BOR	WATER	78 IN		B			
wtr-9044-01	1	BOR	WATER	78 IN		D			
bctv-9017-03	2	COMCAST	CABLE TV			D	BURIED		
bctv-9018-03	2	COMCAST	CABLE TV			D	BURIED		
bctv-9019-03	2, 3, 4	COMCAST	CABLE TV			D	BURIED		
bduct-9005-05	2, 3, 4, 5, 11	FIRST DIGITAL	FIBER DUCT			B	BURIED	TH 90-02, TH 90-04	
bduct-9005-09	2, 3, 4, 5, 11	MBI, ATT, ZAYO	FIBER DUCT			B	BURIED	TH 90-02, TH 90-04	
be-9046-12	2, 3, 4	RMP	POWER		PVC -AL	D	BURIED		
be-9047-12	2	RMP	POWER		PVC -AL	D	BURIED		
btel-9029-02	2, 3	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9030-02	2	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9031-02	2	CENTURY LINK	TELEPHONE		CBO	D	BURIED		
btel-9032-02	2	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9033-02	2, 3	CENTURY LINK	TELEPHONE		CBO	D	BURIED		
ms-0023-19	2	WEST JORDAN	SANITARY SEWER			B			
ms-0087-19	2	WEST JORDAN	SANITARY SEWER			B			
ms-0088-19	2	WEST JORDAN	SANITARY SEWER			B			
ms-0584-19	2	WEST JORDAN	SANITARY SEWER			D			
ms-0585-19	2	WEST JORDAN	SANITARY SEWER			D			
ms-0586-19	2	WEST JORDAN	SANITARY SEWER			D			
msd-0153-19	2	WEST JORDAN	STORM DRAIN			B			
msd-0154-19	2	WEST JORDAN	STORM DRAIN			B			
msd-0155-19	2	WEST JORDAN	STORM DRAIN			B			
msd-0156-19	2	WEST JORDAN	STORM DRAIN			B			
msd-0157-19	2	WEST JORDAN	STORM DRAIN			B			
msd-0516-19	2	WEST JORDAN	STORM DRAIN			B			
msd-0244-19	2	WEST JORDAN	STORM DRAIN	48X48		B			
sd-9032-17	2	UDOT	STORM DRAIN	24 IN	CPP	C			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY VR

APPROVED
MM/DD/YY
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH

PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 90UTSM-01

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sd-9054-17	2	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9055-17	2	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9056-17	2	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9071-19	2	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9072-19	2	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9073-19	2	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9074-19	2	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9103-19	2, 3	WEST JORDAN	STORM DRAIN	30 IN	RCP	C			
sd-9104-19	2	WEST JORDAN	STORM DRAIN	24 IN	RCP	C			
sd-9105-19	2	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9106-19	2	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9107-19	2	WEST JORDAN	STORM DRAIN	24 IN	RCP	C			
sd-9108-19	2	WEST JORDAN	STORM DRAIN	24 IN	RCP	C			
sd-9109-19	2	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9110-19	2	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9111-19	2	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9112-19	2	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9113-19	2	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9119-17	2, 3	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9120-17	2	UDOT	STORM DRAIN	24 IN	CPP	C			
sd-9122-19	2	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sdi-0283-17	2	UDOT	STORM DRAIN			B			
sdi-0284-17	2	UDOT	STORM DRAIN			B			
sdi-0285-17	2	UDOT	STORM DRAIN			B			
sdi-0344-17	2	UDOT	STORM DRAIN			B			
sdi-0345-17	2	UDOT	STORM DRAIN			B			
sdi-0346-17	2	UDOT	STORM DRAIN			B			
sdi-0476-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0477-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0478-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0479-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0481-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0482-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0483-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0484-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0500-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0501-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0502-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0503-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0504-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0557-19	2	WEST JORDAN	STORM DRAIN			B			
sdi-0558-19	2	WEST JORDAN	STORM DRAIN			B			
ss-9018-19	2	WEST JORDAN	SANITARY SEWER	8 IN	PVC	C			
ss-9025-19	2, 3, 4	WEST JORDAN	SANITARY SEWER	8 IN	PVC	D			
ss-9026-19	2	WEST JORDAN	SANITARY SEWER	8 IN	PVC	D			
ss-9027-19	2	WEST JORDAN	SANITARY SEWER	8 IN	PVC	C			
ss-9039-19	2	WEST JORDAN	SANITARY SEWER	8 IN	PVC	D			
ss-9040-19	2	WEST JORDAN	SANITARY SEWER	8 IN	PVC	D			
wtr-9055-19	2, 3, 4	WEST JORDAN	WATER	8 IN		D			
wtr-9056-19	2	WEST JORDAN	WATER	8 IN		D			
wtr-9057-19	2	WEST JORDAN	WATER	8 IN		D			
btel-9202-02	3, 4	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9203-02	3, 4	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9204-02	3, 4	CENTURY LINK	TELEPHONE			D	BURIED		
ms-0582-19	3	WEST JORDAN	SANITARY SEWER			D			
ms-0583-19	3	WEST JORDAN	SANITARY SEWER			D			
msd-0151-19	3	WEST JORDAN	STORM DRAIN			B			
msd-0152-19	3	WEST JORDAN	STORM DRAIN			B			
sd-9052-17	3	UDOT	STORM DRAIN	18 IN	CPP	C			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY VR

APPROVED

MM/DD/YY
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH

PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 90UTSM-02

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sd-9053-17	3	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9070-19	3, 4	WEST JORDAN	STORM DRAIN	30 IN	RCP	C			
sd-9102-19	3	WEST JORDAN	STORM DRAIN	30 IN	RCP	C			
sd-9118-17	3	UDOT	STORM DRAIN	18 IN	CPP	C			
sdi-0286-17	3	UDOT	STORM DRAIN			B			
sdi-0287-17	3	UDOT	STORM DRAIN			B			
sdi-0342-17	3	UDOT	STORM DRAIN			B			
sdi-0343-17	3	UDOT	STORM DRAIN			B			
wtr-9047-01	3, 4, 5, 11	BOR	WATER	78 IN		B		TH 90-28, TH-90-29A (1)	
bctv-9011-03	4, 5, 11	COMCAST	CABLE TV			D	BURIED		
bctv-9012-03	4, 5	COMCAST	CABLE TV			D	BURIED		
be-9043-12	4, 5, 11	RMP	POWER		PVC - AL	D	BURIED		
bfo-9010-17	4, 5, 11	UDOT	FIBER			B	BURIED		
bfo-9025-15	4, 5, 11	SYRINGA	FIBER			B	BURIED		
btel-9028-02	4, 5, 11	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9034-02	4, 10	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9200-02	4, 5, 11	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9201-02	4	CENTURY LINK	TELEPHONE			D	BURIED		
g-9037-11	4	QUESTAR	GAS	3 IN	PTR Plastic	D			
g-9038-11	4	QUESTAR	GAS	2 IN	PTR Plastic	D			
g-9039-11	4	QUESTAR	GAS	1 AND QUARTER IN	PTR Plastic	D			
irr-9200-10	4	PRIVATE	IRRIGATION			D			
ms-0568-19	4	WEST JORDAN	SANITARY SEWER			D			
ms-0581-19	4	WEST JORDAN	SANITARY SEWER			D			
msd-0076-19	4	WEST JORDAN	STORM DRAIN			B			
msd-0077-17	4	UDOT	STORM DRAIN			B			
msd-0078-17	4	UDOT	STORM DRAIN			B			
sd-9022-17	4	UDOT	STORM DRAIN	8 IN	PVC	C			
sd-9023-10	4	PRIVATE	STORM DRAIN	12 IN	RCP	C			
sd-9051-17	4	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9068-19	4	WEST JORDAN	STORM DRAIN	30 IN	RCP	C			
sd-9069-19	4	WEST JORDAN	STORM DRAIN	30 IN	RCP	C			
sd-9101-19	4	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sd-9115-17	4, 5, 11	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9116-17	4	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9117-17	4	UDOT	STORM DRAIN	18 IN	CPP	C			
sdi-0261-19	4	WEST JORDAN	STORM DRAIN			B			
sdi-0288-17	4	UDOT	STORM DRAIN			B			
sdi-0289-17	4	UDOT	STORM DRAIN			B			
sdi-0340-17	4	UDOT	STORM DRAIN			B			
sdi-0341-17	4	UDOT	STORM DRAIN			B			
sdi-0474-19	4	WEST JORDAN	STORM DRAIN			B			
ss-9038-19	4	WEST JORDAN	SANITARY SEWER	8 IN		D			
bctv-9005-03	5, 10, 11	COMCAST	CABLE TV			D	BURIED		
bctv-9006-03	5, 11	COMCAST	CABLE TV			D	BURIED		
bctv-9007-03	5, 11, 12	COMCAST	CABLE TV			D	BURIED		
bduct-9001-09	5, 11	MBI, ATT, ZAYO	FIBER DUCT			D	BURIED	TH 90-13	
bduct-9003-09	5, 6	MBI, ATT, ZAYO	FIBER DUCT			B	BURIED	TH 90-14	
bduct-9001-05	5, 11	FIRST DIGITAL	FIBER DUCT			D	BURIED	TH 90-13	
bduct-9003-05	5, 6	FIRST DIGITAL	FIBER DUCT			B	BURIED	TH 90-14	
be-9006-12	5, 11, 12	RMP	POWER		AL	D	BURIED		
be-9011-17	5, 11	UDOT	POWER			D	BURIED		
be-9012-17	5, 11	UDOT	POWER			D	BURIED		
be-9013-17	5, 11	UDOT	POWER			D	BURIED		
be-9014-17	5, 11	UDOT	POWER			D	BURIED		
be-9015-17	5, 11	UDOT	POWER			D	BURIED		
be-9016-17	5, 11	UDOT	POWER			D	BURIED		
be-9017-17	5, 11, 12	UDOT	POWER			D	BURIED		
be-9029-12	5, 6, 7, 11	RMP	POWER		AL	D	BURIED		
bfo-9000-17	5, 10, 11	UDOT	FIBER			B	BURIED		
bfo-9001-02	5, 11	CENTURY LINK	FIBER			D	BURIED		

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	UPDATE UTILITY SUMMARY

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
CHECKED BY: VR
QC
APPROVED
MM/DD/YY
DATE
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566
UTILITY SUMMARY

SHEET NO. 90UTSM-03

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
bfo-9003-03	5, 10, 11	COMCAST	FIBER			B	BURIED		
bfo-9004-03	5, 11	COMCAST	FIBER			B	BURIED		
bfo-9005-02	5, 11, 12	CENTURY LINK	FIBER			B	BURIED		
btel-9009-17	5, 11, 12	UDOT	FIBER			B	BURIED		
bfo-9014-15	5, 6, 7, 8, 9, 11	SYRINGA	FIBER			B	BURIED	TH 90-18, TH 90-19, TH 90-20, TH 90-21, TH 90-22	
bfo-9015-17	5, 6, 7, 8, 9, 11	UDOT	FIBER			B	BURIED	TH 90-27	
bfo-9016-15	5, 11	SYRINGA	FIBER			B	BURIED		
bfo-9017-03	5, 11	COMCAST	FIBER			B	BURIED		
bfo-9018-03	5, 11, 12	COMCAST	FIBER			B	BURIED		
bfo-9019-02	5, 10, 11, 12	CENTURY LINK	FIBER			B	BURIED		
bfo-9024-15	5, 11	SYRINGA	FIBER			B	BURIED		
bfo-9026-15	5, 10, 11	SYRINGA	FIBER			D	BURIED		
bfo-9028-02	5, 6, 11	CENTURY LINK	FIBER			D	BURIED		
bfo-9032-03	5, 6, 11	COMCAST	FIBER			D	BURIED		
btel-9000-02	5, 11	CENTURY LINK	TELEPHONE			B	BURIED		
btel-9012-02	5, 11	CENTURY LINK	TELEPHONE			B	BURIED		
btel-9013-02	5, 11	CENTURY LINK	TELEPHONE			B	BURIED		
btel-9014-02	5, 11, 12	CENTURY LINK	TELEPHONE			B	BURIED		
btel-9015-02	5, 11, 12	CENTURY LINK	TELEPHONE			B	BURIED		
irr-9200-10	4	PRIVATE	IRRIGATION			D			
btel-9027-02	5, 11, 12	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9038-02	5, 11, 12	CENTURY LINK	TELEPHONE			D	BURIED		
e-9000-12	5, 10, 11, 12	RMP	POWER		AL	D	AERIAL		
g-9001-11	5, 11, 12	QUESTAR	GAS	4 IN	PAL Plastic	D			
g-9002-11	5, 10, 11, 12	QUESTAR	GAS	4 IN	PAL Plastic	D			
g-9004-11	5, 11, 12	QUESTAR	GAS	6 IN	PTR Plastic	D			
g-9005-11	5, 11	QUESTAR	GAS	6 IN	PTR Plastic	D			
g-9007-11	5, 10, 11	QUESTAR	GAS	6 IN	PTR Plastic	B			
g-9013-11	5, 11	QUESTAR	GAS	6 IN	PTR Plastic	B			
g-9036-11	5, 10, 11	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
ms-0022-19	5, 11	WEST JORDAN	SANITARY SEWER			B			
ms-0073-19	5, 11	WEST JORDAN	SANITARY SEWER			B			
ms-0074-19	5, 11	WEST JORDAN	SANITARY SEWER			B			
ms-0075-19	5, 11	WEST JORDAN	SANITARY SEWER			B			
ms-0076-19	5, 11	WEST JORDAN	SANITARY SEWER			B			
msd-0073-19	5, 11	WEST JORDAN	STORM DRAIN			B			
msd-0074-19	5, 11	WEST JORDAN	STORM DRAIN			B			
msd-0075-19	5, 11	WEST JORDAN	STORM DRAIN			B			
msd-0085-19	5, 11	WEST JORDAN	STORM DRAIN			B			
msd-0086-19	5, 11	WEST JORDAN	STORM DRAIN			B			
msd-0087-19	5, 11	WEST JORDAN	STORM DRAIN			B			
msd-0088-19	5, 11	WEST JORDAN	STORM DRAIN			B			
msd-0089-19	5, 11	WEST JORDAN	STORM DRAIN			B			
msd-0090-19	5, 11	WEST JORDAN	STORM DRAIN			B			
mw-0002-19	5, 11	WEST JORDAN	WATER	10.5 FT X 13.00 FT		B			PRV Vault
sd-9001-17	5, 11	UDOT	STORM DRAIN	18 IN	CMP	D			
sd-9017-19	5, 10, 11	WEST JORDAN	STORM DRAIN	36 IN	RCP	C			
sd-9018-19	5, 11	WEST JORDAN	STORM DRAIN	36 IN	RCP	C			
sd-9019-19	5, 11	WEST JORDAN	STORM DRAIN	36 IN	RCP	C			
sd-9020-19	5, 11	WEST JORDAN	STORM DRAIN	36 IN	RCP	C			
sd-9021-19	5, 11	WEST JORDAN	STORM DRAIN	15 IN	CMP	C			
sd-9024-17	5, 11	UDOT	STORM DRAIN	84 IN	CMP	C			
sd-9025-17	5, 11	UDOT	STORM DRAIN	84 IN	CMP	C		TH 90-29 1	
sd-9047-17	5, 11	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9048-17	5, 11	UDOT	STORM DRAIN	18 IN	RCP	C			
sd-9049-17	5, 11	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9050-17	5, 11	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-9079-10	5, 11	PRIVATE	STORM DRAIN	18 IN	CMP	C			
sd-9080-10	5, 11	PRIVATE	STORM DRAIN	18 IN	CMP	C			
sd-9081-10	5, 11	PRIVATE	STORM DRAIN	18 IN	CMP	C			
sd-9091-19	5, 11	WEST JORDAN	STORM DRAIN	15 IN	RCP	D			

1 mw-0002-19

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	UPDATE UTILITY SUMMARY

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QC
DATE MM/DD/YY

PROFESSIONAL ENGINEER

APPROVED

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

4 INTERCHANGES ON
BANGERTER HIGHWAY - 9000 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY SUMMARY

SHEET NO. 90UTSM-04

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sd-9092-10	5, 11	PRIVATE	STORM DRAIN	18 IN	RCP	C			
sd-9093-10	5, 11	PRIVATE	STORM DRAIN	18 IN	CMP	C			
sd-9094-10	5, 11	PRIVATE	STORM DRAIN	18 IN	CMP	C			
sd-9095-10	5, 11	PRIVATE	STORM DRAIN	18 IN	CMP	C			
sd-9096-10	5, 11	PRIVATE	STORM DRAIN	18 IN	CMP	C			
sd-9097-10	5, 11	PRIVATE	STORM DRAIN	18 IN	CMP	C			
sd-9098-10	5, 11	PRIVATE	STORM DRAIN	18 IN	CMP	C			
sd-9099-10	5, 11	PRIVATE	STORM DRAIN	18 IN	CMP	C			
sd-9100-10	5, 11	PRIVATE	STORM DRAIN	18 IN	CMP	C			
sd-9123-17	5, 6, 11	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9130-17	5, 11	UDOT	STORM DRAIN	18 IN	CMP	C			
sdi-0273-19	5, 11	WEST JORDAN	STORM DRAIN			B			
sdi-0290-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0291-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0292-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0293-19	5, 11	WEST JORDAN	STORM DRAIN			B			
sdi-0294-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0338-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0339-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0529-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0564-19	5, 11	WEST JORDAN	STORM DRAIN			B			
ss-9000-19	5, 10, 11	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
ss-9007-19	5, 11	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
ss-9008-19	5, 11, 12	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
ss-9009-19	5, 11	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
ss-9014-19	5, 11	WEST JORDAN	SANITARY SEWER	8 IN	PVC	C			
ss-9015-19	5, 11	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
wtr-9000-01	5, 6, 7, 8, 11	BOR	WATER	78 IN	CONCRETE	B			
wtr-9004-01	5, 11	BOR	WATER	6 IN	STEEL	B			
wtr-9005-19	5, 11, 12	WEST JORDAN	WATER	16 IN		D			
wtr-9006-19	5, 10, 11	WEST JORDAN	WATER	12 IN		D			
wtr-9007-19	5, 11, 12	WEST JORDAN	WATER	12 IN		D			
wtr-9009-19	5, 10, 11, 12	WEST JORDAN	WATER	10 IN		D			
wtr-9011-19	5, 10, 11	WEST JORDAN	WATER	16 IN		D			
wtr-9012-19	5, 11	WEST JORDAN	WATER	10 IN		D			
wtr-9021-19	5, 11	WEST JORDAN	WATER	8 IN		D			
wtr-9054-19	5, 10, 11	WEST JORDAN	WATER	6 IN		D			
bctv-9010-03	6, 7	COMCAST	CABLE TV			D	BURIED		
bduct-9000-09	6, 7, 8	MBI, ATT, ZAYO	FIBER DUCT			D	BURIED		
bduct-9000-05	6, 7, 8	FIRST DIGITAL	FIBER DUCT			D	BURIED		
be-9024-12	6, 7	RMP	POWER		AL	D	BURIED		
bfo-9027-02	6	CENTURY LINK	FIBER			D	BURIED		
btel-9001-02	6, 7	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9026-02	6, 7	CENTURY LINK	TELEPHONE			D	BURIED		
e-9030-12	6	RMP	POWER			D	AERIAL		
e-9031-12	6	RMP	POWER		PVC - ALXLP	D	AERIAL		
e-9032-12	6	RMP	POWER		QX	D	AERIAL		
e-9033-12	6	RMP	POWER		AL	D	AERIAL		
g-9021-11	6	QUESTAR	GAS	4 IN	PTR Plastic	D			
g-9027-11	6, 7	QUESTAR	GAS	1 AND QUARTER IN	PTR Plastic	D			
g-9030-11	6, 7	QUESTAR	GAS	2 IN	PTR Plastic	D			
g-9031-11	6	QUESTAR	GAS	1 AND QUARTER IN	PTR Plastic	D			
ms-0580-19	6	WEST JORDAN	SANITARY SEWER			D			
sd-9046-17	6	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9124-17	6	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9125-17	6	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9126-17	6, 7	UDOT	STORM DRAIN	18 IN	CMP	C			
sdi-0295-17	6	UDOT	STORM DRAIN			B			
sdi-0296-17	6	UDOT	STORM DRAIN			B			
sdi-0335-17	6	UDOT	STORM DRAIN			B			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
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DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITY SUMMARY

SHEET NO. 90UTSM-05

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sdi-0336-17	6	UDOT	STORM DRAIN			B			
sdi-0336-17	6	UDOT	STORM DRAIN	36x48					
ss-9024-19	6, 7	WEST JORDAN	SANITARY SEWER	8 IN		D			
wtr-9022-19	6, 7	WEST JORDAN	WATER	6 IN		D			
wtr-9051-19	6, 7	WEST JORDAN	WATER	6 IN		D			
btel-9008-02	7	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9020-02	7, 8	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9021-02	7, 8	CENTURY LINK	TELEPHONE			D	BURIED		
e-9002-12	7, 8	RMP	POWER			D	AERIAL		
ms-0575-19	7	WEST JORDAN	SANITARY SEWER			B			
ms-0576-19	7	WEST JORDAN	SANITARY SEWER			B			
ms-0578-19	7	WEST JORDAN	SANITARY SEWER			B			
ms-0579-19	7	WEST JORDAN	SANITARY SEWER			D			
msd-0509-19	7	WEST JORDAN	STORM DRAIN			D			
msd-0510-19	7	WEST JORDAN	STORM DRAIN			D			
msd-0511-19	7	WEST JORDAN	STORM DRAIN			D			
msd-0512-19	7	WEST JORDAN	STORM DRAIN			D			
sd-9000-19	7	WEST JORDAN	STORM DRAIN	18 IN		D			
sd-9003-17	7	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9004-17	7	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9082-17	7	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9083-17	7	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9086-19	7, 8	WEST JORDAN	STORM DRAIN	36 IN		D			
sd-9087-19	7	WEST JORDAN	STORM DRAIN	48 IN		D			
sd-9088-19	7	WEST JORDAN	STORM DRAIN	18 IN		D			
sd-9127-17	7	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9128-17	7	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9129-17	7, 8	UDOT	STORM DRAIN	24 IN	CMP	C			
sdi-0297-17	7	UDOT	STORM DRAIN			B			
sdi-0298-17	7	UDOT	STORM DRAIN			B			
sdi-0299-17	7	UDOT	STORM DRAIN			B			
sdi-0331-17	7	UDOT	STORM DRAIN			B			
sdi-0332-17	7	UDOT	STORM DRAIN			B			
sdi-0333-17	7	UDOT	STORM DRAIN			B			
sdi-0334-17	7	UDOT	STORM DRAIN			B			
ss-9023-19	7, 8	WEST JORDAN	SANITARY SEWER	10 IN		D			
ss-9037-19	7	WEST JORDAN	SANITARY SEWER	8 IN		D			
wtr-9007-99	7	UNKNOWN	WATER			D			
wtr-9035-19	7, 8	WEST JORDAN	WATER	8 IN		D			
wtr-9036-19	7, 8	WEST JORDAN	WATER	12 IN		D			
wtr-9046-08	7, 8	KENNECOTT	WATER	26 IN		D			
wtr-9050-19	7	WEST JORDAN	WATER	6 IN		D			
bctv-9001-03	8, 9	COMCAST	CABLE TV			D	BURIED		
bduct-9002-05	8, 9	MBI, ATT, ZAYO	FIBER DUCT			B	BURIED		
bduct-9002-09	8, 9	FIRST DIGITAL	FIBER DUCT			B	BURIED		
be-9018-12	8	RMP	POWER		PVC - AS	D	BURIED		
btel-9002-02	8	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9003-02	8	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9004-02	8, 9	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9005-02	8	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9022-02	8	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9023-02	8, 9	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9024-02	8, 9	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9039-02	8, 9	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9040-02	8, 9	CENTURY LINK	TELEPHONE			D	BURIED		
ctv-9004-03	8	COMCAST	CABLE TV			D	AERIAL		
ctv-9009-03	8	COMCAST	CABLE TV			D	AERIAL		
e-9003-12	8	RMP	POWER		AS, AW	D	AERIAL		
g-9018-11	8	QUESTAR	GAS	4 IN	STEEL	D			
g-9019-11	8	QUESTAR	GAS	4" DISTRIBUTION					
g-9020-11	8	QUESTAR	GAS	4 IN		D			
g-9026-11	8, 9	QUESTAR	GAS	4 IN	STEEL	D			
ms-0572-19	8	WEST JORDAN	SANITARY SEWER			D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY VR

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MM/DD/YY
DATE

PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 9000 SOUTH

PROJECT

PROJECT NUMBER S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 90UTSM-06

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
ms-0574-19	8	WEST JORDAN	SANITARY SEWER			D			
ms-0577-19	8	WEST JORDAN	SANITARY SEWER			D			
ms-0616-19	8	WEST JORDAN	SANITARY SEWER			D			
msd-0093-17	8	UDOT	STORM DRAIN			B			
msd-0094-17	8	UDOT	STORM DRAIN			B			
msd-0508-19	8	WEST JORDAN	STORM DRAIN			D			
msd-0513-19	8	WEST JORDAN	STORM DRAIN			D			
msd-0514-19	8	WEST JORDAN	STORM DRAIN			D			
msd-0515-19	8	WEST JORDAN	STORM DRAIN			D			
msd-0545-19	8	WEST JORDAN	STORM DRAIN			D			
sd-9007-17	8, 9	UDOT	STORM DRAIN	36 IN	CMP	C			
sd-9008-17	8	UDOT	STORM DRAIN	36 IN	CMP	C			
sd-9009-17	8	UDOT	STORM DRAIN	36 IN	CMP	C			
sd-9041-17	8	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9042-17	8	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9043-17	8	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9044-17	8	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9045-17	8	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9084-17	8	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9085-19	8, 9	WEST JORDAN	STORM DRAIN	36 IN		D			
sd-9089-19	8	WEST JORDAN	STORM DRAIN	18 IN		D			
sdi-0300-17	8	UDOT	STORM DRAIN			B			
sdi-0301-17	8	UDOT	STORM DRAIN			B			
sdi-0302-17	8	UDOT	STORM DRAIN			B			
sdi-0325-17	8	UDOT	STORM DRAIN			B			
sdi-0326-17	8	UDOT	STORM DRAIN			B			
sdi-0329-17	8	UDOT	STORM DRAIN			B			
sdi-0330-17	8	UDOT	STORM DRAIN			B			
sdi-0527-17	8	UDOT	STORM DRAIN			B			
sdi-0528-17	8	UDOT	STORM DRAIN			B			
ss-9022-19	8, 9	WEST JORDAN	SANITARY SEWER	10 IN		D			
ss-9033-19	8, 9	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-9034-19	8, 9	WEST JORDAN	SANITARY SEWER	10 IN		D			
ss-9035-19	8	WEST JORDAN	SANITARY SEWER	10 IN		D			
ss-9036-19	8	WEST JORDAN	SANITARY SEWER	8 IN		D			
wtr-9002-01	8, 9	BOR	WATER	78 IN		D			
wtr-9006-99	8	UNKNOWN	WATER			D			
wtr-9031-19	8	WEST JORDAN	WATER	10 IN		D			
wtr-9032-19	8	WEST JORDAN	WATER	8 IN		D			
wtr-9033-19	8	WEST JORDAN	WATER	12 IN		D			
wtr-9034-19	8, 9	WEST JORDAN	WATER	8 IN		D			
wtr-9037-19	8	WEST JORDAN	WATER	12 IN		D			
wtr-9038-19	8	WEST JORDAN	WATER	14 IN		D			
wtr-9039-19	8, 9	WEST JORDAN	WATER	14 IN		D			
wtr-9040-19	8, 9	WEST JORDAN	WATER	10 IN		D			
wtr-9042-19	8	WEST JORDAN	WATER	8 IN		D			
wtr-9049-19	8	WEST JORDAN	WATER	6 IN		D			
bctv-9002-03	9	COMCAST	CABLE TV			D	BURIED		
bfo-9012-17	9	UDOT	FIBER			B	BURIED		
bfo-9013-15	9	SYRINGA	FIBER			B	BURIED		
btel-9017-02	9	CENTURY LINK	TELEPHONE			B	BURIED		
btel-9025-02	9	CENTURY LINK	TELEPHONE			D	BURIED		
g-9017-11	9	QUESTAR	GAS	4 IN	PAL Plastic	B			
g-9019-11	9	QUESTAR	GAS	4 IN	PAL Plastic	D			
g-9022-11	9	QUESTAR	GAS	4 IN	PAL Plastic	D			
g-9023-11	9	QUESTAR	GAS	2 IN	PTR Plastic	D			
g-9024-11	9	QUESTAR	GAS	4 IN	PTR Plastic	D			
g-9025-11	9	QUESTAR	GAS	4 IN	PTR Plastic	D			
ms-0024-19	9	WEST JORDAN	SANITARY SEWER			B			
ms-0025-19	9	WEST JORDAN	SANITARY SEWER			B			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY VR

APPROVED
MM/DD/YY
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITY SUMMARY

SHEET NO. 90UTSM-07

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
ms-0569-19	9	WEST JORDAN	SANITARY SEWER			D			
ms-0570-19	9	WEST JORDAN	SANITARY SEWER			D			
ms-0571-19	9	WEST JORDAN	SANITARY SEWER			D			
msd-0092-17	9	UDOT	STORM DRAIN			B			
sd-9002-17	9	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9005-17	9	UDOT	STORM DRAIN	36 IN	CMP	C			
sd-9006-17	9	UDOT	STORM DRAIN	36 IN	CMP	C			
sd-9039-17	9	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9040-17	9	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-9063-17	9	UDOT	STORM DRAIN	42 IN	CMP	C			
sdi-0303-17	9	UDOT	STORM DRAIN			B			
sdi-0304-17	9	UDOT	STORM DRAIN			B			
sdi-0322-17	9	UDOT	STORM DRAIN			B			
sdi-0323-17	9	UDOT	STORM DRAIN			B			
sdi-0324-17	9	UDOT	STORM DRAIN			B			
ss-9001-19	9	WEST JORDAN	SANITARY SEWER	10 IN	PVC	C			
ss-9021-19	9	WEST JORDAN	SANITARY SEWER	10 IN		D			
ss-9030-19	9	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-9031-19	9	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-9032-19	9	WEST JORDAN	SANITARY SEWER	8 IN		D			
wtr-9000-99		UNKNOWN	water						
wtr-9003-19	9	WEST JORDAN	WATER	6 IN		D			
wtr-9041-19	9	WEST JORDAN	WATER	14 IN		D			
wtr-9043-01	9	BOR	WATER	78 IN		D			
wtr-9048-19	9	WEST JORDAN	WATER	10 IN		D			
bctv-9000-03	10	COMCAST	CABLE TV			D	BURIED		
bctv-9008-03	10	COMCAST	CABLE TV			D	BURIED		
bctv-9013-03	10	COMCAST	CABLE TV			D	BURIED		
bctv-9014-03	10	COMCAST	CABLE TV			D	BURIED		
bctv-9015-03	10	COMCAST	CABLE TV			D	BURIED		
bctv-9016-03	10	COMCAST	CABLE TV			D	BURIED		
be-9001-12	10	RMP	POWER		AL	D	BURIED		
be-9004-12	10	RMP	POWER		AL	D	BURIED		
be-9005-12	10	RMP	POWER		AL	D	BURIED		
be-9037-12	10	RMP	POWER		AL	D	BURIED		
be-9038-12	10	RMP	POWER		AL	D	BURIED		
be-9039-12	10	RMP	POWER			D	BURIED		
bfo-9020-02	10	CENTURY LINK	FIBER			B	BURIED		
bfo-9030-02	10	CENTURY LINK	FIBER			D	BURIED		
btel-9006-02	10	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9007-02	10	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9009-02	10	CENTURY LINK	TELEPHONE			B	BURIED		
btel-9010-02	10	CENTURY LINK	TELEPHONE			B	BURIED		
btel-9011-02	10	CENTURY LINK	TELEPHONE			B	BURIED		
btel-9018-02	10	CENTURY LINK	TELEPHONE			B	BURIED		
btel-9035-02	10	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9036-02	10	CENTURY LINK	TELEPHONE			D	BURIED		
btel-9037-02	10	CENTURY LINK	TELEPHONE			D	BURIED		
e-9044-12	10	RMP	POWER			D	AERIAL		
e-9045-12	10	RMP	POWER			D	AERIAL		
fo-9002-03	10	COMCAST	FIBER			D	AERIAL		
g-9006-11	10	QUESTAR	GAS	4 IN	PAL Plastic	D			
g-9008-11	10	QUESTAR	GAS	2 IN	PAL Plastic	B			
g-9009-11	10	QUESTAR	GAS	2 IN	PAL Plastic	B			
g-9010-11	10	QUESTAR	GAS	1 AND QUARTER IN	HP Service	B			
g-9011-11	10	QUESTAR	GAS	2 IN	PAL Plastic	B			
g-9012-11	10	QUESTAR	GAS	1 AND QUARTER IN	HP Service	B			
g-9032-11	10	QUESTAR	GAS	2 IN	PAL Plastic	D			
g-9033-11	10	QUESTAR	GAS	2 IN	PAL Plastic	D			
g-9034-11	10	QUESTAR	GAS	2 IN	PAL Plastic	D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN BY KKH
QC CHECKED BY VR

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

MM/DD/YY
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH

PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 90UTSM-08

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
g-9035-11	10	QUESTAR	GAS	2 IN	PAL Plastic	D			
ms-0015-19	10	WEST JORDAN	SANITARY SEWER			B			
ms-0017-19	10	WEST JORDAN	SANITARY SEWER			B			
ms-0019-19	10	WEST JORDAN	SANITARY SEWER			B			
ms-0020-19	10	WEST JORDAN	SANITARY SEWER			B			
ms-0567-19	10	WEST JORDAN	SANITARY SEWER			D			
msd-0068-19	10	WEST JORDAN	STORM DRAIN			B			
msd-0069-19	10	WEST JORDAN	STORM DRAIN			B			
msd-0070-19	10	WEST JORDAN	STORM DRAIN			B			
msd-0071-19	10	WEST JORDAN	STORM DRAIN			B			
msd-0072-19	10	WEST JORDAN	STORM DRAIN			B			
msd-0079-19	10	WEST JORDAN	STORM DRAIN			B			
msd-0080-19	10	WEST JORDAN	STORM DRAIN			B			
sd-9010-19	10	WEST JORDAN	STORM DRAIN	12 IN	RCP	C			
sd-9011-19	10	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9012-19	10	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-9013-19	10	WEST JORDAN	STORM DRAIN	36 IN	RCP	C			
sd-9014-19	10	WEST JORDAN	STORM DRAIN	36 IN	RCP	C			
sd-9015-19	10	WEST JORDAN	STORM DRAIN	36 IN	RCP	C			
sd-9016-19	10	WEST JORDAN	STORM DRAIN	36 IN	RCP	C			
sd-9038-19	10, 11	WEST JORDAN	STORM DRAIN	15 IN	CPP	C			
sd-9061-19	10	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sd-9078-19	10	WEST JORDAN	STORM DRAIN	36 IN	RCP	C			
sdi-0521-19	10	WEST JORDAN	STORM DRAIN			B			
sdi-0522-19	10	WEST JORDAN	STORM DRAIN			B			
sdi-0523-19	10	WEST JORDAN	STORM DRAIN			B			
sdi-0524-19	10	WEST JORDAN	STORM DRAIN			B			
ss-9002-19	10	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
ss-9003-19	10	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
ss-9004-19	10	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
ss-9005-19	10	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
ss-9006-19	10	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
ss-9012-19	10	WEST JORDAN	SANITARY SEWER	8 IN	PVC	C			
ss-9013-19	10	WEST JORDAN	SANITARY SEWER	8 IN	PVC	C			
ss-9028-19	10	WEST JORDAN	SANITARY SEWER	8 IN	PVC	C			
ss-9029-19	10	WEST JORDAN	SANITARY SEWER	8 IN		D			
wtr-9010-19	10	WEST JORDAN	WATER	12 IN		D			
wtr-9014-19	10	WEST JORDAN	WATER	6 IN		D			
wtr-9015-19	10	WEST JORDAN	WATER	6 IN		D			
wtr-9016-19	10	WEST JORDAN	WATER	8 IN		D			
wtr-9017-19	10	WEST JORDAN	WATER	1 IN		D			
wtr-9018-19	10	WEST JORDAN	WATER	6 IN		D			
wtr-9019-19	10	WEST JORDAN	WATER	6 IN		D			
wtr-9020-19	10	WEST JORDAN	WATER	6 IN		D			
wtr-9052-19	10	WEST JORDAN	WATER	8 IN		D			
e-9036-12	11	RMP	POWER		AS	D	AERIAL		
g-9000-11	11	QUESTAR	GAS			D			
msd-0505-19	11	WEST JORDAN	STORM DRAIN			B			
1 mw-0001-19	11	WEST JORDAN	WATER	10.25 FT X 13.00 FT		B			PRV Vault
sd-9026-17	11, 12	UDOT	STORM DRAIN	84 IN	CMP	C			
sdi-0262-17	11	UDOT	STORM DRAIN			B			
wtr-9013-19	11	WEST JORDAN	WATER	1 IN		D			
be-9007-12	12	RMP	POWER			D	BURIED		
be-9008-12	12	RMP	POWER			D	BURIED		
be-9009-12	12	RMP	POWER		AL	D	BURIED		
be-9010-12	12	RMP	POWER		PVC -AL	D	BURIED		
be-9034-12	12	RMP	POWER		AL	D	BURIED		
bfo-9006-18	12	VERIZON	FIBER			B	BURIED		
bfo-9007-02	12	CENTURY LINK	FIBER			B	BURIED		
bfo-9008-02	12	CENTURY LINK	FIBER			B	BURIED		

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	UPDATE UTILITY SUMMARY

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: VR

APPROVED
MM/DD/YY
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITY SUMMARY

SHEET NO. 90UTSM-09

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
bfo-9022-02	12	CENTURY LINK	FIBER			B	BURIED		
btel-9016-02	12	CENTURY LINK	TELEPHONE			B	BURIED		
btel-9019-02	12	CENTURY LINK	TELEPHONE			B	BURIED		
e-9035-12	12	RMP	POWER			D	AERIAL		
g-9003-11	12	QUESTAR	GAS	6 IN	PTR Plastic	D			
g-9014-11	12	QUESTAR	GAS	6 IN	PTR Plastic	B			
g-9015-11	12	QUESTAR	GAS	6 IN	PTR Plastic	B			
g-9016-11	12	QUESTAR	GAS	6 IN	PTR Plastic	B			
ms-0077-19	12	WEST JORDAN	SANITARY SEWER			B			
ms-0078-19	12	WEST JORDAN	SANITARY SEWER			B			
ms-0079-19	12	WEST JORDAN	SANITARY SEWER			B			
msd-0082-19	12	WEST JORDAN	STORM DRAIN			B			
msd-0084-19	12	WEST JORDAN	STORM DRAIN			B			
sd-9027-17	12	UDOT	STORM DRAIN	84 IN	CMP	C			
sd-9028-10	12	PRIVATE	STORM DRAIN	12 IN	RCP	C			
sd-9029-10	12	PRIVATE	STORM DRAIN	12 IN	RCP	C			
sd-9030-10	12	PRIVATE	STORM DRAIN	12 IN	RCP	C			
sd-9031-19	12	WEST JORDAN	STORM DRAIN	18 IN	CMP	C			
sd-9062-19	12	WEST JORDAN	STORM DRAIN	18 IN	CMP	C			
sd-9075-19	12	WEST JORDAN	STORM DRAIN	18 IN	CMP	C			
sd-9090-19	12	WEST JORDAN	STORM DRAIN	18 IN	CPP	C			
sd-9114-19	12	WEST JORDAN	STORM DRAIN	18 IN		D			
sdi-0263-19	12	WEST JORDAN	STORM DRAIN			B			
sdi-0268-19	12	WEST JORDAN	STORM DRAIN			B			
sdi-0269-17	12	UDOT	STORM DRAIN			B			
sdi-0270-10	12	PRIVATE	STORM DRAIN			B			
sdi-0271-10	12	PRIVATE	STORM DRAIN			B			
sdi-0272-10	12	PRIVATE	STORM DRAIN			B			
sdi-0525-19	12	WEST JORDAN	STORM DRAIN			B			
sdi-0526-19	12	WEST JORDAN	STORM DRAIN			B			
ss-9010-19	12	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
ss-9011-19	12	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
ss-9017-19	12	WEST JORDAN	SANITARY SEWER	12 IN	PVC	C			
wtr-9008-19	12	WEST JORDAN	WATER	12 IN		D			
wtr-9023-19	12	WEST JORDAN	WATER	10 IN		D			
wtr-9024-19	12	WEST JORDAN	WATER	8 IN		D			
wtr-9025-19	12	WEST JORDAN	WATER	8 IN		D			
wtr-9026-19	12	WEST JORDAN	WATER	12 IN		D			
wtr-9027-19	12	WEST JORDAN	WATER	18 IN		D			
wtr-9028-19	12	WEST JORDAN	WATER	8 IN		D			
wtr-9029-19	12	WEST JORDAN	WATER	8 IN		D			
wtr-9030-19	12	WEST JORDAN	WATER	12 IN		D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN BY KKH
QC CHECKED BY VR

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

MM/DD/YY
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 9000 SOUTH

PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 90UTSM-10

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
bduct-7000-05	1, 2, 3, 4, 5, 6, 7, 8, 10	FIRST DIGITAL	FIBER DUCT			B			
bduct-7000-09	1, 2, 3, 4, 5, 6, 7, 8, 10	MBI_ATT_ZAYO_FIRST DIGITAL	FIBER DUCT		HDPE	B	BURIED	TH 70-01, TH 70-15	
bduct-7001-09	1	MBI_ATT_ZAYO_FIRST DIGITAL	FIBER DUCT		HDPE	D	BURIED		
be-7016-17	1	UDOT	POWEER			D	BURIED		
be-7029-12	1	RMP	POWER		AL	D	BURIED		
be-7030-12	1, 2, 3, 4, 5, 10	RMP	POWER		AL	D	BURIED		
be-7037-12	1	RMP	POWER			D	BURIED		
be-7038-12	1	RMP	POWER			D	BURIED		
be-7039-12	1	RMP	POWER			D	BURIED		
bfo-7006-17	1, 2, 3, 4, 5, 10	UDOT	FIBER			B	BURIED		
bfo-7012-15	1, 2	SYRINGA	FIBER			B	BURIED		
bfo-7013-17	1	UDOT	FIBER			B	BURIED		
g-7009-11	1	QUESTAR	GAS	3 IN		D			
g-7029-11	1	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
g-7030-11	1	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
ms-0561-19	1	WEST JORDAN	SANITARY SEWER			D			
ms-0564-19	1	WEST JORDAN	SANITARY SEWER			D			
ms-0565-19	1	WEST JORDAN	SANITARY SEWER			D			
ms-0566-19	1	WEST JORDAN	SANITARY SEWER			D			
msd-0124-17	1	UDOT	STORM DRAIN			B			
msd-0128-19	1	WEST JORDAN	STORM DRAIN			B			
sd-7009-19	1, 2	WEST JORDAN	STORM DRAIN	12 IN	CPP	D			
sd-7010-19	1	WEST JORDAN	STORM DRAIN	12 IN		D			
sd-7011-17	1	UDOT	STORM DRAIN	18 IN	CPP	D			
sd-7033-17	1	UDOT	STORM DRAIN	42 IN	PVC	D			
sd-7036-19	1, 2	WEST JORDAN	STORM DRAIN	24 IN	PVC	C			
sd-7040-17	1, 2	UDOT	STORM DRAIN	42 IN	PVC	C			
sd-7093-19	1	WEST JORDAN	STORM DRAIN	12 IN	CPP	D			
sd-7101-17	1	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7102-17	1	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7106-19	1	WEST JORDAN	STORM DRAIN	24 IN	RCP	C			
sdi-0408-19	1	WEST JORDAN	STORM DRAIN			B			
sdi-0409-17	1	UDOT	STORM DRAIN			B			
sdi-0410-17	1	UDOT	STORM DRAIN			B			
ss-7001-19	1, 2	WEST JORDAN	SANITARY SEWER	18 IN		D			
ss-7030-19	1	WEST JORDAN	SANITARY SEWER	21 IN		D			
wtr-7005-01	1, 2	BOR	WATER	78 IN		D			
wtr-7034-19	1	WEST JORDAN	WATER	6 IN		D			
wtr-7035-19	1	WEST JORDAN	WATER	6 IN		D			
bctv-7011-03	2, 3, 4, 5, 10	COMCAST	CABLE TV		COPPER	D	BURIED		
bctv-7014-03	2	COMCAST	CABLE TV		COPPER	D	BURIED		
bduct-7001-05	1	FIRST DIGITAL	FIBER DUCT			D			
be-7017-12	2	RMP	POWER		PVC - AL	D	BURIED		
be-7036-12	2, 3	RMP	POWER		SVS15	D	BURIED		
bfo-7011-15	2, 3, 4	SYRINGA	FIBER			B	BURIED		
btel-7005-02	2	CENTURY LINK	TELEPHONE			D	BURIED		
g-7031-11	2	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
g-7032-11	2	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
g-7033-11	2	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
ms-0547-19	2	WEST JORDAN	SANITARY SEWER			D			
ms-0559-19	2	WEST JORDAN	SANITARY SEWER			D			
ms-0560-19	2	WEST JORDAN	SANITARY SEWER			D			
ms-0562-19	2	WEST JORDAN	SANITARY SEWER			D			
ms-0563-19	2	WEST JORDAN	SANITARY SEWER			D			
msd-0127-19	2	WEST JORDAN	STORM DRAIN			B			
sd-7032-17	2	UDOT	STORM DRAIN	24 IN	RCP	D			
sd-7037-17	2	UDOT	STORM DRAIN	12 IN	CPP	C			
sd-7038-17	2	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-7039-17	2	UDOT	STORM DRAIN	18 IN	PVC	C			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY WLS

APPROVED

MM/DD/YY
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH

PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 70UTSM-01

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sd-7041-17	2	UDOT	STORM DRAIN	42 IN	PVC	C			
sd-7042-17	2	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-7043-17	2	UDOT	STORM DRAIN	42 IN	CPP	C			
sd-7044-17	2, 3	UDOT	STORM DRAIN	42 IN	CPP	C			
sd-7045-17	2	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-7092-19	2	WEST JORDAN	STORM DRAIN	15 IN		D			
sdi-0404-17	2	UDOT	STORM DRAIN			B			
sdi-0405-17	2	UDOT	STORM DRAIN			B			
sdi-0406-17	2	UDOT	STORM DRAIN			B			
sdi-0407-01	2	BOR	STORM DRAIN			B			
sdi-0411-17	2	UDOT	STORM DRAIN			B			
sdi-0412-17	2	UDOT	STORM DRAIN			B			
sdi-0413-17	2	UDOT	STORM DRAIN			B			
sdi-0414-17	2	UDOT	STORM DRAIN			B			
ss-7021-19	2	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-7022-19	2	WEST JORDAN	SANITARY SEWER	8 IN		D			
wtr-7000-01	2, 3, 4, 5, 6, 7, 10	BOR	WATER	78 IN		B		TH 70-13	
wtr-7011-19	2	WEST JORDAN	WATER	8 IN		D			
wtr-7022-19	2	WEST JORDAN	WATER	6 IN		D			
wtr-7027-19	2, 3	WEST JORDAN	WATER	8 IN		D			
wtr-7030-19	2	WEST JORDAN	WATER	6 IN		D			
wtr-7031-19	2	WEST JORDAN	WATER	6 IN		D			
bctv-7012-03	3	COMCAST	CABLE TV		Copper	D	BURIED		
bctv-7013-03	3	COMCAST	CABLE TV		Copper	D	BURIED		
be-7027-12	3, 4	RMP	POWER		PVC - AL	D	BURIED		
be-7028-12	3	RMP	POWER		PVC - AL	D	BURIED		
be-7034-12	3, 4	RMP	POWER		AL	D	BURIED		
be-7035-12	3	RMP	POWER		AL	D	BURIED		
btel-7003-02	3	CENTURY LINK	TELEPHONE		Copper	D	BURIED		
btel-7004-02	3	CENTURY LINK	TELEPHONE		Copper	D	BURIED		
btel-7006-02	3, 4	CENTURY LINK	TELEPHONE		PVC	D	BURIED		
btel-7007-02	3, 4	CENTURY LINK	TELEPHONE		PVC	D	BURIED		
btel-7026-02	3	CENTURY LINK	TELEPHONE		PVC	D	BURIED		
btel-7027-02	3, 4, 5, 10	CENTURY LINK	TELEPHONE		PVC	D	BURIED		
btel-7028-02	3, 4, 5, 10	CENTURY LINK	TELEPHONE			D	BURIED		
g-7007-11	3	QUESTAR	GAS	2 IN	PTR Plastic	D			
g-7008-11	3	QUESTAR	GAS	2 IN	PTR Plastic	D			
g-7023-11	3, 4, 5, 10	QUESTAR	GAS	2 IN	PAL Plastic	D			
g-7024-11	3	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
g-7028-11	3	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
g-7034-11	3	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
ms-0546-19	3	WEST JORDAN	SANITARY SEWER			D			
ms-0556-19	3	WEST JORDAN	SANITARY SEWER			D			
ms-0557-19	3	WEST JORDAN	SANITARY SEWER			D			
ms-0558-19	3	WEST JORDAN	SANITARY SEWER			D			
sd-7025-10	3, 4, 5, 10	PRIVATE	STORM DRAIN	18 IN		D			
sd-7026-10	3	PRIVATE	STORM DRAIN	18 IN		D			
sd-7027-10	3	PRIVATE	STORM DRAIN	18 IN		D			
sd-7028-10	3	PRIVATE	STORM DRAIN	18 IN		D			
sd-7029-10	3	PRIVATE	STORM DRAIN	18 IN		D			
sd-7046-17	3	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-7047-17	3	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-7048-17	3	UDOT	STORM DRAIN	42 IN	CPP	C			
sd-7049-17	3, 4	UDOT	STORM DRAIN	42 IN	PVC	C			
sd-7050-17	3	UDOT	STORM DRAIN	18 IN	CPP	C			
sdi-0402-17	3	UDOT	STORM DRAIN			B			
sdi-0403-17	3	UDOT	STORM DRAIN			B			
sdi-0415-17	3	UDOT	STORM DRAIN			B			
sdi-0416-17	3	UDOT	STORM DRAIN			B			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY WLS

APPROVED

MM/DD/YY
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH

PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 70UTSM-02

9/6/2016 1:40:45 PM pw:\\gw.horrocks.com:PWPrimaryDocuments\Projects\2016\PG-858-1604 Bangerter 4 Interchanges PM-12566\Sheet_Files\Utilities\12566_70UTSM-02.dgn

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sdi-0417-17	3	UDOT	STORM DRAIN			B			
ss-7002-19	3, 4, 5, 10	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-7011-19	3	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-7018-19	3	WEST JORDAN	SANITARY SEWER	8 IN	Concrete Reinf.	D			
ss-7019-19	3	WEST JORDAN	SANITARY SEWER	8 IN	Concrete Reinf.	D			
ss-7020-19	3	WEST JORDAN	SANITARY SEWER	8 IN	Concrete Reinf.	D			
wtr-7008-19	3, 4, 5, 10	WEST JORDAN	WATER	8 IN		D			
wtr-7012-19	3	WEST JORDAN	WATER	8 IN		D			
wtr-7013-19	3	WEST JORDAN	WATER	8 IN		D			
wtr-7014-19	3	WEST JORDAN	WATER	6 IN		D			
wtr-7032-19	3	WEST JORDAN	WATER	6 IN		D			
wtr-7033-19	3	WEST JORDAN	WATER	6 IN		D			
bctv-7003-03	4	COMCAST	CABLE TV		Copper	D	BURIED		
bctv-7004-03	4	COMCAST	CABLE TV		Copper	D	BURIED		
bctv-7005-03	4	COMCAST	CABLE TV		Copper	D	BURIED		
be-7013-17	4, 5, 10	UDOT	POWER			D	BURIED		
be-7031-12	4, 5, 10	RMP	POWER		AL	D	BURIED		
be-7032-12	4	RMP	POWER		PVC	D	BURIED		
be-7033-12	4	RMP	POWER		PVC	D	BURIED		
be-7040-12	4	RMP	POWER		PVC	D	BURIED		
be-7200-12	4	RMP	POWER			D	BURIED		
bfo-7008-15	4, 5, 10	SYRINGA	FIBER			B	BURIED	TH 70-16	
btel07200-12	4	RMP	POWER			D			
btel-7000-02	4	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7001-02	4	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7002-02	4	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7008-02	4	CENTURY LINK	TELEPHONE		PVC	D	BURIED		
btel-7025-02	4	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7029-02	4	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7200-02	4	CENTURY LINK	TELEPHONE			B	BURIED		
btel-7200-02	4	CENTURY LINK	TELEPHONE			D			
g-7000-11	4	QUESTAR	GAS			D			
g-7001-11	4	QUESTAR	GAS			D			
g-7025-11	4	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
g-7026-11	4	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
ms-0544-19	4	WEST JORDAN	SANITARY SEWER			D			
ms-0545-19	4	WEST JORDAN	SANITARY SEWER			D			
ms-0554-19	4	WEST JORDAN	SANITARY SEWER			D			
ms-0555-19	4	WEST JORDAN	SANITARY SEWER			D			
sd-7051-17	4	UDOT	STORM DRAIN	42 IN	PVC	C			
sd-7052-17	4	UDOT	STORM DRAIN	42 IN	PVC	C			
sd-7053-17	4, 5, 10	UDOT	STORM DRAIN	42 IN	PVC	C			
sd-7054-17	4	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7055-17	4	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7100-17	4	UDOT	STORM DRAIN	18 IN	RCP	C			
sd-7105-17	4	UDOT	STORM DRAIN	18 IN	CPP	C			
sdi-0399-17	4	UDOT	STORM DRAIN			B			
sdi-0400-17	4	UDOT	STORM DRAIN			B			
sdi-0401-17	4	UDOT	STORM DRAIN			B			
sdi-0418-17	4	UDOT	STORM DRAIN			B			
sdi-0419-17	4	UDOT	STORM DRAIN			B			
sdi-0420-17	4	UDOT	STORM DRAIN			B			
sdi-0421-17	4	UDOT	STORM DRAIN			B			
ss-7016-19	4	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-7017-19	4	WEST JORDAN	SANITARY SEWER	8 IN		D			
wtr-7015-19	4	WEST JORDAN	WATER	6 IN		D			
wtr-7016-19	4	WEST JORDAN	WATER	6 IN		D			
bctv-7002-03	5, 10	COMCAST	CABLE TV			D	BURIED	TH 70-18 1	
bctv-7009-03	5, 6, 7, 8, 10	COMCAST	CABLE TV		Copper	D	BURIED		

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	ADDED TESTHOLES.

DRAWN BY KKH
CHECKED BY WLS
QC

APPROVED

MM/DD/YY
DATE

PROFESSIONAL ENGINEER

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH
PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 70UTSM-03

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
bctv-7010-03	5, 10	COMCAST	CABLE TV		Copper	D	BURIED		
bctv-7200-03	5, 6, 7, 10	COMCAST	CABLE TV			D	BURIED		
be-7000-12	5, 9, 10	RMP	POWER		AL	D	BURIED		
be-7001-12	5, 9, 10	RMP	POWER		AL	D	BURIED		
be-7002-12	5, 10	RMP	POWER			D	BURIED		
be-7003-12	5, 10	RMP	POWER		AL	D	BURIED		
be-7004-12	5, 10	RMP	POWER		AL	D	BURIED		
be-7005-12	5, 10	RMP	POWER		HDPE -AL	D	BURIED		
be-7006-17	5, 10	UDOT	POWER			D	BURIED		
be-7007-17	5, 10	UDOT	POWER			D	BURIED		
be-7008-12	5, 10	RMP	POWER			D	BURIED		
be-7009-17	5, 10	UDOT	POWER			D	BURIED		
be-7011-17	5, 6, 10	UDOT	POWER			D	BURIED		
be-7012-17	5, 10	UDOT	POWER			D	BURIED		
be-7014-17	5, 10	UDOT	POWER			D	BURIED		
be-7015-17	5, 10	UDOT	POWER			D	BURIED		
be-7018-12	5, 10	RMP	POWER		AL	D	BURIED		
be-7023-12	5, 6, 7	RMP	POWER		AL	D	BURIED		
be-7024-12	5, 6, 7, 10	RMP	POWER		AL	D	BURIED		
be-7041-12	5, 6, 7, 10	RMP	POWER		AL	D	BURIED		
be-7042-12	5, 9,10	RMP	POWER		AL	D	BURIED		
bfo-7001-15	5, 9, 10	SYRINGA	FIBER			B	BURIED	TH 70-02	
bfo-7002-15	5, 10	SYRINGA	FIBER			B	BURIED		
bfo-7003-17	5, 9, 10	UDOT	FIBER			B	BURIED	TH 70-02	
bfo-7004-03	5, 10	COMCAST	FIBER			B	BURIED	TH 70-17 1	
bfo-7005-17	5, 10	UDOT	FIBER			B	BURIED		
bfo-7007-17	5, 6, 7, 8, 10	UDOT	FIBER			B	BURIED		
bfo-7014-15	5, 6, 7, 10	SYRINGA	FIBER			B	BURIED		
btel-7013-02	5, 10	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7023-02	5, 6, 7, 8, 10	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7024-02	5, 10	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7030-02	5, 10	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7031-02	5, 6, 7, 10	CENTURY LINK	TELEPHONE			D	BURIED		
g-7002-11	5, 10	QUESTAR	GAS			D			
g-7003-11	5, 9, 10	QUESTAR	GAS	6 IN	PTR Plastic	B			
g-7004-11	5, 10	QUESTAR	GAS	4 IN	Steel	B		TH 70-05A, TH 70-06, TH 70-11	
g-7005-11	5, 10	QUESTAR	GAS	3 IN	Steel	B			
g-7006-11	5, 9, 10	QUESTAR	GAS	2 IN	Steel	D			
g-7010-11	5, 6, 10	QUESTAR	GAS	3 IN	Steel	D			
g-7019-11	5, 10	QUESTAR	GAS	2 IN	PAL Plastic	D			
g-7022-11	5, 10	QUESTAR	GAS	4 IN	PAL Plastic	D			
g-7027-11	5, 10	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
g-7200-11	5, 6, 7, 10	QUESTAR	GAS	2 IN		D			
ms-0129-19	5, 10	WEST JORDAN	SANITARY SEWER			B			
ms-0130-19	5, 10	WEST JORDAN	SANITARY SEWER			B			
ms-0131-19	5, 10	WEST JORDAN	SANITARY SEWER			B			
ms-0543-19	5, 10	WEST JORDAN	SANITARY SEWER			D			
ms-0549-19	5, 10	WEST JORDAN	SANITARY SEWER			D			
ms-0551-19	5, 10	WEST JORDAN	SANITARY SEWER			D			
ms-0553-19	5, 10	WEST JORDAN	SANITARY SEWER			D			
msd-0103-19	5, 10	WEST JORDAN	STORM DRAIN			B			
msd-0104-17	5, 10	UDOT	STORM DRAIN			B			
msd-0105-17	5, 10	UDOT	STORM DRAIN			B			
msd-0112-19	5, 10	WEST JORDAN	STORM DRAIN			B			
msd-0113-19	5, 10	WEST JORDAN	STORM DRAIN			B			
msd-0114-19	5, 10	WEST JORDAN	STORM DRAIN			B			
msd-0115-19	5, 10	WEST JORDAN	STORM DRAIN			B			
msd-0116-19	5, 10	WEST JORDAN	STORM DRAIN			B			
msd-0117-19	5, 10	WEST JORDAN	STORM DRAIN			B			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	ADDED TESTHOLES

DRAWN BY KKH
QC CHECKED BY WLS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED MM/DD/YY
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH
PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 70UTSM-04

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
msd-0118-19	5, 10	WEST JORDAN	STORM DRAIN			B			
msd-0125-17	5, 10	UDOT	STORM DRAIN			B			
msd-0167-19	5, 10	WEST JORDAN	STORM DRAIN			B			
mw-0003-01	5, 10	BOR	WATER	11.50 X 15.00 FT		B			Aqueduct Vault
mw-0004-01	5, 10	BOR	WATER	10.00 X 19.00 FT		B			PRV/Meter Vault
mw-0004-19	5, 10	WEST JORDAN	WATER	10.00 X 19.00 FT		B			PRV/Meter Vault
sd-7000-10	5, 10	PRIVATE	STORM DRAIN	12 IN	CPP	D			
sd-7001-10	5, 10	PRIVATE	STORM DRAIN	12 IN	CPP	D			
sd-7002-19	5, 10	WEST JORDAN	STORM DRAIN	24 IN	CPP	C			
sd-7003-19	5, 10	WEST JORDAN	STORM DRAIN	24 IN	RCP	C			
sd-7004-19	5, 10	WEST JORDAN	STORM DRAIN	24 IN	RCP	C			
sd-7005-19	5, 10	WEST JORDAN	STORM DRAIN	24 IN		C			
sd-7007-19	5, 10	WEST JORDAN	STORM DRAIN	15 IN	CMP	C			
sd-7008-19	5, 10	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-7013-17	5, 10	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7014-17	5, 10	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7015-19	5, 10	WEST JORDAN	STORM DRAIN	18 IN	CPP	C			
sd-7016-19	5, 10	WEST JORDAN	STORM DRAIN	18 IN	CMP	C			
sd-7017-19	5, 10	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sd-7018-19	5, 10	WEST JORDAN	STORM DRAIN	18 IN	CMP	C			
sd-7019-19	5, 10	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sd-7030-19	5, 10	WEST JORDAN	STORM DRAIN	15 IN		D			
sd-7031-17	5, 10	UDOT	STORM DRAIN	18 IN	Concrete Reinf.	C			
sd-7035-19	5, 10	WEST JORDAN	STORM DRAIN	18 IN	CMP	C			
sd-7056-17	5, 10	UDOT	STORM DRAIN	18 IN	RCP	C			
sd-7057-17	5, 10	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7058-17	5, 10	UDOT	STORM DRAIN	42 IN	PVC	C			
sd-7059-17	5, 10	UDOT	STORM DRAIN	42 IN	PVC	C			
sd-7060-17	5, 10	UDOT	STORM DRAIN	18 IN	CMP	D			
sd-7061-17	5, 6, 10	UDOT	STORM DRAIN	42 IN	PVC	C			
sd-7083-19	5, 10	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sd-7084-19	5, 10	WEST JORDAN	STORM DRAIN	12 IN	CPP	C			
sd-7090-19	5, 10	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sd-7091-19	5, 9, 10	WEST JORDAN	STORM DRAIN	24 IN	RCP	D			
sd-7094-19	5, 9, 10	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sd-7095-17	5, 10	UDOT	STORM DRAIN	18 IN	RCP	C			
sd-7096-17	5, 10	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7097-17	5, 10	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7098-17	5, 10	UDOT	STORM DRAIN	18 IN	RCP	C			
sd-7099-17	5, 10	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7103-17	5, 10	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7104-19	5, 10	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-7115-19	5, 10	WEST JORDAN	STORM DRAIN	15 IN	RCP	C			
sd-7117-17	5, 10	UDOT	STORM DRAIN	18 IN	CPP	C			
sdi-0328-17	5, 10	UDOT	STORM DRAIN			B			
sdi-0362-19	5, 10	WEST JORDAN	STORM DRAIN			B			
sdi-0363-17	5, 10	UDOT	STORM DRAIN			B			
sdi-0367-19	5, 10	WEST JORDAN	STORM DRAIN			B			
sdi-0368-19	5, 10	WEST JORDAN	STORM DRAIN			B			
sdi-0369-19	5, 10	WEST JORDAN	STORM DRAIN			B			
sdi-0370-19	5, 10	WEST JORDAN	STORM DRAIN			B			
sdi-0392-17	5, 10	UDOT	STORM DRAIN			B			
sdi-0393-17	5, 10	UDOT	STORM DRAIN			B			
sdi-0394-17	5, 10	UDOT	STORM DRAIN			B			
sdi-0395-17	5	UDOT	STORM DRAIN			B			
sdi-0396-17	5, 10	UDOT	STORM DRAIN			B			
sdi-0397-17	5, 10	UDOT	STORM DRAIN			B			
sdi-0398-17	5	UDOT	STORM DRAIN			B			
sdi-0422-17	5, 10	UDOT	STORM DRAIN			B			
sdi-0423-17	5, 10	UDOT	STORM DRAIN			B			
sdi-0425-17	5, 10	UDOT	STORM DRAIN			B			
sdi-0489-19	5, 10	WEST JORDAN	STORM DRAIN			B			

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	09/16	DCO	WATER VAULTS ADDED.

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY WLS
APPROVED
MM/DD/YY
DATE
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH
PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 70UTSM-05

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
ss-7000-19	5, 10	WEST JORDAN	SANITARY SEWER	12 IN	Concrete Reinf.	C			
ss-7005-19	5, 9, 10	WEST JORDAN	SANITARY SEWER	10 IN	PVC	C			
ss-7006-19	5, 10	WEST JORDAN	SANITARY SEWER	12 IN	Concrete Reinf.	C			
ss-7007-19	5, 10	WEST JORDAN	SANITARY SEWER	12 IN	Concrete Reinf.	C			
ss-7009-19	5, 9, 10	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-7013-19	5, 6,10	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-7014-19	5, 10	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-7015-19	5, 10	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-7029-19	5, 6, 10	WEST JORDAN	SANITARY SEWER	12 IN	Concrete Reinf.	D			
wtr-7001-19	5, 9, 10	WEST JORDAN	WATER	16 IN		D			
wtr-7002-19	5, 10	WEST JORDAN	WATER	12 IN		D		TH 70-09A	
wtr-7003-19	5, 10	WEST JORDAN	WATER	10 IN		D			
wtr-7006-19	5, 9, 10	WEST JORDAN	WATER	18 IN		D		TH 70-05A	
wtr-7009-19	5, 10	WEST JORDAN	WATER	6 IN		D			
wtr-7017-19	5, 10	WEST JORDAN	WATER	6 IN		D			
wtr-7020-19	5, 6, 10	WEST JORDAN	WATER	6 IN		D			
wtr-7021-19	5, 9, 10	WEST JORDAN	WATER	6 IN		D			
wtr-7028-19	5, 6, 7, 10	WEST JORDAN	WATER	6 IN		D			
wtr-7029-19	5, 10	WEST JORDAN	WATER	10 IN		D			
bctv-7200-03	6, 7	COMCAST	CABLE TV			D			
be-7010-17	6	UDOT	POWER			D	BURIED		
be-7026-12	6, 7	RMP	POWER		AL	D	BURIED		
btel-7020-02	6, 7	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7202-02	6, 7	CENTURY LINK	TELEPHONE			D			
g-7011-11	6	QUESTAR	GAS	2 IN	PAL Plastic	D			
g-7012-11	6	QUESTAR	GAS	2 IN	PAL Plastic	D			
g-7018-11	6, 7	QUESTAR	GAS	2 IN	PAL Plastic	D			
ms-0541-19	6	WEST JORDAN	SANITARY SEWER			D			
ms-0542-19	6	WEST JORDAN	SANITARY SEWER			D			
ms-0548-19	6	WEST JORDAN	SANITARY SEWER			D			
ms-0550-19	6	WEST JORDAN	SANITARY SEWER			D			
msd-0126-17	6	UDOT	STORM DRAIN			B			
mvc en	6, 7, 8	CENTURY LINK	TELEPHONE			D			
sd-7012-17	6	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7024-17	6	UDOT	STORM DRAIN	42 IN	PVC	C			
sd-7062-17	6	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7063-17	6	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7064-17	6	UDOT	STORM DRAIN	42 IN	PVC	C			
sd-7065-17	6	UDOT	STORM DRAIN	18 IN	RCP	C			
sd-7066-17	6	UDOT	STORM DRAIN	18 IN	RCP	C			
sd-7067-17	6	UDOT	STORM DRAIN	18 IN	RCP	C			
sd-7068-17	6	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-7069-17	6, 7	UDOT	STORM DRAIN	42 IN	PVC	C			
sdi-0387-17	6	UDOT	STORM DRAIN			B			
sdi-0388-17	6	UDOT	STORM DRAIN			B			
sdi-0389-17	6	UDOT	STORM DRAIN			B			
sdi-0390-17	6	UDOT	STORM DRAIN			B			
sdi-0391-17	6	UDOT	STORM DRAIN			B			
sdi-0424-17	6	UDOT	STORM DRAIN			B			
sdi-0426-17	6	UDOT	STORM DRAIN			B			
sdi-0427-17	6	UDOT	STORM DRAIN			B			
sdi-0428-17	6	UDOT	STORM DRAIN			B			
ss-7010-19	6	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-7012-19	6, 7	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-7027-19	6, 7	WEST JORDAN	SANITARY SEWER	12 IN		D			
ss-7028-19	6	WEST JORDAN	SANITARY SEWER	12 IN		D			
wtr-7018-19	6	WEST JORDAN	WATER	6 IN		D			
wtr-7019-19	6	WEST JORDAN	WATER	6 IN		D			
wtr-7024-19	6, 7	WEST JORDAN	WATER	10 IN		D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

DRAWN BY KKH
QC CHECKED BY WLS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED MM/DD/YY
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH
PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 70UTSM-06

9/6/2016 1:41:17 PM pw:\\gw.horrocks.com:PWPrimaryDocuments/Projects/2016/PG-858-1604 Bangerter 4 Interchanges PM:12566\Sheet_Files\Utilities\12566_70UTSM-06.dgn

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
be-7025-12	7, 8	RMP	POWER		AL	D	BURIED		
bfo-7009-02	7, 8	CENTURY LINK	FIBER			B	BURIED		
bfo-7010-15	7, 8	SYRINGA	FIBER			B	BURIED		
btel-7009-02	7	CENTURY LINK	TELEPHONE		PVC	D	BURIED		
btel-7010-02	7, 8	CENTURY LINK	TELEPHONE		PVC	D	BURIED		
btel-7011-02	7, 8	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7012-02	7	CENTURY LINK	TELEPHONE		PVC	D	BURIED		
btel-7014-02	7	CENTURY LINK	TELEPHONE		PVC	D	BURIED		
btel-7015-02	7, 8	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7017-02	7	CENTURY LINK	TELEPHONE			D	BURIED		
g-7017-11	7, 8	QUESTAR	GAS	2 IN	PAL Plastic	D			
g-7020-11	7	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
ms-0535-19	7	WEST JORDAN	SANITARY SEWER			D			
ms-0539-19	7	WEST JORDAN	SANITARY SEWER			D			
ms-0540-19	7	WEST JORDAN	SANITARY SEWER			D			
msd-0123-17	7	WEST JORDAN	STORM DRAIN			B			
msd-0170-17	7	UDOT	STORM DRAIN			B			
msd-0500-17	7	UDOT	STORM DRAIN			B			
sd-7023-17	7	UDOT	STORM DRAIN	42 IN	RCP	C			
sd-7070-17	7	UDOT	STORM DRAIN	42 IN	PVC	C			
sd-7071-17	7	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7072-17	7	UDOT	STORM DRAIN	18 IN	RCP	C			
sd-7073-17	7	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sd-7074-17	7	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-7075-17	7	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-7076-17	7	UDOT	STORM DRAIN	42 IN	RCP	C			
sd-7077-17	7, 8	UDOT	STORM DRAIN	36 IN	CMP	C			
sd-7085-17	7	UDOT	STORM DRAIN	18 IN	CPP	C			
sd-7086-17	7	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sd-7088-17	7	UDOT	STORM DRAIN	18 IN	RCP	D			
sd-7116-19	7	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sdi-0382-17	7	UDOT	STORM DRAIN			B			
sdi-0383-17	7	UDOT	STORM DRAIN			B			
sdi-0384-01	7	BOR	STORM DRAIN			B			
sdi-0385-17	7	UDOT	STORM DRAIN			B			
sdi-0386-17	7	WEST JORDAN	STORM DRAIN			B			
sdi-0429-17	7	UDOT	STORM DRAIN			B			
sdi-0430-17	7	UDOT	STORM DRAIN			B			
sdi-0431-17	7	UDOT	STORM DRAIN			B			
sdi-0439-17	7	UDOT	STORM DRAIN			B			
sdi-0464-19	7	WEST JORDAN	STORM DRAIN			B			
ss-7008-19	7, 8	WEST JORDAN	SANITARY SEWER	10 IN		D			
wtr-7004-01	7, 8	BOR	WATER	78 IN		B			
wtr-7023-19	7, 8	WEST JORDAN	WATER	6 IN		D			
bctv-7007-03	8	COMCAST	CABLE TV		Copper	D	BURIED		
bctv-7008-03	8	COMCAST	CABLE TV		Copper	D	BURIED		
be-7019-12	8	RMP	POWER		AL	D	BURIED		
be-7020-12	8	RMP	POWER		AL	D	BURIED		
be-7021-12	8	RMP	POWER		AL	D	BURIED		
be-7022-12	8	RMP	POWER		AL	D	BURIED		
btel-7021-02	8	CENTURY LINK	TELEPHONE		PVC	D	BURIED		
btel-7022-02	8	CENTURY LINK	TELEPHONE		PVC	D	BURIED		
g-7013-11	8	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
g-7014-11	8	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
g-7015-11	8	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
g-7016-11	8	QUESTAR	GAS	1 AND QUARTER IN	PAL Plastic	D			
ms-0141-16	8	TAYLORSVILLE	SANITARY SEWER			B			
ms-0536-19	8	WEST JORDAN	SANITARY SEWER			D			
ms-0537-19	8	WEST JORDAN	SANITARY SEWER			D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY WLS

APPROVED

MM/DD/YY
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH

PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 70UTSM-07

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
ms-0538-19	8	WEST JORDAN	SANITARY SEWER			D			
msd-0164-19	8	WEST JORDAN	STORM DRAIN			B			
msd-0165-19	8	WEST JORDAN	STORM DRAIN			B			
msd-0166-19	8	WEST JORDAN	STORM DRAIN			B			
msd-0535-19	8	WEST JORDAN	STORM DRAIN			B			
sd-7078-17	8	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-7079-17	8	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-7080-17	8	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-7081-17	8	UDOT	STORM DRAIN	18 IN	CMP	C			
sd-7082-19	8	WEST JORDAN	STORM DRAIN	24 IN	CMP	D			
sd-7107-17	8	UDOT	STORM DRAIN	30 IN	CMP	C			
sd-7108-17	8	UDOT	STORM DRAIN	30 IN	CMP	C			
sd-7109-17	8	UDOT	STORM DRAIN	30 IN	CMP	C			
sd-7110-19	8	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sd-7111-19	8	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sd-7112-19	8	WEST JORDAN	STORM DRAIN	18 IN	CMP	C			
sd-7113-19	8	WEST JORDAN	STORM DRAIN	18 IN	CMP	C			
sd-7114-19	8	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sdi-0378-17	8	UDOT	STORM DRAIN			B			
sdi-0379-17	8	UDOT	STORM DRAIN			B			
sdi-0380-17	8	UDOT	STORM DRAIN			B			
sdi-0381-17	8	UDOT	STORM DRAIN			B			
sdi-0432-17	8	UDOT	STORM DRAIN			B			
sdi-0433-17	8	UDOT	STORM DRAIN			B			
sdi-0434-17	8	UDOT	STORM DRAIN			B			
sdi-0440-19	8	WEST JORDAN	STORM DRAIN			B			
sdi-0486-19	8	WEST JORDAN	STORM DRAIN			B			
sdi-0487-19	8	WEST JORDAN	STORM DRAIN			B			
ss-7023-16	8	TAYLORSVILLE	SANITARY SEWER	12 IN	Concrete Reinf.	D			
ss-7024-16	8	TAYLORSVILLE	SANITARY SEWER	12 IN	Concrete Reinf.	C			
ss-7025-19	8	WEST JORDAN	SANITARY SEWER	8 IN		D			
ss-7026-19	8	WEST JORDAN	SANITARY SEWER	8 IN		D			
wtr-7025-19	8	WEST JORDAN	WATER	6 IN		D			
wtr-7026-19	8	WEST JORDAN	WATER	6 IN		D			
bctv-7001-03	9, 10	COMCAST	CABLE TV		Copper	D	BURIED		
bctv-7250-03	9	COMCAST	CABLE TV			D	BURIED		
bctv-7251-03	9	COMCAST	CABLE TV			D	BURIED		
bctv-7252-03	9	COMCAST	CABLE TV			D	BURIED		
be-7250-19	9	WEST JORDAN	POWER			D	BURIED		
be-7251-17	9	UDOT	POWER			D	BURIED		
be-7252-17	9	UDOT	POWER			D	BURIED		
be-7253-17	9	UDOT	POWER			D	BURIED		
be-7254-17	9	UDOT	POWER			D	BURIED		
be-7255-12	9	RMP	POWER			D	BURIED		
be-7256-12	9	RMP	POWER			D	BURIED		
bfo-7000-03	9, 10	COMCAST	FIBER		Copper	D	BURIED		
bfo-7250-02	9	CENTURY LINK	FIBER			D	BURIED		
bfo-7252-03	9	COMCAST	FIBER			B	BURIED		
bfo-7253-17	9	UDOT	FIBER			B	BURIED		
bfo-7254-03	9	COMCAST	FIBER			D	BURIED		
bfo-7255-03	9	COMCAST	FIBER			D	BURIED		
btel-7018-02	9	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7019-02	9	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7250-02	9	CENTURY LINK	TELEPHONE			D	BURIED		
btel-7251-02	9	CENTURY LINK	TELEPHONE			D	BURIED		
g-7250-11	9	QUESTAR	GAS	4 IN		B			
g-7251-11	9	QUESTAR	GAS	6 IN		B			
g-7252-11	9	QUESTAR	GAS	1 AND QUARTER IN		B			
g-7253-11	9	QUESTAR	GAS	2 IN		D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
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DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH

PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 70UTSM-08

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
g-7254-11	9	QUESTAR	GAS	2 IN		D			
g-7255-11	9	QUESTAR	GAS	4 IN		D			
g-7256-11	9	QUESTAR	GAS	6 IN		D			
ms-0125-19	9	WEST JORDAN	SANITARY SEWER			B			
ms-0126-19	9	WEST JORDAN	SANITARY SEWER			B			
ms-0127-19	9	WEST JORDAN	SANITARY SEWER			B			
ms-0128-19	9	WEST JORDAN	SANITARY SEWER			B			
msd-0100-19	9	WEST JORDAN	STORM DRAIN			B			
msd-0101-19	9	WEST JORDAN	STORM DRAIN			B			
msd-0102-19	9	WEST JORDAN	STORM DRAIN			B			
msd-0119-19	9	WEST JORDAN	STORM DRAIN			B			
msd-0120-19	9	WEST JORDAN	STORM DRAIN			B			
msd-0121-19	9	WEST JORDAN	STORM DRAIN			B			
msd-0122-19	9	WEST JORDAN	STORM DRAIN			B			
msd-0126-19	9	WEST JORDAN	SANITARY SEWER			B			
msd-0171-19	9	WEST JORDAN	STORM DRAIN			B			
sd-7250-19	9	WEST JORDAN	STORM DRAIN	24 IN		D			
sd-7251-19	9	WEST JORDAN	STORM DRAIN	15 IN		D			
sd-7252-19	9	WEST JORDAN	STORM DRAIN	10 IN		D			
sd-7253-19	9	WEST JORDAN	STORM DRAIN	18 IN		D			
sd-7254-19	9	WEST JORDAN	STORM DRAIN	15 IN		D			
sd-7255-19	9	WEST JORDAN	STORM DRAIN	15 IN		D			
sd-7256-19	9	WEST JORDAN	STORM DRAIN	18 IN		C			
sd-7257-19	9	WEST JORDAN	STORM DRAIN	18 IN		C			
sd-7258-19	9	WEST JORDAN	STORM DRAIN	15 IN		C			
sd-7259-19	9	WEST JORDAN	STORM DRAIN	24 IN		C			
sd-7260-19	9	WEST JORDAN	STORM DRAIN	24 IN		D			
sd-7261-19	9	WEST JORDAN	STORM DRAIN	10 IN		C			
sd-7265-19	9	WEST JORDAN	STORM DRAIN	15 IN		C			
sd-7266-19	9	WEST JORDAN	STORM DRAIN	18 IN		C			
sd-7268-19	9	WEST JORDAN	STORM DRAIN	15 IN		D			
sd-7269-19	9	WEST JORDAN	STORM DRAIN	18 IN		D			
sd-7270-19	9	WEST JORDAN	STORM DRAIN	18 IN		D			
sd-7271-19	9	WEST JORDAN	STORM DRAIN	24 IN		D			
sd-7272-19	9	WEST JORDAN	STORM DRAIN	18 IN		C			
sdi-0361-17	9	UDOT	STORM DRAIN			B			
sdi-0371-19	9	WEST JORDAN	STORM DRAIN			B			
ss-7003-19	9	WEST JORDAN	SANITARY SEWER	10 IN		C			
ss-7004-19	9	WEST JORDAN	SANITARY SEWER	10 IN		C			
ss-7250-19	9	WEST JORDAN	SANITARY SEWER	10 IN		C			
ss-7251-19	9	WEST JORDAN	SANITARY SEWER	10 IN		D			
ss-7252-19	9	WEST JORDAN	SANITARY SEWER	8 IN		D			
wtr-7250-19	9	WEST JORDAN	WATER	6 IN		D			
wtr-7251-19	9	WEST JORDAN	WATER	6 IN		D			
wtr-7252-19	9	WEST JORDAN	WATER	12 IN		D			
wtr-7253-19	9	WEST JORDAN	WATER	8 IN		D			
wtr-7254-19	9	WEST JORDAN	WATER	6 IN		D			
wtr-7255-19	9	WEST JORDAN	WATER	8 IN		D			
wtr-7256-19	9	WEST JORDAN	WATER	12 IN		D			
bctv-7000-03	10	COMCAST	CABLE TV		Copper	D	BURIED		
bctv-7006-03	10	COMCAST	CABLE TV		Copper	D	BURIED		
msd-0108-19	10	WEST JORDAN	STORM DRAIN			C			
msd-0109-19	10	WEST JORDAN	STORM DRAIN			C			
msd-0110-19	10	WEST JORDAN	STORM DRAIN			B			
msd-0111-19	10	WEST JORDAN	STORM DRAIN			B			
sd-7006-19	10	WEST JORDAN	STORM DRAIN	24 IN		C			
sd-7020-19	10	WEST JORDAN	STORM DRAIN	18 IN	CMP	C			
sd-7021-19	10	WEST JORDAN	STORM DRAIN	18 IN	CMP	C			
sd-7022-19	10	WEST JORDAN	STORM DRAIN	18 IN	RCP	C			
sd-7262-19	10	WEST JORDAN	STORM DRAIN	12 IN		C			
sd-7263-19	10	WEST JORDAN	STORM DRAIN	12 IN		C			
sd-7264-19	10	WEST JORDAN	STORM DRAIN	12 IN		C			
sd-7267-19	10	WEST JORDAN	STORM DRAIN	18 IN		C			
sdi-0364-19	10	WEST JORDAN	STORM DRAIN			C			
sdi-0365-19	10	WEST JORDAN	STORM DRAIN			C			
sdi-0366-19	10	WEST JORDAN	STORM DRAIN			B			
wtr-7010-19	10	WEST JORDAN	WATER	6 IN		D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY WLS

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MM/DD/YY
DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH
PROJECT NUMBER: S-0154(12)11 PIN 12566

UTILITY SUMMARY

SHEET NO. 70UTSM-09

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
bctv-5009-03	1, 2, 3	COMCAST	CABLE TV			D	BURIED		
bctv-5022-03	1, 2	COMCAST	CABLE TV			D	BURIED		
bctv-5023-03	1	COMCAST	CABLE TV			D	BURIED		
bctv-5024-03	1	COMCAST	CABLE TV			D	BURIED		
bduct-5002-09	1, 2, 3, 4, 5, 11	MBI, ATT, ZAYO	FIBER DUCT			B	BURIED		
bduct-5002-05	1, 2, 3, 4, 5, 11	FIRST DIGITAL	FIBER DUCT			B	BURIED		
be-5084-12	1, 2, 3	RMP	POWER			D	BURIED		
be-5085-12	1, 2, 3, 4	RMP	POWER			D	BURIED		
be-5087-12	1	RMP	POWER			D	BURIED		
bfo-5018-17	1, 2, 3, 4, 5, 11	UDOT	FIBER			B	BURIED		
bfo-5021-15	1, 2, 3, 4, 5, 11	SYRINGA	FIBER			B	BURIED		
btel-5010-02	1	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5011-02	1, 2, 3, 4	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5030-02	1	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5031-02	1	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5058-02	1, 2	CENTURY LINK	TELEPHONE			D	BURIED		
e-5086-12	1	RMP	POWER			D	AERIAL		
sd-5034-07	1	JVWCD	STORM DRAIN	18 IN		D			
sd-5052-17	1	UDOT	STORM DRAIN	18 IN		C			
sd-5082-17	1	UDOT	STORM DRAIN	18 IN		C			
sd-5084-99	1	UDOT	STORM DRAIN	18 IN		C			
sd-5098-99	1	UDOT	STORM DRAIN	18 IN		C			
sd-5099-99	1, 2	UDOT	STORM DRAIN	18 IN		C			
sdi-0067-17	1	UDOT	STORM DRAIN			B			
sdi-0068-17	1	UDOT	STORM DRAIN			B			
sdi-0076-17	1	UDOT	STORM DRAIN			B			
sdi-0077-17	1	UDOT	STORM DRAIN			B			
sdi-0508-07	1	JVWCD	STORM DRAIN			B			
ss-5019-16	1, 2, 3, 4	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5024-16	1	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5025-16	1	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5026-16	1	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
wtr-5002-16	1	TAYLORSVILLE	WATER	24 IN		B			
wtr-5018-16	1	TAYLORSVILLE	WATER	6 IN		D			
wtr-5019-16	1, 2	TAYLORSVILLE	WATER	6 IN		D			
wtr-5024-16	1	TAYLORSVILLE	WATER	6 IN		D			
wtr-5032-16	1	TAYLORSVILLE	WATER	24 IN		D			
wtr-5033-16	1	TAYLORSVILLE	WATER	24 IN		D			
wtr-5049-01	1, 2, 3, 4, 5, 11	BOR	WATER	66 IN		B		TH 54-01, TH 54-02, TH 54-03, TH 54-04	
btel-5032-02	2	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5033-02	2, 3	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5056-02	2, 3, 4	CENTURY LINK	TELEPHONE			D	BURIED		
g-5031-11	2	QUESTAR	GAS	1 AND QUARTER IN		D			
g-5040-11	2	QUESTAR	GAS	2 IN		D			
ms-0534-16	2	TAYLORSVILLE	SANITARY SEWER			D			
sd-5100-99	2	UDOT	STORM DRAIN	18 IN		C			
sd-5101-99	2	UDOT	STORM DRAIN	18 IN		C			
sd-5102-99	2	UDOT	STORM DRAIN	18 IN		C			
sd-5103-99	2, 3	UDOT	STORM DRAIN	18 IN		C			
sdi-0078-17	2	UDOT	STORM DRAIN			B			
sdi-0079-17	2	UDOT	STORM DRAIN			B			
sdi-0080-17	2	UDOT	STORM DRAIN			B			
sdi-0081-17	2	UDOT	STORM DRAIN			B			
ss-5021-16	2	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5022-16	2	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5023-16	2	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5027-16	2	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5028-16	2	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
wtr-5021-16	2	TAYLORSVILLE	WATER	6 IN		D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW
APPROVED
DATE
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY

SHEET NO. 54UTSM-01

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$$username$$
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9/8/2016

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
wtr-5022-16	2	TAYLORSVILLE	WATER	6 IN		D			
wtr-5023-16	2	TAYLORSVILLE	WATER	6 IN		D			
wtr-5028-16	2	TAYLORSVILLE	WATER	8 IN		D			
wtr-5045-16	2, 3, 4	TAYLORSVILLE	WATER	8 IN		D			
bctv-5007-03	3, 4	COMCAST	CABLE TV			D	BURIED		
bctv-5021-03	3, 4, 11	COMCAST	CABLE TV			D	BURIED		
be-5062-12	3, 4	RMP	POWER			D	BURIED		
btel-5008-02	3	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5009-02	3	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5034-02	3	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5035-02	3	CENTURY LINK	TELEPHONE			D	BURIED		
g-5030-11	3	QUESTAR	GAS	1 AND QUARTER IN		D			
g-5039-11	3, 4	QUESTAR	GAS	2 IN		D			
ms-0531-16	3	TAYLORSVILLE	SANITARY SEWER			D			
ms-0532-16	3	TAYLORSVILLE	SANITARY SEWER			D			
ms-0533-16	3	TAYLORSVILLE	SANITARY SEWER			D			
sd-5028-17	3, 4, 5	UDOT	STORM DRAIN	24 IN		C			
sd-5030-17	3	UDOT	STORM DRAIN	24 IN		C			
sd-5051-17	3	UDOT	STORM DRAIN	18 IN		C			
sd-5079-17	3, 4	UDOT	STORM DRAIN	12 IN		C			
sd-5104-99	3	UDOT	STORM DRAIN	18 IN		C			
sd-5105-99	3	UDOT	STORM DRAIN	18 IN		C			
sd-5106-99	3	UDOT	STORM DRAIN	18 IN		C			
sd-5124-99	3	UDOT	STORM DRAIN	12 IN		C			
sdi-0082-17	3	UDOT	STORM DRAIN			B			
sdi-0083-17	3	UDOT	STORM DRAIN			B			
sdi-0084-17	3	UDOT	STORM DRAIN			B			
sdi-0085-17	3	UDOT	STORM DRAIN			B			
sdi-0086-17	3	UDOT	STORM DRAIN			B			
sdi-0094-17	3	UDOT	STORM DRAIN			B			
ss-5020-16	3	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5029-16	3	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5030-16	3	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5031-16	3, 4	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
wtr-5020-16	3	TAYLORSVILLE	WATER	6 IN		D			
wtr-5037-16	3, 4	TAYLORSVILLE	WATER	8 IN		D			
bctv-5008-03	4	COMCAST	CABLE TV			D	BURIED		
bctv-5010-03	4	COMCAST	CABLE TV			D	BURIED		
be-5013-17	4, 5, 11	UDOT	POWER			D	BURIED		
be-5014-17	4	UDOT	POWER			D	BURIED		
be-5015-17	4	UDOT	POWER			D	BURIED		
be-5035-17	4, 5, 11	UDOT	POWER			D	BURIED		
be-5061-12	4, 11	RMP	POWER			D	BURIED		
be-5083-12	4	RMP	POWER			D	BURIED		
btel-5025-02	4	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5036-02	4	CENTURY LINK	TELEPHONE			D	BURIED		
g-5024-11	4	QUESTAR	GAS	1 AND QUARTER IN		B			
g-5025-11	4, 11	QUESTAR	GAS	1 AND QUARTER IN		B			
g-5032-11	4	QUESTAR	GAS	2 IN		D			
ms-0037-16	4	TAYLORSVILLE	SANITARY SEWER			B			
ms-0038-16	4	TAYLORSVILLE	SANITARY SEWER			B			
ms-0039-16	4	TAYLORSVILLE	SANITARY SEWER			B			
ms-0040-16	4	TAYLORSVILLE	SANITARY SEWER			B			
ms-0508-16	4	TAYLORSVILLE	SANITARY SEWER			D			
ms-0513-16	4	TAYLORSVILLE	SANITARY SEWER			B			
ms-0521-16	4	TAYLORSVILLE	SANITARY SEWER			D			
ms-0530-16	4	TAYLORSVILLE	SANITARY SEWER			D			
msd-0036-17	4	UDOT	STORM DRAIN			B			
msd-0037-17	4	UDOT	STORM DRAIN			B			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

APPROVED _____ DATE _____
PROFESSIONAL ENGINEER

DRAWN BY GS
QC CHECKED BY BDW

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT S-0154(12)11
PIN 12566
PROJECT NUMBER

UTILITY

SHEET NO. 54UTSM-02

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9/8/2016

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
msd-0038-17	4	UDOT	STORM DRAIN			B			
sd-5002-17	4	UDOT	STORM DRAIN	24 IN		C			
sd-5025-17	4	UDOT	STORM DRAIN	8 IN		C			
sd-5029-17	4	UDOT	STORM DRAIN	12 IN		C			
sd-5055-17	4	UDOT	STORM DRAIN	18 IN		C			
sd-5076-17	4, 5	UDOT	STORM DRAIN	24 IN		C			
sd-5078-17	4, 5	UDOT	STORM DRAIN	18 IN		C			
sd-5107-99	4	UDOT	STORM DRAIN	18 IN		C			
sd-5108-99	4	UDOT	STORM DRAIN	18 IN		C			
sd-5109-99	4	UDOT	STORM DRAIN	18 IN		C			
sd-5117-99	4	PRIVATE	STORM DRAIN	24 IN		C			
sd-5118-99	4	PRIVATE	STORM DRAIN	24 IN		C			
sd-5119-99	4	PRIVATE	STORM DRAIN	24 IN		C			
sdi-0087-17	4	UDOT	STORM DRAIN			B			
sdi-0088-17	4	UDOT	STORM DRAIN			B			
sdi-0089-17	4	UDOT	STORM DRAIN			B			
sdi-0090-17	4	UDOT	STORM DRAIN			B			
sdi-0091-17	4	UDOT	STORM DRAIN			B			
sdi-0092-17	4	UDOT	STORM DRAIN			B			
sdi-0093-17	4	UDOT	STORM DRAIN			B			
sdi-0201-17	4	UDOT	STORM DRAIN			B			
sdi-0202-17	4	UDOT	STORM DRAIN			B			
ss-5013-16	4, 5	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5014-16	4	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5015-16	4	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5016-16	4	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5032-16	4	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5033-16	4	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5045-16	4	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5049-16	4	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
wtr-5035-16	4	TAYLORSVILLE	WATER	6 IN		D			
wtr-5036-16	4	TAYLORSVILLE	WATER	6 IN		D			
wtr-5038-16	4	TAYLORSVILLE	WATER	8 IN		D			
wtr-5048-16	4, 5, 11, 12	TAYLORSVILLE	WATER	10 IN		D			
wtr-5050-16	4, 5, 10, 11	TAYLORSVILLE	WATER	8 IN		D			
wtr-5051-16	4	TAYLORSVILLE	WATER	6 IN		D			
bctv-5004-03	5, 6	COMCAST	CABLE TV			D	BURIED		
bctv-5012-03	5, 11, 12	COMCAST	CABLE TV			D	BURIED		
bctv-5208-03	5, 10, 11, 40-6	COMCAST	CABLE TV			D	BURIED		
bduct-5001-09	5, 6, 11	MBI, ATT, ZAYO	FIBER DUCT			B	BURIED		
bduct-5001-05	5, 6, 11	FIRST DIGITAL	FIBER DUCT			B	BURIED		
be-5006-17	5, 11	UDOT	POWER			D	BURIED		
be-5007-17	5, 11	UDOT	POWER			D	BURIED		
be-5008-17	5, 11	UDOT	POWER			D	BURIED		
be-5009-17	5, 11	UDOT	POWER			D	BURIED		
be-5010-12	5, 10, 11	RMP	POWER			D	BURIED		
be-5012-17	5, 11	UDOT	POWER			D	BURIED	TH 54-12	
be-5024-17	5, 10, 11, 40-2, 40-6	UDOT	POWER			D	BURIED		
be-5026-17	5, 11	UDOT	POWER			D	BURIED		
be-5027-17	5, 6, 11	UDOT	POWER			D	BURIED		
be-5028-12	5, 11	RMP	POWER			D	BURIED		
be-5029-12	5, 6, 11	RMP	POWER			D	BURIED		
be-5030-17	5, 11	UDOT	POWER			D	BURIED		
be-5031-17	5, 11	UDOT	POWER			D	BURIED		
be-5032-12	5, 11	RMP	POWER			D	BURIED		
be-5033-17	5, 11	UDOT	POWER			D	BURIED		
be-5034-17	5, 11	UDOT	POWER			D	BURIED		
be-5036-12	5, 11	RMP	POWER			D	BURIED		
be-5037-12	5, 11, 12	RMP	POWER			D	BURIED		
be-5050-12	5, 11	RMP	POWER			D	BURIED		

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9/8/2016

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW

APPROVED

DATE

PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH

PROJECT NUMBER: S-0154(12)11

PIN 12566

UTILITY

SHEET NO. 54UTSM-03

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
be-5056-12	5, 11	RMP	POWER			D	BURIED		
be-5057-12	5, 11	RMP	POWER			D	BURIED		
be-5075-12	5, 10, 11	RMP	POWER			D	BURIED		
bfo-5001-02	5, 10, 11	CENTURY LINK	FIBER			B	BURIED		
bfo-5002-18	5, 11, 12	VERIZON	FIBER			B	BURIED		
bfo-5003-02	5, 11, 12	CENTURY LINK	FIBER			B	BURIED		
bfo-5011-18	5, 10, 11, 40-2, 40-6	VERIZON	FIBER			B	BURIED	TH-54-10	
bfo-5012-17	5, 10, 11	UDOT	FIBER			B	BURIED		
bfo-5013-15	5, 10, 11	SYRINGA	FIBER			B	BURIED		
bfo-5014-17	5, 6, 7, 8, 9, 11	UDOT	FIBER			B	BURIED	TH 54-13, TH 54-14, TH 54-16	
bfo-5015-15	5, 6, 7, 8, 9, 11	SYRINGA	FIBER			B	BURIED	TH 54-19	
bfo-5016-17	5, 11	UDOT	FIBER			B	BURIED	TH- 54-11A	
bfo-5017-15	5, 11	SYRINGA	FIBER			B	BURIED		
bfo-5019-17	5, 11	UDOT	FIBER			B	BURIED		
bfo-5020-15	5, 11	SYRINGA	FIBER			B	BURIED		
bfo-5022-17	5, 11	UDOT	FIBER			B	BURIED		
bfo-5023-17	5, 11, 12	UDOT	FIBER			B	BURIED		
bfo-5027-02	5, 11, 12	CENTURY LINK	FIBER			B	BURIED		
bfo-5029-15	5, 11	SYRINGA	FIBER			B	BURIED		
bfo-5030-15	5, 11, 12	SYRINGA	FIBER			B	BURIED		
btel-5012-02	5, 11, 12	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5013-02	5, 10, 11	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5014-02	5, 11	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5017-02	5, 10, 11	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5019-02	5, 11, 12	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5023-02	5, 11	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5024-02	5, 11	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5039-02	5, 6, 10, 40-6	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5042-02	5, 6	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5051-02	5, 6, 11	CENTURY LINK	TELEPHONE			D	BURIED		
e-5000-12	5, 11	RMP	POWER			D	AERIAL		
e-5023-12	5, 10, 11, 12, 40-2, 40-5, 4	RMP	POWER			D	AERIAL		
g-5000-11	5, 11	QUESTAR	GAS	1 AND QUARTER IN		D			
g-5001-11	5, 11	QUESTAR	GAS	3 QUARTERS IN		D			
g-5002-11	5, 11	QUESTAR	GAS	1 AND QUARTER IN		D			
g-5003-11	5, 6, 10	QUESTAR	GAS			D			
g-5004-11	5, 6, 10	QUESTAR	GAS			D			
g-5005-11	5, 11	QUESTAR	GAS			D			
g-5006-11	5, 11	QUESTAR	GAS	1 AND QUARTER IN		D			
g-5007-11	5, 11	QUESTAR	GAS	1 AND QUARTER IN		D			
g-5008-11	5, 11	QUESTAR	GAS			D			
g-5010-11	5, 11	QUESTAR	GAS			D			
g-5011-11	5, 11	QUESTAR	GAS			D			
g-5022-11	5, 10, 11, 12	QUESTAR	GAS	8 IN		B			
g-5023-11	5, 6, 10, 11	QUESTAR	GAS	2 IN		D			
g-5027-11	5, 11	QUESTAR	GAS	2 IN		B			
g-5033-11	5, 6	QUESTAR	GAS	2 IN		D			
ms-0033-16	5, 11	TAYLORSVILLE	SANITARY SEWER			B			
ms-0034-16	5, 11	TAYLORSVILLE	SANITARY SEWER			B			
ms-0035-16	5, 11	TAYLORSVILLE	SANITARY SEWER			B			
ms-0036-16	5	TAYLORSVILLE	SANITARY SEWER			B			
ms-0041-16	5, 11	TAYLORSVILLE	SANITARY SEWER			B			
ms-0042-16	5, 11	TAYLORSVILLE	SANITARY SEWER			B			
ms-0137-16	5, 11	TAYLORSVILLE	SANITARY SEWER			B			
ms-0502-16	5, 6, 11	TAYLORSVILLE	SANITARY SEWER			D			
ms-0503-16	5, 11	TAYLORSVILLE	SANITARY SEWER			B			
ms-0510-16	5, 11	TAYLORSVILLE	SANITARY SEWER			B			
ms-0511-16	5, 11	TAYLORSVILLE	SANITARY SEWER			B			
ms-0512-16	5, 11	TAYLORSVILLE	SANITARY SEWER			B			

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9/8/2016

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW
APPROVED
DATE
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
S-0154(12)11
PIN 12566
PROJECT NUMBER

UTILITY

SHEET NO. 54UTSM-04

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
msd-0022-17	5, 11	UDOT	STORM DRAIN			B			
msd-0023-17	5, 11	UDOT	STORM DRAIN			B			
msd-0024-17	5, 11	UDOT	STORM DRAIN			B			
msd-0025-17	5, 11	UDOT	STORM DRAIN			B			
msd-0026-17	5, 11	UDOT	STORM DRAIN			B			
msd-0501-17	5, 11	UDOT	STORM DRAIN			B			
msd-0503-17	5, 11	UDOT	STORM DRAIN			B			
sd-5000-17	5, 6, 11	UDOT	STORM DRAIN	24 IN		C			
sd-5001-17	5, 11	UDOT	STORM DRAIN	24 IN		D		TH 54-11	
sd-5013-17	5, 6, 11	UDOT	STORM DRAIN	12 IN		C			
sd-5014-17	5, 11	UDOT	STORM DRAIN	12 IN		C			
sd-5015-17	5, 11	UDOT	STORM DRAIN	10 IN		C			
sd-5020-17	5, 11	UDOT	STORM DRAIN	24 IN		C			
sd-5021-17	5, 11	UDOT	STORM DRAIN	24 IN		C			
sd-5022-17	5, 11	UDOT	STORM DRAIN	24 IN		C			
sd-5023-17	5, 11	UDOT	STORM DRAIN	24 IN		C			
sd-5026-17	5, 11	UDOT	STORM DRAIN	15 IN		C			
sd-5027-17	5, 11	UDOT	STORM DRAIN	15 IN		C			
sd-5031-17	5, 11	UDOT	STORM DRAIN	30 IN		C			
sd-5032-17	5, 11	UDOT	STORM DRAIN	30 IN		C			
sd-5033-17	5, 11	UDOT	STORM DRAIN	30 IN		C			
sd-5049-17	5, 11	UDOT	STORM DRAIN	18 IN		C			
sd-5050-17	5, 11	UDOT	STORM DRAIN	18 IN		C			
sd-5053-17	5, 11	UDOT	STORM DRAIN	30 IN		C			
sd-5054-17	5, 11	UDOT	STORM DRAIN	18 IN		C			
sd-5057-17	5, 10, 11	UDOT	STORM DRAIN	21 IN		C			
sd-5067-17	5, 11	UDOT	STORM DRAIN	18 IN		C			
sd-5069-17	5, 11	UDOT	STORM DRAIN	18 IN		C			
sd-5077-17	5	UDOT	STORM DRAIN	18 IN		C			
sd-5091-99	5, 11	UDOT	STORM DRAIN	18 IN		C			
sd-5092-99	5, 11	UDOT	STORM DRAIN	18 IN		C			
sd-5110-99	5	UDOT	STORM DRAIN	18 IN		C			
sd-5111-99	5, 11	UDOT	STORM DRAIN	18 IN		C			
sd-5112-99	5, 11	UDOT	STORM DRAIN	18 IN		C			
sd-5123-99	5, 11	UDOT	STORM DRAIN	12 IN		C			
sdi-0052-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0053-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0054-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0055-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0056-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0095-17	5	UDOT	STORM DRAIN			B			
sdi-0096-17	5	UDOT	STORM DRAIN			B			
sdi-0097-17	5	UDOT	STORM DRAIN			B			
sdi-0100-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0101-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0102-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0103-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0143-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0144-17	5, 11	UDOT	STORM DRAIN			B			
sdi-0253-17	5, 11	UDOT	STORM DRAIN			B			
ss-5000-16	5, 11	TAYLORSVILLE	SANITARY SEWER	4 IN		D			
ss-5003-16	5, 10, 11	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5004-16	5, 11	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5005-16	5, 11	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5006-16	5, 11, 12	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5011-16	5, 11	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5012-16	5, 11	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5034-16	5, 6, 10, 11	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5036-16	5, 6	TAYLORSVILLE	SANITARY SEWER	8 IN		D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW
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DATE
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITY

SHEET NO. 54UTSM-05

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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
ss-5044-16	5, 11	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5047-16	5, 11, 12	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
wtr-5000-01	5, 6, 7, 11	BOR	WATER	66 IN		B			
wtr-5003-16	5, 11	TAYLORSVILLE	WATER	12 IN		D			
wtr-5005-16	5, 10, 11	TAYLORSVILLE	WATER	8 IN		D			
wtr-5010-16	5, 11	TAYLORSVILLE	WATER	6 IN		D			
wtr-5041-16	5, 6, 10, 11, 40-3, 40-6	TAYLORSVILLE	WATER	8 IN		D			
wtr-5044-16	5, 11, 12	TAYLORSVILLE	WATER	8 IN		D			
wtr-5054-16	5, 6, 11	TAYLORSVILLE	WATER	10 IN		D			
bctv-5001-03	6, 7, 8, 9	COMCAST	CABLE TV			D	BURIED		
bctv-5005-03	6, 7	COMCAST	CABLE TV			D	BURIED		
bctv-5006-03	6, 10, 40-6	COMCAST	CABLE TV			D	BURIED		
bduct-5000-09	6, 7, 8, 9	MBI, ATT, ZAYO	FIBER DUCT			B	BURIED	TH 54-07, TH 54-18	
bduct-5000-05	6, 7, 8, 9	FIRST DIGITAL	FIBER DUCT			B	BURIED		
bduct-5003-09	6	MBI, ATT, ZAYO	FIBER DUCT			D	BURIED		
bduct-5003-05	6	FIRST DIGITAL	FIBER DUCT			D	BURIED		
bduct-5004-09	6	MBI, ATT, ZAYO	FIBER DUCT			D	BURIED		
bduct-5004-05	6	FIRST DIGITAL	FIBER DUCT			D	BURIED		
be-5063-17	6, 7	UDOT	POWER			D	BURIED	TH 54-15	
be-5067-12	6	RMP	POWER			D	BURIED		
be-5068-12	6	RMP	POWER			D	BURIED		
be-5069-12	6, 7	RMP	POWER			D	BURIED		
be-5071-12	6, 7, 8, 9	RMP	POWER			D	BURIED		
be-5073-12	6, 7	RMP	POWER			D	BURIED		
be-5074-12	6	RMP	POWER			D	BURIED		
btel-5020-02	6, 7	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5021-02	6, 7	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5040-02	6, 10	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5043-02	6	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5044-02	6	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5045-02	6, 7	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5046-02	6	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5047-02	6	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5050-02	6	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5052-02	6, 7	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5053-02	6, 7	CENTURY LINK	TELEPHONE			D	BURIED		
g-5029-11	6, 7	QUESTAR	GAS	1 AND QUARTER IN		D			
g-5034-11	6, 7, 8, 9	QUESTAR	GAS	2 IN		D			
g-5041-11	6	QUESTAR	GAS	3 IN		D			
g-5046-11	6, 7	QUESTAR	GAS	2 IN		D			
g-5054-11	6	QUESTAR	GAS	2 IN		D			
ms-0136-16	6	TAYLORSVILLE	SANITARY SEWER			B			
ms-0527-16	6	TAYLORSVILLE	SANITARY SEWER			D			
ms-0528-16	6	TAYLORSVILLE	SANITARY SEWER			D			
sd-5011-17	6, 7	UDOT	STORM DRAIN	24 IN		C			
sd-5012-17	6	UDOT	STORM DRAIN	24 IN		C			
sd-5047-17	6	UDOT	STORM DRAIN	18 IN		C			
sd-5048-17	6	UDOT	STORM DRAIN	18 IN		C			
sd-5059-17	6, 7	UDOT	STORM DRAIN	12 IN		D		TH 54-17, TH 54-18A	
sd-5061-17	6	UDOT	STORM DRAIN	12 IN		D			
sd-5062-17	6	UDOT	STORM DRAIN	8 IN		D			
sd-5063-17	6	UDOT	STORM DRAIN	24 IN		C			
sd-5064-17	6	UDOT	STORM DRAIN	24 IN		C			
sd-5065-17	6	UDOT	STORM DRAIN	18 IN		C			
sd-5066-17	6	UDOT	STORM DRAIN	18 IN		C			
sd-5080-17	6	UDOT	STORM DRAIN	18 IN		C			
sd-5087-17	6	UDOT	STORM DRAIN	18 IN		C			
sd-5116-99	6	UDOT	STORM DRAIN	18 IN		C			
sdi-0098-17	6	UDOT	STORM DRAIN			B			
sdi-0099-17	6	UDOT	STORM DRAIN			B			
sdi-0104-17	6	UDOT	STORM DRAIN			B			
sdi-0105-17	6	UDOT	STORM DRAIN			B			

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

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PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH
PIN 12566
PROJECT NUMBER S-0154(12)11
UTILITY

SHEET NO. 54UTSM-06

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sdi-0136-17	6	UDOT	STORM DRAIN			B			
sdi-0137-17	6	UDOT	STORM DRAIN			B			
sdi-0138-17	6	UDOT	STORM DRAIN			B			
sdi-0139-17	6	UDOT	STORM DRAIN			B			
sdi-0140-17	6	UDOT	STORM DRAIN			B			
sdi-0141-17	6	UDOT	STORM DRAIN			B			
sdi-0142-17	6	UDOT	STORM DRAIN			B			
ss-5035-16	6, 7	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5050-16	6, 7	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5051-16	6	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
wtr-5015-16	6	TAYLORSVILLE	WATER	6 IN		D			
wtr-5029-16	6	TAYLORSVILLE	WATER	8 IN		D			
wtr-5031-16	6	TAYLORSVILLE	WATER	8 IN		D			
wtr-5042-16	6, 7	TAYLORSVILLE	WATER	8 IN		D			
wtr-5043-16	6, 7	TAYLORSVILLE	WATER	8 IN		D			
wtr-5053-16	6	TAYLORSVILLE	WATER	10 IN		D			
bctv-5003-03	7, 8	COMCAST	CABLE TV			D	BURIED		
be-5064-12	7	RMP	POWER			D	BURIED		
be-5065-12	7	RMP	POWER			D	BURIED		
be-5066-12	7	RMP	POWER			D	BURIED		
btel-5022-02	7	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5027-02	7	CENTURY LINK	TELEPHONE			B	BURIED	TH 54-20	
btel-5054-02	7, 8	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5055-02	7	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5057-02	7	CENTURY LINK	TELEPHONE			D	BURIED		
e-5072-12	7, 8	RMP	POWER			D	AERIAL		
g-5035-11	7	QUESTAR	GAS	2 IN		D			
g-5045-11	7, 8	QUESTAR	GAS	1 AND QUARTER IN		D			
g-5047-11	7	QUESTAR	GAS	1 AND QUARTER IN		D			
g-5048-11	7	QUESTAR	GAS	1 AND QUARTER IN		D			
ms-0134-16	7	TAYLORSVILLE	SANITARY SEWER			B			
ms-0135-16	7	TAYLORSVILLE	SANITARY SEWER			B			
ms-0500-16	7	TAYLORSVILLE	SANITARY SEWER			B			
ms-0523-16	7	TAYLORSVILLE	SANITARY SEWER			D			
ms-0524-16	7	TAYLORSVILLE	SANITARY SEWER			D			
ms-0525-16	7	TAYLORSVILLE	SANITARY SEWER			D			
ms-0526-16	7	TAYLORSVILLE	SANITARY SEWER			D			
ms-0529-16	7	TAYLORSVILLE	SANITARY SEWER			D			
ms-0614-99	7	UNKNOWN	SANITARY SEWER			D			
ms-0615-16	7	TAYLORSVILLE	SANITARY SEWER			B			
sd-5010-17	7	UDOT	STORM DRAIN	24 IN		C			
sd-5044-17	7	UDOT	STORM DRAIN	18 IN		C			
sd-5045-17	7	UDOT	STORM DRAIN	18 IN		C			
sd-5046-17	7	UDOT	STORM DRAIN	18 IN		C			
sd-5058-17	7, 8	UDOT	STORM DRAIN	12 IN		D			
sd-5085-99	7, 8	UDOT	STORM DRAIN	24 IN		C			
sd-5086-99	7	UDOT	STORM DRAIN	24 IN		C			
sd-5088-17	7	UDOT	STORM DRAIN	18 IN		C			
sd-5113-99	7	UDOT	STORM DRAIN	18 IN		C			
sd-5120-99	7	TAYLORSVILLE	STORM DRAIN	18 IN		C		TH 54-09	
sd-5121-99	7	TAYLORSVILLE	STORM DRAIN	18 IN		C			
sd-5122-99	7	UDOT	STORM DRAIN	12 IN		C			
sd-5225-17	7	UDOT	STORM DRAIN	12 IN		D			
sdi-0106-17	7	UDOT	STORM DRAIN			B			
sdi-0107-17	7	UDOT	STORM DRAIN			B			
sdi-0108-17	7	UDOT	STORM DRAIN			B			
sdi-0131-17	7	UDOT	STORM DRAIN			B			
sdi-0132-17	7	UDOT	STORM DRAIN			B			
sdi-0133-17	7	UDOT	STORM DRAIN			B			

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

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DATE

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PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY

SHEET NO. 54UTSM-07

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sdi-0134-17	7	UDOT	STORM DRAIN			B			
sdi-0135-17	7	UDOT	STORM DRAIN			B			
sdi-0561-16	7	TAYLORSVILLE	STORM DRAIN			C			
sdi-0562-16	7	TAYLORSVILLE	STORM DRAIN			C			
sdi-0563-16	7	TAYLORSVILLE	STORM DRAIN			C			
ss-5018-16	7	TAYLORSVILLE	SANITARY SEWER	8 IN		C		TH 54-08	
ss-5037-16	7	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5038-16	7	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5039-16	7	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5040-16	7, 8, 9	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5046-16	7	TAYLORSVILLE	SANITARY SEWER	12 IN		C			
wtr-5001-01	7, 8, 9	BOR	WATER	66 IN		B		TH 54-05, TH 54-06	
wtr-5016-16	7	TAYLORSVILLE	WATER	6 IN		D			
wtr-5025-16	7	TAYLORSVILLE	WATER	6 IN		D			
wtr-5030-16	7	TAYLORSVILLE	WATER	8 IN		D		TH 54-08A, TH 54-08B	
wtr-5046-16	7	TAYLORSVILLE	WATER	12 IN		D			
wtr-5047-16	7	TAYLORSVILLE	WATER	18 IN		D			
wtr-5052-16	7, 8, 9	TAYLORSVILLE	WATER	6 IN		D			
bctv-5002-03	8	COMCAST	CABLE TV			D	BURIED		
bctv-5016-03	8	COMCAST	CABLE TV			D	BURIED		
btel-5048-02	8	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5049-02	8, 9	CENTURY LINK	TELEPHONE			D	BURIED		
g-5036-11	8	QUESTAR	GAS	2 IN		D			
g-5037-11	8	QUESTAR	GAS	2 IN		D			
g-5038-11	8	QUESTAR	GAS	2 IN		D			
sd-5007-17	8, 9	UDOT	STORM DRAIN	27 IN		C			
sd-5008-17	8	UDOT	STORM DRAIN	27 IN		C			
sd-5009-17	8	UDOT	STORM DRAIN	27 IN		C			
sd-5041-17	8	UDOT	STORM DRAIN	18 IN		C			
sd-5042-17	8	UDOT	STORM DRAIN	18 IN		C			
sd-5043-17	8	UDOT	STORM DRAIN	18 IN		C			
sd-5083-17	8	UDOT	STORM DRAIN	18 IN		C			
sdi-0109-17	8	UDOT	STORM DRAIN			B			
sdi-0110-17	8	UDOT	STORM DRAIN			B			
sdi-0111-17	8	UDOT	STORM DRAIN			B			
sdi-0127-17	8	UDOT	STORM DRAIN			B			
sdi-0128-17	8	UDOT	STORM DRAIN			B			
sdi-0129-17	8	UDOT	STORM DRAIN			B			
sdi-0130-17	8	UDOT	STORM DRAIN			B			
wtr-5026-16	8	TAYLORSVILLE	WATER	6 IN		D			
wtr-5027-16	8	TAYLORSVILLE	WATER	6 IN		D			
btel-5000-02	9	CENTURY LINK	TELEPHONE			D	BURIED		
ctv-5015-03	9	COMCAST	CABLE TV			D	AERIAL		
e-5070-12	9	RMP	POWER			D	AERIAL		
g-5042-11	9	QUESTAR	GAS	4 IN		D			
g-5043-11	9	QUESTAR	GAS	2 IN		D			
g-5044-11	9	QUESTAR	GAS	1 AND QUARTER IN		D			
ms-0522-16	9	TAYLORSVILLE	SANITARY SEWER			D			
sd-5003-17	9	UDOT	STORM DRAIN	27 IN		C			
sd-5004-17	9	UDOT	STORM DRAIN	27 IN		C			
sd-5005-17	9	UDOT	STORM DRAIN	27 IN		C			
sd-5006-17	9	UDOT	STORM DRAIN	27 IN		C			
sd-5037-17	9	UDOT	STORM DRAIN	18 IN		C			
sd-5038-17	9	UDOT	STORM DRAIN	18 IN		C			
sd-5039-17	9	UDOT	STORM DRAIN	18 IN		C			
sd-5040-17	9	UDOT	STORM DRAIN	18 IN		C			
sdi-0119-17	9	UDOT	STORM DRAIN			B			
sdi-0120-17	9	UDOT	STORM DRAIN			B			
sdi-0121-17	9	UDOT	STORM DRAIN			B			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
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APPROVED
DATE
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH
PROJECT NUMBER: S-0154(12)11
PIN: 12566

UTILITY

SHEET NO. 54UTSM-08

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9/8/2016

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sdi-0122-17	9	UDOT	STORM DRAIN			B			
sdi-0123-17	9	UDOT	STORM DRAIN			B			
sdi-0124-17	9	UDOT	STORM DRAIN			B			
sdi-0125-17	9	UDOT	STORM DRAIN			B			
sdi-0126-17	9	UDOT	STORM DRAIN			B			
ss-5041-16	9	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5042-16	9	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
ss-5043-16	9	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
wtr-5014-16	9	TAYLORSVILLE	WATER	4 IN		D			
wtr-5039-16	9	TAYLORSVILLE	WATER	8 IN		D			
wtr-5040-16	9	TAYLORSVILLE	WATER	8 IN		D			
bctv-5000-03	10	COMCAST	CABLE TV			D	BURIED		
be-5011-12	10	RMP	POWER			D	BURIED		
be-5025-12	10	RMP	POWER			D	BURIED		
be-5058-12	10	RMP	POWER			D	BURIED		
be-5059-12	10	RMP	POWER			D	BURIED		
be-5077-12	10	RMP	POWER			D	BURIED		
be-5080-12	10	RMP	POWER			D	BURIED		
be-5081-12	10	RMP	POWER			D	BURIED		
be-5082-12	10	RMP	POWER			D	BURIED		
bfo-5000-17	10, 22, 26	UDOT	FIBER			B	BURIED		
bfo-5007-15	10	SYRINGA	FIBER			B	BURIED		
bfo-5008-17	10	UDOT	FIBER			B	BURIED		
bfo-5009-02	10, 22, 26	CENTURY LINK	FIBER			B	BURIED		
bfo-5010-02	10, 22, 26	CENTURY LINK	FIBER			B	BURIED		
btel-5001-02	10	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5002-02	10, 26	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5003-02	10	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5015-02	10, 26	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5016-02	10	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5028-02	10	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5038-02	10	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5041-02	10	CENTURY LINK	TELEPHONE			D	BURIED		
g-5020-11	10, 22, 26	QUESTAR	GAS	2 IN		D			
g-5021-11	10	QUESTAR	GAS	6 IN		D			
g-5026-11	10, 22, 26	QUESTAR	GAS	6 IN		D			
g-5049-11	10	QUESTAR	GAS	4 IN		D			
g-5050-11	10	QUESTAR	GAS	2 IN		D			
g-5051-11	10	QUESTAR	GAS			D			
ms-0030-16	10	TAYLORSVILLE	SANITARY SEWER			B			
ms-0031-16	10	TAYLORSVILLE	SANITARY SEWER			B			
msd-0019-17	10	UDOT	STORM DRAIN			B			
msd-0020-17	10	UDOT	STORM DRAIN			B			
msd-0021-17	10	UDOT	STORM DRAIN			B			
sd-5016-17	10	UDOT	STORM DRAIN	24 IN		C			
sd-5017-17	10	UDOT	STORM DRAIN	12 IN		C			
sd-5018-17	10	UDOT	STORM DRAIN	21 IN		C			
sd-5035-17	10	UDOT	STORM DRAIN	15 IN		C			
sd-5070-17	10	UDOT	STORM DRAIN	18 IN		C			
sd-5071-17	10, 26	UDOT	STORM DRAIN	24 IN		C			
sd-5072-17	10	UDOT	STORM DRAIN	18 IN		C			
sd-5073-17	10	UDOT	STORM DRAIN	18 IN		C			
sd-5074-10	10, 26	PRIVATE	STORM DRAIN	18 IN		C			
sd-5075-17	10	UDOT	STORM DRAIN	12 IN		C			
sd-5090-99	10	UDOT	STORM DRAIN	18 IN		C			
sdi-0043-10	10	PRIVATE	STORM DRAIN			B			
sdi-0044-17	10	UDOT	STORM DRAIN			B			
sdi-0045-10	10	PRIVATE	STORM DRAIN			B			
sdi-0046-10	10	PRIVATE	STORM DRAIN			B			

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9/8/2016

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
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DATE

APPROVED

PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PIN 12566

S-0154(12)11

UTILITY

PROJECT
PROJECT NUMBER

SHEET NO. 54UTSM-09

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sdi-0047-10	10	PRIVATE	STORM DRAIN			B			
sdi-0049-17	10	UDOT	STORM DRAIN			B			
sdi-0050-17	10	UDOT	STORM DRAIN			B			
sdi-0051-17	10	UDOT	STORM DRAIN			B			
ss-5001-16	10, 26	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5002-16	10	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5017-16	10	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
wtr-5004-16	10, 26	TAYLORSVILLE	WATER	6 IN		D			
wtr-5006-16	10	TAYLORSVILLE	WATER	12 IN		D			
wtr-5009-16	10	TAYLORSVILLE	WATER	6 IN		D			
wtr-5013-16	10	TAYLORSVILLE	WATER	8 IN		D			
wtr-5017-16	10	TAYLORSVILLE	WATER	6 IN		D			
wtr-5034-16	10	TAYLORSVILLE	WATER	6 IN		D			
be-5055-12	11, 12	RMP	POWER			D	BURIED		
g-5028-11	11, 12	QUESTAR	GAS	1 AND QUARTER IN		B			
msd-0027-17	11	UDOT	STORM DRAIN			B			
sd-5068-17	11, 12	UDOT	STORM DRAIN	30 IN		C			
sd-5093-99	11	UDOT	STORM DRAIN	18 IN		C			
sdi-0070-17	11	UDOT	STORM DRAIN			B			
bctv-5011-03	12	COMCAST	CABLE TV			D	BURIED		
bctv-5013-03	12	COMCAST	CABLE TV			D	BURIED		
bctv-5014-03	12	COMCAST	CABLE TV			D	BURIED		
be-5016-12	12	RMP	POWER			D	BURIED		
be-5017-12	12	RMP	POWER			D	BURIED		
be-5018-12	12	RMP	POWER			D	BURIED		
be-5019-12	12	RMP	POWER			D	BURIED		
be-5020-12	12	RMP	POWER			D	BURIED		
be-5021-12	12	RMP	POWER			D	BURIED		
be-5022-17	12	UDOT	POWER			D	BURIED		
be-5038-12	12	RMP	POWER			D	BURIED		
be-5039-17	12	UDOT	POWER			D	BURIED		
be-5040-17	12	UDOT	POWER			D	BURIED		
be-5041-17	12	UDOT	POWER			D	BURIED		
be-5042-12	12	RMP	POWER			D	BURIED		
be-5043-17	12	UDOT	POWER			D	BURIED		
be-5044-17	12	UDOT	POWER			D	BURIED		
be-5045-17	12	UDOT	POWER			D	BURIED		
be-5046-17	12	UDOT	POWER			D	BURIED		
be-5047-12	12	RMP	POWER			D	BURIED		
be-5048-17	12	UDOT	POWER			D	BURIED		
be-5051-12	12	RMP	POWER			D	BURIED		
be-5052-12	12	RMP	POWER			D	BURIED		
be-5053-12	12	RMP	POWER			D	BURIED		
be-5054-12	12	RMP	POWER			D	BURIED		
be-5060-12	12	RMP	POWER			D	BURIED		
be-5078-12	12	RMP	POWER			D	BURIED		
bfo-5004-02	12	CENTURY LINK	FIBER			B	BURIED		
bfo-5024-17	12	UDOT	FIBER			B	BURIED		
bfo-5025-17	12	UDOT	FIBER			B	BURIED		
bfo-5026-15	12	SYRINGA	FIBER			B	BURIED		
bfo-5028-17	12	UDOT	FIBER			B	BURIED		
btel-5004-02	12	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5005-02	12	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5006-02	12	CENTURY LINK	TELEPHONE			D	BURIED		
btel-5007-02	12	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5018-02	12	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5026-02	12	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5029-02	12	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5037-02	12	CENTURY LINK	TELEPHONE			D	BURIED		

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REGION 2 - AVENUE CONSULTANTS

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4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY

SHEET NO. 54UTSM-10

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9/8/2016

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
ctv-5017-03	12	COMCAST	CABLE TV			D	AERIAL		
ctv-5018-03	12	COMCAST	CABLE TV			D	AERIAL		
ctv-5019-03	12	COMCAST	CABLE TV			D	AERIAL		
ctv-5020-03	12	COMCAST	CABLE TV			D	AERIAL		
e-5001-12	12	RMP	POWER			D	AERIAL		
e-5003-12	12	RMP	POWER			D	AERIAL		
e-5004-12	12	RMP	POWER			D	AERIAL		
e-5076-12	12	RMP	POWER			D	AERIAL		
e-5079-12	12	RMP	POWER			D	AERIAL		
g-5009-11	12	QUESTAR	GAS			D			
g-5012-11	12	QUESTAR	GAS			D			
g-5013-11	12	QUESTAR	GAS			D			
g-5014-11	12	QUESTAR	GAS			D			
g-5015-11	12	QUESTAR	GAS			D			
g-5016-11	12	QUESTAR	GAS			D			
g-5017-11	12	QUESTAR	GAS			D			
g-5018-11	12	QUESTAR	GAS			D			
g-5019-11	12	QUESTAR	GAS			D			
g-5052-11	12	QUESTAR	GAS	4 IN		D			
g-5053-11	12	QUESTAR	GAS	4 IN		D			
ms-0043-16	12	TAYLORSVILLE	SANITARY SEWER			B			
ms-0044-16	12	TAYLORSVILLE	SANITARY SEWER			B			
ms-0045-16	12	TAYLORSVILLE	SANITARY SEWER			B			
ms-0138-16	12	TAYLORSVILLE	SANITARY SEWER			B			
ms-0504-16	12	TAYLORSVILLE	SANITARY SEWER			D			
ms-0505-16	12	TAYLORSVILLE	SANITARY SEWER			D			
ms-0506-16	12	TAYLORSVILLE	SANITARY SEWER			D			
ms-0507-16	12	TAYLORSVILLE	SANITARY SEWER			D			
msd-0028-17	12	UDOT	STORM DRAIN			B			
msd-0029-17	12	UDOT	STORM DRAIN			B			
msd-0030-17	12	UDOT	STORM DRAIN			B			
sd-5081-17	12	UDOT	STORM DRAIN	27 IN		C			
sd-5094-99	12	UDOT	STORM DRAIN	18 IN		C			
sd-5095-99	12	UDOT	STORM DRAIN	18 IN		C			
sd-5096-99	12	UDOT	STORM DRAIN	18 IN		C			
sd-5097-99	12	UDOT	STORM DRAIN	18 IN		C			
sd-5114-99	12	UDOT	STORM DRAIN	36 IN		C			
sd-5115-99	12	UDOT	STORM DRAIN	36 IN		C			
sdi-0057-17	12	UDOT	STORM DRAIN			B			
sdi-0058-17	12	UDOT	STORM DRAIN			B			
sdi-0071-17	12	UDOT	STORM DRAIN			B			
sdi-0072-17	12	UDOT	STORM DRAIN			B			
sdi-0509-17	12	UDOT	STORM DRAIN			B			
sdi-0510-17	12	UDOT	STORM DRAIN			B			
ss-5007-16	12	TAYLORSVILLE	SANITARY SEWER	10 IN		C			
ss-5008-16	12	TAYLORSVILLE	SANITARY SEWER	10 IN		C			
ss-5009-16	12	TAYLORSVILLE	SANITARY SEWER	10 IN		C			
ss-5010-16	12	TAYLORSVILLE	SANITARY SEWER	8 IN		C			
ss-5048-16	12	TAYLORSVILLE	SANITARY SEWER	8 IN		D			
wtr-5007-16	12	TAYLORSVILLE	WATER	12 IN		D			
wtr-5008-16	12	TAYLORSVILLE	WATER	12 IN		D			
wtr-5011-16	12	TAYLORSVILLE	WATER	6 IN		D			
wtr-5012-16	12	TAYLORSVILLE	WATER	6 IN		D			
bctv-5211-03	21, 22	COMCAST	CABLE TV			D	BURIED		
be-5204-17	21	UDOT	POWER			D	BURIED		
be-5226-17	21	UDOT	POWER			D	BURIED		
be-5227-17	21	UDOT	POWER			D	BURIED		
be-5228-17	21	UDOT	POWER			D	BURIED		
be-5229-17	21	UDOT	POWER			D	BURIED		

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9/8/2016

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UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

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4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PIN 12566

PROJECT
S-0154(12)11

PROJECT NUMBER

UTILITY

SHEET NO. 54UTSM-11

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
be-5230-17	21	UDOT	POWER			D	BURIED		
be-5238-12	21	RMP	POWER			D	BURIED		
be-5239-12	21	RMP	POWER			D	BURIED		
be-5240-12	21	RMP	POWER			D	BURIED		
be-5242-12	21	RMP	POWER			D	BURIED		
bfo-5212-02	21	CENTURY LINK	FIBER			D	BURIED		
bfo-5215-03	21, 22	COMCAST	FIBER			B	BURIED		
bfo-5221-02	21	CENTURY LINK	FIBER			B	BURIED		
bfo-5229-02	21, 22	CENTURY LINK	FIBER			B	BURIED		
bfo-5236-09	21, 22, 23	MBI, ATT, ZAYO, FIRST DIGITAL	FIBER			B	BURIED		
btel-5205-02	21, 22	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5216-02	21	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5217-02	21	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5218-02	21	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5219-02	21	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5229-02	21, 22	CENTURY LINK	TELEPHONE			B	BURIED		
e-5236-12	21, 22	RMP	POWER			D	AERIAL		
g-5203-11	21, 22	QUESTAR	GAS	4 IN		D			
g-5206-11	21	QUESTAR	GAS	2 IN		D			
g-5207-11	21	QUESTAR	GAS	2 IN		D			
g-5208-11	21	QUESTAR	GAS	3 IN		D			
g-5209-11	21	QUESTAR	GAS	2 IN		D			
g-5210-11	21	QUESTAR	GAS	4 IN		D			
g-5211-11	21	QUESTAR	GAS	4 IN		D			
g-5217-11	21	QUESTAR	GAS	2 IN		D			
ms-0059-14	21	SVSD	SANITARY SEWER			B			
ms-0060-06	21	KEARNS	SANITARY SEWER			B			
ms-0061-06	21	KEARNS	SANITARY SEWER			B			
ms-0062-06	21	KEARNS	SANITARY SEWER			B			
ms-0063-06	21	KEARNS	SANITARY SEWER			B			
ms-0064-06	21	KEARNS	SANITARY SEWER			B			
ms-0066-06	21	KEARNS	SANITARY SEWER			B			
ms-0067-06	21	KEARNS	SANITARY SEWER			B			
ms-0509-14	21	SVSD	SANITARY SEWER			B			
msd-0010-17	21	UDOT	STORM DRAIN			B			
sd-5221-17	21, 22	UDOT	STORM DRAIN	18 IN		C			
sd-5222-16	21	TAYLORSVILLE	STORM DRAIN	18 IN		C			
sd-5226-17	21	UDOT	STORM DRAIN	18 IN		C			
sd-5227-17	21	UDOT	STORM DRAIN	18 IN		C			
sd-5243-17	21	UDOT	STORM DRAIN	18 IN		C			
sd-5244-17	21	UDOT	STORM DRAIN	18 IN		C			
sd-5258-17	21, 22	UDOT	STORM DRAIN	18 IN		C			
sdi-0028-17	21	UDOT	STORM DRAIN			B			
sdi-0029-17	21	UDOT	STORM DRAIN			B			
sdi-0030-17	21	UDOT	STORM DRAIN			B			
sdi-0031-17	21	UDOT	STORM DRAIN			B			
sdi-0032-17	21	UDOT	STORM DRAIN			B			
sdi-0033-17	21	UDOT	STORM DRAIN			B			
sdi-0506-17	21	UDOT	STORM DRAIN			B			
ss-5221-06	21, 22	KEARNS	SANITARY SEWER	8 IN		C			
ss-5222-06	21	KEARNS	SANITARY SEWER	8 IN		C			
ss-5223-06	21	KEARNS	SANITARY SEWER	8 IN		C			
ss-5224-06	21	KEARNS	SANITARY SEWER	8 IN		C			
ss-5225-06	21	KEARNS	SANITARY SEWER	8 IN		C			
ss-5226-06	21	KEARNS	SANITARY SEWER	8 IN		C			
ss-5227-06	21	KEARNS	SANITARY SEWER	8 IN		C			
ss-5228-06	21	KEARNS	SANITARY SEWER	8 IN		C			
ss-5229-14	21	SVSD	SANITARY SEWER	8 IN		C			
ss-5236-06	21	KEARNS	SANITARY SEWER	8 IN		C			

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REGION 2 - AVENUE CONSULTANTS

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PROJECT
4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PIN 12566

PROJECT NUMBER S-0154(12)11

UTILITY

SHEET NO. 54UTSM-12

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
wtr-5215-06	21, 22	KEARNS	WATER	8 IN		D			
wtr-5223-06	21	KEARNS	WATER	6 IN		D			
wtr-5224-06	21	KEARNS	WATER	6 IN		D			
wtr-5225-06	21	KEARNS	WATER	6 IN		D			
wtr-5226-06	21	KEARNS	WATER	6 IN		D			
wtr-5227-06	21	KEARNS	WATER	6 IN		D			
bctv-5209-03	22	COMCAST	CABLE TV			D	BURIED		
bctv-5210-03	22	COMCAST	CABLE TV			D	BURIED		
bctv-5212-03	22, 26	COMCAST	CABLE TV			D	BURIED		
be-5202-12	22, 25	RMP	POWER			D	BURIED		
be-5208-12	22, 25	RMP	POWER			D	BURIED		
be-5209-12	22, 25	RMP	POWER			D	BURIED		
be-5210-12	22	RMP	POWER			D	BURIED		
be-5216-12	22, 26	RMP	POWER			D	BURIED		
be-5223-17	22, 25	UDOT	POWER			D	BURIED		
be-5225-17	22	UDOT	POWER			D	BURIED		
be-5237-12	22	RMP	POWER			D	BURIED		
be-5241-12	22	RMP	POWER			D	BURIED		
bfo-5005-17	22, 26	UDOT	FIBER			B	BURIED		
bfo-5006-15	22, 26	SYRINGA	FIBER			B	BURIED		
bfo-5202-18	22, 25	VERIZON	FIBER			B	BURIED		
bfo-5205-15	22, 25	SYRINGA	FIBER			B	BURIED		
bfo-5206-17	22, 25	UDOT	FIBER			B	BURIED		
bfo-5207-15	22, 23	SYRINGA	FIBER			B	BURIED		
bfo-5208-02	22, 25	CENTURY LINK	FIBER			B	BURIED		
bfo-5217-03	22	COMCAST	FIBER			D	BURIED		
bfo-5218-02	22, 23, 24	CENTURY LINK	FIBER			B	BURIED		
bfo-5222-02	22	CENTURY LINK	FIBER			B	BURIED		
bfo-5223-02	22	CENTURY LINK	FIBER			B	BURIED		
bfo-5224-02	22	CENTURY LINK	FIBER			B	BURIED		
bfo-5226-02	22	CENTURY LINK	FIBER			B	BURIED		
bfo-5227-02	22, 23	CENTURY LINK	FIBER			B	BURIED		
bfo-5230-02	22	CENTURY LINK	FIBER			B	BURIED		
bfo-5231-02	22	CENTURY LINK	FIBER			B	BURIED		
bfo-5232-99	22, 23	UNKNOWN	FIBER			D	BURIED		
bfo-5235-09	22, 23, 25	MBI, ATT, ZAYO, FIRST DIGITAL	FIBER			B	BURIED		
btel-5202-02	22, 26	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5206-02	22	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5207-02	22	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5208-02	22	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5210-02	22, 23	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5215-02	22, 23	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5221-02	22	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5222-02	22, 25	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5223-02	22, 23	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5224-02	22, 23	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5227-02	22	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5228-02	22	CENTURY LINK	TELEPHONE			B	BURIED		
e-5201-12	22, 23	RMP	POWER			D	AERIAL		
e-5235-12	22	RMP	POWER			D	AERIAL		
g-5201-11	22, 25	QUESTAR	GAS	2 IN		B			
g-5202-11	22	QUESTAR	GAS	2 IN		D			
g-5204-11	22	QUESTAR	GAS	2 IN		D			
g-5205-11	22	QUESTAR	GAS	3 IN		D			
g-5212-11	22, 23, 24	QUESTAR	GAS	6 IN		B			
g-5214-11	22, 25	QUESTAR	GAS	6 IN		B			
g-5219-11	22	QUESTAR	GAS	6 IN		D			
ms-0028-06	22	KEARNS	SANITARY SEWER			B			
ms-0051-06	22	KEARNS	SANITARY SEWER			B			

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UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

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4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT

PROJECT NUMBER S-0154(12)11

PIN 12566

UTILITY

SHEET NO. 54UTSM-13

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9/8/2016

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
ms-0092-06	22	KEARNS	SANITARY SEWER			B			
ms-0093-06	22	KEARNS	SANITARY SEWER			B			
ms-0094-06	22	KEARNS	SANITARY SEWER			B			
msd-0006-17	22	UDOT	STORM DRAIN			B			
msd-0007-17	22	UDOT	STORM DRAIN			B			
msd-0008-17	22	UDOT	STORM DRAIN			B			
msd-0009-17	22	UDOT	STORM DRAIN			B			
msd-0011-17	22	UDOT	STORM DRAIN			B			
msd-0012-17	22	UDOT	STORM DRAIN			B			
msd-0013-17	22	UDOT	STORM DRAIN			B			
msd-0014-17	22, 23	UDOT	STORM DRAIN			B			
msd-0017-17	22	UDOT	STORM DRAIN			B			
sd-5200-17	22	UDOT	STORM DRAIN	42 IN		D			
sd-5201-17	22, 23	UDOT	STORM DRAIN	42 IN		D			
sd-5202-17	22, 23, 24	UDOT	STORM DRAIN	42 IN		D			
sd-5206-17	22, 23	UDOT	STORM DRAIN	15 IN		C			
sd-5208-17	22	UDOT	STORM DRAIN	24 IN		C			
sd-5209-17	22	UDOT	STORM DRAIN	24 IN		C			
sd-5210-17	22	UDOT	STORM DRAIN	42 IN		C			
sd-5211-17	22	UDOT	STORM DRAIN	24 IN		C			
sd-5213-17	22, 23	UDOT	STORM DRAIN	15 IN		C			
sd-5216-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5217-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5218-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5219-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5220-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5224-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5228-17	22	UDOT	STORM DRAIN	24 IN		C			
sd-5229-17	22	UDOT	STORM DRAIN	30 IN		C			
sd-5230-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5231-17	22	UDOT	STORM DRAIN	30 IN		C			
sd-5232-17	22	UDOT	STORM DRAIN	30 IN		C			
sd-5233-17	22, 25	UDOT	STORM DRAIN	30 IN		C			
sd-5237-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5238-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5239-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5240-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5242-17	22, 26	UDOT	STORM DRAIN	18 IN		C			
sd-5247-17	22, 25	UDOT	STORM DRAIN	18 IN		C			
sd-5248-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5256-17	22	UDOT	STORM DRAIN	18 IN		C			
sd-5257-17	22	UDOT	STORM DRAIN	18 IN		C			
sdi-0011-17	22	UDOT	STORM DRAIN			B			
sdi-0016-17	22	UDOT	STORM DRAIN			B			
sdi-0017-17	22	UDOT	STORM DRAIN			B			
sdi-0018-17	22	UDOT	STORM DRAIN			B			
sdi-0020-17	22	UDOT	STORM DRAIN			B			
sdi-0021-17	22	UDOT	STORM DRAIN			B			
sdi-0022-17	22	UDOT	STORM DRAIN			B			
sdi-0023-17	22	UDOT	STORM DRAIN			B			
sdi-0024-17	22	UDOT	STORM DRAIN			B			
sdi-0025-17	22	UDOT	STORM DRAIN			B			
sdi-0026-17	22	UDOT	STORM DRAIN			B			
sdi-0027-17	22	UDOT	STORM DRAIN			B			
sdi-0038-17	22	UDOT	STORM DRAIN			B			
sdi-0039-17	22, 26	UDOT	STORM DRAIN			B			
sdi-0505-17	22	UDOT	STORM DRAIN			B			
sdi-0515-17	22	UDOT	STORM DRAIN			B			
ss-5202-06	22	KEARNS	SANITARY SEWER	8 IN		D			

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9/8/2016

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW
APPROVED
DATE
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY

SHEET NO. 54UTSM-14

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
ss-5206-06	22	KEARNS	SANITARY SEWER	8 IN		D			
ss-5218-06	22, 23	KEARNS	SANITARY SEWER	8 IN		C			
ss-5219-06	22	KEARNS	SANITARY SEWER	8 IN		C			
ss-5220-06	22	KEARNS	SANITARY SEWER	8 IN		C			
ss-5230-06	22, 23	KEARNS	SANITARY SEWER	8 IN		C			
ss-5231-06	22	KEARNS	SANITARY SEWER	8 IN		C			
ss-5232-06	22	KEARNS	SANITARY SEWER	8 IN		C			
ss-5233-06	22, 26	KEARNS	SANITARY SEWER	8 IN		C			
wtr-5200-06	22	KEARNS	WATER	6 IN		D			
wtr-5201-06	22	KEARNS	WATER	6 IN		D			
wtr-5202-06	22	KEARNS	WATER	6 IN		D			
wtr-5203-06	22, 26	KEARNS	WATER	3 QUARTERS IN		D			
wtr-5204-06	22, 26	KEARNS	WATER	3 QUARTERS IN		D			
wtr-5209-06	22, 23	KEARNS	WATER	1 IN		D			
wtr-5214-06	22, 25	KEARNS	WATER	10 IN		D			
wtr-5221-06	22	KEARNS	WATER	6 IN		D			
wtr-5222-06	22	KEARNS	WATER	6 IN		D			
wtr-5230-06	22, 23	KEARNS	WATER	6 IN		D			
wtr-5231-06	22, 23, 25	KEARNS	WATER	6 IN		D			
wtr-5232-06	22, 26	KEARNS	WATER	6 IN		D			
wtr-5233-06	22	KEARNS	WATER	6 IN		D			
wtr-5234-06	22, 23, 24	KEARNS	WATER	8 IN		D			
bctv-5204-03	23	COMCAST	CABLE TV			D	BURIED		
bctv-5206-03	23	COMCAST	CABLE TV			D	BURIED		
bctv-5207-03	23	COMCAST	CABLE TV			D	BURIED		
be-5211-12	23	RMP	POWER			D	BURIED		
be-5212-12	23	RMP	POWER			D	BURIED		
be-5213-17	23	UDOT	POWER			D	BURIED		
be-5214-17	23	UDOT	POWER			D	BURIED		
be-5215-12	23	RMP	POWER			D	BURIED		
be-5217-17	23	UDOT	POWER			D	BURIED		
be-5219-12	23	RMP	POWER			D	BURIED		
be-5220-12	23	RMP	POWER			D	BURIED		
bfo-5213-02	23	CENTURY LINK	FIBER			D	BURIED		
bfo-5219-02	23, 24	CENTURY LINK	FIBER			B	BURIED		
bfo-5220-02	23	CENTURY LINK	FIBER			B	BURIED		
bfo-5225-02	23	CENTURY LINK	FIBER			B	BURIED		
bfo-5228-02	23, 24	CENTURY LINK	FIBER			B	BURIED		
bfo-5233-09	23, 24	MBI, ATT, ZAYO, FIRST DIGITAL	FIBER			B	BURIED		
bfo-5234-09	23	MBI, ATT, ZAYO, FIRST DIGITAL	FIBER			B	BURIED		
btel-5200-02	23	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5201-02	23	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5204-99	23, 24	UNKNOWN	TELEPHONE			D	BURIED		
btel-5211-02	23	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5212-02	23	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5213-02	23	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5214-02	23	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5220-02	23, 24	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5225-02	23, 24	CENTURY LINK	TELEPHONE			B	BURIED		
btel-5226-02	23	CENTURY LINK	TELEPHONE			B	BURIED		
e-5232-12	23, 24	RMP	POWER			D	AERIAL		
g-5215-11	23	QUESTAR	GAS	2 IN		D			
ms-0052-06	23	KEARNS	SANITARY SEWER			B			
ms-0053-06	23	KEARNS	SANITARY SEWER			B			
ms-0054-06	23	KEARNS	SANITARY SEWER			B			
ms-0058-19	23	WEST JORDAN	SANITARY SEWER			B			
ms-0095-06	23	KEARNS	SANITARY SEWER			B			
sd-5207-17	23	UDOT	STORM DRAIN	12 IN		C			
sd-5214-17	23	UDOT	STORM DRAIN	15 IN		C			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW
APPROVED
DATE
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY

SHEET NO. 54UTSM-15

$$pentblis$$
$$username$$
c:\pw_work\bridgeview.westover@hdr-inc.com\dms-7892\12566_54UTSM-15.dgn
9/8/2016

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sdi-0037-17	23	UDOT	STORM DRAIN			B			
ss-5200-06	23	KEARNS	SANITARY SEWER	8 IN		D			
ss-5213-06	23, 24	KEARNS	SANITARY SEWER	8 IN		C			
ss-5214-06	23	KEARNS	SANITARY SEWER	8 IN		C			
ss-5215-14	23	SVSD	SANITARY SEWER	8 IN		C			
ss-5216-06	23	KEARNS	SANITARY SEWER	8 IN		C			
ss-5217-06	23	KEARNS	SANITARY SEWER	8 IN		C			
wtr-5210-06	23	KEARNS	WATER	1 IN		D			
wtr-5235-06	23	KEARNS	WATER	6 IN		D			
wtr-5236-06	23	KEARNS	WATER	6 IN		D			
bctv-5205-03	24	COMCAST	CABLE TV			D	BURIED		
bctv-5213-03	24	COMCAST	CABLE TV			D	BURIED		
be-5203-12	24	RMP	POWER			D	BURIED		
be-5218-12	24	RMP	POWER			D	BURIED		
bfo-5203-02	24	CENTURY LINK	FIBER			B	BURIED		
bfo-5204-03	24	COMCAST	FIBER			B	BURIED		
bfo-5214-03	24	COMCAST	FIBER			D	BURIED		
e-5231-12	24	RMP	POWER			D	AERIAL		
e-5233-12	24	RMP	POWER			D	AERIAL		
g-5216-11	24	QUESTAR	GAS	2 IN		D			
ms-0055-06	24	KEARNS	SANITARY SEWER			B			
ms-0056-14	24	SVSD	SANITARY SEWER			B			
msd-0015-17	24	UDOT	STORM DRAIN			B			
msd-0016-17	24	UDOT	STORM DRAIN			B			
sd-5203-17	24	UDOT	STORM DRAIN	48 IN		D			
sd-5204-17	24	UDOT	STORM DRAIN	48 IN		C			
sd-5205-17	24	UDOT	STORM DRAIN	15 IN		C			
sd-5215-17	24	UDOT	STORM DRAIN	15 IN		C			
sd-5236-17	24	UDOT	STORM DRAIN	15 IN		C			
sdi-0034-17	24	UDOT	STORM DRAIN			B			
sdi-0035-17	24	UDOT	STORM DRAIN			B			
sdi-0036-17	24	UDOT	STORM DRAIN			B			
ss-5212-06	24	KEARNS	SANITARY SEWER	15 IN		C			
wtr-5237-06	24	KEARNS	WATER	6 IN		D			
wtr-5238-06	24	KEARNS	WATER	6 IN		D			
wtr-5239-06	24	KEARNS	WATER	6 IN		D			
wtr-5240-06	24	KEARNS	WATER	6 IN		D			
bctv-5200-03	25	COMCAST	CABLE TV			D	BURIED		
bctv-5201-03	25	COMCAST	CABLE TV			D	BURIED		
bctv-5202-03	25	COMCAST	CABLE TV			D	BURIED		
bctv-5203-03	25	COMCAST	CABLE TV			D	BURIED		
be-5205-17	25	UDOT	POWER			D	BURIED		
be-5206-12	25	RMP	POWER			D	BURIED		
be-5207-12	25	RMP	POWER			D	BURIED		
be-5221-17	25	UDOT	POWER			D	BURIED		
be-5222-17	25	UDOT	POWER			D	BURIED		
be-5224-12	25	RMP	POWER			D	BURIED		
bfo-5200-15	25	SYRINGA	FIBER			B	BURIED		
bfo-5201-17	25	UDOT	FIBER			B	BURIED		
bfo-5209-02	25	CENTURY LINK	FIBER			B	BURIED		
bfo-5210-02	25	CENTURY LINK	FIBER			B	BURIED		
bfo-5211-02	25	CENTURY LINK	FIBER			D	BURIED		
bfo-5216-18	25	VERIZON	FIBER			D	BURIED		
btel-5209-02	25	CENTURY LINK	TELEPHONE			B	BURIED		
g-5200-11	25	QUESTAR	GAS	2 IN		D			
g-5213-11	25	QUESTAR	GAS	6 IN		B			
ms-0068-06	25	KEARNS	SANITARY SEWER			B			
ms-0069-06	25	KEARNS	SANITARY SEWER			B			
ms-0072-06	25	KEARNS	SANITARY SEWER			B			

REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW
DATE
APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PROJECT
PROJECT NUMBER S-0154(12)11
PIN 12566

UTILITY

SHEET NO. 54UTSM-16

$$pentblis$$
$$username$$
c:\pw_work\bryan.westover@hdrinc.com\dms78928\12566_54UTSM-16.dgn
9/8/2016

Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
ms-0122-06	25	KEARNS	SANITARY SEWER			B			
msd-0003-17	25	UDOT	STORM DRAIN			B			
msd-0004-17	25	UDOT	STORM DRAIN			B			
msd-0005-17	25	UDOT	STORM DRAIN			B			
sd-5223-17	25	UDOT	STORM DRAIN	18 IN		C			
sd-5234-17	25	UDOT	STORM DRAIN	30 IN		C			
sd-5235-17	25	UDOT	STORM DRAIN	30 IN		C			
sd-5245-17	25	UDOT	STORM DRAIN	18 IN		C			
sd-5246-17	25	UDOT	STORM DRAIN	18 IN		C			
sd-5249-17	25	UDOT	STORM DRAIN	18 IN		C			
sd-5250-17	25	UDOT	STORM DRAIN	18 IN		C			
sd-5251-17	25	UDOT	STORM DRAIN	18 IN		C			
sd-5252-17	25	UDOT	STORM DRAIN	18 IN		C			
sd-5253-17	25	UDOT	STORM DRAIN	18 IN		C			
sd-5254-17	25	UDOT	STORM DRAIN	18 IN		C			
sd-5255-17	25	UDOT	STORM DRAIN	18 IN		C			
sdi-0004-17	25	UDOT	STORM DRAIN			B			
sdi-0005-17	25	UDOT	STORM DRAIN			B			
sdi-0006-17	25	UDOT	STORM DRAIN			B			
sdi-0007-17	25	UDOT	STORM DRAIN			B			
sdi-0008-17	25	UDOT	STORM DRAIN			B			
sdi-0009-17	25	UDOT	STORM DRAIN			B			
sdi-0010-17	25	UDOT	STORM DRAIN			B			
sdi-0012-17	25	UDOT	STORM DRAIN			B			
sdi-0013-17	25	UDOT	STORM DRAIN			B			
sdi-0014-17	25	UDOT	STORM DRAIN			B			
sdi-0015-17	25	UDOT	STORM DRAIN			B			
ss-5201-06	25	KEARNS	SANITARY SEWER	8 IN		D			
ss-5203-06	25	KEARNS	SANITARY SEWER	8 IN		D			
ss-5204-06	25	KEARNS	SANITARY SEWER	8 IN		D			
ss-5205-06	25	KEARNS	SANITARY SEWER	8 IN		D			
ss-5207-06	25	KEARNS	SANITARY SEWER	8 IN		C			
ss-5208-06	25	KEARNS	SANITARY SEWER	8 IN		C			
ss-5209-06	25	KEARNS	SANITARY SEWER	8 IN		C			
ss-5210-06	25	KEARNS	SANITARY SEWER	8 IN		C			
ss-5211-06	25	KEARNS	SANITARY SEWER	8 IN		C			
wtr-5211-06	25	KEARNS	WATER	1 IN		D			
wtr-5212-06	25	KEARNS	WATER	1 IN		D			
wtr-5213-06	25	KEARNS	WATER	16 IN		D			
wtr-5216-06	25	KEARNS	WATER	6 IN		D			
wtr-5217-06	25	KEARNS	WATER	6 IN		D			
wtr-5218-06	25	KEARNS	WATER	6 IN		D			
wtr-5219-06	25	KEARNS	WATER	2 IN		D			
wtr-5220-06	25	KEARNS	WATER	6 IN		D			
wtr-5228-06	25	KEARNS	WATER	10 IN		D			
wtr-5229-06	25	KEARNS	WATER	6 IN		D			
be-5005-12	26	RMP	POWER			D	BURIED		
btel-5203-02	26	CENTURY LINK	TELEPHONE			B	BURIED		
e-5002-12	26	RMP	POWER			D	AERIAL		
e-5049-12	26	RMP	POWER			D	AERIAL		
e-5200-12	26	RMP	POWER			D	AERIAL		
e-5234-12	26	RMP	POWER			D	AERIAL		
g-5218-11	26	QUESTAR	GAS	2 IN		D			
ms-0029-16	26	TAYLORSVILLE	SANITARY SEWER			B			
ms-0091-06	26	KEARNS	SANITARY SEWER			B			
msd-0018-17	26	UDOT	STORM DRAIN			B			
sd-5019-10	26	PRIVATE	STORM DRAIN	8 IN		C			
sd-5036-17	26	UDOT	STORM DRAIN	15 IN		C			
sd-5089-99	26	UDOT	STORM DRAIN	18 IN		C			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW
DATE
APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY - 5400 SOUTH

PIN 12566
S-0154(12)11

PROJECT
PROJECT NUMBER

UTILITY

SHEET NO. 54UTSM-17

9/8/2016
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$$username$$
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Utility ID Number	Plan Sheet	Owner	Utility Type	Size	Material	Quality Level	Aerial Buried	Test Hole Number	Comments
sd-5212-17	26	UDOT	STORM DRAIN	12 IN		C			
sd-5241-17	26	UDOT	STORM DRAIN	18 IN		C			
sdi-0040-17	26	UDOT	STORM DRAIN			B			
sdi-0041-17	26	UDOT	STORM DRAIN			B			
sdi-0042-10	26	PRIVATE	STORM DRAIN			B			
sdi-0048-17	26	UDOT	STORM DRAIN			B			
sdi-0507-17	26	UDOT	STORM DRAIN			B			
sdi-0584-17	26	UDOT	STORM DRAIN			B			
ss-5234-06	26	KEARNS	SANITARY SEWER	8 IN		C			
ss-5235-06	26	KEARNS	SANITARY SEWER	8 IN		C			
wtr-5205-06	26	KEARNS	WATER	3 QUARTERS IN		D			
wtr-5206-06	26	KEARNS	WATER	3 QUARTERS IN		D			
wtr-5207-06	26	KEARNS	WATER	3 QUARTERS IN		D			
wtr-5208-06	26	KEARNS	WATER	1 IN		D			

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - AVENUE CONSULTANTS

DRAWN BY GS
QC CHECKED BY BDW
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DATE
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY - 5400 SOUTH
PROJECT NUMBER: S-0154(12)11 PIN 12566
UTILITY

SHEET NO. 54UTSM-18

$$pentblis$$
$$username$$
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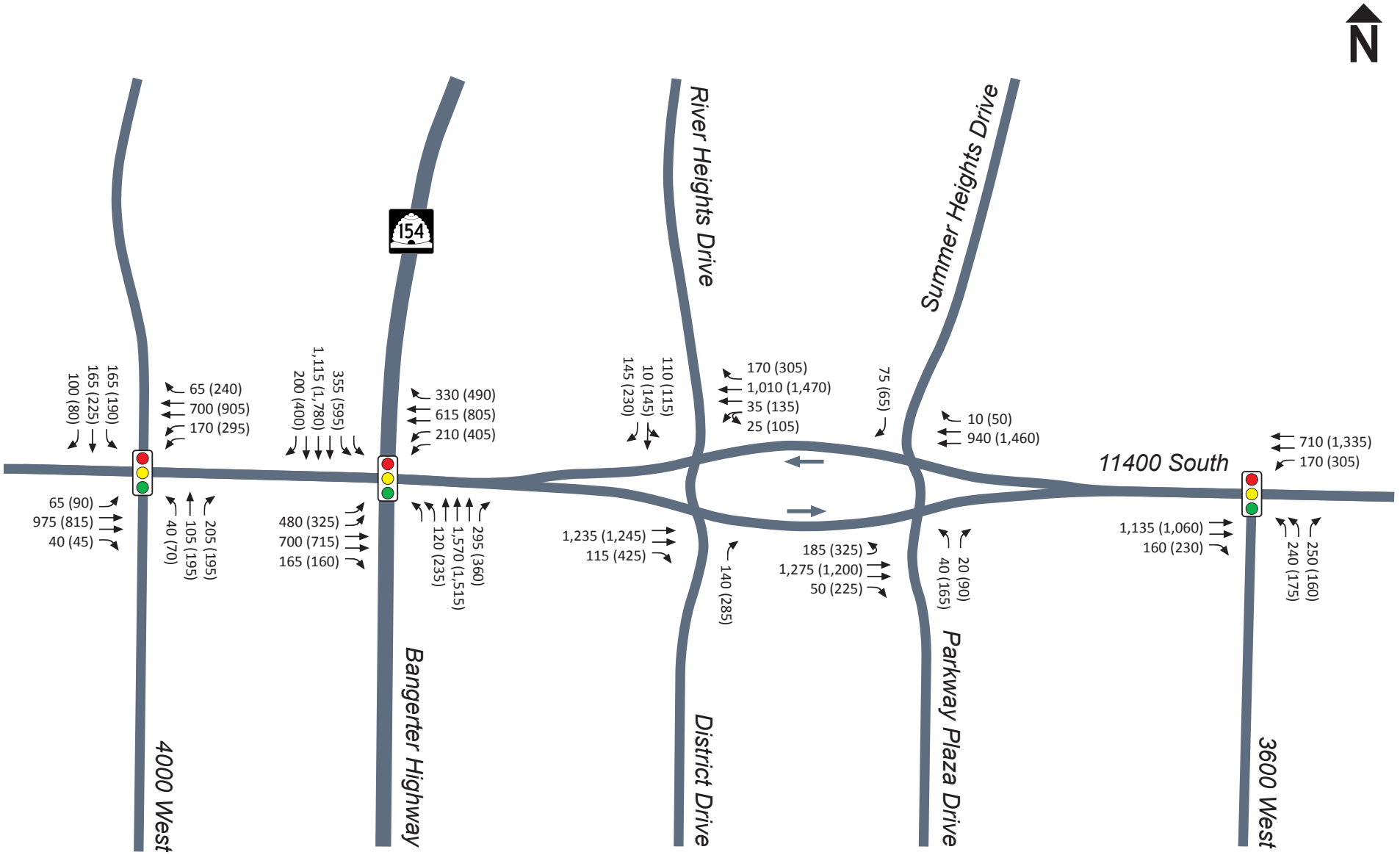
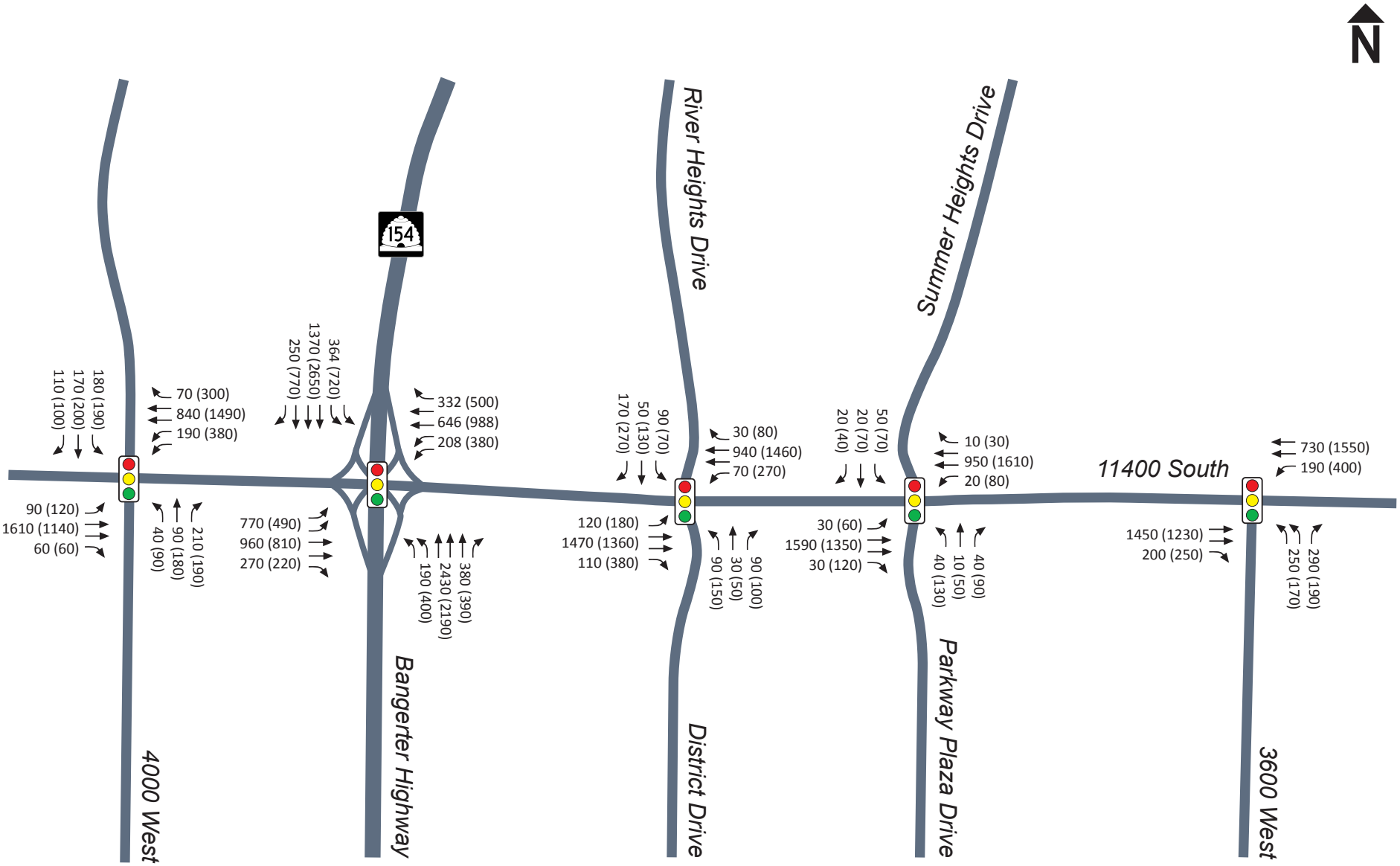


2015 Weekday Peak Hour Turning Movement Volumes

11400 South and Bangerter Highway Area Intersections

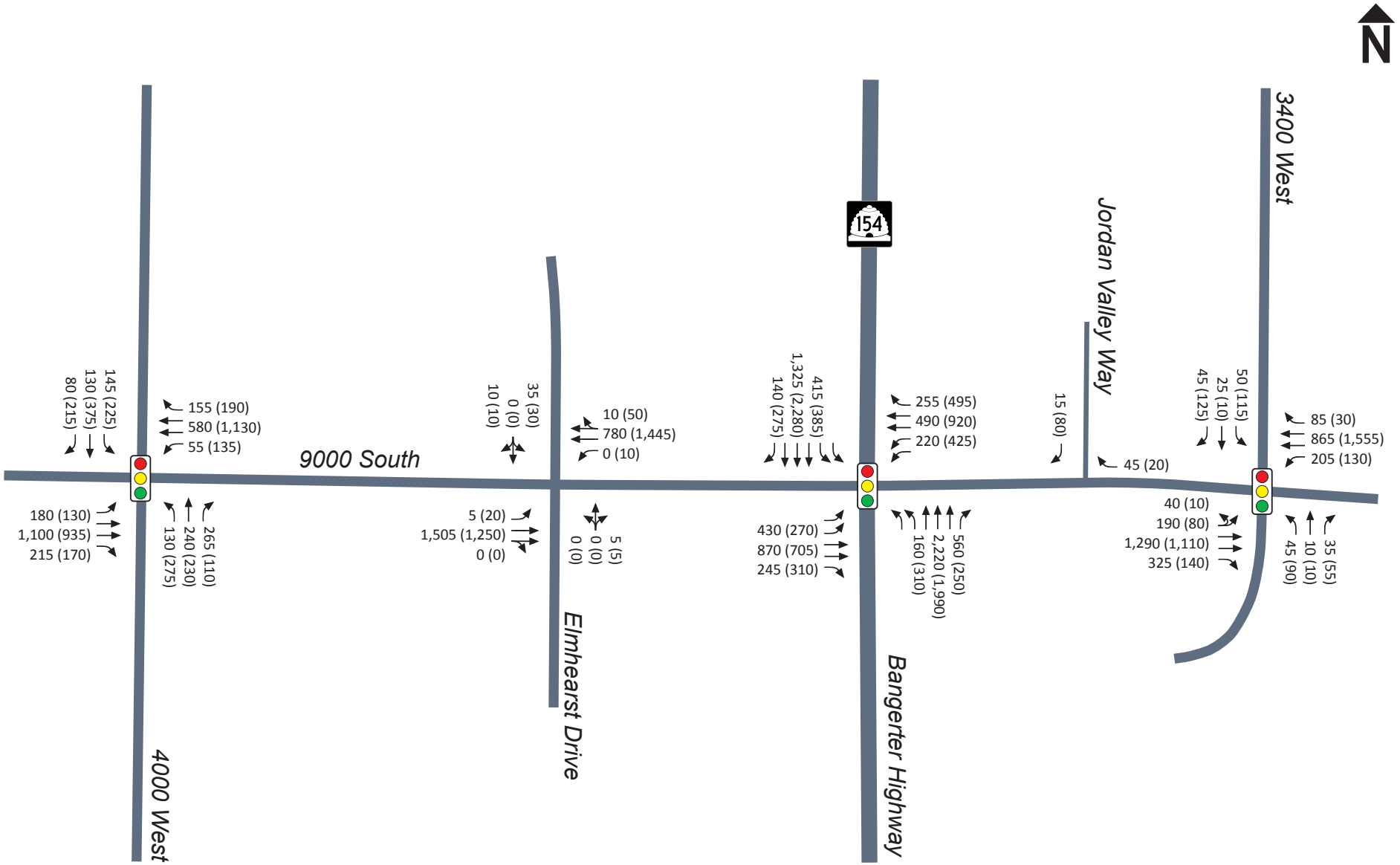
Counts Conducted in November and December 2015



Design Year Weekday Peak Hour Turning Movement Volumes

11400 South and Bangerter Highway Area Intersections

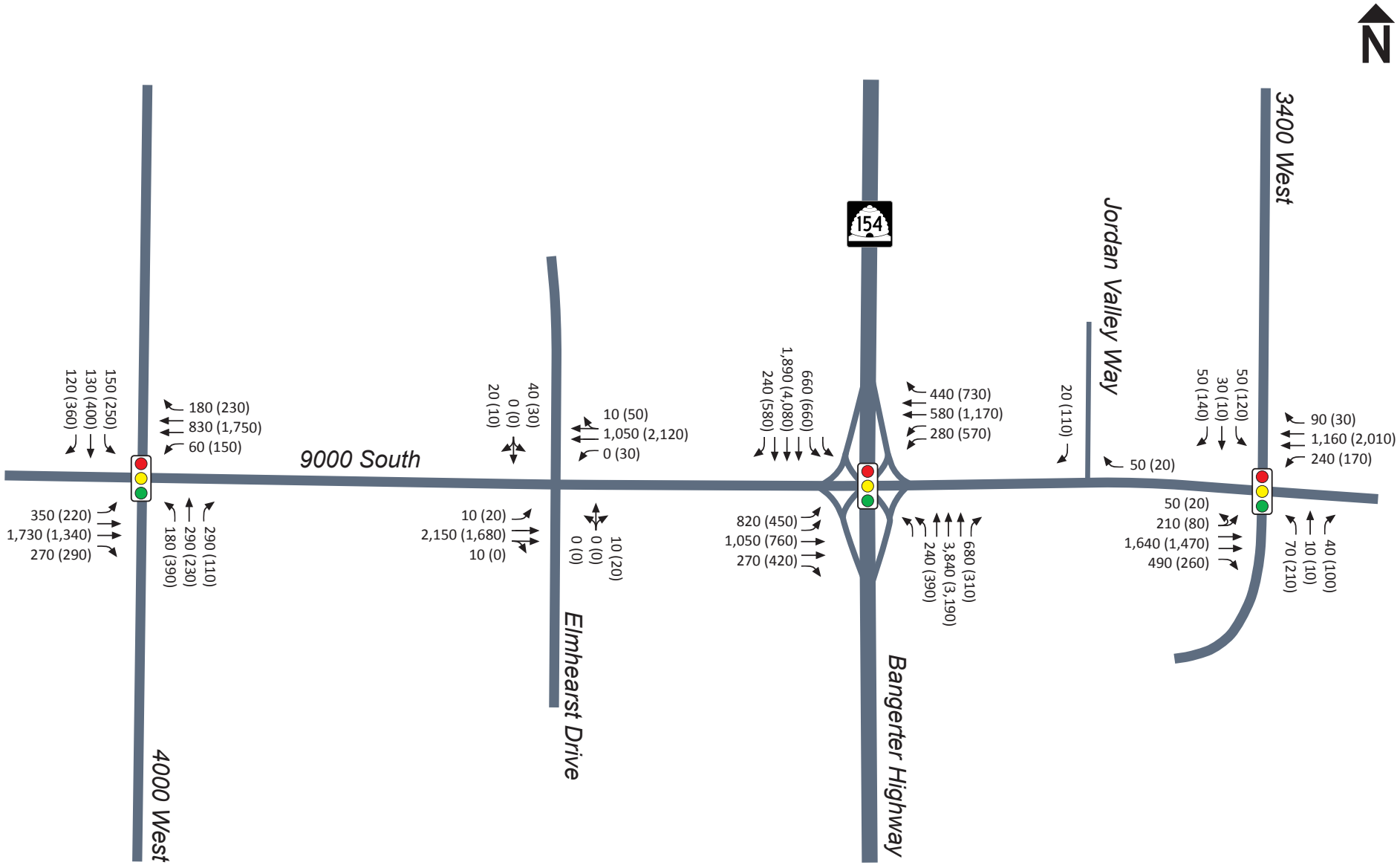
August 1, 2016



2015 Weekday Peak Hour Turning Movement Volumes

9000 South and Bangerter Highway Area Intersections

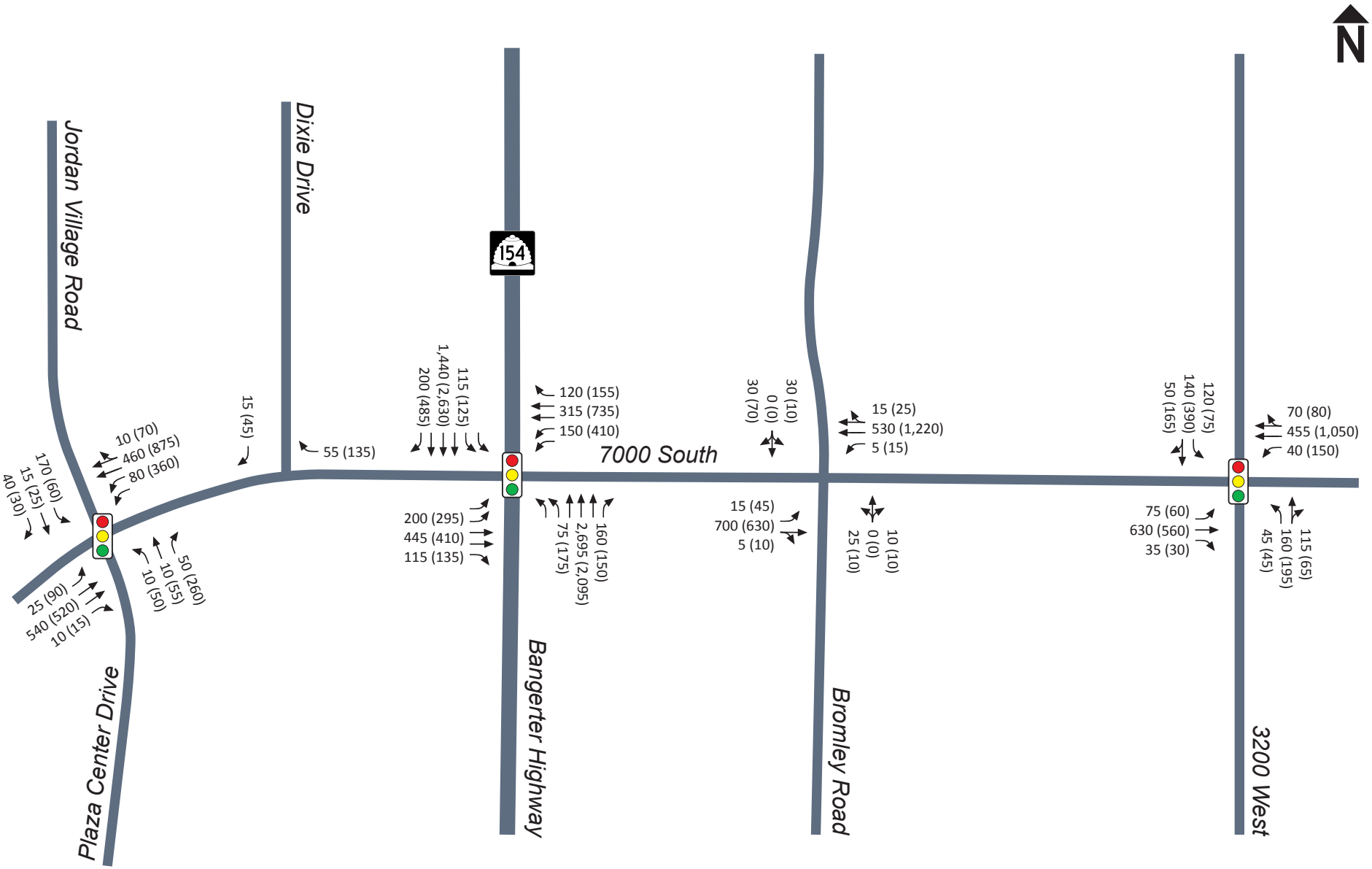
Counts Conducted in November and December 2015



Design Year Weekday Peak Hour Turning Movement Volumes

9000 South and Bangerter Highway Area Intersections

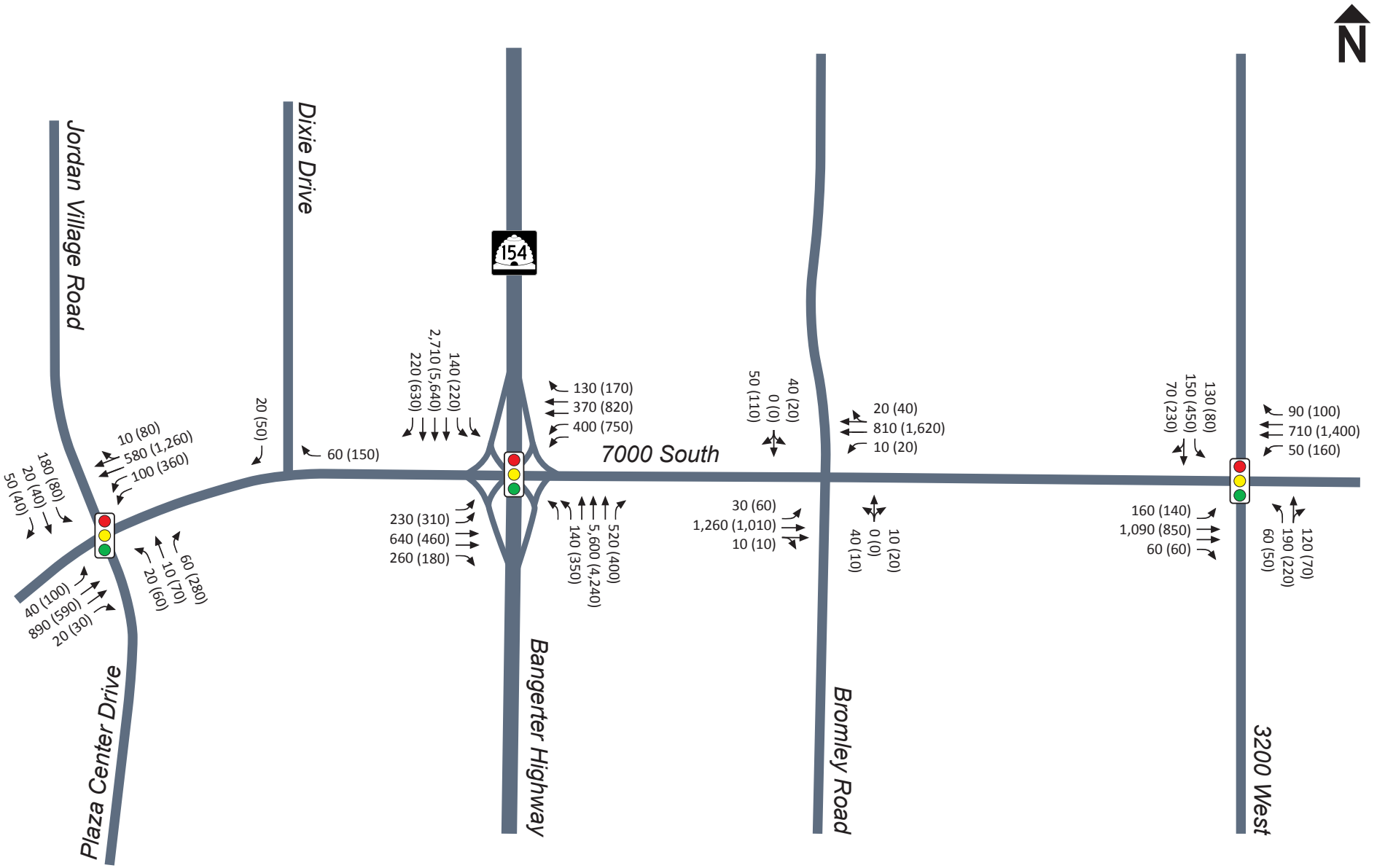
September 1, 2016



2015 Weekday Peak Hour Turning Movement Volumes

7000 South and Bangerter Highway Area Intersections

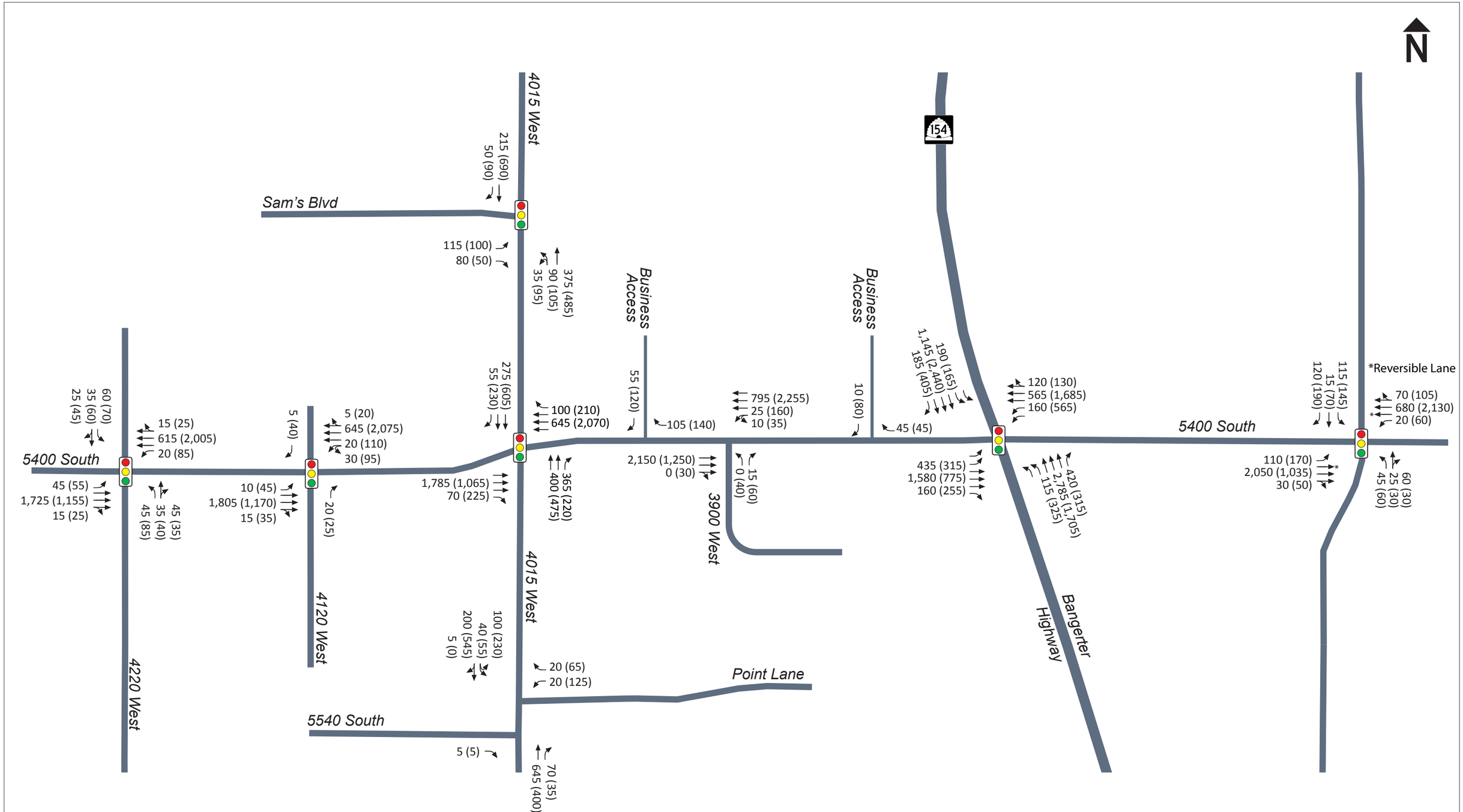
Counts Conducted in November and December 2015



Design Year Weekday Peak Hour Turning Movement Volumes

7000 South and Bangerter Highway Area Intersections

August 1, 2016

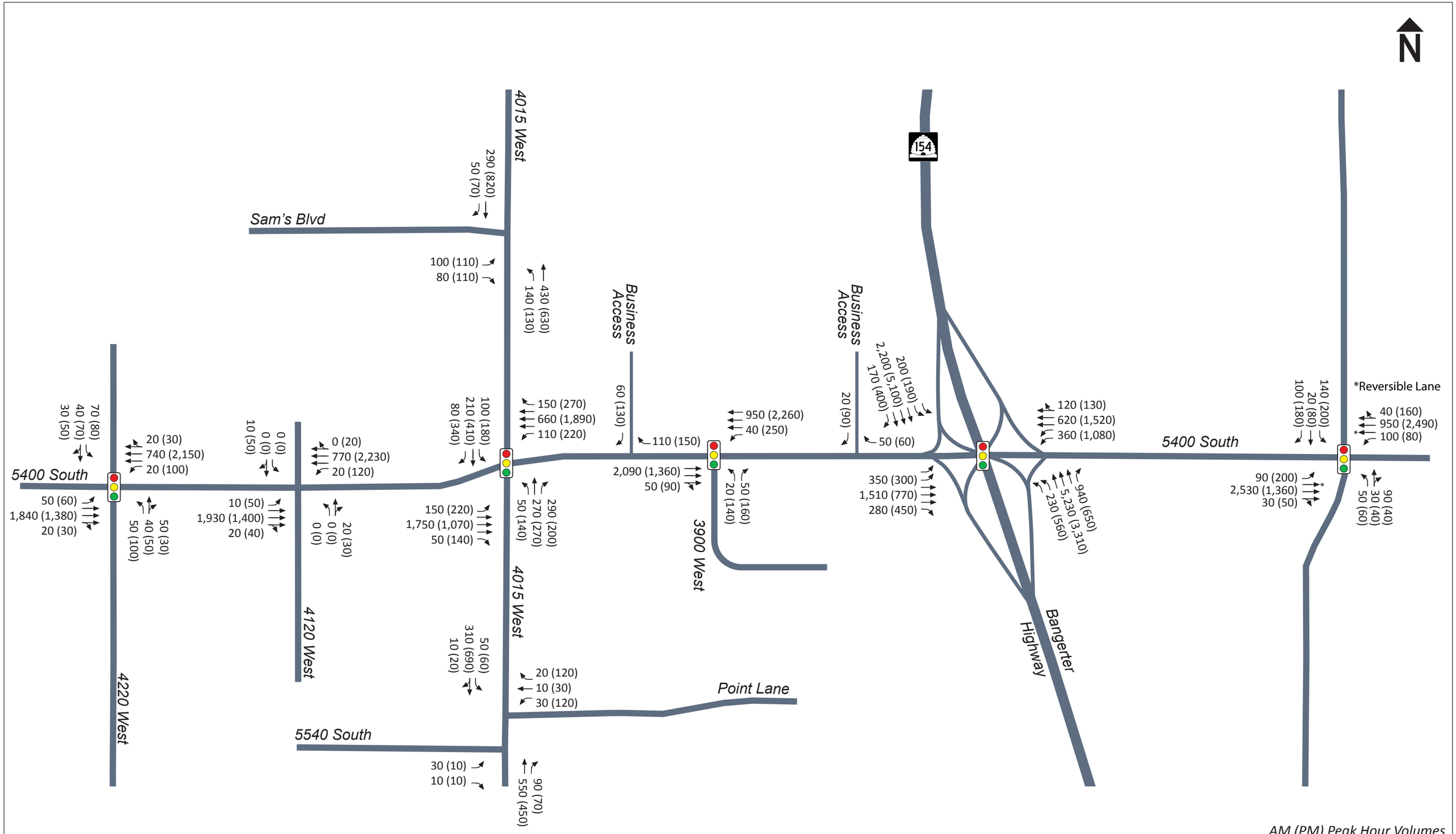


AM (PM) Peak Hour Volumes

2015 Weekday Peak Hour Turning Movement Volumes

5400 South and Bangerter Highway Area Intersections

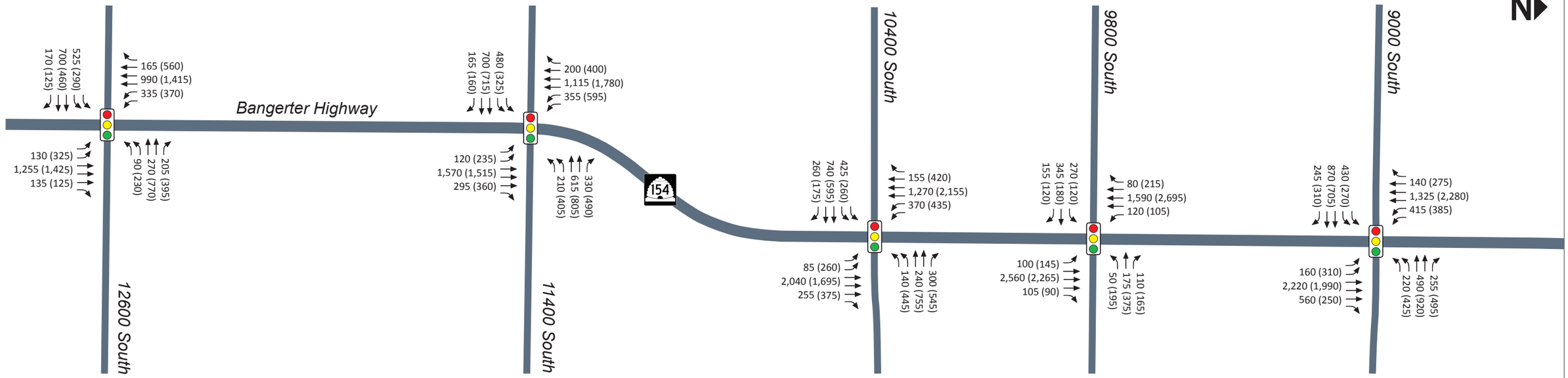
Counts Conducted in November and December 2015

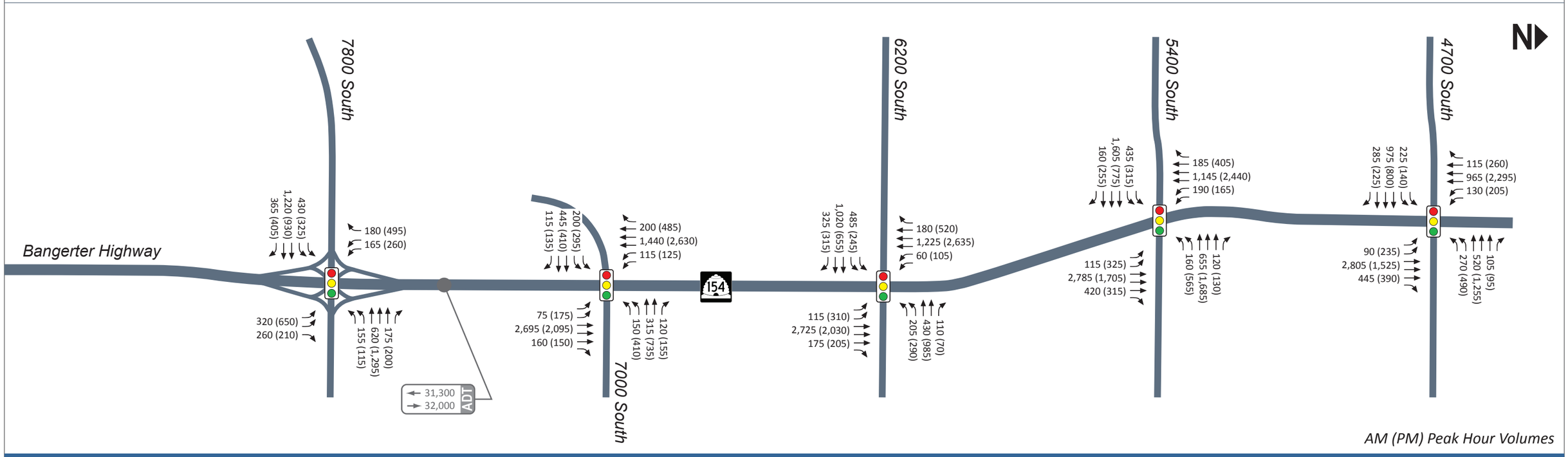


Design Year Weekday Peak Hour Turning Movement Volumes

5400 South and Bangerter Highway Area Intersections

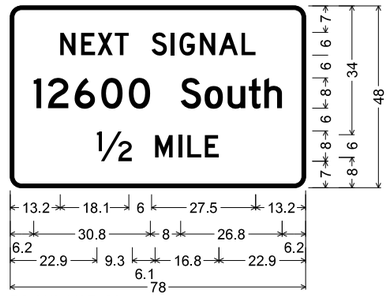
August 1, 2016



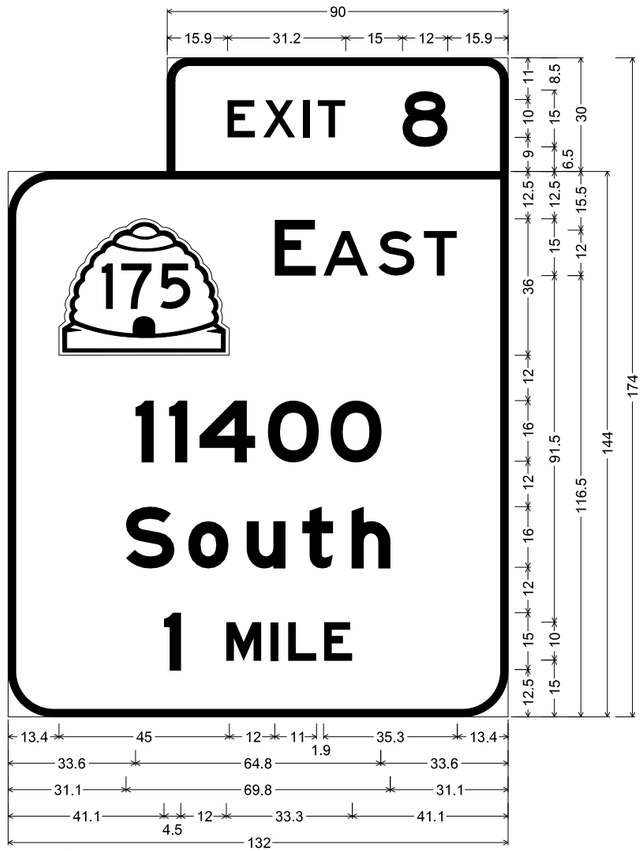


2015 Weekday Peak Hour Turning Movement Volumes
Bangerter Highway Corridor

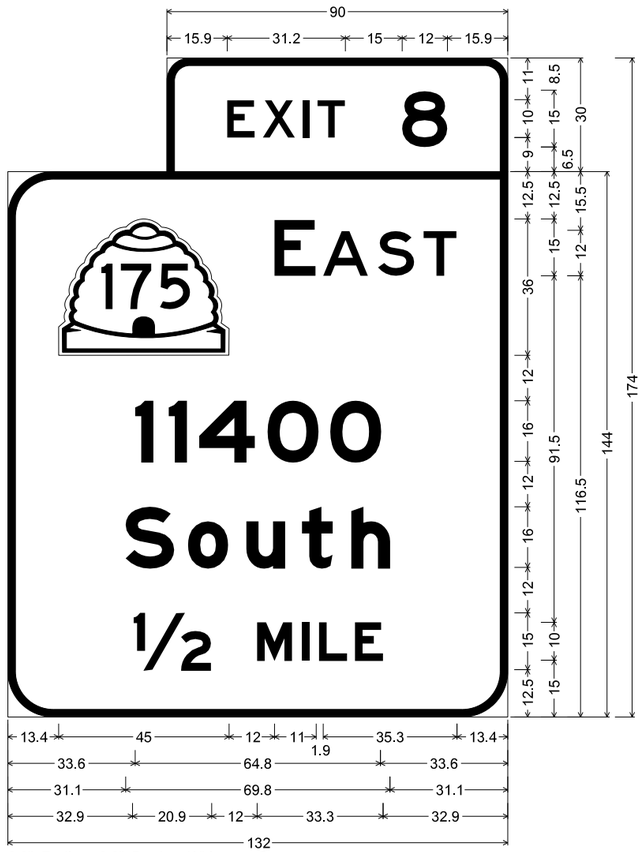
Counts Conducted in November and December 2015



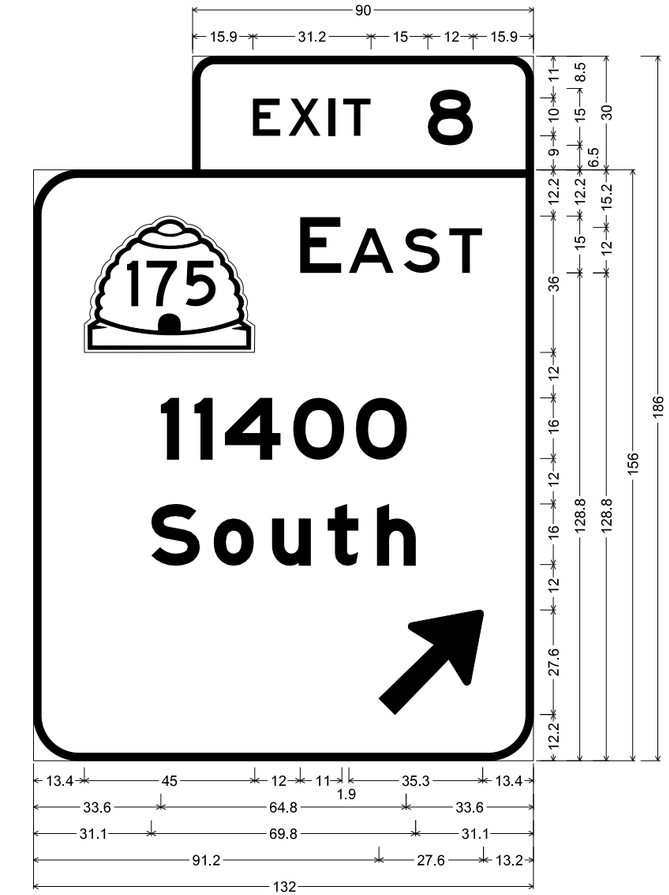
D3-2(1)_VARx36;
3.0" Radius, 1.0" Border, White on Green;
[NEXT SIGNAL] D 2K; [12600] D 2K;
[South] D 2K; [½ MILE] D 2K;



6.0" Radius, 2.0" Border, White on Green;
[EXIT 8] E;
12.0" Radius, 2.0" Border, White on Green;
MS1-5-36c Utah Route 3 Digit 12" D; [EAST] E; [11400] E Mod;
[South] E Mod; [1] E Mod; [MILE] E Mod;



6.0" Radius, 2.0" Border, White on Green;
[EXIT 8] E;
12.0" Radius, 2.0" Border, White on Green;
MS1-5-36c Utah Route 3 Digit 12" D; [EAST] E; [11400] E Mod;
[South] E Mod; [½] E Mod; [MILE] E Mod;



6.0" Radius, 2.0" Border, White on Green;
[EXIT 8] E;
12.0" Radius, 2.0" Border, White on Green;
MS1-5-36c Utah Route 3 Digit 12" D; [EAST] E; [11400] E Mod;
[South] E Mod; Arrow Custom - 35.6" 45°;

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY	KKH
QC CHECKED BY	KGA
MM/DD/YY	
DATE	

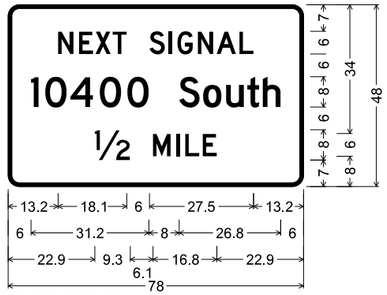
PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY

PROJECT NUMBER: S-0154(12)11 PIN 12566

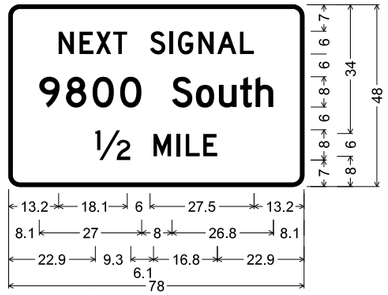
SIGN DETAILS

SHEET NO. SSDT-01

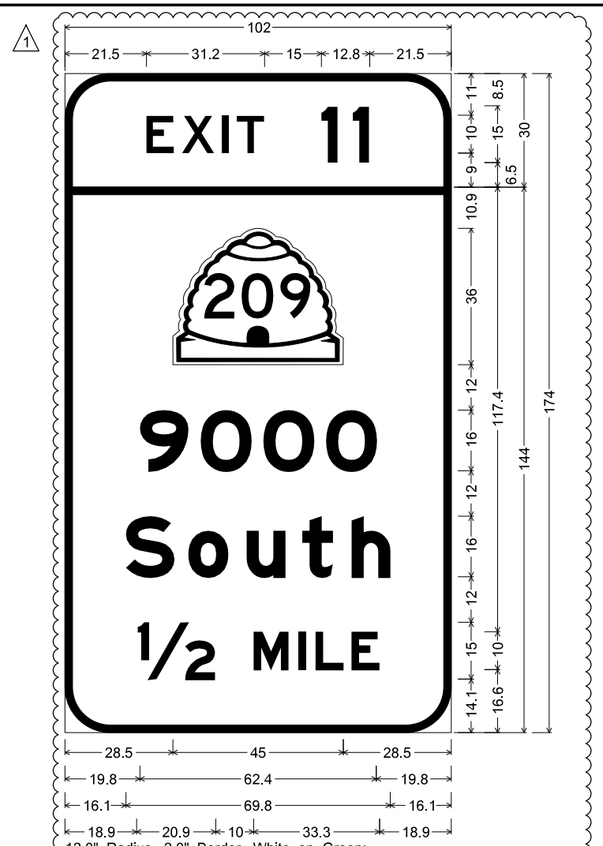
9/6/2016 2:33:41 PM
pw:\\ow.horrocks.com:PWPrimaryDocuments\Projects\2016\PG-658-1604 Bangerter 4 Interchanges PM\12566\Sheet Files\Signing_Striping\12566_SSDT-01.dgn



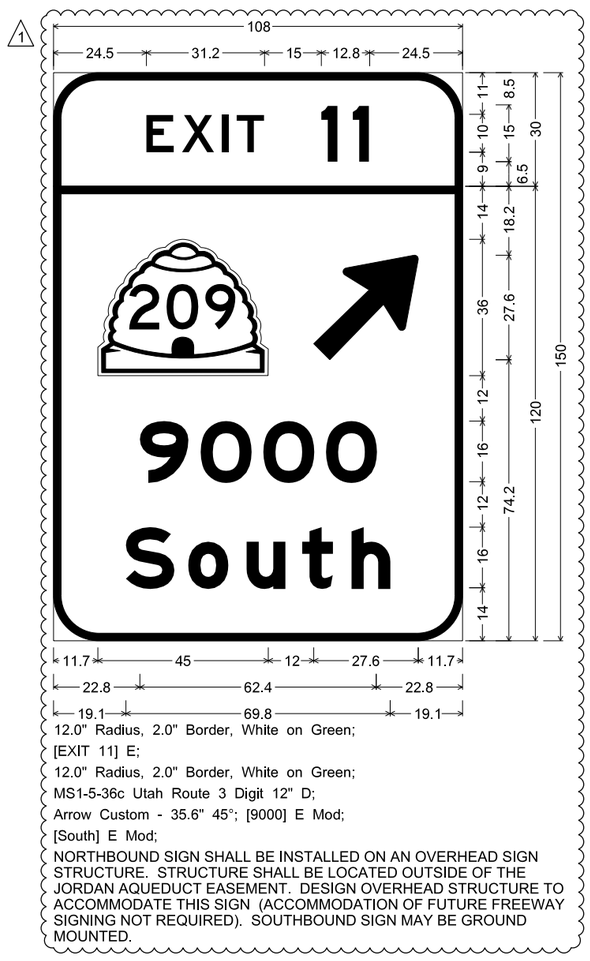
D3-2(1)_VARx36;
3.0" Radius, 1.0" Border, White on Green;
[NEXT SIGNAL] D 2K; [10400] D 2K;
[South] D 2K; [½ MILE] D 2K;



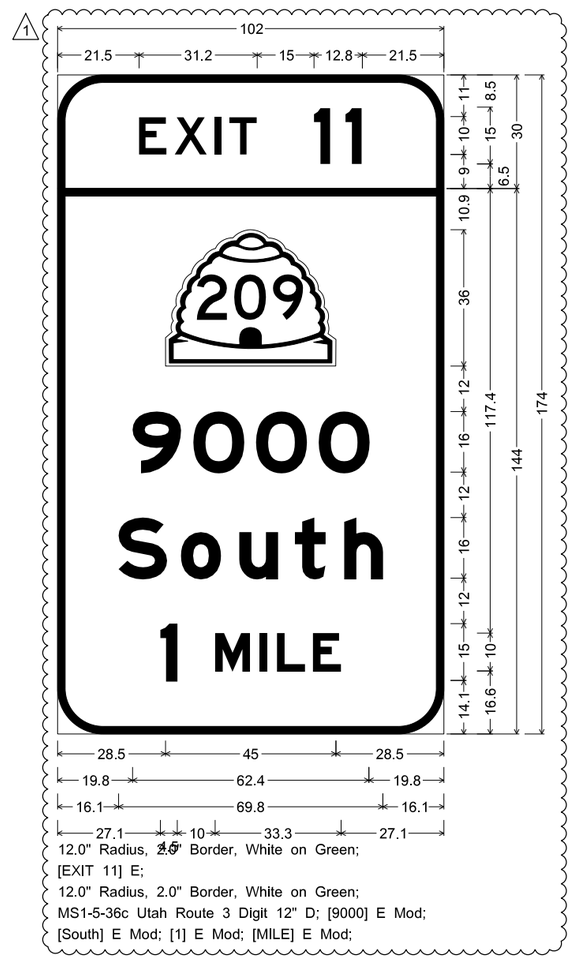
D3-2(1)_VARx36;
3.0" Radius, 1.0" Border, White on Green;
[NEXT SIGNAL] D 2K; [9800] D 2K;
[South] D 2K; [½ MILE] D 2K;



12.0" Radius, 2.0" Border, White on Green;
[EXIT 11] E;
12.0" Radius, 2.0" Border, White on Green;
MS1-5-36c Utah Route 3 Digit 12" D; [9000] E Mod;
[South] E Mod; [½] E Mod; [MILE] E Mod;
NORTHBOUND SIGN SHALL BE INSTALLED ON AN OVERHEAD SIGN STRUCTURE. STRUCTURE SHALL BE LOCATED OUTSIDE OF THE JORDAN AQUEDUCT EASEMENT. DESIGN OVERHEAD STRUCTURE TO ACCOMMODATE THIS SIGN (ACCOMMODATION OF FUTURE FREEWAY SIGNING NOT REQUIRED). SOUTHBOUND SIGN MAY BE GROUND MOUNTED.



12.0" Radius, 2.0" Border, White on Green;
[EXIT 11] E;
12.0" Radius, 2.0" Border, White on Green;
MS1-5-36c Utah Route 3 Digit 12" D;
Arrow Custom - 35.6" 45°; [9000] E Mod;
[South] E Mod;
NORTHBOUND SIGN SHALL BE INSTALLED ON AN OVERHEAD SIGN STRUCTURE. STRUCTURE SHALL BE LOCATED OUTSIDE OF THE JORDAN AQUEDUCT EASEMENT. DESIGN OVERHEAD STRUCTURE TO ACCOMMODATE THIS SIGN (ACCOMMODATION OF FUTURE FREEWAY SIGNING NOT REQUIRED). SOUTHBOUND SIGN MAY BE GROUND MOUNTED.



12.0" Radius, 2.0" Border, White on Green;
[EXIT 11] E;
12.0" Radius, 2.0" Border, White on Green;
MS1-5-36c Utah Route 3 Digit 12" D; [9000] E Mod;
[South] E Mod; [1] E Mod; [MILE] E Mod;

REVISIONS				
NO.	DATE	APPROVED BY		REMARKS
1	08/16	KGA	UPDATED SIGNS.	

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY KGA

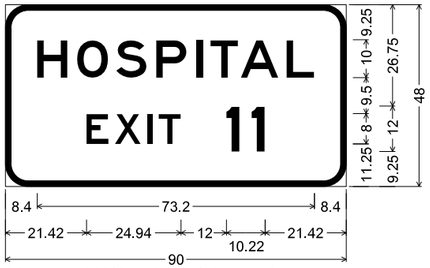
APPROVED
PROFESSIONAL ENGINEER
MM/DD/YY
DATE

PROJECT		PIN	
	4 INTERCHANGES ON BANGERTER HIGHWAY	PROJECT NUMBER	S-0154(12)11 12566

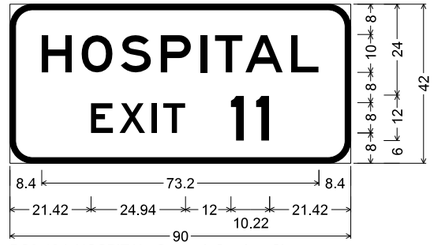
SIGN DETAILS

SHEET NO. SSDT-02

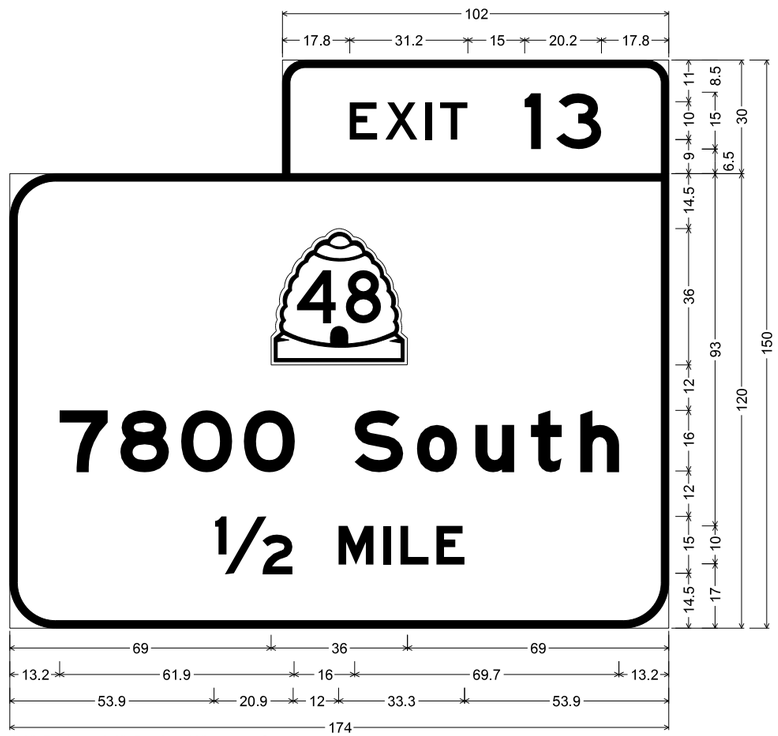
9/6/2016 2:33:44 PM pw:\\pw.horrocks.com\PWPrimary\Documents\Projects\2016\PG-658-1604 Bangerter 4 Interchanges PM\12566\Sheet_Files\Signing_Striping\12566_SSDT-02.dgn



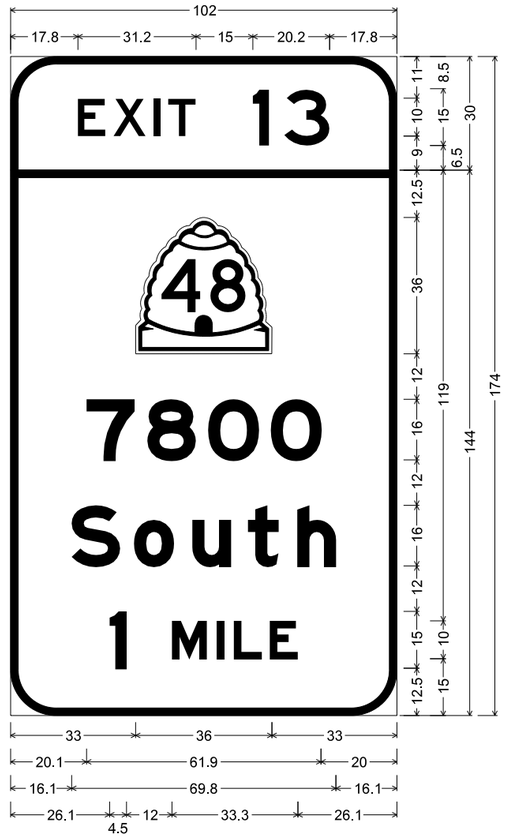
DS9-18d HOSPITAL General Service Sign;
6.00" Radius, 1.50" Border, White on Blue;
[HOSPITAL] E; [EXIT 11] E;
SIGN FOR SOUTHBOUND BANGERTER HWY
APPROACHING 9000 SOUTH.



DS9-18d HOSPITAL General Service Sign;
6.00" Radius, 1.50" Border, White on Blue;
[HOSPITAL] E; [EXIT 11] E;
SIGN FOR NORTHBOUND BANGERTER HWY
APPROACHING 9000 SOUTH (SMALLER THAN
SOUTHBOUND SIGN TO BE INSTALLED IN THE AQUEDUCT
EASEMENT).



6.0" Radius, 2.0" Border, White on Green;
[EXIT 13] E;
12.0" Radius, 2.0" Border, White on Green;
[7800 South] E Mod; [½] E Mod; [MILE] E Mod;
SIGN STRUCTURE FOR THIS SIGN SHALL BE CONSTRUCTED
TO ACCOMMODATE FUTURE FREEWAY SIZE SIGN. SEE SHEET
SSDT-11 FOR THE SIZE OF THE SIGN THAT THE OVERHEAD
SIGN STRUCTURE SHALL BE DESIGNED TO ACCOMMODATE.



12.0" Radius, 2.0" Border, White on Green;
[EXIT 13] E;
12.0" Radius, 2.0" Border, White on Green;
[7800] E Mod; [South] E Mod; [1] E Mod;
[MILE] E Mod;

REVISIONS

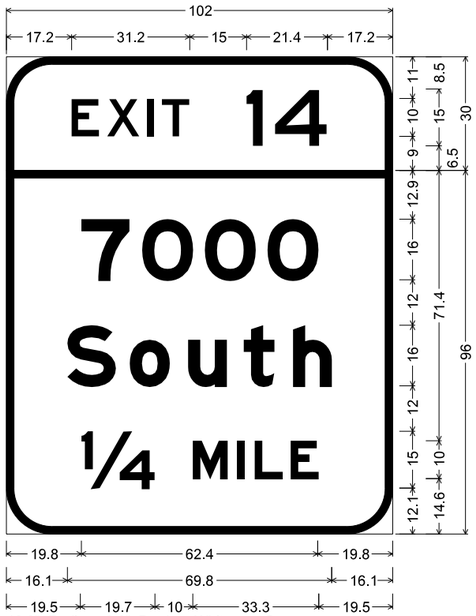
NO.	DATE	APPROVED BY	REMARKS

DRAWN BY: KKH
CHECKED BY: QC KGA
DATE: MM/DD/YY
APPROVED: PROFESSIONAL ENGINEER

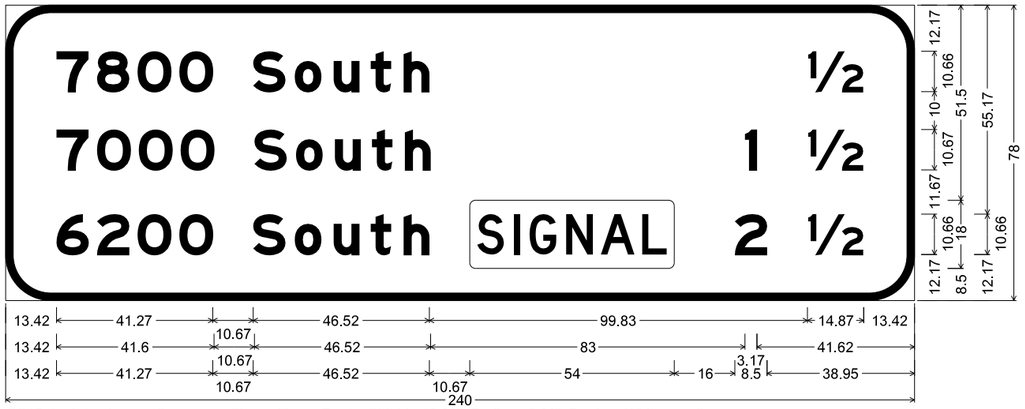
UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11 PIN 12566
SIGN DETAILS
SHEET NO. SSDT-03

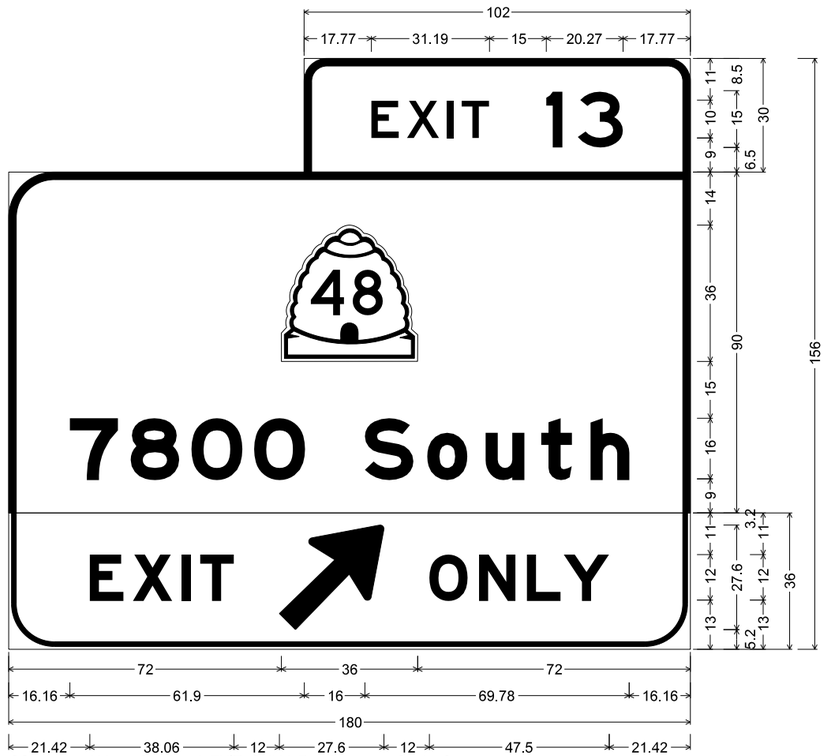
9/6/2016 2:33:47 PM pw:\\ow.horrocks.com\PWPrimaryDocuments\Projects\2016\PG-658-1604 Bangerter 4 Interchanges PM\12566\Sheet_Files\Signing_Striping\12566_SSDT-03.dgn



12.0" Radius, 2.0" Border, White on Green;
[EXIT 14] E;
12.0" Radius, 2.0" Border, White on Green;
[7000] E Mod; [South] E Mod; [¼] E Mod;
[MILE] E Mod;
SIGN STRUCTURE FOR THIS SIGN SHALL BE CONSTRUCTED TO ACCOMMODATE FUTURE FREEWAY SIZE SIGN. SEE SHEET SSDT-09 FOR THE SIZE OF THE SIGN THAT THE OVERHEAD SIGN STRUCTURE SHALL BE DESIGNED TO ACCOMMODATE.



GS15-1a Interchange Sequence Sign without Route Shield; 12.00" Radius, 2.00" Border, White on Green;
[7800 South] E Mod; [½] E Mod; [7000 South] E Mod; [1] E Mod; [½] E Mod; [6200 South] E Mod; [2] E Mod; [½] E Mod;
SIGN STRUCTURE FOR THIS SIGN SHALL BE CONSTRUCTED TO ACCOMMODATE FUTURE FREEWAY SIZE SIGN. SEE SHEET SSDT-11 FOR THE SIZE OF THE SIGN THAT THE OVERHEAD SIGN STRUCTURE SHALL BE DESIGNED TO ACCOMMODATE.



GS4-1 Non-Urban Overhead EXIT ONLY Exit Direction Guide Signs;
6.00" Radius, 2.00" Border, White on Green;
[EXIT 13] E;
12.00" Radius, 2.00" Border, White on Green;
MS1-5-36b Utah Route 2 Digit 12" D; [7800 South] E Mod;
12.00" Radius, 1.25" Border, 0.75" Indent, Black on Yellow;
[EXIT] E Mod; Arrow Custom - 35.63" 45°; [ONLY] E Mod;
MOUNT SIGN ON EXISTING OVERHEAD SIGN STRUCTURE.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY	CHECKED BY	QC	DATE
KKH	KGA		MM/DD/YY

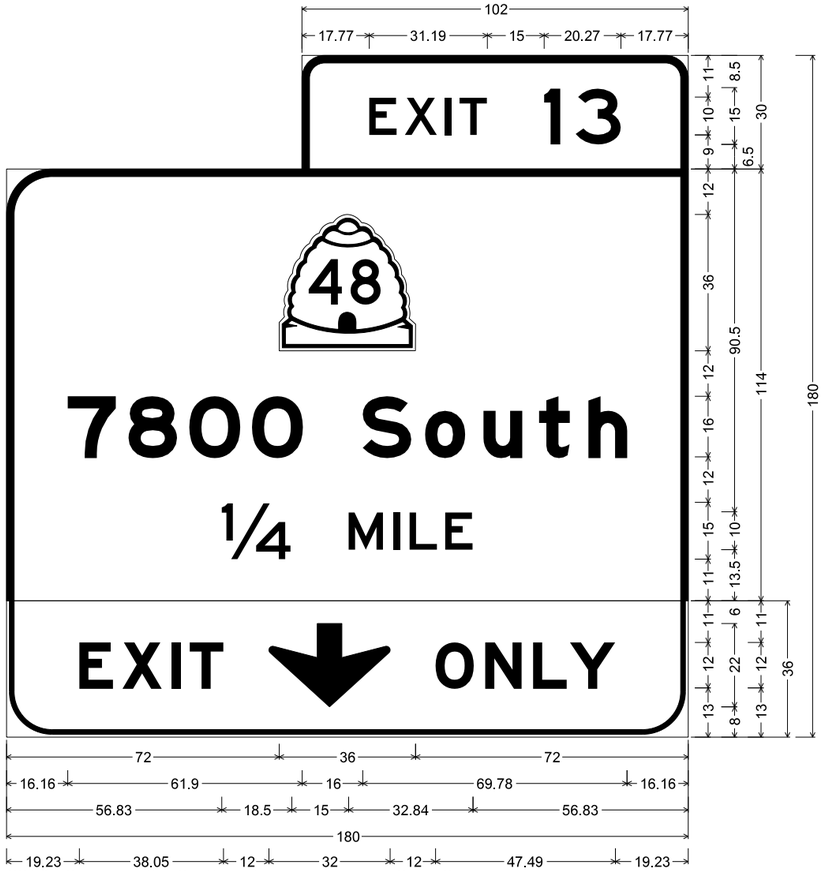
PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY

PROJECT NUMBER: S-0154(12)11 PIN 12566

SIGN DETAILS

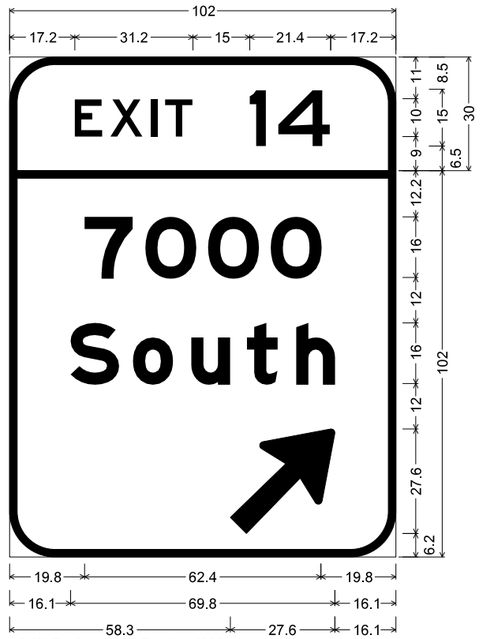
SHEET NO. SSDT-04

9/6/2016 2:33:50 PM pw:\\pw.horrocks.com\PWPrimary\Documents\Projects\2016\PG-858-1604 Bangerter 4 Interchanges PM\12566\Sheet_Files\Signing_Striping\12566_SSDT-04.dgn



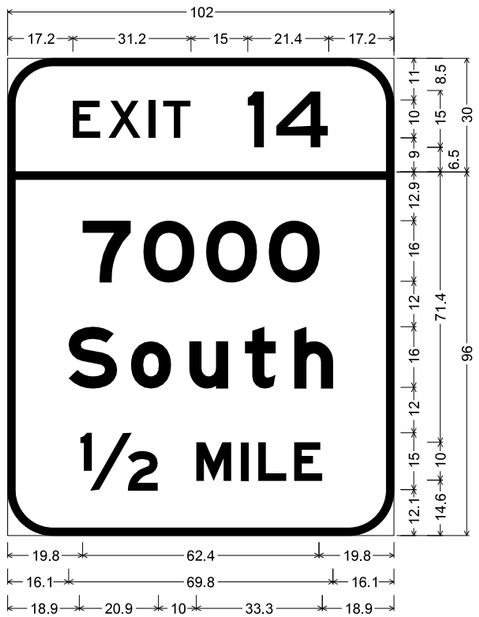
GS4-2a Overhead EXIT ONLY Fractional Mile Advance Guide Signs;
6.00" Radius, 2.00" Border, White on Green;
[EXIT 13] E;
12.00" Radius, 2.00" Border, White on Green;
MS1-5-36b Utah Route 2 Digit 12" D; [7800 South] E Mod; [¼ MILE] E;
12.00" Radius, 1.25" Border, 0.75" Indent, Black on Yellow;
[EXIT] E Mod; Down Arrow 22.00" 270°; [ONLY] E Mod;

SIGN STRUCTURE FOR THIS SIGN SHALL BE CONSTRUCTED TO ACCOMMODATE FUTURE FREEWAY SIZE SIGN. SEE SHEET SSDT-10 FOR THE SIZE OF THE SIGN THAT THE OVERHEAD SIGN STRUCTURE SHALL BE DESIGNED TO ACCOMMODATE.



12.0" Radius, 2.0" Border, White on Green;
[EXIT 14] E;
12.0" Radius, 2.0" Border, White on Green;
[7000] E Mod; [South] E Mod;
Arrow Custom - 35.6" 45°;

SIGN STRUCTURE FOR THE NORTHBOUND SIGN SHALL BE CONSTRUCTED TO ACCOMMODATE FUTURE FREEWAY SIZE SIGN. SEE SHEET SSDT-07 FOR THE SIZE OF THE SIGN THE OVERHEAD SIGN STRUCTURE SHALL BE DESIGNED TO ACCOMMODATE. SEE SSDT-13 FOR SIGN STRUCTURE LOCATION DETAILS FOR THE NORTHBOUND SIGN. SOUTHBOUND SIGN SHALL BE INSTALLED ON AN OVERHEAD SIGN STRUCTURE. SOUTHBOUND STRUCTURE SHALL BE LOCATED OUTSIDE OF THE JORDAN AQUEDUCT EASEMENT. DESIGN SOUTHBOUND OVERHEAD STRUCTURE TO ACCOMMODATE THIS SIGN (ACCOMMODATION OF FUTURE FREEWAY SIGNING NOT REQUIRED).



12.0" Radius, 2.0" Border, White on Green;
[EXIT 14] E;
12.0" Radius, 2.0" Border, White on Green;
[7000] E Mod; [South] E Mod; [½] E Mod;
[MILE] E Mod;

SOUTHBOUND SIGN SHALL BE INSTALLED ON AN OVERHEAD SIGN STRUCTURE. REFER TO SSDT-13 FOR SIGN STRUCTURE LOCATION DETAILS.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
CHECKED BY QC KGA
DATE MM/DD/YY

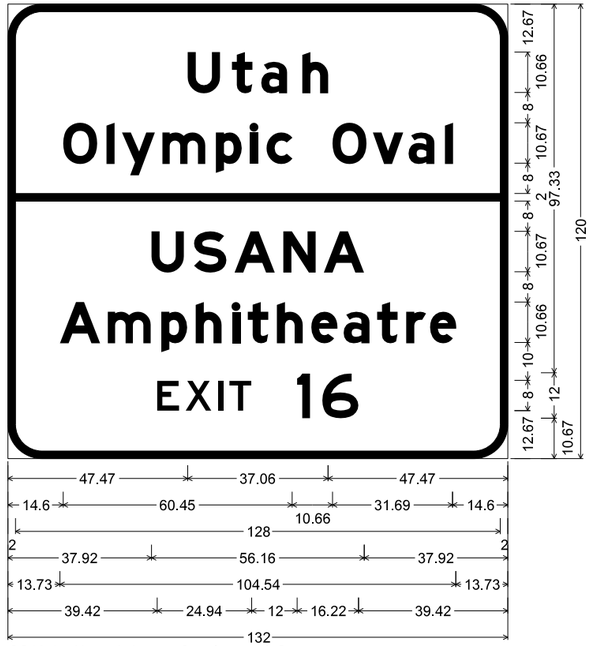
APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566

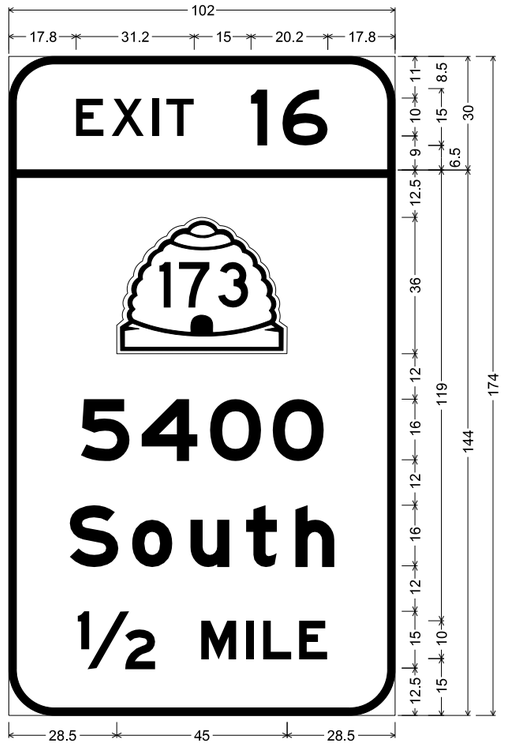
SIGN DETAILS

SHEET NO. SSDT-05

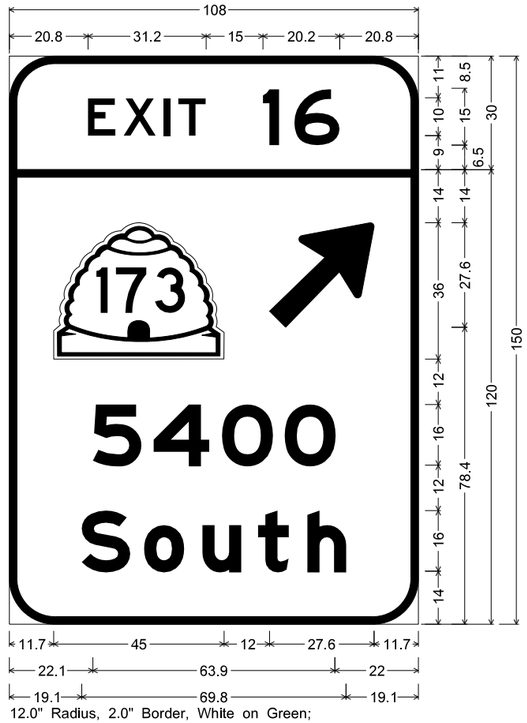
9/6/2016 2:33:54 PM pw2\ow.horrocks.com\PWPrimary\Documents\Projects\2016\PG-858-1604 Bangerter 4 Interchanges PM\12566\Sheet_Files\Signing_Str\dnp\12566_SSDT-05.dgn



GS16-1a Named Airport Supplemental Sign;
9.00" Radius, 2.00" Border, White on Brown;
[Utah] E Mod; [Olympic Oval] E Mod 70% spacing;
[USANA] E Mod; [Amphitheatre] E Mod 70% spacing; [EXIT 16] E;

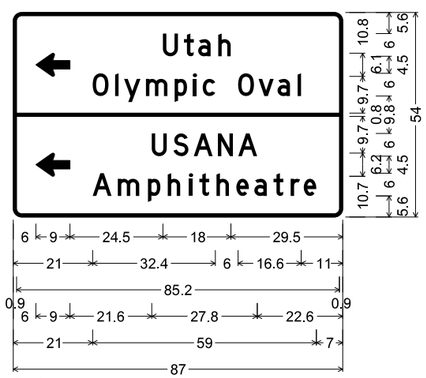


12.0" Radius, 2.0" Border, White on Green;
[EXIT 16] E;
12.0" Radius, 2.0" Border, White on Green;
MS1-5-36c Utah Route 3 Digit 12" D; [5400] E Mod;
[South] E Mod; [½] E Mod; [MILE] E Mod;

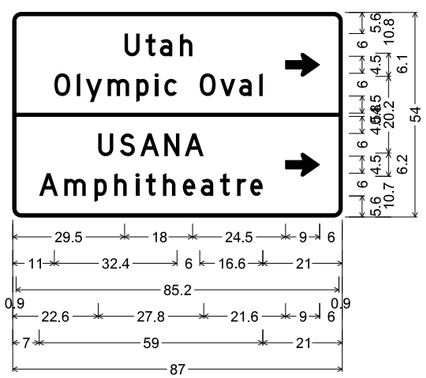


12.0" Radius, 2.0" Border, White on Green;
[EXIT 16] E;
12.0" Radius, 2.0" Border, White on Green;
MS1-5-36c Utah Route 3 Digit 12" D;
Arrow Custom - 35.6" 45°; [5400] E Mod;
[South] E Mod;

SIGN STRUCTURE FOR THE NORTHBOUND SIGN SHALL BE CONSTRUCTED TO ACCOMMODATE FUTURE FREEWAY SIZE SIGN. SEE SHEET SSDT-08 FOR THE SIZE OF THE SIGN THE OVERHEAD SIGN STRUCTURE SHALL BE DESIGNED TO ACCOMMODATE. SEE SSDT-13 FOR SIGN STRUCTURE LOCATION DETAILS FOR THE NORTHBOUND SIGN. SOUTHBOUND SIGN MAY BE GROUND MOUNTED.



D1-3;
2.3" Radius, 0.9" Border, White on Brown;
Standard Arrow Custom 9.0" X 6.1" 180°;
[Utah] D; [Olympic Oval] D;
Standard Arrow Custom 9.0" X 6.1" 180°;
[USANA] D 120% spacing;
[Amphitheatre] D 120% spacing;



D1-3;
2.3" Radius, 0.9" Border, White on Brown;
[Utah] D; [Olympic Oval] D;
Standard Arrow Custom 9.0" X 6.1" 0°;
[USANA] D 120% spacing;
[Amphitheatre] D 120% spacing;
Standard Arrow Custom 9.0" X 6.1" 0°;

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: KGA
DATE: MM/DD/YY

APPROVED
PROFESSIONAL ENGINEER

4 INTERCHANGES ON
BANGERTER HIGHWAY

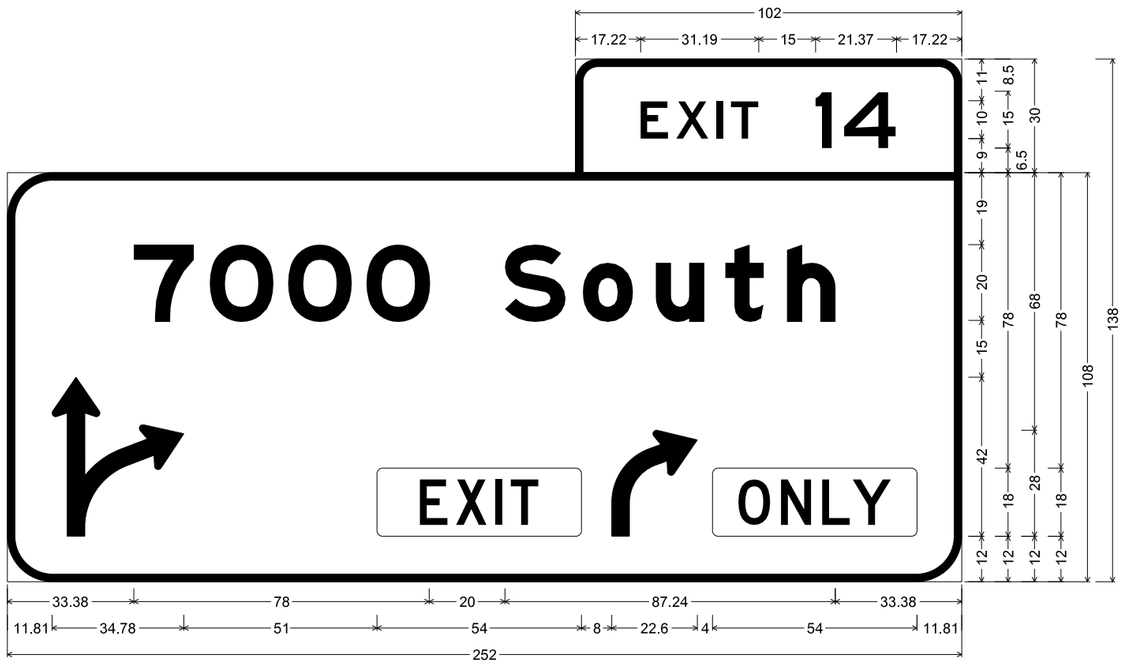
PROJECT
PROJECT NUMBER: S-0154(12)11
PIN: 12566

SIGN DETAILS

SHEET NO. SSDT-06

9/6/2016 2:33:57 PM pw2:\\pw.horrocks.com\PWPrimary\Documents\Projects\2016\PG-858-1604 Bangerter 4 Interchanges PM\12566\Sheet_Files\Signing_Stripping\12566_SSDT-06.dgn

DO NOT CONSTRUCT SIGN SHOWN BELOW. FOR REFERENCE ONLY. FUTURE FREEWAY SIGN - ALL OVERHEAD SIGN STRUCTURES SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE FUTURE FREEWAY SIZED SIGNING.



GS2-2a Non-System Overhead Arrow-per-Lane Fractional Mile Advance Guide Sign for a Two Lane Exit with an Option Lane;
6.00" Radius, 2.00" Border, White on Green;
[EXIT 14] E;
12.00" Radius, 2.00" Border, White on Green;
[7000 South] E Mod; 42" Through Right Arrow; 54"x18" B/FY Panel; "EXIT" 12" D; 28" Right Turn Arrow;
54"x18" B/FY Panel; "ONLY" 12" D;

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY KGA
DATE MM/DD/YY

APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566

SIGN DETAILS

SHEET NO. SSDT-07

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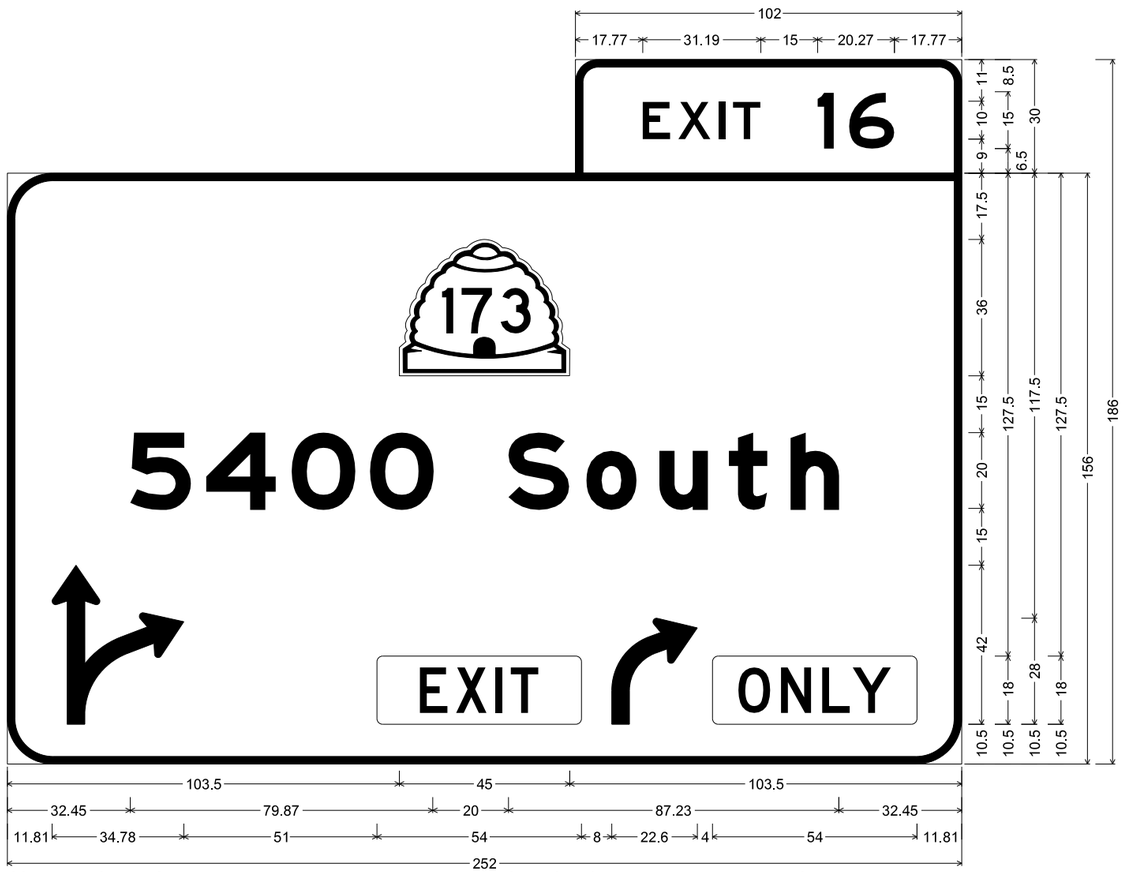
DO NOT CONSTRUCT SIGN SHOWN BELOW. FOR REFERENCE ONLY. FUTURE FREEWAY SIGN - ALL OVERHEAD SIGN STRUCTURES SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE FUTURE FREEWAY SIZED SIGNING.



GS2-2a Non-System Overhead Arrow-per-Lane Fractional Mile Advance Guide Sign for a Two Lane Exit with an Option Lane;
6.00" Radius, 2.00" Border, White on Green;
[EXIT 16] E;
12.00" Radius, 2.00" Border, White on Green;
MS1-5-36c Utah Route 3 Digit 12" D; [5400 South] E Mod; 42" Through Right Arrow; 54"x18" B/FY Panel; "EXIT" 12" D;
28" Right Turn Arrow; 54"x18" B/FY Panel; "ONLY" 12" D;

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: KGA
DATE: MM/DD/YY

APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11 PIN 12566
SHEET NO. SSDT-08
SIGN DETAILS

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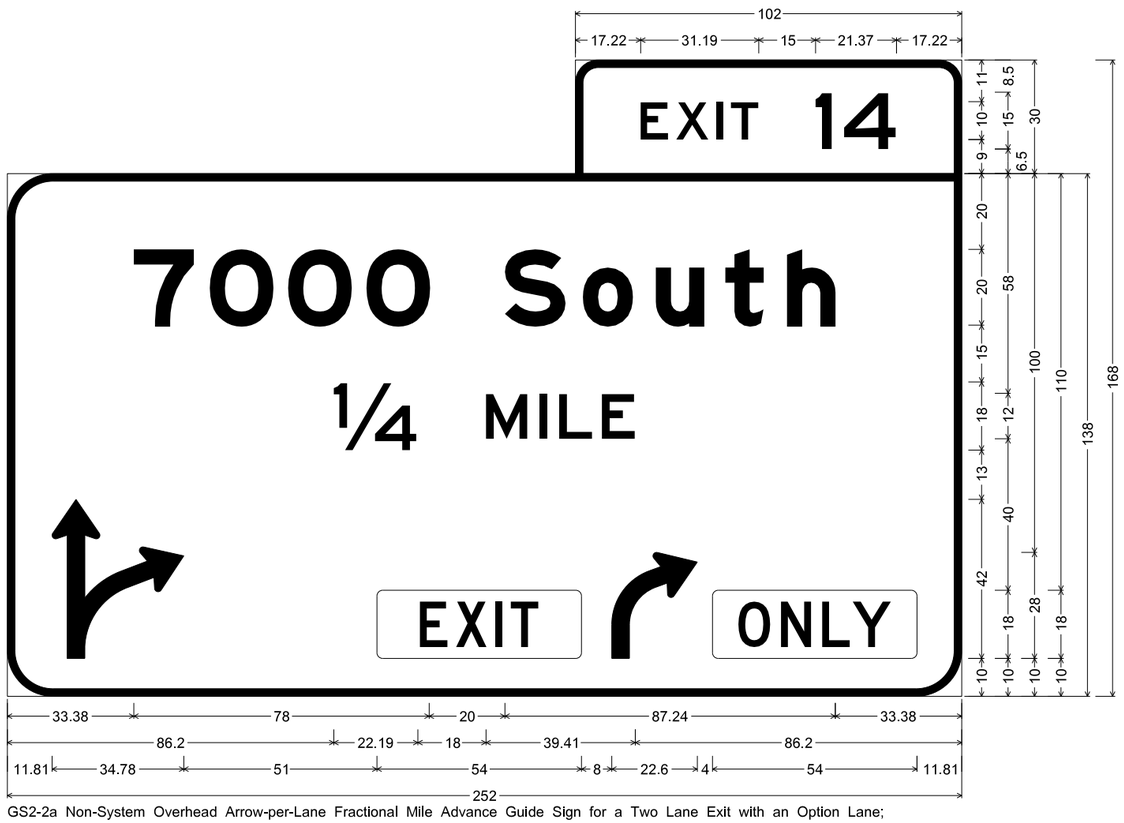

GS2-2a Non-System Overhead Arrow-per-Lane Fractional Mile Advance Guide Sign for a Two Lane Exit with an Option Lane;
6.00" Radius, 2.00" Border, White on Green;
[EXIT 14] E;
12.00" Radius, 2.00" Border, White on Green;
[7000 South] E Mod; [¼ MILE] E; 42" Through Right Arrow; 54"x18" B/FY Panel; "EXIT" 12" D; 28" Right Turn Arrow;
54"x18" B/FY Panel; "ONLY" 12" D;

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY KGA
DATE MM/DD/YY

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PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PIN 12566
PROJECT NUMBER S-0154(12)11
SIGN DETAILS
SHEET NO. SSDT-09

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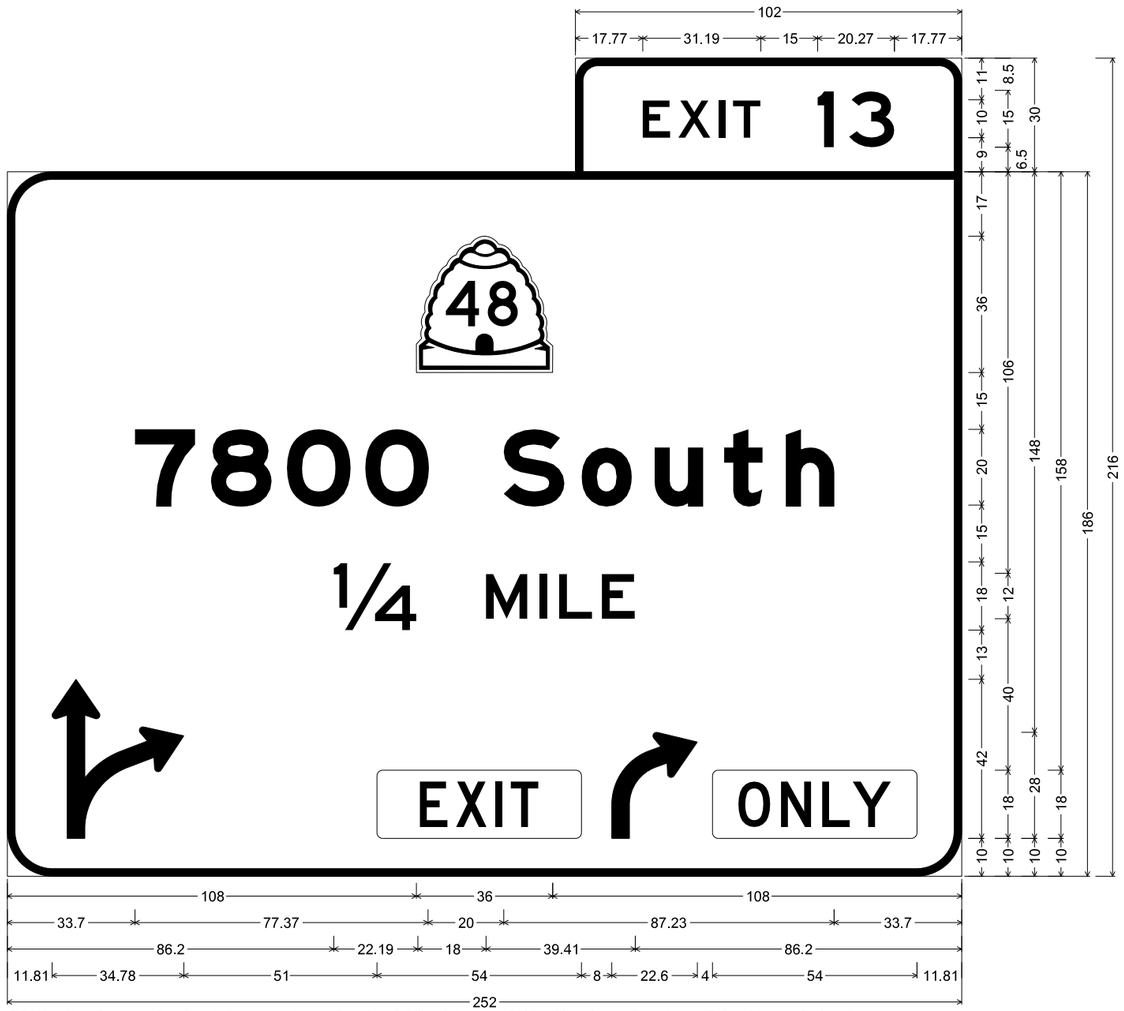
DO NOT CONSTRUCT SIGN SHOWN BELOW. FOR REFERENCE ONLY. FUTURE FREEWAY SIGN - ALL OVERHEAD SIGN STRUCTURES SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE FUTURE FREEWAY SIZED SIGNING.



GS2-2a Non-System Overhead Arrow-per-Lane Fractional Mile Advance Guide Sign for a Two Lane Exit with an Option Lane;
6.00" Radius, 2.00" Border, White on Green;
[EXIT 13] E;
12.00" Radius, 2.00" Border, White on Green;
MS1-5-36b Utah Route 2 Digit 12" D; [7800 South] E Mod; [¼ MILE] E; 42" Through Right Arrow;
54"x18" B/FY Panel; "EXIT" 12" D; 28" Right Turn Arrow; 54"x18" B/FY Panel; "ONLY" 12" D;

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
QC CHECKED BY KGA
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APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11 PIN 12566
SIGN DETAILS
SHEET NO. SSDT-10

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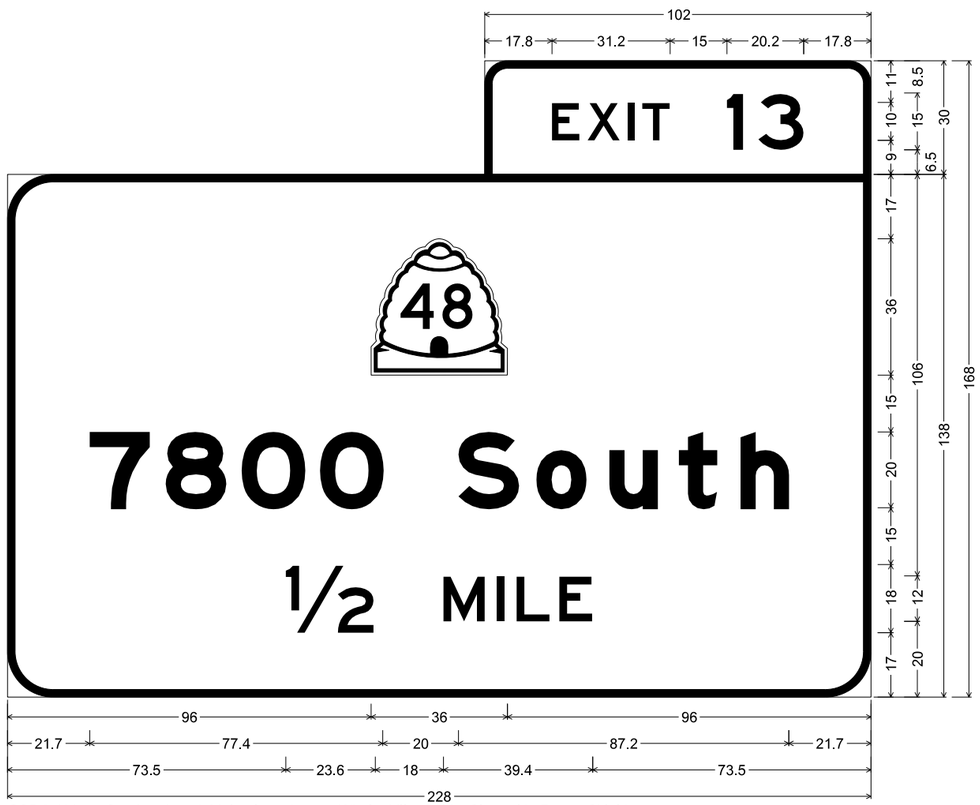
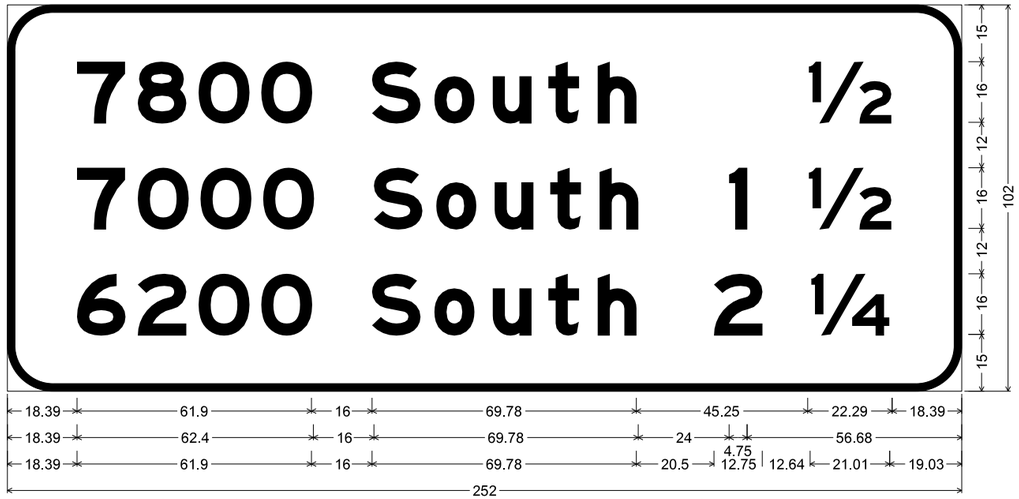


GS5-3 Urban Overhead and Major Interchange Whole Mile Guide Sign with Route Shield;
6.0" Radius, 2.0" Border, White on Green;
[EXIT 13] E;
12.0" Radius, 2.0" Border, White on Green;
MS1-5-36b Utah Route 2 Digit 12" D; [7800 South] E Mod; [½ MILE] E;

DO NOT CONSTRUCT SIGN SHOWN BELOW. FOR REFERENCE ONLY. FUTURE FREEWAY SIGN - ALL OVERHEAD SIGN STRUCTURES SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE FUTURE FREEWAY SIZED SIGNING.



GS15-1a Interchange Sequence Sign without Route Shield; 12.00" Radius, 2.00" Border, White on Green;
[7800 South] E Mod; [1½] E Mod; [7000 South] E Mod; [1] E Mod; [1½] E Mod; [6200 South] E Mod; [2] E Mod; [¼] E Mod;

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY KKH
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APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: PIN 12566 S-0154(12)11
SIGN DETAILS
SHEET NO. SSDT-11

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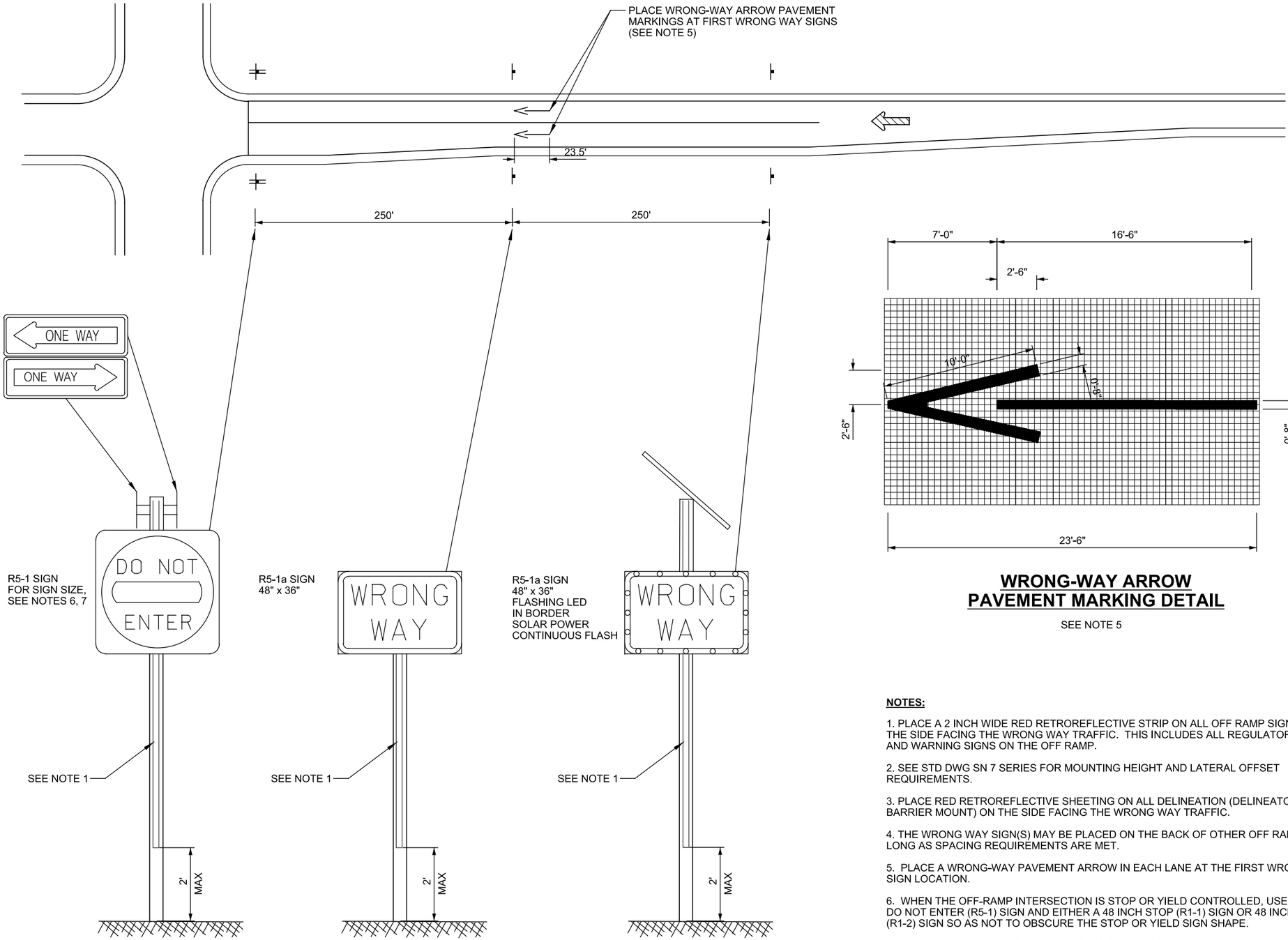

WRONG-WAY ARROW PAVEMENT MARKING DETAIL

SEE NOTE 5

NOTES:

1. PLACE A 2 INCH WIDE RED RETROREFLECTIVE STRIP ON ALL OFF RAMP SIGN POSTS ON THE SIDE FACING THE WRONG WAY TRAFFIC. THIS INCLUDES ALL REGULATORY, GUIDE, AND WARNING SIGNS ON THE OFF RAMP.

2. SEE STD DWG SN 7 SERIES FOR MOUNTING HEIGHT AND LATERAL OFFSET REQUIREMENTS.

3. PLACE RED RETROREFLECTIVE SHEETING ON ALL DELINEATION (DELINEATOR POST OR BARRIER MOUNT) ON THE SIDE FACING THE WRONG WAY TRAFFIC.

4. THE WRONG WAY SIGN(S) MAY BE PLACED ON THE BACK OF OTHER OFF RAMP SIGNS AS LONG AS SPACING REQUIREMENTS ARE MET.

5. PLACE A WRONG-WAY PAVEMENT ARROW IN EACH LANE AT THE FIRST WRONG WAY SIGN LOCATION.

6. WHEN THE OFF-RAMP INTERSECTION IS STOP OR YIELD CONTROLLED, USE A 36 INCH DO NOT ENTER (R5-1) SIGN AND EITHER A 48 INCH STOP (R1-1) SIGN OR 48 INCH YIELD (R1-2) SIGN SO AS NOT TO OBSCURE THE STOP OR YIELD SIGN SHAPE.

7. WHEN THE OFF-RAMP INTERSECTION IS SIGNAL CONTROLLED, USE A 48 INCH DO NOT ENTER (R5-1) SIGN.

REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

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PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11 PIN 12566

SIGN DETAILS

SHEET NO. SSDT-12

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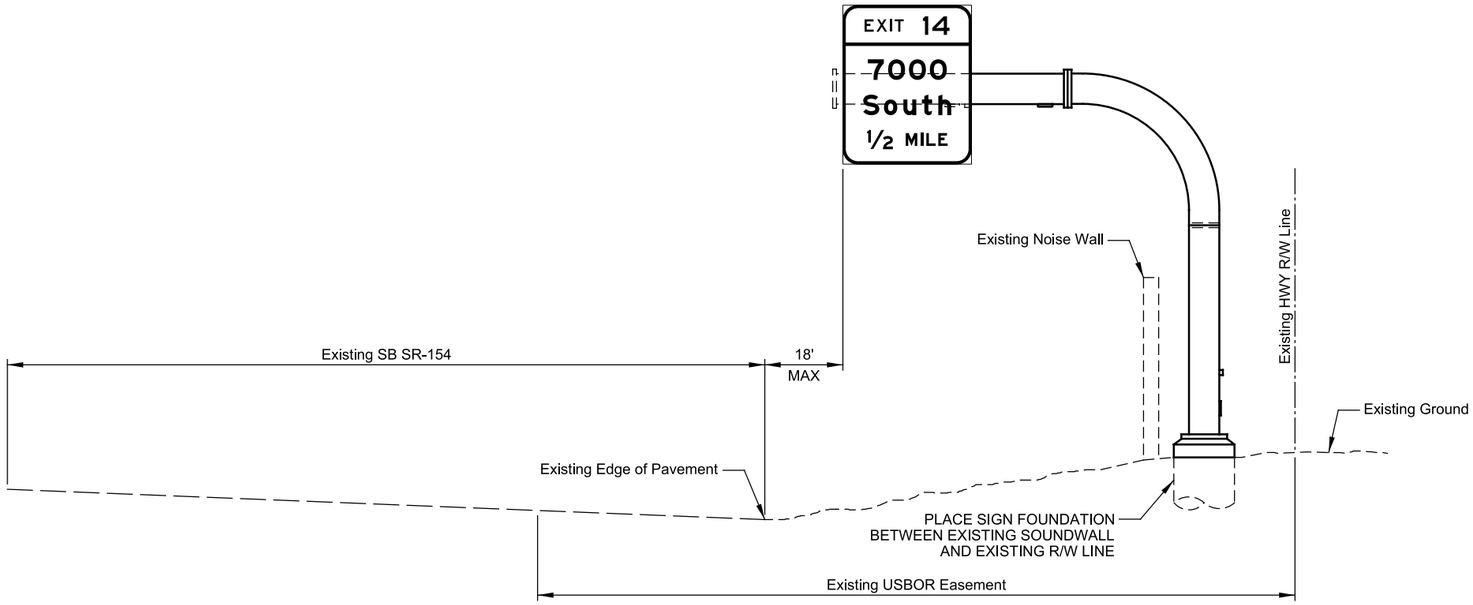
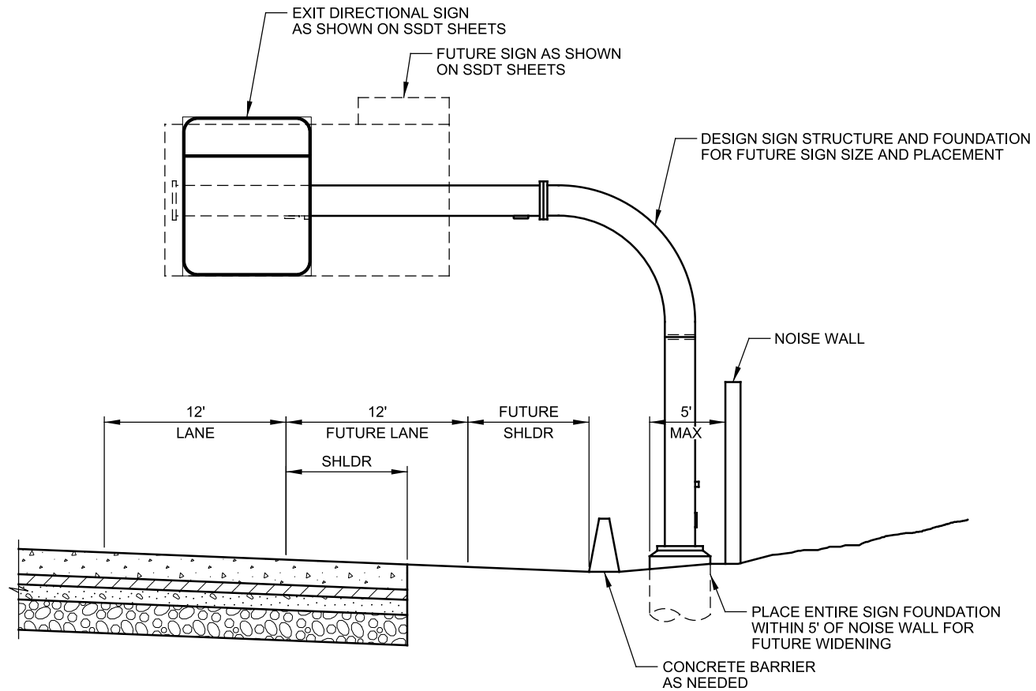


SOUTHBOUND OVERHEAD 1/2 MILE EXIT SIGN FOR 7000 SOUTH



OVERHEAD SIGNS TO ACCOMMODATE FUTURE WIDENING AT NORTHBOUND 7000 SOUTH EXIT AND AT NORTHBOUND 5400 SOUTH EXIT

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

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KKH	KGA		

DATE: MM/DD/YY

PROFESSIONAL ENGINEER

PROJECT	PIN
4 INTERCHANGES ON BANGERTER HIGHWAY	12566

PROJECT NUMBER: S-0154(12)11

SIGN DETAILS

SHEET NO. SSDT-13

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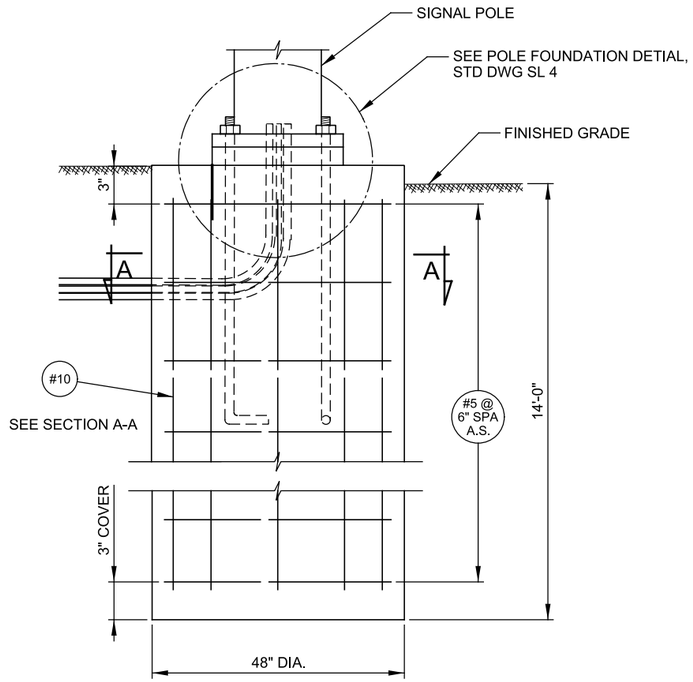
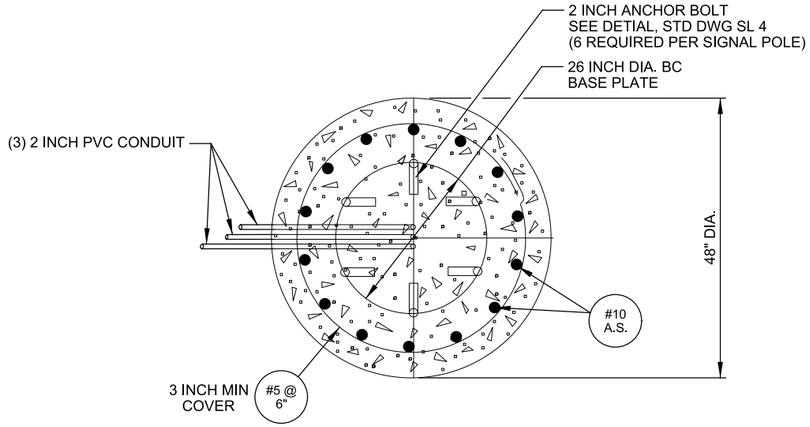


80' - 85' MAST ARM POLE FOUNDATION



SECTION A-A

PRELIMINARY
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UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

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QC CHECKED BY	KGA
MM/DD/YY (DATE)	

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PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY

PROJECT NUMBER: S-0154(12)11 PIN 12566

SIGNAL POLE FOUNDATION DETAIL

SHEET NO. SG-01

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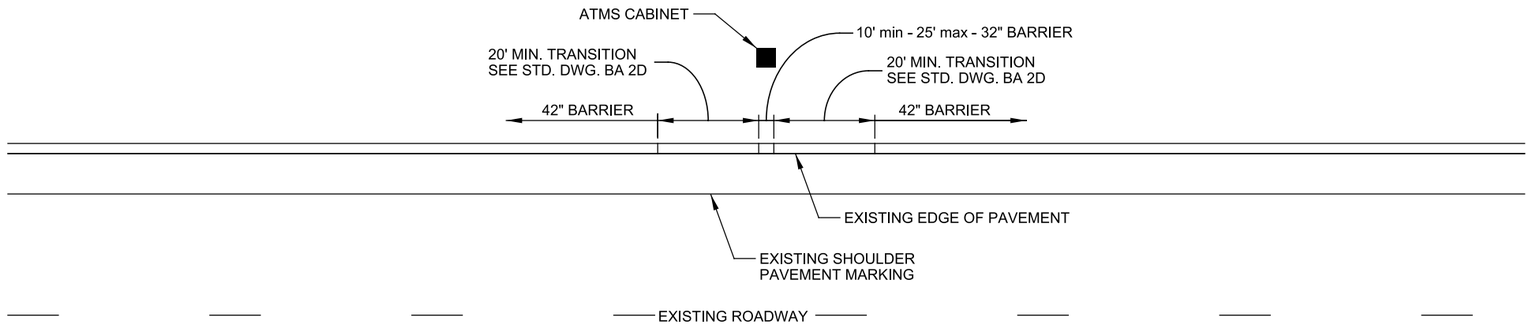
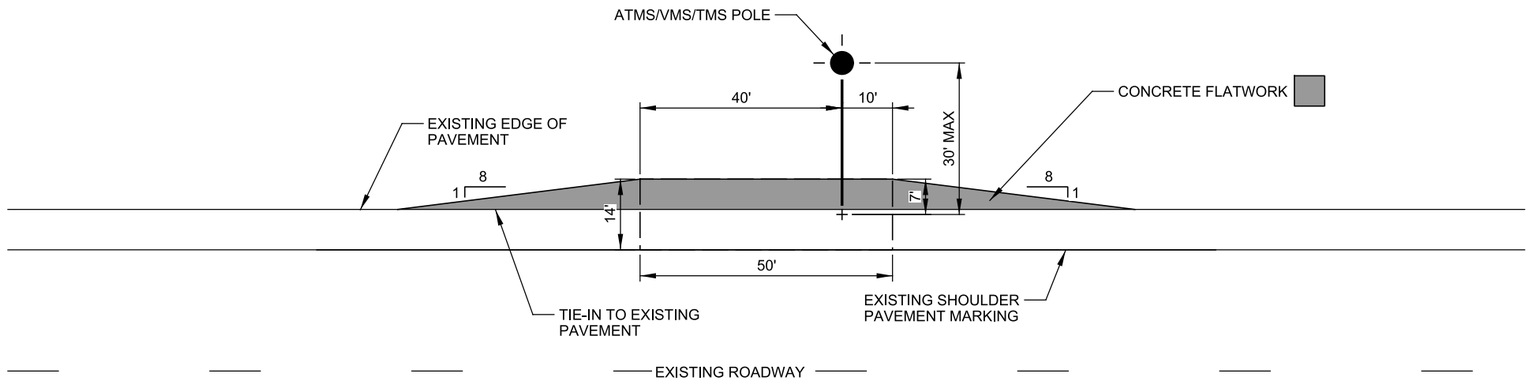


ATMS BARRIER



ATMS MAINTENANCE ACCESS

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY: CMC
DATE: MM/DD/YY
APPROVED
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566
ATMS DETAIL

SHEET NO. ATDT-01

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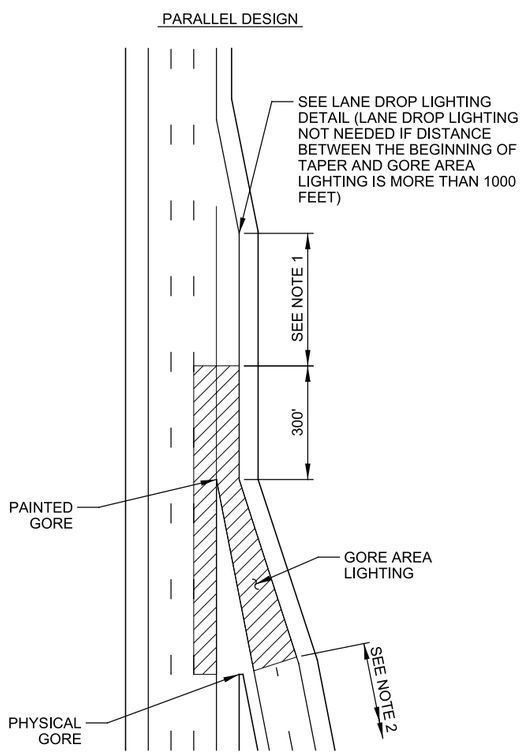
ON-RAMP LIGHTING AREAS

PARALLEL DESIGN



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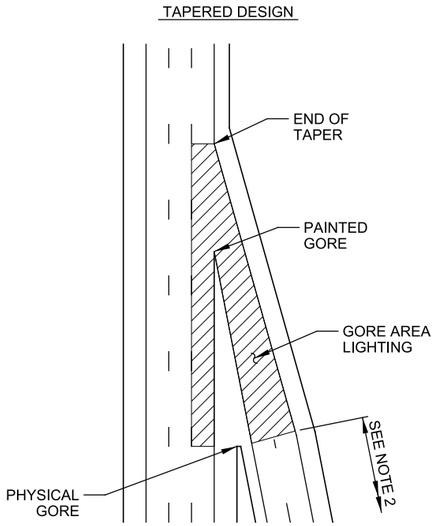

OFF-RAMP LIGHTING AREAS

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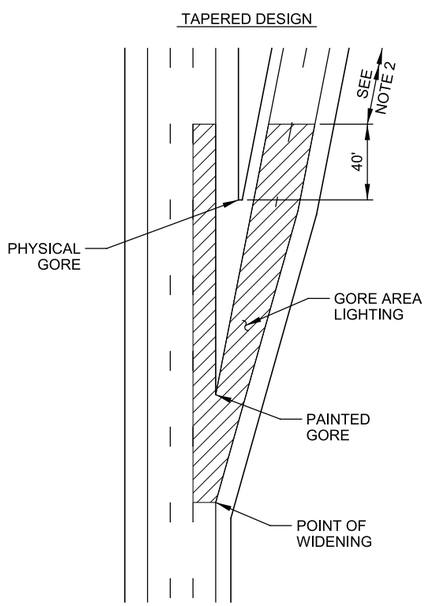

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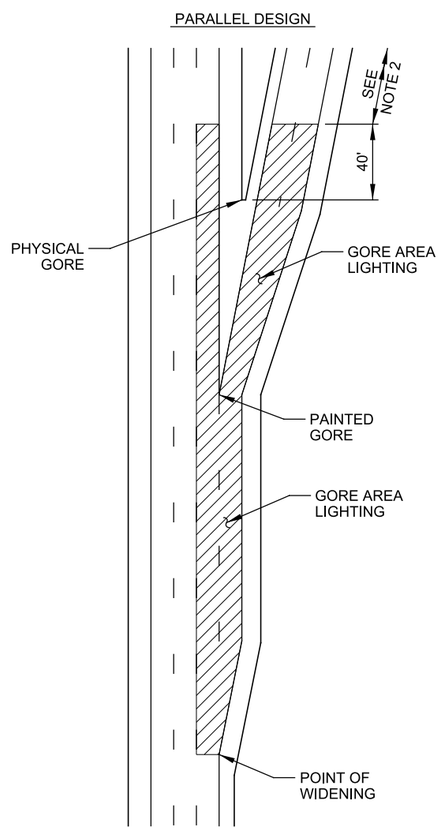
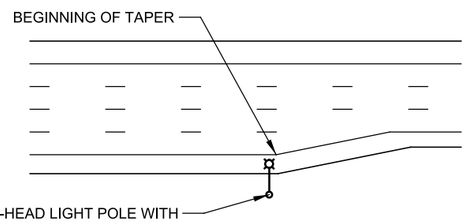


LANE DROP LIGHTING DETAIL



RAMP TERMINAL INTERSECTION LIGHTING AREAS

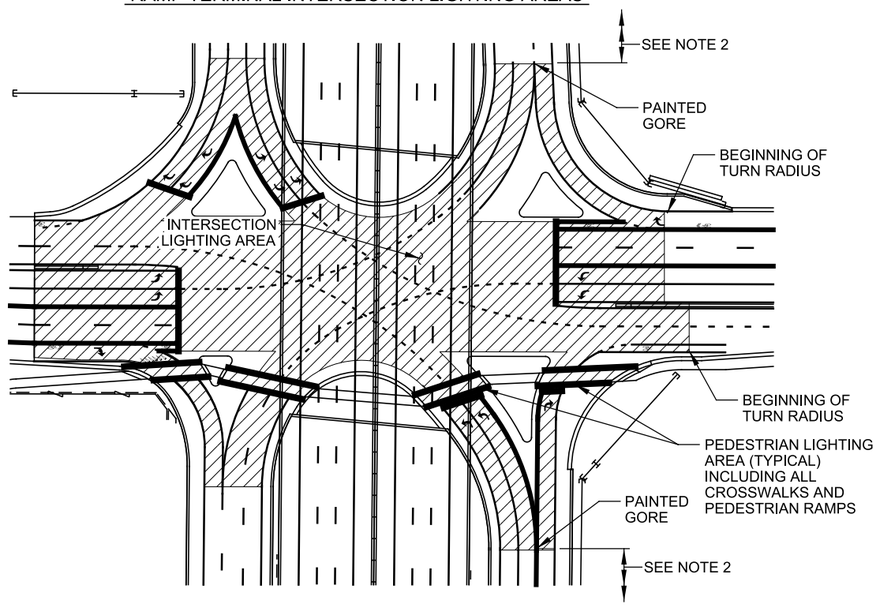


TABLE 1 LIGHTING CALCULATION REQUIREMENTS

Location	Pavement Type	E_{avg} (fc)	EV_{min} (fc)	Max. Uniformity Ratio (E_{avg}/E_{min})	Method
Pedestrian Crosswalks	HMA/PCC	0.5	0.2	4.0	Illuminance
Partial Interchange Lighting (On-ramp Lighting Areas, Off-Ramp Lighting Areas, Lane Drop Lighting, Ramp Terminal Intersections)	HMA/PCC	0.9	N/A	3.0	Illuminance
Mainline Bangerter Highway Through the Vertical Sag Curve at 11400 South	HMA/PCC	0.4	N/A	3.0	Illuminance

E_{avg} - minimum maintained average horizontal illuminance at pavement

EV_{min} - minimum vertical illuminance at 1.5m above pavement

E_{min} - minimum horizontal illuminance at pavement

LEGEND

MEET REQUIRED LIGHTING AND PROVIDE LIGHTING CALCULATIONS IN ACCORDANCE WITH TABLE 1

NOTES:

1. EXTEND THE LIGHTING AREA ON BANGERTER HWY TO PROVIDE CONTINUOUS AND UNIFORM LIGHTING IF THE DISTANCE BETWEEN THE GORE LIGHTING AREA AND THE ADJACENT LANE DROP LIGHTING OR ADJACENT GORE LIGHTING AREA IS LESS THAN 1000 FEET.
2. EXTEND THE LIGHTING AREA ON RAMPS TO PROVIDE CONTINUOUS AND UNIFORM LIGHTING IF THE DISTANCE BETWEEN THE INTERSECTION LIGHTING AREA AND ADJACENT LANE DROP LIGHTING OR GORE AREA LIGHTING IS LESS THAN 500 FEET.

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NOT FOR CONSTRUCTION

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED
PROFESSIONAL ENGINEER

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ALD	KGA		

MM/DD/YY
DATE

4 INTERCHANGES ON BANGERTER HIGHWAY - 7000 SOUTH

PROJECT

PROJECT NUMBER: S-0154(12)11

PIN: 12566

PARTIAL INTERCHANGE LIGHTING REQUIREMENTS

SHEET NO. LTDT-01

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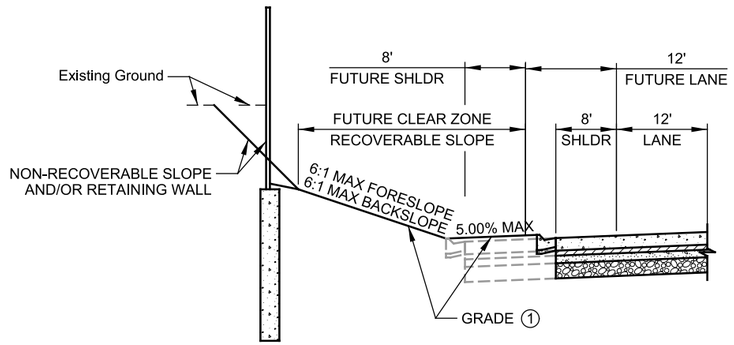
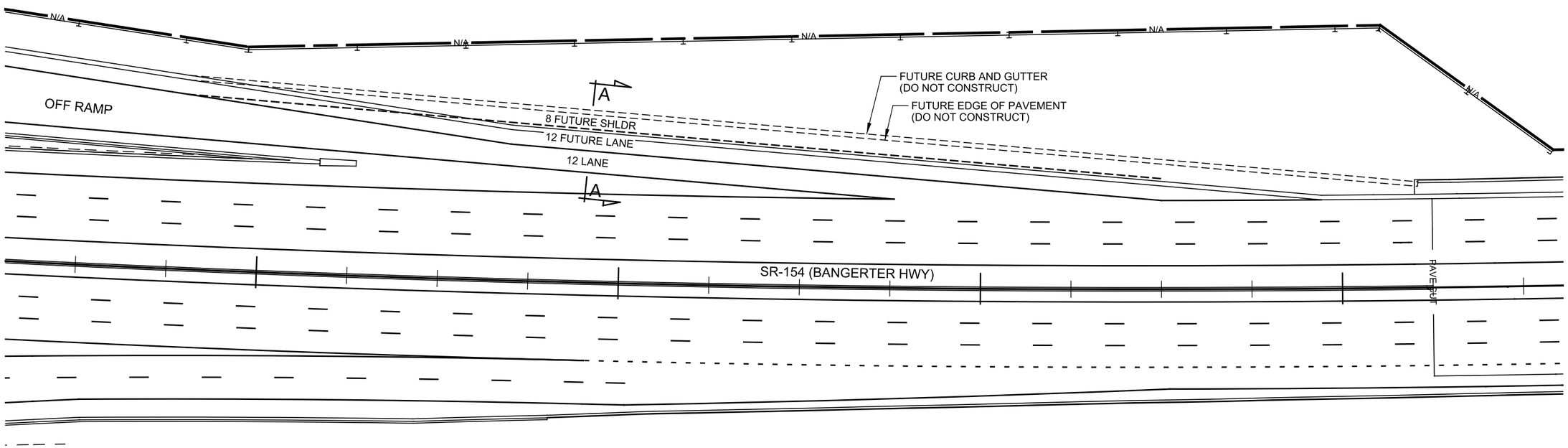


SECTION A-A



OFF RAMP GRADING FOR FUTURE LANE

NOTES:

1. PROVIDE GRADING FOR FUTURE LANE, SHOULDER, AND CLEAR ZONE.
2. DETAIL APPLIES TO ALL INTERCHANGES EXCEPT 5400 SOUTH SOUTHBOUND OFF RAMP. 9000 SOUTH SOUTHBOUND SHOWN OTHER RAMPS SIMILAR.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
CHECKED BY: DLC
QC
APPROVED
PROFESSIONAL ENGINEER
DATE: MM/DD/YY

4 INTERCHANGES ON
BANGERTER HIGHWAY

PROJECT
PROJECT NUMBER: S-0154(12)11
PIN: 12566

DETAIL

SHEET NO. DT-01

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7000 SOUTH

SEC

r/w

l/a

pe

1/4

Existing Jordan Aqueduct Easement
Existing HWY R/W & L/A LIne

CONSTRUCT PEDESTRIAN BRIDGE
LANDGING / RAMP ON PARCEL 565

Existing Jordan Aqueduct Easement

SR-154 (BANGERTER HWY)

CONSTRUCT PEDESTRIAN BRIDGE
LANDING / RAMP ON PARCEL 562

PEDESTRIAN BRIDGE AT 7000 SOUTH INTERCHANGE

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

DRAWN BY: KKH
QC CHECKED BY:
APPROVED: MM/DD/YY DATE
PROFESSIONAL ENGINEER

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11 PIN 12566
DETAILS

SHEET NO. DT-02

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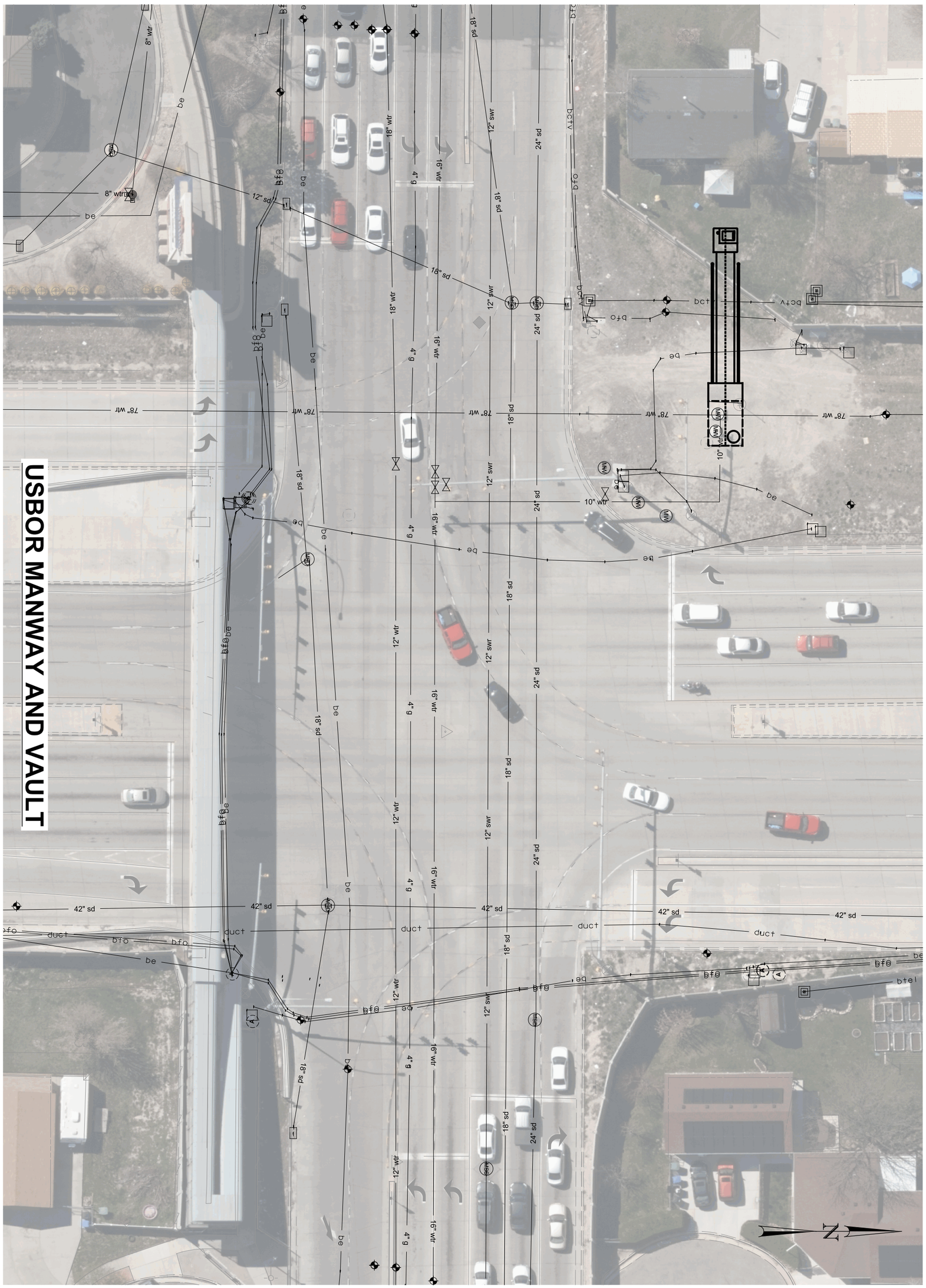
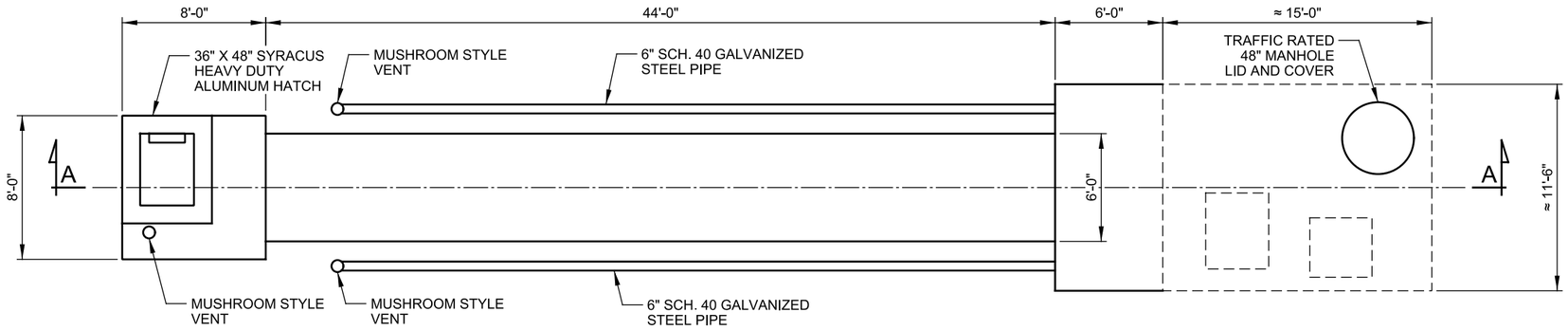
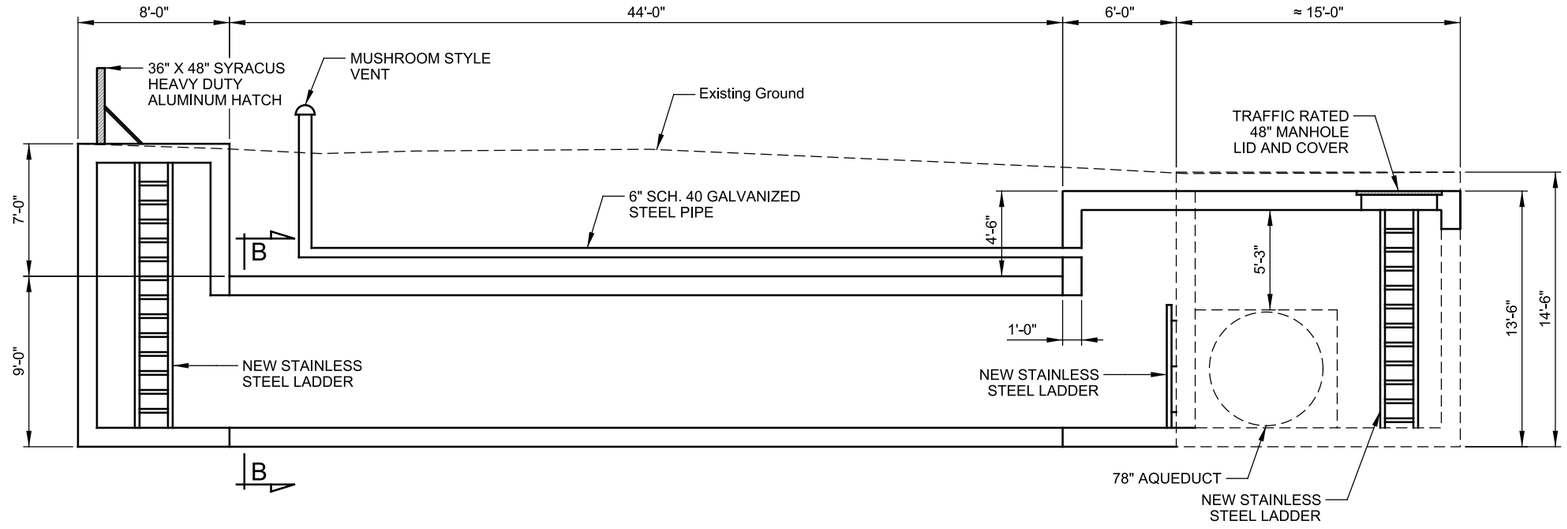


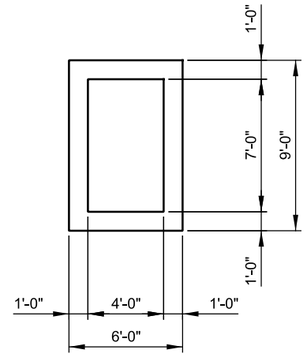
SHEET NO. DT-03	PROJECT	4 INTERCHANGES ON BANGERTER HIGHWAY	**UTAH DEPARTMENT OF TRANSPORTATION** REGION 2 - HORROCKS ENGINEERS			REVISIONS	
	PROJECT NUMBER	S-0154(12)11 PIN 12566	APPROVED	DRAWN BY KKH		NO. DATE APPROVED BY	REMARKS
	DETAILS		PROFESSIONAL ENGINEER MM/DD/YY DATE	QC CHECKED BY DLC			



PLAN



SECTION A - A



SECTION B - B

USBOR MANWAY AND VAULT

REVISIONS				
NO.	DATE	APPROVED BY	REMARKS	

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - HORROCKS ENGINEERS

APPROVED
PROFESSIONAL ENGINEER

DRAWN BY	KKH
QC CHECKED BY	DLC
DATE	MM/DD/YY

PROJECT: 4 INTERCHANGES ON BANGERTER HIGHWAY
PROJECT NUMBER: S-0154(12)11
PIN: 12566
DETAILS

SHEET NO. DT-04

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RECLAMATION

Managing Water in the West

Engineering and O&M Guidelines for Crossings

Bureau of Reclamation Water Conveyance Facilities (Canals, Pipelines, and Similar Facilities)

U.S. Department of the Interior
Bureau of Reclamation
Technical Service Center
Denver, Colorado

April 2008

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Engineering and O&M Guidelines for Crossings

Bureau of Reclamation Water Conveyance Facilities (Canals, Pipelines, and Similar Facilities)

Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Official
AOE	authorized operating entity
AWWA	American Water Works Association
CFR	Code of Federal Regulations
CPS	cathodic protection system
DOT	Department of Transportation
HDD	horizontal directional drilling
kV	kilovolt(s)
MERL	Materials Engineering and Research Laboratory
O&M	operations and maintenance
Reclamation	Bureau of Reclamation
ROW	right-of-way
WB-67	67-foot wheelbase

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Appendix B Guidelines – Removal of Trees and Other Vegetative Growth from Earth Dams, Dikes, and Conveyance Features (Appendix B of *Review and Operation and Maintenance Program Field Examination Guidelines*)

1.0 PURPOSE

These are general guidelines for Bureau of Reclamation (Reclamation) offices to follow when reviewing the engineering and operations and maintenance (O&M) factors in outside entity requests for authorization to cross (encroach upon) Reclamation lands that contain project features such as levees, canals, pipelines, or other water conveyance facilities owned or administered by Reclamation. These guidelines include a general overview of the permitting process administered by Reclamation Lands Groups for allowing a particular use on lands where Reclamation holds a fee or an easement right-of-way interest. These engineering and construction recommendations are minimum guidelines for engineers to use in reviewing and evaluating these portions of the applications.

2.0 GENERAL PERMIT INFORMATION

Applicants requesting to cross any Reclamation land, facility, or water body must obtain a written land use authorization from Reclamation. Requirements for obtaining a use authorization to cross Reclamation project land and water surfaces are in the Code of Federal Regulations (CFR) at 43 CFR 429 and Reclamation Manual LND 08-01. The applicant must complete the *Standard Form (SF) 29*9, "**Application for Transportation and Utility Systems and Facilities on Federal Lands**," or similar forms in use at the local Reclamation office. The form can be obtained by contacting the involved Reclamation office, or it can be accessed electronically at Reclamation's Web site at: <http://www.usbr.gov/pmts/lands>.

Applicants can contact their local Reclamation office to discuss their proposed use before filing an application for a use authorization.

3.0 ENGINEERING AND O&M REVIEW CONSIDERATIONS

3.1 Introduction

Technical review of the crossing evaluates impacts on any existing Reclamation facility and **does not determine the adequacy of the crossing design for the applicant's intended purpose**.

The use authorization or consent document specifies criteria which, if followed, would not be deemed unreasonable interference. These review guidelines are strictly limited to those criteria which:

- Protect Reclamation's facility and/or appurtenant facility from damage
- Ensure unrestricted flow and quality of water in Reclamation's facility
- Do not diminish the ability to perform O&M of Reclamation's facility, including access
- Prevent any burden of liability

These guidelines are provided as recommendations that apply to most Reclamation facilities. Each Reclamation office and/or authorized operating entity (AOE) should apply these guidelines using **sound engineering judgment** that best applies to their facilities and existing conditions. Additional Reclamation guidelines for specific locations (e.g., Central Arizona Project Reach 11 Basin Guidelines) may also apply and may be provided to applicants when necessary. These guidelines are minimums, and local conditions may be more stringent depending on the direct impacts to facilities and lands. AOEs may have additional requirements.

Uses that may be deemed reasonable within Reclamation pipeline easements include greenbelts, asphalt roadways, flexible pavement parking lots, transverse curbs and gutters, and sidewalks. Canals and pipelines may have overhead power and telephone lines (but not their supporting poles), transverse fences with gated openings (no walls), and similar surface and overhead structures.

3.2 General

The following individual items should be addressed by the applicant and evaluated by Reclamation and/or AOE as they may affect the Reclamation facility's engineering and O&M aspects. If unusual conditions are proposed for the encroaching structure or unusual field conditions within a Reclamation facility right-of-way (ROW) are encountered, Reclamation reserves the right to impose more stringent criteria than prescribed in these guidelines.

1. Structures that should not be constructed on Reclamation pipeline or canal ROW (whether fee owned or easement) include foundations, buildings, garages, carports, trailers, street light standards, supports for large signs, walls, longitudinal fences (except security/safety fences), power or telephone poles, and similar surface structures.

2. Prior to construction, a joint inspection should be conducted and the condition of existing facilities documented. Reclamation's ROW should be restored to pre-existing conditions following completion of work.

3. When applications are requesting public use of trails and maintenance roads adjacent to or crossing Reclamation canals, these facilities should be fenced for safety to separate them from open canal water, except when Reclamation's ROW is used as a greenbelt and the applicant accepts legal hazard responsibility. Trails and maintenance roads should be fenced on an as-needed basis whenever such fencing is warranted for public safety, restricted access, security, etc. If a fence is allowed within Reclamation's ROW, Reclamation should approve the fence materials. Any gates allowed within Reclamation's ROW should be at least 16 feet wide. Reclamation will be provided with full access through any fences or gates.

4. Prior to construction of any structure that encroaches within a Reclamation pipeline or canal ROW, a "pothole excavation" should be made to determine the locations of any existing Reclamation and non-Reclamation facilities and their appurtenant features that may be affected. Potholing is the practice of digging test holes to expose underground utilities to determine the horizontal and vertical location of the utility.

   All work within 18 inches of the facility should be done using hand-held tools only. The excavation should be made by or in the presence of Reclamation and/or AOE personnel. The presence of a Reclamation and/or AOE inspector may be required throughout the excavation process, but this presence in no way relieves the applicant or their contractor of responsibility.

   The resultant elevation information should be delineated on the profile view and labeled as:

   POTHOLED ELEVATION XX.X
   Surface Elevation XX.X

   The pothole excavation should be filled in, or a safety fence installed, prior to departing the site each day.

5. If Reclamation facilities need to be modified to avoid adverse impacts from the applicant's crossing facility, the applicant should be responsible for the cost of such modifications.

6. A temporary permit may be required for visual inspections, ground and aerial surveys,[1] or potholing that requires physical entrance onto a Reclamation facility. **A use authorization or consent document issued by Reclamation and/or AOE should be obtained prior to entering or crossing Reclamation's ROW for any activity**.

7. Applications should include a project description, calculations, specifications, and detailed construction plans showing plan views, profiles and sections, and grading plans of proposed work within or adjacent to Reclamation's ROW. Plans should show an easily recognizable boundary (tied to a known corner) and Reclamation's ROW and Reclamation stationing or mile post designation.

   All Reclamation facilities should be shown and labeled (e.g., "Centerline of xx-inch Reclamation Pipeline," "Reclamation Communication and Control Cable," etc.) The type and weight of the construction equipment crossing Reclamation pipelines, roads, and bridges as well as the crossing locations should be included. Additional information, as identified in following individual specific feature sections of these guidelines, should also be included with the application for review.

   Any engineering or land survey drawing should contain the appropriate registered engineer's or land surveyor's stamp and signature. A construction schedule outlining the anticipated duration of the construction should be submitted. A minimum of two[2] copies of the application (including calculations, specifications, and plans) should be submitted to Reclamation and/or AOE for review and approval.

8. For crossings of all Reclamation facilities, Reclamation and/or AOE personnel familiar with the facilities (including cathodic protection systems) will obtain and provide copies of existing files showing information about existing buried facilities (center of pipeline, depth of cover, size of pipe, class of pipe, etc.) to the applicant.

9. Existing Reclamation facilities (e.g., canal lining, canal check structure, turnout structure, etc.) and appurtenances (e.g., existing blow-offs, air valves, vents, manholes, and/or cathodic protection test stations) and existing non-Reclamation facilities on Reclamation's ROW (e.g., petroleum pipelines, natural gas pipelines, communications lines, powerlines, water lines, sewer lines, storm drain lines, etc.) **should be protected** in place prior to and during construction.

[1] Aerial surveys require placing on-the-ground survey control markers.
[2] Revise per local Reclamation office and/or AOE practice.

The applicant and/or their contractor may be liable for all damages to Reclamation facilities and appurtenances as a result of construction and for any other damages or losses suffered by Reclamation or its water contractors, including power, irrigation, municipal and industrial water supply, and communication losses.

10. Trench excavation should comply with the most current Occupational Safety and Health Administration standards or Reclamation Health and Safety Standards, whichever are more stringent. Trench backfill should be placed in 4- to 6-inch lifts if hand compacted or no more than 8-inch lifts if power compacted. Trench backfill within Reclamation's ROW should be compacted to 95 percent relative compaction (ASTM D 698, Standard Proctor) (or 90 percent of ASTM D 1557). Mechanical compaction using heavy equipment (greater than 2,000 pounds) should not be used within 18 inches of the Reclamation pipeline. Flowable fill (or controlled low strength material) should be substituted for compacted pipe embedment under canals and may be used when crossing pipelines.

11. Erosion control measures, including re-vegetation, should be implemented after completing construction.

12. If existing drainage features are to be modified during construction, detailed drawings showing the proposed drainage replacement/ restoration should be submitted with the application for review and approval. The applicant is responsible for the care and handling of storm water runoff both during and after construction.

13. The applicant should not divert surface runoff[3] toward Reclamation canal or canal embankments. The 100-year storm[4] surface runoff should use detention basins outside of Reclamation's ROW. Lined drainage channels should be designed to transfer flow from the detention basins to the existing cross drainage facilities that drained the original area. Also refer to "4.4 Storm Water Cross Drainage."

14. Proposed temporary or permanent modifications to the existing cover over Reclamation pipelines should be subject to review and approval by Reclamation and/or AOE. Design parameters for roadway, parking lot, and driveway crossings over the pipe should also be subject to review and approval by Reclamation and/or AOE.

[3] Subdivision or commercial development on the uphill side of canals that pave large areas and have large roof areas will greatly increase peak storm runoff—most city development requires retention basins. Applicants should provide the same retention basins that are required for similar development projects.

[4] Revise per Reclamation field office for specific canal if a higher storm frequency is required.

15. When a Reclamation pipeline system being crossed has pipe with an "A" cover pipe designation (less than 5 feet of earth), the applicant is to analyze the crossing to show "A" pipe load carrying capability exists to meet their carrying requirements or replace the "A" pipe with pipe of sufficient load carrying capability.

16. Reclamation's ongoing O&M activities should not be disrupted during construction. The primary or secondary operating road should be kept available for Reclamation and/or AOE use at all times.

17. Detectable warning tape may be required over below-ground utilities. Refer to "3.3 Detectable Warning Tape."

18. The points where the proposed utilities enter and exit Reclamation's ROW should be plainly and permanently marked by sign posts extending 5 feet above grade. Applicants should provide sign posts directly above their utilities and at all angle points within Reclamation's ROW. The distance between adjacent sign posts should not exceed 500 feet. Sign posts should contain the name of owner/operator, contents of the pipeline, utility identification, and emergency contact telephone number. Sign posts for angle points that lie within roads or canals should be offset and have a reference noted. The locations of the sign posts should be shown on the plans.

19. Following completion of work, applicants should provide as-built drawings of their facilities on Reclamation's ROW. Reclamation as-built drawings are to be updated by the appropriate Reclamation office and/or AOE to reflect the crossing. As-built drawings may be maintained by the AOE, but should remain accessible to Reclamation upon request.

3.3 Detectable Warning Tape

Detectable warning tape may be required over below-ground utilities situated within Reclamation's ROW and should be a minimum of 18 inches above the utility and between 18 and 30 inches below the ground surface. Warning tapes should conform to the following specifications:

a. For potable water lines, the warning tape should be a 3-inch-wide blue detectable tape imprinted with "**CAUTION BURIED POTABLE WATER LINE**."

b. For nonpotable water lines, the warning tape should be a 3-inch-wide purple detectable tape imprinted with "**CAUTION BURIED NONPOTABLE WATER LINE**."

c. For sewer and storm drain lines, the warning tape should be a 3-inch-wide green detectable tape imprinted with "**CAUTION BURIED (type) LINE**."

d. For gas, oil, and steam chemical lines, the warning tape should be a 3-inch-wide yellow detectable tape imprinted with "**CAUTION BURIED (type) LINE**."

e. For telecommunications, telephone, and television conduit(s), the warning tape should be a 3-inch-wide orange detectable tape imprinted with "**CAUTION BURIED (type) CONDUIT**."

f. For electrical, street lighting, and traffic signal conduit(s), the warning tape should be a 3-inch-wide red detectable tape imprinted with "**CAUTION BURIED (type) CONDUIT**."

4.0 SPECIFIC FEATURE REVIEW GUIDELINES

4.1 Bridges

1. New bridge crossings (vehicular, pedestrian, and utility) should be perpendicular (between 70 and 90 degrees) to the centerline of the water conveyance facility and at locations approved by Reclamation and/or the AOE. Exceptions to the policy may be considered on an individual basis.

2. Public use bridges in urban areas should be spaced no closer together than 1/3 mile (about 4 blocks or 1,700 feet) apart. This is to ensure O&M operations are not overly restricted.

3. Bridge crossings should be of free span design. Consideration of any anticipated (known or ongoing) canal subsidence issues, anticipated raising of the canal lining, or anticipated increases in the canal's high water level should be made. The minimum vertical clearance between the bottom of the superstructure and the top of the canal lining should be 3 feet. For unlined canals, the vertical clearance may be measured to the high water level. If this minimum clearance is reduced by subsidence or by future Reclamation modifications to the canal lining, the minimum clearance should be re-established at the applicant's expense. The minimum horizontal clearance from the face of the abutment to the top of the canal lining should be 5 feet. For unlined canals, the horizontal clearance may be measured to the high water level.

These clearances are suggested to minimize impact on the canal section during construction and future inspections and O&M. Applicants may request to re-construct a canal section if Reclamation's operations are impacted by close construction during periods when the canal is normally unwatered. If so, vertical clearances may be reduced to 1 foot and horizontal clearance to 3 feet.

4. Canal O&M roads should intersect public roads at bridges at right angles for proper visibility. This may require the applicant to acquire additional ROW for use if the existing canal ROW is not sufficient. American Association of State Highway and Transportation Official (AASHTO) criteria for sight distances at the intersection of O&M roads and roadways at new bridges should be met to allow O&M vehicles to cross them safely.

5. Driving piles at concrete-lined canals should not be permitted. Any abutment foundation support piles, at concrete-lined canals, should be drilled and cast-in-place.

   At a minimum, the applicant's drilling and piling plan should include:

   - Drilling methods and equipment
   - Methods for preserving existing foundation material
   - Methods and equipment to determine the presence of quick soil conditions or scouring and caving
   - The proposed method for casing installation and removal if casings are used
   - Methods and equipment for accurately determining the depth of concrete and actual or theoretical volume placed

   At a minimum, the applicant's contingency plan should include:

   - Means to repair in a certain time
   - Minimum flows after event
   - Review of geotechnical conditions surrounding the pile locations
   - Assessment of how the proposed mitigations will address geotechnical conditions
   - Methods for restoring foundation material

- A list of material, equipment, and personnel with qualifications to be used during mitigation work

- A seal from a Professional Engineer on all relevant plans and drawings

6. The submitted plan drawings for the bridge should contain the following information:

    a. Superstructure, abutments, railings, embankments, and drainage, including details and sections

    b. Type of materials (concrete, steel, timber, etc.) used for different members

    c. Details of cast-in-place foundation piles, if any, on both sides of the canal

    d. The elevation of the bottom of the superstructure and the clearance between the top of the canal lining (or high water level if unlined canal) to the superstructure or bottom of deck slab, whichever is lowest

    e. Design loadings

    f. Design standards on which the bridge is based (AASHTO, etc.)

7. The calculations and specifications for the bridge should be submitted to Reclamation and/or AOE for review.

8. The right lane turn radius from the new road onto a Reclamation operating road should comply with the provisions of a 67-foot wheelbase[5] (WB-67) truck turning template in the AASHTO manual on Geometric Design of Highway and Streets.

9. Details of any proposed utilities to be attached to an existing bridge include:

    a. Anchor bolt locations should not intercept the critical reinforcing steel of the bridge.

[5] The field office should adjust these provisions according to anticipated needs.

b. Utilities should be placed and anchored under bridge decks and through utility openings, if they are present. The utility should be placed off center in the utility opening, if possible, to allow for future utility additions.

c. If an expansion joint is used in the pipeline, the joint should be placed near the bridge deck expansion joint.

d. Holes through bridge concrete or abutment and retaining walls for passage of utilities should be allowed by core drilling. The annular space between the utility and core hole surface should be completely filled with an elastomeric sealant to prevent loss of material or water piping from behind the wingwalls and abutments.

e. Submit calculations showing the effects of the weights of the proposed utilities on the load carrying capacity of the bridge for Reclamation review.

f. Intermediate supports for the utility should withstand the same seismic load considerations as the bridge.

g. Load limit signs should be placed adjacent to the bridge, as required under AASHTO criteria.

h. Beam guardrails should be installed at bridges and bridge approaches, as required under AASHTO criteria.

10. The applicant will be responsible for changes to Reclamation existing ROW; bridge O&M approach roads; existing fencing, gates, and signs; and the addition of new fencing, O&M gates, cattle guards, signs, etc.

4.2 Landscaping

1. No landscaping or other changes in ground surfaces within Reclamation pipeline and canal/lateral ROW should be made without advance written permission of Reclamation through the application process. Landscaping changes may (1) limit, prevent, or hamper O&M access; (2) increase the costs of operations and maintenance of the facility; (3) impact facility reliability; or (4) create a public nuisance or liability issue.

2. Open space with natural hiking trails and walkways may be permitted if vehicle access to Reclamation pipeline and appurtenant facilities for patrol and maintenance is provided.

3. The following may apply within Reclamation's ROW:

    a. The easement may be used as a greenbelt upon Reclamation approval.

    b. Ground cover and shrubs are permitted upon Reclamation approval.

    c. Trees and vines should not be allowed. See Appendix B of *Review of Operation and Maintenance Program Field Examination Guidelines* (reproduced as appendix B at the end of these guidelines).

4. All temporary or permanent changes in ground surfaces within Reclamation pipeline and canal ROW are considered encroaching structures and are handled as such. Earthfills and cuts on adjacent property should not encroach onto Reclamation pipeline and canal ROW. Excavations of adjacent property (even property not within Reclamation's purview) within the projection of the Reclamation embankment line may impact embankment stability and should be evaluated.

5. Permanent landscaping structures should not be allowed within the exterior limits of a Reclamation linear facility ROW (fee owned or easement).

6. Pressurized lawn and park sprinkler irrigation lines (3-inch maximum size) and isolation valves within Reclamation easements that run parallel to a Reclamation pipeline should be installed at least 15 feet from the edge of the Reclamation pipeline.

    Irrigating lawns and flower beds along canal embankments should not overwater the area or threaten the embankment stability.

4.3 Roadway Crossing

Note: This type of encroachment also includes parking areas and recreational trails.

1. The applicant should submit a grading plan as part of the application.

2. If the roadway crosses a Reclamation pipeline system that has a cover pipe designation of "A," refer to "3.2 General."

3. If the applicant intends to modify existing drainage features during construction, detailed drawings showing the proposed drainage replacement/restoration should be submitted with the application for review and approval. (Refer to "3.2 General.")

4. If the proposed roadway includes a bridge crossing over a Reclamation canal or pipeline, Reclamation and/or AOE should review and approve the vertical clearance and location of the abutments. (Refer to "4.1 Bridges.")

5. Streets, roads, or parking areas crossing Reclamation pipeline easements are permissible. All streets, roads, and parking surfaces are to be asphalt or other flexible pavement. Depressed curbs or driveways should be provided for Reclamation vehicular access when new roads cross Reclamation pipelines or canals.

6. Roadway ditch drainage should not be allowed to flow into the canal. Drainage should be retained and released in a controlled way to maintain peak discharges that are less than any peak historical runoff rate before these modifications. Applicants should direct drainage to an original sub-basin cross drainage culvert or overchute. (Refer to "3.2 General" and "4.4 Storm Water Cross Drainage.")

7. If existing roadway embankments are to be widened, the work should be conducted in accordance with the provisions of construction in the applicable State Department of Transportation (DOT) Standard Specifications.

4.4 Storm Water Cross Drainage

1. Upslope development impacts historic natural drainage volumes and peak flow rates. Development re-grades and revises drainage sub-basins. Revised ground cover from constructing roads, parking areas, and buildings may result in the need to change the cross drainage features (culverts and/or overchutes) along Reclamation canals.

2. A hydrologic study should accompany all plans that modify the existing drainage across and/or along Reclamation facilities. The study or report should show the proposed flows of the canal and the associated crossings. The drainage study or report should show that the downstream system can accept the flows without creating any flooding to properties adjacent to or downstream of the canal.

3. All drainage crossings, whether existing or proposed, should carry the peak runoff of a 100-year event while preventing any storm water from entering the canal and/or ponding against the canal embankment.

4. Urban runoff should not be allowed to enter into, or drain onto, Reclamation's land. All flows generated outside Reclamation's ROW should enter the storm drain system prior to entering Reclamation's ROW. Piped connections are preferred, but concrete-lined channels may be acceptable upon Reclamation's review.

5. The new crossing under a canal should be designed with 3 feet vertical clearance from the top of the cross drainage structure to the bottom of the canal (or liner). The structure should extend completely across Reclamation's ROW.

6. New overcrossings of the canal should have 2 feet of vertical clearance from the top of the liner and 2 feet of horizontal clearance from the support abutments to the outside edge of the canal lining. The O&M road crossing of the cross drainage structure should be structurally capable of withstanding highway-legal vehicle loadings and provide at least 1 foot of cover in the roadway.

7. Pipe crossing barriers should be installed on all pipe overcrossings.

8. All drainage flow should be discharged to a downstream storm drainage system owned, operated, and maintained by a public agency (such as a city or county) or into areas such as channels, roadways, parks, wetland basins, or other non-private lands that can accept the concentrated flows from the drainage crossing.

9. All drainage from upland property should be collected by the applicant's installed system of curbs and inlets within their property and discharged into a non-Reclamation public agency's drainage system.

10. New drainage system designs will not use ponding against the existing canal embankment for temporary detention of storm runoff that will not immediately pass through existing or new crossings.

    Proposed permanent detention facilities adjacent to Reclamation's property should include engineered fill beyond the canal ROW to provide, at a minimum, a fill-width maintenance access roadway between the canal property and the basin. The applicant shall submit a geotechnical report verifying that the canal embankments can perform as detention basin embankments. The design should provide for sufficient freeboard to contain the 100-year event within the proposed basin adjacent to Reclamation's property and shall have adequate protection from seepage and erosion.

    The ownership and related O&M of the embankments shall be the responsibility of the applicant requesting the crossing.

11. When grading operations upstream of existing canal drainage crossings are scheduled to take longer than a normal construction season to complete, temporary basins shall be installed. These temporary basins should be designed to detain the 100-year event, capture silt from the disturbed area, and meter the flows across the existing drain crossings without spilling flows into the canal.

12. Unless Reclamation specifies otherwise, the applicant should remove or plug and abandon existing drainage crossings that are not used by the development unless they are shown to provide an additional measure of safety for the canal by reducing the likelihood of spill into the canal caused by extreme runoff flows. Otherwise, these crossings should remain in place for Reclamation's benefit and will not require ownership transfer to a public agency.

    These crossings must discharge into the non-Reclamation public agency's storm drainage systems or into areas such as channels, roadways, parks, wetland basins, or other nonprivate lands that can accept the concentrated flows from the drainage crossing in the case of an extreme runoff event.

    Grading in Reclamation property should be preserved or revised to direct extreme runoff flows into these unused drainage crossings without allowing said flows to enter into the canal until the crossings reach their capacity.

4.5 Subdivision

Urban developments are reaching Reclamation's lands and ROWs. These are general guidelines for accommodating development in subdivisions (refer to "3.2 General" and "4.4 Storm Water Cross Drainage").

1. Permanent structures should not be permitted within Reclamation fee-owned linear ROWs.

2. Open space with natural hiking trails and vegetation may be allowable.

3. Where subdivision development is adjacent to a canal, fencing should include these characteristics:

    a. Temporary chain link fences must be installed prior to removing any portion of existing fences.

b. Upon completion of grading for drainage and other work, fencing should be installed along the subdivision's boundary length of the adjacent ROW plus 150 feet beyond the development's property boundary. The fence should be per project standards and at the applicant's expense.

c. The new fence should be located 1 foot outside of Reclamation's ROW. The fence location should be shown on the improvement plans.

4. Use of Reclamation pipeline easements as part of residential subdivision lots should not be allowed. Pipeline easements may be included within the subdivision greenbelt or similar use areas.

5. Drawings should include all proposed improvements (i.e., streets, utilities, landscaping, etc.) within, and adjacent to, Reclamation's ROW.

6. Trees or vines should not be allowed within a Reclamation pipeline or canal ROW. See Appendix B of *Review and Operation and Maintenance Program Field Examination Guidelines* (reproduced as appendix B at the end of these guidelines).

7. Streets, roads, or parking areas using Reclamation easements may be permissible. All streets, roads, and parking surfaces should be asphalt or other flexible pavement. Depressed curbs or driveways should be provided for Reclamation vehicular access when new roads cross Reclamation pipelines or canals.

8. Where fencing is proposed within Reclamation easements, a minimum 16-foot-wide gate should be provided for Reclamation access.

9. Pipelines containing sewage, oil, gasoline, natural gas, or hazardous materials should only cross perpendicular (between 70 and 90 degrees) to the Reclamation pipeline or canal and be installed with the necessary safety measures and separation clearance as required in "4.6 Utility Crossing."

10. Electroliers, posts, etc., should be installed at the maximum distance possible from the edge of the pipeline or canal.

11. If crossing a Reclamation pipeline system that has "A" cover pipe designation, refer to recommendations in "3.2 General."

4.6 Utility Crossing

Note: All pipelines, electrical, and communication lines and conduits are referred to as "utilities" in these guidelines.

4.6.1 Casings

The Reclamation Materials Engineering and Research Laboratory's (MERL) position is to avoid using casing pipes around metallic carrier pipelines (steel, ductile iron, cast iron, reinforced concrete, pretensioned concrete cylinder, etc.) whenever possible. The experience of the corrosion community in general is that these casings often cause corrosion-control problems. Furthermore, dielectric (plastic, fiberglass, etc.) casings, or even dielectrically coated casings, should not be used. They can shield the carrier pipe from receiving cathodic protection current.

Cathodic protection to a buried metallic pipeline is more trouble free and more certain without a casing pipe. MERL recommends relying on effective corrosion control measures on the carrier pipeline rather than relying on a casing pipe (which may shield cathodic protection current) to direct a leak away from Reclamation property.

4.6.2 Overhead Line Crossing

1. Overhead wires across Reclamation pipeline and canal ROWs should be at least 32 feet above all ground levels in the Reclamation ROW. For electrical powerlines of 69 kilovolts (kV) or higher voltage, the minimum clearance should be 40 feet plus 0.25 inch per kV of line-to-line voltage above 450 kV. In any case, the minimum clearance is to be that determined to be needed with an ambient temperature of 120 degrees Fahrenheit.

2. Reclamation has the following requirements for overhead crossings:

    a. Poles or towers should not be allowed within Reclamation's ROW.

    b. Overhead electrical and communication lines should cross perpendicular (between 70 and 90 degrees) to the centerline of the Reclamation facility.

    c. If necessary, fence grounding is to be provided for existing fence lines, especially under power transmission lines.

3. A marker warning sign should be provided that shows the clearance and electrical line voltage. The warning sign should face oncoming traffic and state, "**DANGER, HIGH VOLTAGE OVERHEAD**."

4.6.3 Utility Crossing Reclamation's Canal

Utility crossings include open ditch laterals, subsurface and surface drains, levees, and similar facilities.

General Requirements:

1. Utilities crossing Reclamation canals should be designed to cross perpendicular (between 70 and 90 degrees).

2. Pier construction in the canal for new utility crossing(s) should not be allowed. New utility crossings should be free span design.

3. Open cut crossings of Reclamation canals and ditches, when allowed, should require replacing linings to re-establish the original construction style and materials (i.e., disturbed concrete lining panels should be removed in their entirety and replaced, membrane lining and earth or concrete protective cover should be re-constructed, gravel and canal under-drainage systems should be re-established to full working order, etc.) Proposals should be submitted for approval with the crossing permit application.

4. For trench excavation and backfill requirements, refer to "3.2 General."

5. Boring and jacking of a utility through canal embankments or protective levees should not be permitted. Boring and jacking of a utility should be constructed through the embankment foundation materials. Applicants should make special design and construction considerations with bored crossings under canals containing water during construction. Among these should be using proper bentonite slurry to seal the annulus space between the utility conduit and the boring cavity from canal seepage. Refer to appendix A for more details to be considered.

   The applicant's drilling plan should cover:

   a. Drilling methods and equipment

   b. Methods for preserving existing foundation material

   c. Methods and equipment to determine the presence of quick soil conditions or scouring and caving

d. Proposed method for casing installation and removal if casings are used

e. Methods and equipment for accurately determining the depth of concrete and actual or theoretical volume placed

The applicant's contingency plan should cover:

a. Means to repair in a certain time

b. Minimum flows after event

c. Review of geotechnical conditions surrounding the pile locations

d. Assessment of how the proposed mitigations will address geotechnical conditions

e. Methods for restoring foundation material

f. List of material, equipment, and personnel with qualifications to be used during mitigation work

g. A seal from a Professional Engineer on all relevant plans and drawings

6. When horizontal directional drilling (HDD) or other trenchless methods are used, canal seepage conditions may be aggravated by the collapse of the canal foundation material into the annular void between the bore and pipe. Penetration through the top stratum of fine-grained materials may concentrate seepage at those locations. Pipe installed with trenchless methods should proceed only after completion of a comprehensive evaluation of the following:

(a) Comprehensive understanding of the subsurface soil and groundwater conditions to a minimum depth of 20 feet below the lowest pipe elevation

(b) Locations of the HDD pipe penetration entry and exit

(c) Construction procedure

(d) Allowable uplift pressures

(e) Onsite quality control and quality assurance monitoring during construction operation

(f) Grouting of the pipe annulus

(g) Backfilling of any excavated areas

(h) Repair and reinstatement of the construction staging areas

A geotechnical report should be submitted with the application for review prior to approval of the proposed utility crossing.

Directional drilling under a canal may be considered if a minimum clearance of 25 feet to the bottom of the canal lining is maintained for utilities with less than a 24-inch outside diameter. Larger utility crossings should be considered on an individual basis and may require additional clearance from the bottom of the canal lining.

7. Cut and cover constructed utilities under Reclamation canals should have a minimum cover of 36 inches when within Reclamation's ROWs. Bored construction utilities should have a minimum of 3 diameters cover.

8. Reclamation's ongoing O&M activities should not be disrupted during crossing construction. The primary or secondary operating road should be kept available for Reclamation use at all times.

9. Canal embankments should be re-built or repaired with materials and standards equal to or better than the existing embankments.

10. Drawings should be stamped and signed by a Professional Engineer and contain the following information:

    a. Canal milepost or station at each proposed crossing, utility size and location, and type of utility or material transported

    b. Maximum utility operating pressure, type of pipe, joints, wall thickness, maximum test pressure, and description of test procedures

    c. Type of sleeve/casing (when allowed) including diameter, joints, and wall thickness

    d. For utilities attached to a bridge or an overchute, details showing the structure name, superstructure, abutments, embankments, protective dikes, method of attachment, spacing of utility supports on the structure, location of other attached utilities, and structural calculations

e. Protective coatings and corrosion control measures

f. Method of handling pipeline expansion and contraction

g. Location of nearest shutoff valve on each side of the crossing

h. Location and details of thrust restraint

i. Design code(s) used for the utility crossing

j. Location, including depth, of the buried pipeline communication and control cables

k. Other existing utility easements in the immediate vicinity

Hazardous Material Carrier Requirements:

1. Pipelines carrying hazardous material or pollutants (e.g., oils, gasoline, sewage, contaminated waters, and nonpotable waters) should be designed for a reduced risk of failure in the portion within Reclamation's ROW. The design should require either:

    a. Designing the crossing pipeline with an additional 50 percent working pressure factor

    or

    b. Using secondary containment (casing pipe) for all hazardous material pipelines

2. To minimize the amount of any hazardous material entering the canal, Reclamation may require the installation of a block (gate) valve and or a check valve on each side of the canal between the ROW boundary and the embankment. When selecting the type of the valves, take into the account the flow direction and the terrain.

3. A final hazardous material spill contingency plan and an emergency response plan should be approved by Reclamation prior to start of construction.

4. A monitoring program and/or Supervisory Control and Data Acquisition System alarm may be required depending on the hazardous material transported. This applies to all "overcrossings" and "undercrossings" when the hydraulic grade line is within 60 inches of the canal liner or when local geology would promote this requirement.

Attaching Utilities to Bridges and Overchutes:

Note: Reclamation does not guarantee the long-term availability of bridges or overchutes as support devices for utility crossings because they may require structural modifications or alterations to accommodate widening, repairs, subsidence offsets, etc., to such an extent that service may be interrupted or stopped. Reclamation may determine the bridge is no longer required and may remove it. In that event, the owner/operator of each utility attached to a bridge or an overchute may be required to re-locate or permanently remove their utility at their own expense.

Specific details for attaching utilities to bridges are:

a. Utilities should not be placed on the bridge deck.

b. Anchor bolt locations should not intercept the critical reinforcing steel of the bridge.

c. Utilities should be placed and anchored under bridge decks between girders and through utility openings, if they are present. The utility should be placed off center in the utility opening, if possible, to allow for future utility additions.

d. If an expansion joint is used in the pipeline, it should be placed near the bridge deck expansion joint.

e. Holes through bridge concrete or abutment and retaining walls for passage of utilities may be allowed and should be core drilled. The annular space between the utility and core hole surface should be completely filled with an elastomeric sealant to prevent loss of material or water piping from behind the wingwalls and abutments.

f. Calculations showing the effects of the weights of the proposed utilities on the load carrying capacity of the bridge should be submitted for Reclamation review.

g. Intermediate supports for the utility should withstand the seismic conditions of the bridge.

4.6.4 Utility Crossing Reclamation's Underground Pipelines

1. The applicant should submit the procedures, excavation plans, schedules, as well as type and weight of the construction equipment to be used for crossing the Reclamation pipeline.

2. High voltage, direct current powerlines should not be permitted to encroach on the Reclamation pipeline ROW, except in unusual circumstances and with proper cathodic protection considerations.

3. For proposed metallic pipelines, refer to "5.0 Cathodic Protection Requirements."

4. For utilities crossing above or under the Reclamation pipeline, the vertical clearance between the utility and Reclamation pipeline should be a minimum of 12 inches.

5. The location of the Reclamation pipeline and the communication and control cables throughout the area of the proposed construction should be shown on the plans. Prior to Reclamation and/or AOE issuing a use authorization or consent document, the pipeline and the cable(s) should be located and exposed by potholing. The pothole locations should be shown on the drawings. The pothole elevations should be referenced to Reclamation stationing or milepost. (Refer to "3.2 General.")

6. Drawings should contain the following information:

    a. Reclamation milepost or station at each proposed crossing, pipeline size and location, and type of utility or material transported.

    b. Maximum utility operating pressure, type of pipe and joints, maximum test pressure and description of test procedures, wall thickness, and utility pipe classification.

    c. Type of sleeve/casing pipe (when allowed) including diameter, joints, and wall thickness.

    d. Protective coatings and corrosion control measures.

    e. Location of nearest shutoff valve on each side of the crossing.

    f. Location and details of thrust restraint.

    g. Design code(s) used for utility crossing.

    h. Location, including depth of the Reclamation pipeline and the communication and control cables.

    i. Other existing utility easements in the immediate vicinity.

7. Detectable warning tape may be required over trenched utilities. (Refer to "3.3 Detectable Warning Tape.")

8. For trench excavation and backfill requirements, refer to "3.2 General."

9. Embankments should not be permitted within Reclamation's ROW where underground pipeline exists.

4.6.5 Utility Crossing Under Reclamation's Roadways

1. The applicant should supply typical cross sections that show existing ground surface elevations, utility trench invert elevations, and utility details.

2. For trench excavation and backfill requirements, refer to "3.2 General."

3. Conduits with diameters up to 24 inches should be bored and jacked underneath pavements. Larger conduits may be considered on an individual basis. Pavement or road surfaces should not be cut unless an acceptable detour, if required, is approved. The cover over the conduit(s) when within Reclamation's ROWs should be a minimum of 36 inches. (Refer to "3.2 General.")

4. Unless otherwise approved, the applicant should replace existing Reclamation roads and parking surfaces that are removed or damaged by the applicant's construction activities in accordance with provisions in the latest edition of the applicable State DOT Standard Specifications.

5. If existing road embankments are to be widened, the work should be conducted in accordance with the provisions of embankment construction in the applicable State DOT Standard Specifications.

6. Detectable warning tape may be required over buried utilities. (Refer to "3.3 Detectable Warning Tape.")

5.0 CATHODIC PROTECTION REQUIREMENTS

5.1 Cathodically Protected Metallic Pipelines

Unless approved in writing by Reclamation, metallic pipelines or those containing metallic reinforcement (e.g., reinforced concrete) installed within Reclamation's ROW should have a suitable bonded dielectric coating (see "5.2 Protective Coatings for Corrosion Control") and be cathodically protected. Impressed current cathodic protection rectifiers and deep-well anode systems should not be

permitted within Reclamation facilities without prior approval from MERL's Corrosion Technology Group. All submittals should include details of the cathodic protection system (CPS) and its appurtenances.

1. All existing Reclamation cathodic protection test stations, cables running to these stations, rectifiers, anode beds, and any other appurtenances should be located prior to any grading or excavation. The test stations should be staked and flagged. The test stations, cables running to these stations, any anode beds, etc., should be suitably enclosed or protected during construction to prevent damage. No re-location or modification of the test stations, cables, anode beds, etc., is allowed without prior approval from MERL's Corrosion Technology Group.

2. Generally, the CPS to the proposed pipeline should be the sacrificial anode type unless the proposed installation continues an existing pipeline that uses impressed current type of cathodic protection.

3. A means of monitoring the effectiveness of the CPS on the proposed pipeline should be provided within Reclamation's ROWs. The number of anodes and test stations will differ with each project. Test stations should be located at every anode bed connection and should not be more than 1,000 feet apart. A test station should also be located where any metallic pipeline crosses over or under a metallic Reclamation pipeline, metallic fence, other metallic structure embedded in the ground, or comes within 20 feet of a Reclamation structure on or embedded in the ground. Both the proposed cathodically protected pipeline and the Reclamation pipeline should be monitored regularly using these test stations. Monitoring results should be reported to MERL's Corrosion Technology Group. In addition, the owner of the proposed crossing pipeline should investigate and mitigate any adverse potential shift caused by the proposed pipeline on the Reclamation pipeline. Owners of proposed crossing pipelines should return Reclamation pipelines to their original electrochemical potentials or to more benign potentials. Mitigation measures should be approved by MERL's Corrosion Technology Group. The effectiveness of mitigation measures should be confirmed in the presence of a Reclamation representative following installation.

   For those pipelines under DOT regulation, the application and monitoring of the CPS should conform to Title 49 CFR, Part 195, any special provisions of this guideline, and the provisions of NACE International RP 0169, in that order. For other pipelines, any special provisions of this guideline should take precedence, followed by the provisions of NACE RP 0169.

5.2 Protective Coatings for Corrosion Control

1. *Atmospheric Exposed Pipe*

   The coating should be a high build modified aluminum epoxy mastic primer and top coated with a high build aliphatic urethane. The type of coating should be listed in the submitted plans and specifications. Information should include the surface preparation and the thickness of the coating to be applied.

2. *Buried Pipe*

   The type of coating may vary from project to project due to geology and soil corrosivity and should be considered on an individual basis. The type of coating should be listed in the submitted plans and specifications. Information should include the surface preparation and the thickness of the coating to be applied.

REFERENCES

Application for Transportation and Utility Systems and Facilities on Federal Lands, <http://www.ntia.doc.gov/FROWsite/SF-299_2006.pdf>.

Application for Use of Reclamation Project Land and Water Surfaces, <http://www.usbr.gov/pmts/lands/>.

Bureau of Reclamation Right-of-Use Application, <http://www.usbr.gov/pmts/lands/FINAL7-2540-5-06ExpDate03312009.pdf>.

California Department of Water Resources - Encroachment Permit Guidelines.

Central Arizona Project, Reach 11 Guidelines.

GP Region Billings MT – Standard Crossing & Clearance Requirements, Utility Lines and Cables, drawing 40-600-51. The office also uses a Preliminary Project Description Form and a Special Use Permit.

NACE, International RP 0169, "Standard Recommended Practice – Control of External Corrosion on Underground or Submerged Metallic Piping Systems."

PN Region Burley ID – Overhead and underground crossing clearances.

Policy on Geometric Design of Highway and Streets, American Association of State Highway and Transportation Officials (AASHTO), Fifth Edition, 2004.

Reclamation, 2005. Preliminary drawing 103-D-1700 that provides general requirements for installation of crossings, June 2005.

Reclamation Manual, Directive and Standards LND 08-01, Land Use Authorizations, <http://www.usbr.gov/recman/lnd/lnd08-01.pdf>.

Title 29 CFR, Part 195.

U.S. Army Corps of Engineers – Engineering and Design, Design and Construction of Levees EM 1110-2-1913, 30 Apr 2000, CECW-EG Washington, DC 20314-1000.

GLOSSARY

Bored and jacked – This terminology is a general way of referring to a family of trenchless methods.

Bridge, class A – Vehicular bridge used by the public. May or may not be owned by the Bureau of Reclamation.

Consent Document Permit – Permit required across fee-owned lands.

Detention basin – An artificial flow control structure used to contain flood water for a limited period of a time, thereby providing protection for areas downstream. Detention basins provide a way to reduce storm peak flows, while retention basins hold water for an extended period of time. These basins are generally a part of a larger engineered flood water management system.

Electroliers – A branching frame, often of ornamental design, used to support electric illuminating lamps.

Pothole excavation – See potholing.

Potholing – The practice of digging test holes to expose underground utilities (e.g., cables) to determine the horizontal and vertical location of these utilities.

Trenchless methods – Procedures for installing pipe without using traditional trench cut and cover methods. These trenchless methods may be referred to as bore and jack, tunneling, horizontal directional drilling, and microtunneling, among others.

Water conveyance facility – Canal, ditch, pipeline, drain, levee, open or closed laterals, and similar facilities and their associated appurtenant features.

Appendix A

General Requirements for Installing Bored and Jacked Pipe Undercrossings

Bored and Jacked Under the Canal – This terminology is a general way of referring to a family of trenchless technologies. Similar guidance to the requirements listed below should be followed no matter what method is used for installation.

1. Installing a lone carrier pipe (without casing) is encouraged. Refer to "4.6 Utility Crossing," and "4.6.1 Casings" for information on cautions of using casings around metallic carrier pipe.

2. Plans must show carrier/casing pipe type, diameter, and thickness. Casing pipes should be steel pipe (American Water Works Association [AWWA] C-200) and have 1/4-inch minimum wall thickness. Applicants should provide the type of carrier pipe and appropriate bell dimensions for said carrier pipe to verify annular clearances.

3. When installing pipe while the canal is unwatered, a minimum of 3 pipe diameters or 60 inches of clearance (whichever is greater) between the top of the pipe and the bottom of the canal must be maintained. However, 72 inches or more clearance is recommended.

4. Provide a minimum of 3 inches of clearance between the carrier and casing pipes at all points (including bells).

5. A bulkhead or effective sealing device should be provided at both ends of each casing pipe to seal the annular space between the two pipes. Vent pipe should be included to allow ventilation and reduce the risk of condensation buildup and flooding.

6. As a result of the installation process, an annular void is usually created around the outside of the casing pipe. Provisions should be made to pressure grout or effectively seal (e.g., bentonite slurry) this void space.

7. Requirements below are provided to establish minimums for determination of the length of pipe to be installed. It is strongly recommended that pipes be installed perpendicular (between 70 and 90 degrees) to the canal alignment. Regardless, the pipe must extend completely through the Bureau of Reclamation's (Reclamation) right-of-way (ROW). Theses minimums do not relieve the applicant's engineer from performing an onsite investigation or other work to determine local conditions that may require additional pipe length.

   Jacking pit configuration, location, and length of pipe to be installed should be based on the following parameters:

   a. One operating road shall remain open to vehicular traffic at all times.

b. The minimum operating road embankment top width to be maintained during construction should be either 14 feet wide, the width of the existing embankment, or as required by Reclamation.

c. As a minimum, jacking pit excavations should not be within:

(1) A line drawn from the outside edge of the operating road embankment extended downward and away from the canal at a slope of 3/4 horizontal to 1 vertical.

(2) A line drawn from the outside edge of the top of the concrete lining extended downward and away from the canal at a slope of 1 horizontal to 1 vertical.

d. To contain the slurry during installation, jacking pits should be constructed so that natural ground or a compacted dike is entirely around the pit to an elevation at least 1 foot above the top of the canal lining.

e. All excavations should be in compliance with Occupation Safety and Health Administration regulations and Reclamation's Health and Safety Standards.

f. If the contractor elects to install shoring in the jacking pits, all shoring designs should be prepared by a Professional Engineer knowledgeable in said type of work. A copy of the shoring designs should be submitted to Reclamation.

8. Jacking pits should be backfilled with native material and mechanically compacted to 95 percent of the maximum dry density per ASTM D-698.

9. The contractors should be responsible for any damage to the canal section during the construction of a crossing, and the contractor shall repair the damage at their own expense.

10. If an emergency situation develops during construction, the contractor should immediately notify appropriate contacts with Reclamation. Reclamation must approve further work at that point.

11. The minimum distance between two jacked pipes should be 10 feet.

12. Any pressure lines installed within Reclamation's ROW must have adequate thrust restraint at bends and valves. Specified design pressures and thrust restraint calculations shall be provided to Reclamation to confirm the design configuration.

Appendix B

Guidelines – Removal of Trees and Other Vegetative Growth from Earth Dams, Dikes, and Conveyance Features

Excerpted from: Review of Operation and Maintenance Program Field Examination Guidelines

APPENDIX B

GUIDELINES
REMOVAL OF TREES AND OTHER VEGETATIVE GROWTH FROM EARTH DAMS, DIKES, AND CONVEYANCE FEATURES*

Growth of trees and other significant vegetation on or adjacent to earth dams, dikes, and conveyance features, should be prevented from becoming established for the following reasons:

1. To allow proper surveillance and inspection of the structures and adjacent areas for seepage, cracking, sinkholes, settlement, deflection, and other signs of distress.
2. To allow adequate access for normal and emergency Operation and Maintenance (O&M) activities.
3. To prevent damage to the structures due to root growth, such as shortened seepage paths through embankments; voids in embankments from decayed roots or toppled trees; expansion of cracks or joints of concrete walls, canal lining, or pipes; and plugging of perforated or open-jointed drainage pipes.
4. To discourage animal/rodent activity (by eliminating their food source and habitat), thereby preventing voids within embankments and possible shortened seepage paths.
5. To allow adequate flow-carrying capability of water conveyance channels (e.g., spillway inlet and outlet channels; open canals, laterals, and drains).

The growth of trees and potentially detrimental vegetation should be prevented during its early stages as part of the operating office or entity's normal O&M program. Early control is generally the most cost effective means of avoiding potential adverse effects on these structures from their continued growth. Control efforts may consist of applying herbicides, spraying, cutting, and/or removing the trees or undesirable vegetation.

Suggested clearance zones (areas of control) adjacent to these structures are provided within these guidelines. Concerted efforts should be made to maintain these clearance zones. However, site-specific conditions, such as landscaping, accessibility, erosion susceptibility of material in the area, type of abutment material, original construction clearance zone, right-of-way easement, etc., may influence the necessity or success of these control efforts.

Should trees and/or other significant vegetation become established, proper O&M of earth embankment dams, dikes, and conveyance features, may require their discriminate removal. During the Review of Operation and Maintenance examination for the facility or system, the examiners should use these guidelines, along with their experience and professional judgment, to evaluate the need for removal of such established growth.

If trees and other significant growth are identified by the examination team in locations delineated by these guidelines, a determination should be made regarding their need for removal. If the identified vegetation is deemed to be in location such that its existence is not considered to be detrimental and therefore does not require removal, sufficient justification should be provided during the examination and included within the associated report to support that determination.

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* Enclosure to memorandum dated April 26, 1989, from Manager, Project Operation Services Staff, to all Regional Directors, Subject: Revised Guidelines — *Removal of Trees and Other Vegetative Growth From Earth Dams, Dikes, and Conveyance Features.*

When, in the opinion of an Review of Operation and Maintenance examination team, such established growth requires removal, specific followup procedures should be addressed as part of the examination. Such procedures may include the need for right-of-way easement determination; the need for an assessment for potential environmental impacts (any impact assessments should be coordinated with designated regional or project office environmental staff); whether removal of the root system is necessary and to what extent; the method of removal and recompaction of material within the void created; and the need for any erosion stabilization measures.

National Environmental Policy Act compliance is required relative to such tree and vegetation removal. Additionally, the application of herbicides should comply with applicable provisions of the Endangered Species Act. The determination of appropriate procedures to be followed in assessing potential environmental impacts and mitigation (including those to wildlife and its habitat) will be the responsibility of each regional and/or project office. This will include the preparation of an appropriate National Environmental Policy Act document and an assessment of the need for mitigation prior to the onset of removal activities. Appropriate National Environmental Policy Act compliance may include a Categorical Exclusion Checklist, an environmental assessment followed by a Finding of No Significant Impact, or an Environmental Impact Statement.

The following guidelines and associated clearance zones should be used for all Reclamation earth dams, dikes, and conveyance features. They are not considered "policy;" rather, they are guides which should be used with reasonable judgment and practicality.

1. Trees and detrimental vegetative growth should be prevented from becoming established on the surface of all earth dam, dike, and conveyance feature embankments. A small amount of shallow-rooted vegetation may be acceptable to aid in erosion protection and slope stabilization. Mowing of grass and other small vegetation is desirable and may be necessary to allow proper surveillance of the surfaces and observation of animal/rodent activity.

2. A clearance zone of 25 feet beyond each contact (groins and toe) of earth dam embankments and dikes should be maintained of all trees and detrimental vegetation. Similarly, a clearance zone of 15 feet should be maintained beyond the outside toe of all fill sections/embankments for open canals and laterals. These clearance zones may need to be extended for seepage areas or other conditions where proper surveillance or access may be warranted.

3. Earth dam, dike, and conveyance feature (open canal and lateral) embankments have large tree growth or stumps from previously cut trees on or near them should be evaluated, usually in conjunction with an Review of Operation and Maintenance examination, for any necessary future action, (i.e., monitor, excavation and backfill, rebuild, etc.). Generally, sizable old root systems of large trees should be grubbed out and the embankment replaced and compacted to prevent the development of piping action or erosion. Likewise, any sizable voids resulting from animal/rodent burrowing activity should be filled and compacted. Seeding may be necessary for protection from surface erosion.

4. Spillway inlet and outlet channels, outlet works discharge channels, and other open conveyance channels (open canals, laterals, and drains) should be free of vegetative growth that could significantly impede water flow or reduce design capacity.

5. A clearance zone of 25 feet adjacent to all concrete structures associated with such facilities should be maintained of all trees and detrimental vegetative growth to prevent damage from root growth, to allow proper surveillance, and to allow adequate O&M access.

6. Associated cut slopes adjacent to open canals and laterals should be kept clear of vegetation which, if toppled and/or uprooted, could affect operations or O&M access.

7. For pipe conveyance systems (such as siphons, aqueducts, discharge lines, perforated or open-jointed drains, etc.), to provide O&M access and to prevent root encroachment, a clearance zone should be maintained 15 feet from each side of the pipeline. However, in some cases, farming of annual crops over pipelines may be permissible.

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REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS

PART 8:

ENGINEERING DATA

Final Issued September 15, 2016

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4 INTERCHANGES ON BANGERTER HWY (SR-154)

S-0154(12)11

Description of Geotechnical Data

August 2, 2016

The data described herein are the results of geotechnical investigations performed for the proposed "4 Interchanges on Bangerter Hwy" project. A primary objective of these investigations was to obtain geotechnical data for Design-Build teams to consider in proposal preparation and design. This introduction provides details relative to the geotechnical testing and sampling procedures used in the investigations.

I. SUBSURFACE DRILLING, TESTING, AND SAMPLING

Preliminary geotechnical subsurface investigations were conducted for five general areas along the existing Bangerter Highway (SR-154) corridor, including four proposed interchange locations at 11400 South, 9000 South, 7000 South, and 5400 South, and in an existing drainage pond area near 11800 South. The approximate locations of geotechnical borings completed at each of the locations are shown on Figures 1 through 5. Sampling was generally conducted at depth intervals of 3 feet in the upper 15 to 30 feet of the borings, and at 5-foot depth intervals thereafter.

At each of the proposed interchange locations, borings intended primarily to investigate bridge structure foundation conditions were drilled near three of the four corners of the anticipated bridge footprint area. These bridge borings are numbered with the prefix "16-S" to indicate the year of the drilling (20<u>16</u>) and the primary purpose of the boring (foundation investigations for (<u>S</u>tructures). Two to four additional borings were drilled in each interchange area to investigate roadway <u>E</u>mbankment and/or <u>E</u>xcavation subsurface conditions, and these borings are numbered with the prefix "16-E". The borings drilled in the existing <u>D</u>rainage pond area near 11800 South are numbered with the prefix 16-D.

The geotechnical borings were performed using a CME-55 rotary drill rig mounted on a two-ton truck and a CME-850 drill rig on a rubber-tired ATV. Borings were advanced with the CME-55 using NW drill rods and tri-cone rock bits. NW or HWT casing was used with water as the drilling fluid to maintain an open hole in shallow soils. At greater depths, polymer and/or bentonite drilling mud products were used to maintain an open hole below the casing. The borings drilled with the CME-850 were advanced using HQ drill rod and a 3-7/8" open-face bit the full depth of the exploration. Sampling in all cases was performed using NW drill rods lowered through the NW or HWT casing or the HQ drill rod.

Disturbed samples were obtained by driving a standard 2-inch O.D. split spoon sampling tube through a distance of 18 inches using a 140-pound weight dropped from a distance of 30 inches. In some cases, a 2.5-inch or 3-inch O.D. sampling spoon was used. The sampler size is indicated on the boring logs. The sampling tubes used were internally dimensioned to accommodate liners; however, no liners were used.

Based on energy evaluations conducted approximately annually in general accordance with ASTM D 4633, the automatic trip hammer used for sampling with the CME-55 has an average tested energy equal to about 79 percent of the theoretical maximum energy, and the automatic hammer on the CME-850 has an average tested energy equal to about 80 percent of the theoretical maximum energy.

The number of hammer blows required to drive the sampling spoon through each 6 inches of penetration is shown on the boring logs. These 6-inch blow counts are uncorrected. The sum of the last two blow counts, which represents the number of blows recorded while driving the sampling spoon through 12 inches, is defined as the standard penetration value, *N*.

Standard penetration values corrected for sampler size, overburden, and hammer energy provide a good indication of the in-place density of sandy soils; however, they only provide an indication of the relative stiffness of cohesive material, since the penetration resistance of materials of this type is a function of moisture content.

Considerable care must be exercised in interpreting the standard penetration value in gravelly-type soils, particularly where the size of the granular particle(s) exceeds the inside diameter of the sampling spoon. If the spoon can be driven through the full 18 inches with reasonable sample recovery, the standard penetration value generally provides a good indication of the in-place density of gravelly-type material.

At some locations, it was not possible to drive the sampling spoon through the full 18 inches without excessive blow counts. In these instances, the number of blows and resulting penetration are noted on the boring logs.

Corrections applied to the raw field blow counts to determine the corrected standard penetration $(N_1)_{60}$ values shown on the boring logs were as follows:

- Sampler size correction for 2.5-inch OD sampler or 3.0-inch OD sampler (where applicable) = 0.938 and 0.767, respectively
- Hammer energy correction from 79% (CME-55) or 80% (CME-850) average measured hammer energy ratio to 60% standard energy ratio = 1.32 and 1.33, respectively
- Correction for sampler with internal dimensions to accommodate liners but used without liners: No correction was applied for the purposes of calculating the $(N_1)_{60}$ values shown on the boring logs in this data report
- Overburden correction $C_N = (P_a / \sigma'_{vc})^{0.5} \leq 1.7$
  where: P_a = atmospheric pressure = approximated as 2000 psf,
  σ'_{vc} = effective vertical stress calculated using an assumed average total soil unit weight of 115 pcf and hydrostatic pore pressure calculated from the measured or estimated static groundwater level.

Relatively undisturbed samples were obtained from the borings by pushing thin-walled (Shelby) sampling tubes with sharpened cutting edges into the subsurface material, using the hydraulic pressure on the drill rig. Where NW casing was used, the tubes had a nominal outside diameter of 2.75 inches and nominal wall thickness of 0.06 inch. Where HWT or HQ were used, the tubes had a nominal outside diameter of 3.00 inches and a nominal wall thickness of 0.065 inch. The depths at which Shelby tube samples were attempted are identified on the boring logs.

Miniature vane shear tests, which may provide an approximate indication of the undrained shearing strength of cohesive materials, were performed on most samples of cohesive soils during the field investigations. The results of these tests are shown on the boring logs as "torvane" values in units of tons per square foot. Pocket penetrometer tests, which may provide an approximate indication of the unconfined compressive strength of cohesive soil, were also performed on selected samples.

Relative stiffness and density descriptors noted on the boring logs were determined from the field and lab data in general accordance with the UDOT Geotechnical Manual of Instruction. In describing the stiffness of cohesive soils, preference was typically given to UU triaxial

compression test results prior to torvane and pocket penetrometer results, and to torvane and pocket penetrometer results prior to blow counts.

Each sample obtained in the field was classified in the laboratory according to the Unified Soil Classification System. The symbols designating soil types according to this system are presented on the boring logs. A description of the Unified Soil Classification System is included in the Appendix, and the meanings of the various symbols shown on the logs can be obtained from this figure. Laboratory-tested samples were also classified according to the AASHTO Classification System, and the symbols designating the soil types according to this system are noted on the boring logs.

II. LABORATORY TESTING PROCEDURES

Laboratory tests performed during this investigation to define the characteristics of the subsurface material included the following:

1) Moisture Content
2) Sieve Analysis
3) Atterberg Limits
4) Soil Density
5) One-Dimensional Consolidation
6) Direct Shear
7) Unconsolidated-Undrained (UU) Triaxial Compression
8) Consolidated-Undrained (CU) Triaxial Compression w/ pore pressure measurements
9) Electro-chemical Tests (pH, Resistivity, Sulfate, and Chloride)

Consolidation tests were performed on specimens measuring approximately one inch thick and 2.37 inches in diameter, with drainage allowed at both top and bottom during testing. The results of these tests are plotted in the Appendix in terms of both strain and void ratio versus pressure. The specific gravity of the samples was assumed to equal 2.7 in estimating void ratios.

As noted on the plots of the consolidation test results, most of the test samples were inundated with water either throughout the test or after a load of 0.25 tsf had been applied. In some cases, a comparison specimen from the same Shelby tube sample was tested without adding water, with the sample, ring, and porous stones enclosed in a loose-fitting sealed plastic bag to prevent loss of sample moisture to evaporation.

Laboratory testing was performed in accordance with applicable standards published by the ASTM International and/or the American Association of State Highway and Transportation Officials (AASHTO). Variations from the standards, if any, are noted on the test data plots.

IV. LIMITATIONS

The information presented herein is based upon the results of field and laboratory tests. It should be recognized that soil materials are inherently heterogeneous and that conditions may exist throughout the site which were not defined during these investigations. Water levels noted on the test hole logs represent the depths to water measured at the time of the investigation. Groundwater levels and soil moisture conditions will vary with time and location.

The number and depths of the subsurface investigations presented herein are limited, and are not intended to provide a sufficient basis for complete geotechnical design of the Project. It is anticipated that supplemental investigations will be conducted for final design.

It is not the intent of this data report to provide any geotechnical analyses nor recommendations related to the project, and interpretations have been limited to those necessary to draw the boring logs. The Design-Builder is responsible for conducting geotechnical investigations, analysis, and design to complete the project, and for interpretations of all data used.

The information accompanying this document is provided for the specific location and purpose of the “4 Interchanges on Bangerter Hwy” project, and is not intended or considered suitable for any other use. Any such unauthorized use by any other party is at that party's sole risk, and the Department does not accept any liability or responsibility for its use.

FIGURES

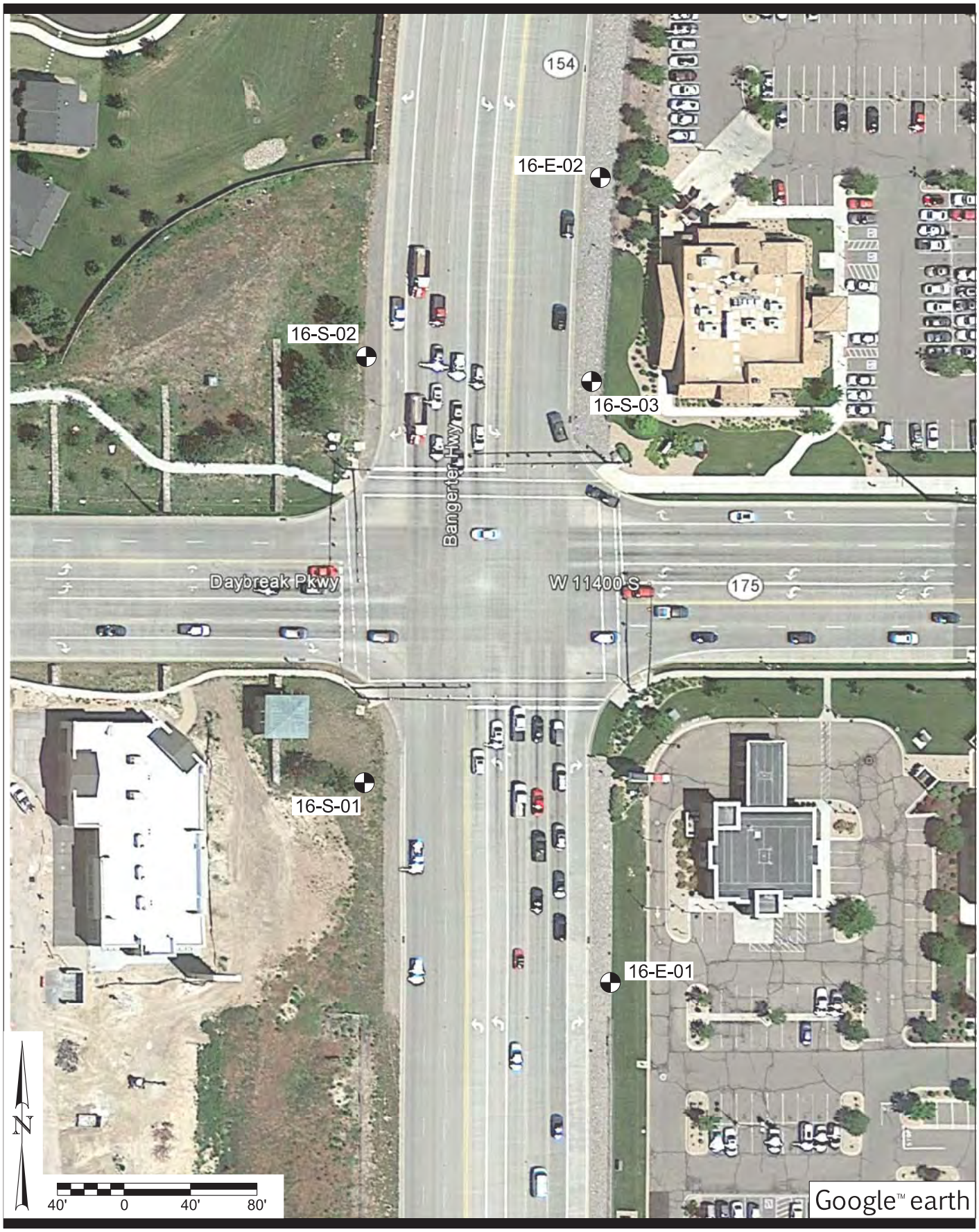


Figure 1 SITE PLAN & APPROXIMATE TEST HOLE LOCATIONS

Bangerter Highway 4 Interchanges - 11400 South

Salt Lake County, Utah

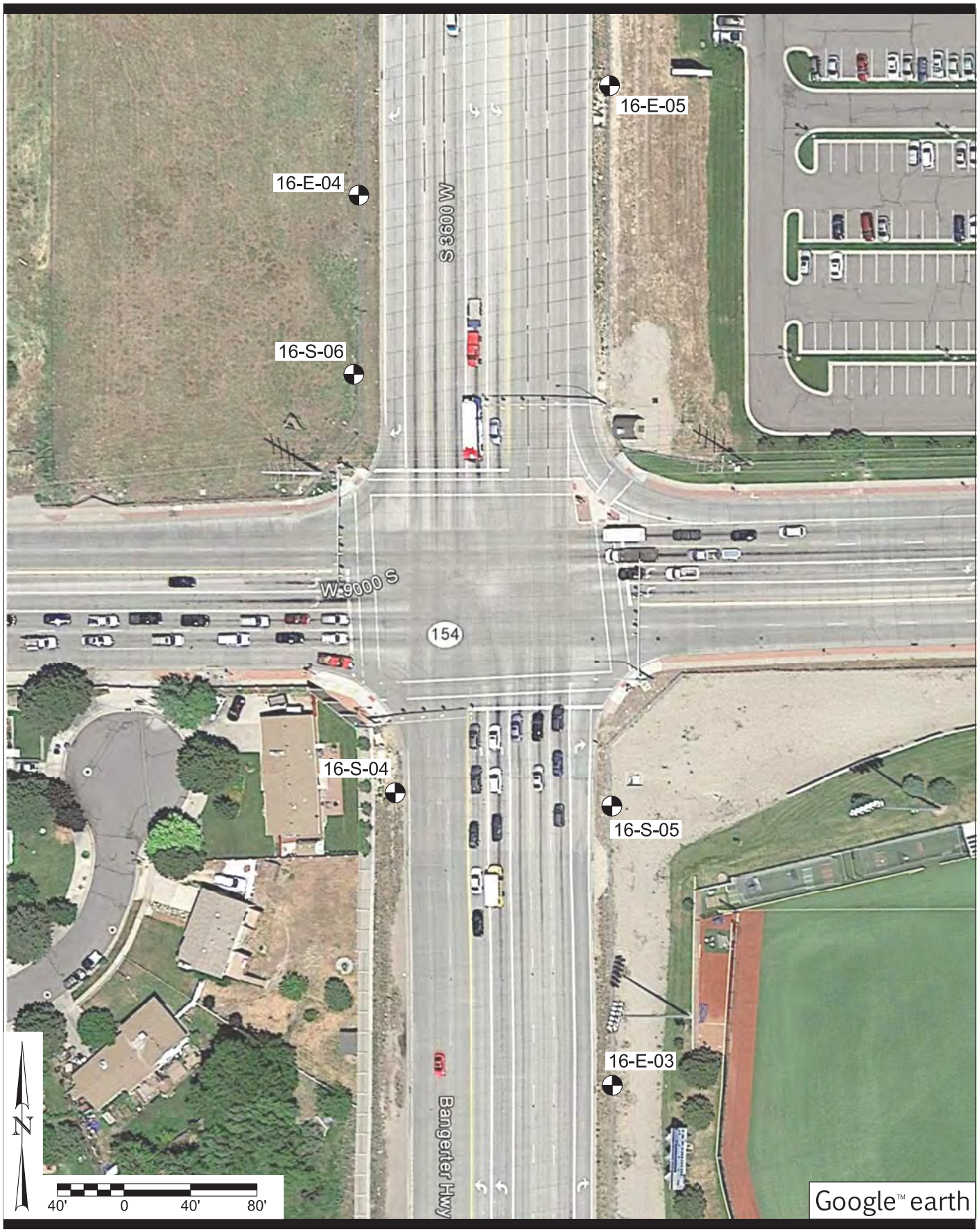


Figure 2 SITE PLAN & APPROXIMATE TEST HOLE LOCATIONS

Bangerter Highway 4 Interchanges - 9000 South

Salt Lake County, Utah

Figure 3 SITE PLAN & APPROXIMATE TEST HOLE LOCATIONS

Bangerter Highway 4 Interchanges - 7000 South

Salt Lake County, Utah

Figure 4 SITE PLAN & APPROXIMATE TEST HOLE LOCATIONS

Bangerter Highway 4 Interchanges - 5400 South

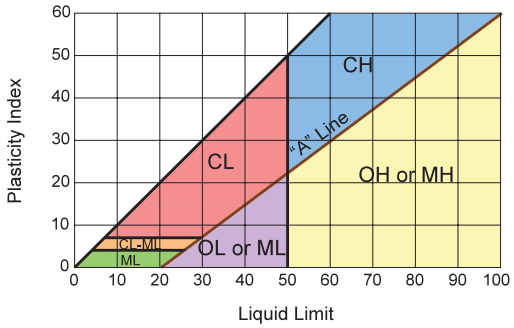
Salt Lake County, Utah

Figure 5 SITE PLAN & APPROXIMATE TEST HOLE LOCATIONS

Bangerter Highway 4 Interchanges - 11800 South Pond

Salt Lake County, Utah

Unified Soil Classification System

Major Divisions			Group Symbols		Typical Names	Laboratory Classification Criteria		
COARSE-GRAINED SOILS *more than half of material is larger than No. 200 sieve*	Gravels *more than half of coarse fraction is larger than No. 4 sieve size*	Clean Gravels *little or no fines*	GW		Well graded gravels, gravel-sand mixtures, little or no fines	*For laboratory classification of coarse-grained soils* Determine percentage of gravel and sand from grain-size curve. Depending on percentage of fines (*fraction smaller than No. 200 sieve size*), coarse-grained soils are classified as follows: **Less than 5%** GW, GP, SW, SP **More than 12%** GM, GC, SM, SC **5% to 12%** Borderline cases requiring use of dual symbols**	$C_u = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		Gravels With Fines *appreciable amount of fines*	GM*	d	Silty gravels, poorly graded gravel-sand-silt mixtures		Atterberg limits below "A" line, or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring uses of dual symbols
				u				
			GC		Clayey gravels, poorly graded gravel-sand-clay mixtures		Atterberg limits above "A" line, or PI greater	
	Sands *more than half of coarse fraction is smaller than No. 4 sieve size*	Clean Sands *little or no fines*	SW		Well graded sands, gravelly sands, little or no fines		$C_u = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			SP		Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW	
		Sands with Fines *appreciable amount of fines*	SM*	d	Silty sands, poorly graded sand-silt mixtures		Atterberg limits below "A" line, or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring uses of dual symbols
				u				
			SC		Clayey sands, poorly graded sand-clay mixtures		Atterberg limits above "A" line, or PI greater	
FINE-GRAINED SOILS *more than half of material is smaller than No. 200 sieve*	Silts and Clays *liquid limit is less than 50*		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	*For laboratory classification of fine-grained soils*  Plasticity Chart		
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL		Organic silts and organic silt-clays of low plasticity			
	Silts and Clays *liquid limit is greater than 50*		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH		Inorganic clays of high plasticity, fat clays			
			OH		Organic clays of medium to high plasticity, organic silts			
HIGHLY ORGANIC SOILS			Pt		Peat and other highly organic soils			

*Division of GM and SM groups into subdivisions of d and u for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when liquid limit is 28 or less and the PI is 6 or less, the suffix u used when liquid limit is greater than 28.

***Borderline classification*: Soils possessing characteristics of two groups are designated by combinations of group symbols. (For example GW-GC, well graded gravel-sand mixture with clay biner.)

11400 SOUTH

Boring Logs

DRILL HOLE LOG

BORING NO. 16-S-01

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154) SHEET 1 OF 2

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION **PROJECT NUMBER:** S-0154(12)11

LOCATION: N: 368874 E: 506116 / LAT: 40.543873 LONG: -111.984459 **DATE STARTED:** 4/25/16

DRILLING METHOD: 08-CME-55 / N.W. CASING TO 28.5' **DATE COMPLETED:** 4/26/16

DRILLER: T.K. **GROUND ELEVATION:** 4654.5'

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ 65.3' (5/5/16) **LOGGED BY:** M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4650	5			16	8,16,11,(57)	CL	dk. gray-brown, sl. moist — SANDY LEAN CLAY W/GRAVEL								
				11	Pushed *T 0.40*	CL (*A-6(7)*)	lt. brown, moist, firm	113.5	15.5	30	13	6	23	71	
							LEAN CLAY W/SAND								
				12	2,3,3,(13) *T 0.45*	CL	lt. brown, very moist, firm								
4645	10			16	Pushed *T 0.31*	CL (*A-6(15)*)	lt. brown, very moist, firm — LEAN CLAY	82.3	32.2	36	15	0	6	94	UU 1,495 psf
				16	14,43,43,(99+)	SM	lt. brown, moist, very dense — SILTY SAND TRANSITIONING TO SILTY SAND W/GRAVEL								
				13	30,40,34,(99+)	SM (*A-1-b(0)*)	brown, very moist, very dense		13.3		NP	40	42	18	
4640	15						brown, very moist, very dense — SILTY SAND W/GRAVEL possible cobbles								
				15	22,32,28,(78)	SM	brown, very moist, very dense								Chem.
4635	20			10	44,60/5"	GP-GM	brown, wet, very dense								
				13	24,40,40,(88)	GP-GM (*A-1-a(0)*)	brown, wet, very dense — GRAVEL W/SILT & SAND possible cobbles		9.0		NP	56	37	7	
4630	25			15	58,41,21,(62)	GP-GM SM	brown, wet, very dense; brown, moist, very dense — SILTY SAND								
4625	30			8	Pushed *PP 0.5*	CL (*A-4(3)*) GP	GRAVELLY LEAN CLAY trace sand; brown, very moist, firm; ~~brown, moist~~ — GRAVELS (driller's observation)	100.1	21.3	23	8	19	12	69	CT UU 874 psf
4620	35			18	2,4,4,(7) *T 0.36*	CL (*A-6(9)*)	brown, very moist, firm — LEAN CLAY W/SAND (drillers report occasional gravels)		23.6	27	13	0	17	83	
4615	40			2	18,33,24,(46)	GP-GC	brown, wet, med. dense								
4610	45			12	52,60/6"	GP-GC (*A-2-4(0)*)	brown, very moist, very dense — GRAVEL W/CLAY & SAND possible cobbles		13.1	26	10	52	36	12	
4605	50			3	60/5"	GP-GC	brown, wet, very dense								
4600															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"; $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf); *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-01

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 368874 E: 506116 / LAT: 40.543873 LONG: -111.984459

DRILLING METHOD: 08-CME-55 / N.W. CASING TO 28.5'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ 65.3' (5/5/16)

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 4/25/16

DATE COMPLETED: 4/26/16

GROUND ELEVATION: 4654.5'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
			2	60/6"	GP-GC		brown, wet, very dense								
							CLAY (driller's observation)								
4595	60		12	44,65/6"	GC-GM (*A-2-4(0)*)		gray-brown, very moist, very dense — SILTY CLAYEY GRAVEL W/SAND possible cobbles		13.9	26	7	59	28	13	
							CLAY (driller's observation)								
4590	▼65		10	53,60/5"	GP-GC		brown, very moist, very dense — GRAVEL W/CLAY & SAND possible cobbles								
4585	70		18	8,10,12,(14) *T 0.46*	CL-ML (*A-4(1)*)		brown, wet, firm to stiff — SILTY CLAY W/SAND trace gravels		22.8	23	5	12	16	72	
4580	75		18	4,6,7,(8)* *PP 1.5*	CL (*A-6(7)*)		brown, wet, stiff — LEAN CLAY W/SAND		32.5	28	11	0	20	80	
4575	80		3	60/5"	GP-GC		brown, wet, very dense								
4570	85		12	45,48,30,(46)	GP-GC (*A-2-4(0)*)		GRAVEL W/CLAY & SAND possible cobbles — brown, wet, med. dense		14.9	27	7	58	32	10	
4565	90		0	50/1"	-		no recovery								
							CLAY (driller's observation)								
4560	95		11	40,60/5"	GP-GM		brown, wet, very dense — GRAVEL W/SILT & SAND slightly plastic, possible cobbles								
4555	100		0	60/3"	-		no recovery								
							BOH								
4550	105						*Sample disturbed by prior attempt to obtain shelby tube sample.								
4545															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- Blow Count per 6" (2,3,2,(6))
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-02

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 369127 E: 506118 / LAT: 40.544568 LONG: -111.984456

DRILLING METHOD: 08-CME-55 / N.W. CASING TO 33.5'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ 39.8' **AFTER 24 HOURS:** ▼ 68.7' (5/5/16)

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 4/26/16

DATE COMPLETED: 4/27/16

GROUND ELEVATION: 4658.1'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4655				7	11,20,20,(84)	GP-GM	brown, moist, very dense — GRAVEL W/SILT & SAND clay lenses (fill?)								
				12	1,2,3,(11) *T 0.22*	CL	dk. gray-brown, moist, soft — SANDY LEAN CLAY								
	5			16	Pushed *T 0.25*	CL (*A-6(13)*)	lt. brown, moist, firm — LEAN CLAY trace sand	94.4	28.5	34	16	1	11	88	CT UU 1,135 psf Chem.
4650															
	10			16	1,1,2,(5) *T 0.16*	CL	lt. brown, very moist, soft								
4645				17	24,44,61,(99+)	GC-GM (*A-1-b(0)*)	brown, very moist, very dense		11.8	25	4	46	36	18	
	15			16	35,40,51,(99+)	GC-GM	brown, wet, very dense — SILTY CLAYEY GRAVEL W/SAND possible cobbles								
4640															
	20			11	65,60/5"	GP-GC	brown, wet, very dense								
4635															
	25			12	22,65/6"	GP-GC	brown, wet, very dense — GRAVEL W/CLAY & SAND possible cobbles								
4630															
	30			18	35,66,60,(99+)	GP-GC (*A-1-a(0)*)	brown, wet, very dense		13.2	24	6	50	41	9	
4625															
	35			15	8,24,25,(45)	SM (*A-2-4(0)*)	brown, moist — SILTY SAND		13.9		NP	23	48	29	
						GP-GC	brown, very moist, med. dense								
4620			▽												
	40			8	38,35,37,(56)	GP-GC	brown, wet, dense								
4615															
	45			14	44,62,60,(93)	GP-GC (*A-2-6(0)*)	brown, wet, very dense — GRAVEL W/CLAY & SAND possible cobbles or boulders		15.9	27	11	52	37	11	
4610															
	50			6	60/6"	GP-GC	brown, wet, very dense								
4605															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-02

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 369127 E: 506118 / LAT: 40.544568 LONG: -111.984456

DATE STARTED: 4/26/16

DRILLING METHOD: 08-CME-55 / N.W. CASING TO 33.5'

DATE COMPLETED: 4/27/16

DRILLER: T.K.

GROUND ELEVATION: 4658.1'

DEPTH TO WATER - INITIAL: ▽ 39.8' **AFTER 24 HOURS:** ▼ 68.7' (5/5/16)

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				0	30/0"	-	no recovery								
4600							GRAVEL W/CLAY & SAND possible cobbles or boulders								
	60			18	26,40,50,(59)	SM (*A-2-4(0)*) GP-GC	brown, very moist, dense SILTY SAND brown, very moist, dense GRAVEL W/CLAY & SAND clay lenses, possible cobbles		19.9		NP	6	59	35	
4595							CLAY (driller's observation)								
	65			4	60/6"	GP-GC	brown, wet, very dense GRAVEL W/CLAY & SAND possible cobbles								
4590															
	70			18 0	5,10,15,(15) *PP >4.5* Pushed	CL (*A-4(7)*) -	brown, very moist to wet, very stiff LEAN CLAY trace sand no recovery		26.6	28	9	0	13	87	
4585															
	75			18	40,65,58,(75)	GC (*A-2-6(1)*)	brown, very moist, dense CLAYEY GRAVEL W/SAND possible cobbles		14.7	38	22	43	32	25	
4580															
	80			18	10,14,50,(38)	GC	brown, very moist, med. dense		23.3						
4575															
	85			0	75/3"	-	no recovery GRAVEL W/CLAY & SAND possible cobbles								
4570															
	90			3	75/4"	GP-GC	brown, very moist, very dense								
4565							CLAY (driller's observation)								
	95			0	Pushed	-	no recovery, crushed tube								
				0	6,8,9,(10)	-	no recovery								
4560				12	7,10,9,(12)	CL (*A-6(3)*)	brown, moist, very stiff SANDY LEAN CLAY W/GRAVEL		21.9	30	12	23	25	52	
	100			9	24,40,50/4"	GP-GC	brown, moist GRAVEL W/CLAY & SAND possible cobbles								
							BOH								
4555															
	105														
4550															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon

Split Spoon Sample

Blow Count per 6"
2,3,2,(6) ← $(N_1)_{60}$ Value
T 0.45 ← Torvane (tsf)
PP 2.0 ← Pocket Penetrometer (tsf)
With Liners

Thin-Walled Tube Sample

Pushed
T 0.45 ← Torvane (tsf)
PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-03

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 369113 E: 506254 / LAT: 40.544530 LONG: -111.983970

DRILLING METHOD: 08-CME-55 / N.W. CASING TO 28'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ 64.1' (5/5/16)

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 4/28/16

DATE COMPLETED: 4/29/16

GROUND ELEVATION: 4653.2'

LOGGED BY: C.S., M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				14	4,5,6,(23)	CL	dk. brown, moist, stiff — SANDY LEAN CLAY W/GRAVEL (fill?)								
4650				17	*T 0.36* 0,2,3,(11) *T 0.38*	CL	dk. brown to brown, moist, firm								
	5			16	Pushed *T 0.39*	CL (*A-6(17)*)	brown, moist, firm — LEAN CLAY	93.2	24.9	36	18	0	6	94	CU
4645				14	*T 0.34* 0,1,8,(16)	CL	brown, moist, firm								
	10					SM	brown, moist — SILTY SAND								
						GP-GM	brown, moist, very loose								
4640				11	20,36,39,(99+)	GP-GM (*A-1-a(0)*)	brown, moist, very dense		9.9		NP	54	36	10	
	15			11	16,30,25,(71)	GP-GM	brown, moist, dense — GRAVEL W/SILT & SAND possible cobbles								
4635				14	39,62,80,(99+)	GP-GM (*A-1-a(0)*)	brown, moist, very dense		10.3		NP	57	35	8	
	20			7	73,50/2"	GP-GM	brown, moist, very dense								
4630															
	25			14	27,61,41,(99+)	GP-GC (*A-1-a(0)*)	brown, moist, very dense		11.5	22	4	51	40	9	
4625							GRAVEL W/CLAY & SAND possible cobbles								
	30			7	58,50/2"	GP-GC	brown, moist, very dense								
4620															
	35			12	41,52,50/3"	GM	brown, moist, very dense — SILTY GRAVEL W/SAND plastic fines, possible cobbles								
4615															
	40			15	10,13,17,(24) *T 0.64*	ML (*A-4(1)*)	brown, very moist — SANDY SILT trace gravels		23.0	26	4	11	28	61	
						CL	brown, moist, stiff — SANDY LEAN CLAY W/GRAVEL								
4610															
	45			6	68/6"	GP-GC	brown, very moist, very dense								
4605							GRAVEL W/CLAY & SAND possible cobbles, boulders								
	50			4	60/4"	GP-GC	brown, very moist, very dense								
4600															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-03

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 369113 E: 506254 / LAT: 40.544530 LONG: -111.983970

DRILLING METHOD: 08-CME-55 / N.W. CASING TO 28'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ 64.1' (5/5/16)

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 4/28/16

DATE COMPLETED: 4/29/16

GROUND ELEVATION: 4653.2'

LOGGED BY: C.S., M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				15	40,58,62,(81)	GP-GC SM (*A-4(0)*)	brown, very moist brown, very moist, very dense SILTY SAND		17.5		NP	3	54	43	
4595															
	60			0	60/5"	-	no recovery								
							GRAVEL W/COBBLES (driller's observation)								
4590															
	65			0	60/3"	-	no recovery								
4585							CLAY (driller's observation)								
	70						GRAVEL (driller's observation)								
				18	0,5,9,(10) *T 0.21*	CL (*A-6(8)*)	brown, moist, soft SANDY LEAN CLAY		27.4	35	15	4	31	65	
4580							LEAN CLAY W/GRAVEL (driller's observation)								
	75			17	5,6,7,(9) *T 0.30*	CL (*A-6(10)*)	brown, very moist, firm LEAN CLAY W/SAND		27.8	31	14	0	16	84	
4575															
	80			3	60/5"	GP-GC	brown, wet, very dense								
4570							GRAVEL W/CLAY & SAND possible cobbles, boulders								
	85			4	60/5"	GP-GC	brown, wet, very dense								
4565															
	90			7	27,55/6"	GP-GC	brown, wet, very dense CLAY (driller's observation) GRAVEL W/CLAY & SAND silty sand layers								
4560															
	95			0	7,14,15,(17)	-	no recovery SAND (driller's observation)								
4555															
	100			0	3,7,9,(10)	-	no recovery SANDY CLAY (driller's observation)								
							BOH								
4550															
	105														
4545															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-01

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 1

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 368755 E: 506262 / LAT: 40.543549 LONG: -111.983931

DATE STARTED: 5/5/16

DRILLING METHOD: UDOT CME-850 / H.Q. TO 49'

DATE COMPLETED: 5/9/16

DRILLER: D.M.

GROUND ELEVATION: 4649.7'

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ N.M.

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4645	0			14	2,4,4,(14)	CL	brown, moist, firm — SANDY LEAN CLAY (fill)								
				18	1,3,5,(18)	CL (A-4(7))	brown, moist — LEAN CLAY W/SAND (fill?)		20.0	26	10	5	10	85	
	5			16	0/12",2,(3) *T 0.10*	CL-ML/CL	lt. brown, very moist to wet, very soft — SILTY CLAY TO LEAN CLAY silt lenses								Chem.
				30	Pushed *T 0.20*	CL (A-7-6(20))	lt. brown, moist, soft — LEAN CLAY	76.4	36.6	43	18	0	4	96	UU 899 psf
						SM	lt. brown, very moist — SILTY SAND								
4640	10			14	15,37,48,(99+)	GP-GM (A-1-a(0))	brown, moist, very dense		6.8		NP	57	33	10	
				12	12,36,45,(99+)	GP-GM	brown, moist, very dense								
4635	15			9	6,22,54,(84)	GP-GM	brown, moist, very dense — GRAVEL W/SILT & SAND possible cobbles								
4630	20			6	20,50/5"	GP-GM	brown, moist, very dense								
4625	25			13	14,41,27,(58)	GP-GM (A-1-a(0))	brown, moist, very dense		7.7		NP	65	30	5	
							SAND (driller's observation)								
4620	30			13	5,7,5,(9) *T 0.21*	CL-ML	brown, moist, soft — SILTY CLAY W/SAND								
4615	35			28	Pushed *T 0.29* *PP 2.3*	CL (A-4(3))	brown, very moist to wet, stiff — LEAN CLAY W/SAND sand lenses	100.2	22.8	23	8	0	24	76	CT UU 6,293 psf
4610	40			18	3,9,26,(24) *PP 2.0*	CL	brown, moist, stiff								
4605	45			9	12,57/4"	GP-GM	brown, very moist, very dense — GRAVEL W/SILT & SAND possible cobbles								
4600	50			9	17,70/6"	GP-GM	brown, very moist, very dense								
							BOH								
4595															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6" (N_1)$_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-02

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 1

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 369233 E: 506258 / LAT: 40.544861 LONG: -111.983955

DATE STARTED: 5/4/16

DRILLING METHOD: UDOT CME-850 / H.Q. TO 49.5'

DATE COMPLETED: 5/5/16

DRILLER: D.M.

GROUND ELEVATION: 4654.5'

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ N.M.

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				8	1,1,2,(7) *T 0.43*	CL	dk. gray-brown, sl. moist — SANDY LEAN CLAY (fill)								
				18	3,6,9,(26) *T 0.20*	SC (*A-4(1)*)	gray-brown, moist — Fabric at 2.5' CLAYEY SAND W/GRAVEL (fill?)		17.8	25	9	23	32	45	
4650	5			1	Pushed *T 0.15*	CL-ML	lt. brown, moist, soft — SILTY CLAY silt lenses								
				15	1,4,4,(12) *T 0.30*	CL (*A-6(8)*)	lt. brown, moist, firm — GRAVELLY LEAN CLAY silt lenses, trace sand		24.0	33	18	24	14	62	
4645	10			18	1,1,2,(4) *T 0.11*	CL	lt. brown, wet, very soft — LEAN CLAY W/SAND								
				14	Pushed *T 0.11*	CL (*A-6(11)*)	lt. brown, wet, very soft — LEAN CLAY sand lenses	85.1	33.8	30	13	0	8	92	UU 466 psf
4640	15			16	10,41,52,(99+)	GP-GM	brown, very moist, very dense — GRAVEL W/SILT & SAND possible cobbles								
				14	15,37,45,(84)	GP-GM (*A-1-a(0)*)	brown, wet, very dense — GRAVEL W/SILT & SAND silty sand layers, possible cobbles		11.0		NP	51	40	9	
4635	20			9	12,63/6"	GP-GM	brown, wet, very dense — GRAVEL W/SILT & SAND possible cobbles								
4630	25			10	30,57,63,(99+)	GP	brown, wet, very dense — GRAVEL W/SAND possible cobbles								
4625	30			11	11,48,59,(83)	GP-GM (*A-1-a(0)*)	brown, very moist, very dense		11.0		NP	55	36	9	
4620	35			6	16,50/3"	GP-GM	brown, very moist, very dense — GRAVEL W/SILT & SAND possible cobbles								
4615	40			10	23,70/5"	GP-GM	brown, very moist, very dense								
4610	45			11	11,39,70/5"	GP-GM (*A-1-a(0)*)	brown & dk. brown, moist, very dense — GRAVEL W/SILT & SAND clay lenses, possible cobbles		7.0		NP	58	33	9	
4605	50			6	20,70/6"	GP	brown, wet, very dense — GRAVEL W/SAND								
4600							BOH								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6" ($(N_1)_{60}$ Value)
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- Pushed *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

Laboratory Test Results – Summary Tables

SUMMARY OF TEST DATA
BANGERTER 4 INTERCHANGES
11400 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	IN-PLACE		UNCONFINED OR UU TRIAXIAL COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO CLASSIFICATION)
		DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
16-S-01	3-4.5	113.5	15.5		30	17	13	6	23	71	CL (A-6 (7))
	9-10.5	82.3	32.2	UU 1,495	36	21	15	0	6	94	CL (A-6 (15))
	10.5-12		13.3				NP	40	42	18	SM (A-1-b (0))
	21-22.5		9.0				NP	56	37	7	GP-GM (A-1-a (0))
	30-31	100.1	21.3	UU 874	23	15	8	19	12	69	CL (A-4 (3))
	35-36.5		23.6		27	14	13	0	17	83	CL (A-6 (9))
	45-46.5		13.1		26	16	10	52	36	12	GP-GC (A-2-4 (0))
	60-61.5		13.9		26	19	7	59	28	13	GC-GM (A-2-4 (0))
	70-71.5		22.8		23	18	5	12	16	72	CL-ML (A-4 (1))
	75-76.5		32.5		28	17	11	0	20	80	CL (A-6 (7))
	85-86.5		14.9		27	20	7	58	32	10	GP-GC (A-2-4 (0))
16-S-02	6-7.5	94.4	28.5	UU 1,135	34	18	16	1	11	88	CL (A-6 (13))
	12-13.5		11.8		25	21	4	46	36	18	GC-GM (A-1-b (0))
	30-31.5		13.2		24	18	6	50	41	9	GP-GC (A-1-a (0))
	35-36.5		13.9				NP	23	48	29	SM (A-2-4 (0))
	45-46.5		15.9		27	16	11	52	37	11	GP-GC (A-2-6 (0))
	60-61.5 (top)		19.9				NP	6	59	35	SM (A-2-4 (0))
	70-71.5		26.6		28	19	9	0	13	87	CL (A-4 (7))
	75-76.5		14.7		38	16	22	43	32	25	GC (A-2-6 (1))
	80-81.5		23.3								
	97.5-99		21.9		30	18	12	23	25	52	CL (A-6 (3))
16-S-03	6-7.5	93.2	24.9		36	18	18	0	6	94	CL (A-6 (17))
	12-13.5		9.9				NP	54	36	10	GP-GM (A-1-a (0))
	18-19.5		10.3				NP	57	35	8	GP-GM (A-1-a (0))
	25-26.5		11.5		22	18	4	51	40	9	GP-GC (A-1-a (0))
	40-41.5		23.0		26	22	4	11	28	61	ML (A-4 (1))
	55-56.5		17.5				NP	3	54	43	SM (A-4 (0))
	70.5-72		27.4		35	20	15	4	31	65	CL (A-6 (8))
	75.5-77		27.8		31	17	14	0	16	84	CL (A-6 (10))

NP=Non-Plastic

SUMMARY OF TEST DATA
BANGERTER 4 INTERCHANGES
11400 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	IN-PLACE		UNCONFINED OR UU TRIAXIAL COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO CLASSIFICATION)
		DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
16-E-01	2.5-4		20.0		26	16	10	5	10	85	CL (A-4 (7))
	6-8.5	76.4	36.6	UU 899	43	25	18	0	4	96	CL (A-7-6 (20))
	9-10.5		6.8				NP	57	33	10	GP-GM (A-1-a (0))
	24-25.5		7.7				NP	65	30	5	GP-GM (A-1-a (0))
	34-36.4	100.2	22.8	UU 6,293	23	15	8	0	24	76	CL (A-4 (3))
16-E-02	2.5-4		17.8		25	16	9	23	32	45	SC (A-4 (1))
	6.5-8		24.0		33	15	18	24	14	62	CL (A-6 (8))
	11.5-13	85.1	33.8	UU 466	30	17	13	0	8	92	CL (A-6 (11))
	16.5-18		11.0				NP	51	40	9	GP-GM (A-1-a (0))
	29.5-31		11.0				NP	55	36	9	GP-GM (A-1-a (0))
	44.5-46		7.0				NP	58	33	9	GP-GM (A-1-a (0))

NP=Non-Plastic

SUMMARY OF ELECTRO-CHEMICAL TEST DATA
BANGERTER 4 INTERCHANGES
11400 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	pH	RESISTIVITY (ohm-cm)	CHLORIDE (mg/kg-dry)	SULFATE (mg/kg-dry)
16-S-01	12-18	8.2	1400	21.6	41.7
16-S-02	3-9	8.0	550	396	203
16-E-01	2.5-5.5	8.7	935	66	57.7

NP=Non-Plastic

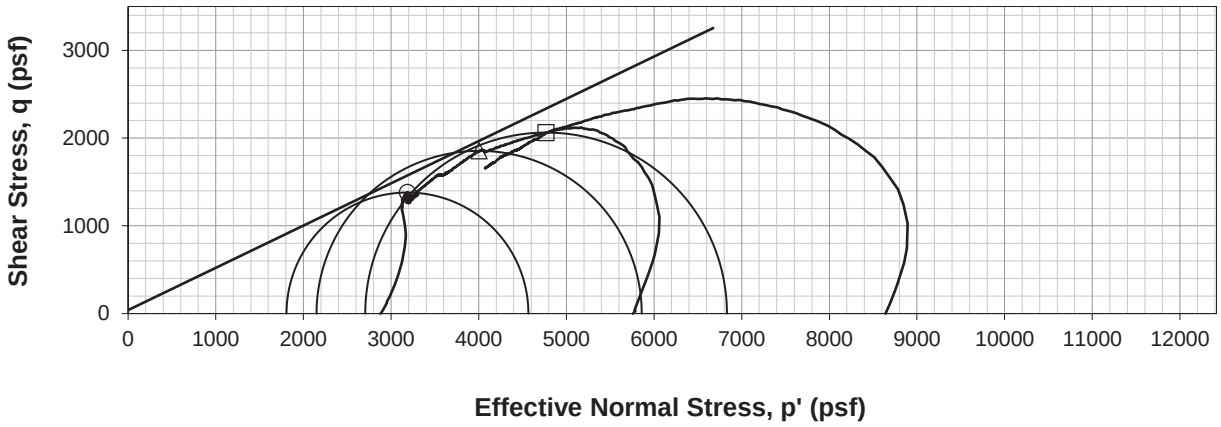
Laboratory Test Results – CU Triaxial Compression

CONSOLIDATED-UNDRAINED
TRIAXIAL COMPRESSION TEST

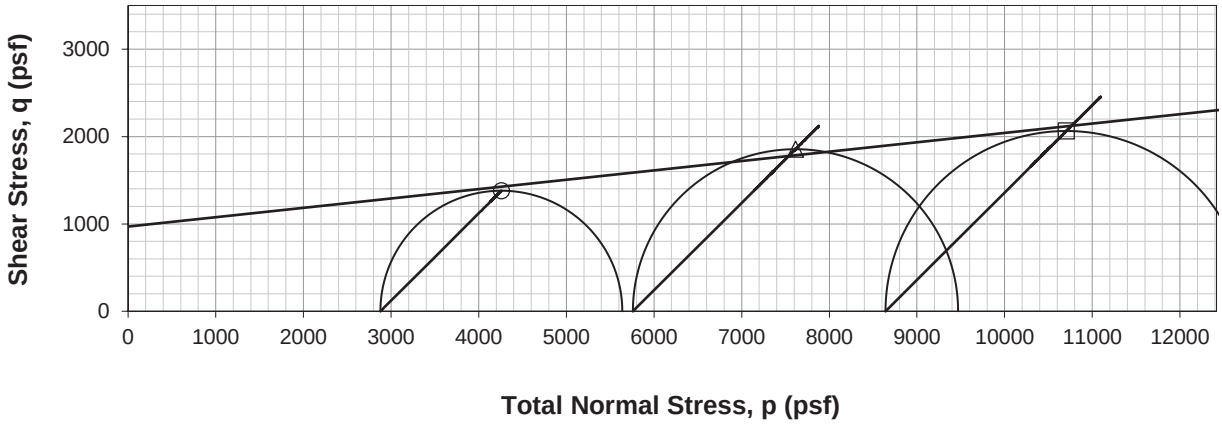
Project	Bangerter 4 Interchanges		
Project No.	201601-010	**Boring No**	16-S3
Location	11400 South	**Depth / Elev. (ft)**	6-7.5'
Date	5/4/16	**Sample Type**	Shelby
		Failure Criteria	Max obliquity
Sample Description	Lean Clay, CL: LL = 36, PI = 18		

Summary of Results		σ'_{consol}	$\sigma_{d,f}$*	ε_f	$\sigma'_{1,f}$*	$\sigma'_{3,f}$*
		psf	psf		psf	psf
Specimen 1	○	2879	2759	2.5%	4566	1807
Specimen 2	Δ	5759	3710	6.2%	5860	2150
Specimen 3	□	8641	4126	6.1%	6832	2705

Effective stress failure envelope **c'** = 40 psf (0.3 psi) ϕ' = 25.7°



Total stress failure envelope **c** = 970 psf (6.7 psi) ϕ = 6.1°



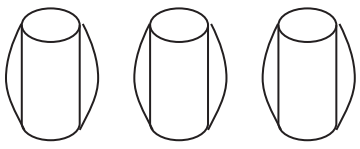
See page two for plots of deviator stress and pore water pressure versus strain.

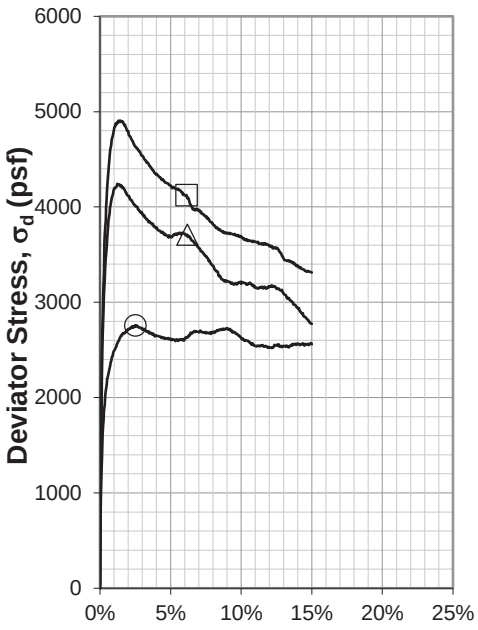
*Values corrected for membrane effects
**A_c calculated according to ASTM D 4767 10.3.2.1 *Method A*

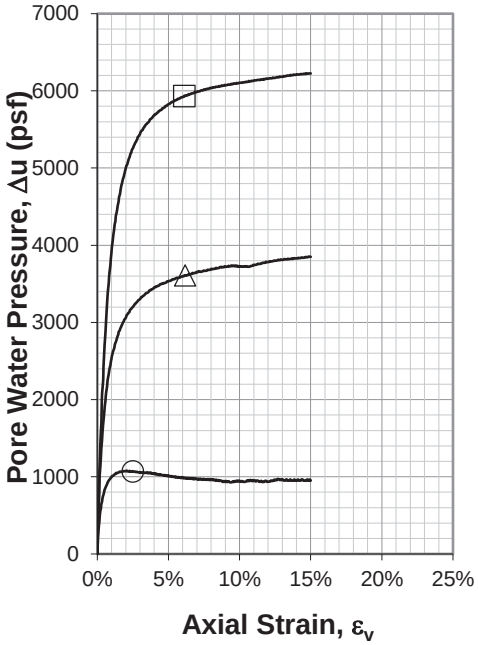
Tested in general accordance with
ASTM D 4767

CONSOLIDATED-UNDRAINED
TRIAXIAL COMPRESSION TEST

Project	Bangerter 4 Interchanges		
Project No.	201601-010	**Boring No**	16-S3
Location	11400 South	**Depth / Elev. (ft)**	6-7.5'
Date	5/4/16	**Sample Type**	Shelby
		Failure Criteria	Max obliquity
Sample Description	Lean Clay, CL: LL = 36, PI = 18		

Symbol			○	Δ	□	
Specimen			1	2	3	
Vertical effective consolidation stress		σ'_c	2879	5759	8641	(psf)
Initial	**Height**	L_o	3.41	3.16	3.21	(in)
	Diameter	D_o	1.37	1.43	1.41	(in)
	Moisture	w_o	24.9%	24.9%	24.9%	
	Dry unit weight	γ_{do}	95.3	93.2	91.2	(pcf)
	Est. specific gravity	G_s	2.68	2.68	2.68	
	Void ratio	e_o	0.76	0.80	0.83	
	Saturation	S_o	88%	84%	80%	
After consolidation	**Moisture**	w	28.1%	30.1%	30.5%	
	Dry unit weight	γ_d	95.4	92.6	92.1	(pcf)
	Void ratio	e	0.75	0.81	0.82	
	Saturation	S	100%	100%	100%	
	Area	A_c	1.75	1.63	1.74	(in^2)
	Time to 50% consolidation	t_{50}	3.24	0.64	0.52	(min)
	B-value	B	0.89	0.93	0.92	
	Total back pressure		13968	14372	13968	(psf)
Results at Failure	**Deviator stress**	$\sigma_{d,f}$	2759	3710	4126	(psf)
	Major principal effective stress	σ'_1	4566	5860	6832	(psf)
	Minor principal effective stress	σ'_3	1807	2150	2705	(psf)
	Strain	ε_f	2.5%	6.2%	6.1%	
	Strain rate, /min		0.02%	0.02%	0.02%	
	Sketch at Failure					





Remarks

Sand lenses observed in Specimen 2.

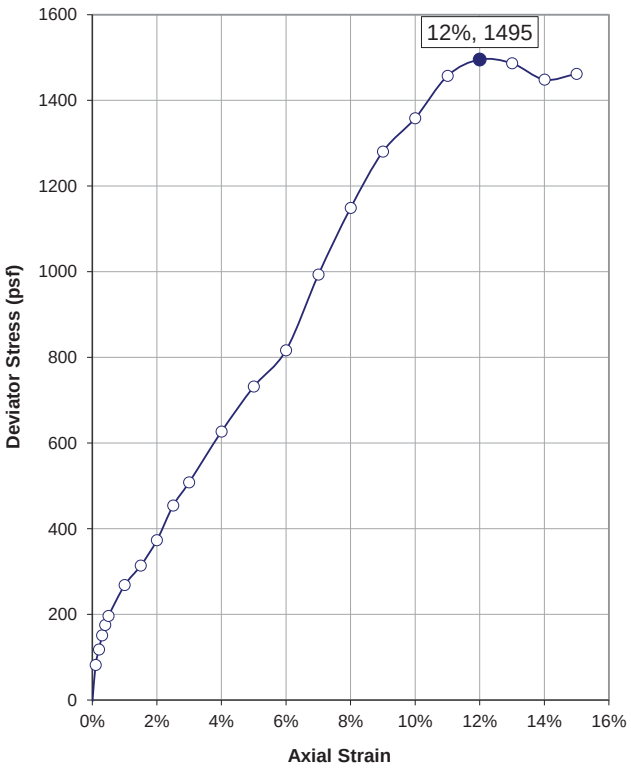
*Values corrected for membrane effects
**A_c calculated according to ASTM D 4767 10.3.2.1 *Method A*

Tested in general accordance with
ASTM D 4767

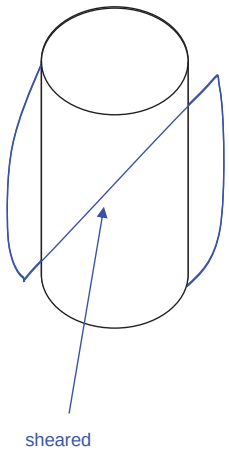
Laboratory Test Results – UU Triaxial Compression

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-S-01
Project No.	201601-009	**Sample**	1
Location	11400 So.	**Depth / Elev. (ft)**	9'-10.5'
Date	Tuesday, June 07, 2016	**Sample Description**	Lean Clay CL
		Sample Type	Shelby Tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-7	-3	
0.1%	82	41	
0.2%	118	59	
0.3%	151	75	
0.4%	175	88	
0.5%	197	98	
1.0%	268	134	
1.5%	314	157	
2.0%	373	187	
2.5%	454	227	
3.0%	509	254	
4.0%	627	313	
5.0%	732	366	
6.0%	817	408	
7.0%	993	497	
8.0%	1149	575	
9.0%	1280	640	
10.0%	1358	679	
11.0%	1458	729	
12.0%	1495	748	
13.0%	1487	743	
14.0%	1448	724	
15.0%	1462	731	



Initial Sample Data

Initial height of specimen	L_o	4.79	(in)	**Moisture content***	w	32.2%	
Initial diameter of specimen	D_o	2.54	(in)	**Dry unit weight**	γ_d	82.3	(pcf)
Height-to-diameter ratio	L_o / D_o	1.89		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	36		**Initial void ratio**	e_o	1.033	
Plastic index	PI	15		**Saturation**	S	84%	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	1495	(psf)	**Major principal stress at failure****	σ_1	2644	(psf)
Shear stress at failure**	c_u	748	(psf)	**Minor principal stress at failure****	σ_3	1149	(psf)

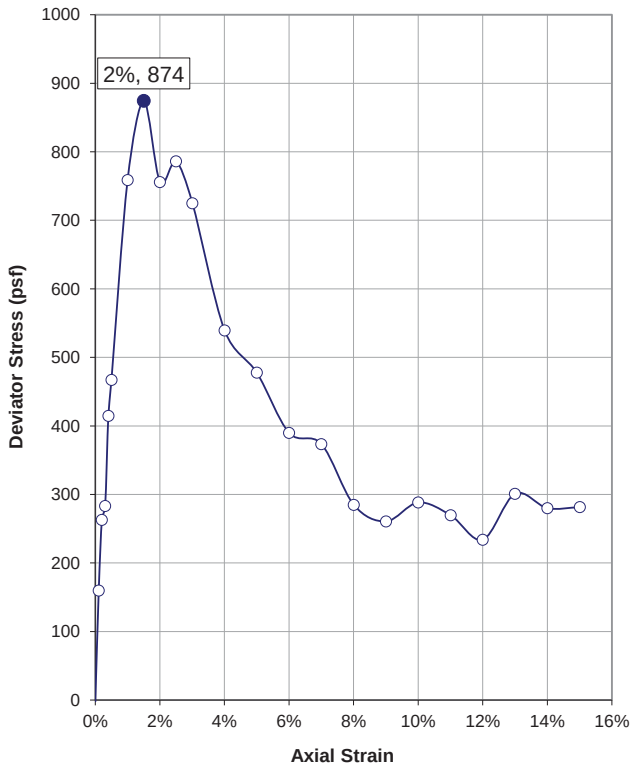
Average strain rate to failure	1%	/ min
Strain at failure	12%	

Remarks Confining Pressure 8 psi

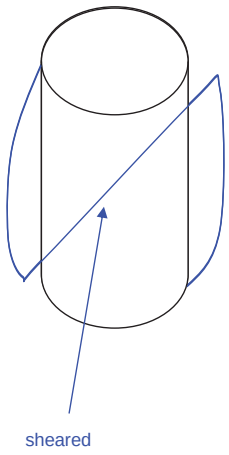
*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-S-01
Project No.	201601-009	**Sample**	1
Location	11400 So.	**Depth / Elev. (ft)**	30' -31'3"
Date	Tuesday, June 07, 2016	**Sample Description**	Gravelly Lean Clay CL
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-4	-2	
0.1%	160	80	
0.2%	263	132	
0.3%	283	142	
0.4%	415	207	
0.5%	467	234	
1.0%	759	379	
1.5%	874	437	
2.0%	756	378	
2.5%	786	393	
3.0%	725	363	
4.0%	540	270	
5.0%	478	239	
6.0%	390	195	
7.0%	374	187	
8.0%	285	143	
9.0%	261	130	
10.0%	288	144	
11.0%	270	135	
12.0%	234	117	
13.0%	301	151	
14.0%	280	140	
15.0%	281	141	



Initial Sample Data

Initial height of specimen	L_o	5.28	(in)	**Moisture content***	w	21.3%	
Initial diameter of specimen	D_o	2.60	(in)	**Dry unit weight**	γ_d	104.3	(pcf)
Height-to-diameter ratio	L_o / D_o	2.03		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	23		**Initial void ratio**	e_o	0.604	
Plastic index	PI	8		**Saturation**	S	95%	

Test Results

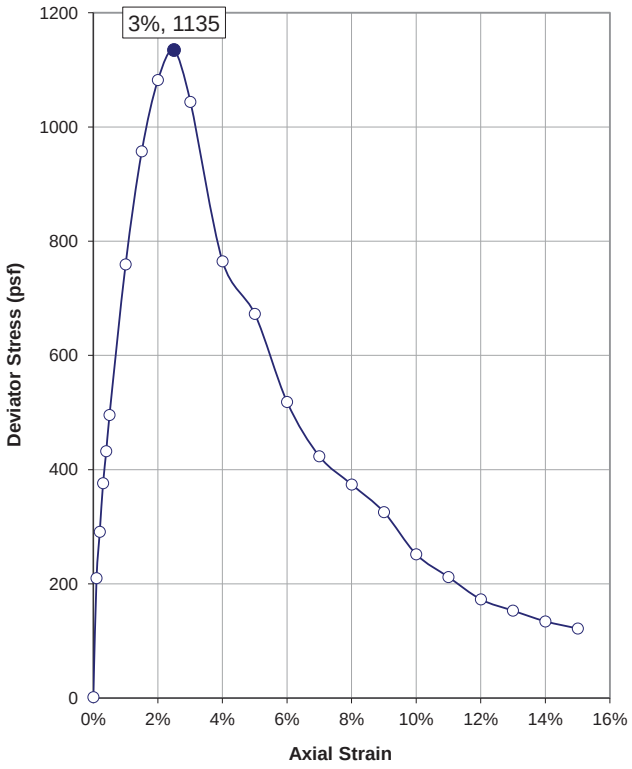
Deviator stress at failure**	$\sigma_{d,f}$	874	(psf)	**Major principal stress at failure****	σ_1	4474	(psf)
Shear stress at failure**	c_u	437	(psf)	**Minor principal stress at failure****	σ_3	3600	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		2%					

Remarks Confining Pressure 25 psi

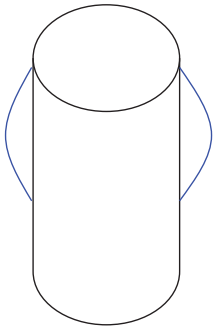
*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-S-02
Project No.	201601-009	**Sample**	1
Location	11400 So.	**Depth / Elev. (ft)**	6'-7.5'
Date	Tuesday, June 07, 2016	**Sample Description**	Lean Clay CL
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	2	1	
0.1%	210	105	
0.2%	291	146	
0.3%	376	188	
0.4%	432	216	
0.5%	496	248	
1.0%	759	380	
1.5%	957	479	
2.0%	1082	541	
2.5%	1135	567	
3.0%	1044	522	
4.0%	765	382	
5.0%	673	336	
6.0%	518	259	
7.0%	424	212	
8.0%	374	187	
9.0%	326	163	
10.0%	252	126	
11.0%	212	106	
12.0%	173	86	
13.0%	153	76	
14.0%	134	67	
15.0%	122	61	



Initial Sample Data

Initial height of specimen	L_o	5.33	(in)	**Moisture content***	w	28.5%	
Initial diameter of specimen	D_o	2.60	(in)	**Dry unit weight**	γ_d	91.6	(pcf)
Height-to-diameter ratio	L_o / D_o	2.05		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	34		**Initial void ratio**	e_o	0.826	
Plastic index	PI	16		**Saturation**	S	92%	

Test Results

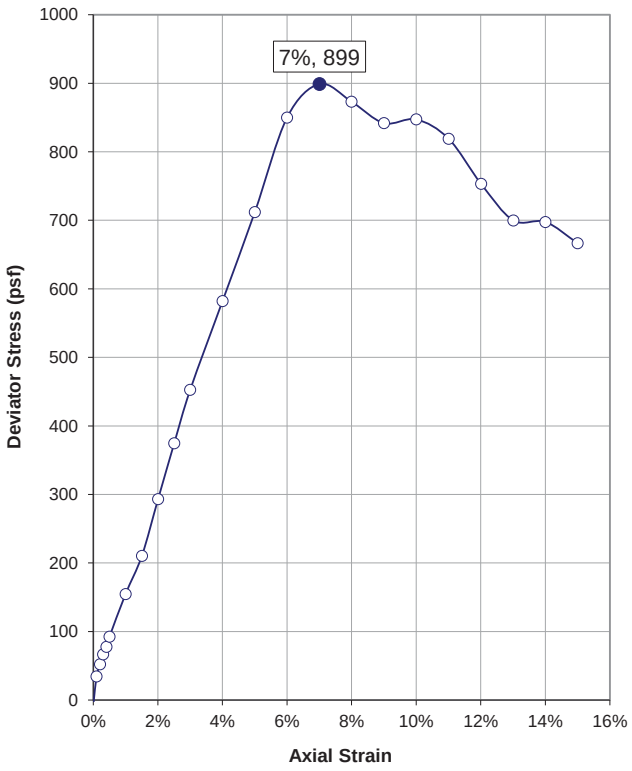
Deviator stress at failure**	$\sigma_{d,f}$	1135	(psf)	**Major principal stress at failure****	σ_1	1847	(psf)
Shear stress at failure**	c_u	567	(psf)	**Minor principal stress at failure****	σ_3	712	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		3%					

Remarks Confining Pressure 5 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-1
Project No.	201601-009	**Sample**	1
Location	114th south	**Depth / Elev. (ft)**	6'-8.5'
Date	Friday, July 22, 2016	**Sample Description**	Lean Clay CL
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-8	-4	
0.1%	35	17	
0.2%	52	26	
0.3%	67	33	
0.4%	78	39	
0.5%	92	46	
1.0%	155	77	
1.5%	211	105	
2.0%	293	147	
2.5%	375	187	
3.0%	453	226	
4.0%	582	291	
5.0%	712	356	
6.0%	850	425	
7.0%	899	449	
8.0%	873	437	
9.0%	842	421	
10.0%	847	424	
11.0%	819	410	
12.0%	753	377	
13.0%	700	350	
14.0%	698	349	
15.0%	667	333	

Initial Sample Data

Initial height of specimen	L_o	5.16	(in)	**Moisture content***	w	36.6%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	76.4	(pcf)
Height-to-diameter ratio	L_o / D_o	1.84		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	43		**Initial void ratio**	e_o	1.188	
Plastic index	PI	18		**Saturation**	S	83%	

Test Results

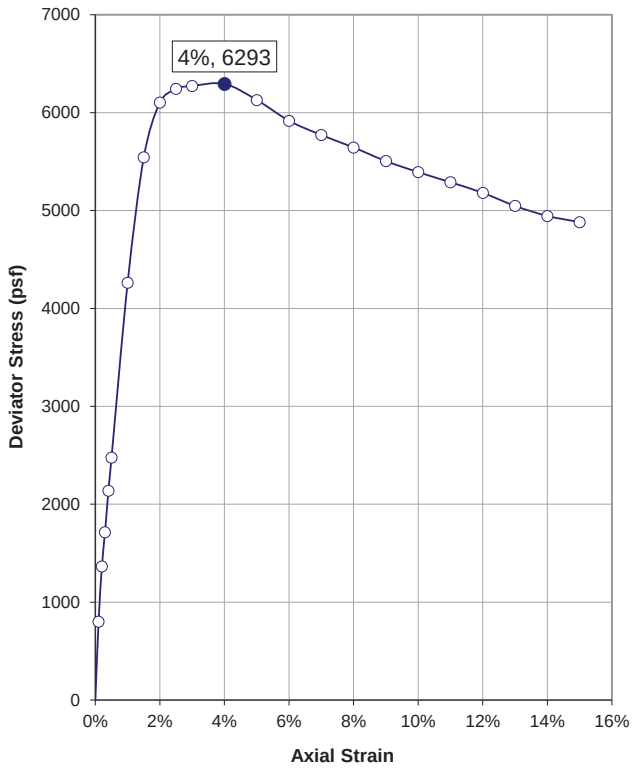
Deviator stress at failure**	$\sigma_{d,f}$	899	(psf)	**Major principal stress at failure****	σ_1	1613	(psf)
Shear stress at failure**	c_u	449	(psf)	**Minor principal stress at failure****	σ_3	714	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		7%					

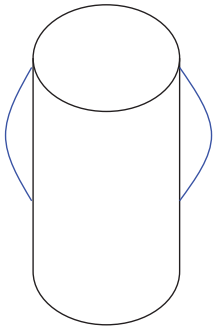
Remarks Confining Pressure 5 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-1
Project No.	201601-009	**Sample**	1
Location	114th South	**Depth / Elev. (ft)**	34'-36'4
Date	Friday, July 22, 2016	**Sample Description**	Lean Clay w/ Sand CL
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	0	0	
0.1%	801	400	
0.2%	1364	682	
0.3%	1714	857	
0.4%	2139	1070	
0.5%	2477	1238	
1.0%	4262	2131	
1.5%	5545	2772	
2.0%	6104	3052	
2.5%	6243	3122	
3.0%	6273	3136	
4.0%	6293	3147	
5.0%	6129	3064	
6.0%	5916	2958	
7.0%	5771	2885	
8.0%	5644	2822	
9.0%	5505	2752	
10.0%	5392	2696	
11.0%	5289	2644	
12.0%	5181	2590	
13.0%	5047	2524	
14.0%	4944	2472	
15.0%	4882	2441	

Initial Sample Data

Initial height of specimen	L_o	5.6	(in)	**Moisture content***	w	22.8%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	103.6	(pcf)
Height-to-diameter ratio	L_o / D_o	2.00		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	23		**Initial void ratio**	e_o	0.614	
Plastic index	PI	8		**Saturation**	S	100%	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	6293	(psf)	**Major principal stress at failure****	σ_1	10308	(psf)
Shear stress at failure**	c_u	3147	(psf)	**Minor principal stress at failure****	σ_3	4015	(psf)

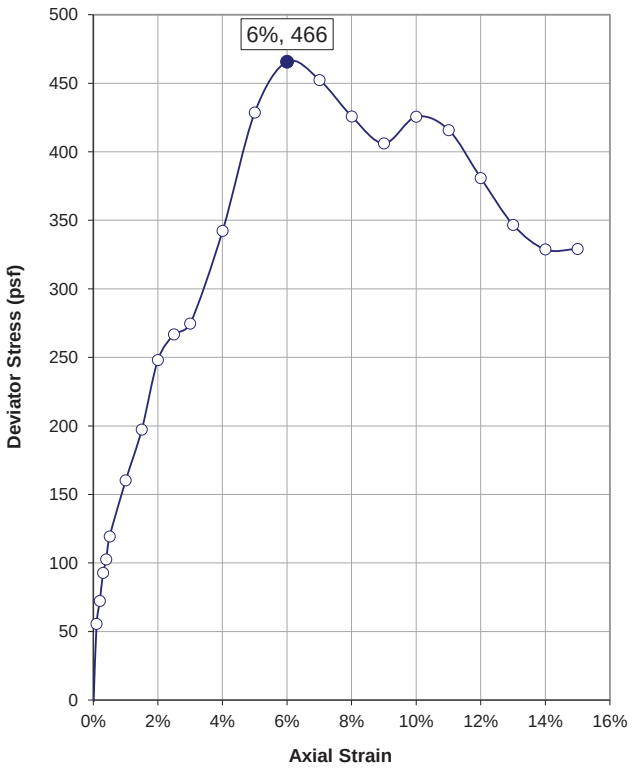
Average strain rate to failure	1%	/ min
Strain at failure	4%	

Remarks Confining Pressure 28 psi

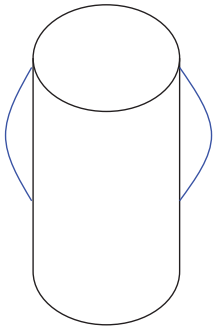
*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-2
Project No.	201601-010	**Sample**	1
Location	11400 South	**Depth / Elev. (ft)**	11.5' to 13
Date	Friday, July 22, 2016	**Sample Description**	Lean Clay CL
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-8	-4	
0.1%	56	28	
0.2%	72	36	
0.3%	93	46	
0.4%	103	51	
0.5%	119	60	
1.0%	160	80	
1.5%	197	99	
2.0%	248	124	
2.5%	267	133	
3.0%	275	137	
4.0%	342	171	
5.0%	429	214	
6.0%	466	233	
7.0%	452	226	
8.0%	426	213	
9.0%	406	203	
10.0%	426	213	
11.0%	416	208	
12.0%	381	190	
13.0%	347	173	
14.0%	329	164	
15.0%	329	165	



Initial Sample Data

Initial height of specimen	L_o	4.06	(in)	**Moisture content***	w	33.8%	
Initial diameter of specimen	D_o	2.60	(in)	**Dry unit weight**	γ_d	85.1	(pcf)
Height-to-diameter ratio	L_o / D_o	1.56		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	30		**Initial void ratio**	e_o	0.966	
Plastic index	PI	13		**Saturation**	S	94%	

Test Results

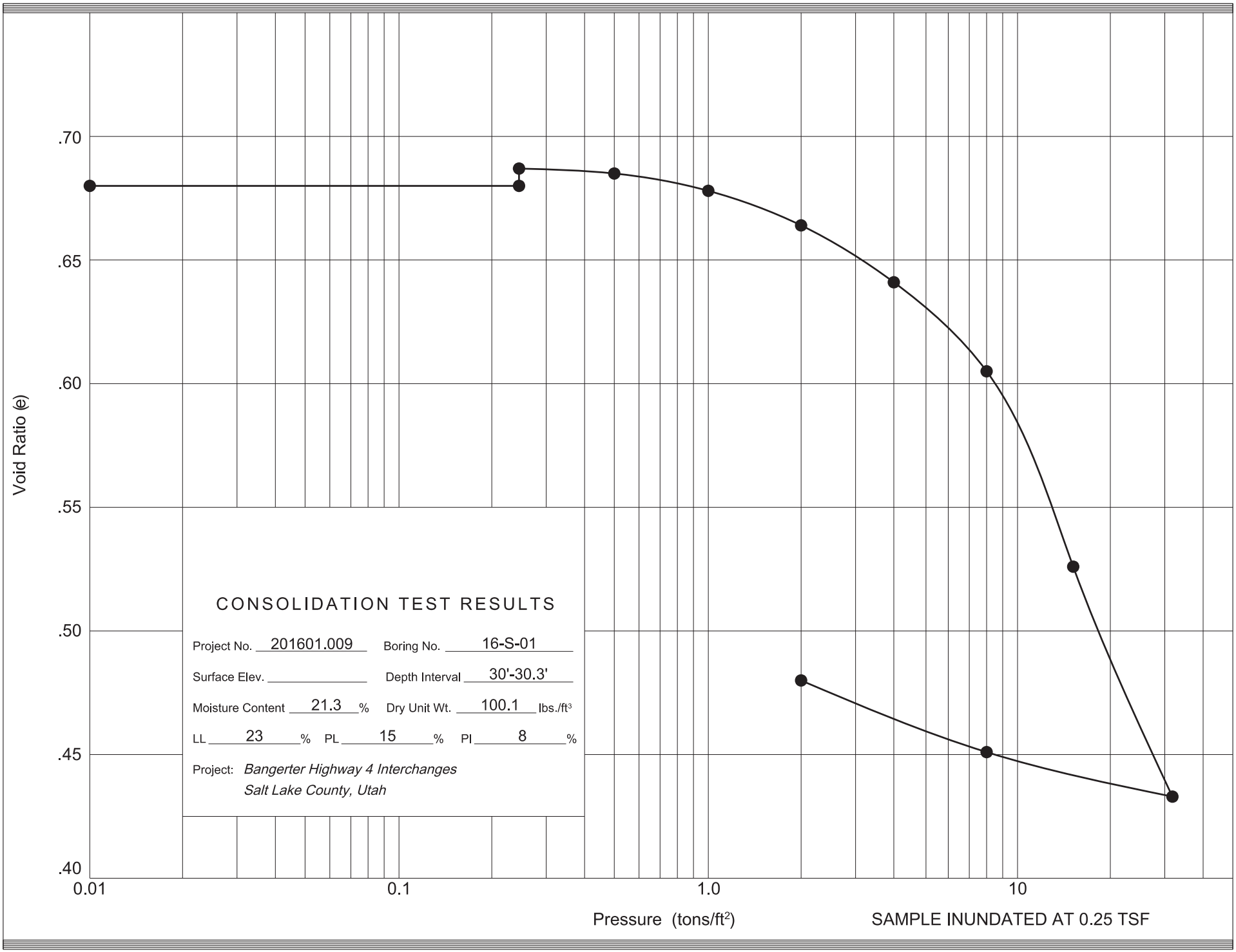
Deviator stress at failure**	$\sigma_{d,f}$	466	(psf)	**Major principal stress at failure****	σ_1	1903	(psf)
Shear stress at failure**	c_u	233	(psf)	**Minor principal stress at failure****	σ_3	1438	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		6%					

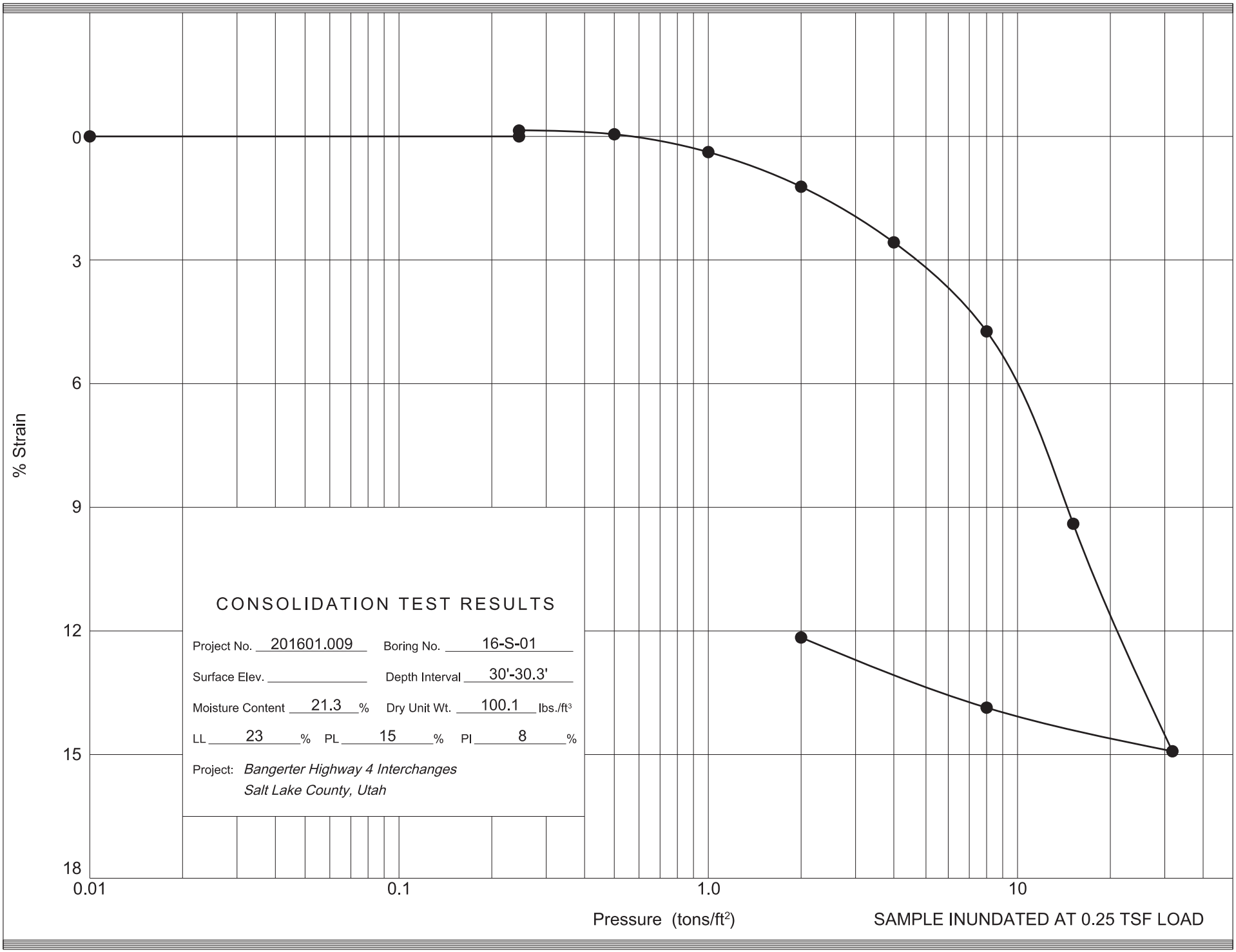
Remarks Confining Pressure 10 psi

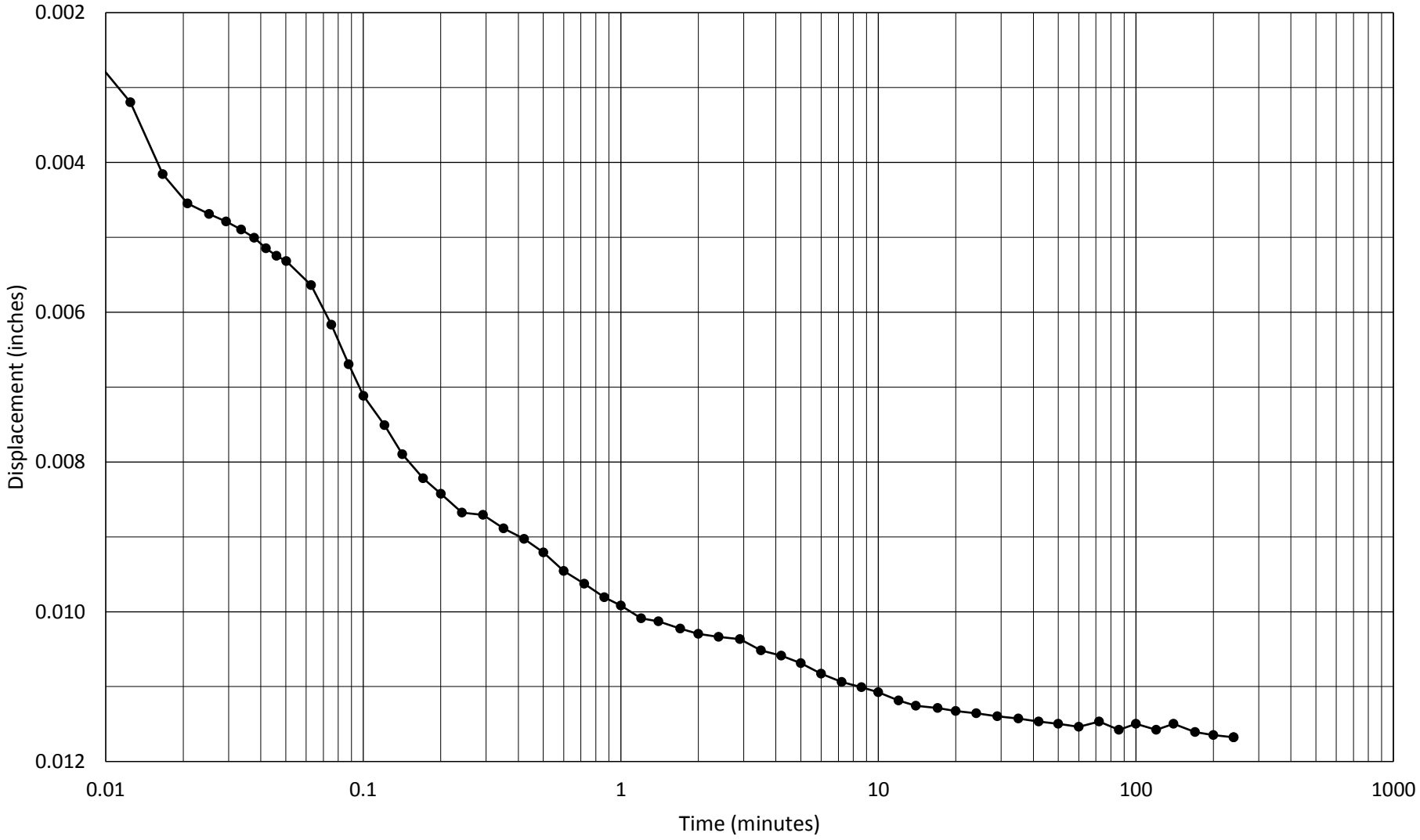
*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

ASTM D 2850

Laboratory Test Results – Consolidation


.70
.65
.60
.55
.50
.45
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-01
Surface Elev.
Depth Interval 30'-30.3'
Moisture Content 21.3 %
Dry Unit Wt. 100.1 lbs./ft³
LL 23 %
PL 15 %
PI 8 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

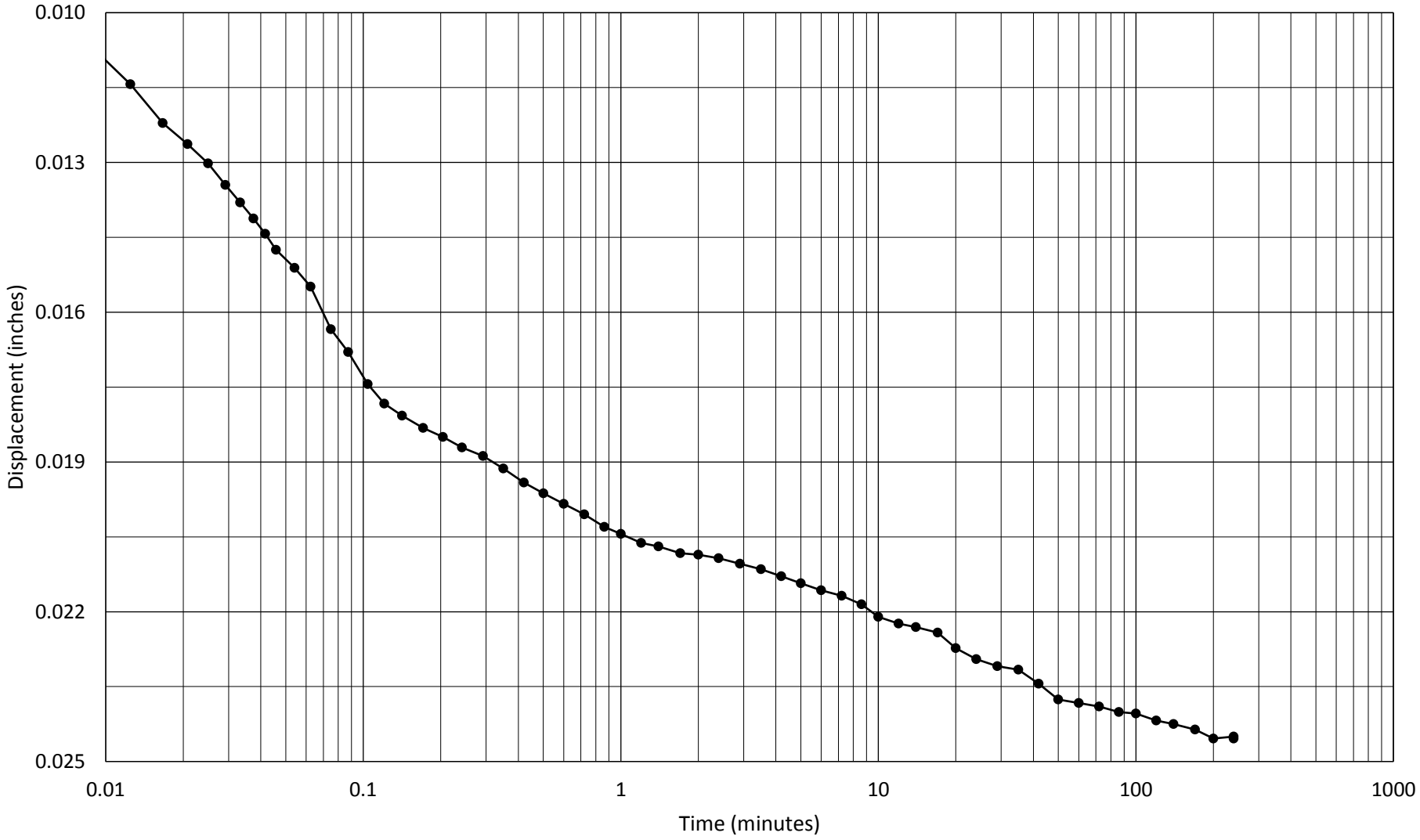

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-01
Surface Elev.
Depth Interval 30'-30.3'
Moisture Content 21.3 %
Dry Unit Wt. 100.1 lbs./ft³
LL 23 %
PL 15 %
PI 8 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-01
Depth: 30'-30.3'
Load: 1 to 2 tsf

TIME CONSOLIDATION

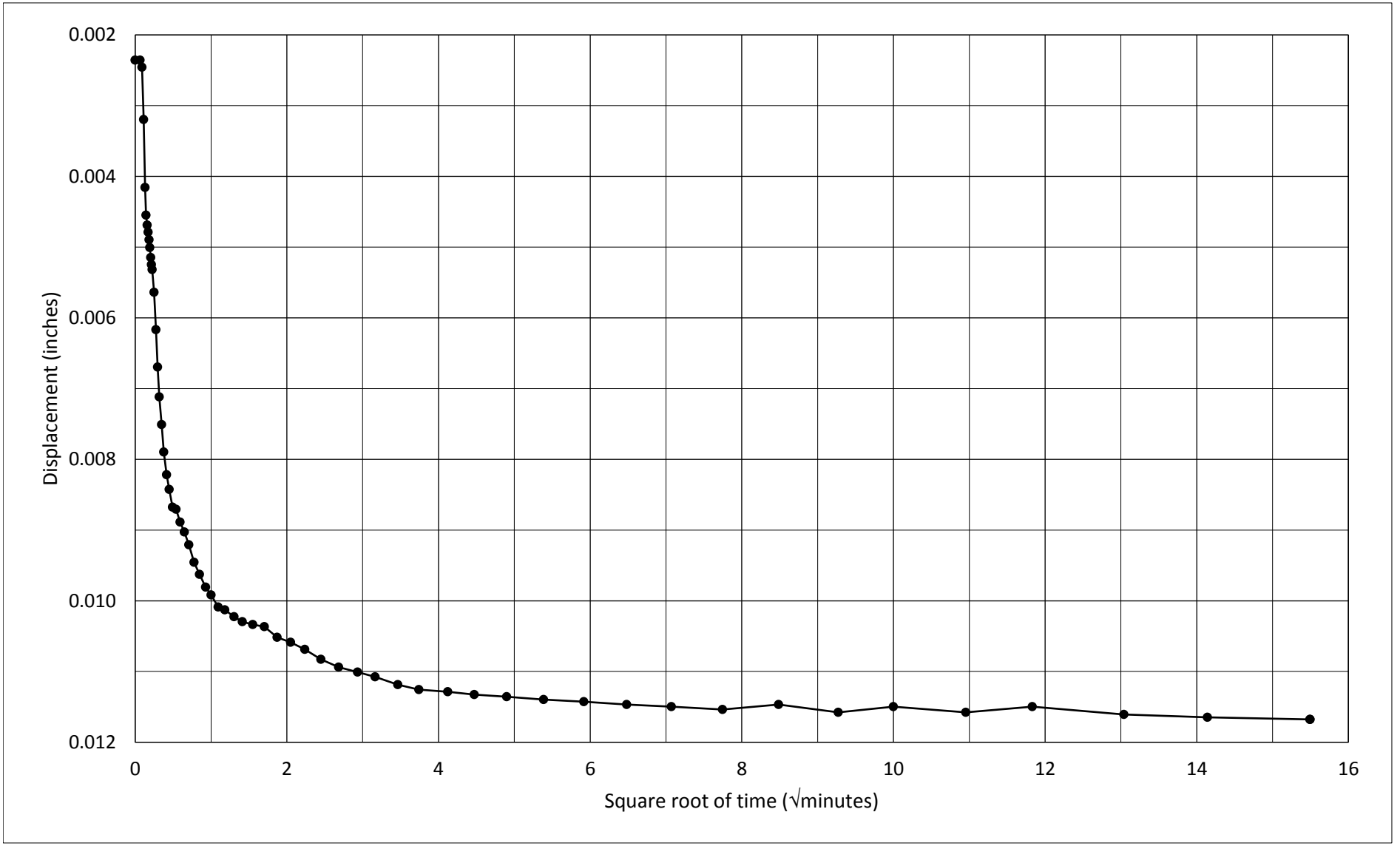
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-01
Depth: 30'-30.3'
Load: 2 to 4 tsf

TIME CONSOLIDATION

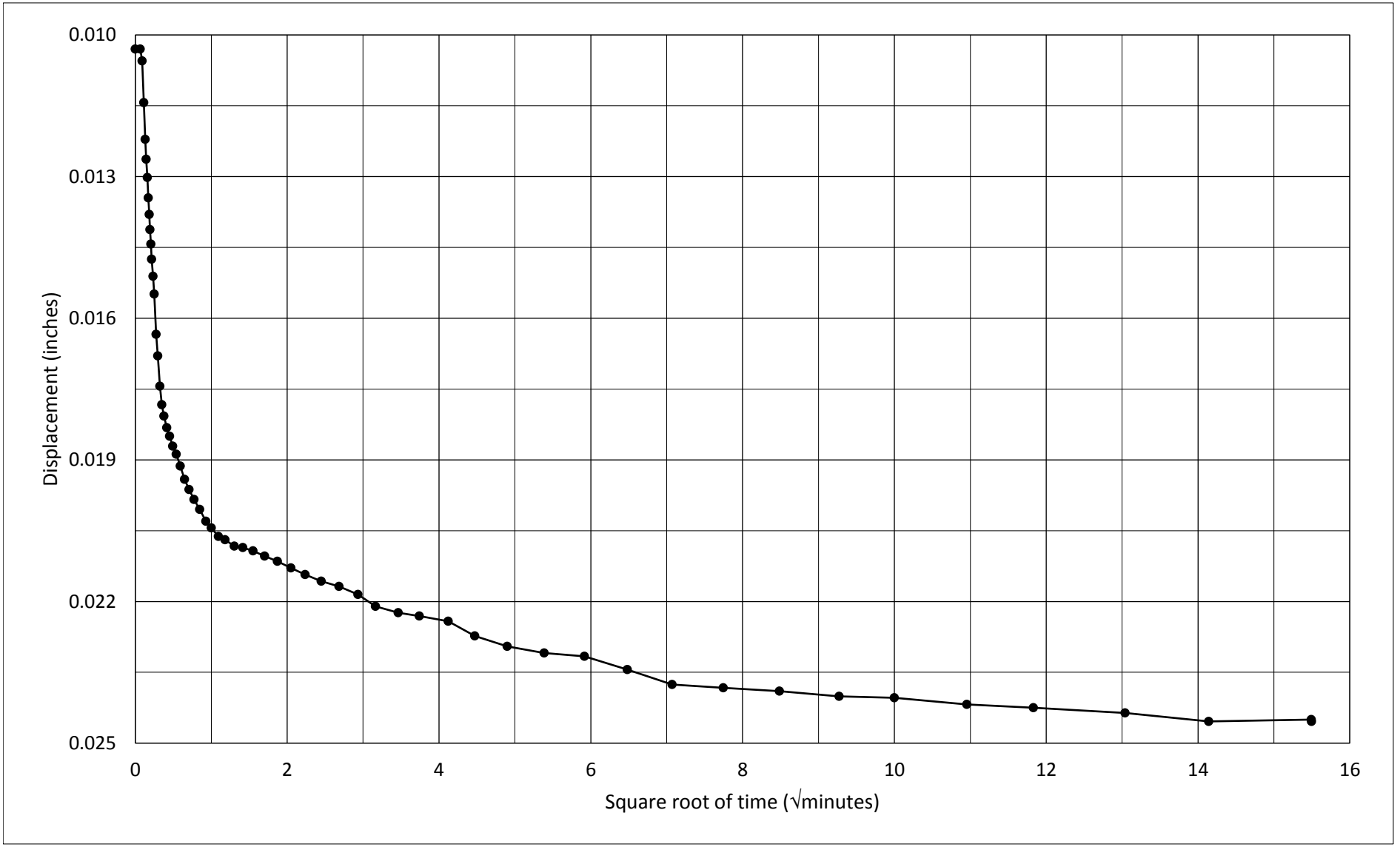
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-01
Depth: 30'-30.3'
Load: 1 to 2 tsf

TIME CONSOLIDATION

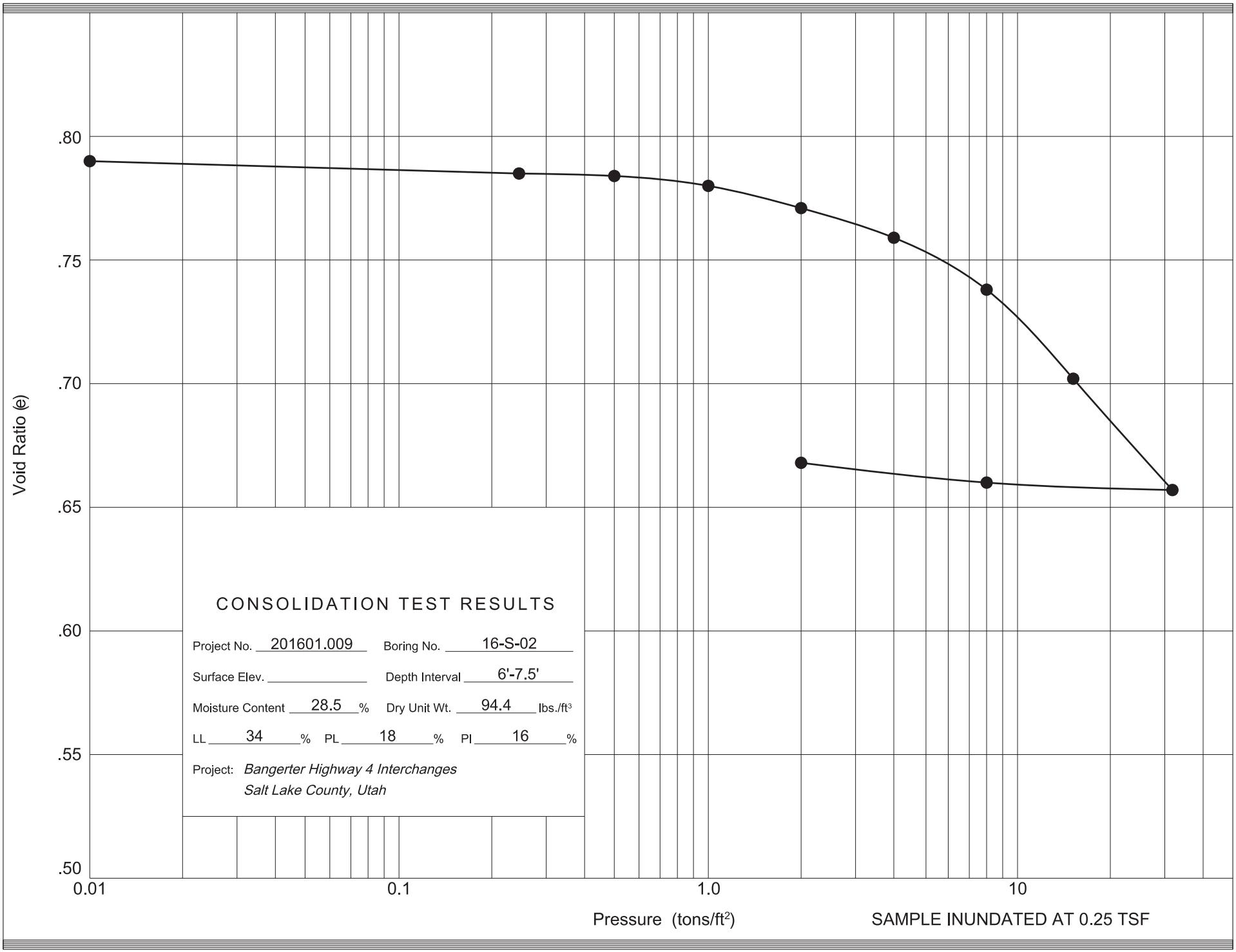
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-01
Depth: 30'-30.3'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah



CONSOLIDATION TEST RESULTS

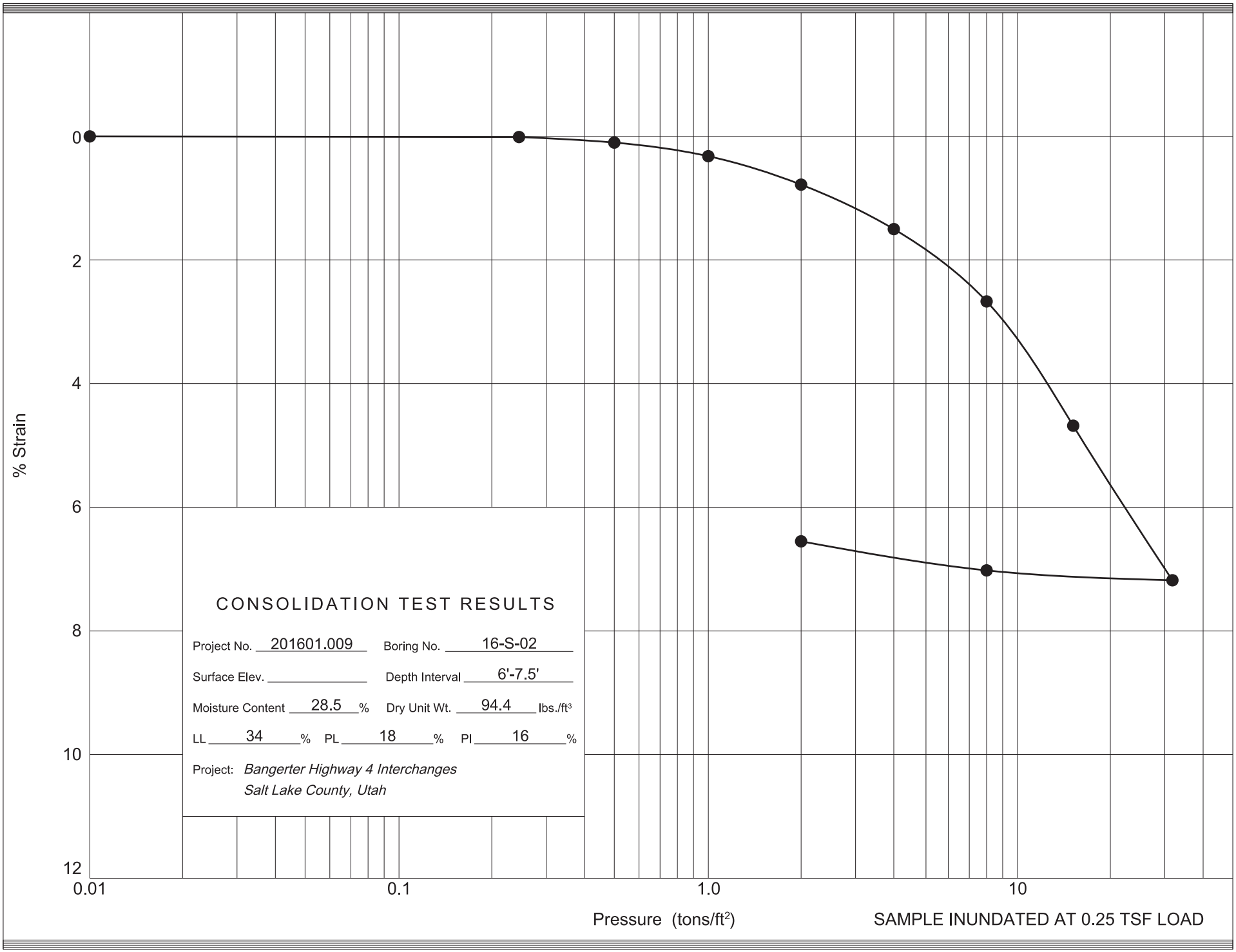
Project No. 201601.009 Boring No. 16-S-02

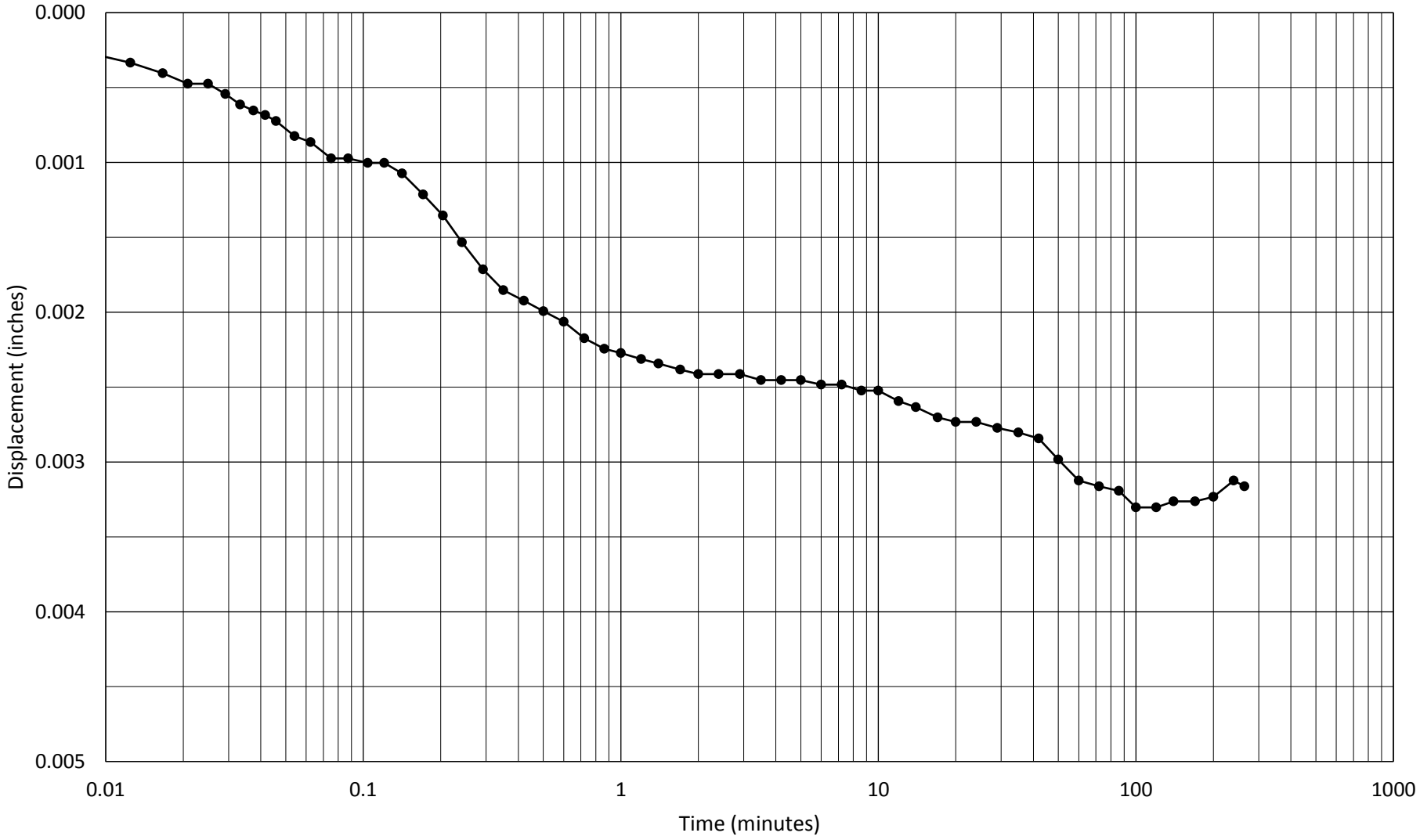
Surface Elev. _____ Depth Interval 6'-7.5'

Moisture Content 28.5 % Dry Unit Wt. 94.4 lbs./ft³

LL 34 % PL 18 % PI 16 %

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

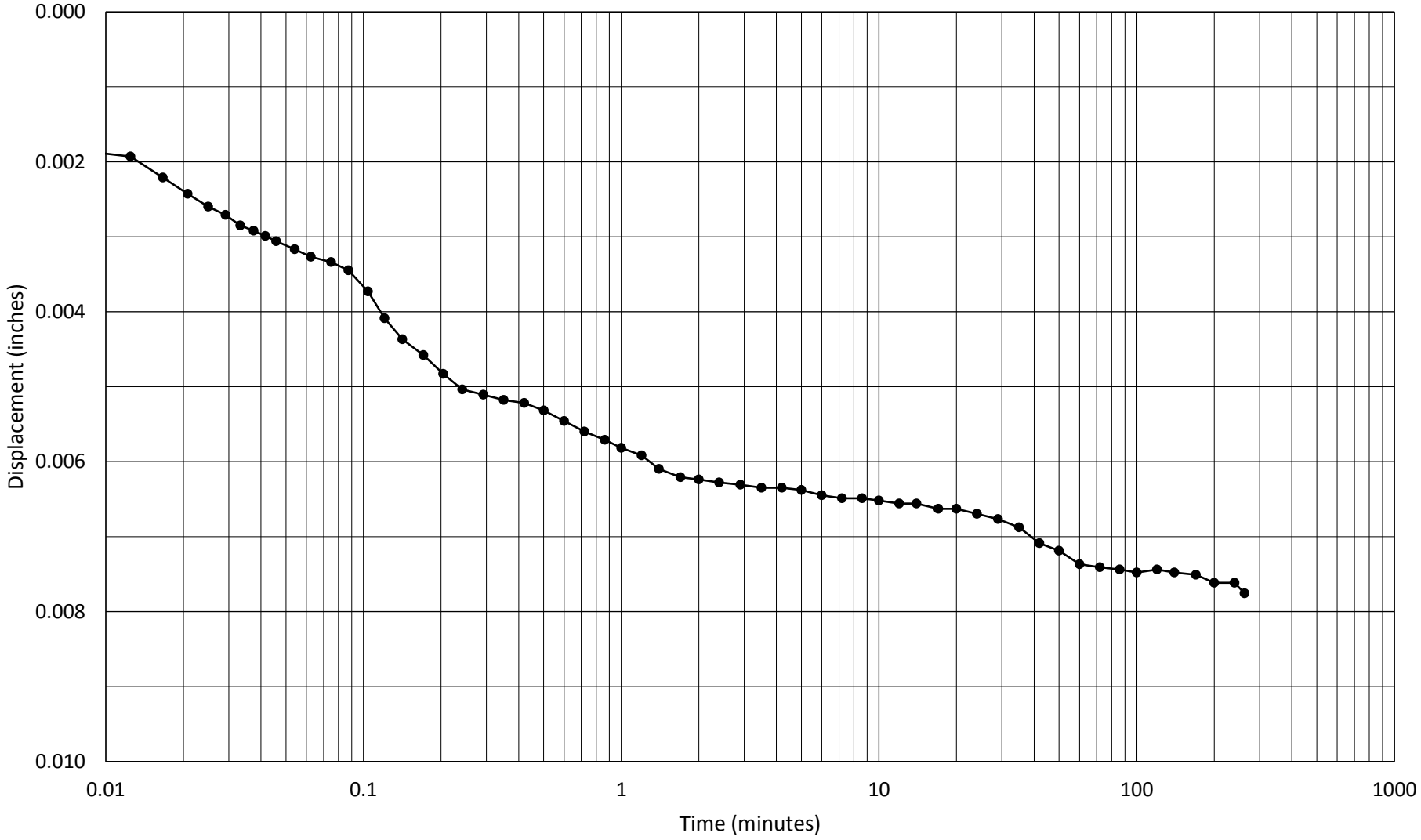

0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-02
Surface Elev.
Depth Interval 6'-7.5'
Moisture Content 28.5 %
Dry Unit Wt. 94.4 lbs./ft³
LL 34 %
PL 18 %
PI 16 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-02
Depth: 6'-7.5'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

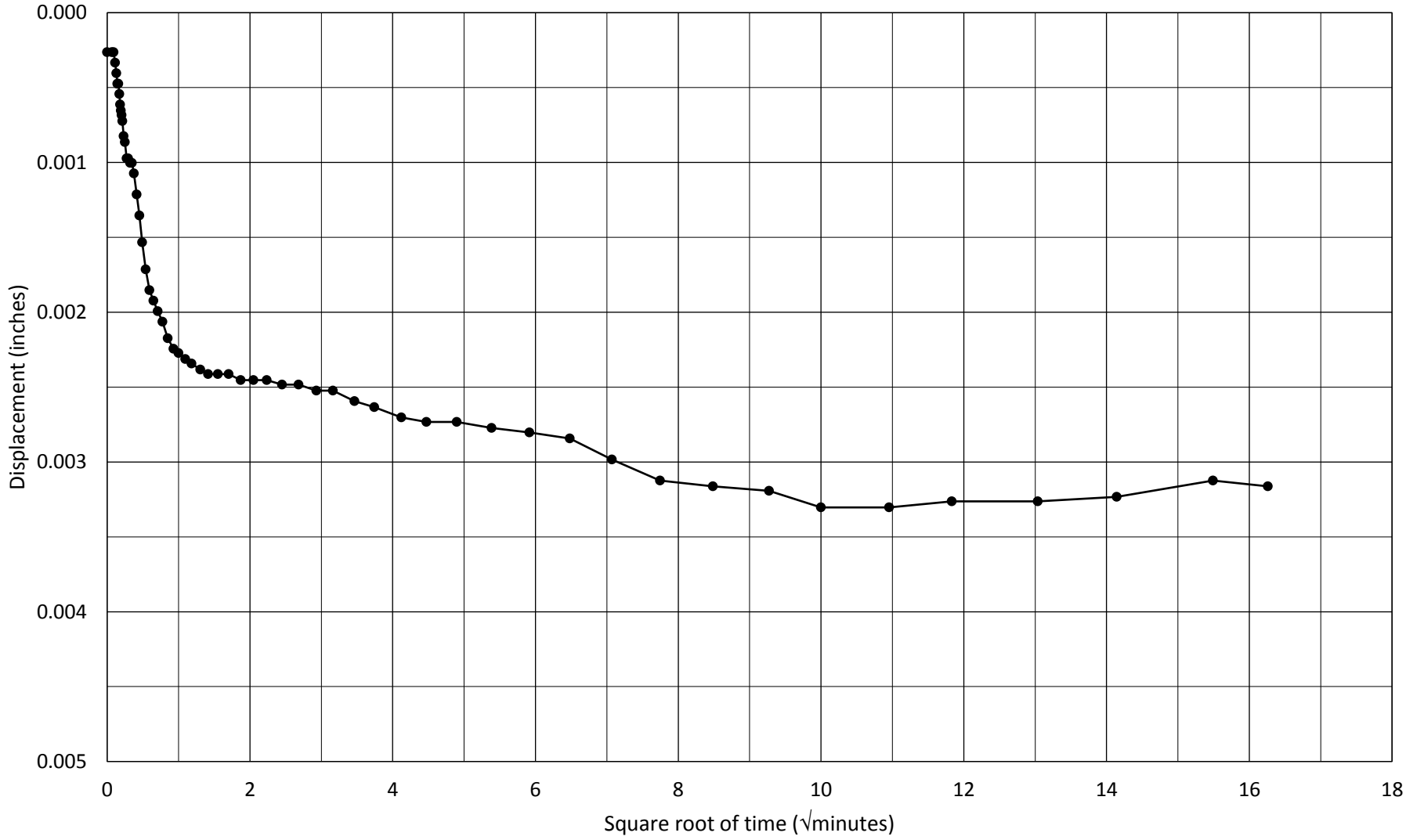
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-02
Depth: 6'-7.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

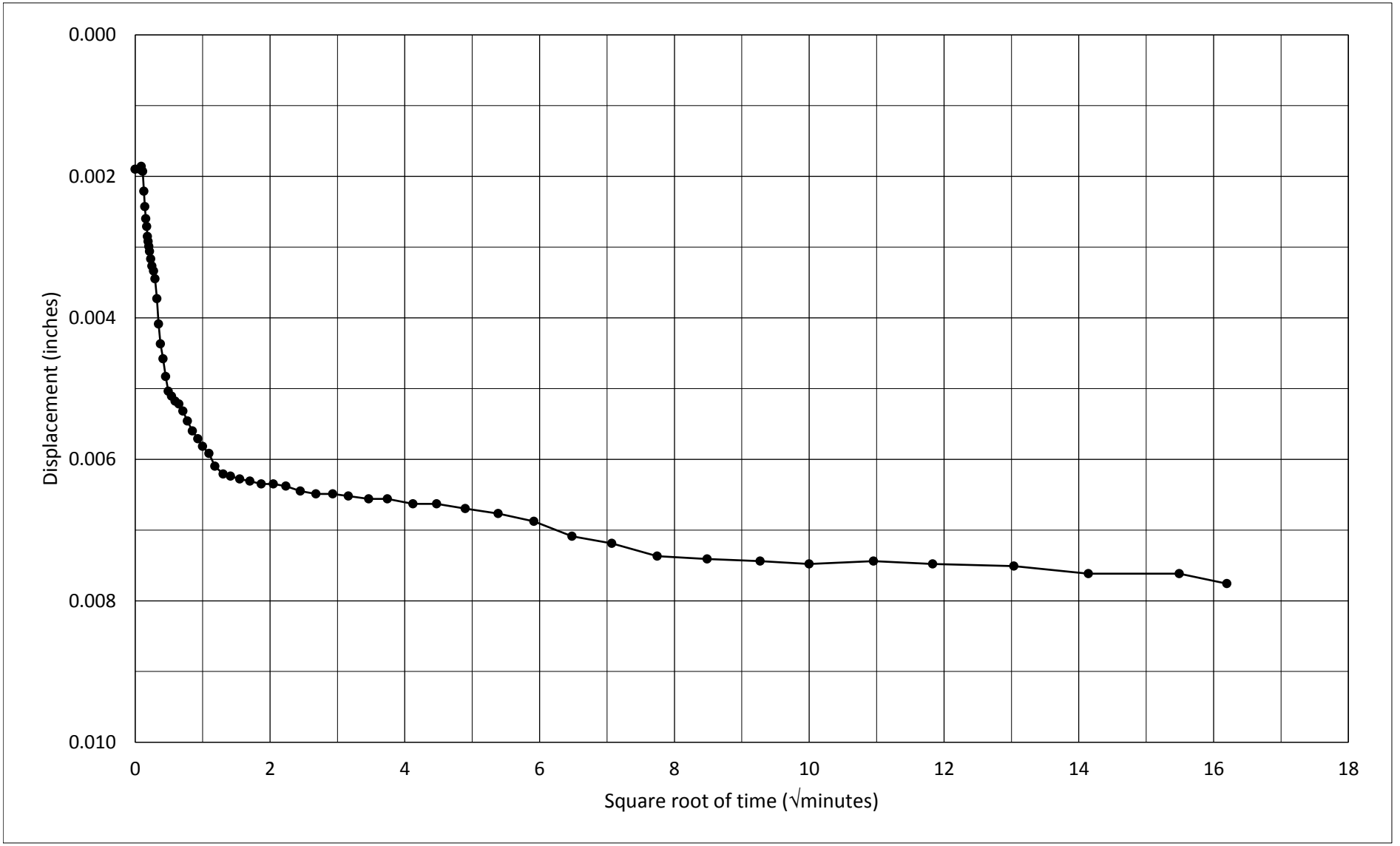
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-02
Depth: 6'-7.5'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

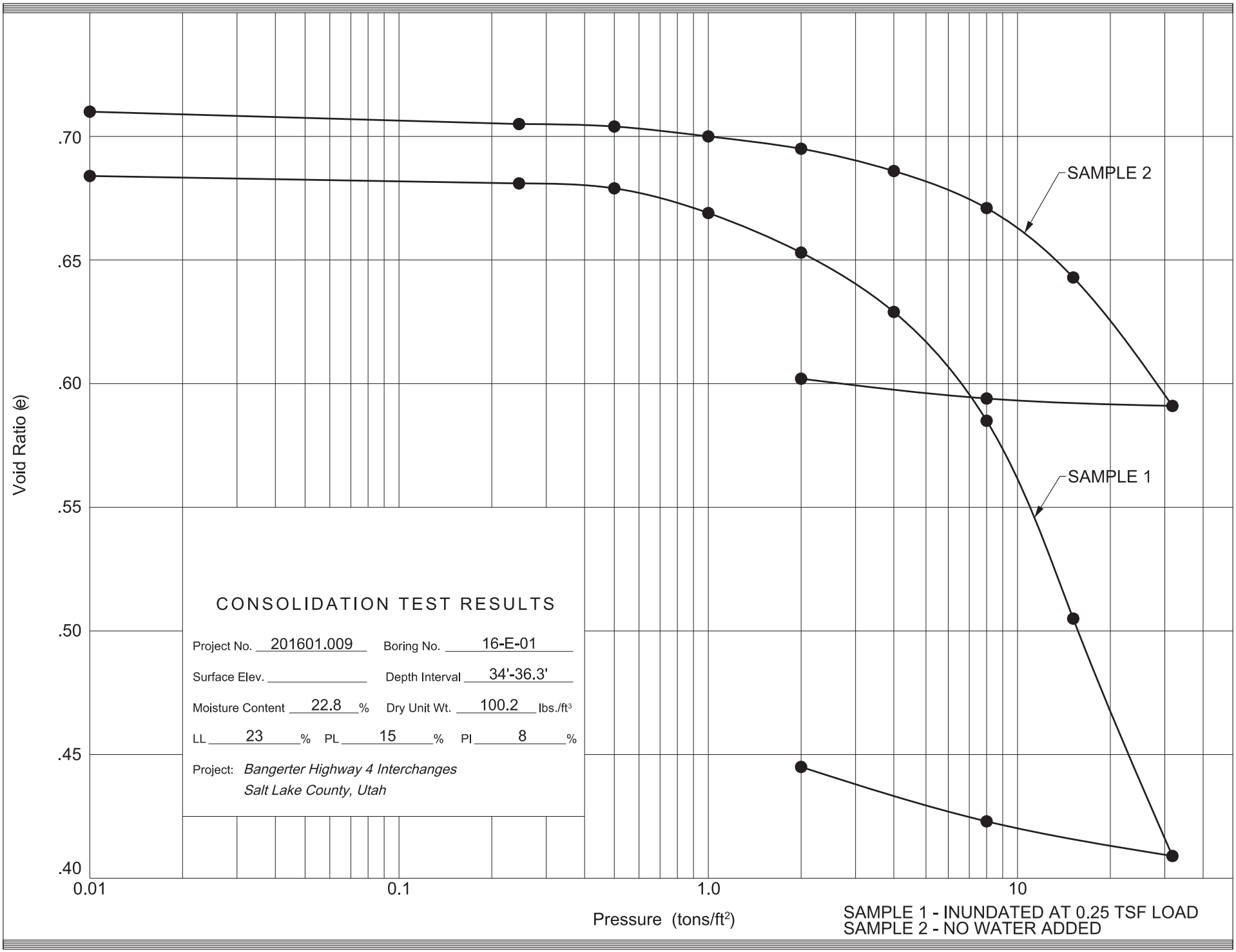
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

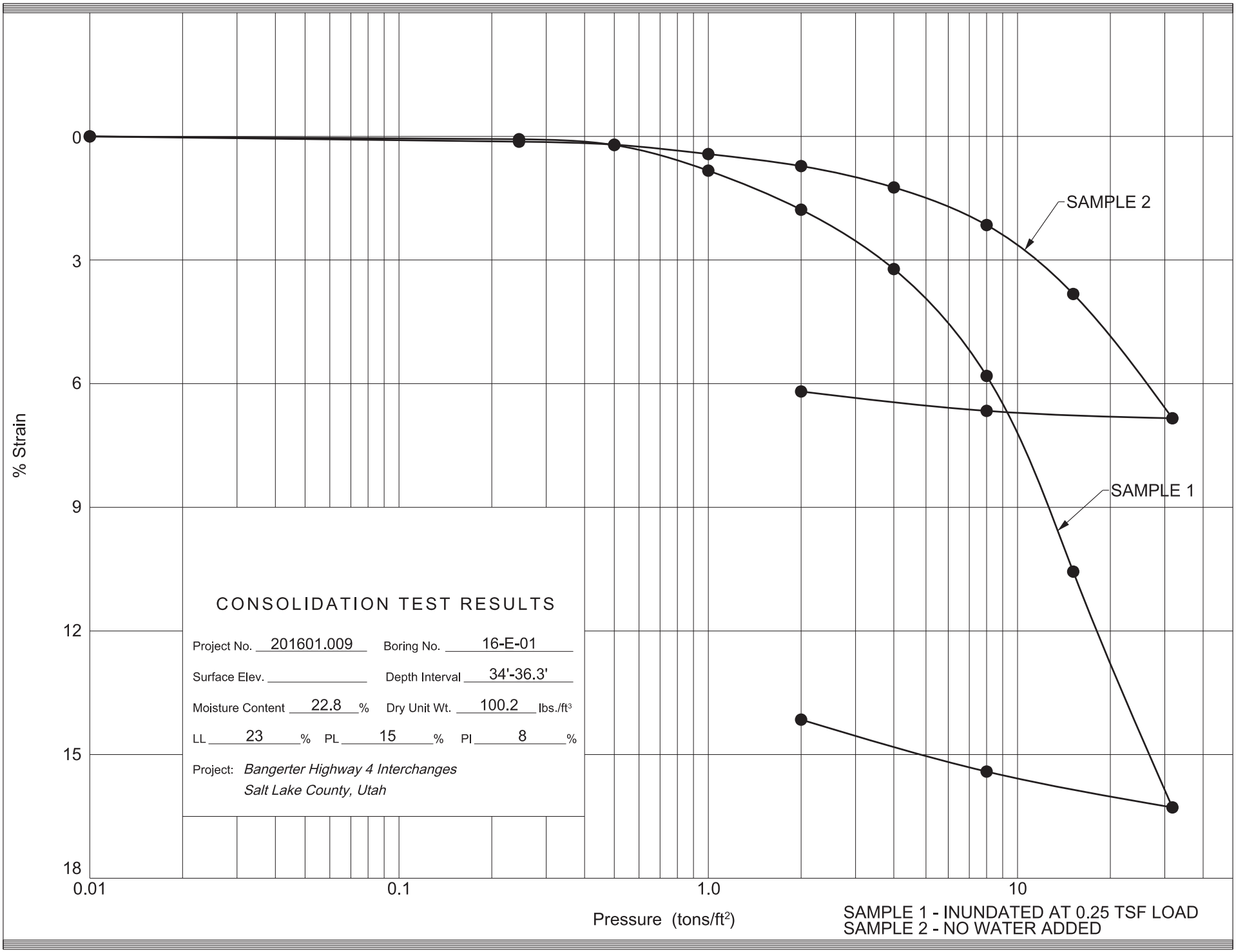


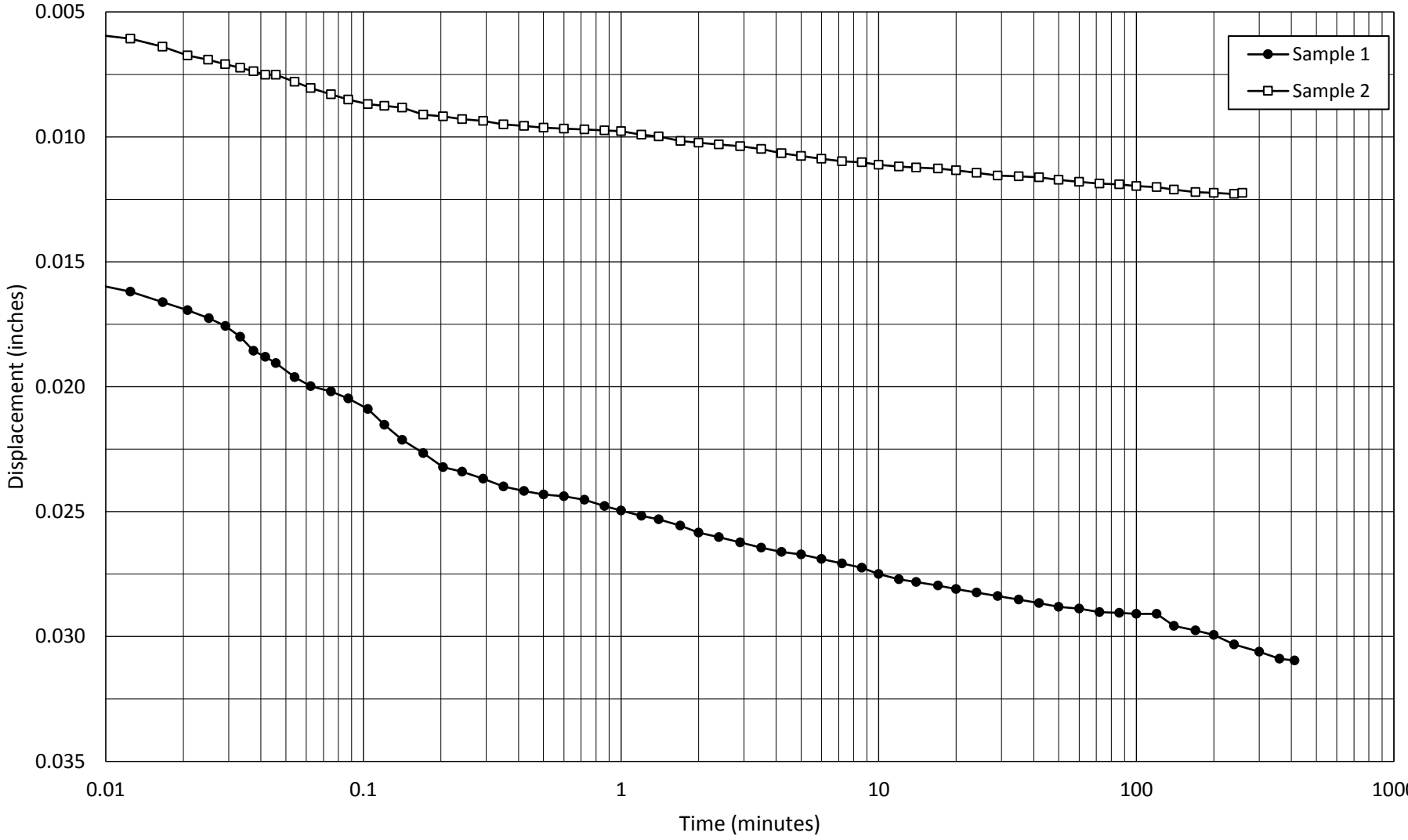
Hole no.: 16-S-02
Depth: 6'-7.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.70
.65
.60
.55
.50
.45
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 2
SAMPLE 1
CONSOLIDATION TEST RESULTS
Project No. 201601.009 Boring No. 16-E-01
Surface Elev. Depth Interval 34'-36.3'
Moisture Content 22.8 % Dry Unit Wt. 100.2 lbs./ft³
LL 23 % PL 15 % PI 8 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED AT 0.25 TSF LOAD
SAMPLE 2 - NO WATER ADDED


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 2
SAMPLE 1
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-01
Surface Elev.
Depth Interval 34'-36.3'
Moisture Content 22.8 %
Dry Unit Wt. 100.2 lbs./ft³
LL 23 % PL 15 % PI 8 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED AT 0.25 TSF LOAD
SAMPLE 2 - NO WATER ADDED

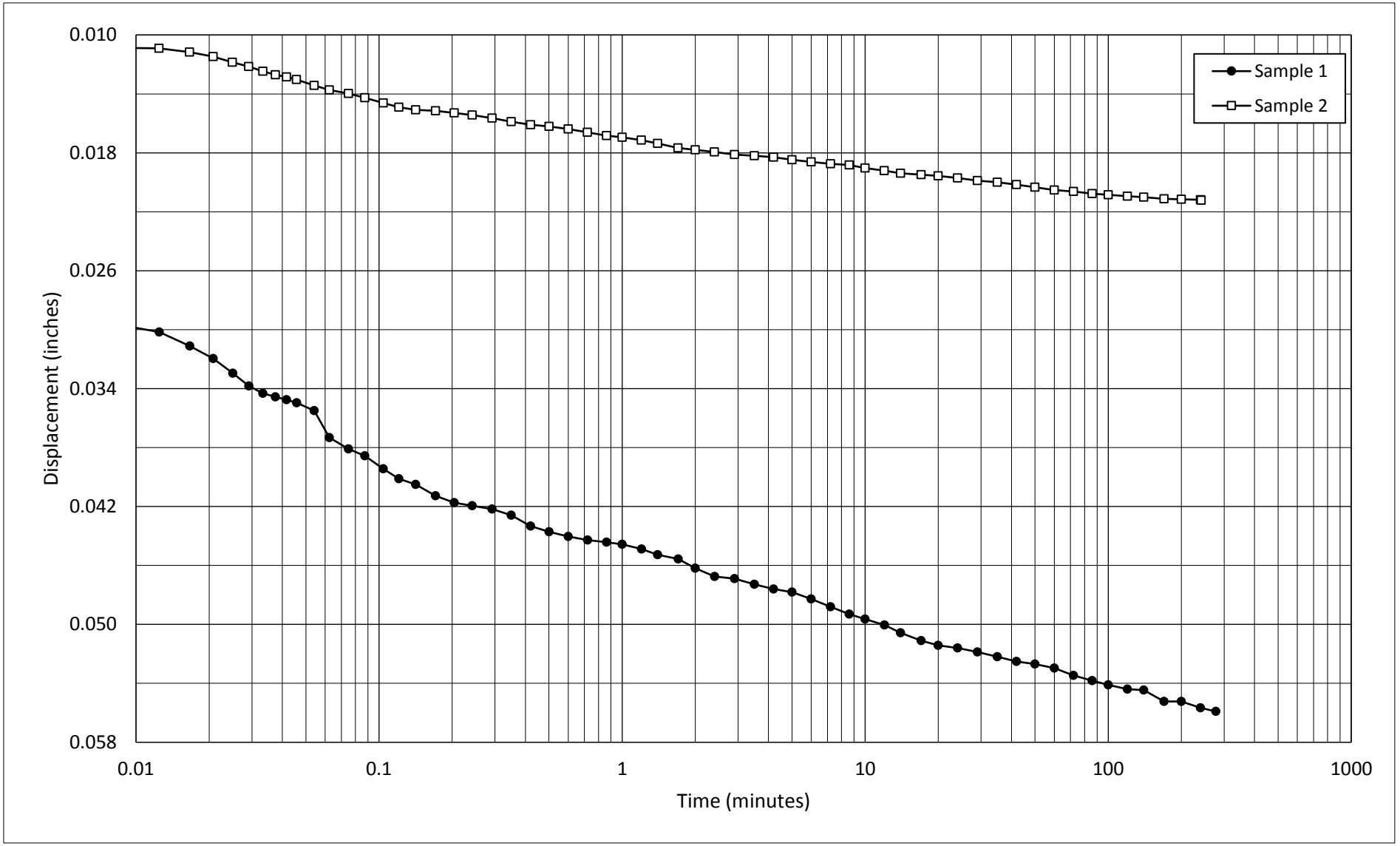


RB&G ENGINEERING, INC.

Hole no.: 16-E-01
Depth: 34'-36.3'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah

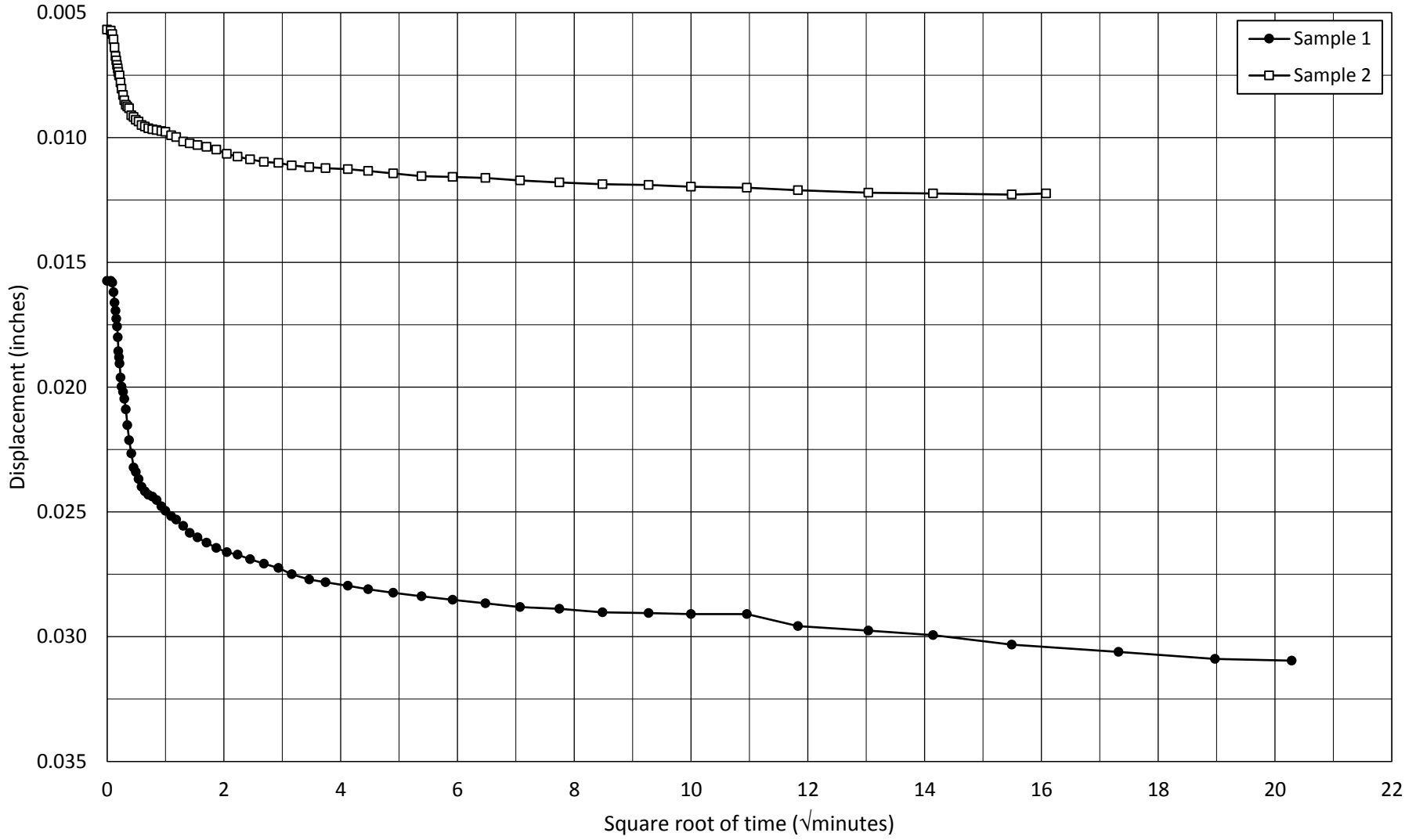


RB&G ENGINEERING, INC.

Hole no.: 16-E-01
Depth: 34'-36.3'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah

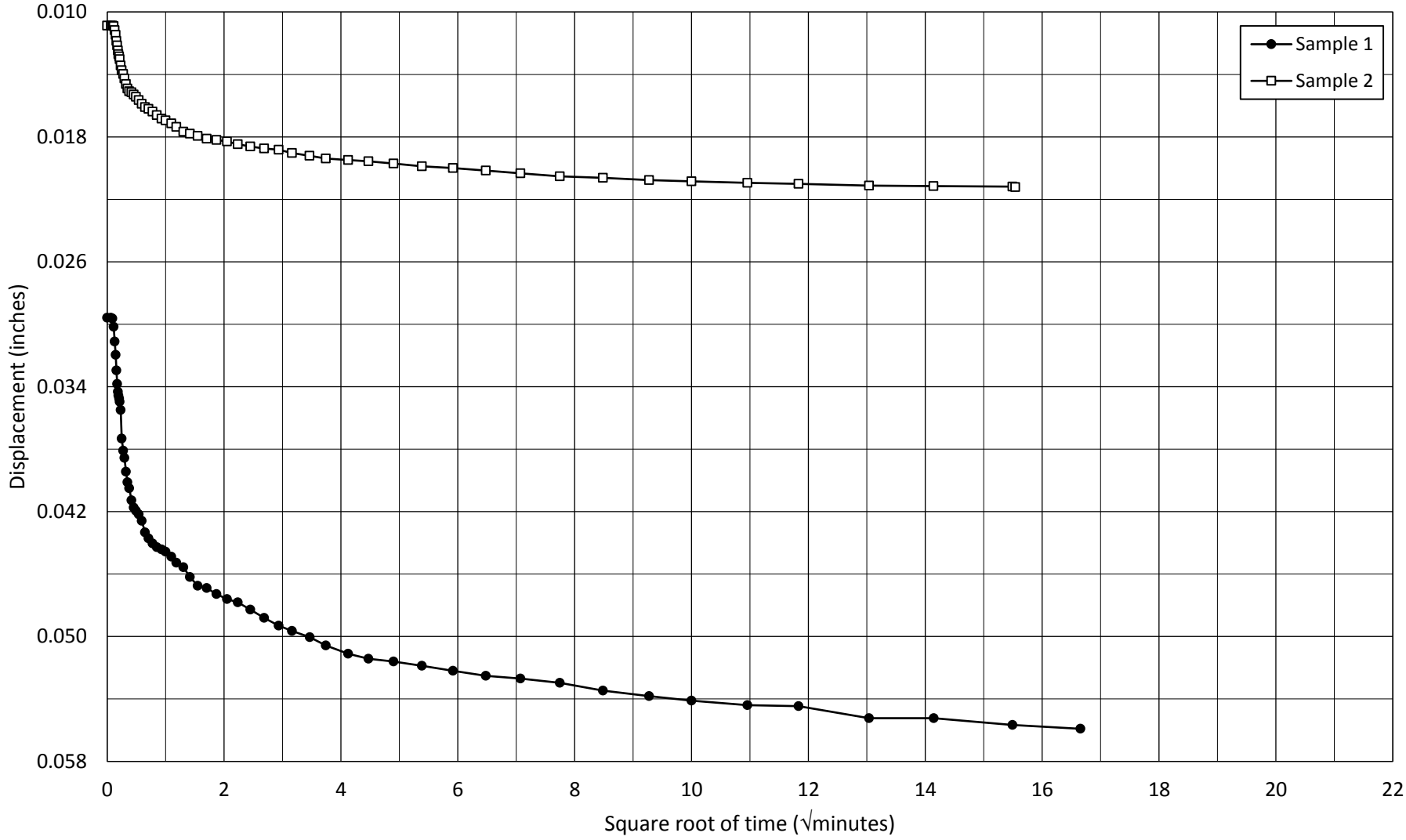


RB&G ENGINEERING, INC.

Hole no.: 16-E-01
Depth: 34'-36.3'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah



RB&G ENGINEERING, INC.

Hole no.: 16-E-01
Depth: 34'-36.3'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah

9000 SOUTH

Boring Logs

DRILL HOLE LOG

BORING NO. 16-S-04

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 384769 E: 508170 / LAT: 40.587523 LONG: -111.977378

DATE STARTED: 4/20/16

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 23.5'

DATE COMPLETED: 4/21/16

DRILLER: T.K.

GROUND ELEVATION: 4599.3'

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ DRY TO 53'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				13	7,8,14,(46)	SM (*A-1-b(0)*)	gray-brown, moist, dense	SILTY SAND W/GRAVEL		7.7		NP	35	40	25	
4595	5			9	14,17,16,(69)	GP-GM/GM	brown, sl. moist, dense	GRAVEL W/SILT & SAND TO SILTY GRAVEL W/SAND possible cobbles								
				10	12,16,24,(79)	GP-GM/GM	brown, moist, very dense									
4590	10			14	6,8,7,(25)	ML (*A-4(0)*)	brown, very moist, med. dense	SANDY SILT		27.6		NP	0	43	57	
				17	Pushed	ML (*A-4(0)*)	brown, moist	SANDY SILT clay lenses & layers to 0.25" thick		19.3		NP	0	49	51	
4585	15			12	7,8,8,(22)	ML (*A-4(0)*)	brown, very moist, med. dense	SANDY SILT		29.0		NP	0	40	60	
4580	20			10	Pushed	ML (*A-4(0)*)	brown, very moist		86.0	28.1		NP	0	33	67	DS
				11	3,4,4,(9)	ML	brown, very moist, loose	SANDY SILT clay lenses								
4575	25			11	9,7,7,(15)	ML (*A-4(0)*)	brown, very moist, med. dense			30.3		NP	0	44	56	
				18	2,3,3,(6) *T 0.30*	CL	lt. brown, moist, firm									
4570	30			18	Pushed *T 0.33* *PP 2.0*	CL (*A-6(16)*)	lt. brown, moist, firm to stiff	LEAN CLAY silty sand lenses	94.6	28.6	36	15	0	1	99	CT UU 5,020 psf
4565	35			10	4,4,6,(9) *T 0.29*	CL	lt. brown, very moist, firm	GRAVEL (driller's observation) LEAN CLAY W/SAND								
4560	40			10	44,60/5"	GP-GM	brown, very moist, very dense	GRAVEL W/SILT & SAND probable cobbles								
4555	45			14	7,9,10,(15) *T 0.43*	CL (*A-6(8)*)	lt. brown, moist, firm to stiff	LEAN CLAY W/SAND		20.0	29	13	1	24	75	
4550	50			14	31,58,42,(72)	GM	brown, very moist, dense	SILTY GRAVEL W/SAND clayey sand layers, possible cobbles								
4545																

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample

2,3,2,(6) ← Blow Count per 6" (N_1)$_{60}$ Value

T 0.45 ← Torvane (tsf)

PP 2.0 ← Pocket Penetrometer (tsf)

With Liners

Pushed

T 0.45 ← Torvane (tsf)

PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-04

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 384769 E: 508170 / LAT: 40.587523 LONG: -111.977378

DATE STARTED: 4/20/16

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 23.5'

DATE COMPLETED: 4/21/16

DRILLER: T.K.

GROUND ELEVATION: 4599.3'

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ DRY TO 53'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
			7	44,57,60,(81)	GP-GM,SM	brown, very moist, very dense	INTERBEDDED GRAVEL W/SILT & SAND AND SILTY SAND LAYERS possible cobbles								
4540	60		18	7,11,11,(15) *T 0.46*	CL (*A-6(11)*)	lt. brown, moist, firm	LEAN CLAY		27.2	36	13	0	14	86	
4535	65		13	Pushed *T 0.55*	CL (*A-6(15)*)	brown, very moist, stiff		87.8	34.2	37	15	0	6	94	CT
							GRAVEL (driller's observation)								
4530	70		*T 0.43* 18	16,36,43,(52)	CL SM	brown to rusty-brown, very moist, very dense	SAND (driller's observation) LEAN CLAY SILTY SAND								
4525	75		0	9,6,50/5"	-	no recovery	GRAVEL (driller's observation) SAND (driller's observation)								
4520	80		15	50,70,40,(63)	SM (*A-1-b(0)*)	brown, moist, very dense	SILTY SAND W/GRAVEL possible cobbles		12.2		NP	33	46	21	
					SM	brown, moist, very dense	SILTY SAND								
4515	85		15	11,27,50/5"	SM SM	brown, moist brown, moist, very dense	SILTY SAND W/GRAVEL possible cobbles								
4510	90		2	60/4"	GP-GM/GM	brown, moist, very dense	GRAVEL W/SILT & SAND TO SILTY GRAVEL W/SAND clay lenses, probable cobbles								
4505	95		3	60/4"	GP-GM/GM	brown, moist, very dense									
4500	100		16	9,15,15,(16)	ML (*A-4(0)*)	brown, very moist, med. dense	SANDY SILT		25.8		NP	3	30	67	
							BOH								
4495	105														
4490															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- Pushed *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-05

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 384760 E: 508298 / LAT: 40.587501 LONG: -111.976915

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 17.5'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ 17.0' **AFTER 24 HOURS:** ▼ DRY TO 93'

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 4/1/16

DATE COMPLETED: 4/4/16

GROUND ELEVATION: 4596.9'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4595	0			16	2,8,7,(31)	SM (*A-2-4(0)*)	dk. brown, moist, dense	SILTY SAND W/GRAVEL plastic		12.5	20	3	30	39	31	
				4	7,14,8,(46)	GC	dk. brown, moist, med. dense	CLAYEY GRAVEL W/SAND								
4590	5			3	1,1,3,(8)	CL	brown to dk. brown, moist to wet, firm	LEAN CLAY W/SAND								
				0	Pushed	-	no recovery									
	10			1	1,2,2,(7)	CL	dk. brown, wet, soft	SANDY LEAN CLAY W/GRAVEL								
4585				8	7,8,8,(23)	SM (*A-2-4(0)*)	brown, moist, med. dense	SILTY SAND W/GRAVEL		13.3		NP	25	46	29	
	15			12	3,6,9,(21)	SM	brown, moist, med. dense	SILTY SAND								
4580 ▽				15	2,2,3,(6)	ML (*A-4(4)*)	brown, wet, loose	SILT plastic		31.9	32	4	0	10	90	
	20			17	2,2,2,(5) *T 0.42*	SC,CL	brown, wet, firm	INTERBEDDED CLAYEY SAND & SANDY LEAN CLAY LAYERS silty sand lenses								Chem.
4575	25			18	Pushed *T 0.53* *PP 1.8*	ML (*A-6(15)*)	brown, wet, stiff	SILT plastic	79.6	39.4	40	14	0	7	93	CT UU 5,318 psf
4570																
	30			18	2,4,5,(9) *T 0.45*	ML (*A-4(7)*)	brown, wet, loose/firm	SILT W/SAND plastic, sand lenses & layers		30.9	32	8	0	15	85	
4565				3	13,7,8,(14)	GC	brown, moist, very loose	CLAYEY GRAVEL W/SAND								
	35			11	30,60/5"	GC-GM	brown, wet, very dense	SILTY CLAYEY GRAVEL W/SAND possible cobbles								
4560																
	40			10	22,60/6"	GP-GM (*A-1-a(0)*)	brown, wet, very dense	GRAVEL W/SILT & SAND possible cobbles		9.7		NP	58	33	9	
4555																
	45			4	7,10,5,(11) *T 0.27*	CL	lt. brown, moist, firm	LEAN CLAY		22.3						
4550								SILTY GRAVEL W/SAND possible cobbles								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample: 2,3,2,(6) ← Blow Count per 6"; $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Thin-Walled Tube Sample: Pushed
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-05

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 384760 E: 508298 / LAT: 40.587501 LONG: -111.976915

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 17.5'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ 17.0' **AFTER 24 HOURS:** ▼ DRY TO 93'

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 4/1/16

DATE COMPLETED: 4/4/16

GROUND ELEVATION: 4596.9'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4545				5	45,60/3"	GM	brown, wet, very dense								
	55						SILTY GRAVEL W/SAND possible cobbles								
				0	26,32,27,(41)	-	no recovery								
4540				1	27,27,30,(41)	GM	brown, wet, med. dense								
	60			17	Pushed *PP 1.5*	ML (*A-6(11)*)	brown & rusty-brown, wet lt. brown, wet	88.6	31.6	36	11	0	6	94	CT
							SILT plastic								
4535				5	5,3,2,(3) *T 0.16* *PP 1.1*	ML CL	rusty-brown, very moist, soft								
							LEAN CLAY								
	65			17	1,2,7,(6) *T 0.33*	CL (*A-6(15)*)	brown & lt. gray, wet, firm		42.2	39	16	0	10	90	
4530							LEAN CLAY silt lenses								
							GRAVEL (driller's observation)								
	70			2	80/5"	GC-GM	SAND (driller's observation) brown, wet, very dense								
4525							SILTY CLAYEY GRAVEL W/SAND possible cobbles								
	75			1	80/5"	GP-GM	brown, wet, very dense								
4520							GRAVEL W/SILT & SAND possible cobbles, boulders								
	80			5	80/5"	GP-GM	brown, very moist, very dense								
4515															
	85			16	11,15,20,(21)	ML (*A-4(0)*)	brown, very moist, med. dense		30.6		NP	0	27	73	
4510							SILT W/SAND white stringers								
	90			2	80/3"	GP-GM	brown, wet, very dense								
4505							GRAVEL W/SILT & SAND possible cobbles								
	95			13	27,45,34,(42)	SM	brown, very moist, dense								
4500							SILTY SAND								
							BOH								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample

2,3,2,(6) ← Blow Count per 6"
$(N_1)_{60}$ Value
T 0.45 ← Torvane (tsf)
PP 2.0 ← Pocket Penetrometer (tsf)
With Liners

Pushed
T 0.45 ← Torvane (tsf)
PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-06

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 385017 E: 508146 / LAT: 40.588204 LONG: -111.977467

DRILLING METHOD: UDOT CME-850 / H.Q. ROD

DRILLER: D.M.

DEPTH TO WATER - INITIAL: ▽ 97.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 5/12/16

DATE COMPLETED: 5/17/16

GROUND ELEVATION: 4598.0'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Rec. (in)	See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				12	8,9,14,(40)	GC-GM (*A-2-4(0)*)	dk. gray-brown, sl. moist, med. dense — SILTY CLAYEY GRAVEL W/SAND		5.8	24	7	39	32	29	
4595															
	5			8	23,28,27,(99+)	GP-GM	dk. gray-brown, moist, very dense — GRAVEL W/SILT & SAND possible cobbles								
				10	6,12,15,(59)	GP-GM (*A-1-a(0)*)	dk. gray-brown, wet, med. dense		6.8		NP	70	22	8	
4590															
	10			10	5,7,10,(23)	SM/ML SM	brown, wet — SILTY SAND TO SANDY SILT; brown, wet, med. dense								
				7	14,15,16,(38)	SM	brown, wet, dense — SILTY SAND								Chem.
4585															
	15			12	14,14,15,(32)	SM (*A-4(0)*)	brown, wet, dense		20.5		NP	2	58	40	
				14	6,6,8,(14)	ML	brown, very moist — SANDY SILT silty sand layers, clay lenses								
4580															
	20			30	Pushed	ML (*A-4(0)*)	brown, wet — SILT	76.0	41.8		NP	0	7	93	CT UU 4,373 psf
				18	3,3,8,(10) *T 0.20*	CL-ML,ML,SM	brown, wet, soft/loose								
4575							INTERBEDDED SILTY CLAY, SILT & SILTY SAND LAYERS								
	25			18	2,2,4,(5) *T 0.19*	CL-ML,ML,SM	brown, wet, soft/loose								
				28	Pushed *T 0.57*	CL (*A-6(17)*)	brown, very moist, stiff — LEAN CLAY	92.4	30.9	38	16	0	1	99	CT DS Chem.
4570															
	30			18	3,3,6,(7) *T 0.42*	CL (*A-6(19)*)	lt. green-brown, very moist, firm		37.6	39	19	0	3	97	
				12	36,60/6"	SM GP-GM	SILTY SAND W/GRAVEL — brown, moist, very dense								
4565															
	35			9	19,70/6"	GP-GM	brown, moist, very dense — GRAVEL W/SILT & SAND probable cobbles								
4560															
	40			11	24,72/4"	GP-GM (*A-1-a(0)*)	brown, moist, very dense		7.4		NP	64	28	8	
4555															
	45			13	12,15,11,(16) *T 0.48*	CL CL	brown, moist — LEAN CLAY W/GRAVEL; brown w/black spots, moist, firm to stiff — LEAN CLAY								
4550															
	50			10	Pushed *T 0.40*	SC-SM (*A-4(0)*)	brown, moist — SILTY CLAYEY SAND W/GRAVEL	104.7	18.8	22	6	28	30	42	CT
4545							GRAVEL W/SILT & SAND possible cobbles								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6" (N_1)$_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf) With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- Pushed *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-06

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 385017 E: 508146 / LAT: 40.588204 LONG: -111.977467

DRILLING METHOD: UDOT CME-850 / H.Q. ROD

DRILLER: D.M.

DEPTH TO WATER - INITIAL: ▽ 97.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 5/12/16

DATE COMPLETED: 5/17/16

GROUND ELEVATION: 4598.0'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				10	16,30,48,(45)	GP-GM	brown, moist, med. dense — GRAVEL W/SILT & SAND, possible cobbles								
4540															
	60			1	7,15,18,(18)	ML	brown, moist, med. dense — SANDY SILT, trace gravels								
4535															
	65			5	Pushed *T 0.22*	CL	lt. brown, very moist, soft — LEAN CLAY W/GRAVEL		25.9						
				16	9,26,56,(45)	SM (*A-4(0)*)	lt. brown, moist, dense — SILTY SAND, silt & clay layers		20.6		NP	4	53	43	
4530															
	70			11	37,51,60,(60)	SM	brown to rusty-brown, moist & wet, very dense								
4525							GRAVEL (driller's observation)								
	75			14	10,10,8,(10) *T 0.32*	CL (*A-6(8)*)	lt. brown, moist, firm — SANDY LEAN CLAY W/GRAVEL		20.0	32	16	15	21	64	
4520															
	80			13	33,33,40,(38)	GP-GM CL-ML (*A-4(0)*)	brown, moist — GRAVEL W/SILT & SAND; brown, moist, hard — SANDY SILTY CLAY, some pinhole structure, white stringers, some partially cemented layers, trace gravels		18.9	23	4	9	35	56	
4515															
	85			7	31,60/6"	GM	brown, very moist, very dense — SILTY GRAVEL W/SAND, possible cobbles								
4510															
	90			5	19,50/3"	GP-GM	brown, very moist, very dense								
4505															
	95			0	60/3"	-	no recovery — GRAVEL W/SILT & SAND, possible cobbles, boulders								
4500															
	100			3	46,50/3"	GP-GM	brown, very moist, very dense								
							BOH								
4495															
	105														
4490															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample

2,3,2,(6) ← Blow Count per 6"
$(N_1)_{60}$ Value
T 0.45 ← Torvane (tsf)
PP 2.0 ← Pocket Penetrometer (tsf)
With Liners

Pushed
T 0.45 ← Torvane (tsf)
PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-03

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 1

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 384595 E: 508298 / LAT: 40.587047 LONG: -111.976914

DATE STARTED: 4/4/16

DRILLING METHOD: 08-CME-55 / H.W. CASING TO 20'

DATE COMPLETED: 4/5/16

DRILLER: T.K.

GROUND ELEVATION: 4597.2'

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ N.M.

LOGGED BY: M.H., C.S., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4595				15	5,6,7,(27)	GM	brown, sl. moist, med. dense — SILTY GRAVEL W/SAND								
	5			16	6,9,6,(31)	SC-SM (A-4(0))	dk. gray, moist, dense — SILTY CLAYEY SAND W/GRAVEL slight organic odor		15.4	24	7	22	35	43	
4590				9	3,2,2,(8) T 0.55	CL	dk. brown, moist, stiff								
				15	Pushed T 0.67	CL (A-6(13))	dk. brown, moist, stiff — LEAN CLAY	103.9	26.8	33	15	1	9	90	CT UU 3,279 psf
	10			12	1,2,1,(5) T 0.28	CL	brown, moist, firm								
4585				12	7,13,14,(39)	GP-GM (A-1-a(0))	brown, moist, med. dense		8.4		NP	54	39	7	
	15			9	3,19,23,(54)	GP-GM	brown, sl. moist, dense — GRAVEL W/SILT & SAND								
4580				8	3,48,55,(99+)	GP-GM	brown, sl. moist, very dense								
	20			6	7,7,3,(11) T 0.14	ML	brown-gray, moist, soft/med. dense — SANDY SILT plastic								
4575				17	Pushed PP 1.8	ML (A-4(9))	brown, moist — SILT plastic	74.8	42.5	35	8	0	2	98	CT UU 3,958 psf
	25			18	1,1,1,(2) T 0.51	CL (A-7-6(18))	brown w/rust, moist, stiff — LEAN CLAY		38.0	42	17	0	7	93	
4570															
	30			16	4,9,11,(20)	ML (A-4(0))	brown w/gray & rust, moist — SILT W/SAND 1" clay layer		26.3		NP	0	22	78	
4565															
	35			9	48,50/3"	GM	brown, moist, very dense								
4560															
	40			1	75/4"	GM	brown, moist, very dense — SILTY GRAVEL W/SAND possible cobbles								
4555															
	45			14	46,35,55,(68)	GM	brown, moist, dense								
4550															
	50			14	5,9,8,(13)	ML (A-4(0))	brown w/gray & rust, very moist, med. dense — SILT W/SAND clay seams to 0.5" thick		27.5		NP	0	25	75	
4545							BOH								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- Pushed *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-04

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 1

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 385124 E: 508150 / LAT: 40.588496 LONG: -111.977456

DATE STARTED: 5/18/16

DRILLING METHOD: UDOT CME-850 / H.W. CASING TO 9'

DATE COMPLETED: 5/19/16

DRILLER: D.M.

GROUND ELEVATION: 4595.0'

DEPTH TO WATER - INITIAL: ▽ DRY'

AFTER 24 HOURS: ▼ N.M.

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				8	2,3,4,(16)	SC (A-4(0))	dk. gray-brown, moist, med. dense — CLAYEY SAND trace gravels		9.3	25	9	14	47	39	
				8	13,50/2"	SC SP-SM	dk. gray-brown, moist — brown, moist, very dense — SAND W/SILT & GRAVEL probable cobbles								
4590	5			11	8,35,44,(99+)	SP-SM (A-1-a(0))	gray-brown, moist, very dense		6.6		NP	39	49	12	
				5	10,15,16,(46)	SM	brown, sl. moist, dense — SILTY SAND								
4585	10			10	9,8,10,(31)	SM (A-2-4(0))	brown, moist, dense — SILTY SAND clay lenses		17.8		NP	3	68	29	
				10	10,11,14,(29)	SM	brown, moist, med. dense								
4580	15			10	5,5,4,(13)	ML (A-4(0))	brown, very moist, med. dense — SILT W/SAND		27.2		NP	0	24	76	
				14	7,5,4,(12) T 0.16	ML CL-ML	brown, very moist — brown, sl. moist, soft — SILTY CLAY								
4575	20			18	3,1,3,(5)	ML	brown, wet, firm — SILT plastic		36.2						
				24	Pushed PP 2.5	ML (A-4(7))	lt. brown, wet, stiff	72.9	44.6	34	6	0	2	98	CT DS UU 4,171 psf
4570	25			18	1,2,3,(5) T 0.50	CL	brown, moist, firm to stiff — LEAN CLAY sand lenses		32.7						
				24	Pushed T 0.49	CL (A-7-6(25))	brown, moist, firm	82.9	37.2	46	22	0	1	99	CT UU 3,035 psf
4565	30			12	7,17,50/5"	GP-GM	brown, moist, very dense								
4560	35			0	4,5,7,(9)	-	no recovery, sluff — GRAVEL W/SILT & SAND probable cobbles								
4555	40			5	70/5"	GP-GM	brown, moist, very dense								
4550	45			10	14,19,12,(20) PP 3.0	ML (A-4(0)) CL	brown, very moist — SANDY SILT trace gravel — brown, very moist, very stiff — LEAN CLAY		16.7		NP	10	38	52	
4545	50			6	Pushed	CL GP-GM	brown, very moist								
				11	20,21,24,(35)	GP-GM	brown, very moist, med. dense — GRAVEL W/SILT & SAND possible cobbles — BOH								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample: 2,3,2,(6) ← Blow Count per 6"; $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Thin-Walled Tube Sample: Pushed
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-05

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 1

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 385188 E: 508300 / LAT: 40.588674 LONG: -111.976918

DATE STARTED: 4/5/16

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 16.5'

DATE COMPLETED: 4/6/16

DRILLER: T.K.

GROUND ELEVATION: 4595.5'

DEPTH TO WATER - INITIAL: ▽ 12.0'

AFTER 24 HOURS: ▼ N.M.

LOGGED BY: C.S., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4595							dk. brown, moist, very stiff — LEAN CLAY								
				14	*T 1.88* 2,5,12,(36)	CL SM	brown, sl. moist, dense — SILTY SAND W/GRAVEL								
				15	4,7,6,(27) *T 0.30*	SM (*A-4(0)*)	dk. brown, moist, med. dense — SILTY SAND plastic, trace gravels		13.5	21	3	13	46	41	
4590	5			11	11,22,16,(75)	GP-GM	brown, sl. moist, very dense — GRAVEL W/SILT & SAND possible cobbles								
4585	10			8	13,23,19,(69)	SM	brown w/rust, moist, very dense — SILTY SAND W/GRAVEL possible gravels								
				8	Pushed	CL	brown, moist — LEAN CLAY								
				12	12,21,16,(55)	SP-SM SP-SM (*A-3(0)*)	brown, moist; brown, very moist, very dense — SAND W/SILT silt layers to 1" thick		21.6		NP	1	89	10	
4580	15			12	6,6,9,(21)	SP-SM	brown, very moist, med. dense								
				17	Pushed	ML	brown, moist								
4575	20			17	4,8,11,(23)	ML (*A-4(0)*)	brown, moist, med. dense — SANDY SILT clay lenses		25.6		NP	0	47	53	
				15	12,16,12,(33)	ML	brown, moist, dense								
4570	25			18	1,1,2,(3) *T 0.20*	ML (*A-4(3)*) CL ML	brown, wet — SILT plastic; brown, moist, soft — LEAN CLAY; brown, moist, very loose — SILT plastic		36.7	31	3	0	12	88	
4565	30			18	Pushed *T 1.25*	CL (*A-7-6(20)*)	brown & green, moist, very stiff — LEAN CLAY	88.9	33.5	41	19	0	2	98	UU 4,929 psf
4560	35			15	11,12,12,(22)	SM	brown, moist, med. dense — SILTY SAND occasional clay lenses								
4555	40			15	24,46,33,(64)	GM	brown, moist, dense — SILTY GRAVEL W/SAND possible cobbles								
4550	45			14	2,5,6,(8) *T 0.89*	CL (*A-6(10)*)	brown, moist, stiff — LEAN CLAY		23.7	32	13	0	13	87	
4545	50			18	3,5,4,(7) *T 0.63*	CL-ML	brown, very moist, stiff — SANDY SILTY CLAY								CT
				18	Pushed *PP 2.8*	CL-ML (*A-4(2)*)	brown, very moist, very stiff	95.9	22.6	23	7	0	31	69	UU 5,452 psf
							BOH								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- Pushed *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

Laboratory Test Results – Summary Tables

SUMMARY OF TEST DATA
BANGERTER 4 INTERCHANGES
9000 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	IN-PLACE		UNCONFINED OR UU TRIAXIAL COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO CLASSIFICATION)
		DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
16-S-04	0-1.5		7.7				NP	35	40	25	SM (A-1-b (0))
	9-10.5		27.6				NP	0	43	57	ML (A-4 (0))
	12-13.5		19.3				NP	0	49	51	ML (A-4 (0))
	15-16.5		29.0				NP	0	40	60	ML (A-4 (0))
	18-19.5	86.0	28.1				NP	0	33	67	ML (A-4 (0))
	24-25.5		30.3				NP	0	44	56	ML (A-4 (0))
	28.5-30	94.6	28.6	UU 5,020	36	21	15	0	1	99	CL (A-6 (16))
	45-46.5		20.0		29	16	13	1	24	75	CL (A-6 (8))
	60-61.5		27.2		36	23	13	0	14	86	CL (A-6 (11))
	65-66.5	87.8	34.2		37	22	15	0	6	94	CL (A-6 (15))
	80-81.5		12.2				NP	33	46	21	SM (A-1-b (0))
	100-101.5		25.8				NP	3	30	67	ML (A-4 (0))
16-S-05	0-1.5		12.5		20	17	3	30	39	31	SM (A-2-4 (0))
	12-13.5		13.3				NP	25	46	29	SM (A-2-4 (0))
	18-19.5		31.9		32	28	4	0	10	90	ML (A-4 (4))
	25-26.5	79.6	39.4	UU 5,318	40	26	14	0	7	93	ML (A-6 (15))
	30-31.5		30.9		32	24	8	0	15	85	ML (A-4 (7))
	40-41.5		9.7				NP	58	33	9	GP-GM (A-1-a (0))
	45-46.5		22.3								
	60-61.5	88.6	31.6		36	25	11	0	6	94	ML (A-6 (11))
	65-66.5		42.2		39	23	16	0	10	90	CL (A-6 (15))
	85-86.5		30.6				NP	0	27	73	ML (A-4 (0))
16-S-06	0-1.5		5.8		24	17	7	39	32	29	GC-GM (A-2-4 (0))
	6.5-8		6.8				NP	70	22	8	GP-GM (A-1-a (0))
	14.5-16		20.5				NP	2	58	40	SM (A-4 (0))
	18.5-20	76.0	41.8	UU 4,373			NP	0	7	93	ML (A-4 (0))
	26.5-28.8	92.4	30.9		38	22	16	0	1	99	CL (A-6 (17))
	29.5-31		37.6		39	20	19	0	3	97	CL (A-6 (19))
	39.5-40.3		7.4				NP	64	28	8	GP-GM (A-1-a (0))
	49.5-51	104.7	18.8		22	16	6	28	30	42	SC-SM (A-4 (0))

NP=Non-Plastic

SUMMARY OF TEST DATA
BANGERTER 4 INTERCHANGES
9000 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	IN-PLACE		UNCONFINED OR UU TRIAXIAL COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO CLASSIFICATION)
		DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
16-S-06	64.5-66		25.9								
	66-67.5		20.6				NP	4	53	43	SM (A-4 (0))
	74.5-76		20.0		32	16	16	15	21	64	CL (A-6 (8))
	79.5-81		18.9		23	19	4	9	35	56	CL-ML (A-4 (0))
16-E-03	3-4.5		15.4		24	17	7	22	35	43	SC-SM (A-4 (0))
	7.5-9	103.9	26.8	UU 3,279	33	18	15	1	9	90	CL (A-6 (13))
	12-13.5		8.4				NP	54	39	7	GP-GM (A-1-a (0))
	23.5-25	74.8	42.5	UU 3,958	35	27	8	0	2	98	ML (A-4 (9))
	25-26.5		38.0		42	25	17	0	7	93	CL (A-7-6 (18))
	30-31.5		26.3				NP	0	22	78	ML (A-4 (0))
	50-51.5		27.5				NP	0	25	75	ML (A-4 (0))
16-E-04	0-1.5		9.3		25	16	9	14	47	39	SC (A-4 (0))
	5-6.5		6.6				NP	39	49	12	SP-SM (A-1-a (0))
	10-11.5		17.8				NP	3	68	29	SM (A-2-4 (0))
	15-16.5		27.2				NP	0	24	76	ML (A-4 (0))
	20-21.5		36.2								
	22.5-24.5	72.9	44.6	UU 4,171	34	28	6	0	2	98	ML (A-4 (7))
	25-26.5		32.7								
	27.5-29.5	82.9	37.2	UU 3,035	46	24	22	0	1	99	CL (A-7-6 (25))
	44.5-46 (top)		16.7				NP	10	38	52	ML (A-4 (0))
16-E-05	3-4.5		13.5		21	18	3	13	46	41	SM (A-4 (0))
	12.8-14.3		21.6				NP	1	89	10	SP-SM (A-3 (0))
	19.5-21		25.6				NP	0	47	53	ML (A-4 (0))
	25-26.5		36.7		31	28	3	0	12	88	ML (A-4 (3))
	30-31.5	88.9	33.5	UU 4,929	41	22	19	0	2	98	CL (A-7-6 (20))
	45-46.5		23.7		32	19	13	0	13	87	CL (A-6 (10))
	51.5-53	95.9	22.6	UU 5,452	23	16	7	0	31	69	CL-ML (A-4 (2))

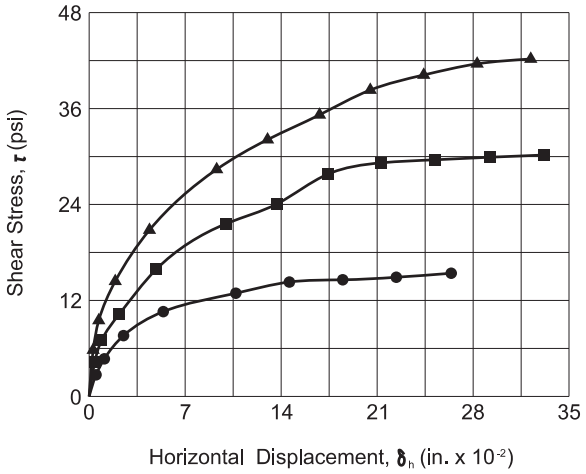
NP=Non-Plastic

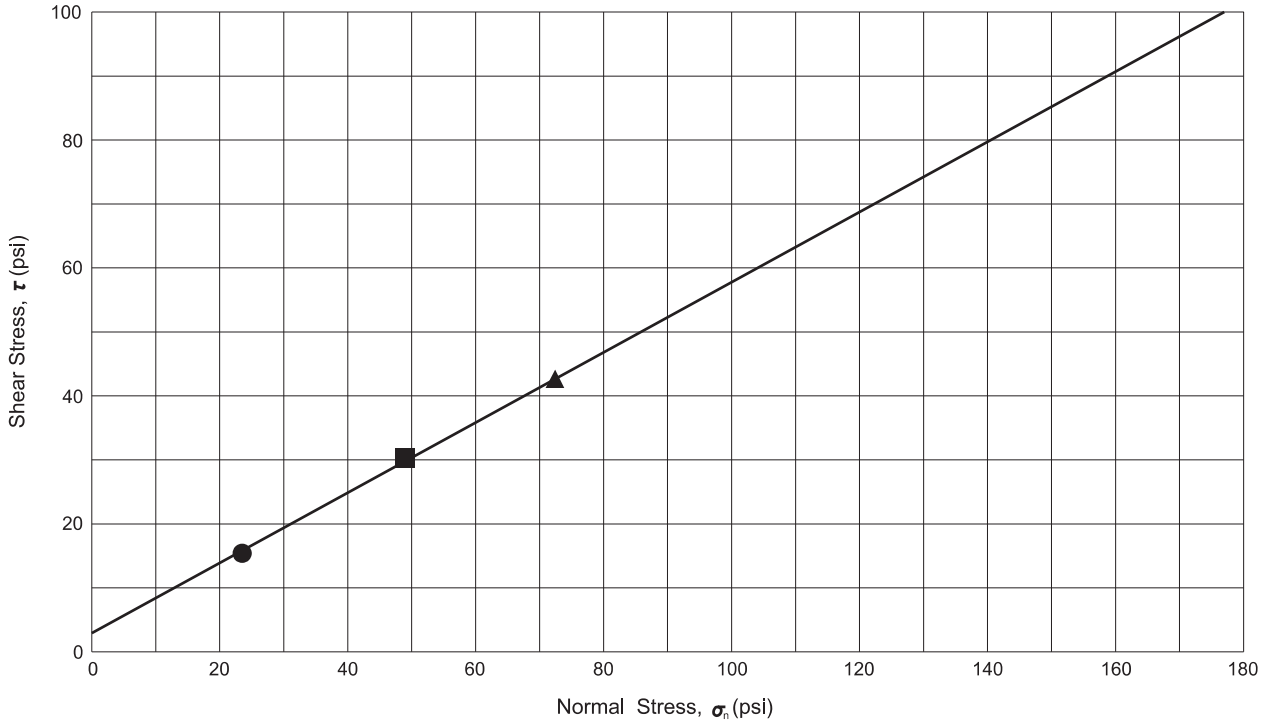
SUMMARY OF ELECTRO-CHEMICAL TEST DATA
BANGERTER 4 INTERCHANGES
9000 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	pH	RESISTIVITY (ohm-cm)	CHLORIDE (mg/kg-dry)	SULFATE (mg/kg-dry)
16-S-05	21-22.5	7.4	300	1090	83.2
16-S-06	11.5-18	9.1	3100	85	8.46
	26.5-28.8	8.1	1700	<6,61	19.6

NP=Non-Plastic

Laboratory Test Results – Direct Shear





Test No. or Symbol	Sample Size (inches)	Sample Data		Degree of Saturation (%)	Normal Stress σ_n (psi)	Maximum Shear Stress τ (psi)	Strain Rate (inches/ minute)	Shear Strength Parameters	
		Dry Density (pcf)	Moisture Content (%)					Friction Angle (degrees)	Cohesion (psi)
●	2.36	87.8	28.6	~100	23.5	15.4	0.0014	28.7	3
■	2.36	84.8	28.2	~100	49.0	30.2	0.0014		
▲	2.37	85.5	27.6	~100	72.4	42.2	0.0014		

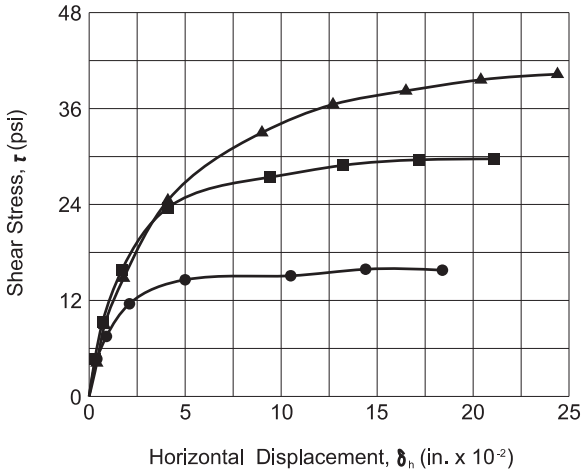
MATERIAL: SANDY SILT, ML

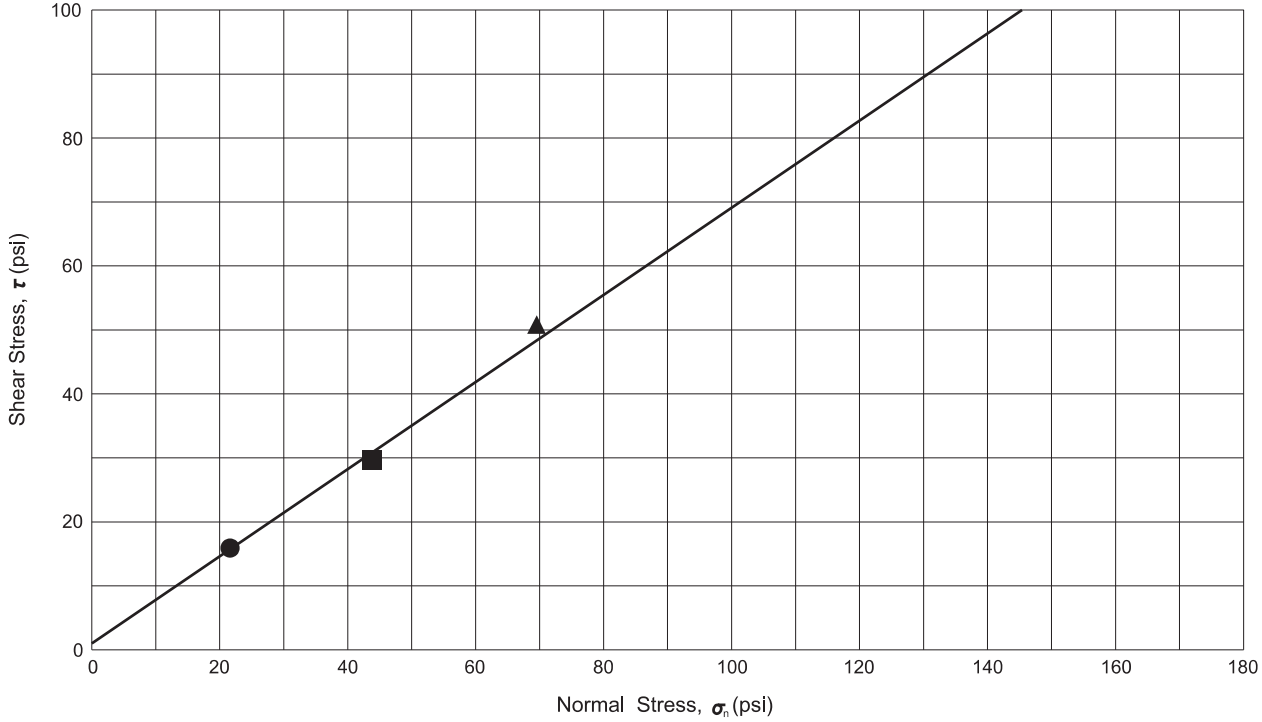
DIRECT SHEAR TEST

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

HOLE NO.: 16-S-04

DEPTH: 18'-19.5'





Test No. or Symbol	Sample Size (inches)	Sample Data		Degree of Saturation (%)	Normal Stress σn (psi)	Maximum Shear Stress τ (psi)	Strain Rate (inches/ minute)	Shear Strength Parameters	
		Dry Density (pcf)	Moisture Content (%)					Friction Angle (degrees)	Cohesion (psi)
●	2.37	91.1	31.5	~100	21.6	15.9	0.0006	34.3	1
■	2.40	91.2	31.7	~100	43.8	29.7	0.0006		
▲	2.36	92.1	31.6	~100	69.5	40.3	0.0006		

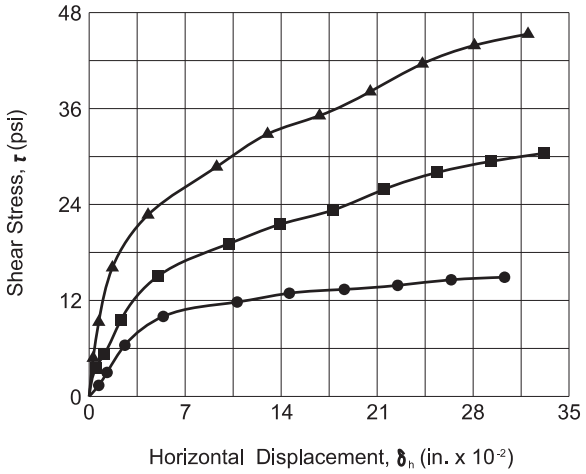
MATERIAL: LEAN CLAY, CL

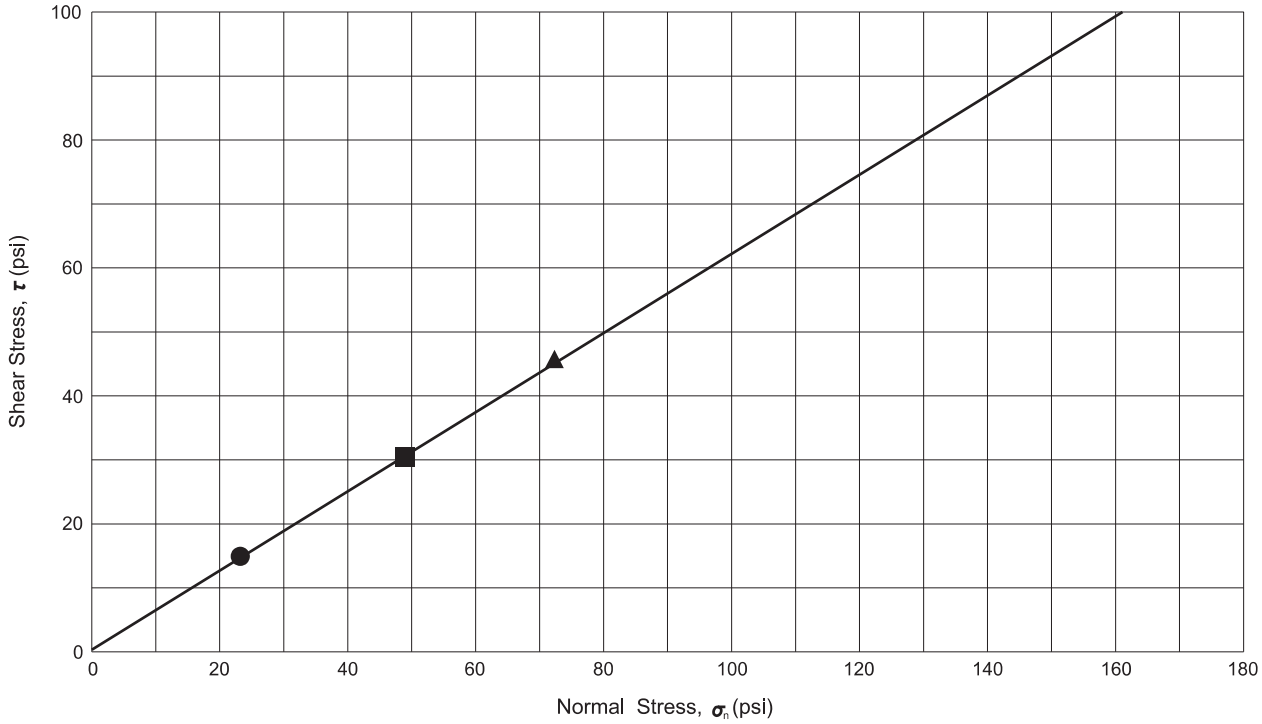
DIRECT SHEAR TEST

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

HOLE NO.: 16-S-06

DEPTH: 26.5'-28'





Test No. or Symbol	Sample Size (inches)	Sample Data		Degree of Saturation (%)	Normal Stress σ_n (psi)	Maximum Shear Stress τ (psi)	Strain Rate (inches/ minute)	Shear Strength Parameters	
		Dry Density (pcf)	Moisture Content (%)					Friction Angle (degrees)	Cohesion (psi)
●	2.40	73.9	44.5	~100	23.2	14.9	0.0006	31.7	0
■	2.36	73.0	44.3	~100	49.0	30.4	0.0006		
▲	2.37	73.3	43.9	~100	72.3	45.3	0.0006		

MATERIAL: SILT (PLASTIC), ML

DIRECT SHEAR TEST

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

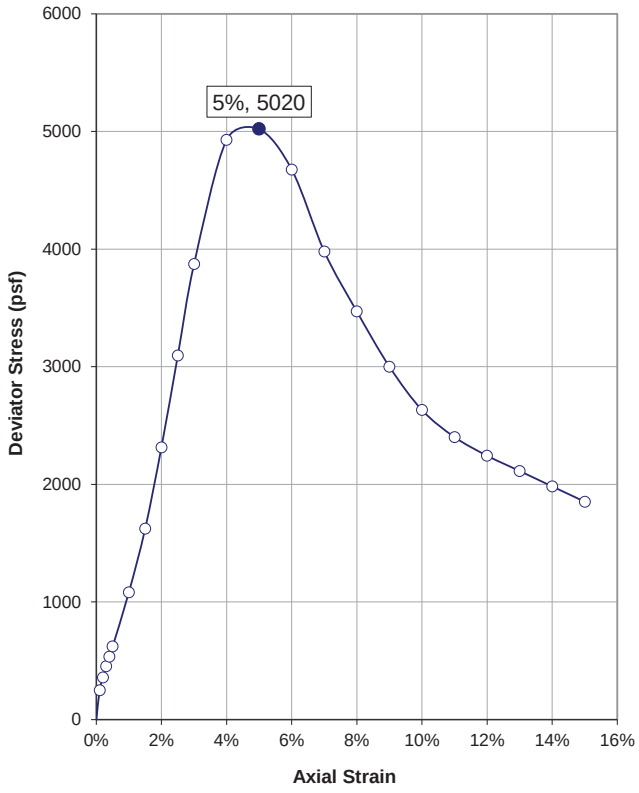
HOLE NO.: 16-E-04

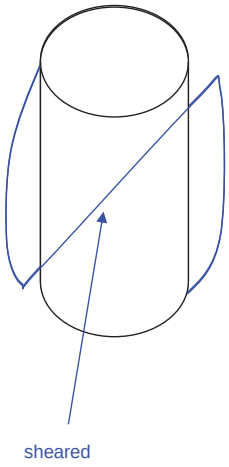
DEPTH: 22.5'-24.5'

Laboratory Test Results – UU Triaxial Compression

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-S-04
Project No.	201601-010	**Sample**	1
Location	9000 So.	**Depth / Elev. (ft)**	28.5'-30'
Date	Wednesday, May 04, 2016	**Sample Description**	Lean Clay CL
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-5	-2	
0.1%	249	125	
0.2%	360	180	
0.3%	454	227	
0.4%	537	268	
0.5%	622	311	
1.0%	1082	541	
1.5%	1624	812	
2.0%	2316	1158	
2.5%	3097	1548	
3.0%	3873	1937	
4.0%	4929	2465	
5.0%	5020	2510	
6.0%	4676	2338	
7.0%	3979	1989	
8.0%	3471	1735	
9.0%	3000	1500	
10.0%	2632	1316	
11.0%	2402	1201	
12.0%	2244	1122	
13.0%	2113	1057	
14.0%	1983	991	
15.0%	1852	926	

Initial Sample Data

Initial height of specimen	L_o	5.5	(in)	**Moisture content***	w	28.6%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	96.5	(pcf)
Height-to-diameter ratio	L_o / D_o	1.96		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	36		**Initial void ratio**	e_o	0.733	
Plastic index	PI	15		**Saturation**	S	100%	

Test Results

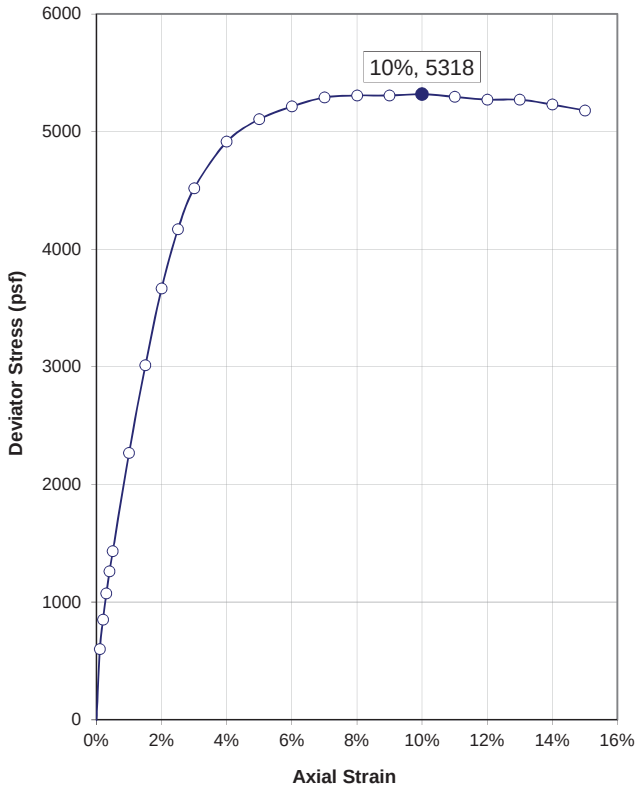
Deviator stress at failure**	$\sigma_{d,f}$	5020	(psf)	**Major principal stress at failure****	σ_1	8328	(psf)
Shear stress at failure**	c_u	2510	(psf)	**Minor principal stress at failure****	σ_3	3308	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		5%					

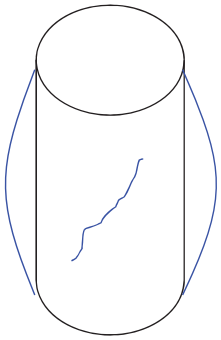
Remarks Confining Pressure 23 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-S-05
Project No.	201601-009	**Sample**	1
Location	9000 So.	**Depth / Elev. (ft)**	25'-26.5'
Date	Wednesday, May 04, 2016	**Sample Description**	Silt (plastic) ML (A-4(15))
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-4	-2	
0.1%	602	301	
0.2%	850	425	
0.3%	1073	536	
0.4%	1261	631	
0.5%	1434	717	
1.0%	2269	1135	
1.5%	3015	1507	
2.0%	3668	1834	
2.5%	4170	2085	
3.0%	4518	2259	
4.0%	4915	2458	
5.0%	5105	2552	
6.0%	5214	2607	
7.0%	5291	2645	
8.0%	5308	2654	
9.0%	5307	2653	
10.0%	5318	2659	
11.0%	5295	2648	
12.0%	5272	2636	
13.0%	5272	2636	
14.0%	5230	2615	
15.0%	5180	2590	

Initial Sample Data

Initial height of specimen	L_o	5.6	(in)	**Moisture content***	w	31.6%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	91.0	(pcf)
Height-to-diameter ratio	L_o / D_o	2.00		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	40		**Initial void ratio**	e_o	0.837	
Plastic index	PI	14		**Saturation**	S	100%	

Test Results

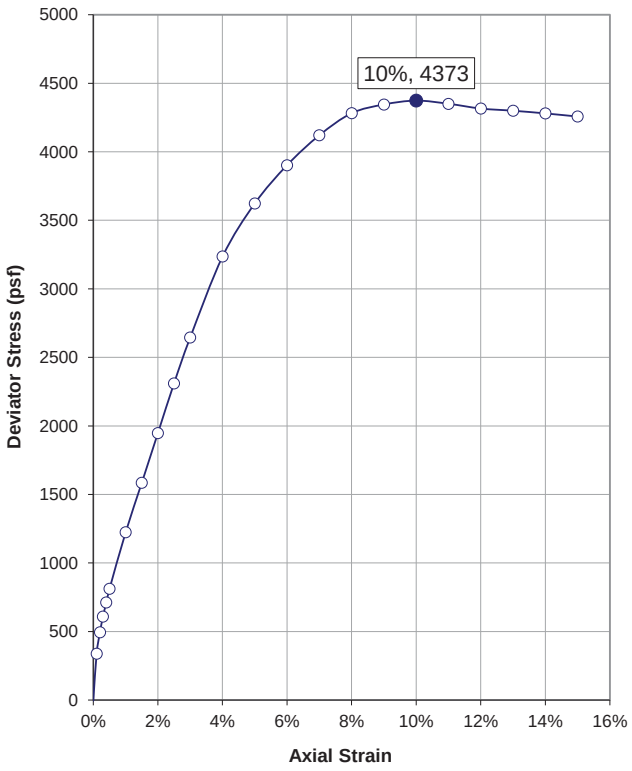
Deviator stress at failure**	$\sigma_{d,f}$	5318	(psf)	**Major principal stress at failure****	σ_1	8341	(psf)
Shear stress at failure**	c_u	2659	(psf)	**Minor principal stress at failure****	σ_3	3022	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		10%					

Remarks Confining Pressure 21 psi

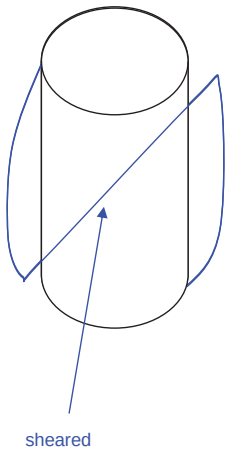
*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-S6
Project No.	201601-009	**Sample**	1
Location	16-S6	**Depth / Elev. (ft)**	18.5'-20'
Date	Monday, June 27, 2016	**Sample Description**	Silt ML
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-6	-3	
0.1%	339	169	
0.2%	495	248	
0.3%	608	304	
0.4%	712	356	
0.5%	811	406	
1.0%	1225	612	
1.5%	1585	793	
2.0%	1948	974	
2.5%	2311	1155	
3.0%	2645	1323	
4.0%	3236	1618	
5.0%	3623	1811	
6.0%	3902	1951	
7.0%	4120	2060	
8.0%	4281	2141	
9.0%	4345	2173	
10.0%	4373	2187	
11.0%	4350	2175	
12.0%	4316	2158	
13.0%	4299	2150	
14.0%	4280	2140	
15.0%	4257	2129	



Initial Sample Data

Initial height of specimen	L_o	5.58	(in)	**Moisture content***	w	41.8%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	77.2	(pcf)
Height-to-diameter ratio	L_o / D_o	1.99		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL			**Initial void ratio**	e_o	1.167	
Plastic index	PI	NP		**Saturation**	S	96%	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	4373	(psf)	**Major principal stress at failure****	σ_1	6530	(psf)
Shear stress at failure**	c_u	2187	(psf)	**Minor principal stress at failure****	σ_3	2157	(psf)

Average strain rate to failure	1%	/ min
Strain at failure	10%	

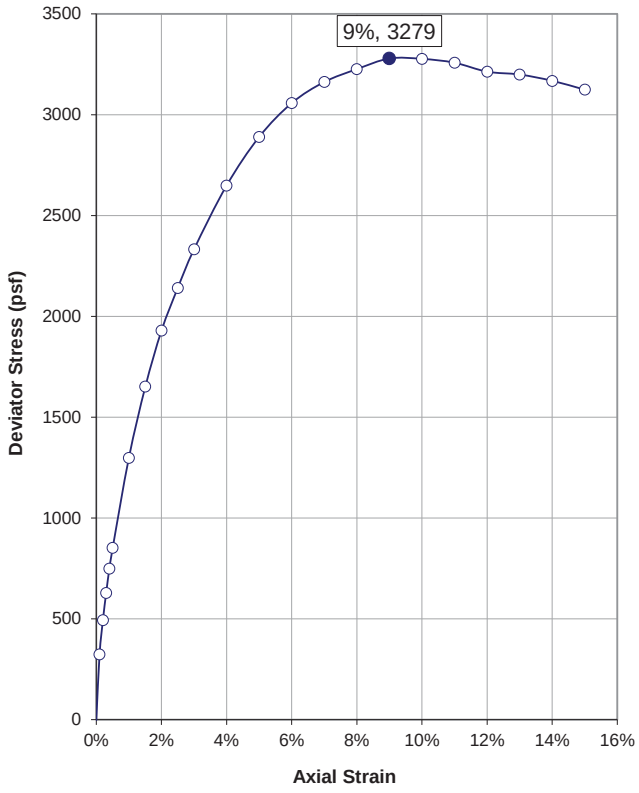
Remarks Confining Pressure 15 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

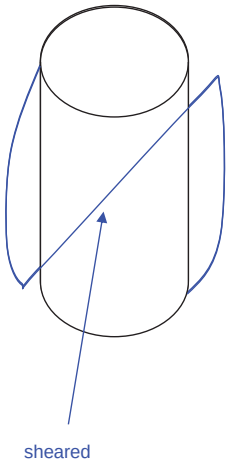
ASTM D 2850

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-3
Project No.	201601-009	**Sample**	1
Location	90000 So.	**Depth / Elev. (ft)**	7.5'-9'
Date	Monday, April 25, 2016	**Sample Description**	Lean Clay CL (A6(13))
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-3	-2	
0.1%	323	162	
0.2%	494	247	
0.3%	629	314	
0.4%	748	374	
0.5%	852	426	
1.0%	1298	649	
1.5%	1651	826	
2.0%	1930	965	
2.5%	2140	1070	
3.0%	2332	1166	
4.0%	2649	1324	
5.0%	2890	1445	
6.0%	3058	1529	
7.0%	3162	1581	
8.0%	3226	1613	
9.0%	3279	1639	
10.0%	3277	1638	
11.0%	3258	1629	
12.0%	3213	1607	
13.0%	3199	1600	
14.0%	3168	1584	
15.0%	3124	1562	



Initial Sample Data

Initial height of specimen	L_o	4.91	(in)	**Moisture content***	w	26.8%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	104.8	(pcf)
Height-to-diameter ratio	L_o / D_o	1.75		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	33		**Initial void ratio**	e_o	0.595	
Plastic index	PI	15		**Saturation**	S	100%	

Test Results

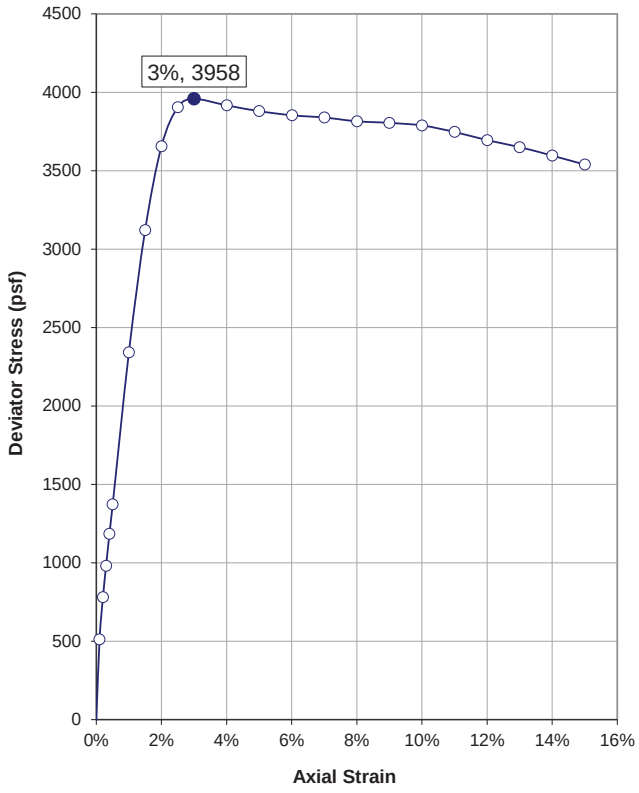
Deviator stress at failure**	$\sigma_{d,f}$	3279	(psf)	**Major principal stress at failure****	σ_1	4287	(psf)
Shear stress at failure**	c_u	1639	(psf)	**Minor principal stress at failure****	σ_3	1008	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		9%					

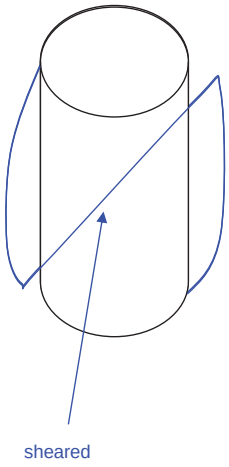
Remarks Confining Pressure 7 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-3
Project No.	201601-009	**Sample**	1
Location	16-E-3	**Depth / Elev. (ft)**	23.5'-25'
Date	Monday, April 25, 2016	**Sample Description**	Silt (plastic) ML (A-4(9))
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-5	-3	
0.1%	511	256	
0.2%	780	390	
0.3%	981	490	
0.4%	1184	592	
0.5%	1372	686	
1.0%	2343	1171	
1.5%	3122	1561	
2.0%	3655	1828	
2.5%	3905	1952	
3.0%	3958	1979	
4.0%	3917	1958	
5.0%	3880	1940	
6.0%	3853	1927	
7.0%	3839	1919	
8.0%	3815	1908	
9.0%	3805	1902	
10.0%	3788	1894	
11.0%	3747	1873	
12.0%	3694	1847	
13.0%	3650	1825	
14.0%	3596	1798	
15.0%	3539	1770	

Initial Sample Data

Initial height of specimen	L_o	5.6	(in)	**Moisture content***	w	42.5%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	80.7	(pcf)
Height-to-diameter ratio	L_o / D_o	2.00		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	35		**Initial void ratio**	e_o	1.073	
Plastic index	PI	8		**Saturation**	S	100%	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	3958	(psf)	**Major principal stress at failure****	σ_1	6690	(psf)
Shear stress at failure**	c_u	1979	(psf)	**Minor principal stress at failure****	σ_3	2732	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		3%					

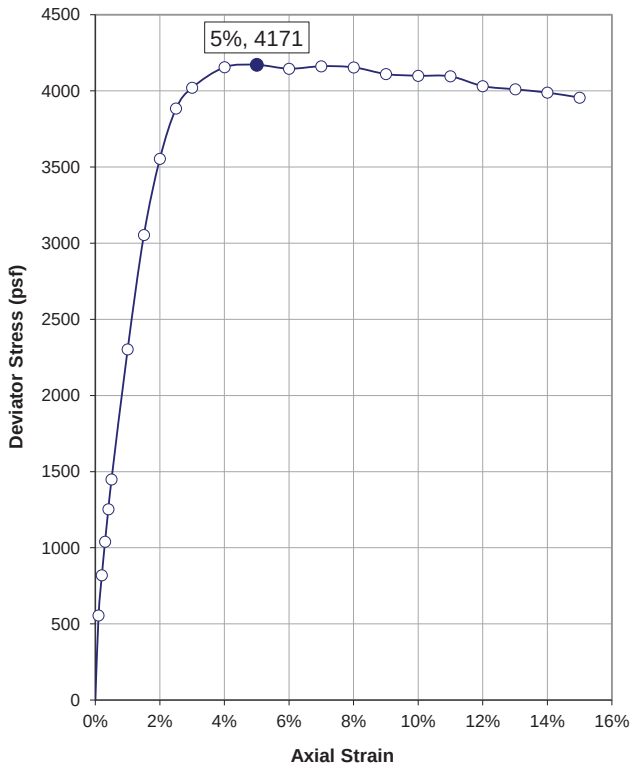
Remarks Confining Pressure 19 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

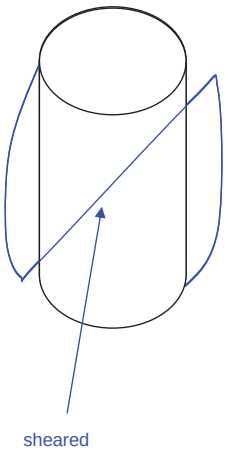
ASTM D 2850

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-4
Project No.	201601-009	**Sample**	1
Location	16-E-4	**Depth / Elev. (ft)**	22.5'-24.5'
Date	Wednesday, June 29, 2016	**Sample Description**	Silt (plastic) ML
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-5	-3	
0.1%	555	278	
0.2%	819	410	
0.3%	1040	520	
0.4%	1253	627	
0.5%	1448	724	
1.0%	2302	1151	
1.5%	3053	1527	
2.0%	3554	1777	
2.5%	3884	1942	
3.0%	4021	2011	
4.0%	4155	2078	
5.0%	4171	2085	
6.0%	4146	2073	
7.0%	4162	2081	
8.0%	4154	2077	
9.0%	4110	2055	
10.0%	4099	2050	
11.0%	4096	2048	
12.0%	4031	2016	
13.0%	4010	2005	
14.0%	3989	1994	
15.0%	3956	1978	



Initial Sample Data

Initial height of specimen	L_o	5.6	(in)	**Moisture content***	w	44.6%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	78.3	(pcf)
Height-to-diameter ratio	L_o / D_o	2.00		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	34		**Initial void ratio**	e_o	1.137	
Plastic index	PI	6		**Saturation**	S	100%	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	4171	(psf)	**Major principal stress at failure****	σ_1	6901	(psf)
Shear stress at failure**	c_u	2085	(psf)	**Minor principal stress at failure****	σ_3	2730	(psf)

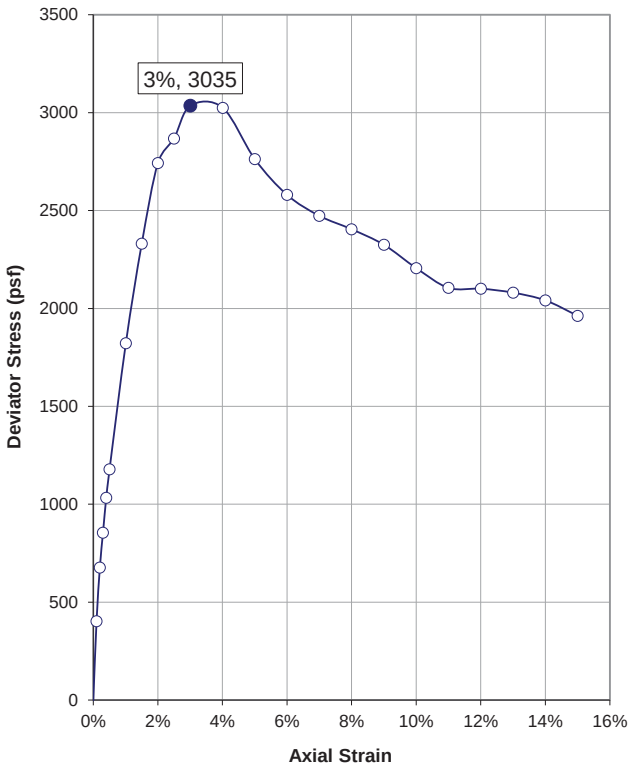
Average strain rate to failure	1%	/ min
Strain at failure	5%	

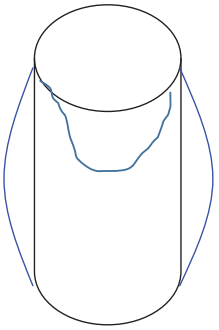
Remarks Confining Pressure 19 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-4
Project No.	201601-009	**Sample**	1
Location	16-E-4	**Depth / Elev. (ft)**	27.5'-29.5'
Date	Wednesday, July 06, 2016	**Sample Description**	Lean Clay CL
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-2	-1	
0.1%	403	202	
0.2%	676	338	
0.3%	855	428	
0.4%	1033	517	
0.5%	1178	589	
1.0%	1822	911	
1.5%	2331	1166	
2.0%	2742	1371	
2.5%	2868	1434	
3.0%	3035	1518	
4.0%	3025	1512	
5.0%	2762	1381	
6.0%	2580	1290	
7.0%	2473	1237	
8.0%	2405	1202	
9.0%	2325	1162	
10.0%	2206	1103	
11.0%	2105	1053	
12.0%	2101	1050	
13.0%	2080	1040	
14.0%	2041	1021	
15.0%	1963	981	

Initial Sample Data

Initial height of specimen	L_o	4.03	(in)	**Moisture content***	w	35.0%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	81.6	(pcf)
Height-to-diameter ratio	L_o / D_o	1.44		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	46		**Initial void ratio**	e_o	1.050	
Plastic index	PI	22		**Saturation**	S	89%	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	3035	(psf)	**Major principal stress at failure****	σ_1	6343	(psf)
Shear stress at failure**	c_u	1518	(psf)	**Minor principal stress at failure****	σ_3	3308	(psf)

Average strain rate to failure	1%	/ min
Strain at failure	3%	

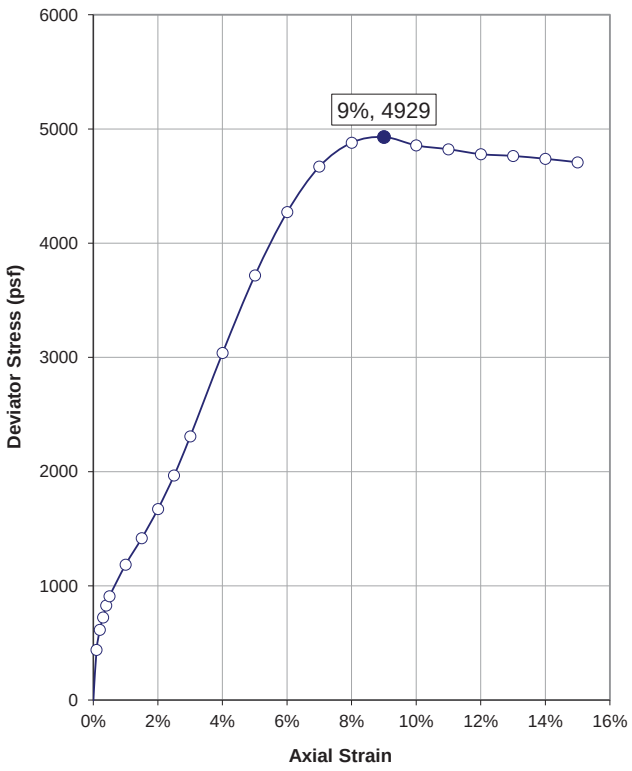
Remarks Confining Pressure 23 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

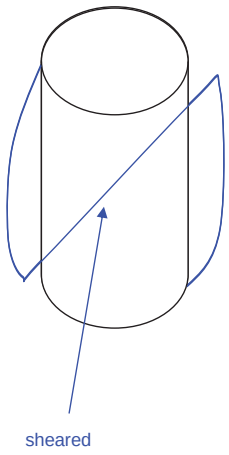
ASTM D 2850

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-5
Project No.	201601-009	**Sample**	1
Location	90000 So.	**Depth / Elev. (ft)**	30'-31.5'
Date	Monday, April 25, 2016	**Sample Description**	Lean Clay CL
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-5	-2	
0.1%	439	219	
0.2%	614	307	
0.3%	724	362	
0.4%	827	414	
0.5%	909	454	
1.0%	1186	593	
1.5%	1417	709	
2.0%	1673	837	
2.5%	1966	983	
3.0%	2308	1154	
4.0%	3039	1519	
5.0%	3718	1859	
6.0%	4272	2136	
7.0%	4670	2335	
8.0%	4880	2440	
9.0%	4929	2465	
10.0%	4856	2428	
11.0%	4822	2411	
12.0%	4779	2390	
13.0%	4764	2382	
14.0%	4739	2369	
15.0%	4708	2354	



Initial Sample Data

Initial height of specimen	L_o	5.62	(in)	**Moisture content***	w	33.5%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	91.5	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	41		**Initial void ratio**	e_o	0.827	
Plastic index	PI	19		**Saturation**	S	100%	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	4929	(psf)	**Major principal stress at failure****	σ_1	7233	(psf)
Shear stress at failure**	c_u	2465	(psf)	**Minor principal stress at failure****	σ_3	2303	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		9%					

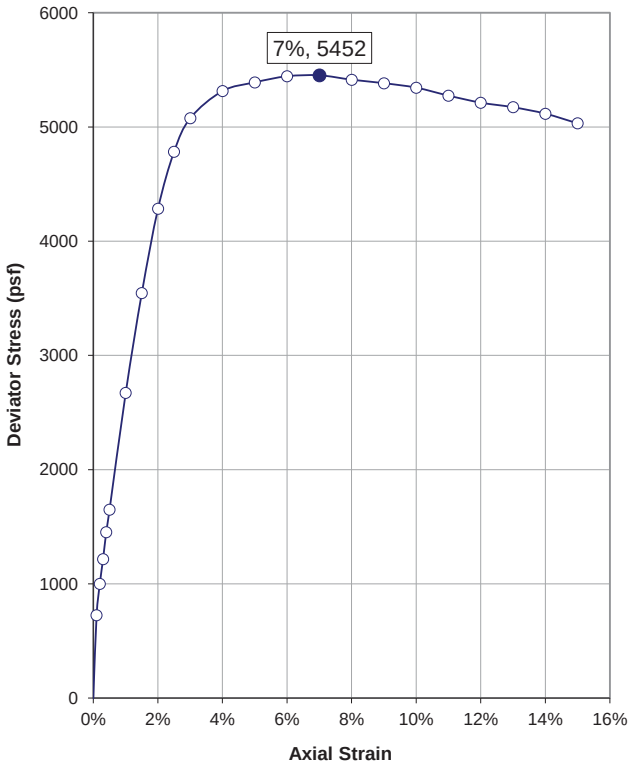
Remarks Confining Pressure 16 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

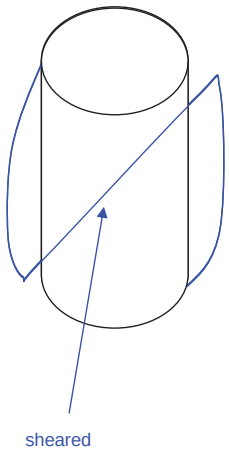
ASTM D 2850

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-5
Project No.	201601-009	**Sample**	1
Location	90000 So.	**Depth / Elev. (ft)**	51.5'-53'
Date	Monday, April 25, 2016	**Sample Description**	Sandy Silty Clay CL-ML
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-4	-2	
0.1%	725	363	
0.2%	1000	500	
0.3%	1216	608	
0.4%	1453	726	
0.5%	1649	824	
1.0%	2672	1336	
1.5%	3546	1773	
2.0%	4284	2142	
2.5%	4782	2391	
3.0%	5077	2539	
4.0%	5314	2657	
5.0%	5390	2695	
6.0%	5444	2722	
7.0%	5452	2726	
8.0%	5413	2707	
9.0%	5383	2691	
10.0%	5344	2672	
11.0%	5274	2637	
12.0%	5213	2606	
13.0%	5173	2586	
14.0%	5116	2558	
15.0%	5031	2516	



Initial Sample Data

Initial height of specimen	L_o	5.82	(in)	**Moisture content***	w	22.6%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	98.4	(pcf)
Height-to-diameter ratio	L_o / D_o	2.08		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	23		**Initial void ratio**	e_o	0.700	
Plastic index	PI	7		**Saturation**	S	86%	

Test Results

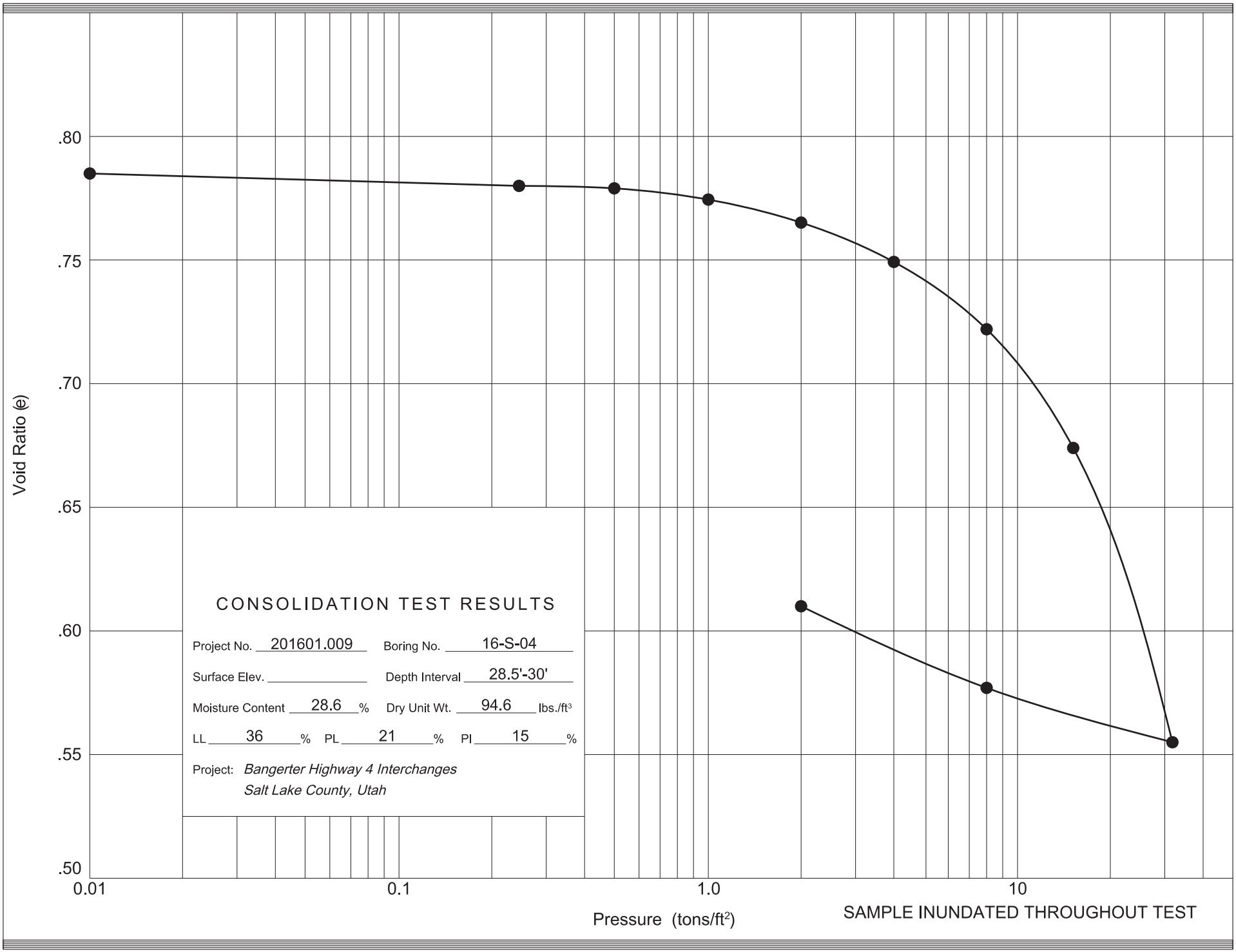
Deviator stress at failure**	$\sigma_{d,f}$	5452	(psf)	**Major principal stress at failure****	σ_1	8907	(psf)
Shear stress at failure**	c_u	2726	(psf)	**Minor principal stress at failure****	σ_3	3456	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		7%					

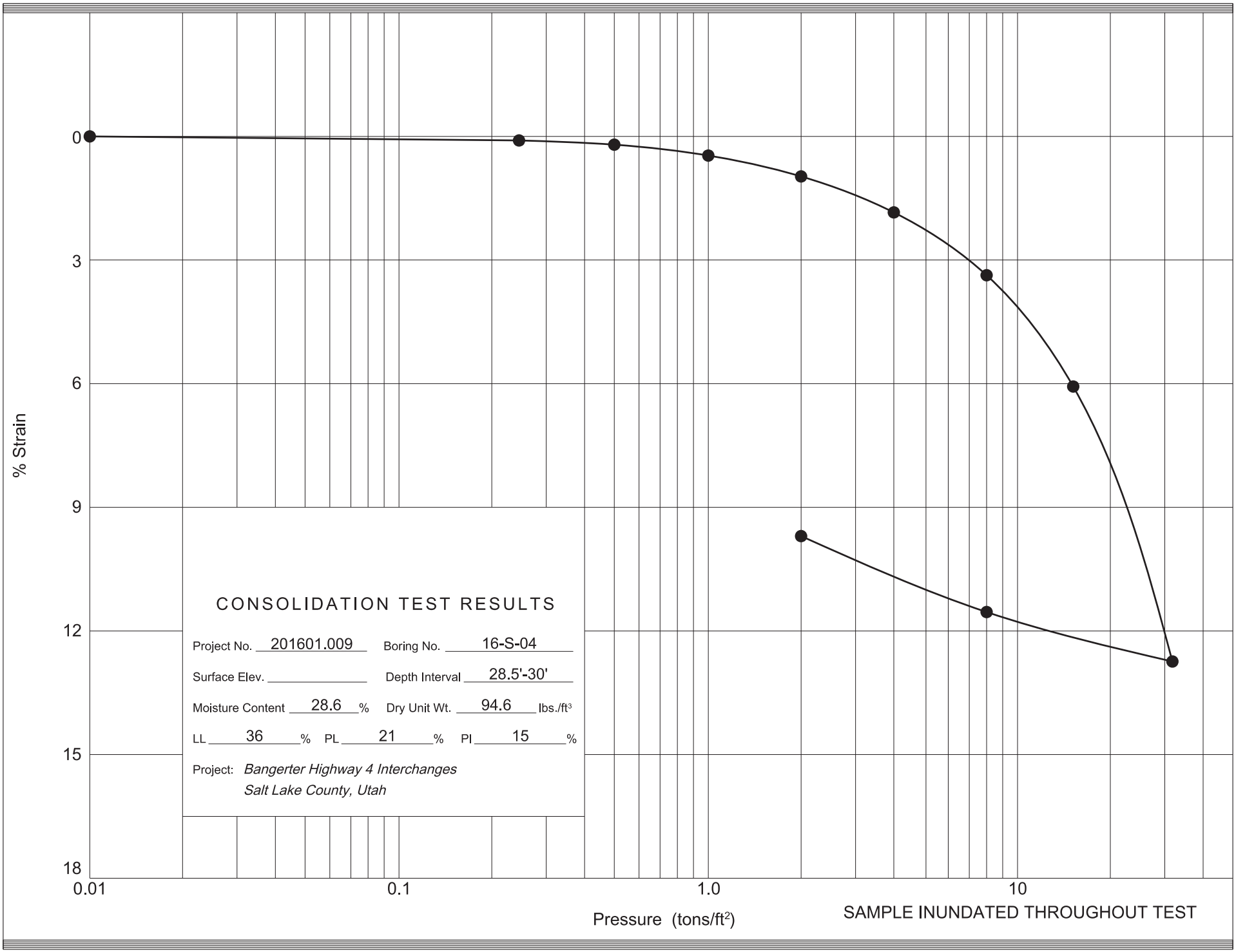
Remarks Confining Pressure 24 psi

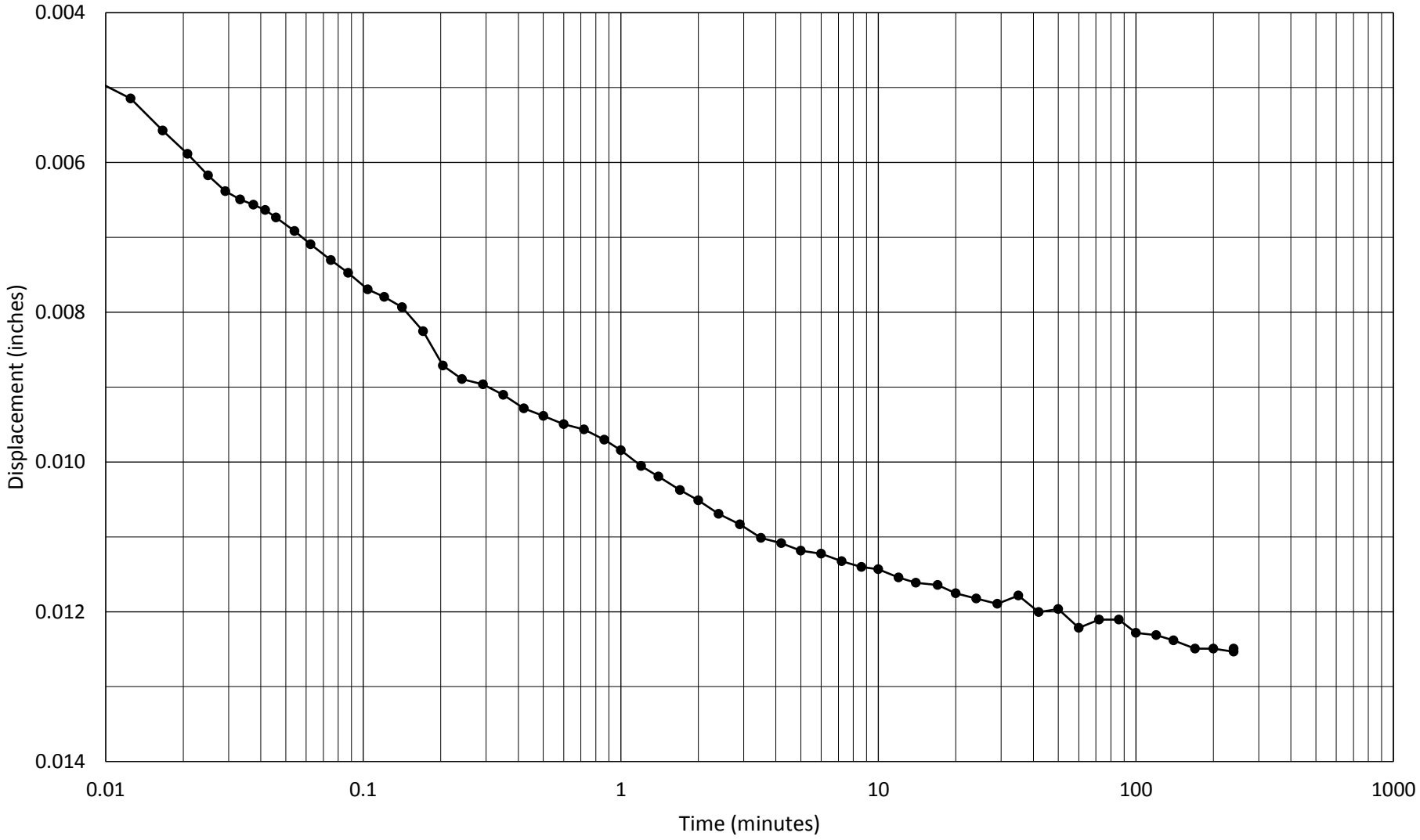
*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

ASTM D 2850

Laboratory Test Results – Consolidation


.80
.75
.70
.65
.60
.55
.50
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-04
Surface Elev.
Depth Interval 28.5'-30'
Moisture Content 28.6 %
Dry Unit Wt. 94.6 lbs./ft³
LL 36 % PL 21 % PI 15 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

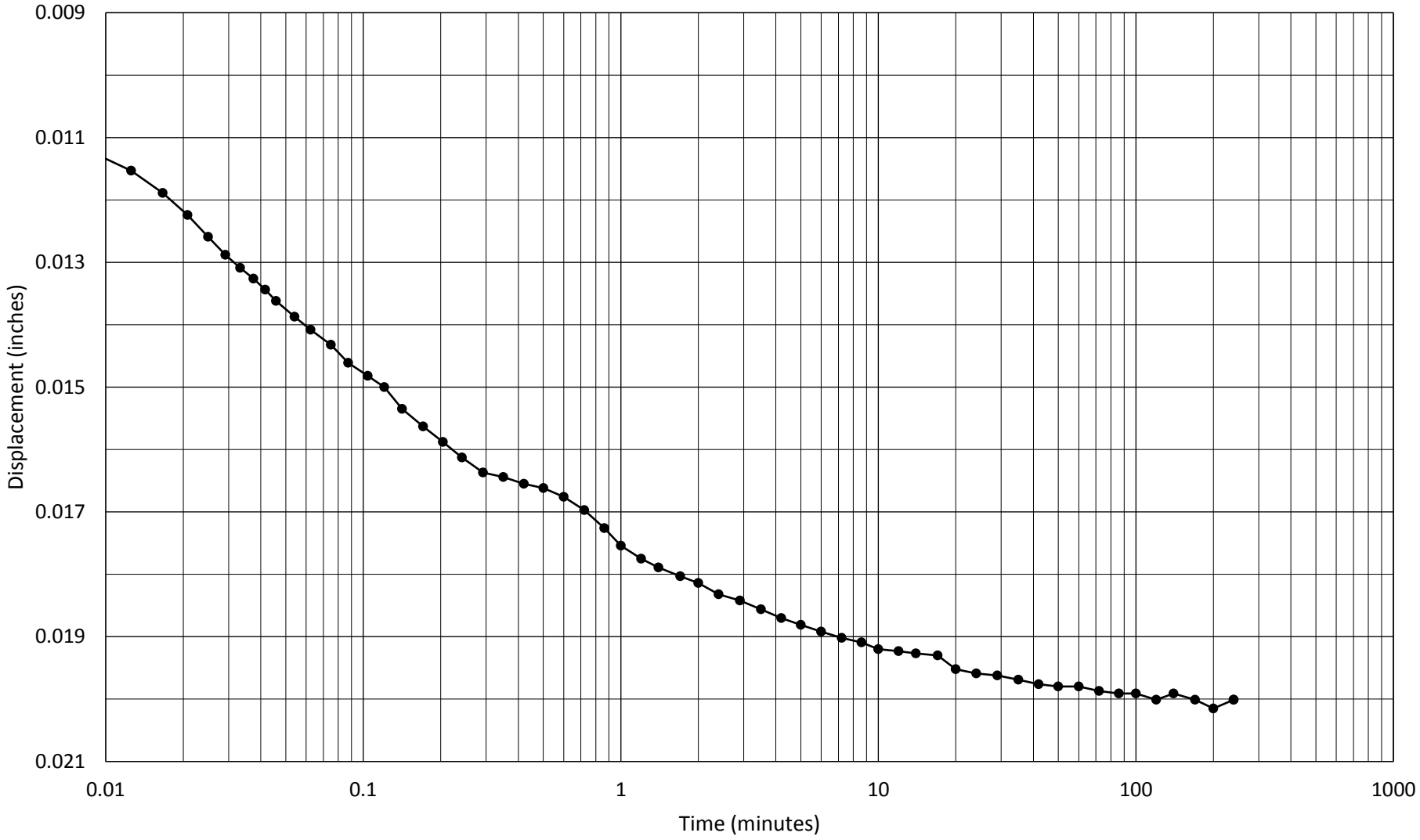

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-04
Surface Elev.
Depth Interval 28.5'-30'
Moisture Content 28.6 %
Dry Unit Wt. 94.6 lbs./ft³
LL 36 %
PL 21 %
PI 15 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-04
Depth: 28.5'-30'
Load: 1 to 2 tsf

TIME CONSOLIDATION

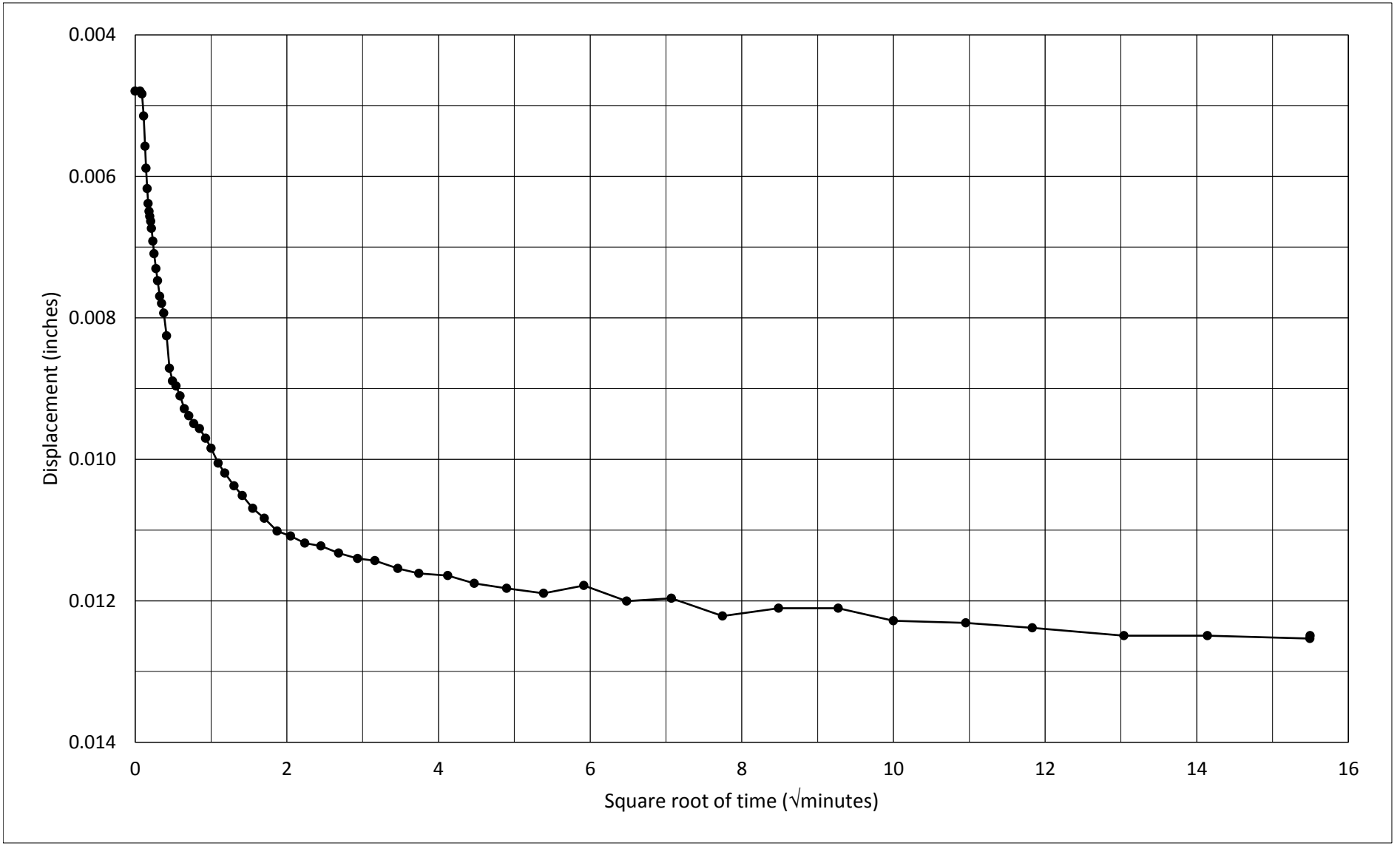
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-04
Depth: 28.5'-30'
Load: 2 to 4 tsf

TIME CONSOLIDATION

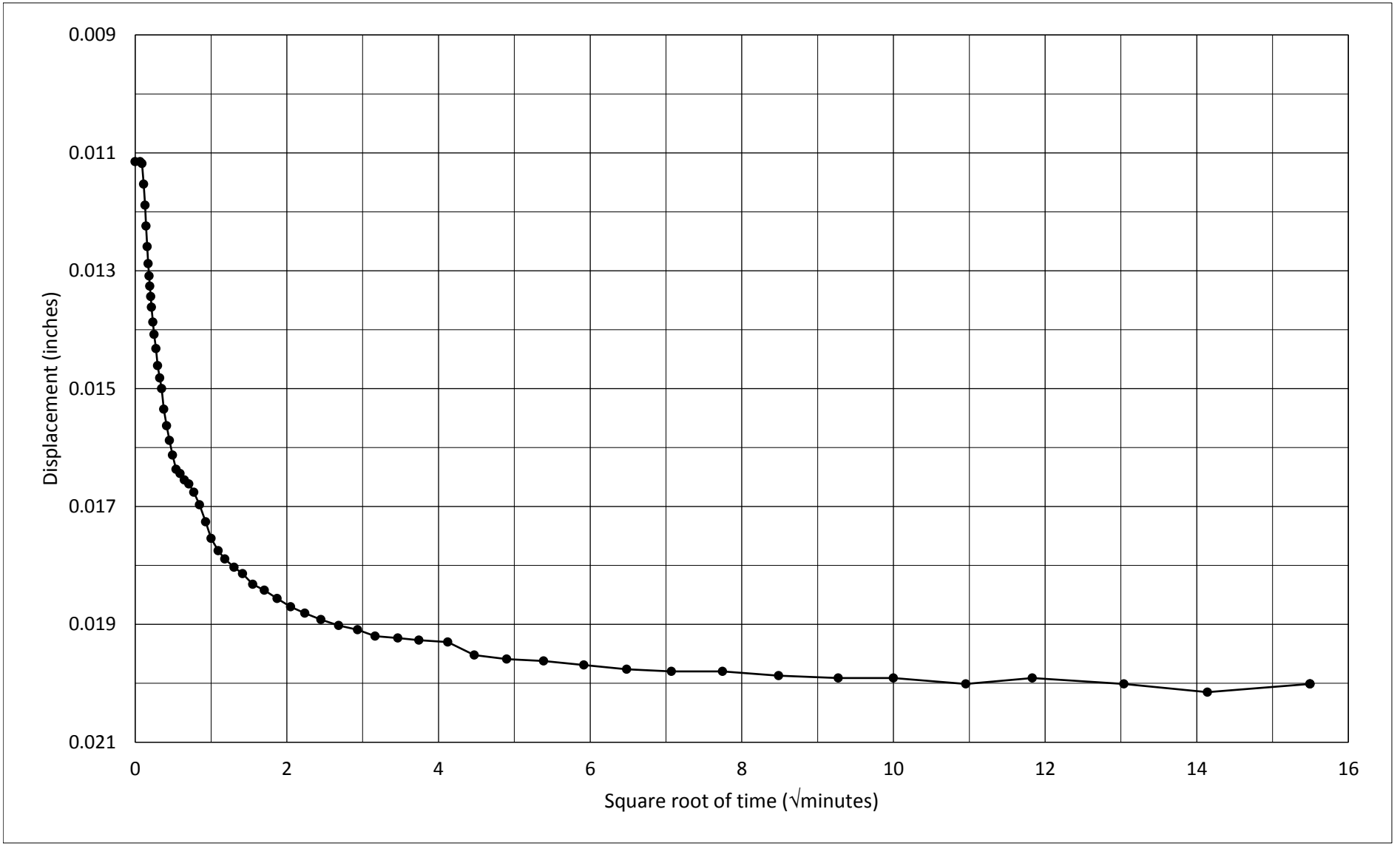
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-04
Depth: 28.5'-30'
Load: 1 to 2 tsf

TIME CONSOLIDATION

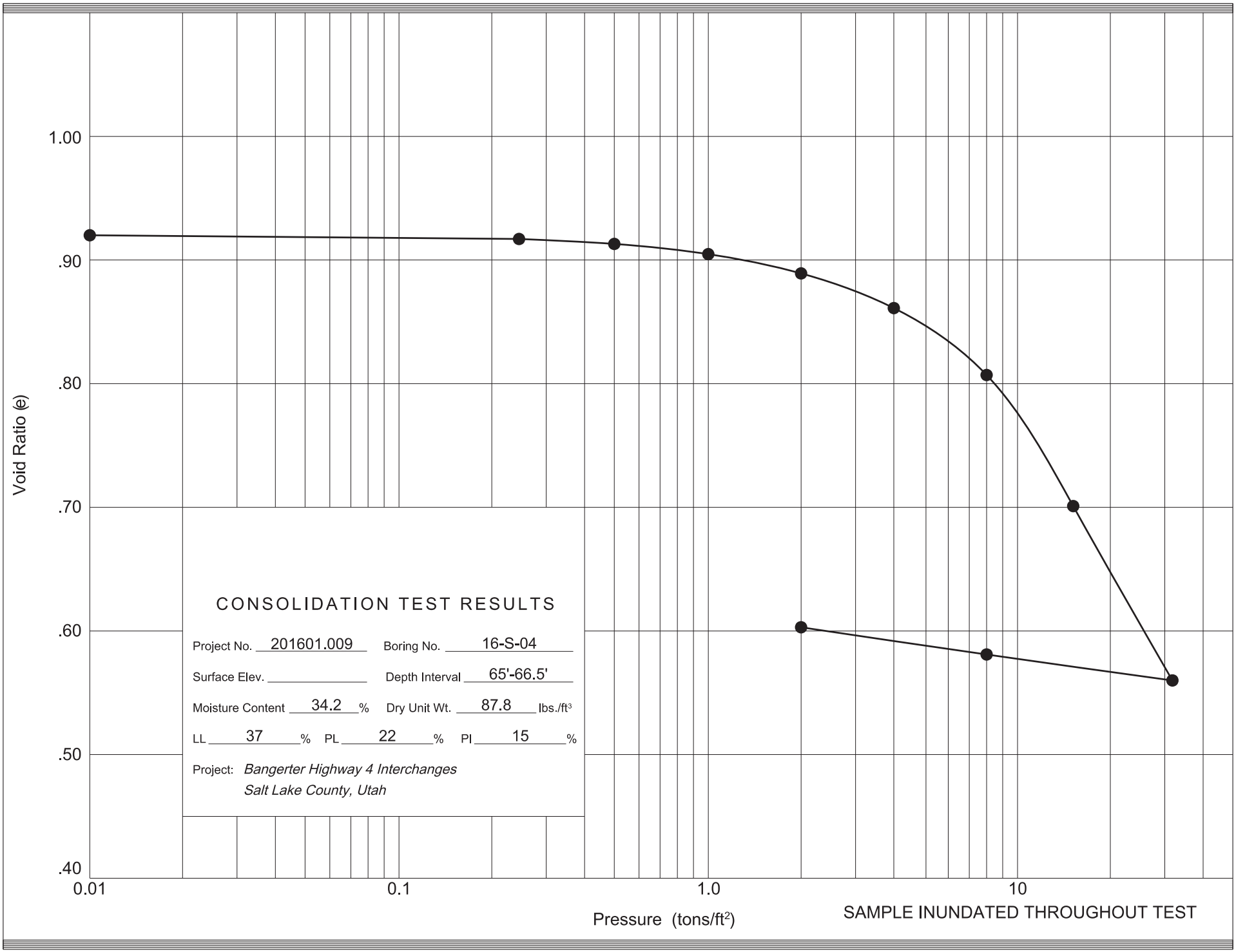
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

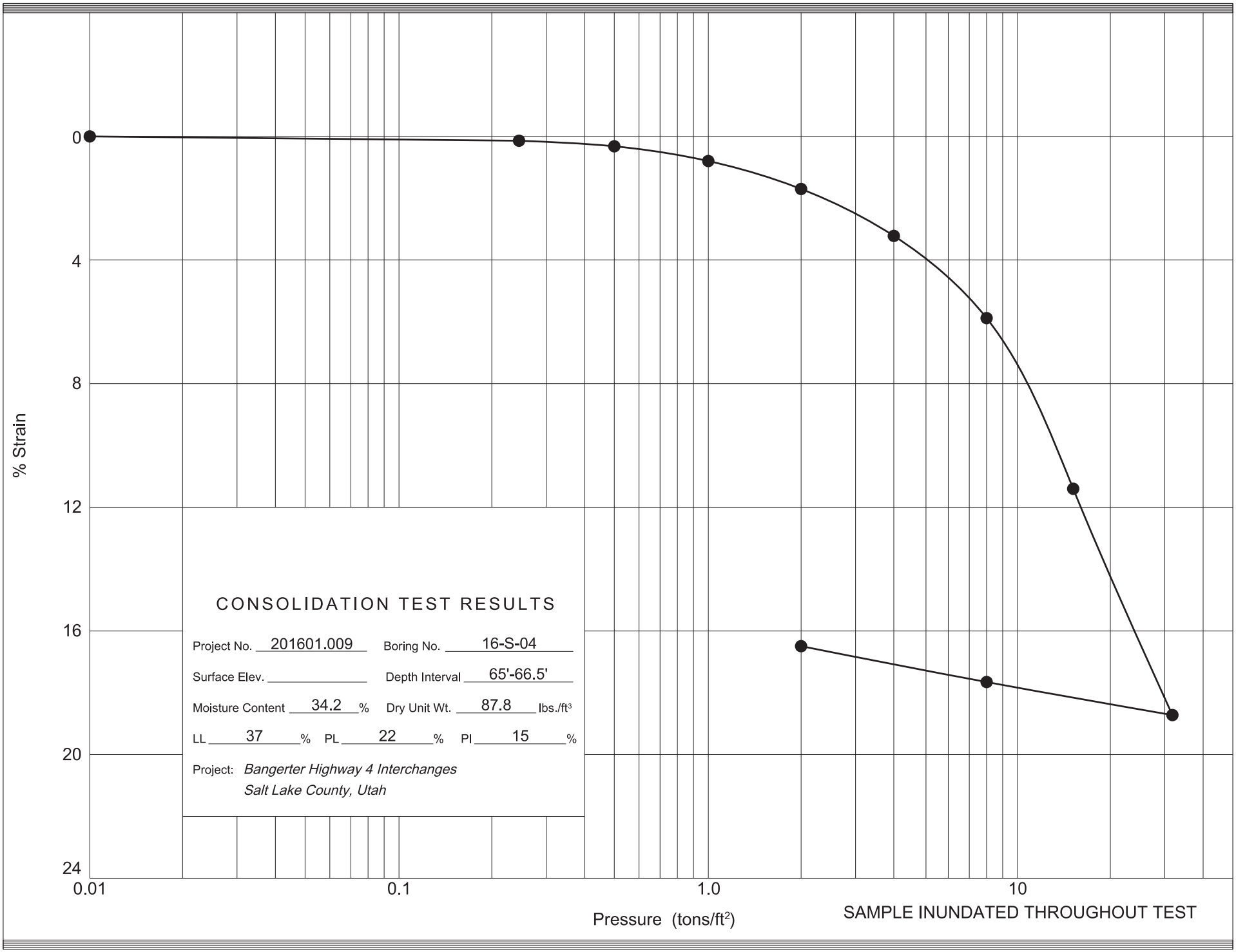


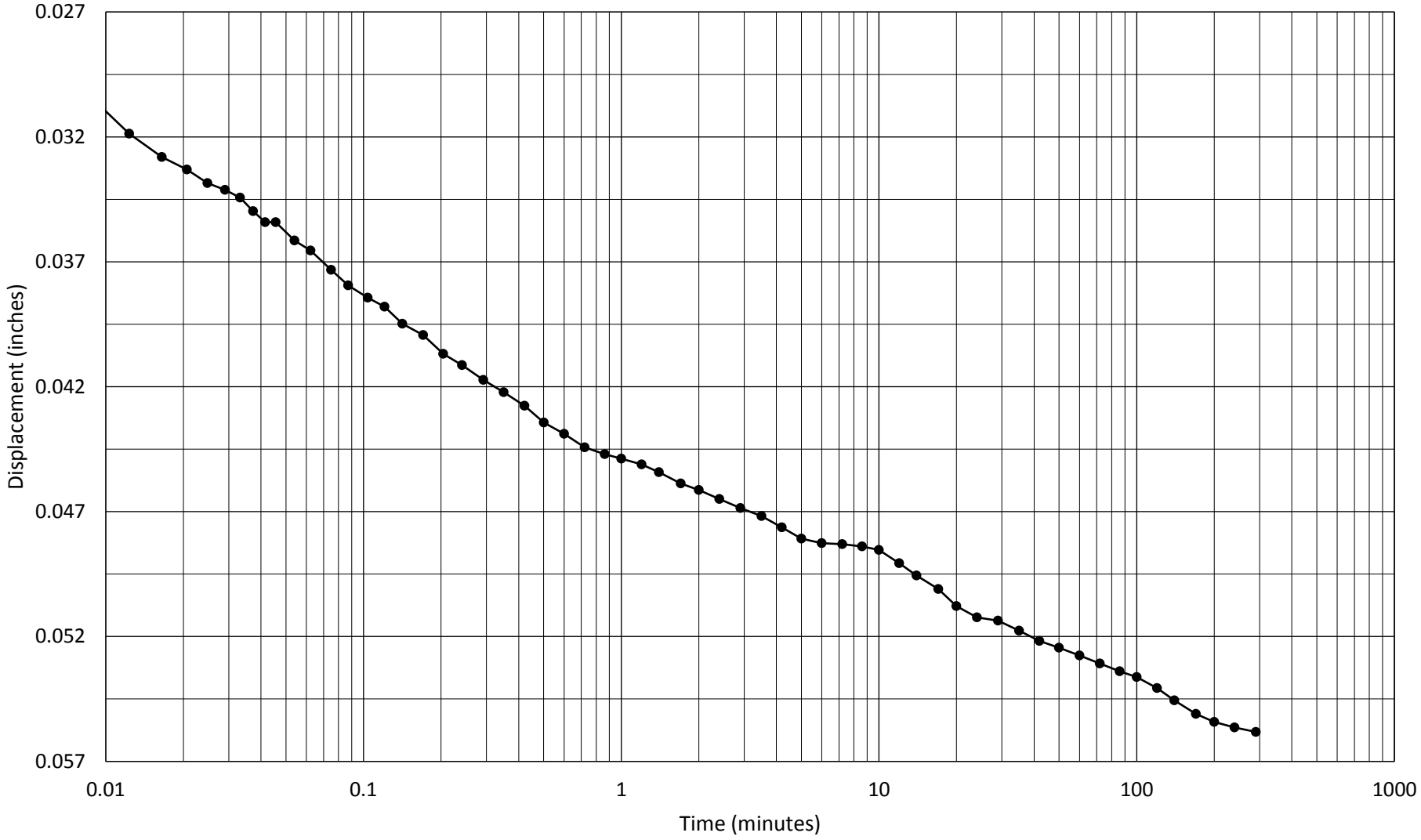
Hole no.: 16-S-04
Depth: 28.5'-30'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


1.00
.90
.80
.70
.60
.50
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-04
Surface Elev.
Depth Interval 65'-66.5'
Moisture Content 34.2 %
Dry Unit Wt. 87.8 lbs./ft³
LL 37 %
PL 22 %
PI 15 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

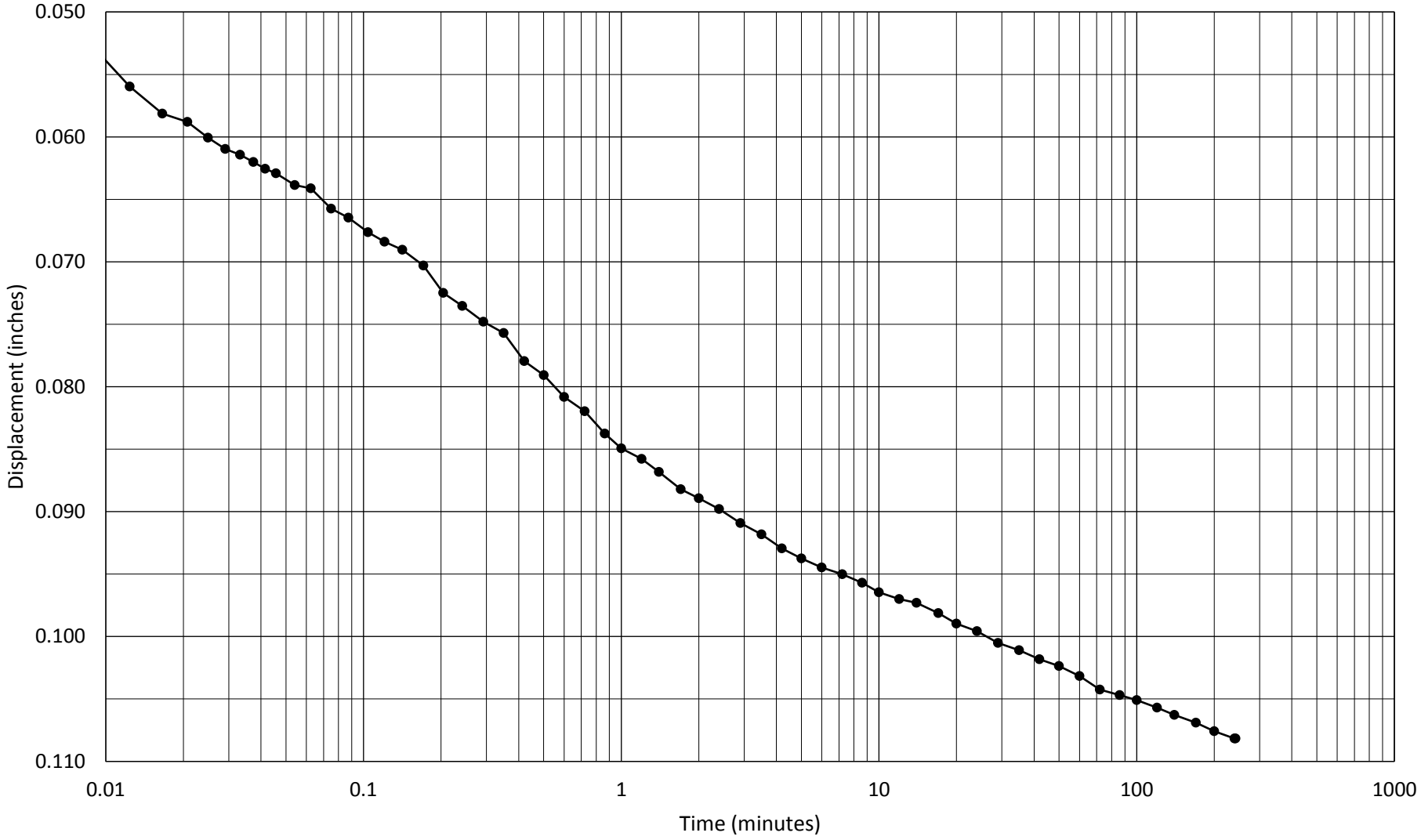

0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-04
Surface Elev.
Depth Interval 65'-66.5'
Moisture Content 34.2 %
Dry Unit Wt. 87.8 lbs./ft³
LL 37 %
PL 22 %
PI 15 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-04
Depth: 65'-66.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

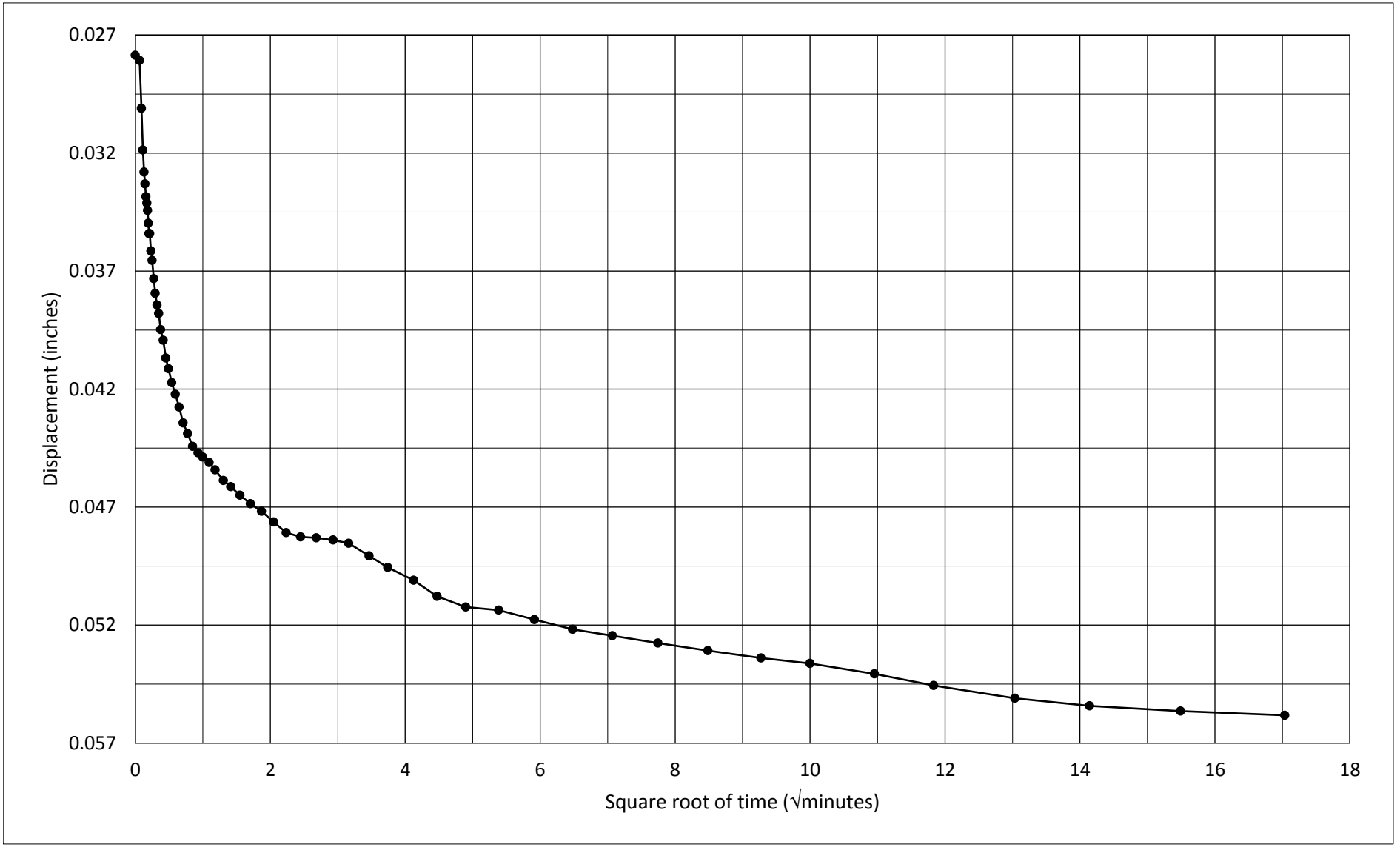
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-04
Depth: 65'-66.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

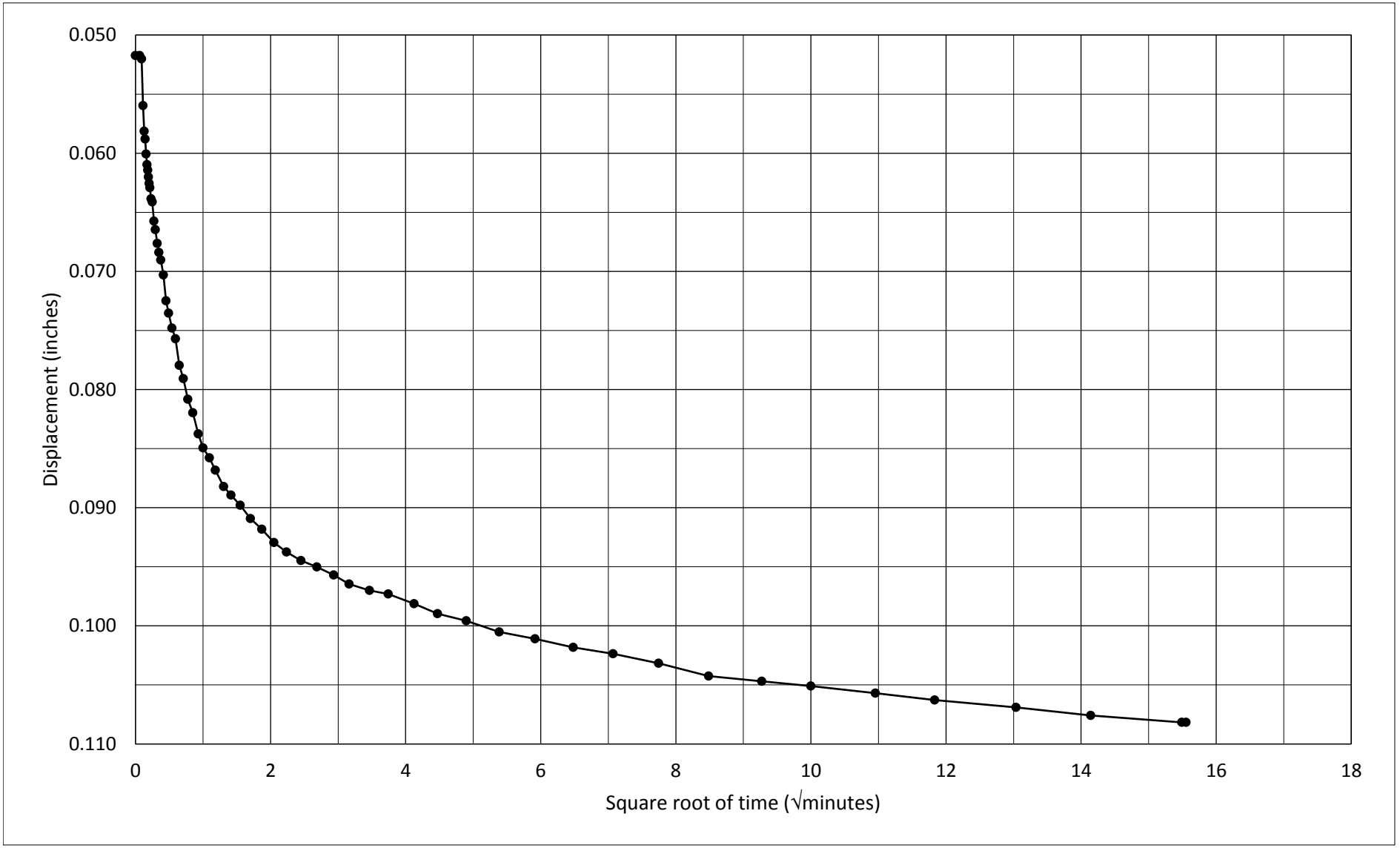
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-04
Depth: 65'-66.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

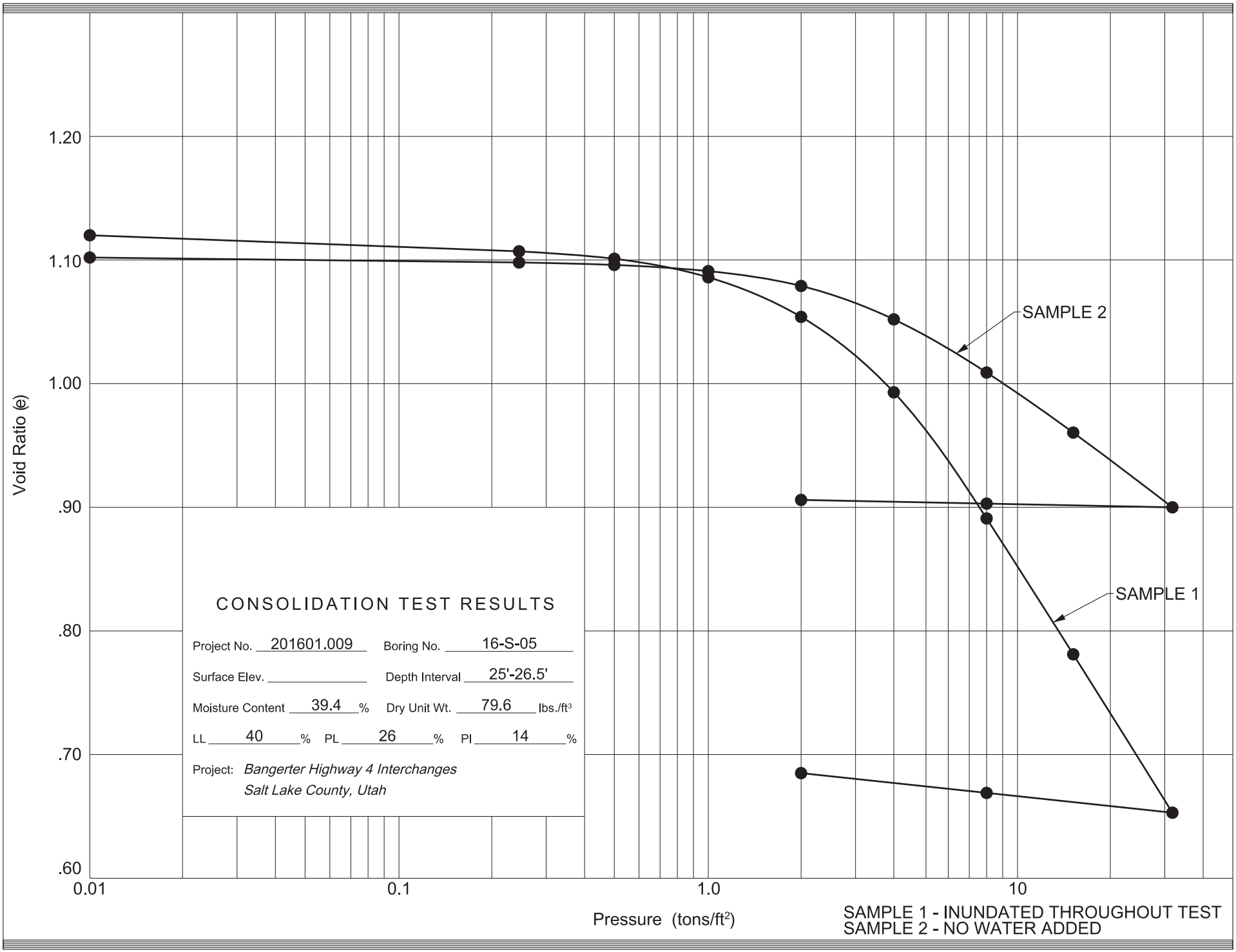
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

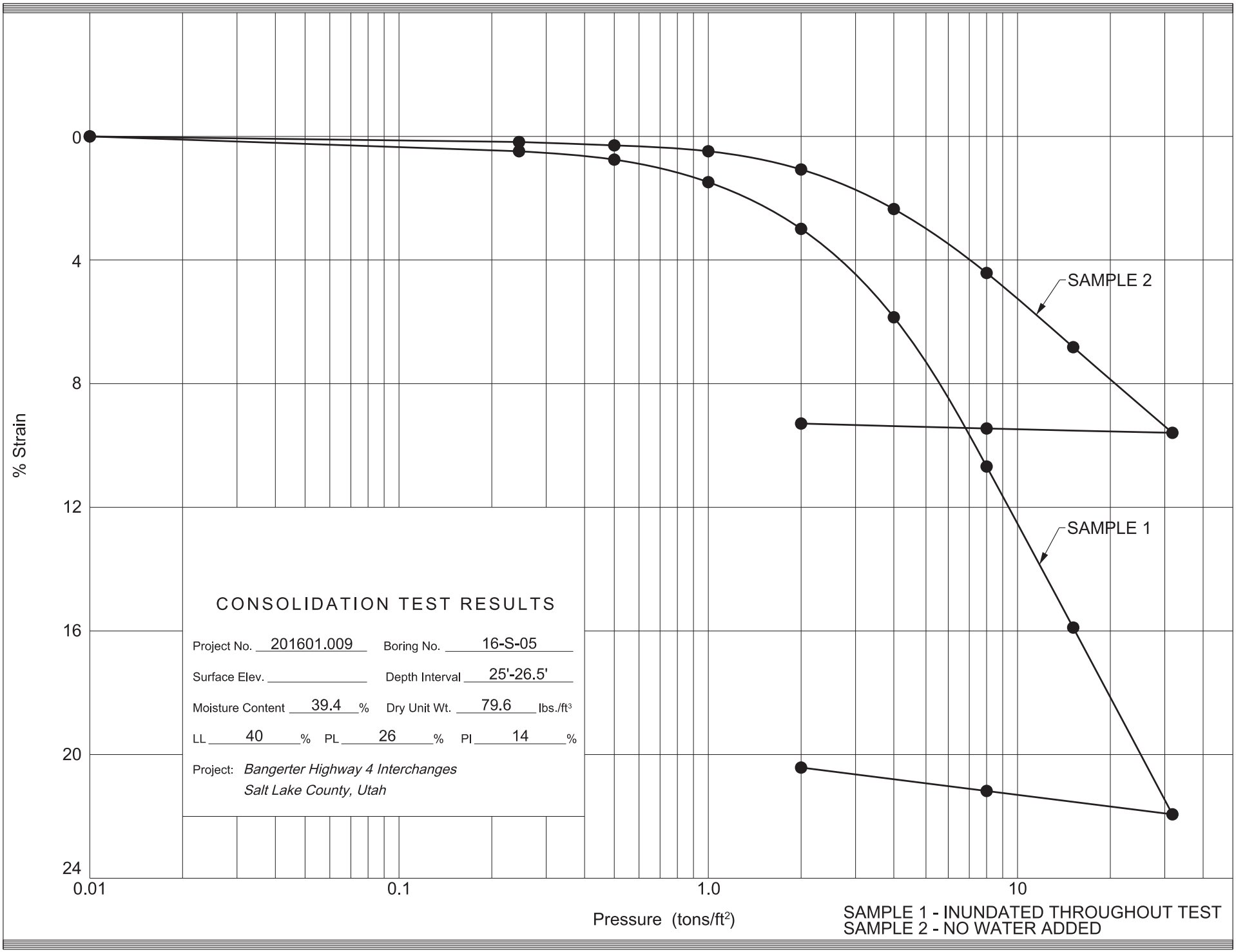


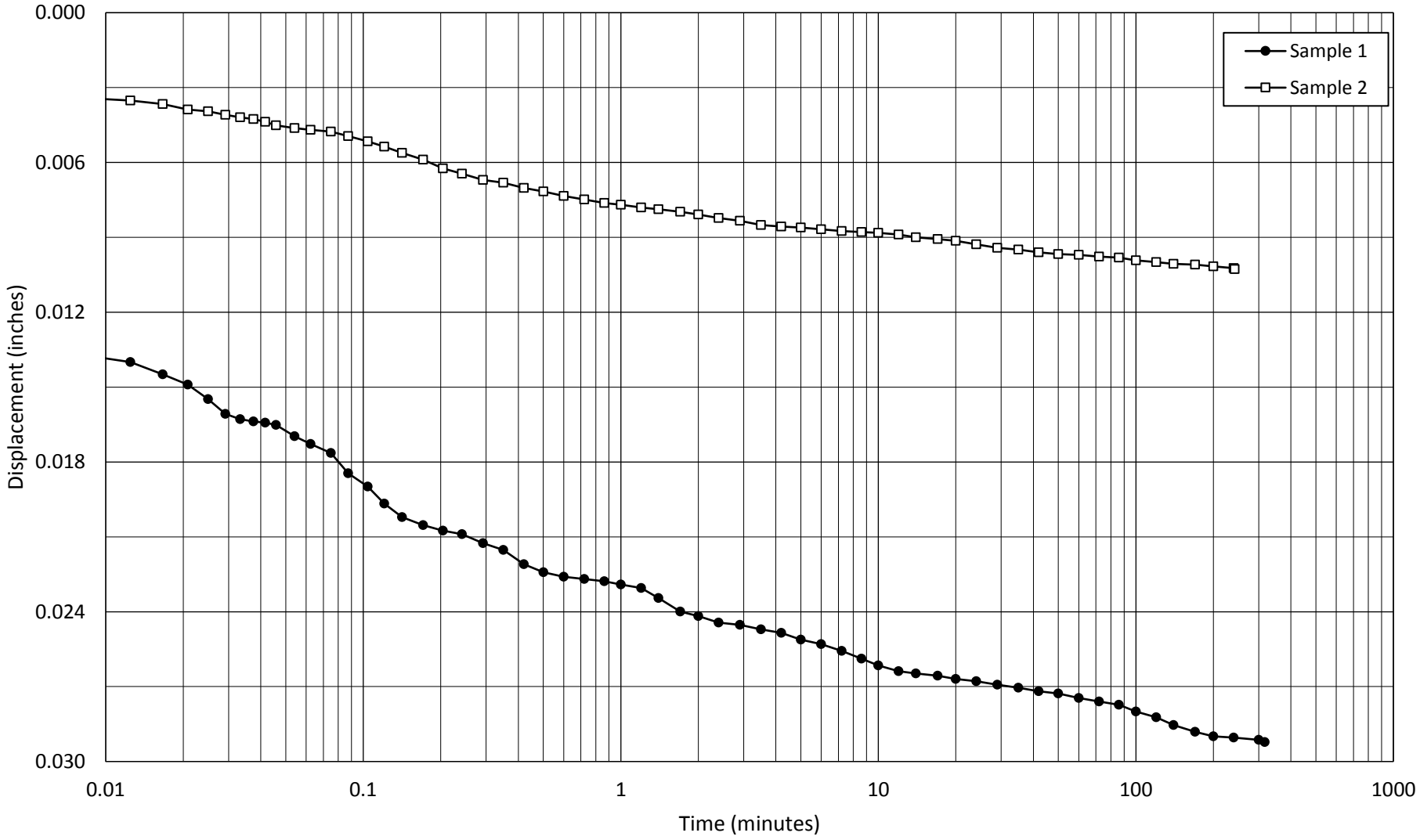
Hole no.: 16-S-04
Depth: 65'-66.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


1.20
1.10
1.00
.90
.80
.70
.60
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 2
SAMPLE 1
CONSOLIDATION TEST RESULTS
Project No. 201601.009 Boring No. 16-S-05
Surface Elev. Depth Interval 25'-26.5'
Moisture Content 39.4 % Dry Unit Wt. 79.6 lbs./ft³
LL 40 % PL 26 % PI 14 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED THROUGHOUT TEST
SAMPLE 2 - NO WATER ADDED

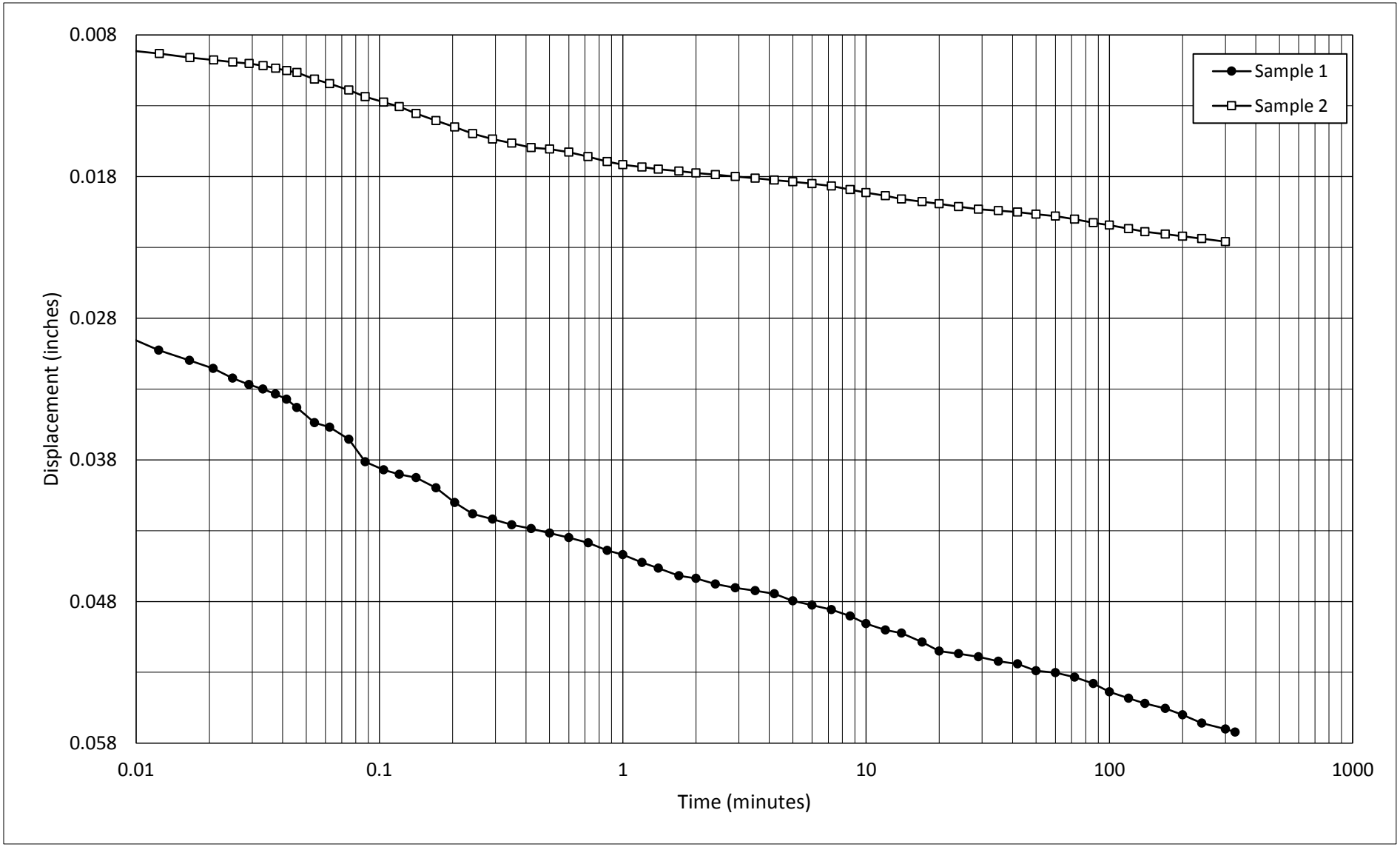

0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 2
SAMPLE 1
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-05
Surface Elev.
Depth Interval 25'-26.5'
Moisture Content 39.4 %
Dry Unit Wt. 79.6 lbs./ft³
LL 40 %
PL 26 %
PI 14 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED THROUGHOUT TEST
SAMPLE 2 - NO WATER ADDED



Hole no.: 16-S-05
Depth: 25'-26.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

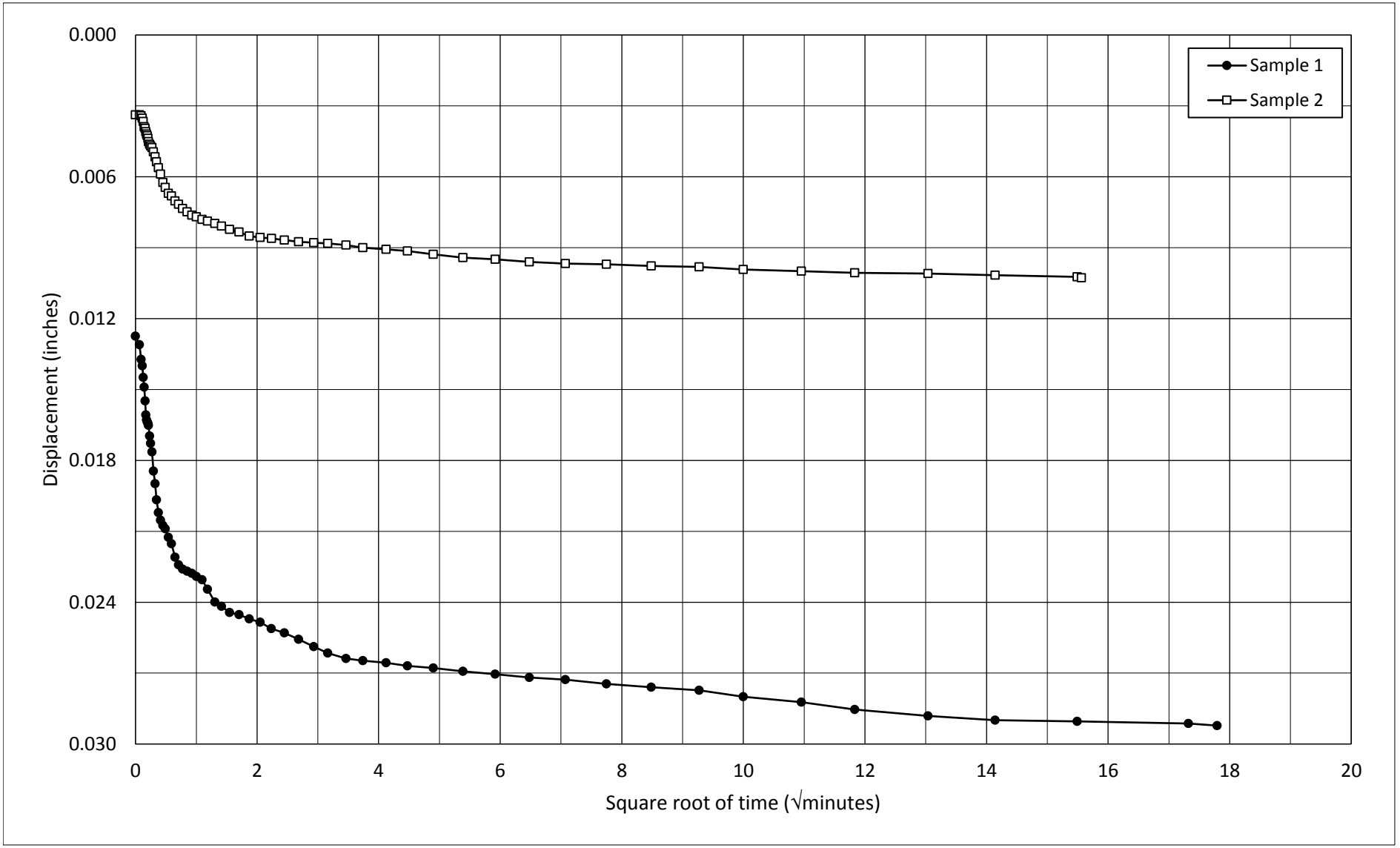
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-05
Depth: 25'-26.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

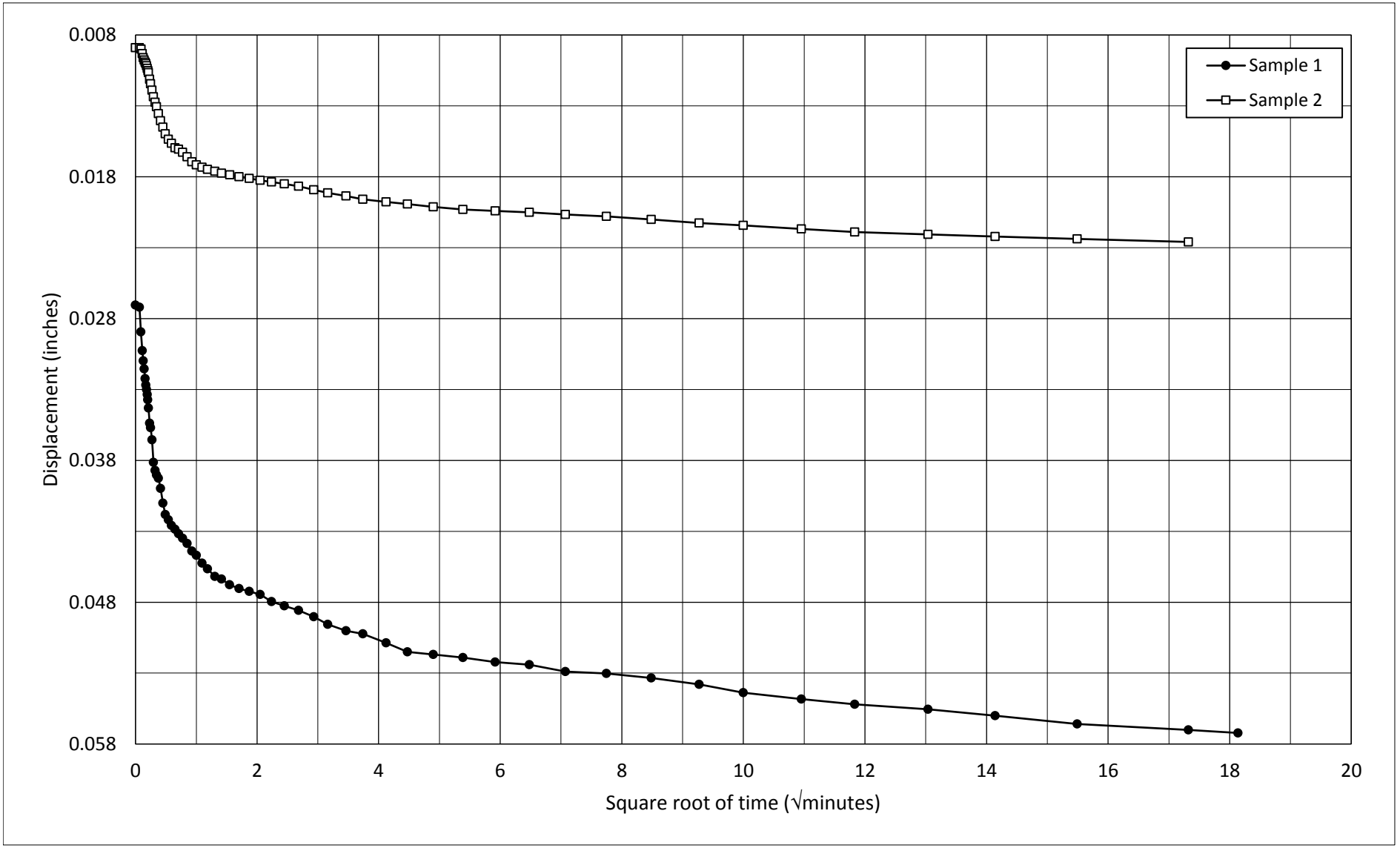
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-05
Depth: 25'-26.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

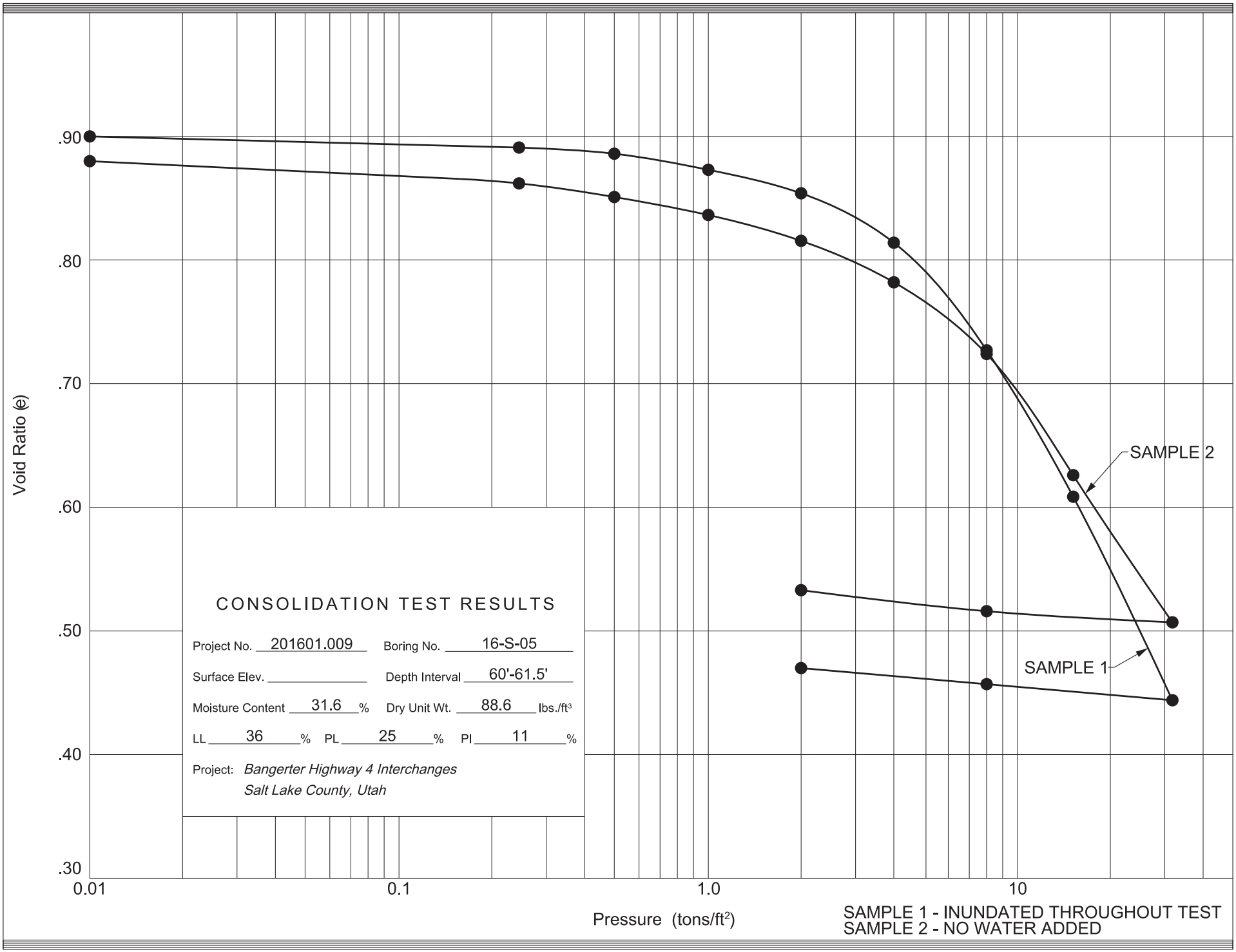
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

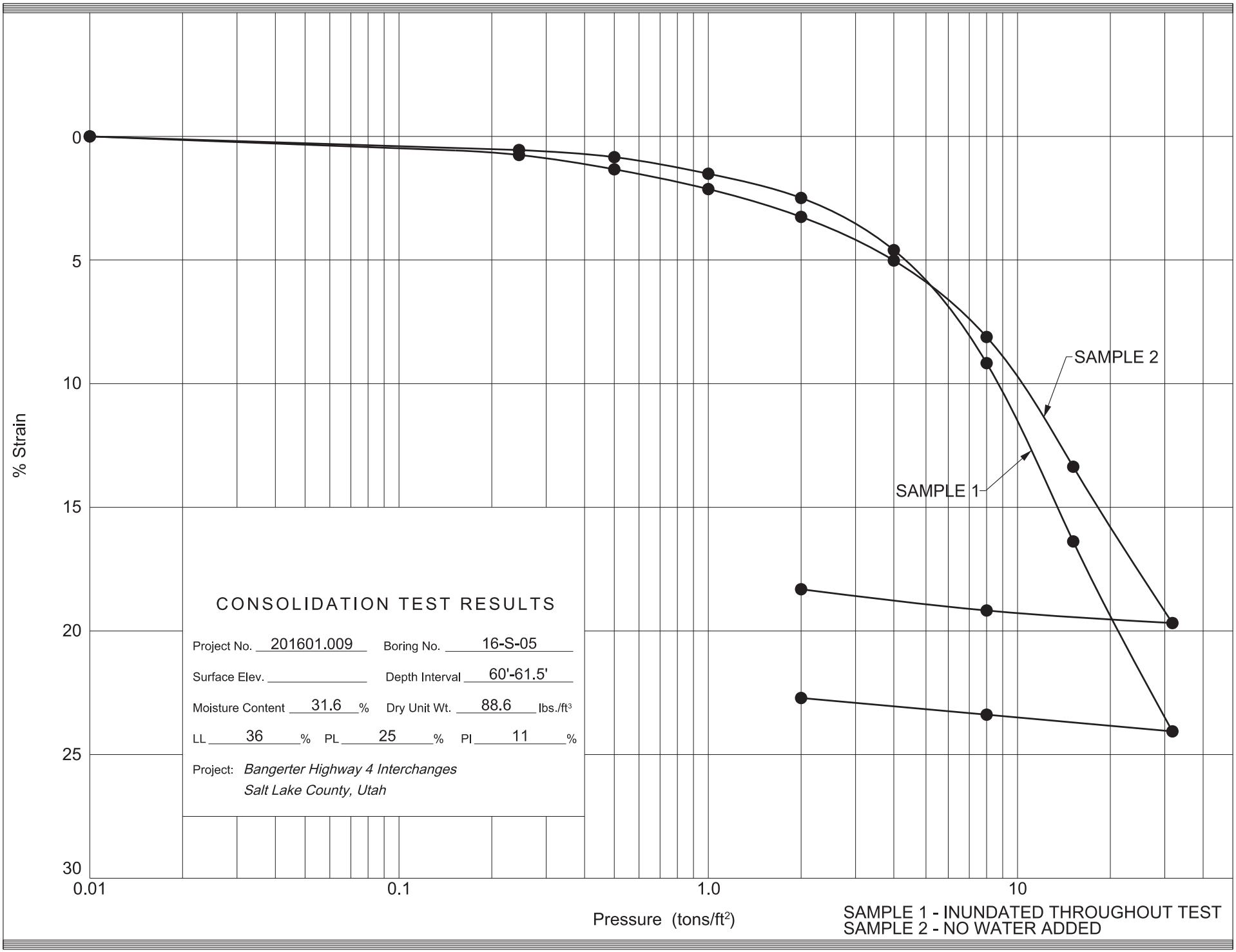


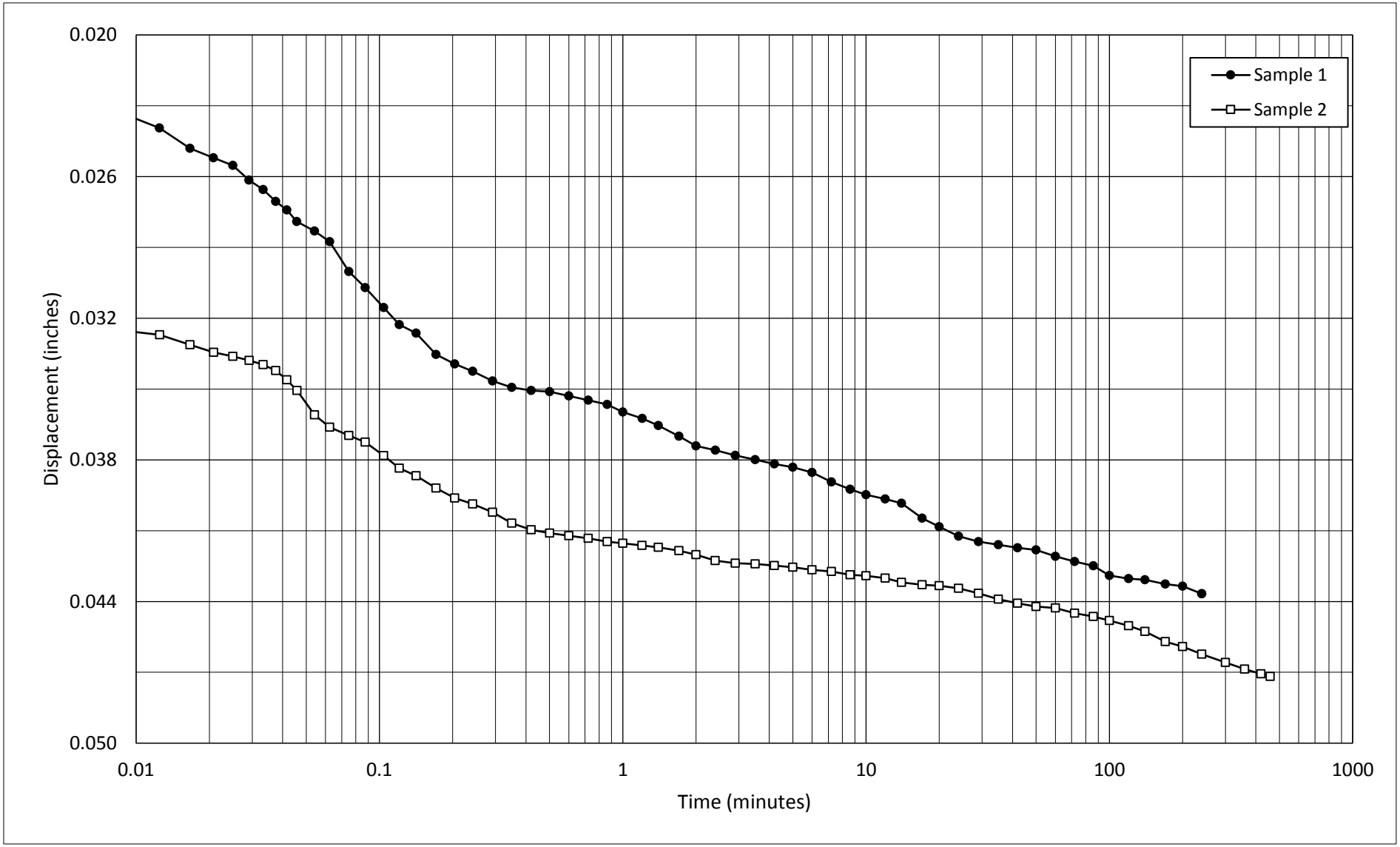
Hole no.: 16-S-05
Depth: 25'-26.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.90
.80
.70
.60
.50
.40
.30
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 2
SAMPLE 1
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-05
Surface Elev.
Depth Interval 60'-61.5'
Moisture Content 31.6 %
Dry Unit Wt. 88.6 lbs./ft³
LL 36 % PL 25 % PI 11 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED THROUGHOUT TEST
SAMPLE 2 - NO WATER ADDED

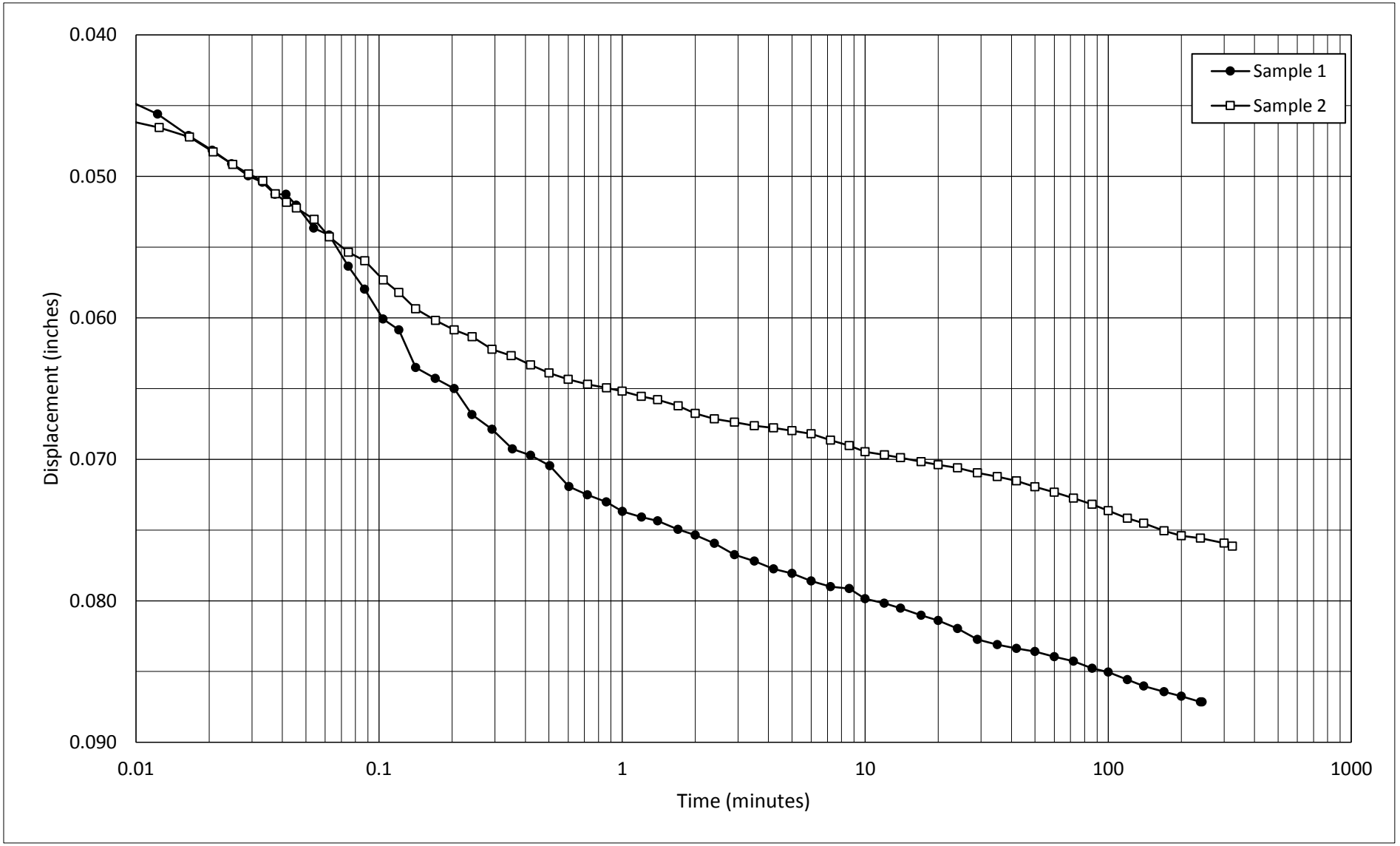

0
5
10
15
20
25
30
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 2
SAMPLE 1
CONSOLIDATION TEST RESULTS
Project No. 201601.009 Boring No. 16-S-05
Surface Elev. Depth Interval 60'-61.5'
Moisture Content 31.6 % Dry Unit Wt. 88.6 lbs./ft³
LL 36 % PL 25 % PI 11 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED THROUGHOUT TEST
SAMPLE 2 - NO WATER ADDED



Hole no.: 16-S-05
Depth: 60'-61.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

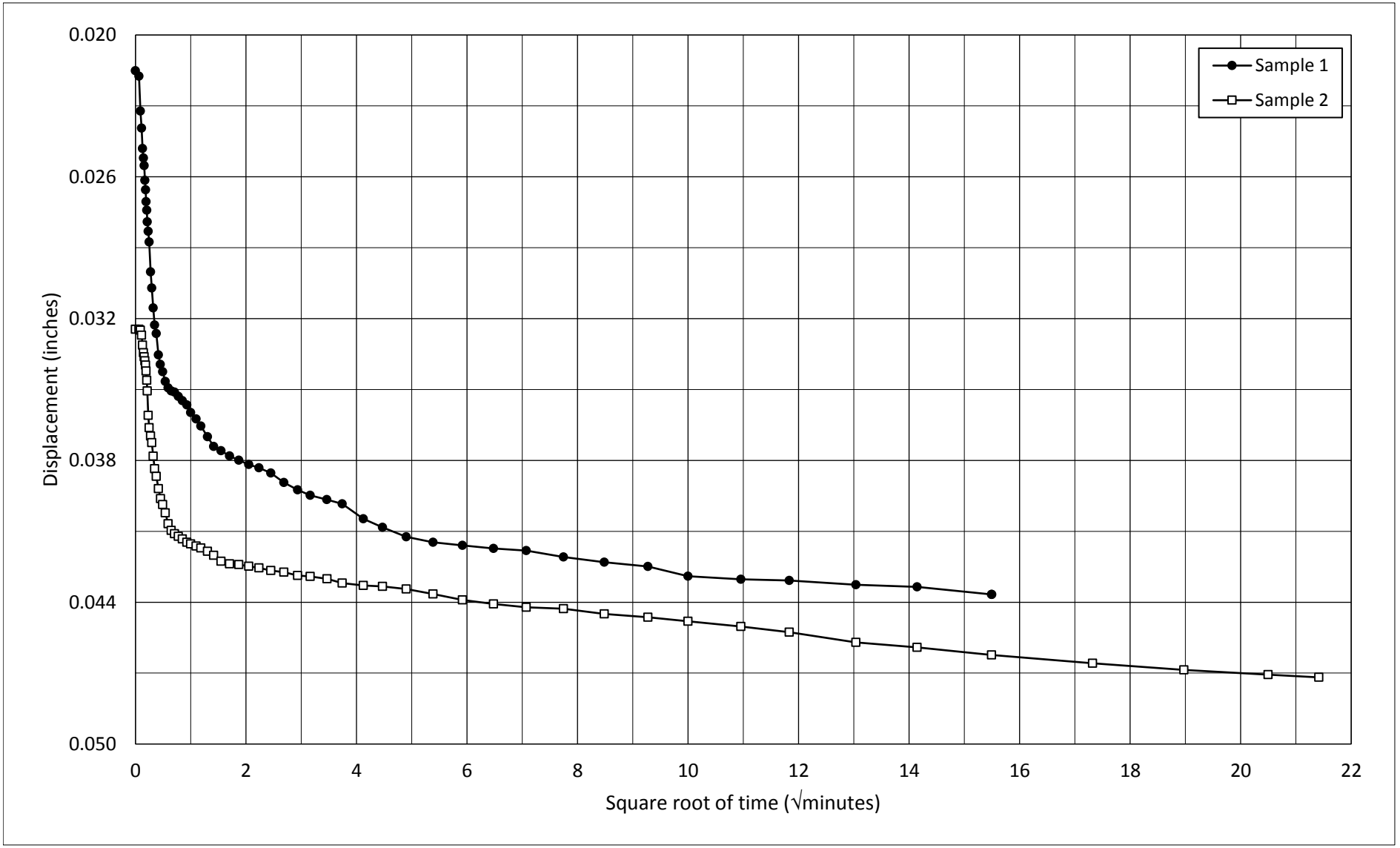
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-05
Depth: 60'-61.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

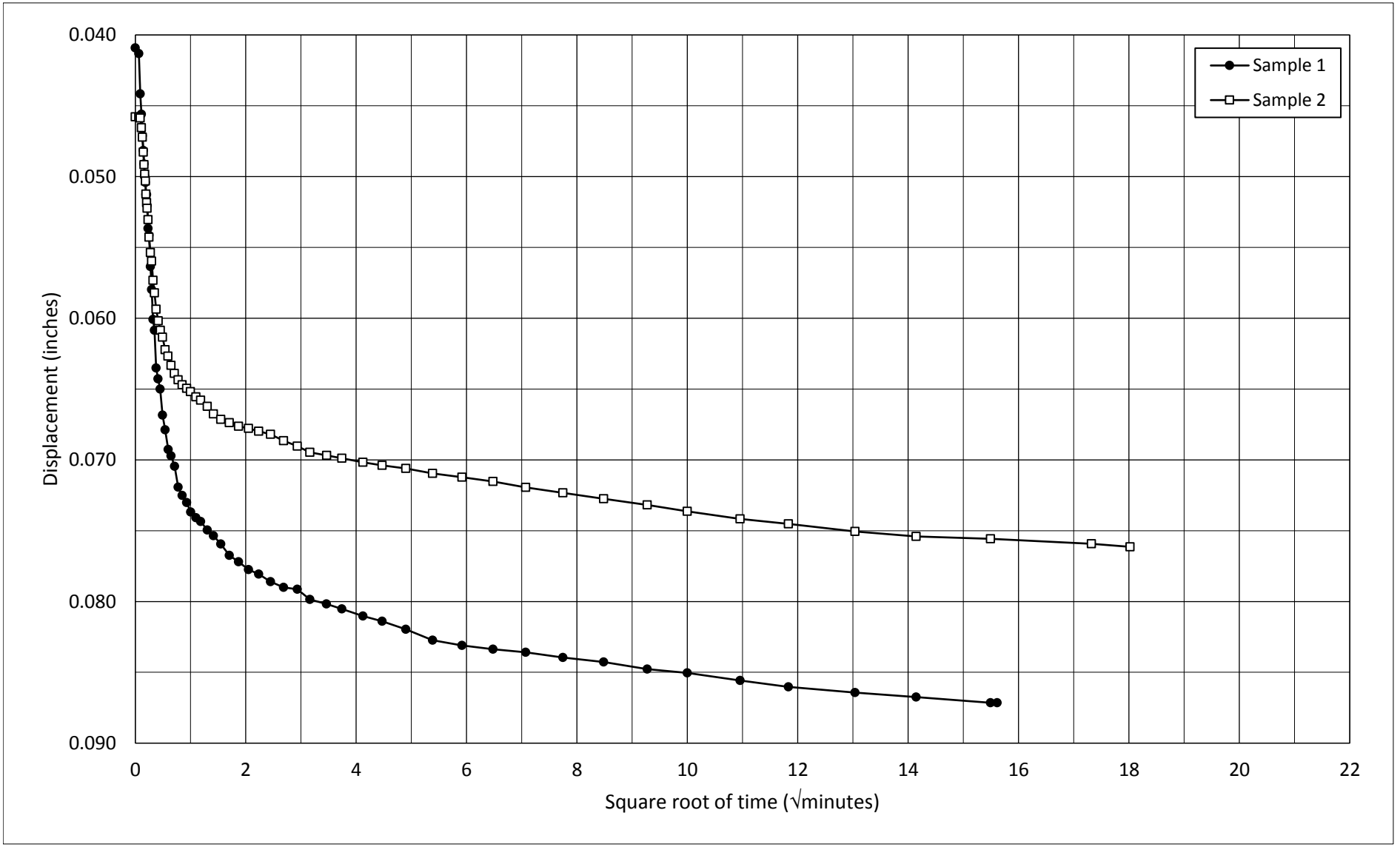
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-05
Depth: 60'-61.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

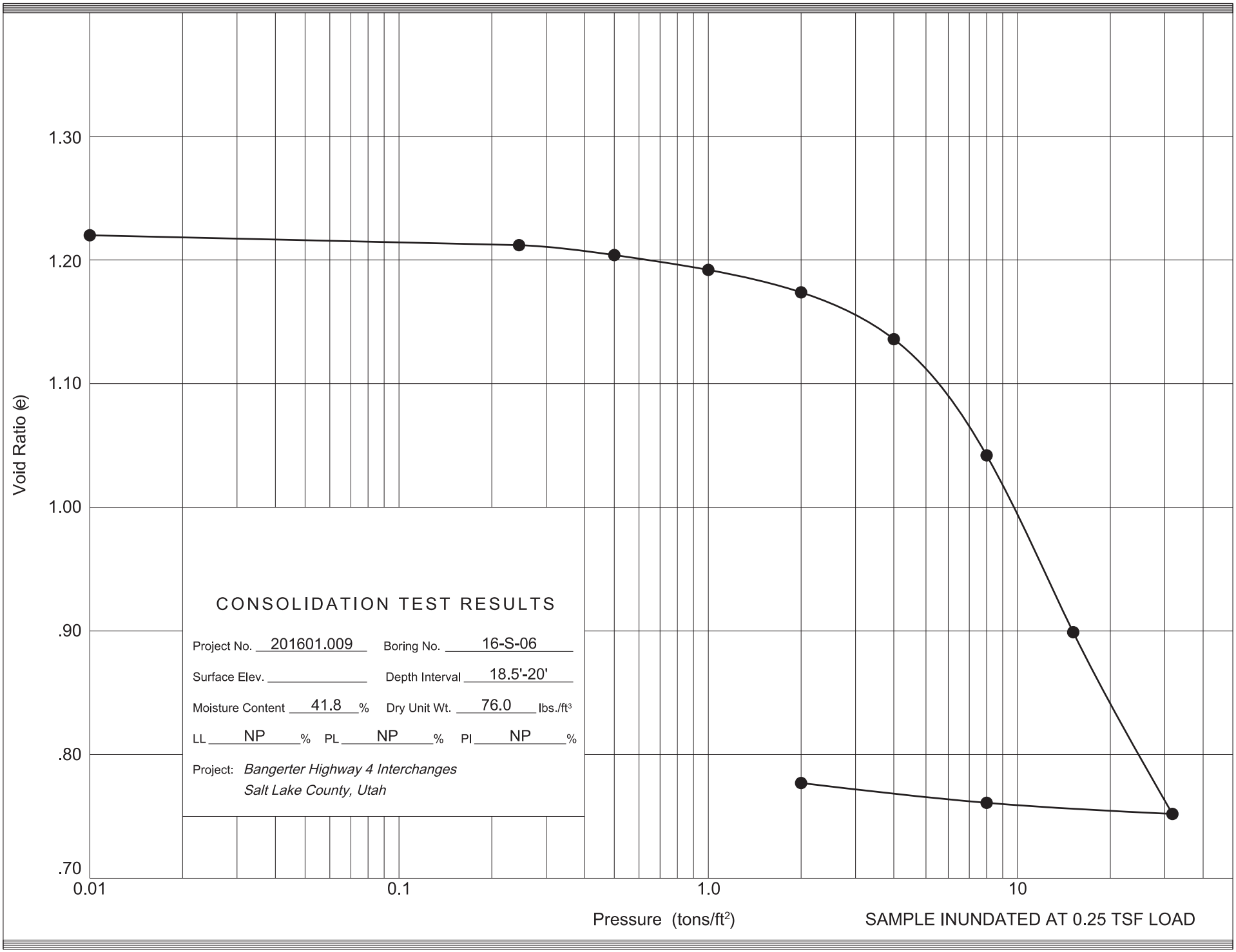
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

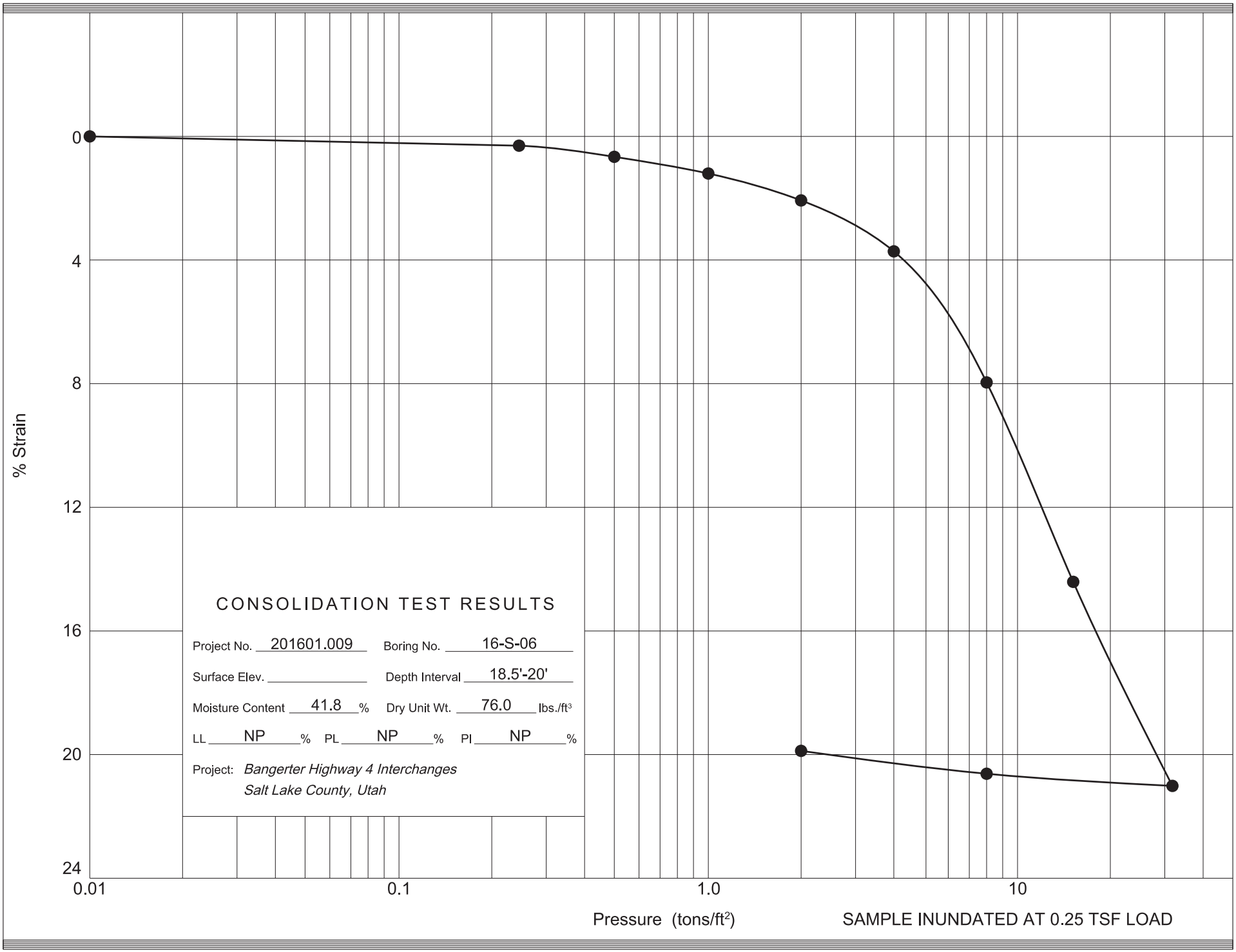


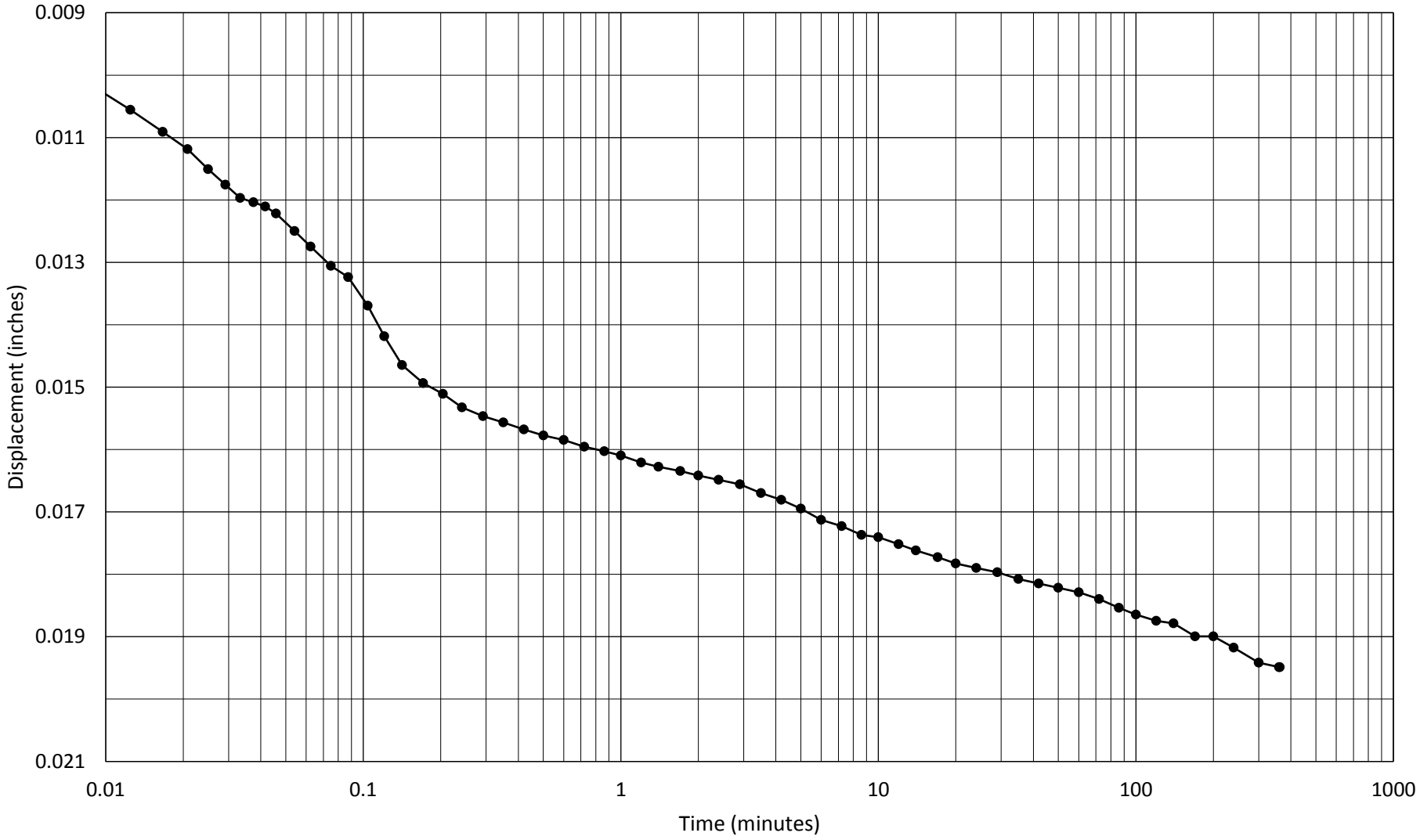
Hole no.: 16-S-05
Depth: 60'-61.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


1.30
1.20
1.10
1.00
.90
.80
.70
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-06
Surface Elev.
Depth Interval 18.5'-20'
Moisture Content 41.8 %
Dry Unit Wt. 76.0 lbs./ft³
LL NP %
PL NP %
PI NP %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

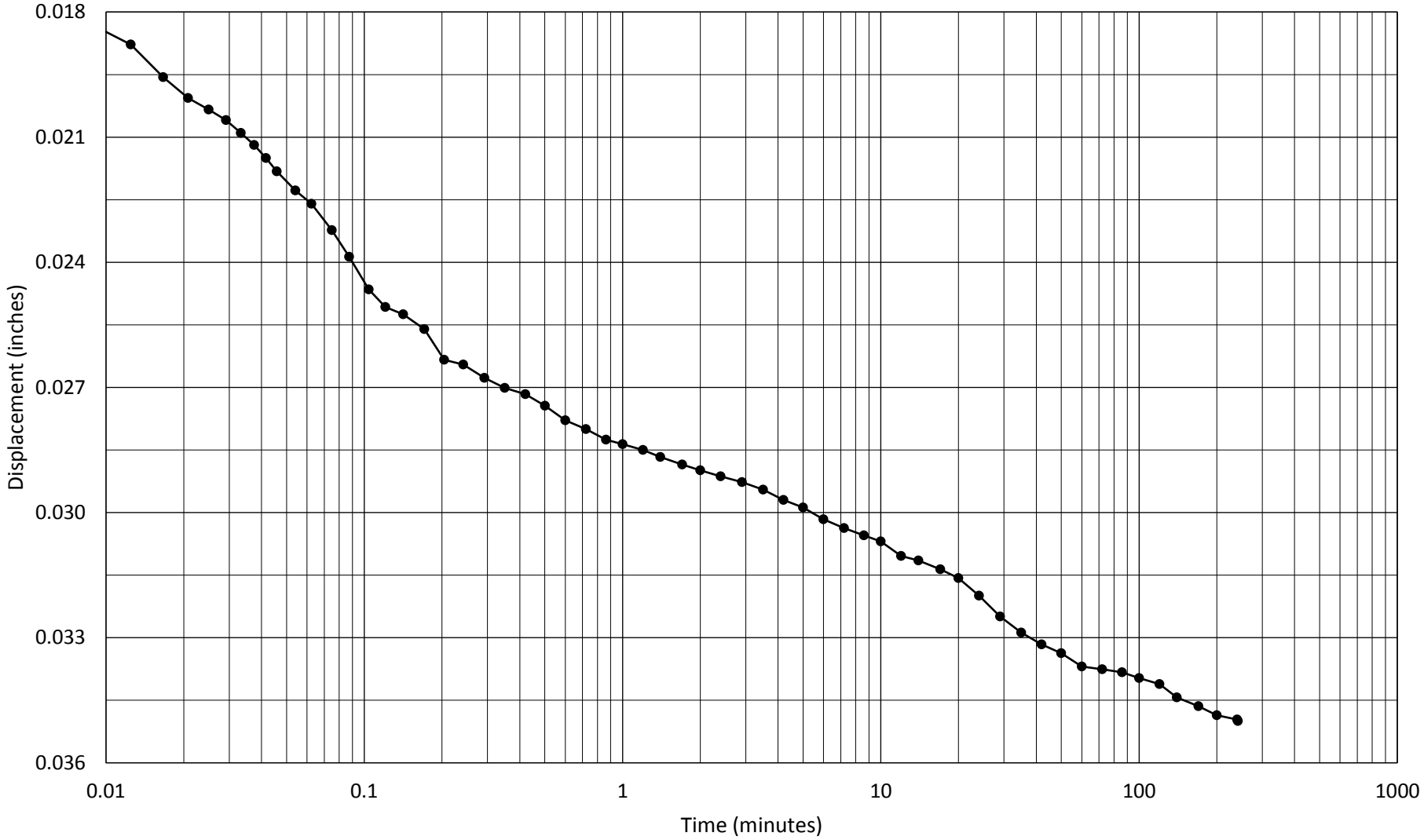

0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-06
Surface Elev.
Depth Interval 18.5'-20'
Moisture Content 41.8 %
Dry Unit Wt. 76.0 lbs./ft³
LL NP %
PL NP %
PI NP %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-06
Depth: 18.5'-20'
Load: 1 to 2 tsf

TIME CONSOLIDATION

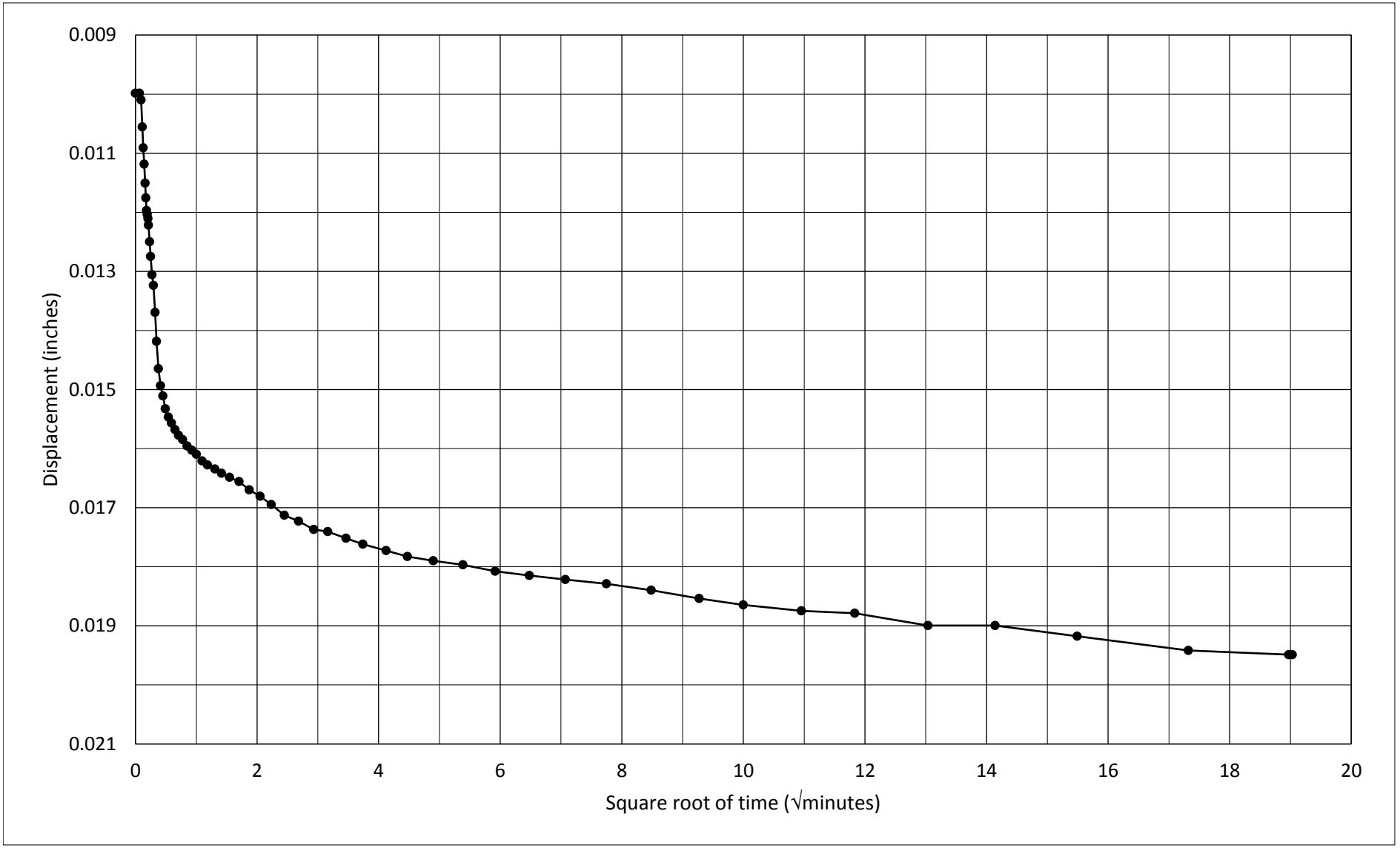
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-06
Depth: 18.5'-20'
Load: 2 to 4 tsf

TIME CONSOLIDATION

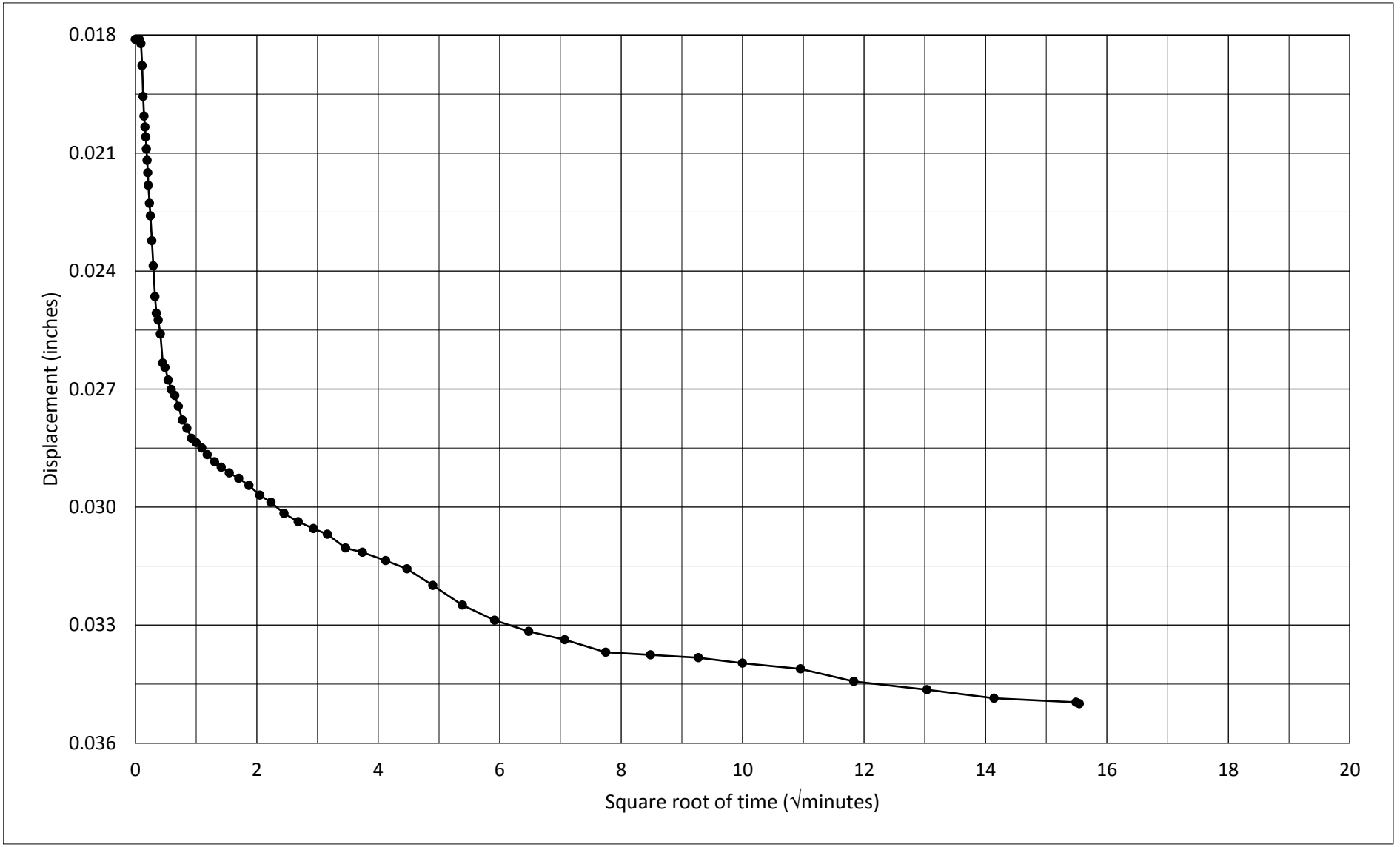
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-06
Depth: 18.5'-20'
Load: 1 to 2 tsf

TIME CONSOLIDATION

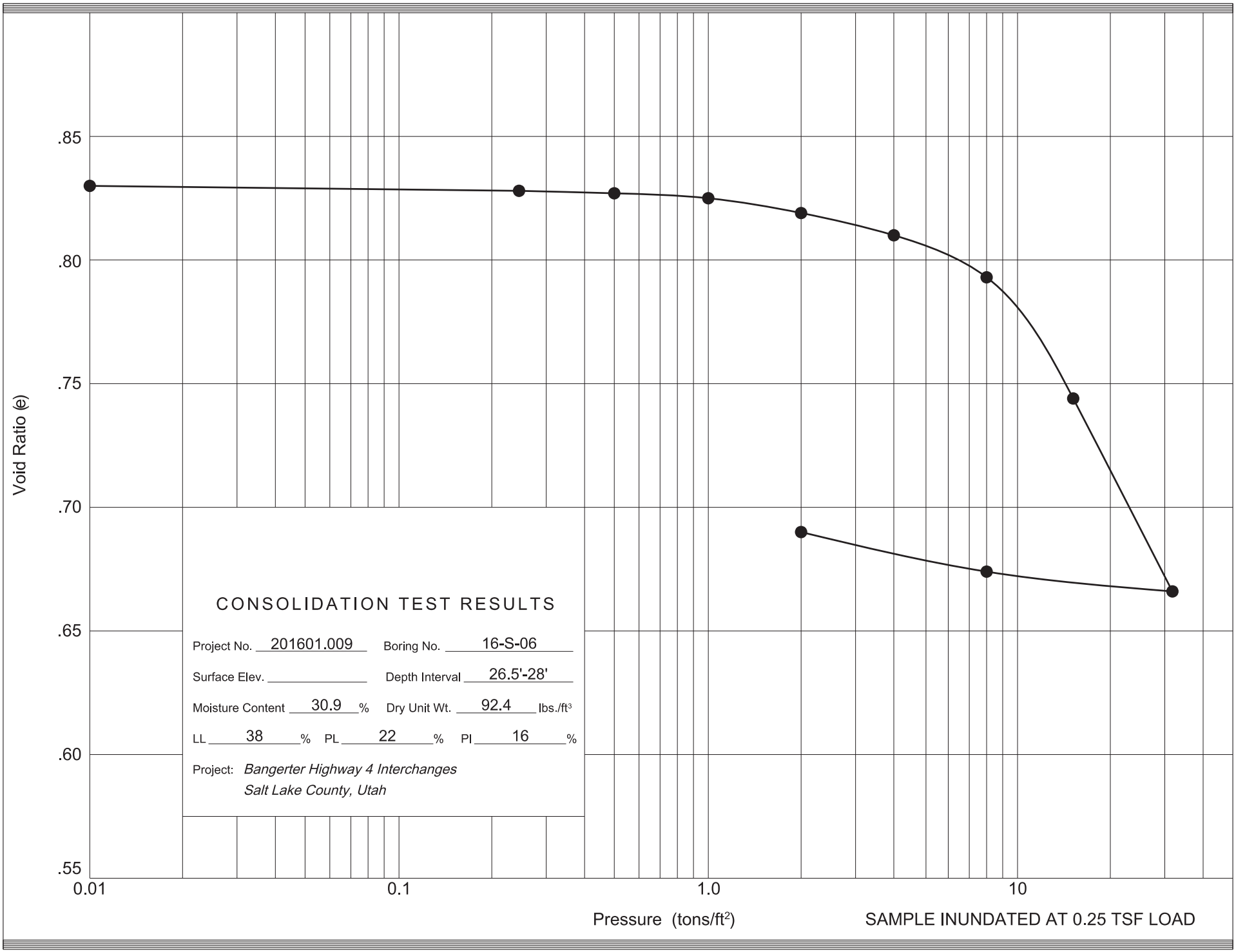
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-06
Depth: 18.5'-20'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah



CONSOLIDATION TEST RESULTS

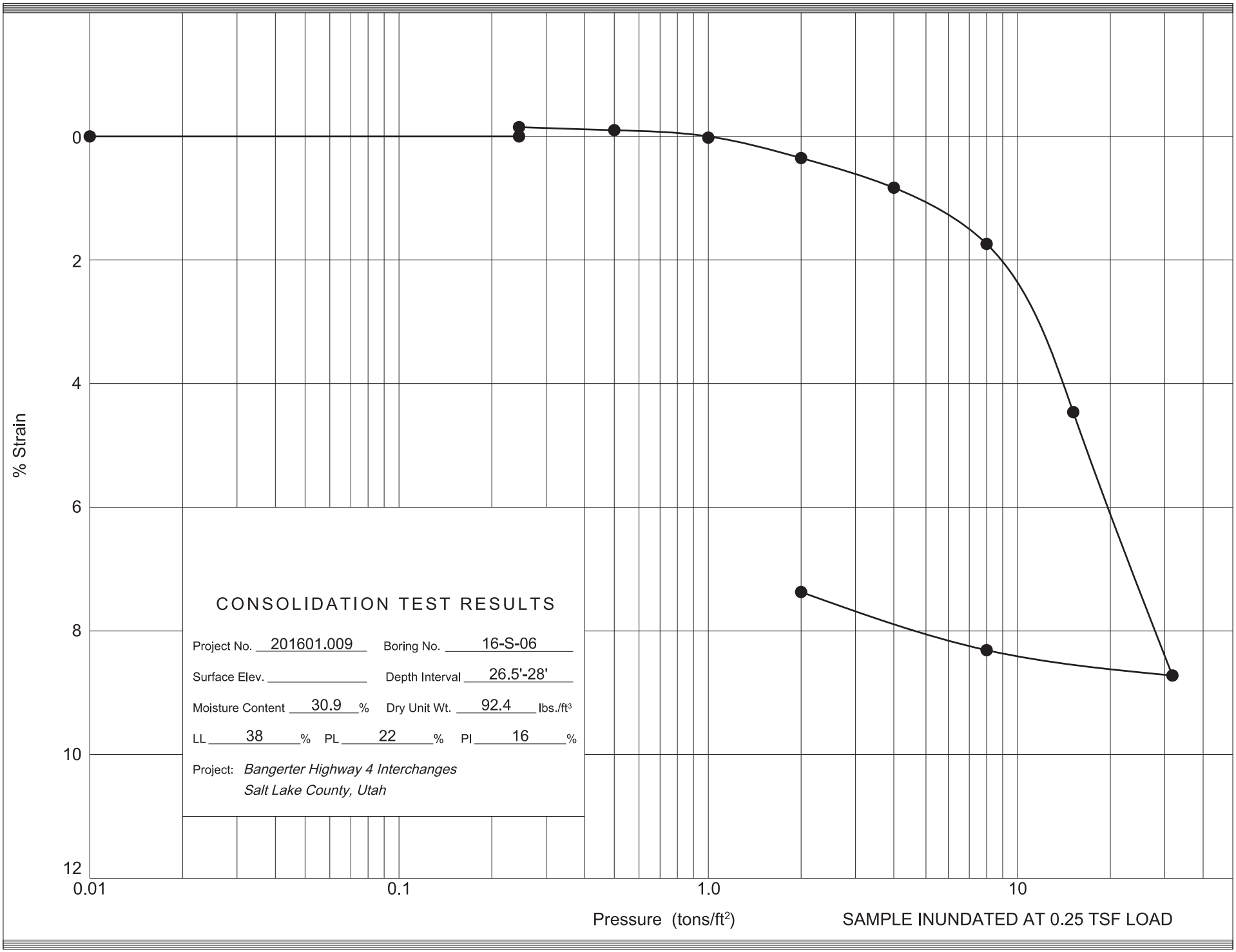
Project No. 201601.009 Boring No. 16-S-06

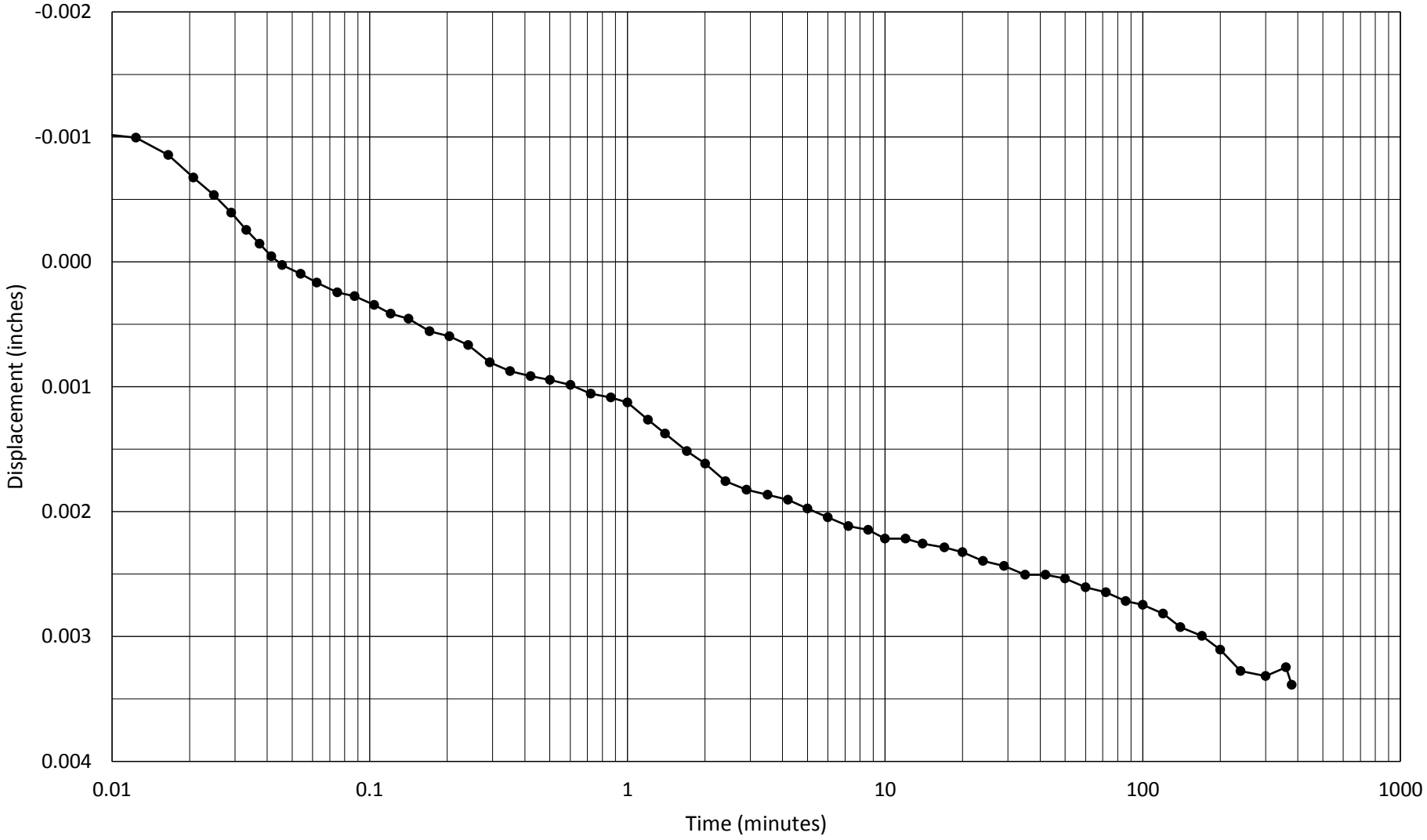
Surface Elev. _____ Depth Interval 26.5'-28'

Moisture Content 30.9 % Dry Unit Wt. 92.4 lbs./ft³

LL 38 % PL 22 % PI 16 %

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

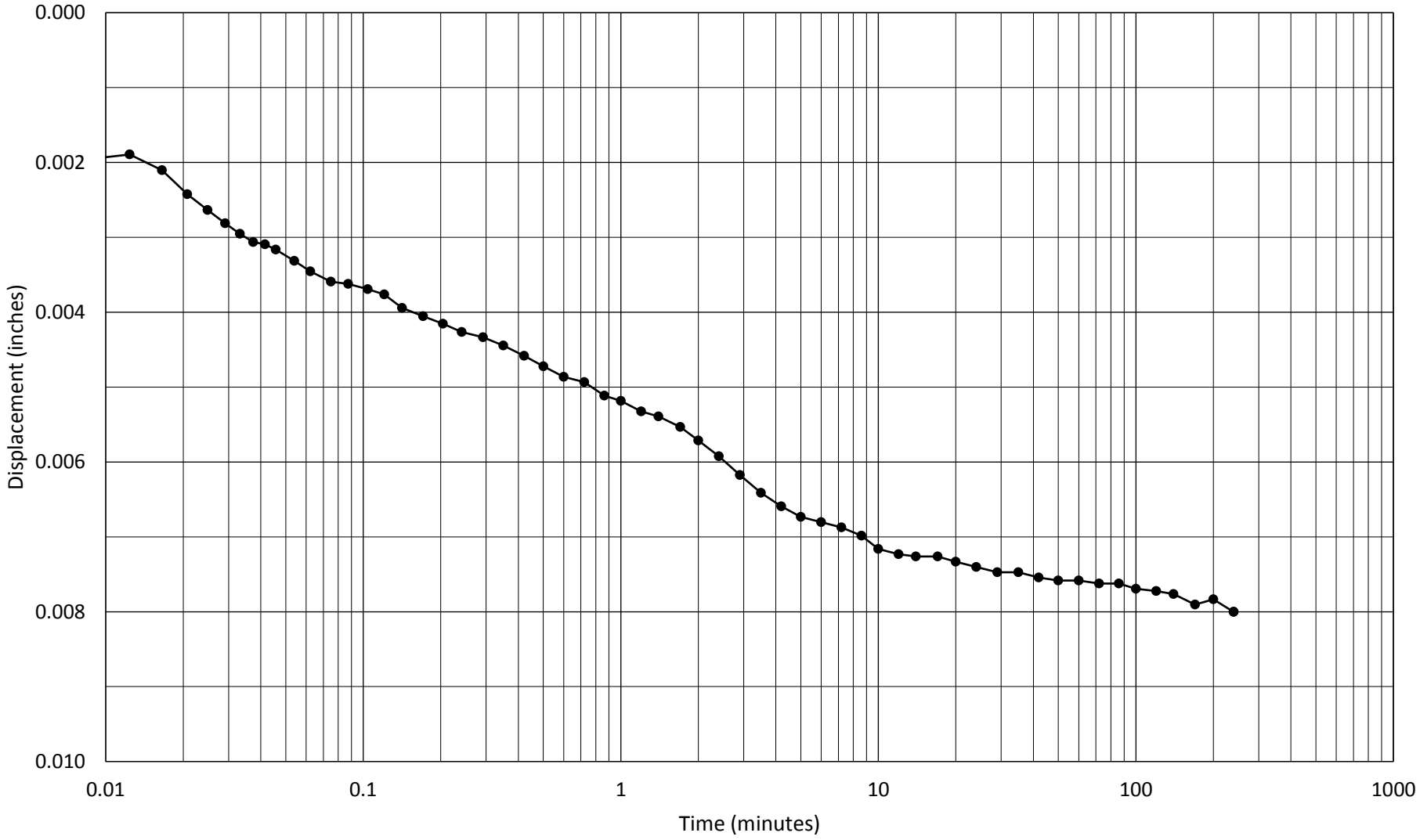

% Strain
0
2
4
6
8
10
12
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-06
Surface Elev.
Depth Interval 26.5'-28'
Moisture Content 30.9 %
Dry Unit Wt. 92.4 lbs./ft³
LL 38 % PL 22 % PI 16 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-06
Depth: 26.5'-28'
Load: 1 to 2 tsf

TIME CONSOLIDATION

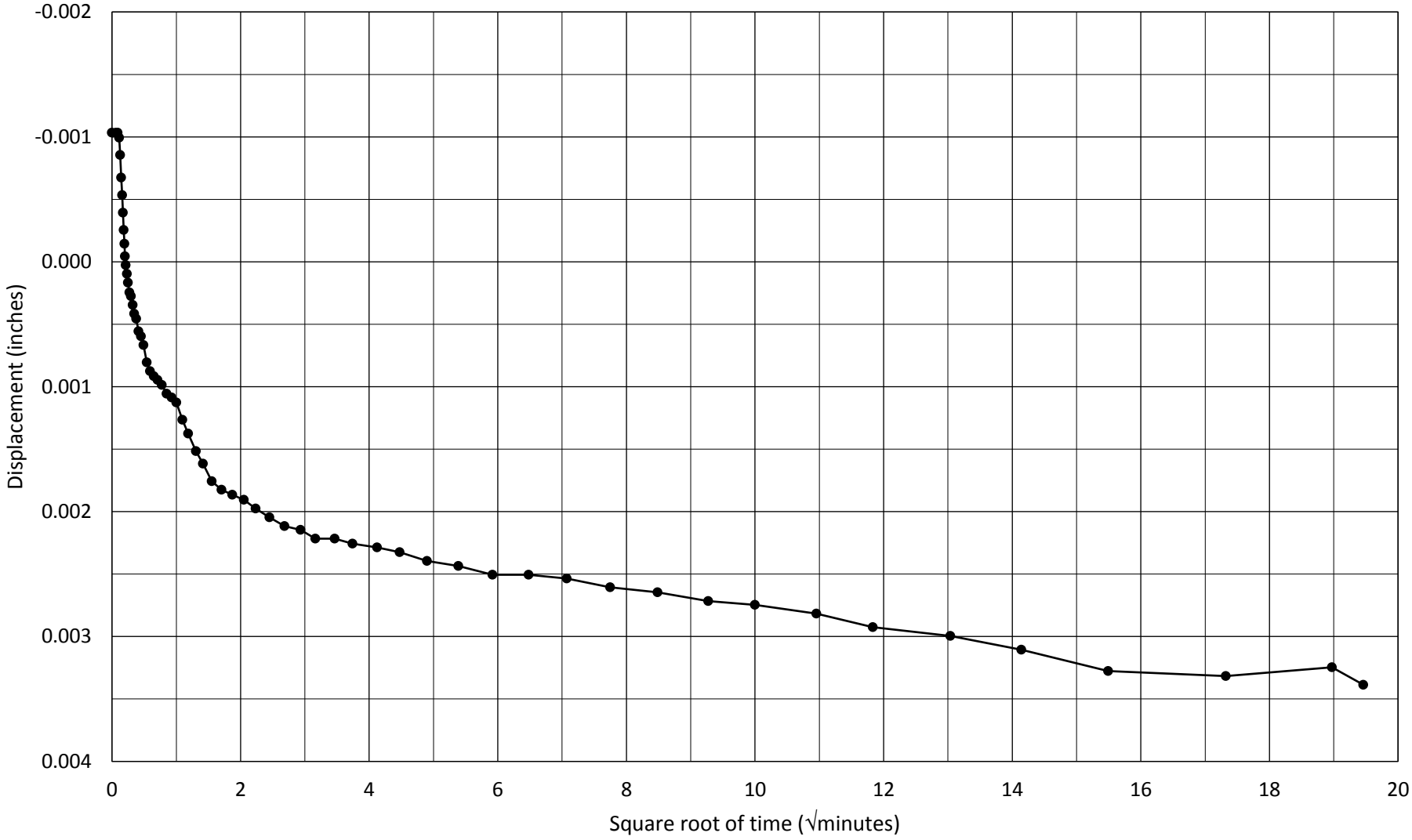
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-06
Depth: 26.5'-28'
Load: 2 to 4 tsf

TIME CONSOLIDATION

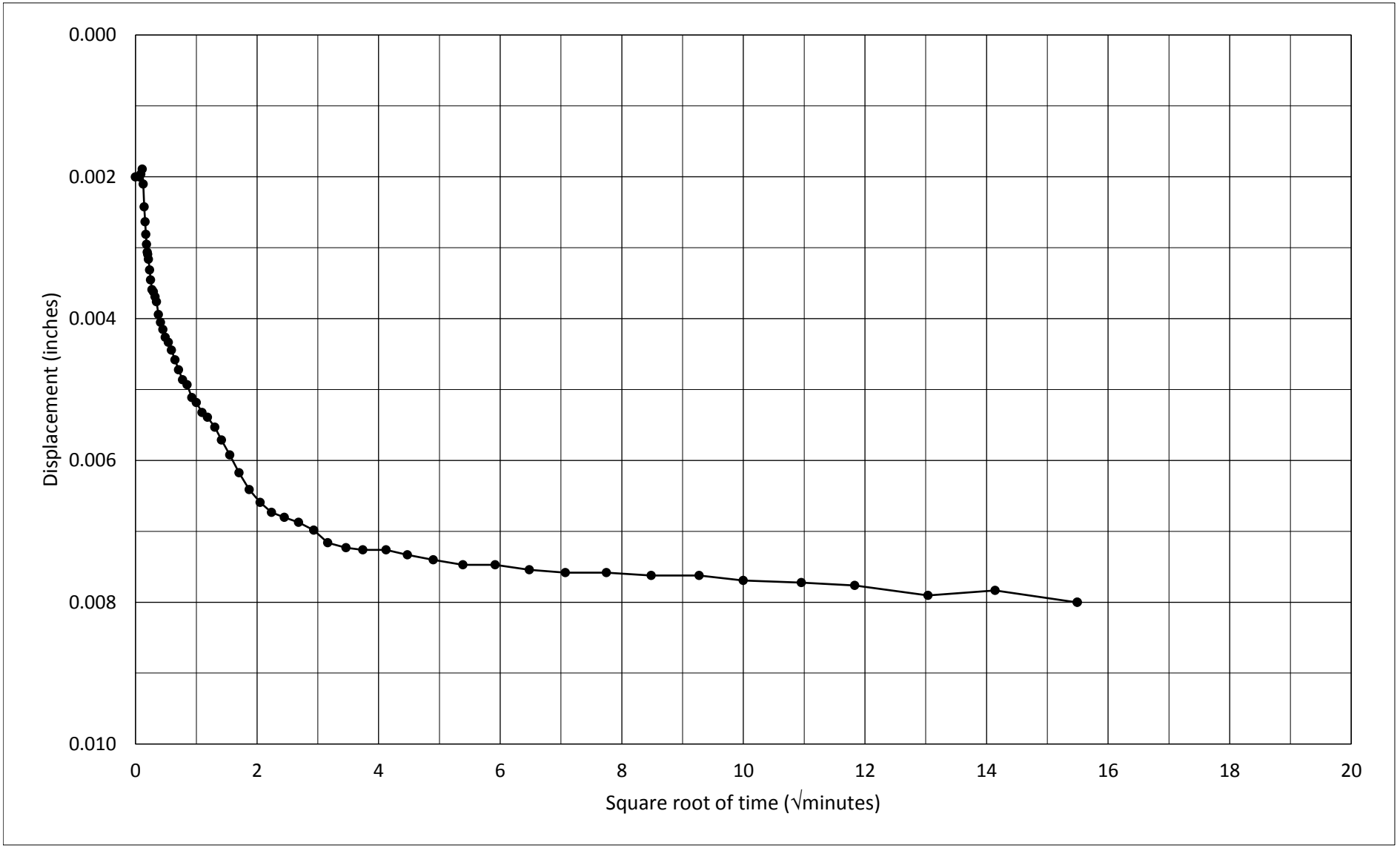
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-06
Depth: 26.5'-28'
Load: 1 to 2 tsf

TIME CONSOLIDATION

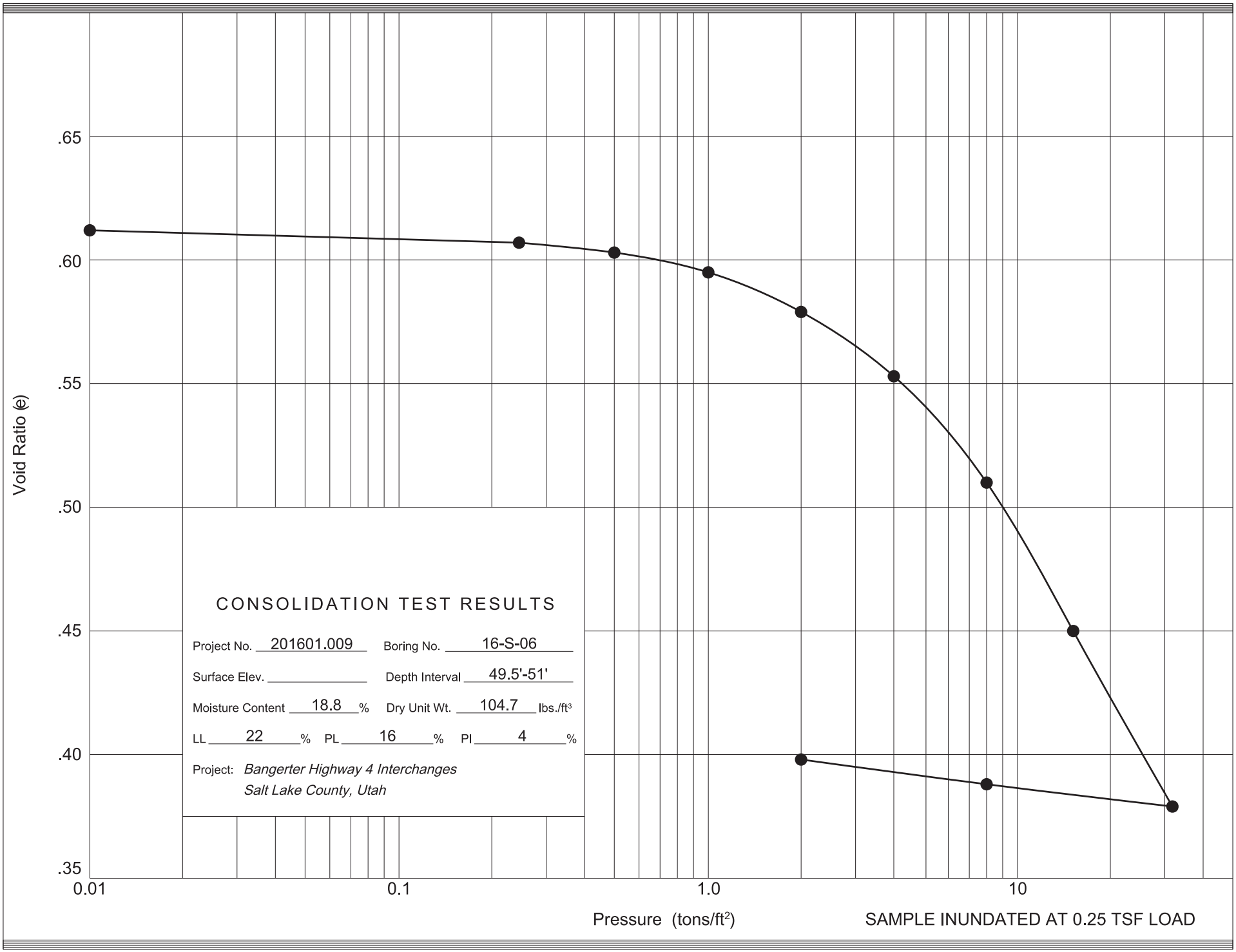
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

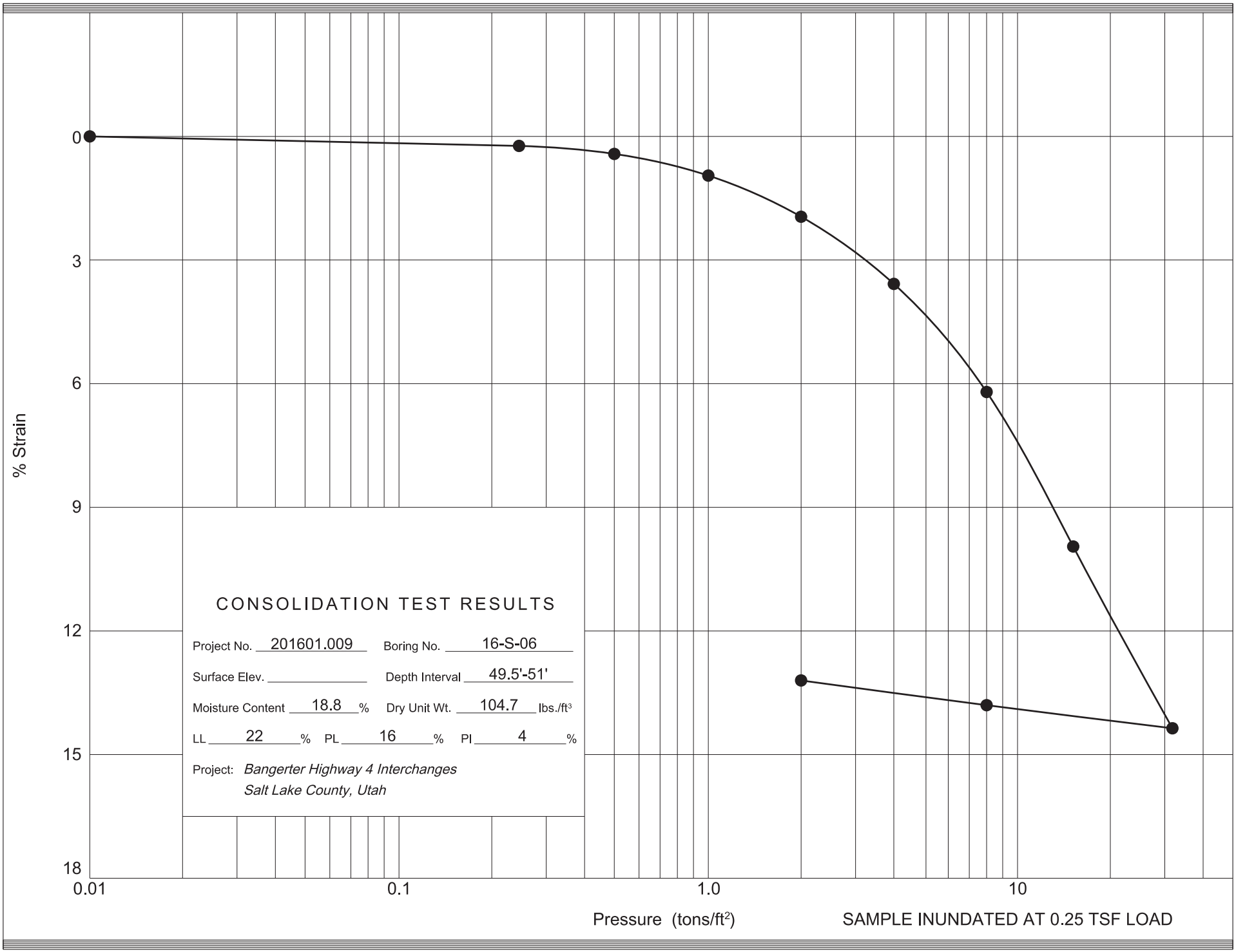


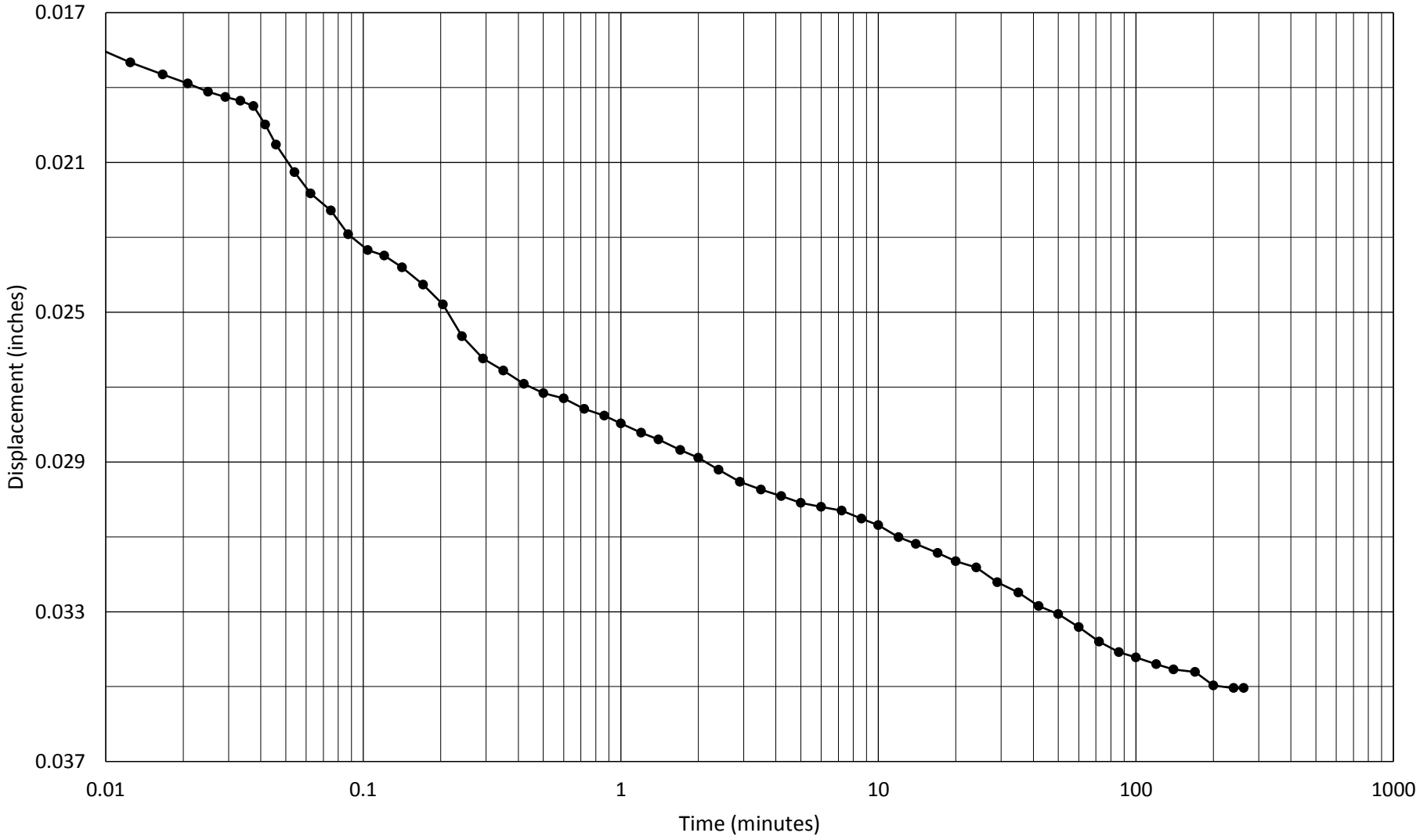
Hole no.: 16-S-06
Depth: 26.5'-28'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.65
.60
.55
.50
.45
.40
.35
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-06
Surface Elev.
Depth Interval 49.5'-51'
Moisture Content 18.8 %
Dry Unit Wt. 104.7 lbs./ft³
LL 22 %
PL 16 %
PI 4 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

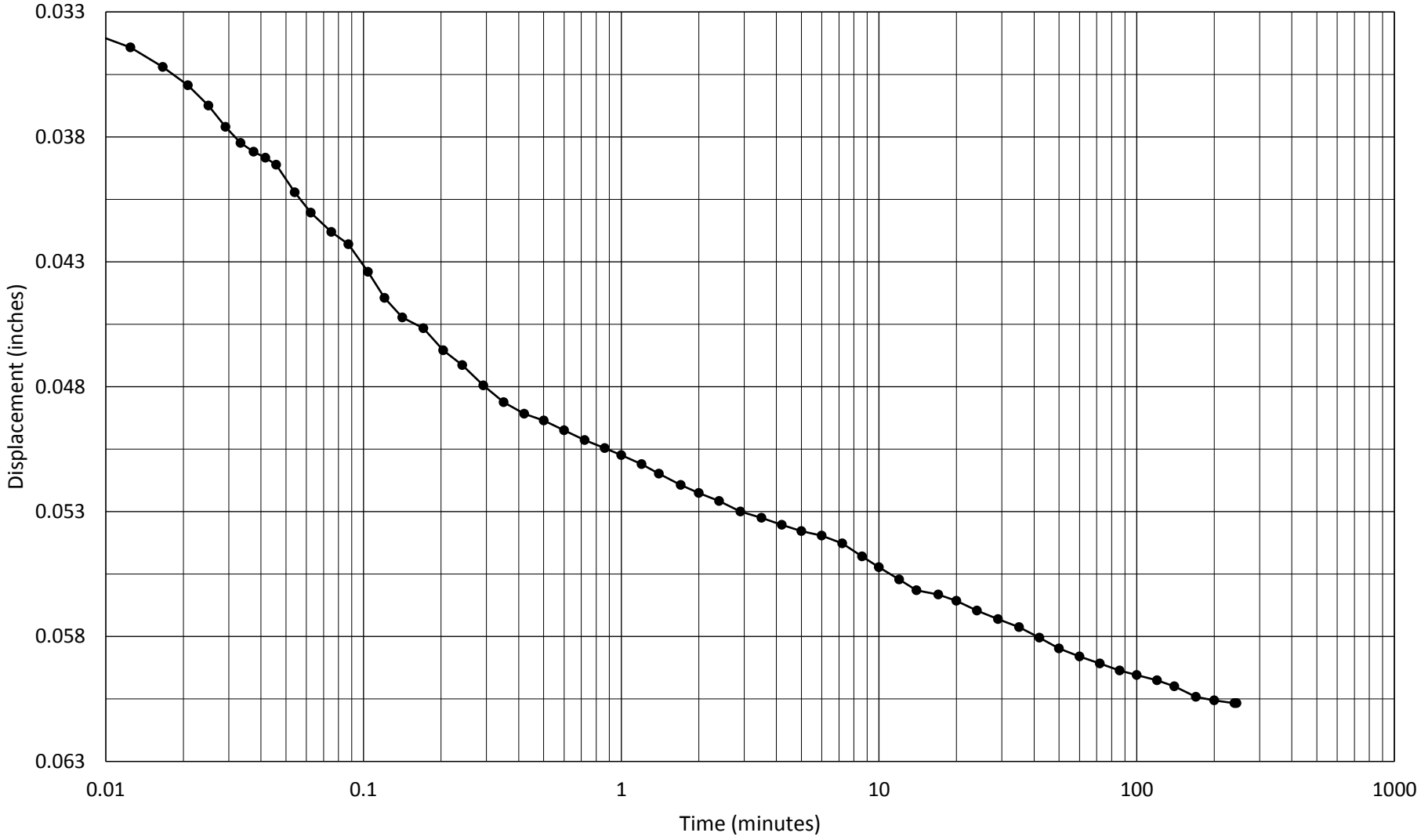

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-06
Surface Elev.
Depth Interval 49.5'-51'
Moisture Content 18.8 %
Dry Unit Wt. 104.7 lbs./ft³
LL 22 %
PL 16 %
PI 4 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-06
Depth: 49.5'-51'
Load: 2 to 4 tsf

TIME CONSOLIDATION

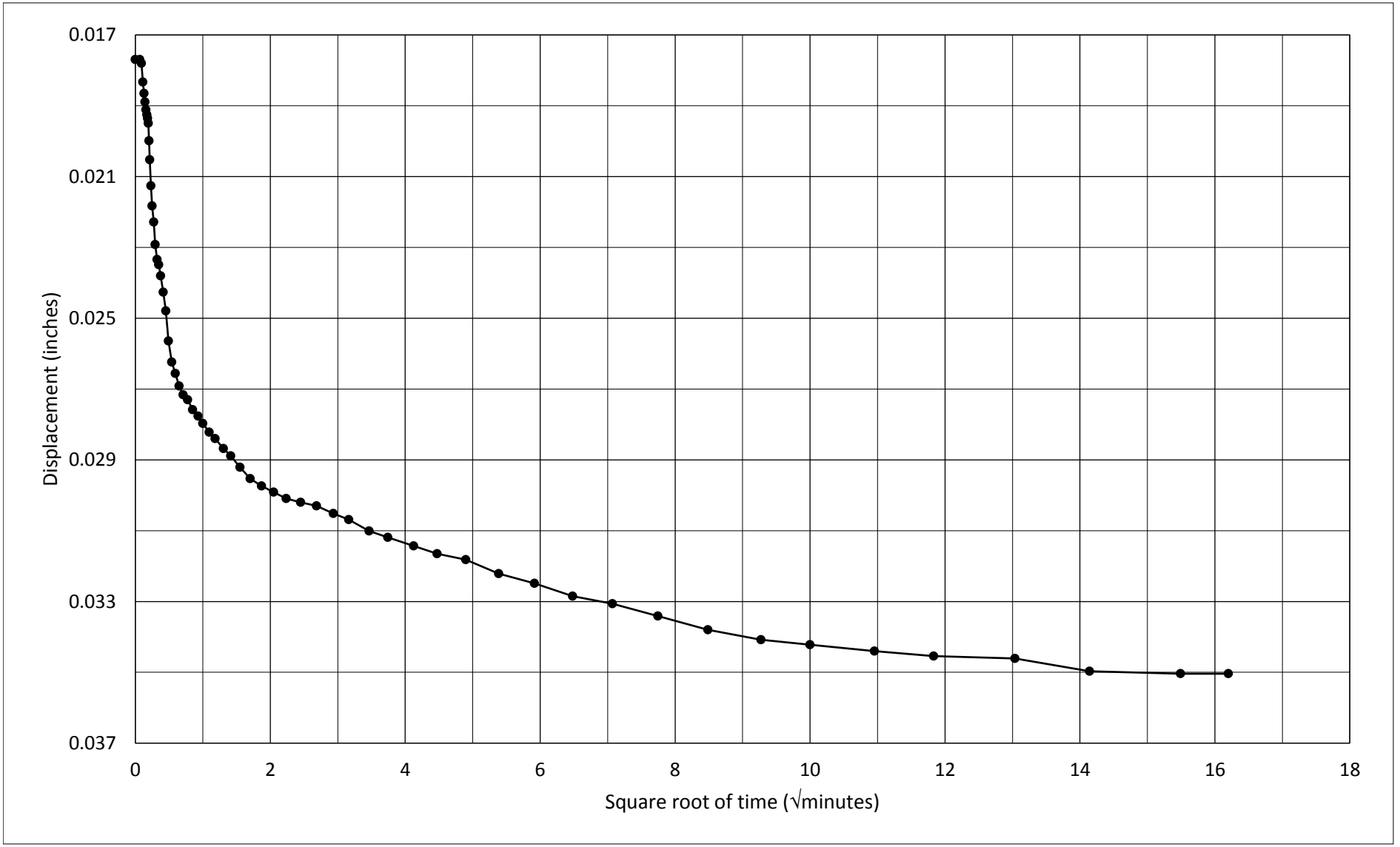
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-06
Depth: 49.5'-51'
Load: 4 to 8 tsf

TIME CONSOLIDATION

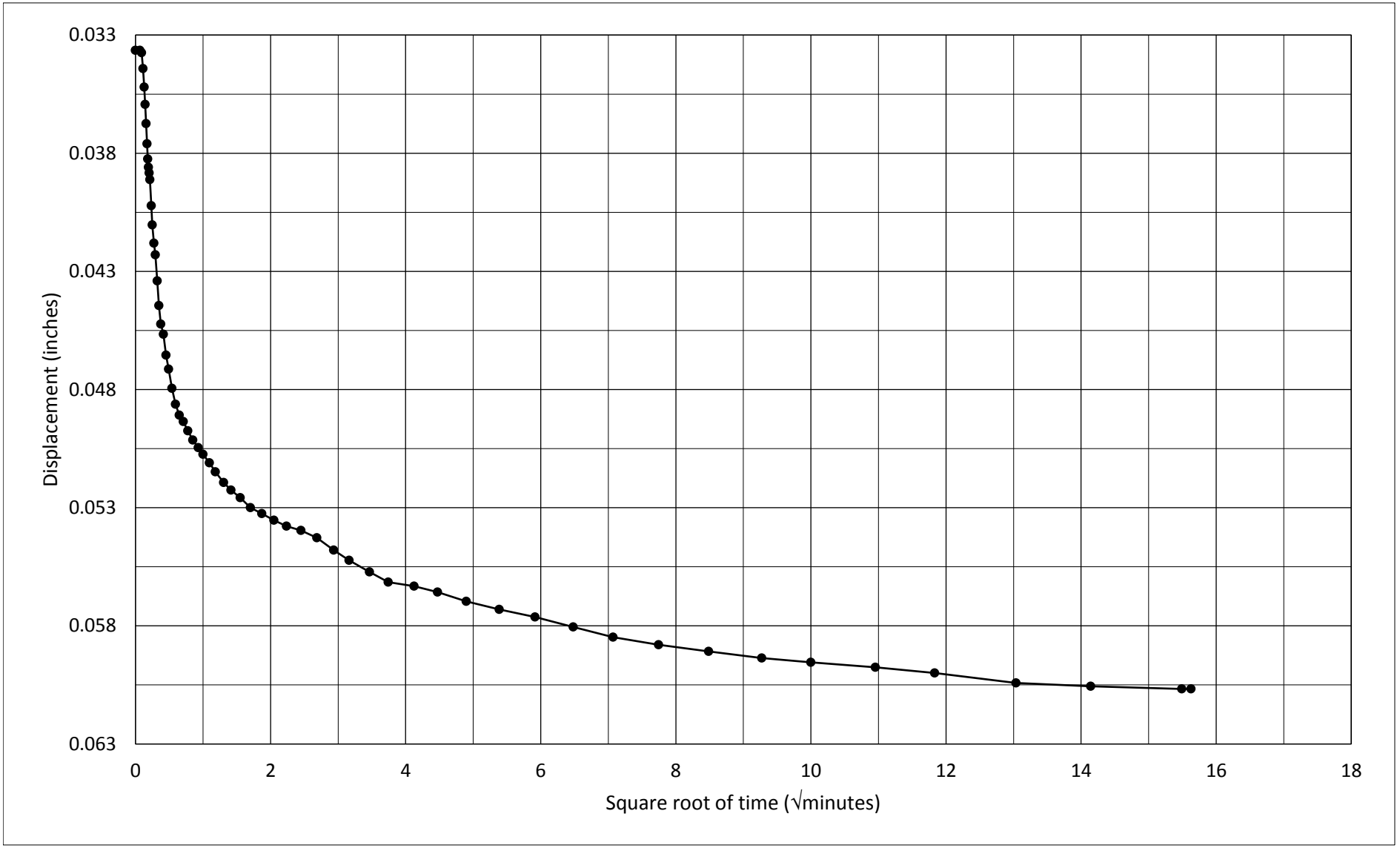
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-06
Depth: 49.5'-51'
Load: 2 to 4 tsf

TIME CONSOLIDATION

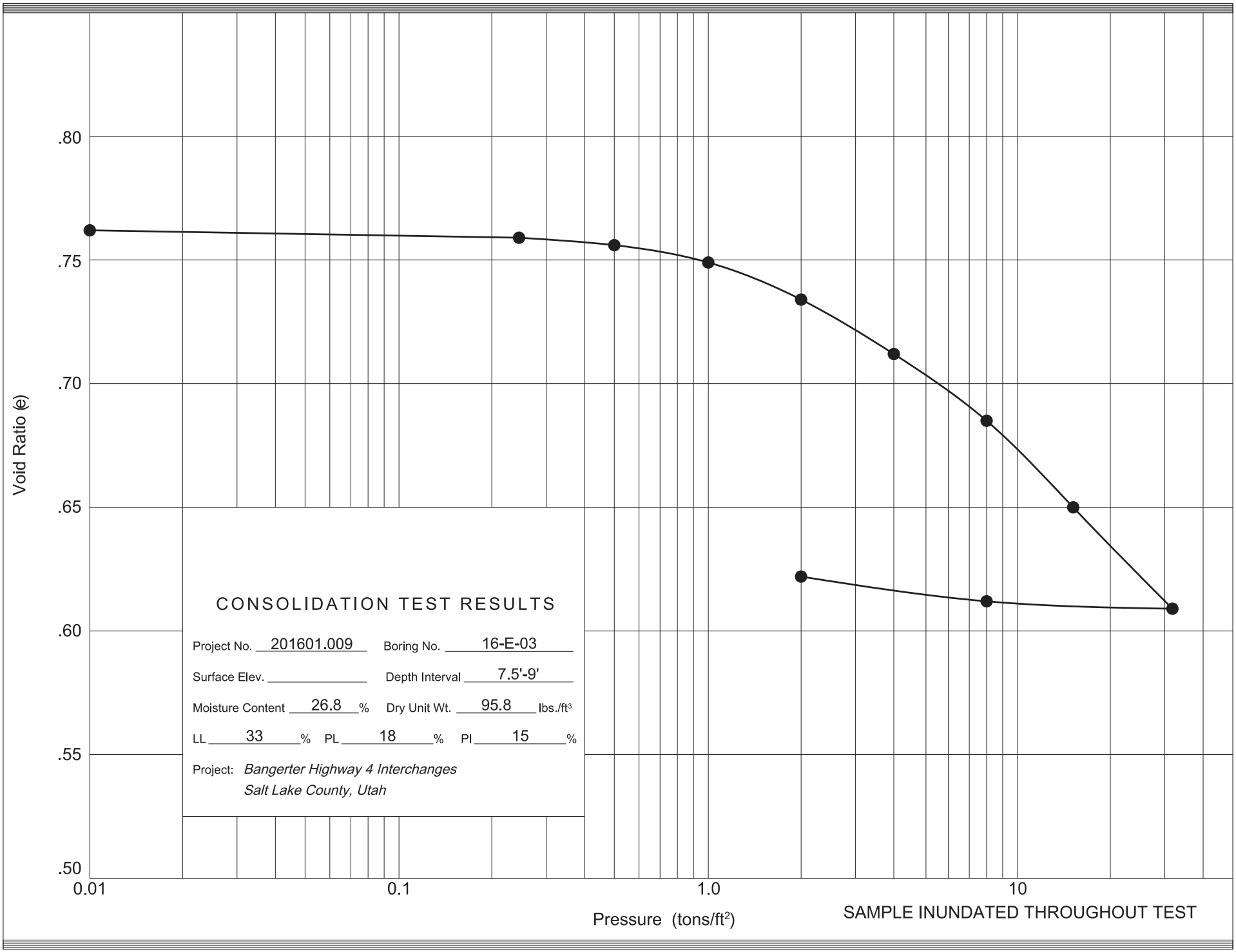
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

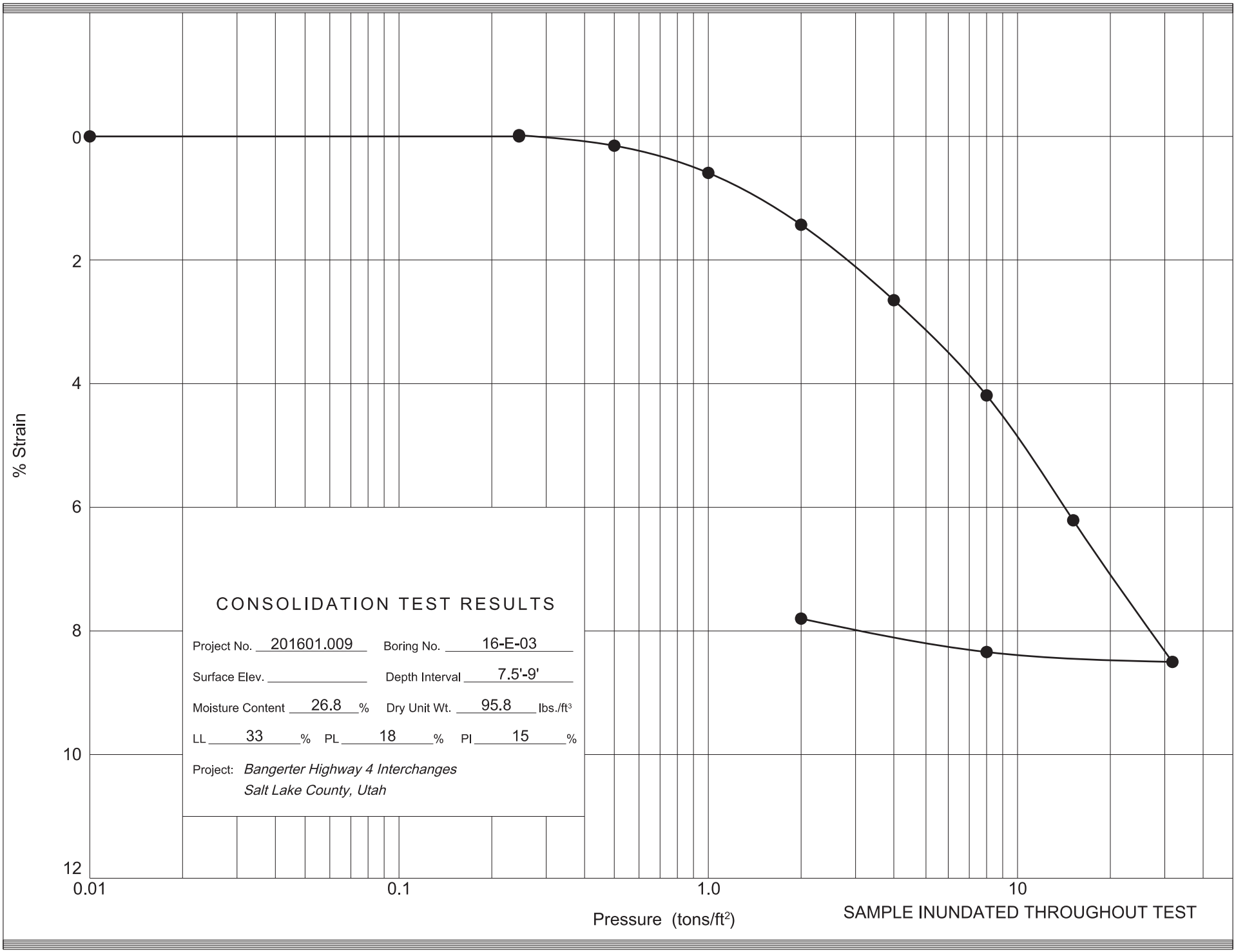


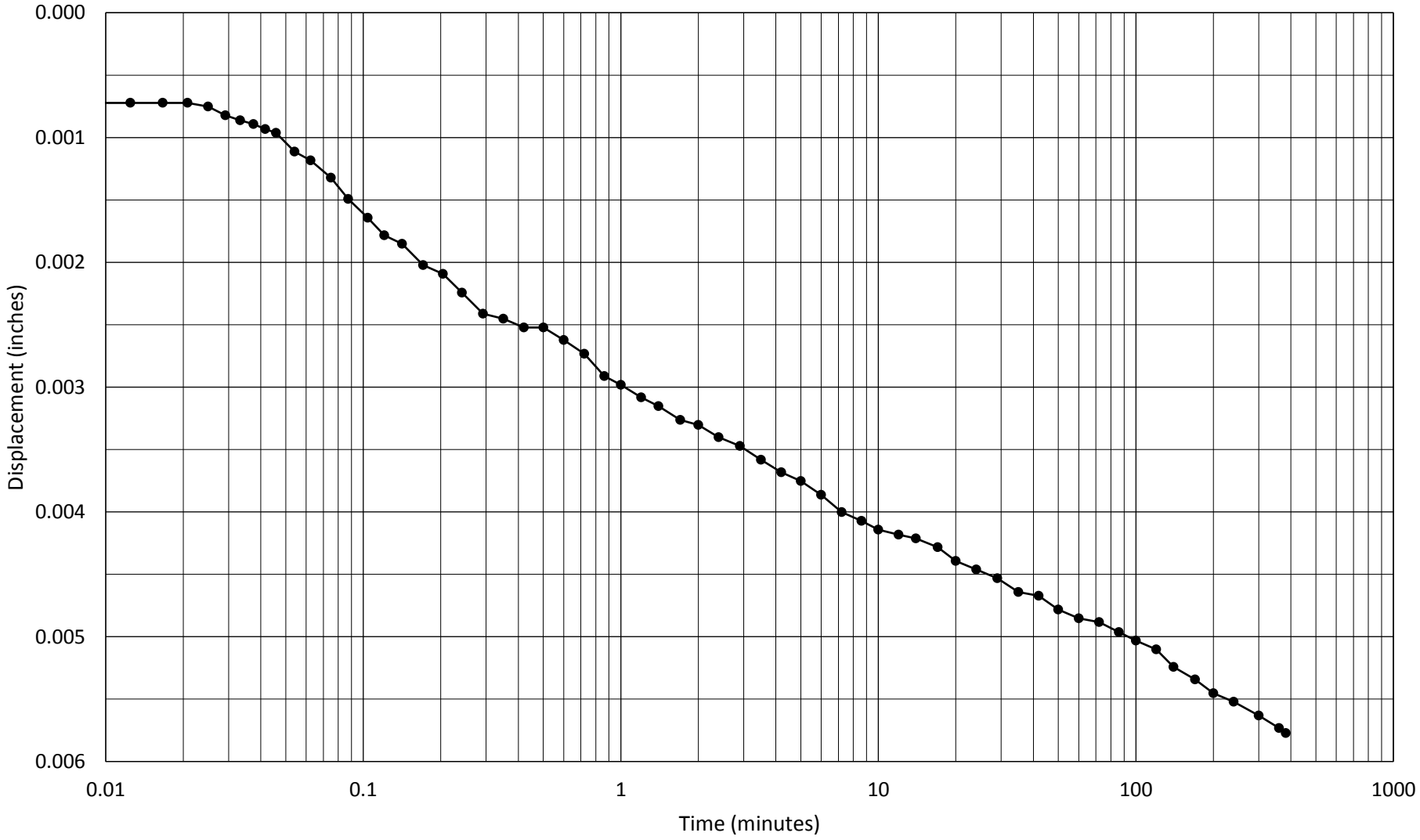
Hole no.: 16-S-06
Depth: 49.5'-51'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.80
.75
.70
.65
.60
.55
.50
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-03
Surface Elev.
Depth Interval 7.5'-9'
Moisture Content 26.8 %
Dry Unit Wt. 95.8 lbs./ft³
LL 33 %
PL 18 %
PI 15 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah


0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-03
Surface Elev.
Depth Interval 7.5'-9'
Moisture Content 26.8 %
Dry Unit Wt. 95.8 lbs./ft³
LL 33 %
PL 18 %
PI 15 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

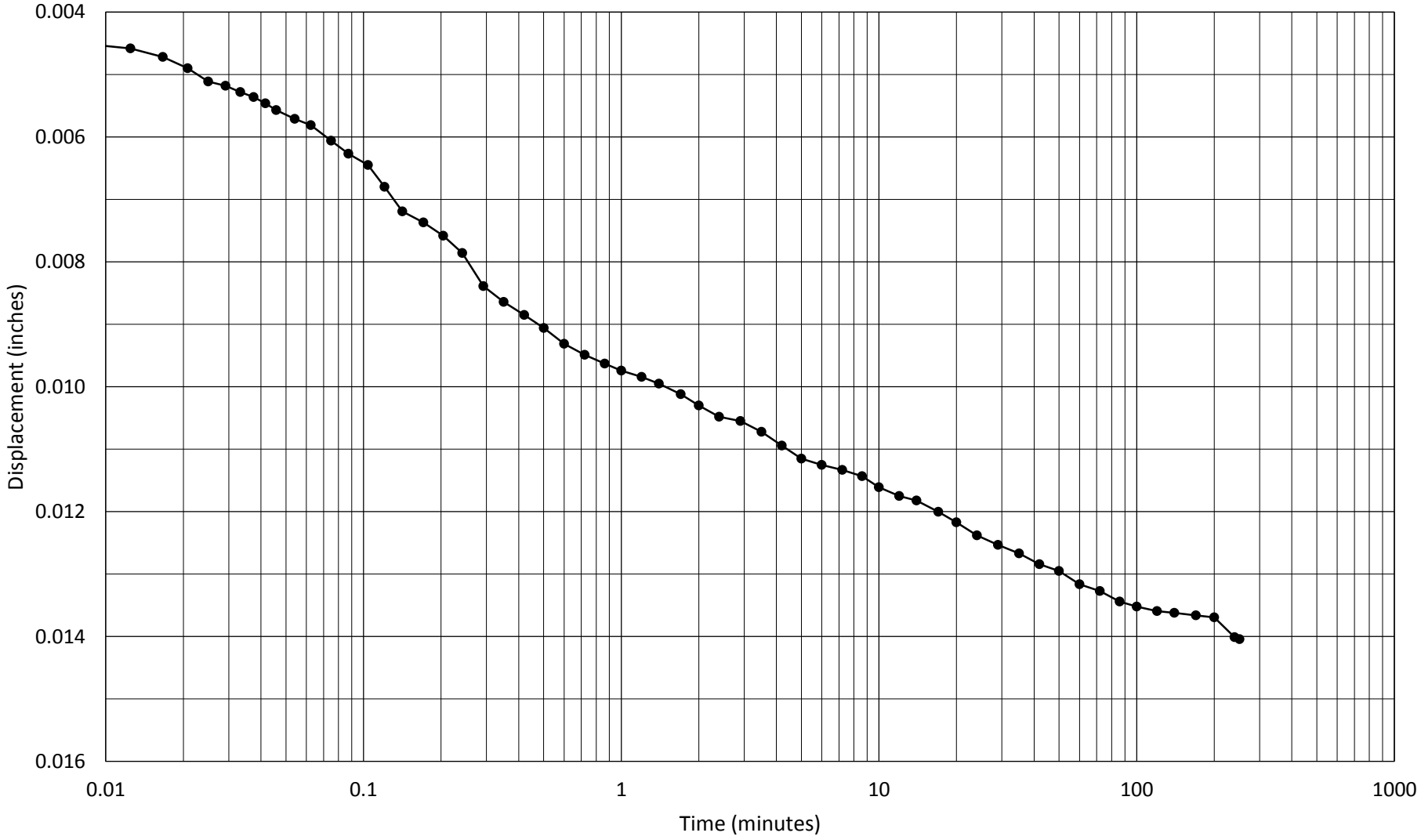


RB&G ENGINEERING, INC.

Hole no.: 16-E-03
Depth: 7.5'-9'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah

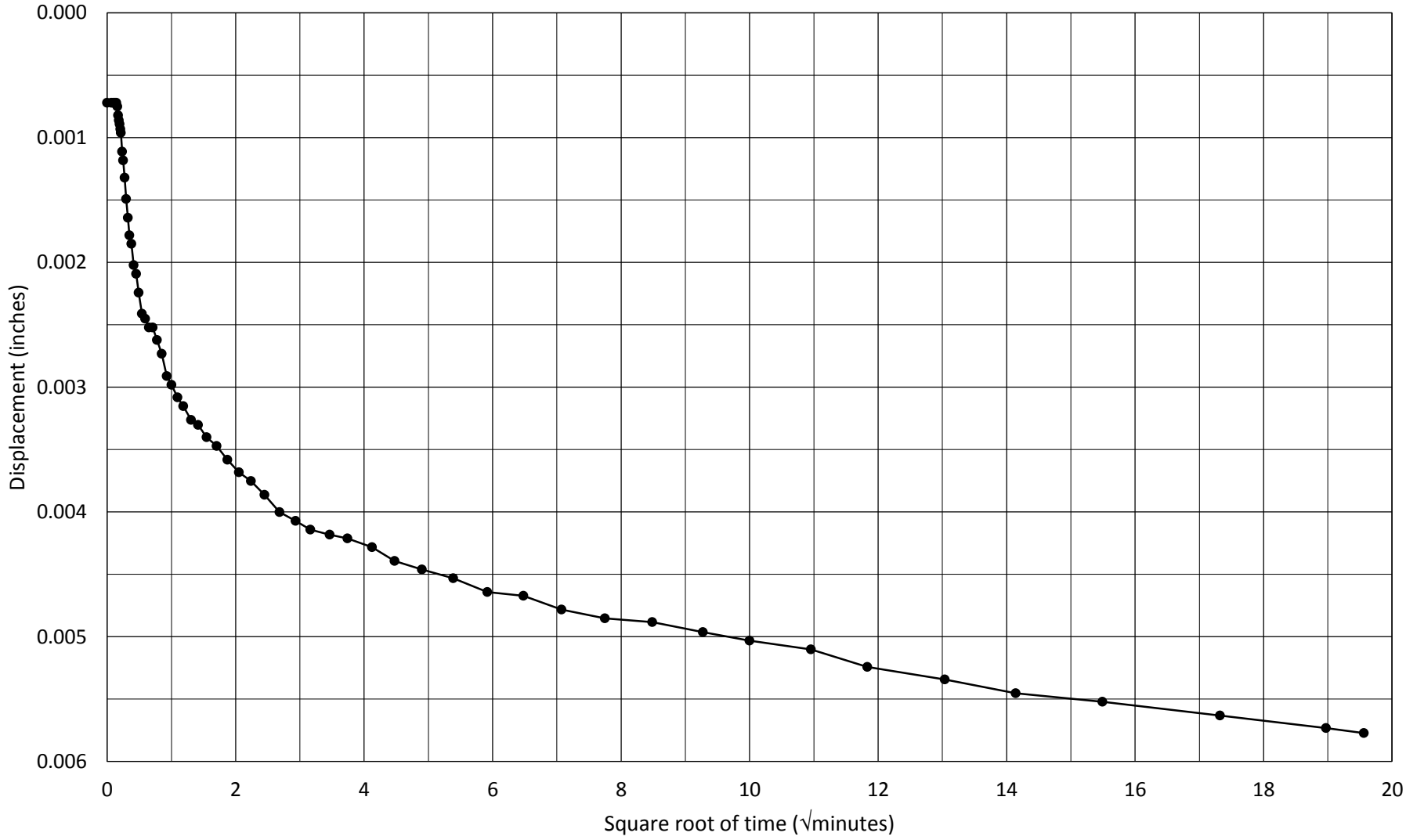


RB&G ENGINEERING, INC.

Hole no.: 16-E-03
Depth: 7.5'-9'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah

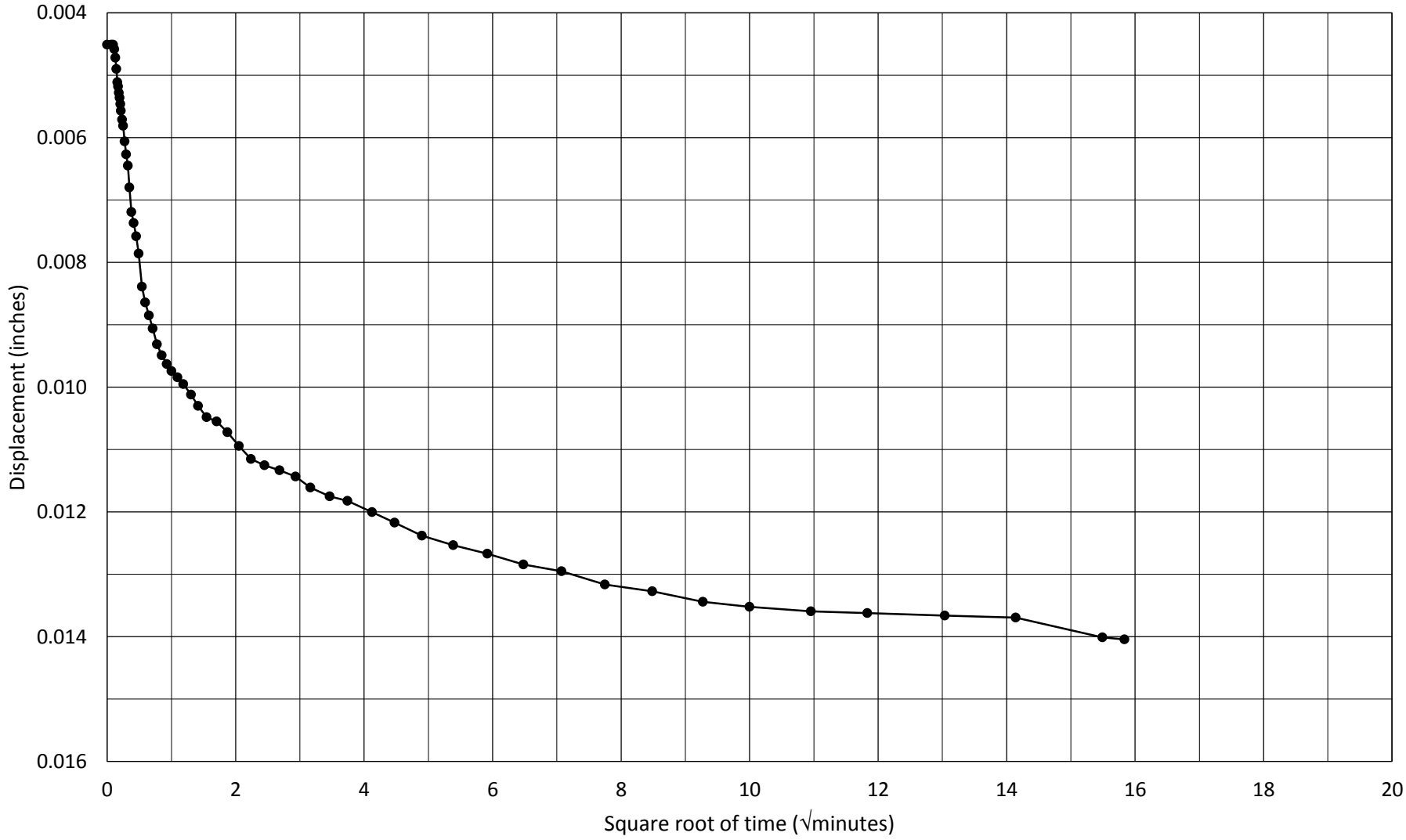


RB&G ENGINEERING, INC.

Hole no.: 16-E-03
Depth: 7.5'-9'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah

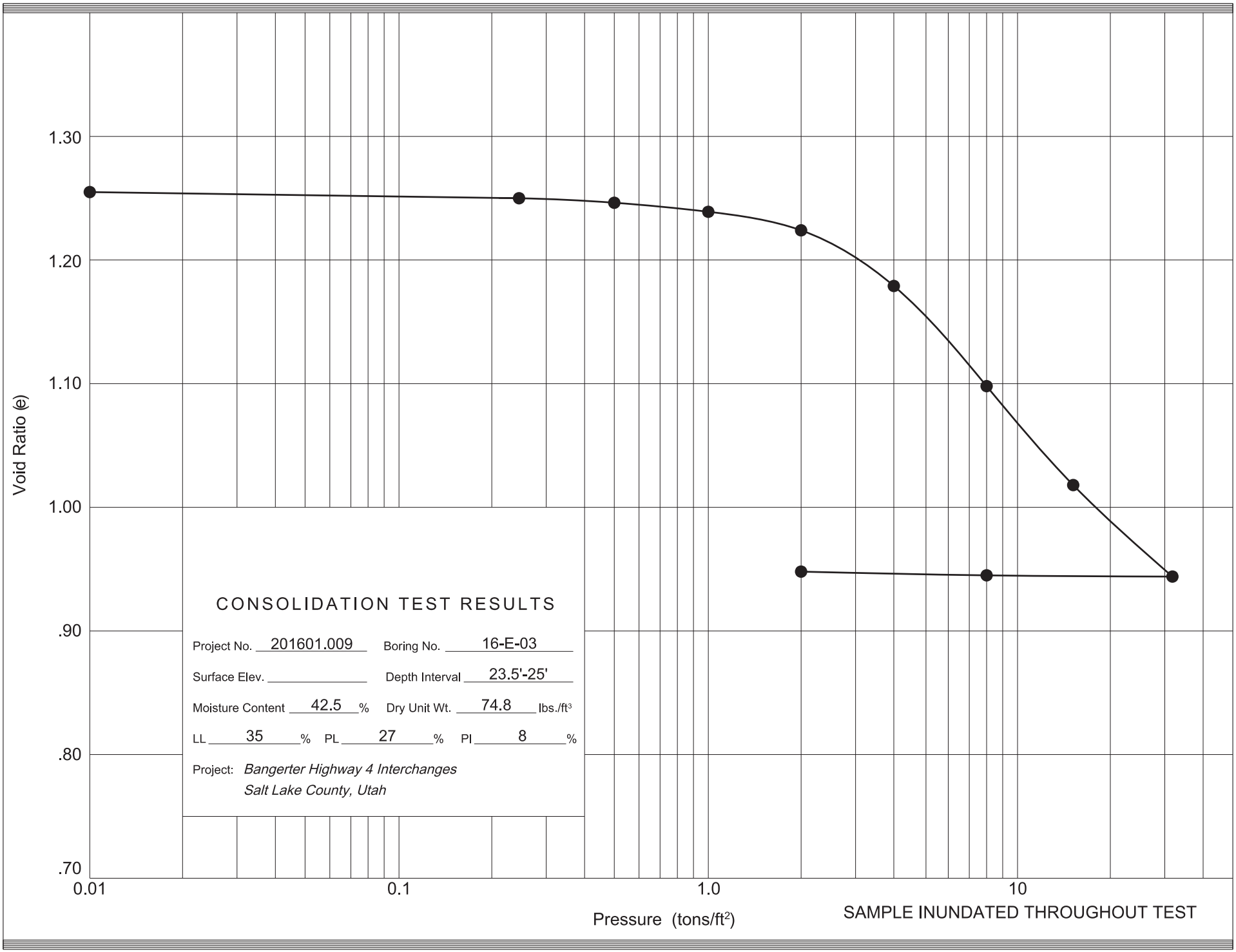


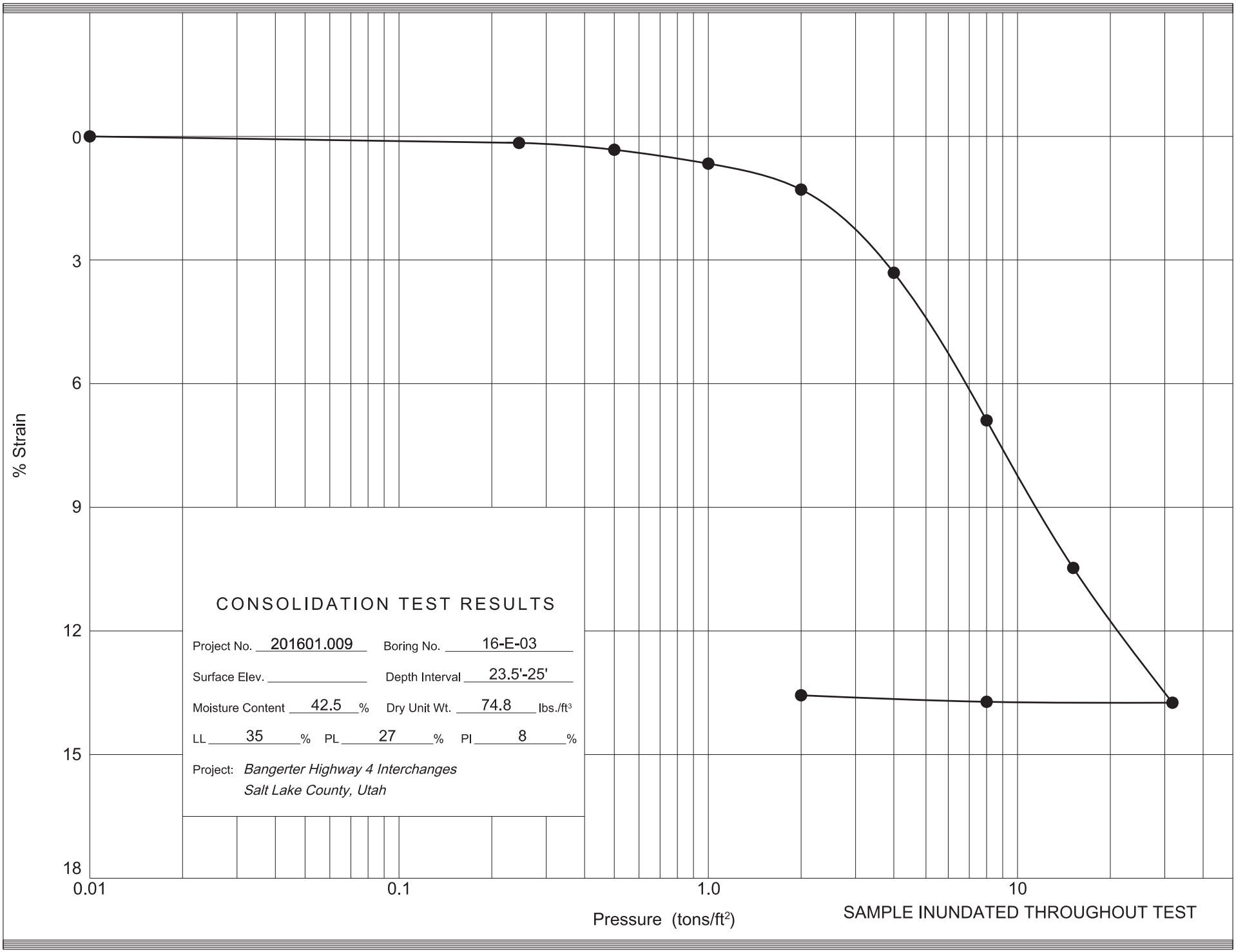
RB&G ENGINEERING, INC.

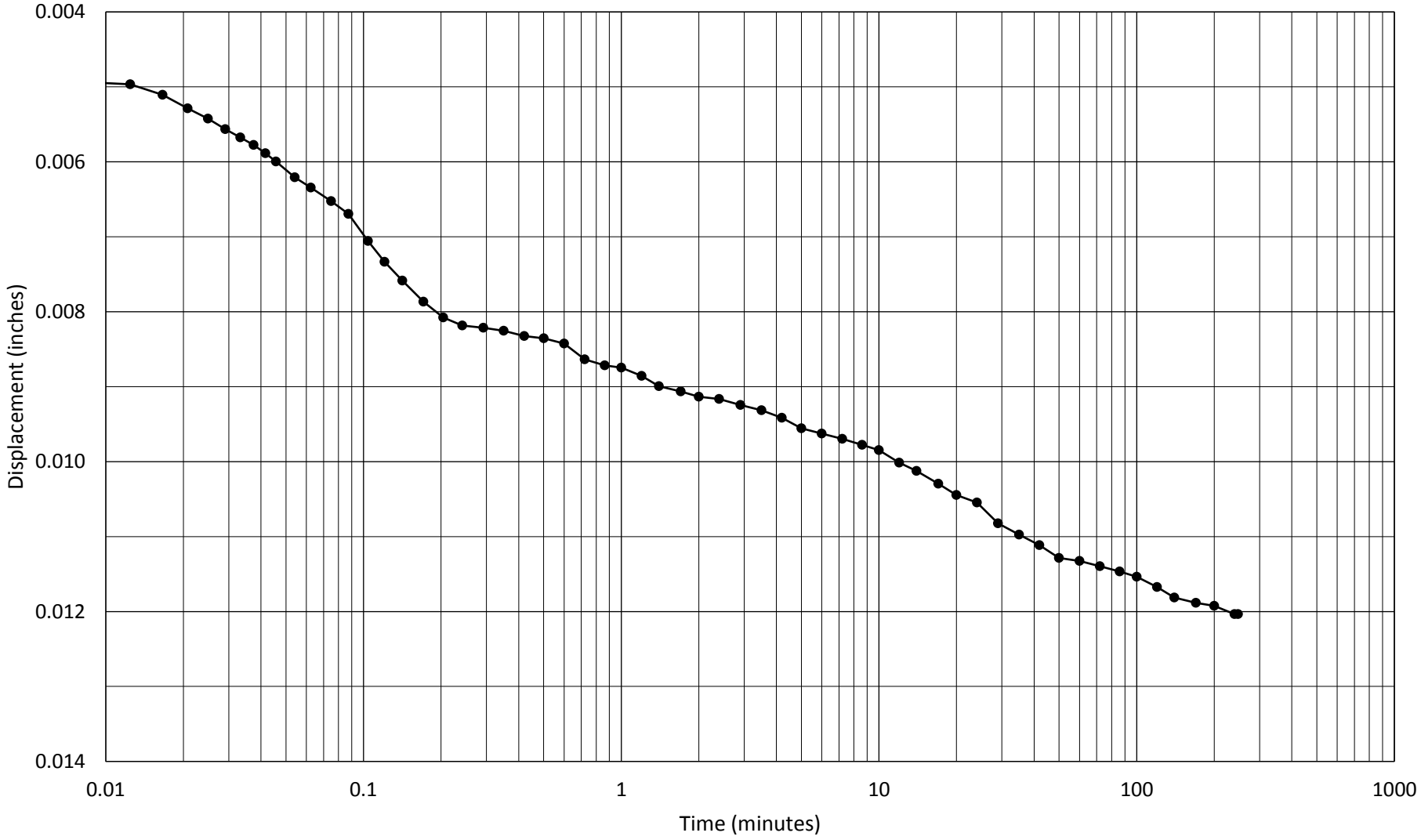
Hole no.: 16-E-03
Depth: 7.5'-9'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


1.30
1.20
1.10
1.00
.90
.80
.70
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-03
Surface Elev.
Depth Interval 23.5'-25'
Moisture Content 42.5 %
Dry Unit Wt. 74.8 lbs./ft³
LL 35 % PL 27 % PI 8 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

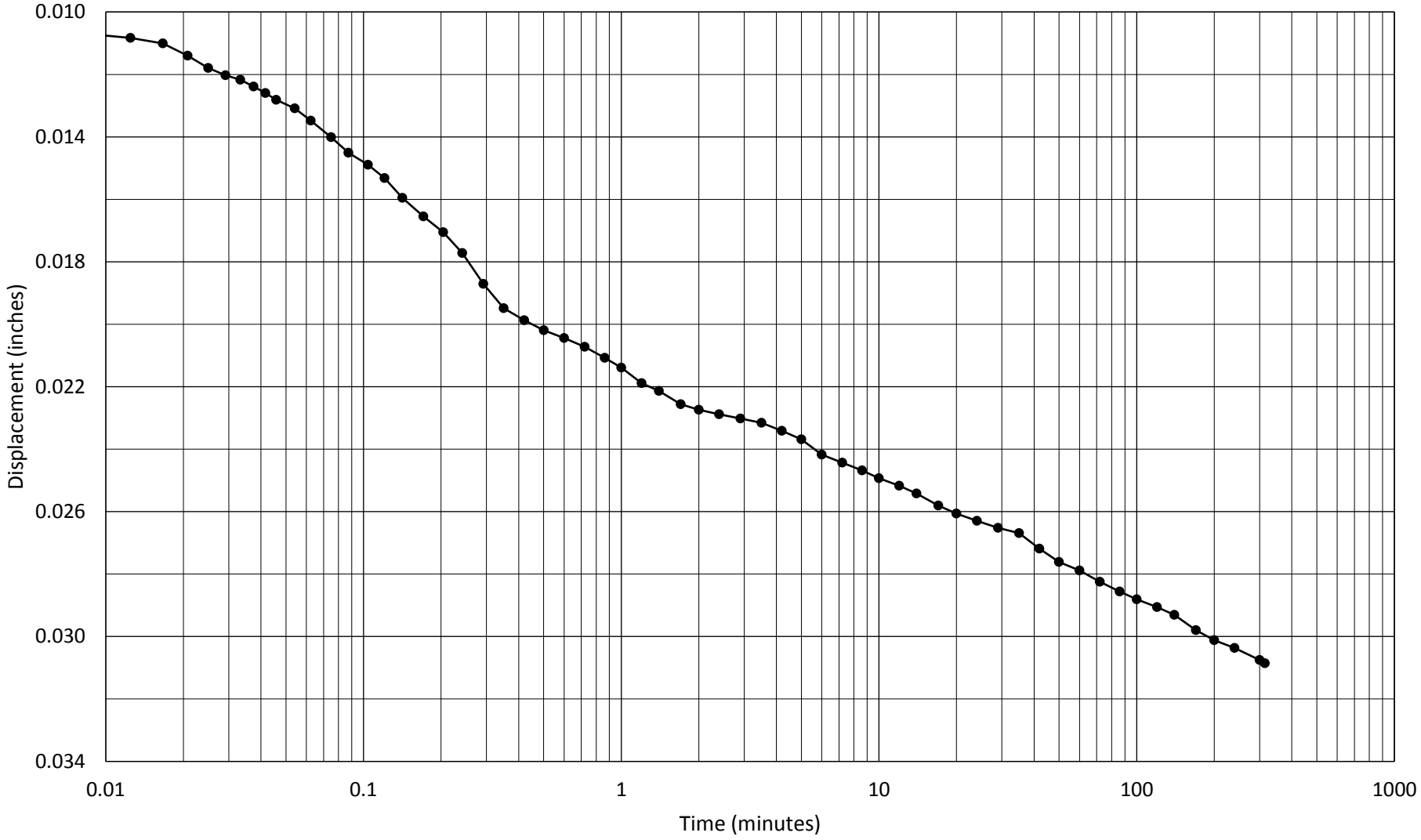

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-03
Surface Elev.
Depth Interval 23.5'-25'
Moisture Content 42.5 %
Dry Unit Wt. 74.8 lbs./ft³
LL 35 % PL 27 % PI 8 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-03
Depth: 23.5'-25'
Load: 1 to 2 tsf

TIME CONSOLIDATION

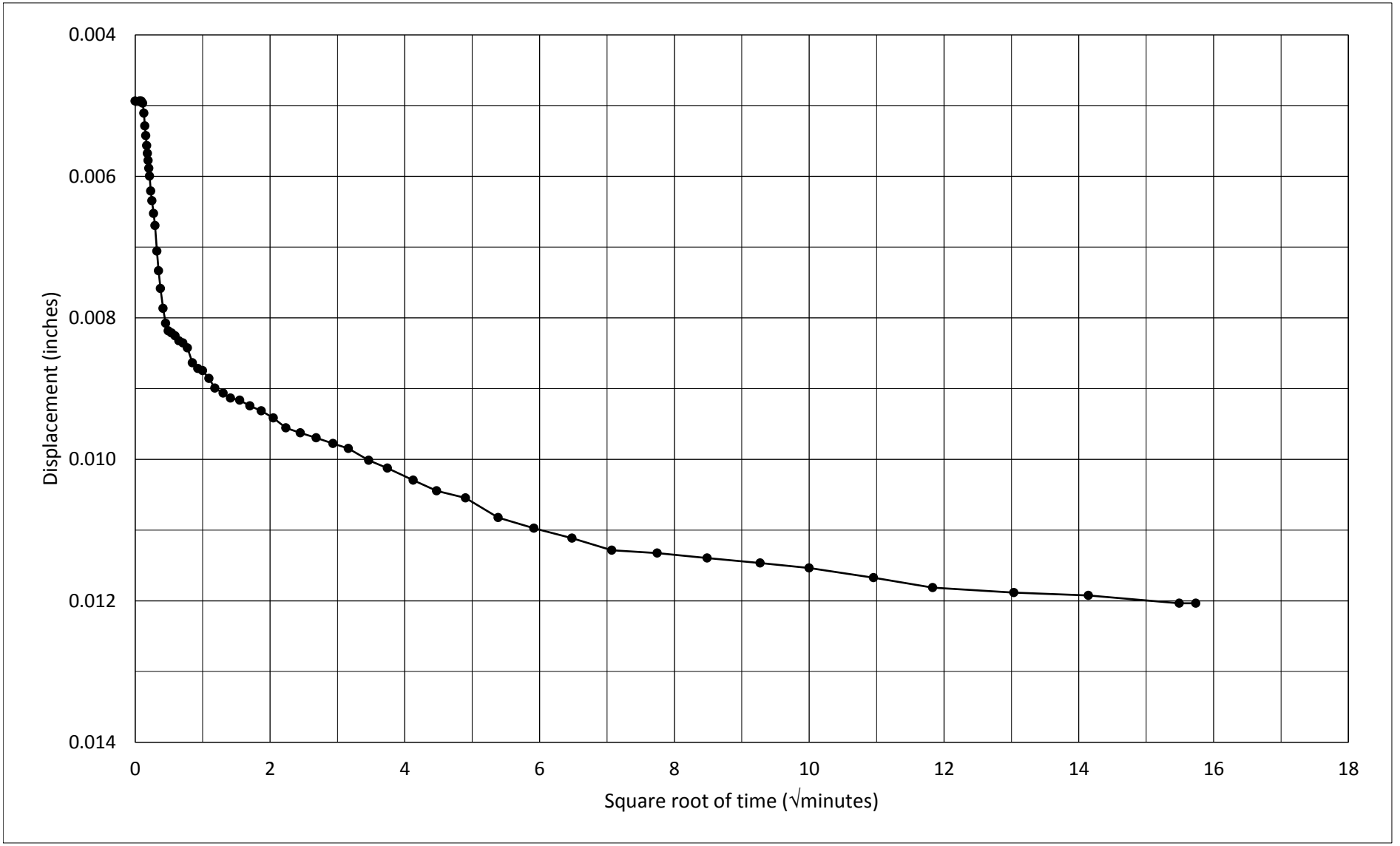
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-03
Depth: 23.5'-25'
Load: 2 to 4 tsf

TIME CONSOLIDATION

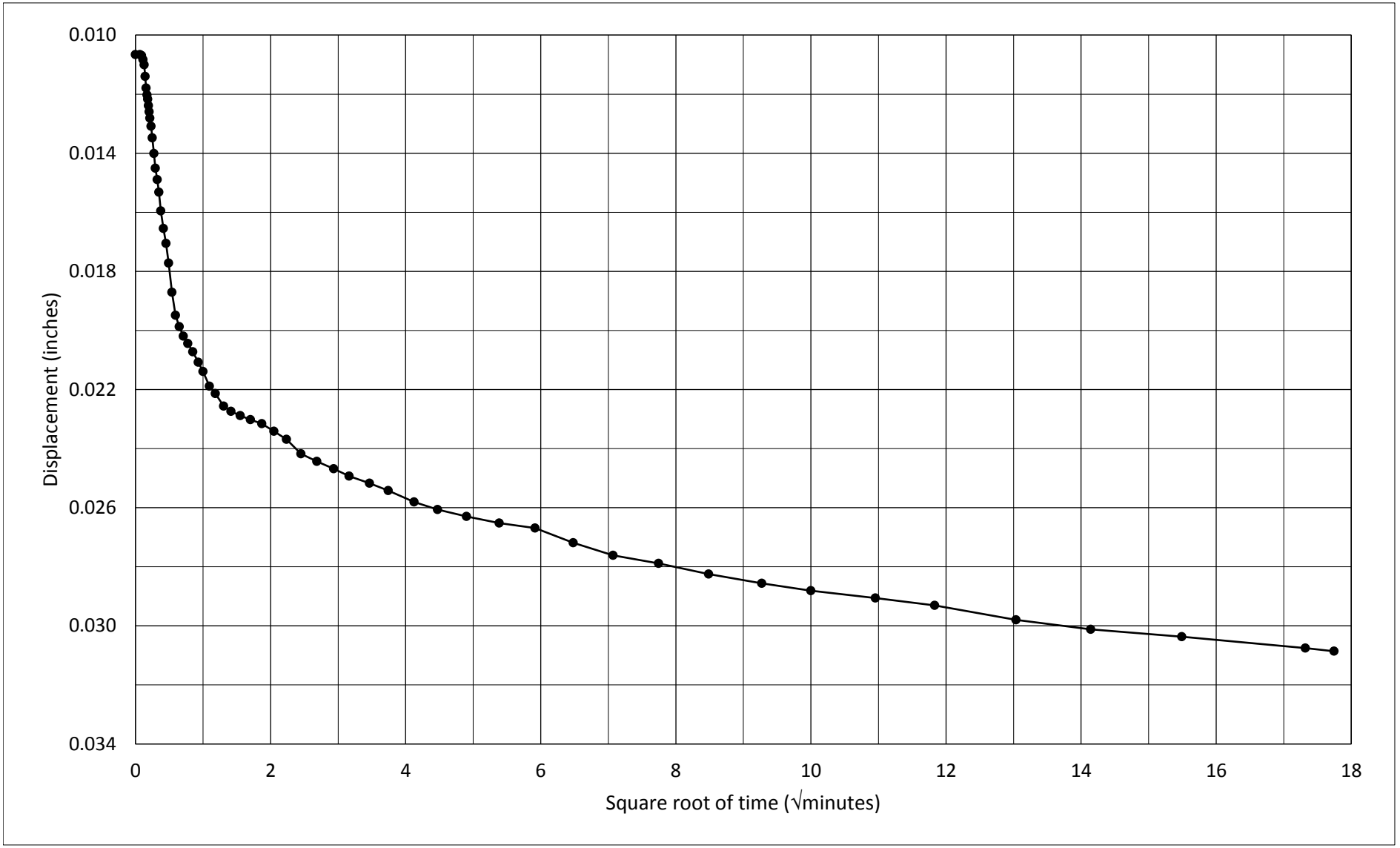
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-03
Depth: 23.5'-25'
Load: 1 to 2 tsf

TIME CONSOLIDATION

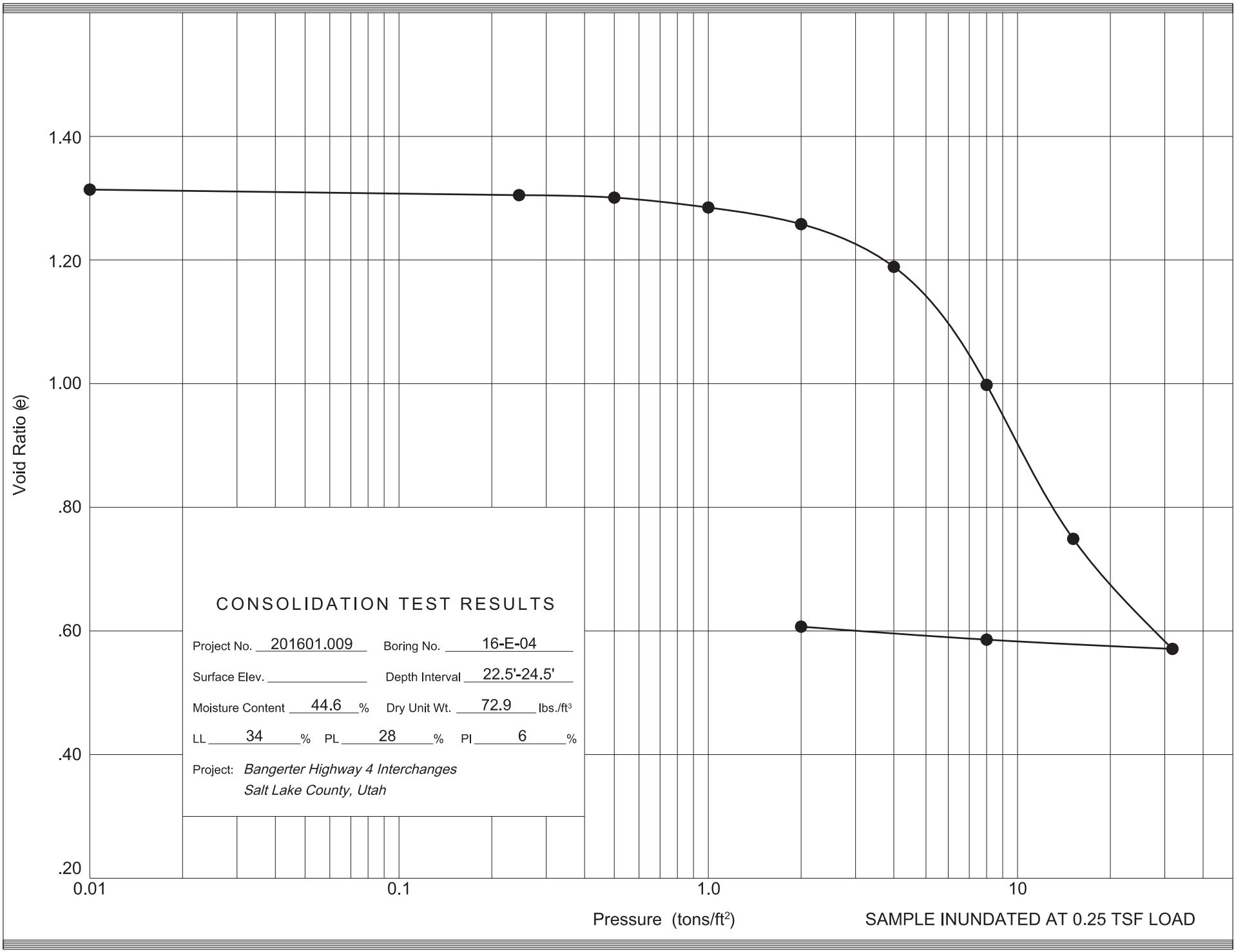
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

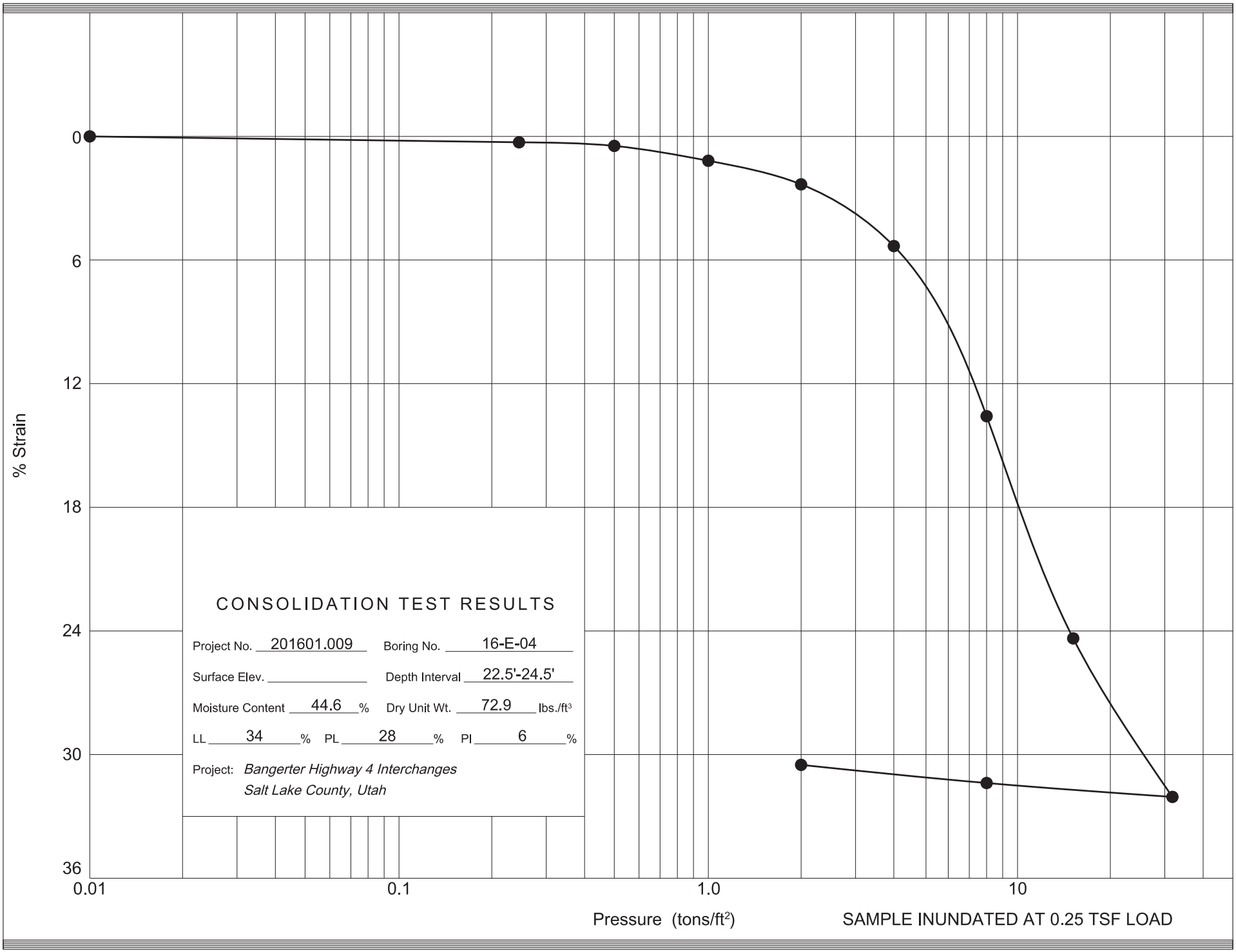


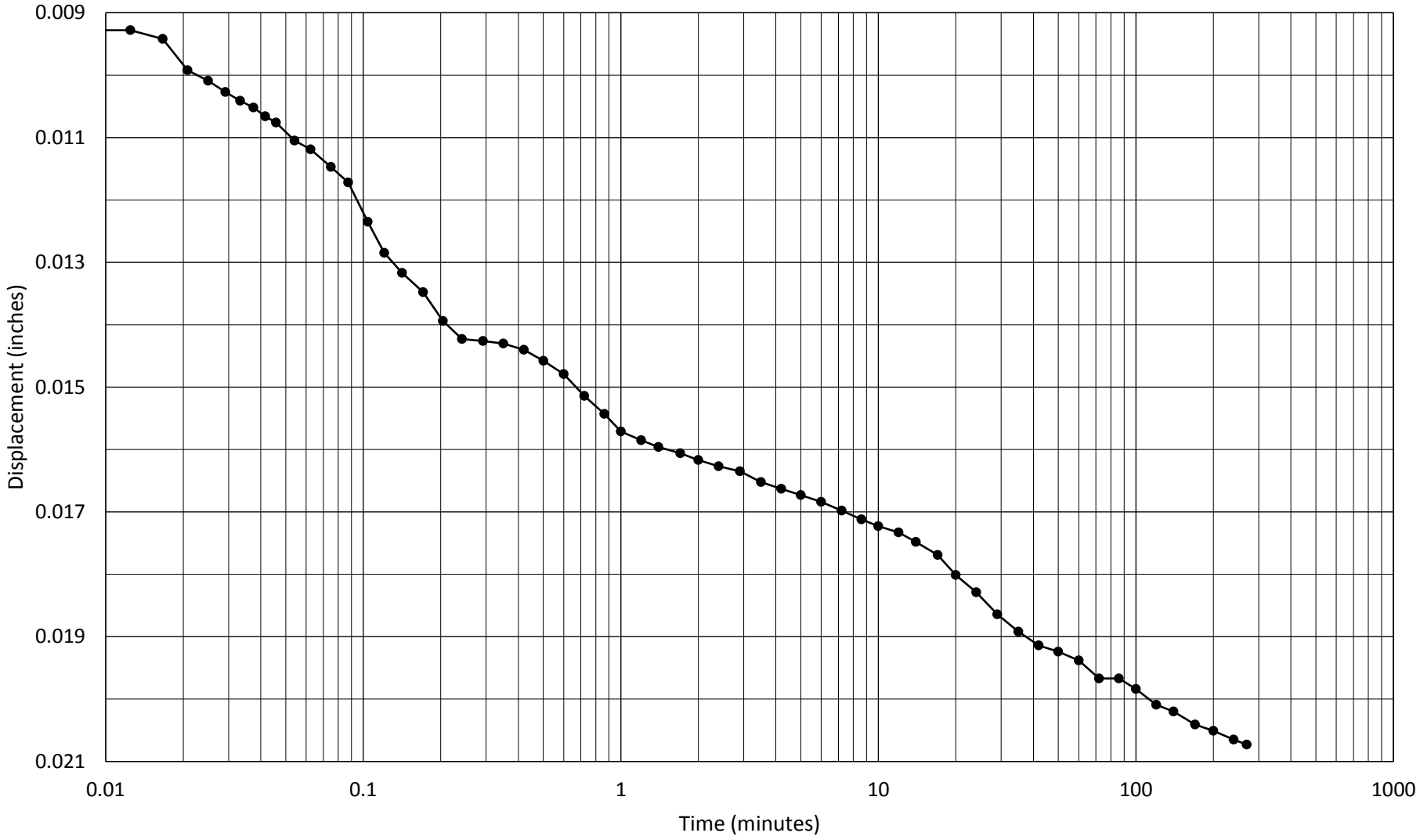
Hole no.: 16-E-03
Depth: 23.5'-25'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


1.40
1.20
1.00
.80
.60
.40
.20
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-04
Surface Elev.
Depth Interval 22.5'-24.5'
Moisture Content 44.6 %
Dry Unit Wt. 72.9 lbs./ft³
LL 34 %
PL 28 %
PI 6 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

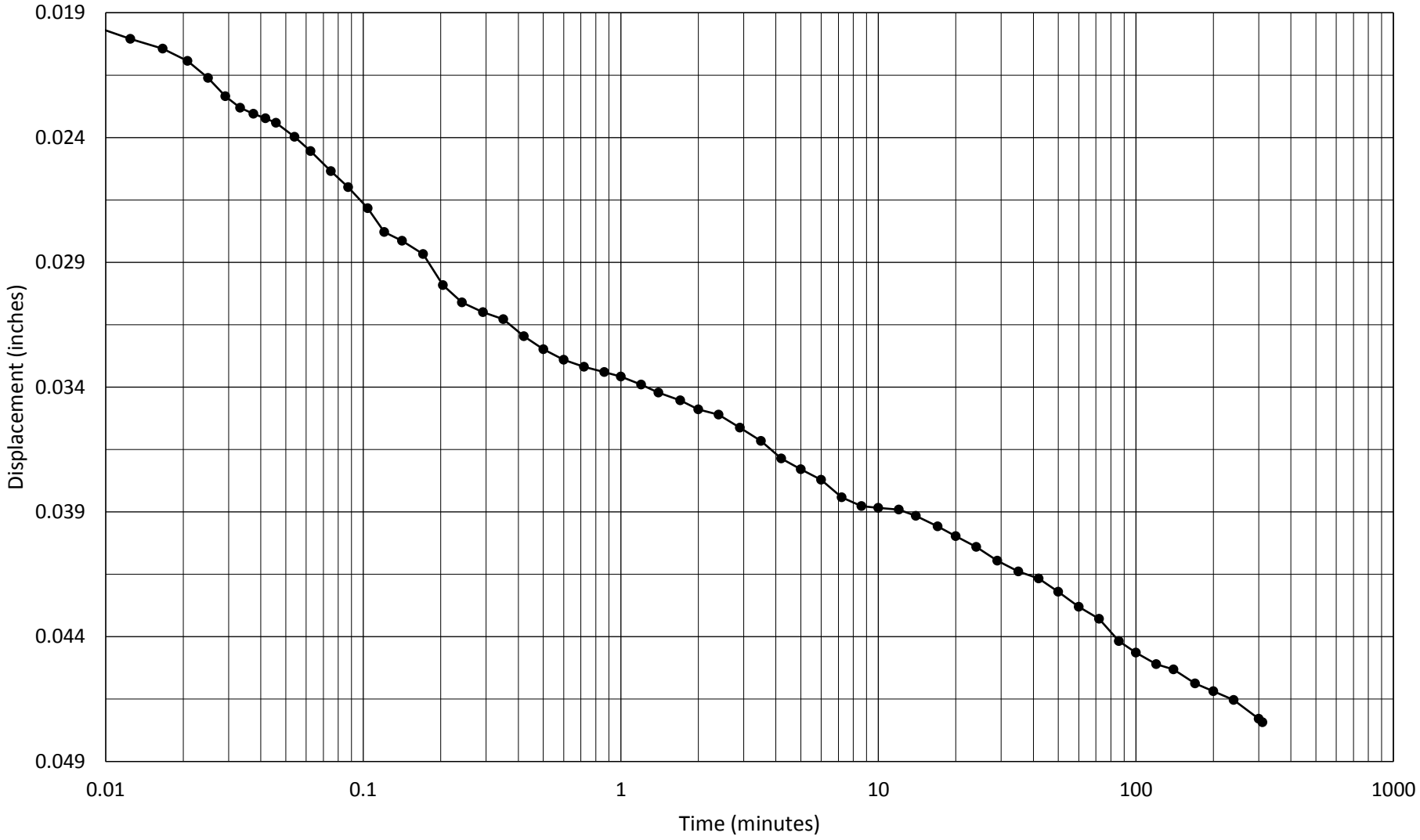

0
6
12
18
24
30
36
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-04
Surface Elev.
Depth Interval 22.5'-24.5'
Moisture Content 44.6 %
Dry Unit Wt. 72.9 lbs./ft³
LL 34 %
PL 28 %
PI 6 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-04
Depth: 22.5'-24.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

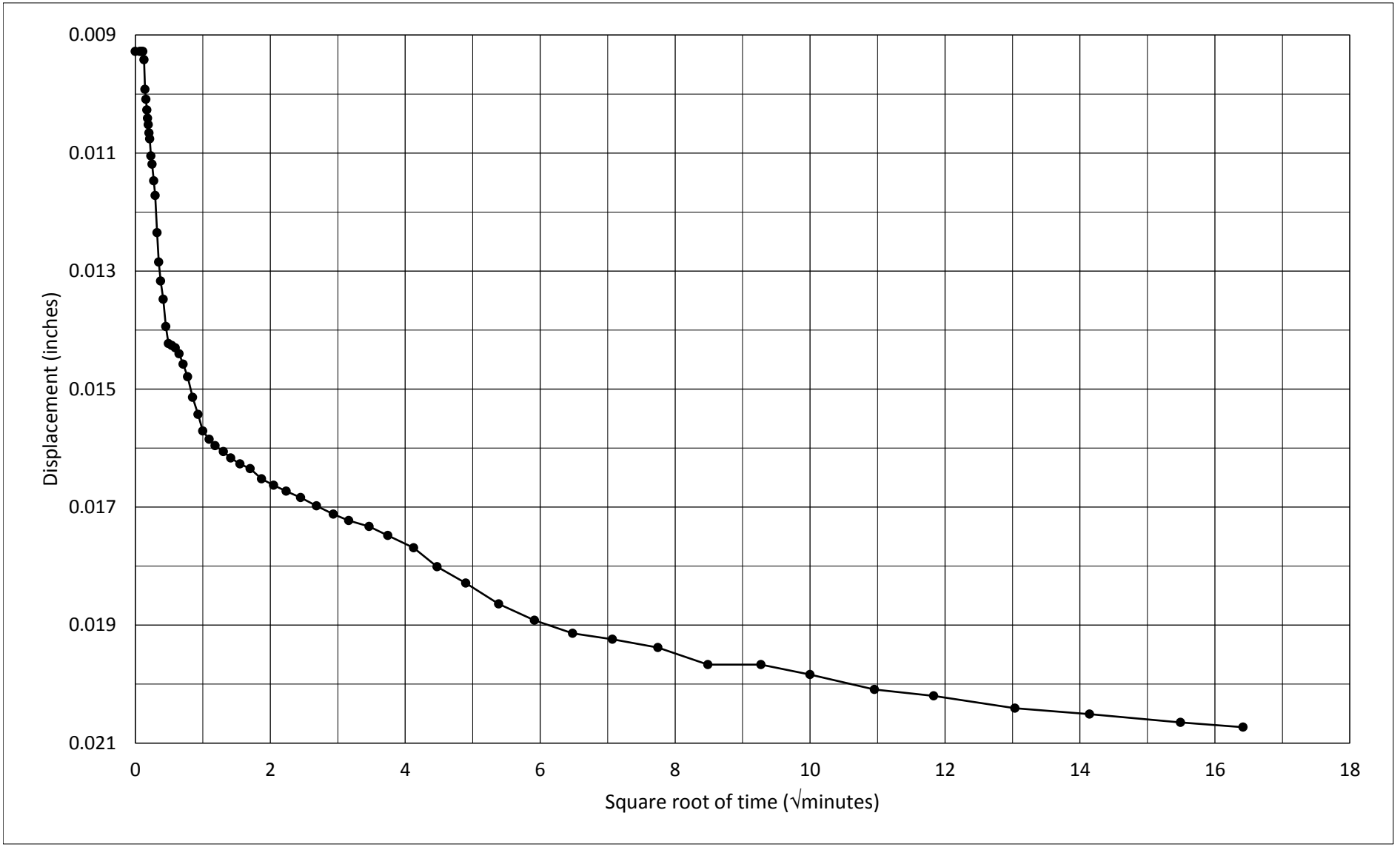
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-04
Depth: 22.5'-24.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

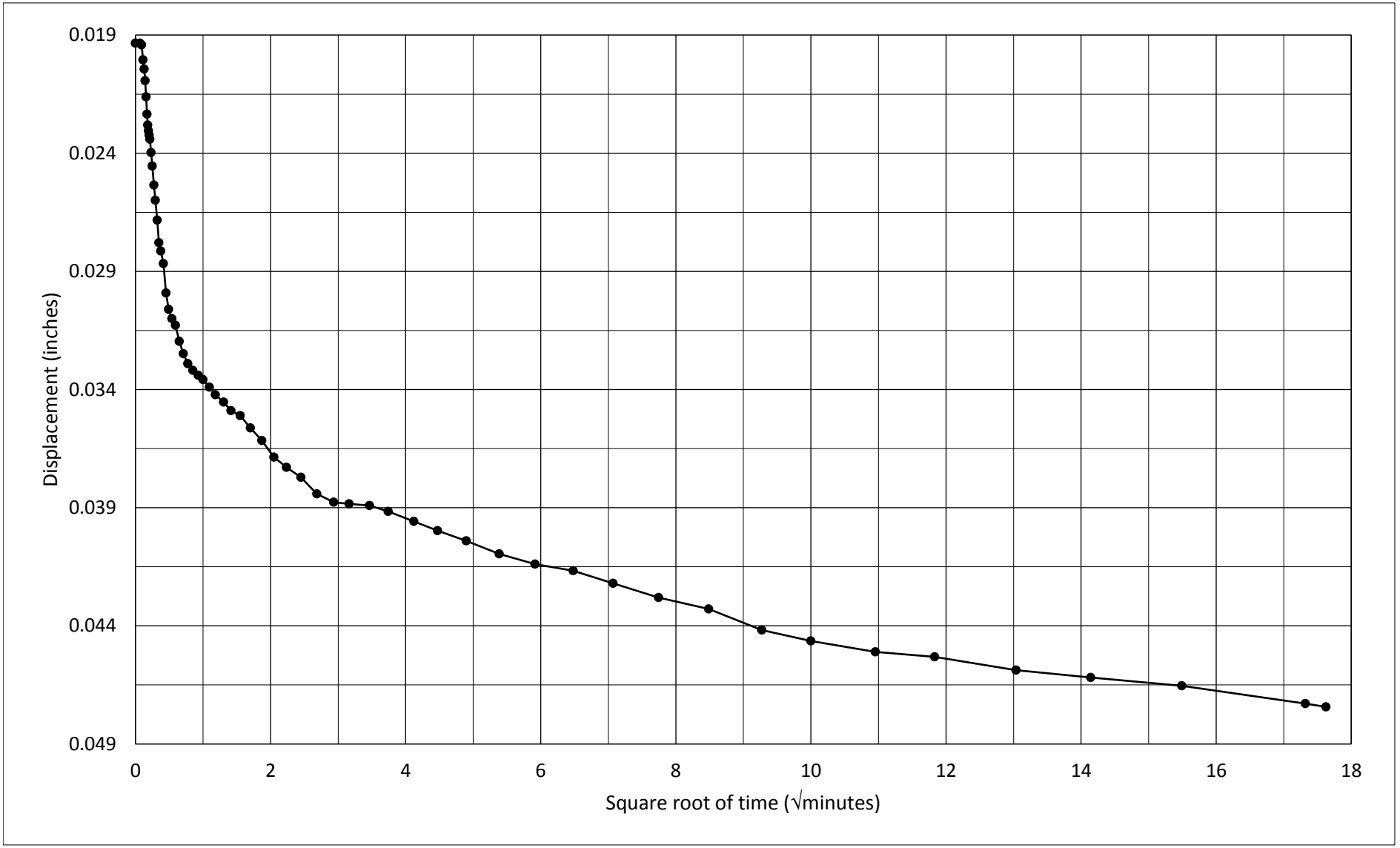
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-04
Depth: 22.5'-24.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

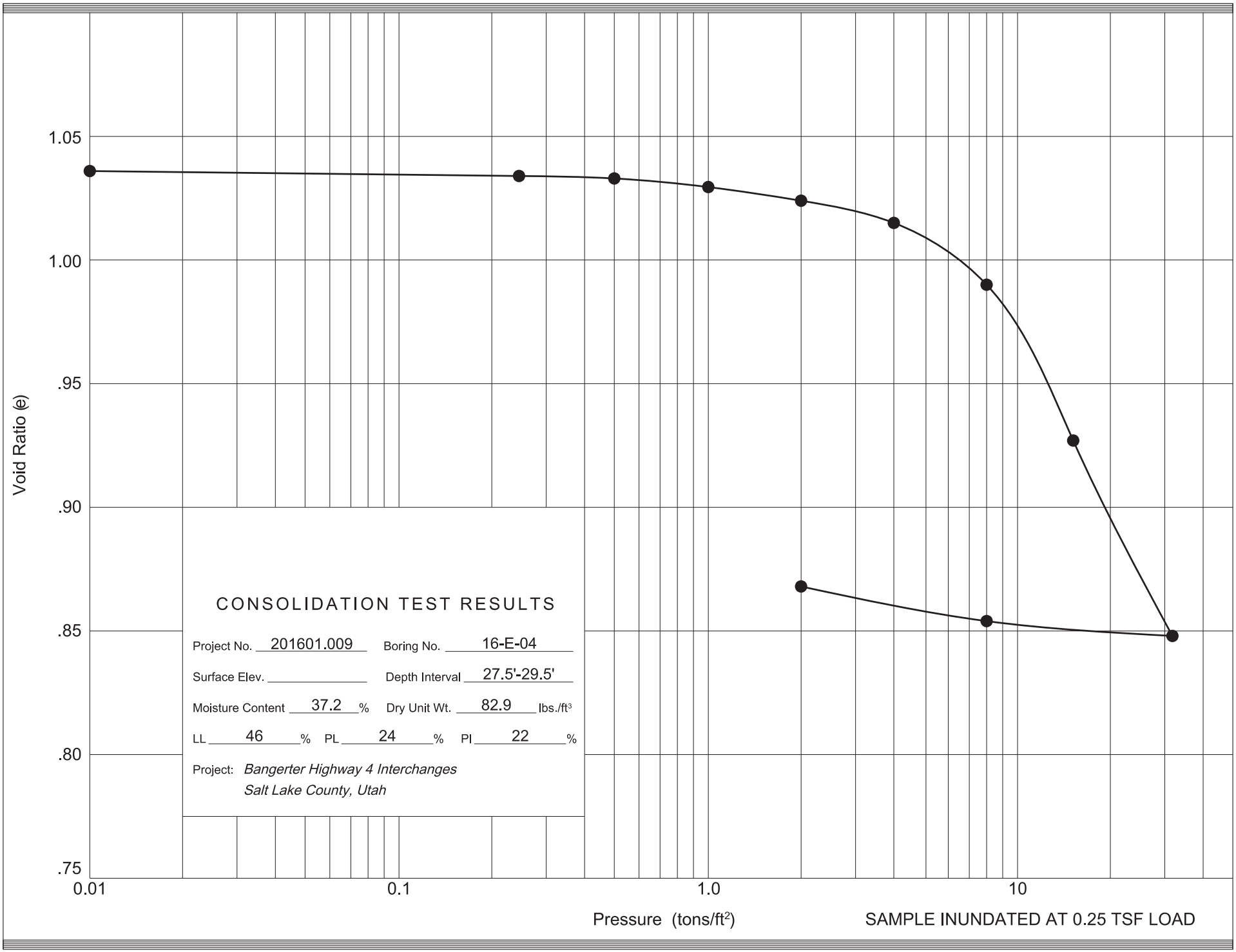
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-04
Depth: 22.5'-24.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah



CONSOLIDATION TEST RESULTS

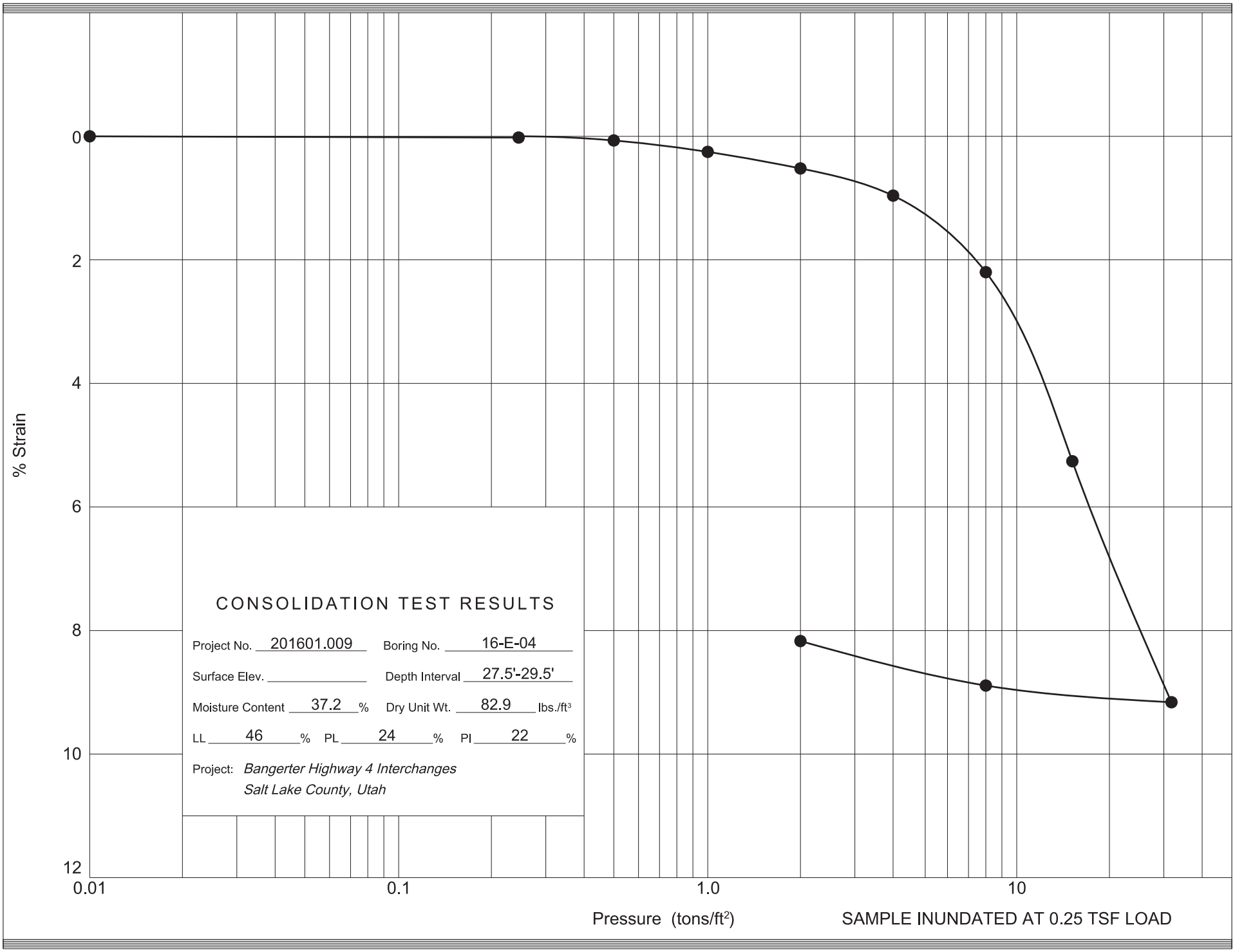
Project No. 201601.009 Boring No. 16-E-04

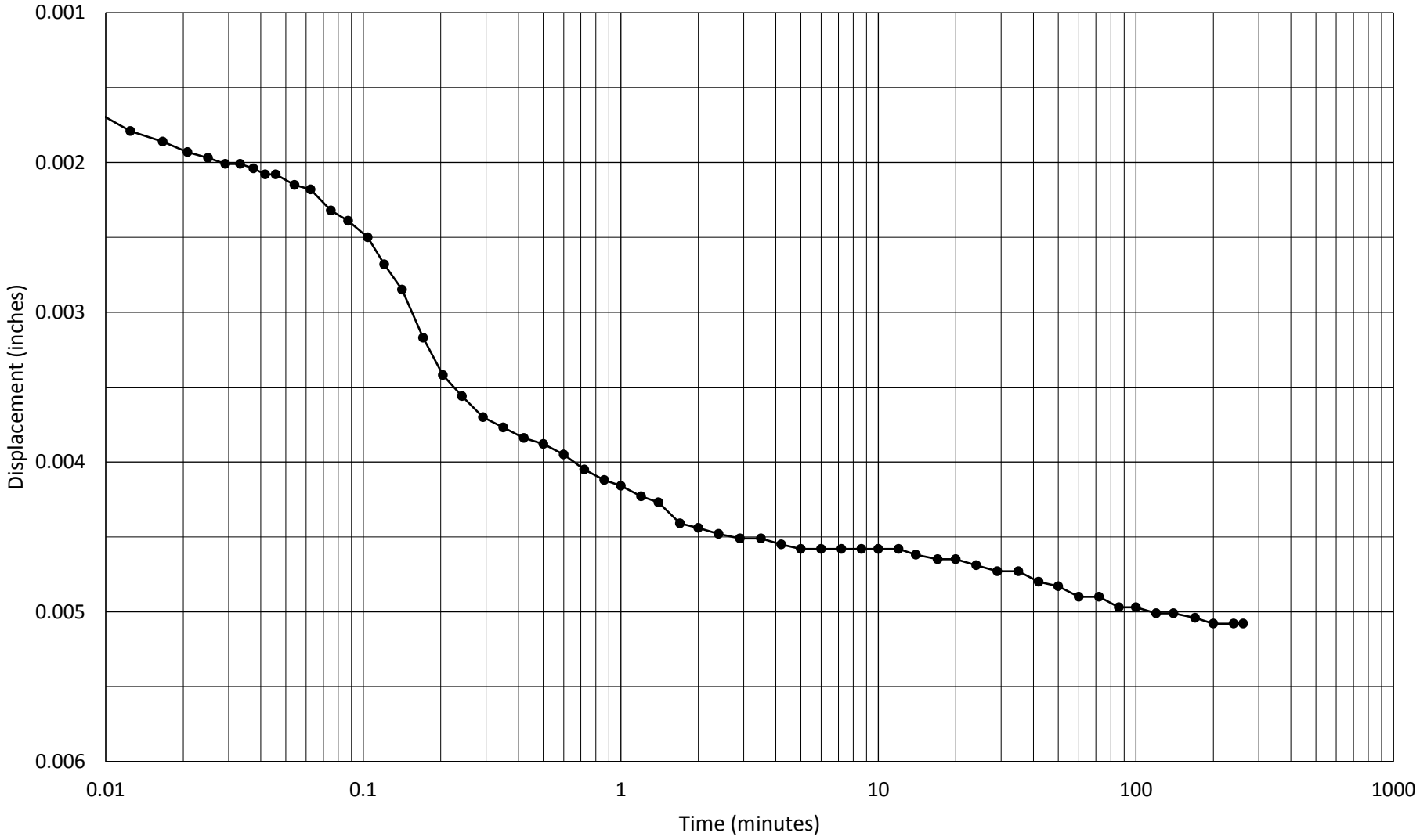
Surface Elev. _____ Depth Interval 27.5'-29.5'

Moisture Content 37.2 % Dry Unit Wt. 82.9 lbs./ft³

LL 46 % PL 24 % PI 22 %

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

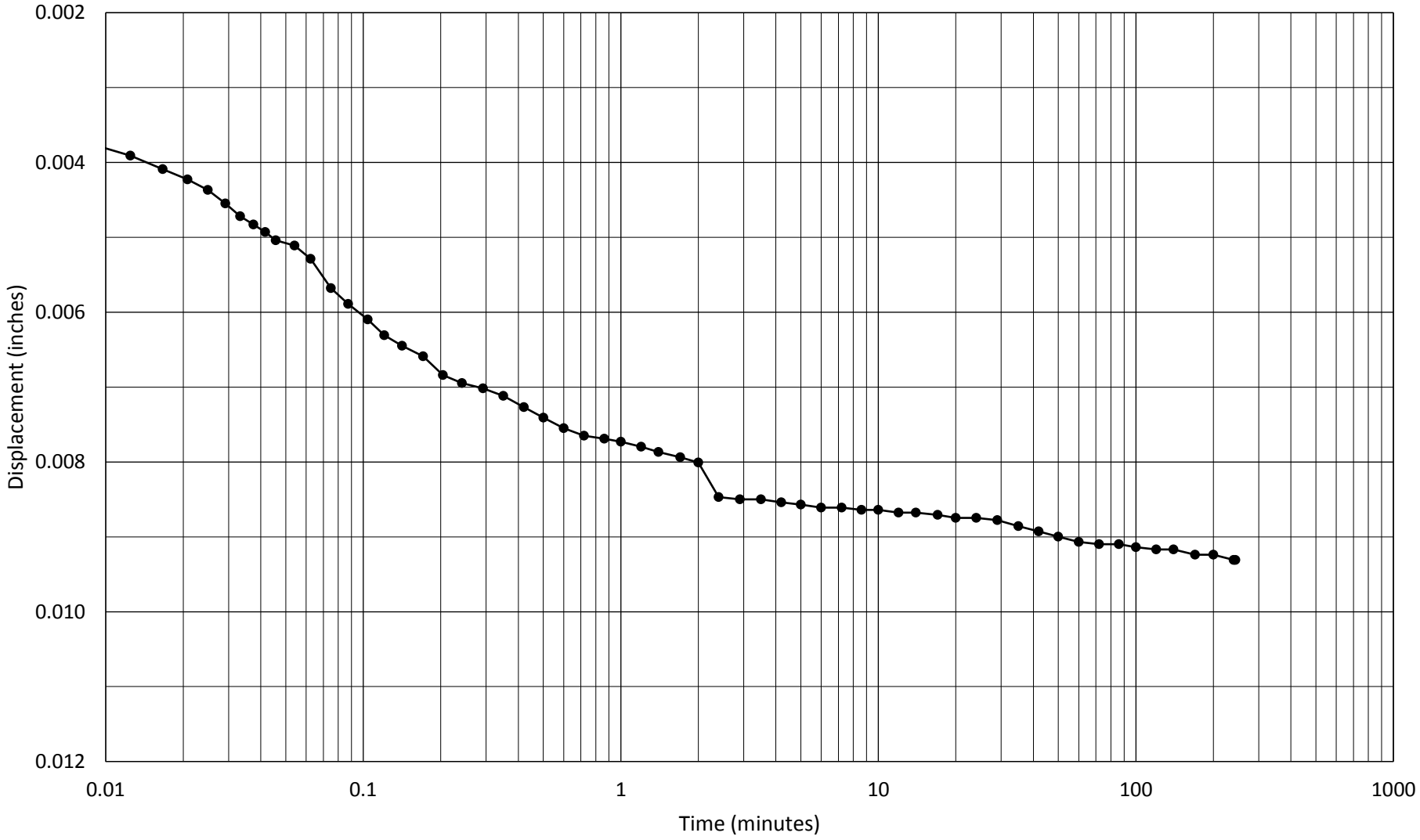

0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-04
Surface Elev.
Depth Interval 27.5'-29.5'
Moisture Content 37.2 %
Dry Unit Wt. 82.9 lbs./ft³
LL 46 % PL 24 % PI 22 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-04
Depth: 27.5'-29.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

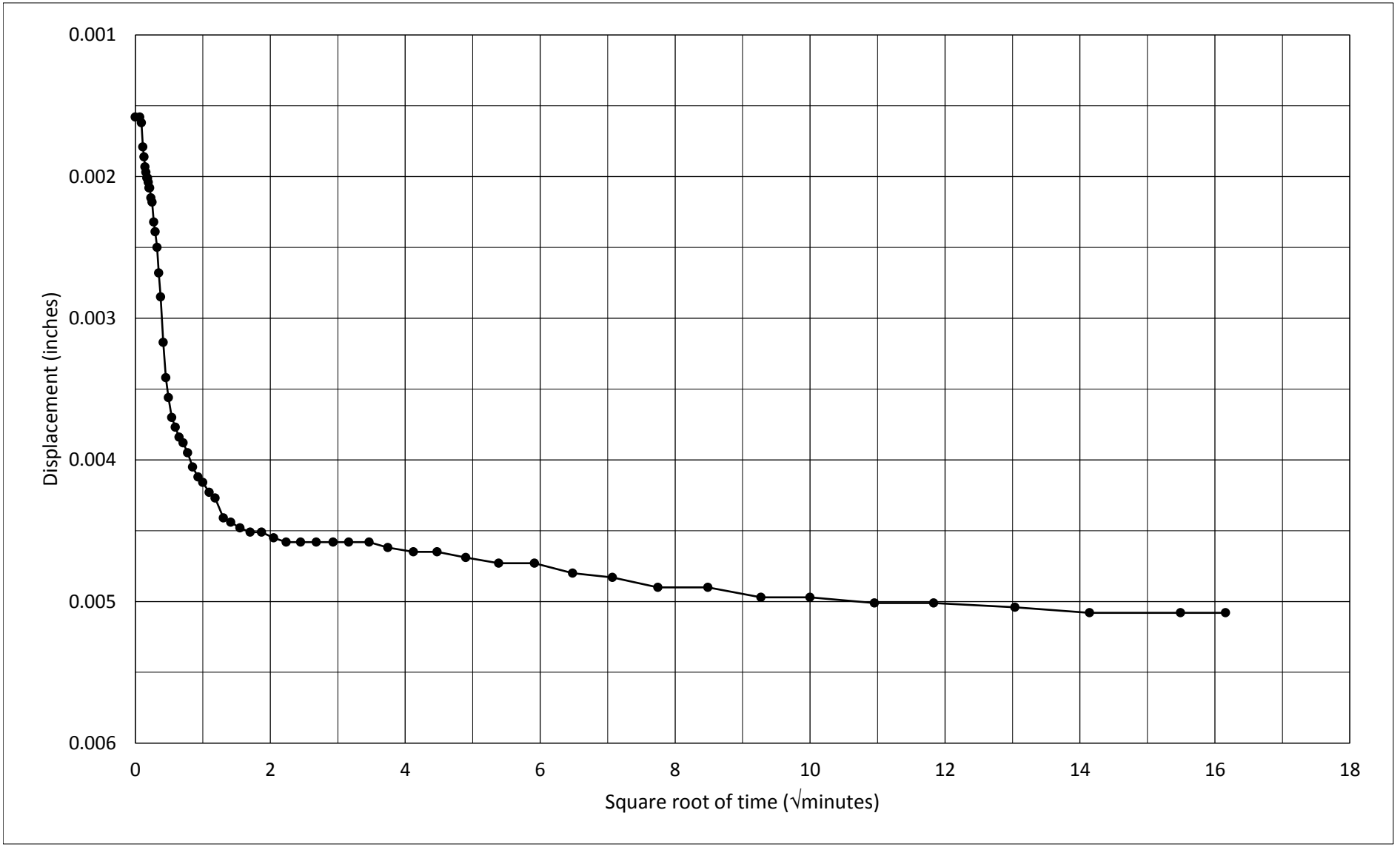
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-04
Depth: 27.5'-29.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

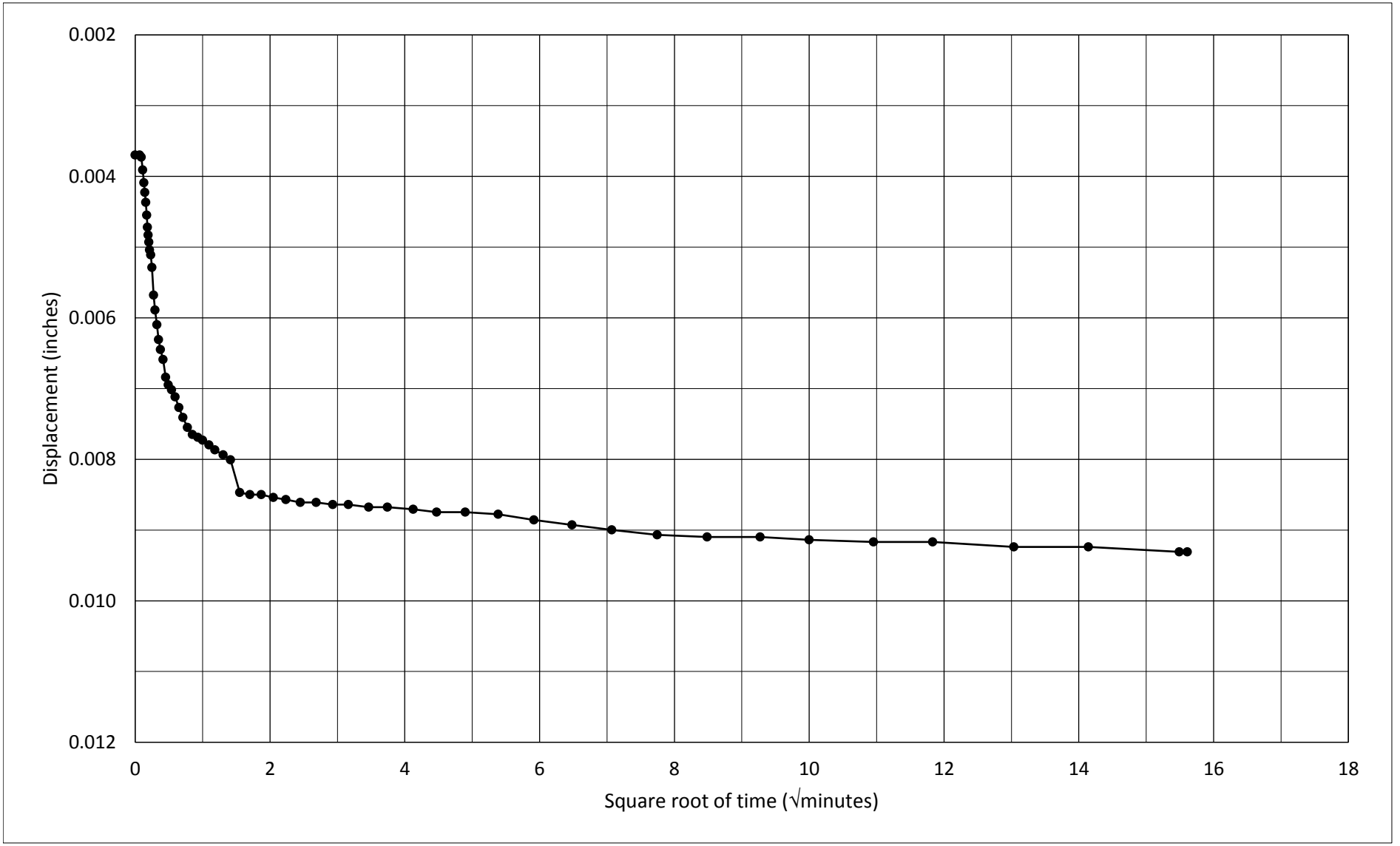
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-04
Depth: 27.5'-29.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

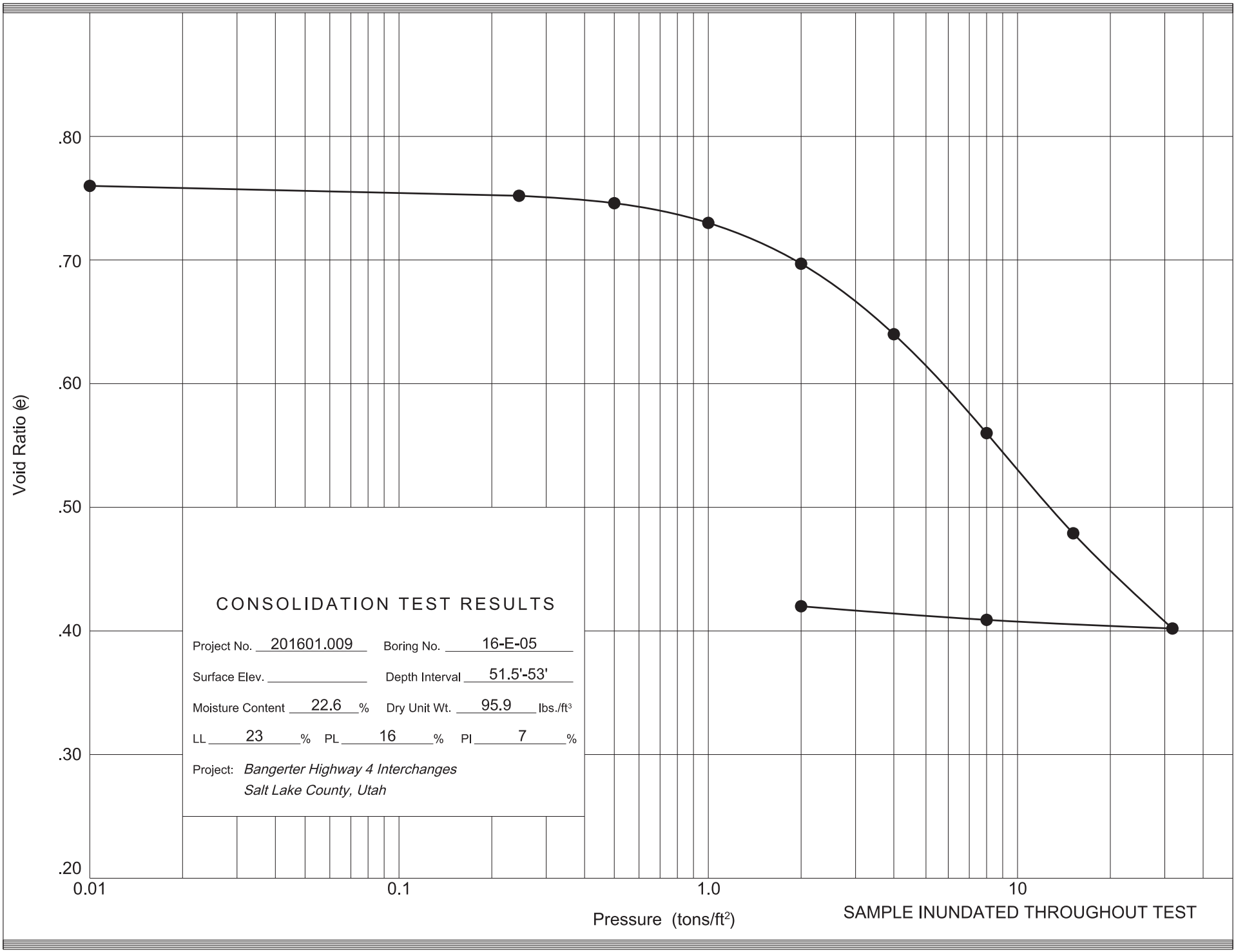
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

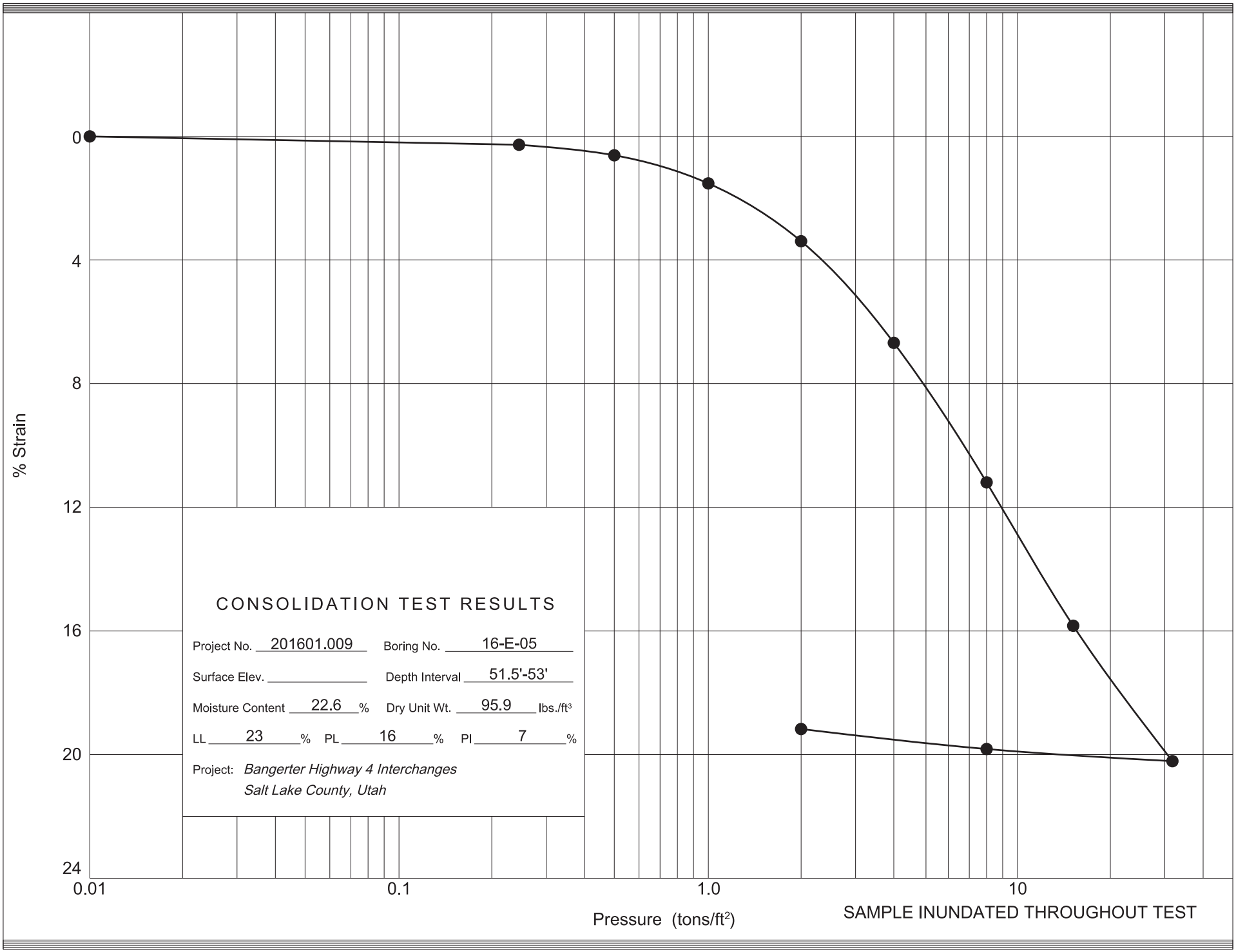


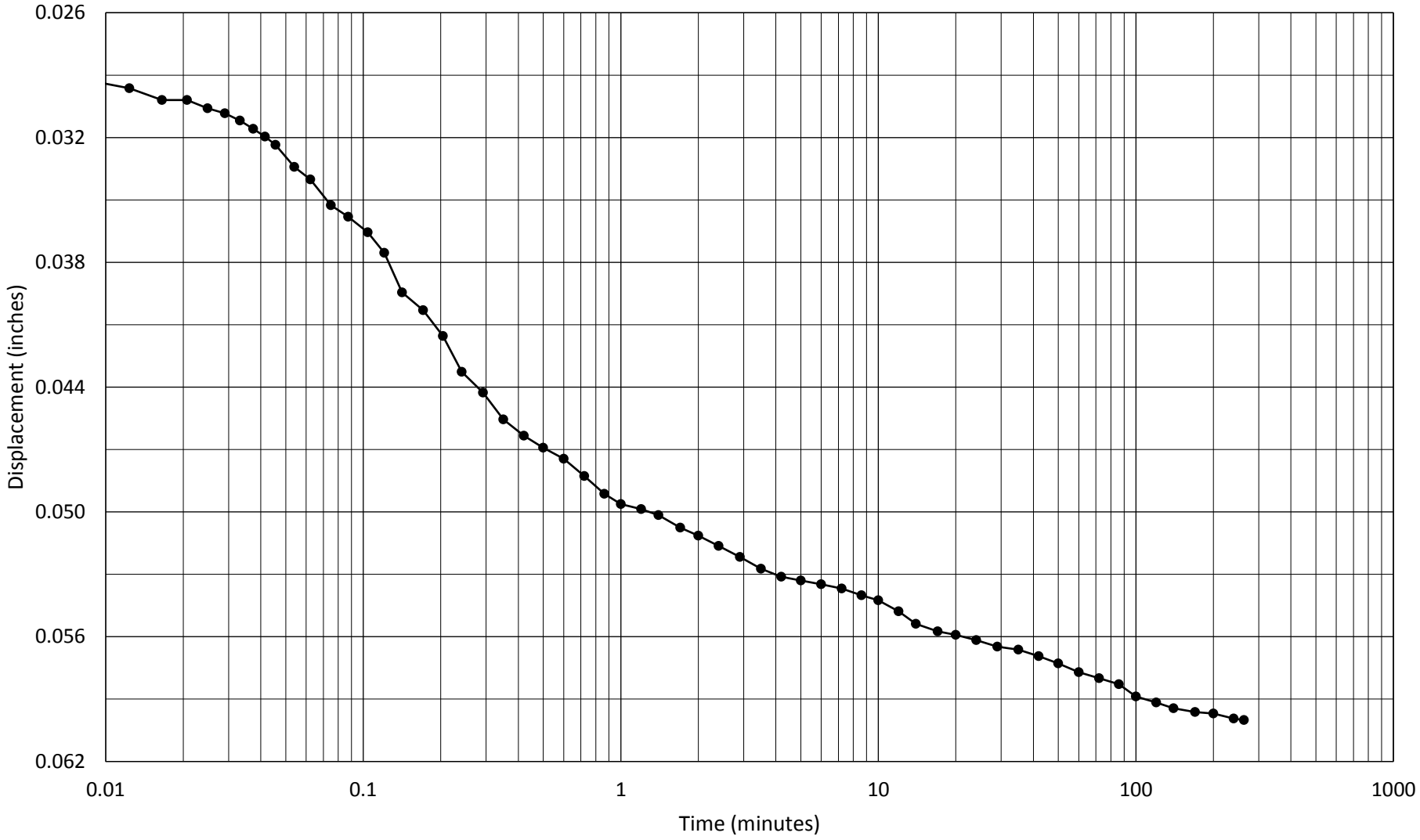
Hole no.: 16-E-04
Depth: 27.5'-29.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.80
.70
.60
.50
.40
.30
.20
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-05
Surface Elev.
Depth Interval 51.5'-53'
Moisture Content 22.6 %
Dry Unit Wt. 95.9 lbs./ft³
LL 23 %
PL 16 %
PI 7 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

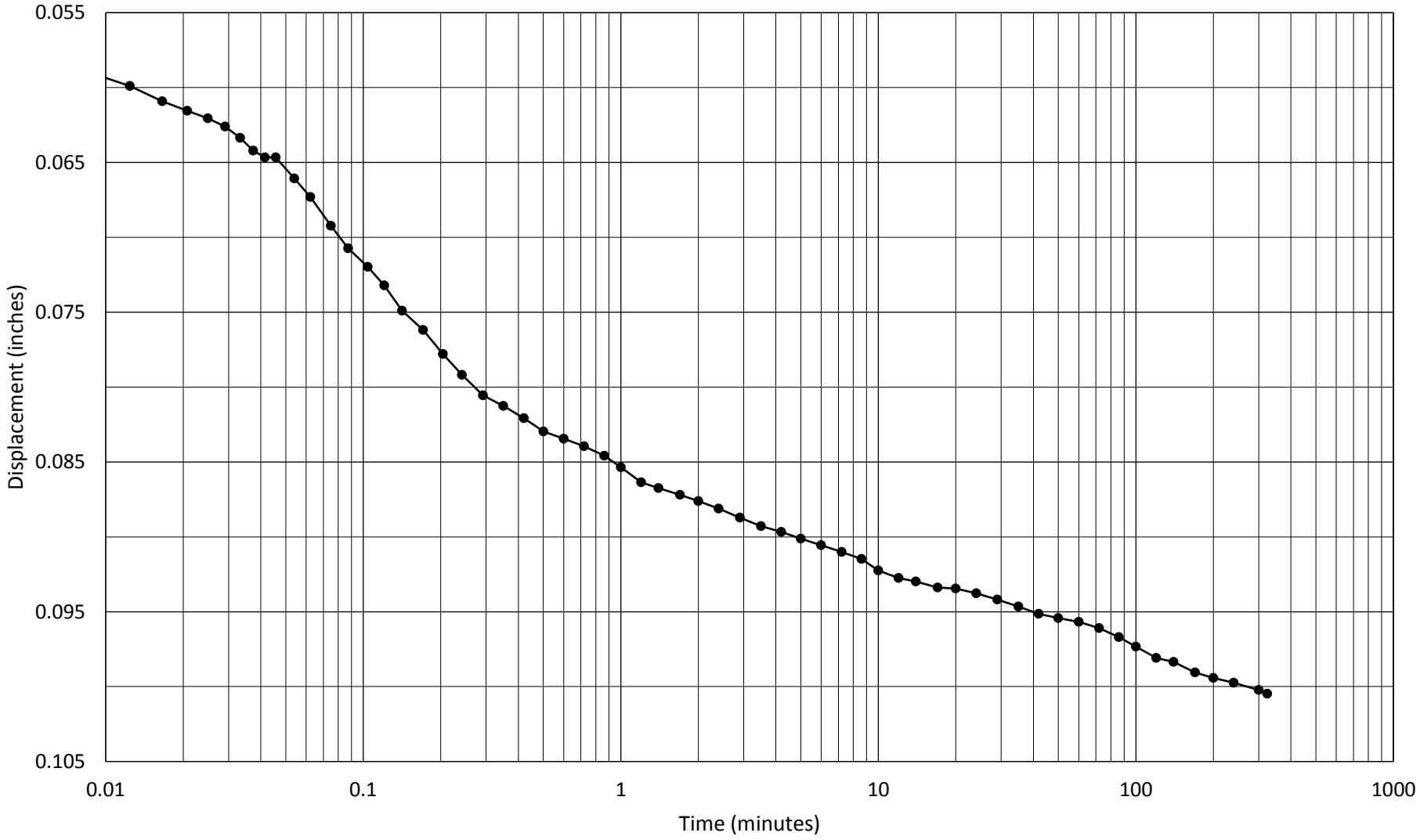

0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-05
Surface Elev.
Depth Interval 51.5'-53'
Moisture Content 22.6 %
Dry Unit Wt. 95.9 lbs./ft³
LL 23 % PL 16 % PI 7 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-05
Depth: 51.5'-53'
Load: 2 to 4 tsf

TIME CONSOLIDATION

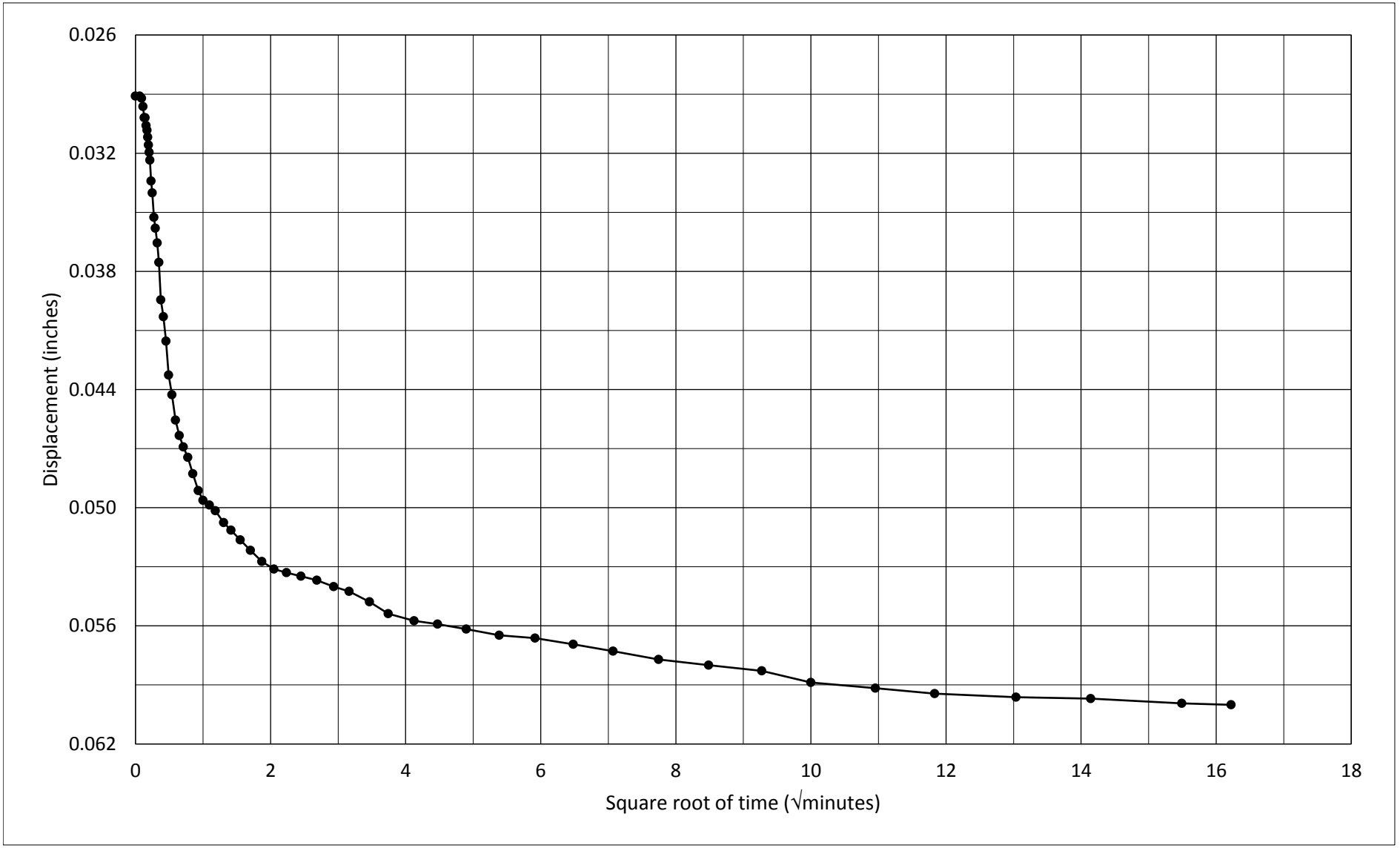
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-05
Depth: 51.5'-53'
Load: 4 to 8 tsf

TIME CONSOLIDATION

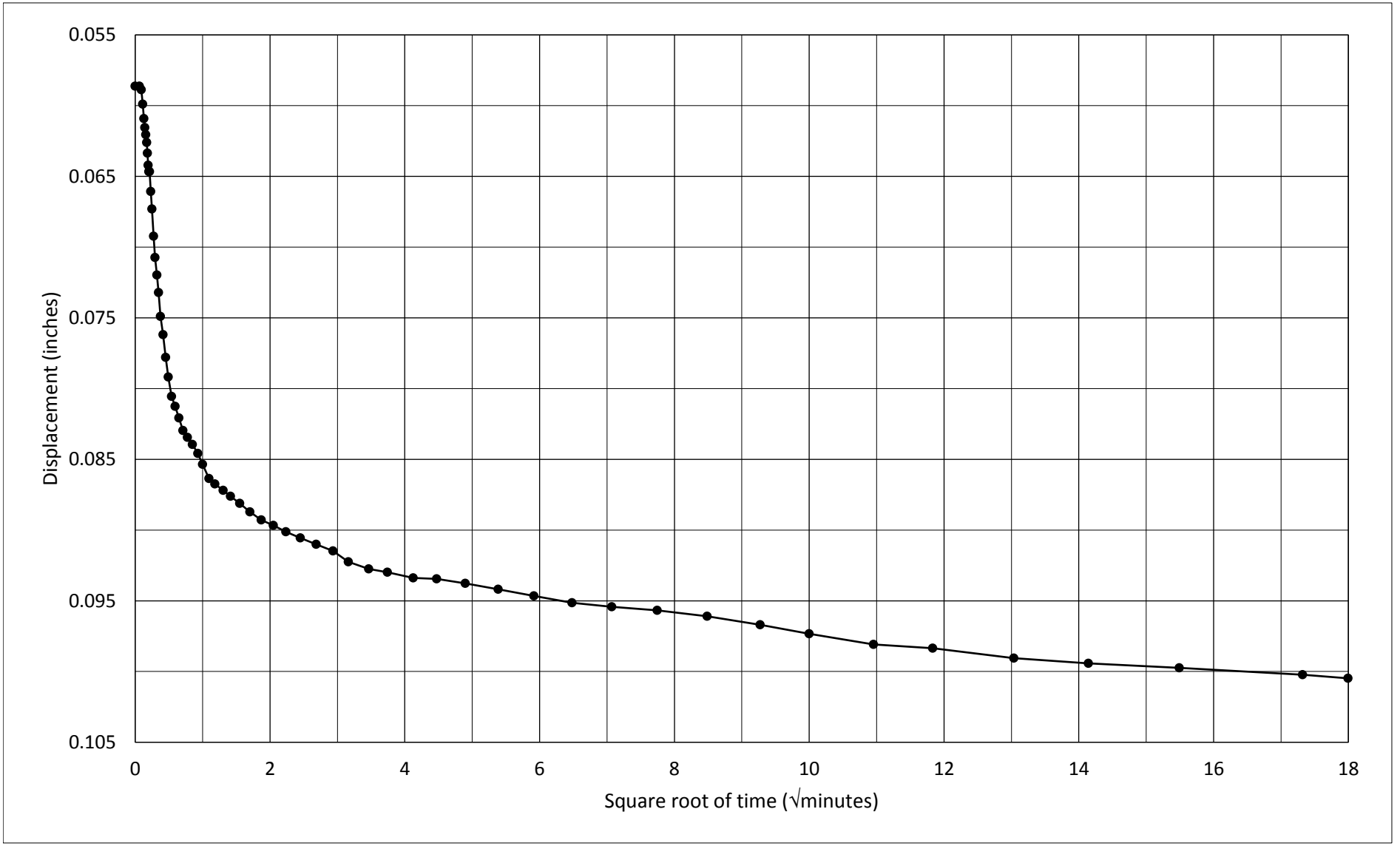
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-05
Depth: 51.5'-53'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-05
Depth: 51.5'-53'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah

7000 SOUTH

Boring Logs

DRILL HOLE LOG

BORING NO. 16-S-07

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 2

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 397920 E: 508576 / LAT: 40.623617 LONG: -111.976167

DATE STARTED: 4/13/16

DRILLING METHOD: UDOT CME-850 / H.Q.

DATE COMPLETED: 5/3/16

DRILLER: D.M.

GROUND ELEVATION: 4513.5'

DEPTH TO WATER - INITIAL: ▽ 78.0' **AFTER 24 HOURS:** ▼ N.M.

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
							14.5" CONCRETE								
				12	7,10,10,(45)	GP-GM	brown, moist, med. dense GRAVEL W/SILT & SAND								
4510				12	9,8,9,(30)	SC (A-6(3))	lt. brown, moist, dense		21.8	33	16	24	31	45	
	5			11	7,5,4,(15)	SC	lt. brown, moist, med. dense CLAYEY SAND W/GRAVEL								
4505				2	3,4,5,(17)	SC	lt. brown, moist, med. dense								
	10			6	2,3,4,(9)	SP-SM (A-1-a(0))	brown, moist, loose SAND W/SILT & GRAVEL		10.5		NP	40	48	12	
4500				13	19,25,26,(59)	SM	brown, moist, very dense								
	15			14	16,30,27,(61)	SM (A-1-a(0))	brown, very moist, very dense SILTY SAND W/GRAVEL possible cobbles		11.5		NP	35	51	14	
4495															
	20			14	18,35,30,(62)	GM	brown, very moist, dense SILTY GRAVEL W/SAND possible cobbles								
4490						ML (A-4(0))	brown, very moist SANDY SILT		20.7		NP	4	39	57	
	25			15	9,15,59,(63)	GP-GM	brown, very moist, dense GRAVEL W/SILT & SAND possible cobbles								
4485						GP-GM	brown, very moist								
	30			10	14,12,27,(30)	SM GP-GC	brown, very moist, med. dense SILTY SAND trace gravels								
4480															
	35			12	12,28,31,(43)	GP-GC (A-1-a(0))	brown, very moist, med. dense GRAVEL W/CLAY & SAND possible cobbles		10.3	22	4	59	29	12	
4475															
	40			11	10,27,21,(32)	GP-GC	brown, very moist, med. dense								
4470															
	45			19	Pushed PP >4.0	CL (A-4(3))	brown, very moist, hard GRAVELLY LEAN CLAY W/SAND	102.1	18.6	26	10	21	18	61	CT UU 10,097 psf
4465															
	50			12	19,60,45/3"	GP-GM	brown, very moist, very dense GRAVEL W/SILT & SAND possible cobbles								
4460															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample

2,3,2,(6) ← Blow Count per 6"
$(N_1)_{60}$ ← $(N_1)_{60}$ Value
T 0.45 ← Torvane (tsf)
PP 2.0 ← Pocket Penetrometer (tsf)
With Liners

Pushed
T 0.45 ← Torvane (tsf)
PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-07

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 397920 E: 508576 / LAT: 40.623617 LONG: -111.976167

DATE STARTED: 4/13/16

DRILLING METHOD: UDOT CME-850 / H.Q.

DATE COMPLETED: 5/3/16

DRILLER: D.M.

GROUND ELEVATION: 4513.5'

DEPTH TO WATER - INITIAL: ▽ 78.0' **AFTER 24 HOURS:** ▼ N.M.

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
	55			11	4,7,8,(11) *T 0.24* *PP 0.6*	CL (*A-4(3)*)	lt. brown, very moist, soft to firm SANDY LEAN CLAY		20.4	22	9	3	27	70	
4455	60			0	50/3"	-	no recovery								
4450	65			10	39,49,50/3"	GP-GM (*A-1-a(0)*)	brown, wet, very dense GRAVEL W/SILT & SAND possible cobbles, boulders		9.7		NP	48	42	10	
4445	70			7	14,50/6"	GP-GM	brown, wet, very dense								
4440	75			9	16,28,50/5"	GP-GM SM GP-GM	brown, very moist SILTY SAND brown, very moist, very dense								
4435 ▽	80			3	16,50/6"	GP-GM	gray & brown, very moist, very dense GRAVEL W/SILT & SAND possible cobbles								
4430	85			9	10,36,50,(40)	GP-GM (*A-1-a(0)*)	brown, wet, med. dense		9.2		NP	58	36	6	
4425	90			13	12,29,39,(31)	SM (*A-2-4(0)*)	SILTY SAND W/GRAVEL brown, very moist, dense		14.7		NP	17	51	32	
4420	95			7	40,50/3"	GP-GM	brown, wet, very dense GRAVEL W/SILT & SAND possible cobbles								
4415	100			8	28,53/6"	GP-GM	brown, very moist, very dense BOH								
4410	105														

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-08

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 398200 E: 508441 / LAT: 40.624384 LONG: -111.976658

DRILLING METHOD: UDOT CME-850 / H.Q.

DRILLER: D.M.

DEPTH TO WATER - INITIAL: ▽ 76.6' **AFTER 24 HOURS:** ▼ 94.0'

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 4/5/16

DATE COMPLETED: 4/11/16

GROUND ELEVATION: 4515.3'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4515															
				16	5,6,14,(45)	CL	dk. brown, dry, very stiff — SANDY LEAN CLAY W/GRAVEL								
				15	3,3,3,(14) *T 0.40*	CL (*A-6(16)*)	lt. brown, moist, firm — LEAN CLAY		29.9	37	16	0	6	94	Chem.
4510	5			13	Pushed	SM (*A-4(0)*)	lt. brown, very moist — SILTY SAND	90.2	24.9		NP	1	51	48	DS
				16	10,14,13,(52)	GM (*A-1-b(0)*)	brown, moist, dense — SILTY GRAVEL W/SAND possible cobbles		10.3		NP	47	36	17	
4505	10			0	17,34,35,(99+)	-	no recovery								
				8	11,16,16,(50)	GP-GM	brown, moist, dense — GRAVEL W/SILT & SAND possible cobbles								
						GP-GM	brown, moist								
4500	15			12	13,9,12,(23)	GM (*A-4(0)*)	brown, moist, loose — SILTY GRAVEL W/SAND plastic fines		14.4	21	2	31	30	39	
				12	8,21,18,(50)	SM (*A-1-b(0)*)	brown, moist, dense — SILTY SAND W/GRAVEL plastic fines		10.6	20	3	36	46	18	
4495	20			4	8,9,12,(25)	SM	brown, moist, med. dense								
4490	25			13	16,25,28,(45)	GC-GM (*A-2-4(0)*)	brown, very moist, med. dense — SILTY CLAYEY GRAVEL W/SAND		22.9	23	5	38	30	32	
							SANDY SILT plastic								
4485	30			10	4,10,11,(16)	ML (*A-4(0)*)	brown to lt. brown, wet, very stiff/med. dense		17.4	18	2	7	36	57	
				9	Pushed *PP 1.2*	CL (*A-4(3)*)	lt. brown, very moist, stiff — LEAN CLAY W/SAND	99.2	22.4	23	8	4	21	75	CT
4480	35			13	30,41,50/5"	GP-GM (*A-1-a(0)*)	brown, moist, very dense — GRAVEL W/SILT & SAND possible cobbles		10.1		NP	49	42	9	
4475	40			7	16,22,50/5"	GP-GM	brown, moist, very dense								
4470	45			6	33,70/3"	GM	brown, moist, very dense — SILTY GRAVEL W/SAND possible cobbles								
4465	50			6	36,50/3"	GP-GM	brown, moist, very dense — GRAVEL W/SILT & SAND possible cobbles								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- Pushed *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-08

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 398200 E: 508441 / LAT: 40.624384 LONG: -111.976658

DRILLING METHOD: UDOT CME-850 / H.Q.

DRILLER: D.M.

DEPTH TO WATER - INITIAL: ▽ 76.6' **AFTER 24 HOURS:** ▼ 94.0'

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 4/5/16

DATE COMPLETED: 4/11/16

GROUND ELEVATION: 4515.3'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4460				5	29,50/4"	GP-GM	brown, very moist, very dense GRAVEL W/SILT & SAND possible cobbles								
4455	60			8	11,12,14,(14) *T 0.22*	GC (*A-6(2)*)	brown, wet, med. dense CLAYEY GRAVEL W/SAND		17.9	31	13	34	24	42	
4450	65			0	50/6"	-	no recovery								
4445	70			5	24,53/6"	GP-GM	brown, wet, very dense GRAVEL W/SILT & SAND possible cobbles								
4440	75			4	24,50/4"	GP-GM	brown, wet, very dense								
4435	80			11	21,61,50/4"	GP-GM (*A-1-a(0)*)	brown, very moist, very dense		9.3		NP	62	27	11	
4430	85			7	22,63/5"	GM	brown, very moist, very dense SILTY GRAVEL W/SAND possible cobbles								
4425	90			8	76,43/2"	GM	brown, very moist, very dense								
4420	95			9	17,29,18,(27)	GM SM	brown, very moist brown, moist, med. dense SILTY SAND								
4415	100			11	21,40,44,(47)	GM	brown, wet, med. dense SILTY GRAVEL W/SAND possible cobbles								
4410	105						BOH								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- Blow Count per 6" (2,3,2,(6))
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-09

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 398152 E: 508592 / LAT: 40.624254 LONG: -111.976114

DATE STARTED: 5/9/16

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 26.5'

DATE COMPLETED: 5/10/16

DRILLER: T.K.

GROUND ELEVATION: 4512.5'

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ DRY TO 98'

LOGGED BY: C.S., M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4510	0			13	*T 1.13* 5,7,7,(29)	CL GM	brown, very stiff — LEAN CLAY brown, sl. moist, m. dense — SILTY GRAVEL W/SAND								
						GM	brown, moist — clay layers to 1" thick								
				13	4,3,3,(13) *T 0.30*	CL	brown, moist, firm								
4505	5			18	Pushed *T 0.35*	CL (*A-6(16)*)	brown, very moist, firm — LEAN CLAY		37.9	40	15	0	5	95	Chem.
					T 0.15	CL	brown, very moist, soft								
	10			12	1,4,4,(14)	SM	brown, sl. moist, med. dense — SILTY SAND								
4500				17	Pushed *T 0.52*	CL (*A-6(4)*)	lt. brown, very moist — SANDY LEAN CLAY W/GRAVEL	98.3	20.4	31	14	22	28	50	CT
	15					GC-GM	lt. brown, moist — SILTY CLAYEY GRAVEL W/SAND possible cobbles								
				16	12,28,38,(86)	GM	brown, moist, very dense								
4495				14	34,55,50/4"	GM (*A-1-a(0)*)	brown, very moist, very dense — SILTY GRAVEL W/SAND sandy silt layers, possible cobbles		11.0		NP	55	32	13	
	20			15	10,34,46,(88)	GM	brown, very moist, very dense								
4490															
	25			8	4,17,26,(44)	SC-SM	brown, moist, dense								
4485							SILTY CLAYEY SAND W/GRAVEL possible cobbles								
	30			11	14,32,17,(49)	SC-SM (*A-1-b(0)*)	brown, very moist, dense		12.3	21	6	38	44	18	
4480															
	35			14	12,23,56,(68)	GM	brown, moist, dense — SILTY GRAVEL W/SAND slightly plastic, possible cobbles								
4475							SILTY SAND (driller's observation)								
	40						GRAVELS (driller's observation)								
				13	21,38,40,(63)	SP-SM (*A-1-a(0)*)	brown, moist, very dense — SAND W/SILT & GRAVEL		11.0		NP	25	65	10	
4470															
	45			1	Pushed	CL	brown, moist								
				15	6,13,11,(18) *T 0.59*	CL (*A-6(3)*)	brown, moist, stiff — SANDY LEAN CLAY W/GRAVEL		20.8	29	13	16	33	51	
4465															
	50			12	5,16,12,(20)	GC-GM (*A-2-4(0)*)	brown, moist, loose — SILTY CLAYEY GRAVEL W/SAND		12.5	20	4	44	27	29	
4460															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample: 2,3,2,(6) ← Blow Count per 6" ($(N_1)_{60}$ Value); *T 0.45* ← Torvane (tsf); *PP 2.0* ← Pocket Penetrometer (tsf); With Liners
- Thin-Walled Tube Sample: Pushed; *T 0.45* ← Torvane (tsf); *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-09

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 398152 E: 508592 / LAT: 40.624254 LONG: -111.976114

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 26.5'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ DRY TO 98'

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 5/9/16

DATE COMPLETED: 5/10/16

GROUND ELEVATION: 4512.5'

LOGGED BY: C.S., M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4455				12	20,31,30,(42)	GC-GM	brown, moist, med. dense								
	60			13	10,24,55,(52)	GC-GM	lt. brown to brown, moist, dense SILTY CLAYEY GRAVEL W/SAND								
4450															
	65			15	30,36,26,(41)	GC-GM (A-2-4(0))	brown, moist, med. dense		12.7	21	4	45	27	28	
4445															
	70			10	36,63/6"	GP-GM	brown, very moist, very dense GRAVEL W/SILT & SAND possible cobbles								
4440															
	75			8	37,50/2"	GP-GM SP-SM	brown, very moist brown, very moist, very dense SAND W/SILT & GRAVEL possible cobbles								
4435															
	80			17	29,45,32,(44)	SM (A-4(0))	brown, moist, dense SILTY SAND trace gravels, many clayey sand layers		21.6		NP	13	41	46	
4430															
	85			5	67/6"	GP-GM	brown, very moist, very dense								
4425															
	90			5	70/6"	GP-GM	brown, very moist, very dense GRAVEL W/SILT & SAND possible cobbles, boulders								
4420															
	95			4	60/5"	GP-GM	brown, very moist, very dense								
4415							SANDY SILT clay lenses & layers								
	100			18	9,24,40,(33)	ML (A-4(0))	brown, wet, dense		29.2		NP	0	36	64	
4410							BOH								
	105														
4405															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- T 0.45 ← Torvane (tsf)
- PP 2.0 ← Pocket Penetrometer (tsf)
- With Liners
- Pushed
- T 0.45 ← Torvane (tsf)
- PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-06

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 1

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 397733 E: 508448 / LAT: 40.623103 LONG: -111.976625

DATE STARTED: 4/12/16

DRILLING METHOD: UDOT CME-850 / H.Q.

DATE COMPLETED: 4/12/16

DRILLER: D.M.

GROUND ELEVATION: 4513.8'

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ N.M.

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
							8.5" CONCRETE								
				15	6,5,4,(20)	GP-GM CL	lt. brown, moist, stiff — GRAVEL W/SILT & SAND								
4510				17	6,7,5,(21)	CL	lt. brown, moist, stiff — SANDY LEAN CLAY trace gravels		23.0						Chem.
	5			14	2,2,6,(14)	CL (A-6(5))	lt. brown, moist		23.6	31	12	14	27	59	
				0	6,4,2,(12)	-	no recovery								
4505				24	Pushed T 0.20 PP 1.0	CL (A-6(10))	lt. brown, wet, firm — SANDY LEAN CLAY	86.6	31.8	34	17	2	28	70	CT DS UU 2,044 psf
	10			13	2,2,4,(9) T 0.24 PP 1.0	CL	lt. brown, moist, firm								
4500															
	15			11	4,13,16,(31)	GM (A-1-b(0))	lt. brown, very moist, med. dense — SILTY GRAVEL W/SAND clay lenses		16.1		NP	42	38	20	
4495															
	20			11	11,44,32,(71)	GP-GM	brown, very moist, dense								
4490															
	25			2	48,50/5"	GP-GM	brown, very moist, very dense								
4485							GRAVEL W/SILT & SAND possible cobbles								
	30			11	13,37,36,(57)	GP-GM (A-1-a(0))	brown, very moist, dense		8.7		NP	62	30	8	
4480															
	35			3	12,25,36,(43)	GP-GM	brown, very moist, med. dense								
4475															
	40			6	5,5,6,(7)	GC-GM (A-1-b(0))	mottled brown & lt. brown, wet, very loose — SILTY CLAYEY GRAVEL W/SAND		15.7	23	6	53	23	24	
				18	4,3,4,(6) T 0.40	CL-ML (A-4(0))	mottled brown & lt. brown, wet — SANDY SILTY CLAY trace gravels		26.1	25	6	14	36	50	
4470															
	45			4	12,39,50/5"	GP-GM	black, wet, very dense — GRAVEL W/SILT & SAND possible cobbles								
4465							SILTY GRAVEL W/SAND possible cobbles								
	50			10	10,21,23,(26)	GM	brown, wet, loose								
							BOH								
4460															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6" ($(N_1)_{60}$ Value)
- T 0.45 ← Torvane (tsf)
- PP 2.0 ← Pocket Penetrometer (tsf)
- With Liners
- Pushed T 0.45 ← Torvane (tsf)
- Pushed PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-07

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 1

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 398381 E: 508440 / LAT: 40.624879 LONG: -111.976666

DATE STARTED: 4/7/16

DRILLING METHOD: UDOT CME-850 / H.Q.

DATE COMPLETED: 4/11/16

DRILLER: D.M.

GROUND ELEVATION: 4513.6'

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ N.M.

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				15	1,2,2,(9) *T 0.10*	GP-GM CL	brown, very moist — GRAVEL W/SILT & SAND lt. brown, moist, very soft								
4510				18	7,4,4,(18) *T 0.10*	CL CL	lt. brown, wet, very soft to soft — GRAVELLY LEAN CLAY trace sand, strong sewer odor (fill)								
	5			24	Pushed *PP 0.5*	(*A-6(5)*) CL-ML	lt. brown, wet		24.9	34	13	29	14	57	
						(*A-4(5)*)	brown, wet, soft — SILTY CLAY W/SAND	83.4	34.5	27	7	0	16	84	CT
				15	7,6,7,(25)	SM,GM	brown, moist — SILTY SAND & GRAVEL lt. gray, sl. moist, stiff								
4505						CL									
	10			8	4,4,4,(13) *PP 0.4*	CL (*A-7-6(17)*)	LEAN CLAY W/SAND lt. brown, moist, firm		24.8	43	26	3	26	71	
							lt. brown, moist — GRAVEL W/SILT & SAND								
				3	3,1,3,(6)	GP-GM CL	lt. brown, very moist — LEAN CLAY								
4500															
	15			11	Pushed	SM (*A-4(0)*)	brown, moist — SILTY SAND W/GRAVEL clay lenses & layers to 1" thick	118.6	17.0	21	2	15	38	47	
				9	5,6,9,(19)	GP-GM	brown, very moist, loose								
4495				8	12,13,14,(33)	GP-GM	brown, very moist, med. dense								
	20														
4490															
	25			2	11,14,9,(25)	GP-GM	brown, moist, loose — GRAVEL W/SILT & SAND possible cobbles								
4485															
	30			11	14,29,30,(45)	GP-GM (*A-1-a(0)*)	brown, wet, med. dense		9.7		NP	49	41	10	
4480															
	35			4	12,6,8,(13)	CL	brown, wet, stiff — SANDY LEAN CLAY W/GRAVEL								
4475							SAND W/SILT & GRAVEL lt. brown, very moist								
	40			13	17,46,25,(47)	SP-SM SM	brown, very moist, dense — SILTY SAND W/GRAVEL								
4470															
	45			12	50,51/6"	SP-SM (*A-1-a(0)*)	brown, very moist, very dense — SAND W/SILT & GRAVEL possible cobbles		11.1		NP	45	45	10	
4465															
	50			9	23,60/6"	SP-SM	brown, very moist, very dense								
							BOH								
4460															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6" ($(N_1)_{60}$ Value)
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- Pushed *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-08

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 1

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 397471 E: 508581 / LAT: 40.622384 LONG: -111.976141

DATE STARTED: 5/16/16

DRILLING METHOD: 08-CME-55 / N.W. CASING TO 28'

DATE COMPLETED: 5/16/16

DRILLER: T.K.

GROUND ELEVATION: 4516.1'

DEPTH TO WATER - INITIAL: ▽ DRY'

AFTER 24 HOURS: ▼ N.M.

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4515	0			13	6,11,13,(50)	CL (A-4(2))	dk. gray-brown, sl. moist, very stiff — SANDY LEAN CLAY, trace gravel		11.2	27	10	11	38	51	
				4	Pushed T 0.42	CL	dk. brown, moist, firm — LEAN CLAY W/SAND								
4510	5			14	T 0.37 Pushed	CL (A-6(12))	dk. brown, wet, firm	79.6	39.0	38	14	0	15	85	CT
				13	5,7,8,(29)	SM	lt. brown, moist, med. dense — SILTY SAND, trace gravel								
	10			8	5,6,6,(21)	SM (A-2-4(0))	lt. brown, moist, med. dense		18.0		NP	13	69	18	
4505				10	Pushed T 0.21 PP 0.6	CL (A-6(6))	brown, moist, soft to firm — SANDY LEAN CLAY	103.2	19.8	32	12	3	31	66	CT
	15			14	12,27,31,(75)	GP-GM	brown, very moist, dense — GRAVEL W/SILT & SAND, possible cobbles								
4500				8	11,18,23,(49)	GP-GM	brown, moist, med. dense								
	20			10	25,15,12,(30)	GM GC	brown, very moist — SILTY GRAVEL W/SAND, slightly plastic; brown, very moist, med. dense — CLAYEY GRAVEL W/SAND								
4495															
	25			12	40,35,20,(56)	GP-GM (A-1-a(0))	brown, very moist, dense — GRAVEL W/SILT & SAND, plastic, possible cobbles		10.8	21	3	64	26	10	
4490															
	30			13	10,39,40,(73)	SM (A-4(0)) GP-GM	brown, moist — SILTY SAND, trace gravel, pinhole structure; brown, moist, dense — GRAVEL W/SILT & SAND, slightly plastic, possible cobbles		15.4		NP	13	78	49	
4485															
	35			13	13,33,28,(53)	SM,GP-GM	brown, moist, dense — INTERBEDDED SILTY SAND W/GRAVEL & GRAVEL W/SILT & SAND LAYERS, possible cobbles								
4480															
	40			12	8,9,14,(19)	GC (A-4(0))	brown, moist, loose — CLAYEY GRAVEL W/SAND, possible cobbles		13.1	24	10	37	27	36	
4475															
	45			10	45,60/4"	GP-GM	brown, moist, very dense — GRAVEL W/SILT & SAND, possible cobbles								
4470															
	50			13	40,60,61/5"	GP-GM	brown, moist, very dense								
4465							BOH								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6" (N_1)$_{60}$ Value
- T 0.45 ← Torvane (tsf)
- PP 2.0 ← Pocket Penetrometer (tsf)
- With Liners
- Pushed T 0.45 ← Torvane (tsf)
- Pushed PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
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Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

Laboratory Test Results – Summary Tables

SUMMARY OF TEST DATA
BANGERTER 4 INTERCHANGES
7000 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	IN-PLACE		UNCONFINED OR UU TRIAXIAL COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO CLASSIFICATION)
		DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
16-S-07	2.8-4.3		21.8		33	17	16	24	31	45	SC (A-6 (3))
	11-12.5		10.5				NP	40	48	12	SP-SM (A-1-a (0))
	15-16.5		11.5				NP	35	51	14	SM (A-1-a (0))
	24-25.5 (top)		20.7				NP	4	39	57	ML (A-4 (0))
	34-35.5		10.3		22	18	4	59	29	12	GP-GC (A-1-a (0))
	44-46	102.1	18.6	UU 10,097	26	16	10	21	18	61	CL (A-4 (3))
	54-55.5		20.4		22	13	9	3	27	70	CL (A-4 (3))
	64-65.3		9.7				NP	48	42	10	GP-GM (A-1-a (0))
	84-85.5		9.2				NP	58	36	6	GP-GM (A-1-a (0))
	89--90.5		14.7				NP	17	51	32	SM (A-2-4 (0))
16-S-08	3-4.5		29.9		37	21	16	0	6	94	CL (A-6 (16))
	6-7.5	90.2	24.9				NP	1	51	48	SM (A-4 (0))
	7.5-9		10.3				NP	47	36	17	GM (A-1-b (0))
	15-16.5		14.4		21	19	2	31	30	39	GM (A-4 (0))
	18-19.5		10.6		20	17	3	36	46	18	SM (A-1-b (0))
	25-26.5		22.9		23	18	5	38	30	32	GC-GM (A-2-4 (0))
	30-31.5		17.4		18	16	2	7	36	57	ML (A-4 (0))
	31.5-33	99.2	22.4		23	15	8	4	21	75	CL (A-4 (3))
	35-36.5		10.1				NP	49	42	9	GP-GM (A-1-a (0))
	60-61.5		17.9		31	18	13	34	24	42	GC (A-6 (2))
	80-81.5		9.3				NP	62	27	11	GP-GM (A-1-a (0))
16-S-09	6-7.5		37.9		40	25	15	0	5	95	CL (A-6 (16))
	12-13.5	98.3	20.4		31	17	14	22	28	50	CL (A-6 (4))
	18-19.4		11.0				NP	55	32	13	GM (A-1-a (0))
	30-31.5		12.3		21	15	6	38	44	18	SC-SM (A-1-b (0))
	40-41.5		11.0				NP	25	65	10	SP-SM (A-1-a (0))
	45.2-46.7		20.8		29	16	13	16	33	51	CL (A-6 (3))
	50-51.5		12.5		20	16	4	44	27	29	GC-GM (A-2-4 (0))
	65-66.5		12.7		21	17	4	45	27	28	GC-GM (A-2-4 (0))

NP=Non-Plastic

SUMMARY OF TEST DATA
BANGERTER 4 INTERCHANGES
7000 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	IN-PLACE		UNCONFINED OR UU TRIAXIAL COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO CLASSIFICATION)
		DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
16-S-09	80-81.5		21.6				NP	13	41	46	SM (A-4 (0))
	100-101.5		29.2				NP	0	36	64	ML (A-4 (0))
16-E-06	3-4.5		23.0								
	4.5-6		23.6		31	19	12	14	27	59	CL (A-6 (5))
	8.5-10.5	86.6	31.8	UU 2,044	34	17	17	2	28	70	CL (A-6 (10))
	14.5-16		16.1				NP	42	38	20	GM (A-1-b (0))
	29.5-31		8.7				NP	62	30	8	GP-GM (A-1-a (0))
	39.5-41		15.7		23	17	6	53	23	24	GC-GM (A-1-b (0))
	41-42.5		26.1		25	19	6	14	36	50	CL-ML (A-4 (0))
16-E-07	5-7 (top)		24.9		34	21	13	29	14	57	CL (A-6 (5))
	5-7 (middle)	83.4	34.5		27	20	7	0	16	84	CL-ML (A-4 (5))
	10-11.5		24.8		43	17	26	3	26	71	CL (A-7-6 (17))
	15-16.2	118.6	17.0		21	19	2	15	38	47	SM (A-4 (0))
	29-30.5		9.7				NP	49	41	10	GP-GM (A-1-a (0))
	44-45		11.1				NP	45	45	10	SP-SM (A-1-a (0))
16-E-08	0-1.5		11.2		27	17	10	11	38	51	CL (A-4 (2))
	6-7.3	79.6	39.0		38	24	14	0	15	85	CL (A-6 (12))
	9-10.5		18.0				NP	13	69	18	SM (A-2-4 (0))
	12-13	103.2	19.8		32	20	12	3	31	66	CL (A-6 (6))
	25-26.5		10.8		21	18	3	64	26	10	GP-GM (A-1-a (0))
	30-31.5 (top)		15.4				NP	13	38	49	SM (A-4 (0))
	40-41.5		13.1		24	14	10	37	27	36	GC (A-4 (0))

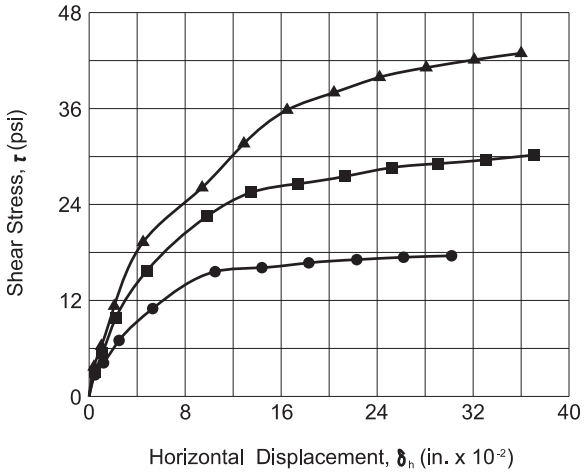
NP=Non-Plastic

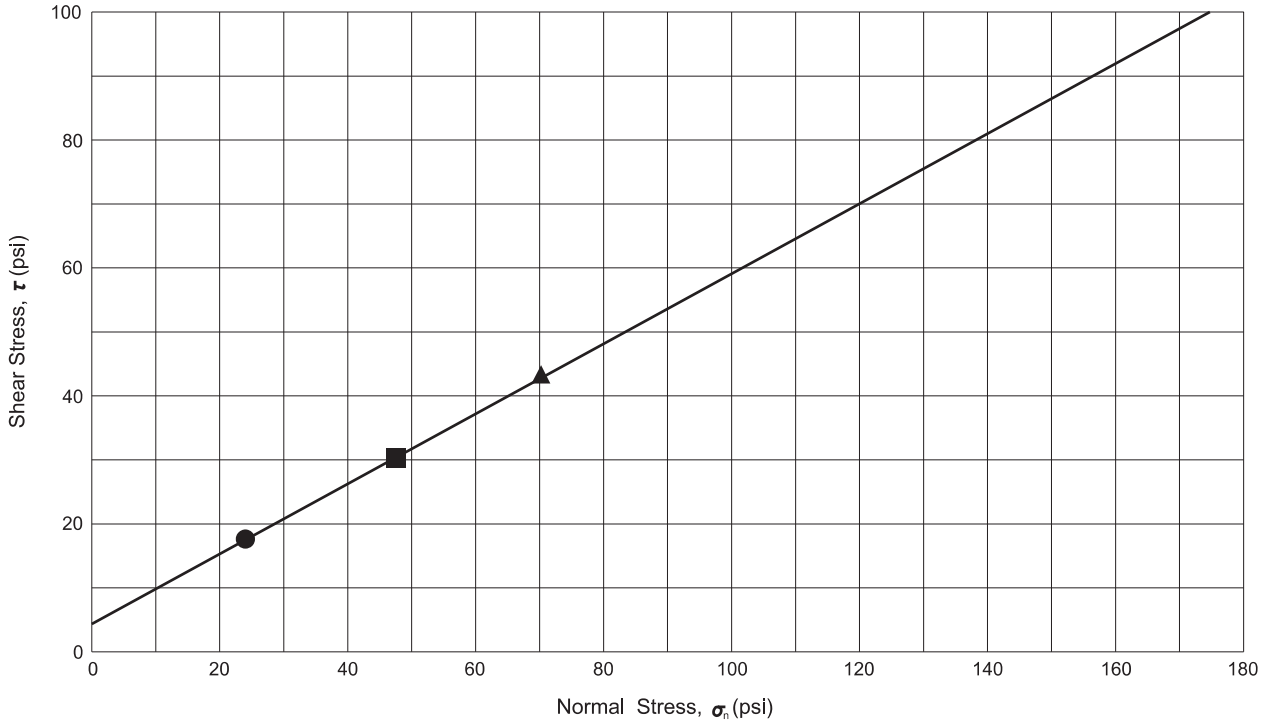
SUMMARY OF ELECTRO-CHEMICAL TEST DATA
BANGERTER 4 INTERCHANGES
7000 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	pH	RESISTIVITY (ohm-cm)	CHLORIDE (mg/kg-dry)	SULFATE (mg/kg-dry)
16-E-06	3-4.5	8.8	1400	95	43.7
16-S-08	3-4.5	6.7	1300	90	13.4
16-S-09	6-7.5'	9.4	530		

NP=Non-Plastic

Laboratory Test Results – Direct Shear





Test No. or Symbol	Sample Size (inches)	Sample Data		Degree of Saturation (%)	Normal Stress σ_n (psi)	Maximum Shear Stress τ (psi)	Strain Rate (inches/ minute)	Shear Strength Parameters	
		Dry Density (pcf)	Moisture Content (%)					Friction Angle (degrees)	Cohesion (psi)
●	2.36	90.2	25.2	~100	24.0	17.6	0.0014	28.7	4
■	2.42	90.4	25.3	~100	47.5	30.2	0.0014		
▲	2.43	90.0	24.9	~100	70.2	42.9	0.0014		

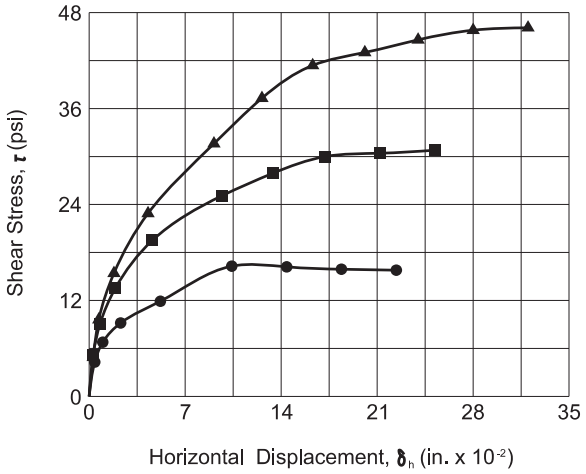
MATERIAL: SILTY SAND, SM (A-4(0))

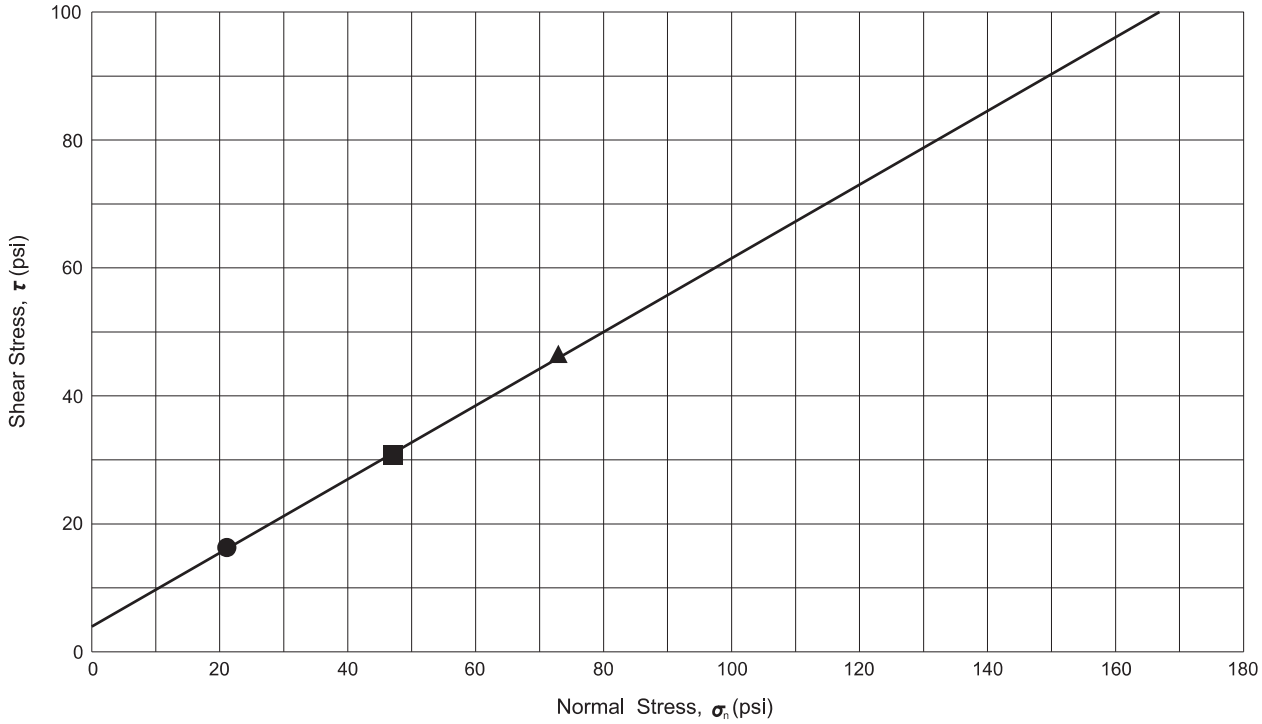
DIRECT SHEAR TEST

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

HOLE NO.: 16-S-08

DEPTH: 6'-7.5'





Test No. or Symbol	Sample Size (inches)	Sample Data		Degree of Saturation (%)	Normal Stress σ_n (psi)	Maximum Shear Stress τ (psi)	Strain Rate (inches/ minute)	Shear Strength Parameters	
		Dry Density (pcf)	Moisture Content (%)					Friction Angle (degrees)	Cohesion (psi)
●	2.37	87.9	31.1	~100	21.1	16.3	0.0006	29.9	4
■	2.35	88.4	31.3	~100	47.0	30.8	0.0006		
▲	2.36	88.2	31.0	~100	72.9	46.1	0.0006		

MATERIAL: SANDY LEAN CLAY, CL

DIRECT SHEAR TEST

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

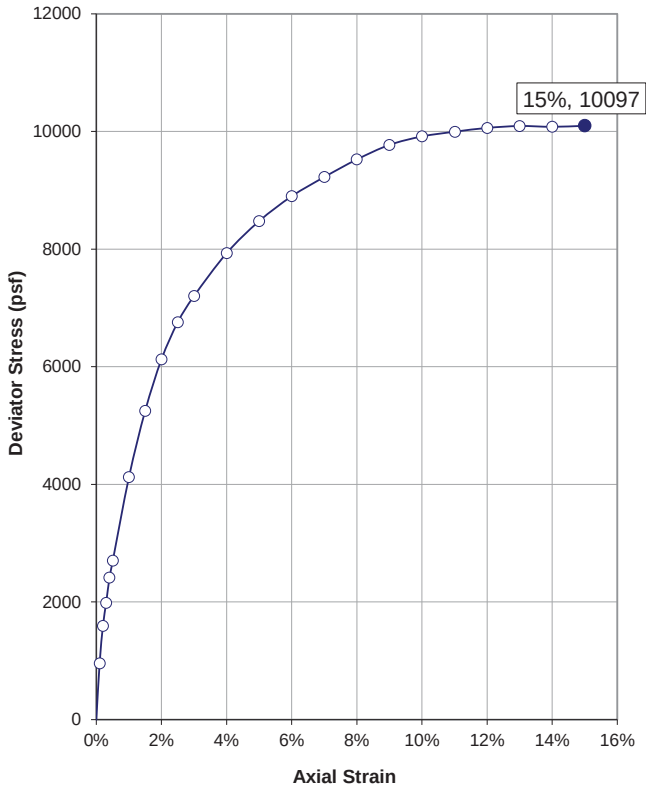
HOLE NO.: 16-E-06

DEPTH: 8.5'-10.5'

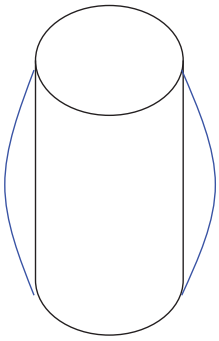
Laboratory Test Results – UU Triaxial Compression

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-S-07
Project No.	201601-009	**Sample**	1
Location	70000 So.	**Depth / Elev. (ft)**	44'-46'
Date	Wednesday, May 18, 2016	**Sample Description**	Gravelly Lean Clay w/ Sand CL
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-3	-1	
0.1%	959	480	
0.2%	1595	798	
0.3%	1987	994	
0.4%	2414	1207	
0.5%	2702	1351	
1.0%	4126	2063	
1.5%	5250	2625	
2.0%	6126	3063	
2.5%	6758	3379	
3.0%	7203	3602	
4.0%	7932	3966	
5.0%	8476	4238	
6.0%	8899	4449	
7.0%	9226	4613	
8.0%	9524	4762	
9.0%	9772	4886	
10.0%	9916	4958	
11.0%	9997	4998	
12.0%	10061	5031	
13.0%	10093	5047	
14.0%	10080	5040	
15.0%	10097	5049	



Initial Sample Data

Initial height of specimen	L_o	5.28	(in)	**Moisture content***	w	18.6%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	102.3	(pcf)
Height-to-diameter ratio	L_o / D_o	1.89		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	26		**Initial void ratio**	e_o	0.634	
Plastic index	PI	10		**Saturation**	S	79%	

Test Results

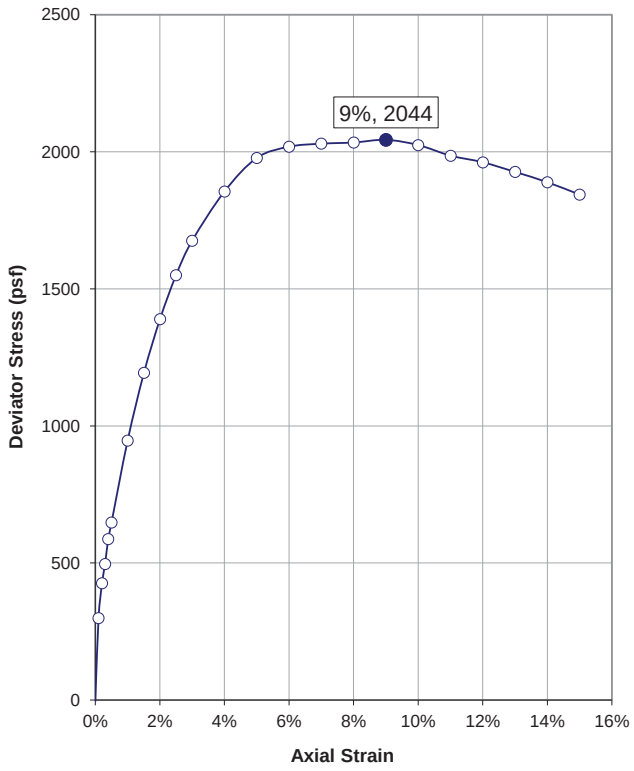
Deviator stress at failure**	$\sigma_{d,f}$	10097	(psf)	**Major principal stress at failure****	σ_1	15263	(psf)
Shear stress at failure**	c_u	5049	(psf)	**Minor principal stress at failure****	σ_3	5166	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

Remarks Confining Pressure 36 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-6
Project No.	201601-009	**Sample**	1
Location	7000 So.	**Depth / Elev. (ft)**	8.5'-10.5'
Date	Friday, April 29, 2016	**Sample Description**	Sandy Lean Clay CL (A-610))
		Sample Type	Shelby tube



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-5	-3	
0.1%	299	150	
0.2%	426	213	
0.3%	496	248	
0.4%	588	294	
0.5%	648	324	
1.0%	947	473	
1.5%	1194	597	
2.0%	1389	695	
2.5%	1550	775	
3.0%	1676	838	
4.0%	1855	928	
5.0%	1978	989	
6.0%	2019	1009	
7.0%	2030	1015	
8.0%	2034	1017	
9.0%	2044	1022	
10.0%	2024	1012	
11.0%	1986	993	
12.0%	1962	981	
13.0%	1927	963	
14.0%	1889	944	
15.0%	1844	922	

Initial Sample Data

Initial height of specimen	L_o	5.33	(in)	**Moisture content***	w	31.0%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	90.0	(pcf)
Height-to-diameter ratio	L_o / D_o	1.90		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	34		**Initial void ratio**	e_o	0.858	
Plastic index	PI	17		**Saturation**	S	97%	

Test Results

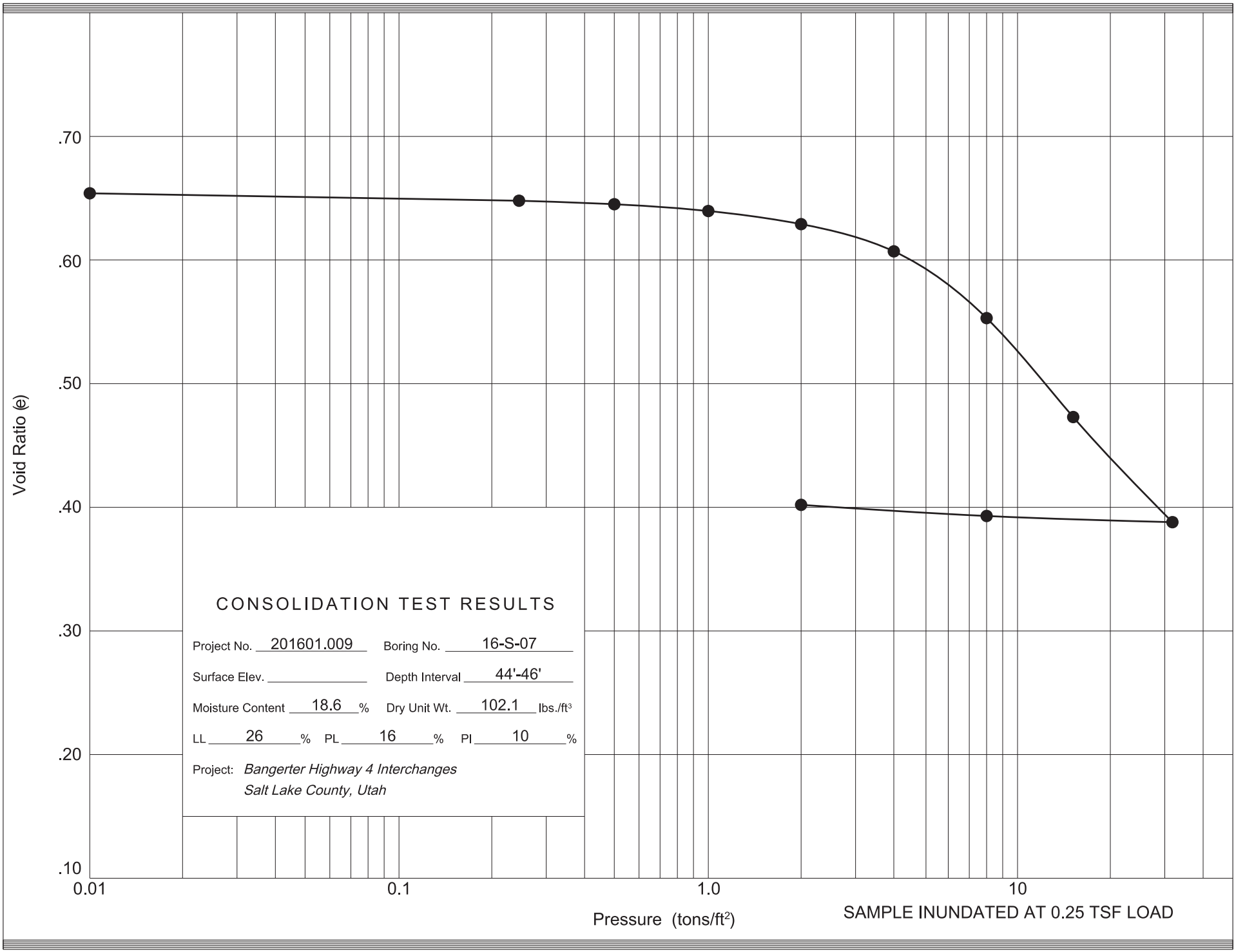
Deviator stress at failure**	$\sigma_{d,f}$	2044	(psf)	**Major principal stress at failure****	σ_1	3195	(psf)
Shear stress at failure**	c_u	1022	(psf)	**Minor principal stress at failure****	σ_3	1151	(psf)

Average strain rate to failure	1%	/ min
Strain at failure	9%	

Remarks Confining Pressure 8 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

Laboratory Test Results – Consolidation



CONSOLIDATION TEST RESULTS

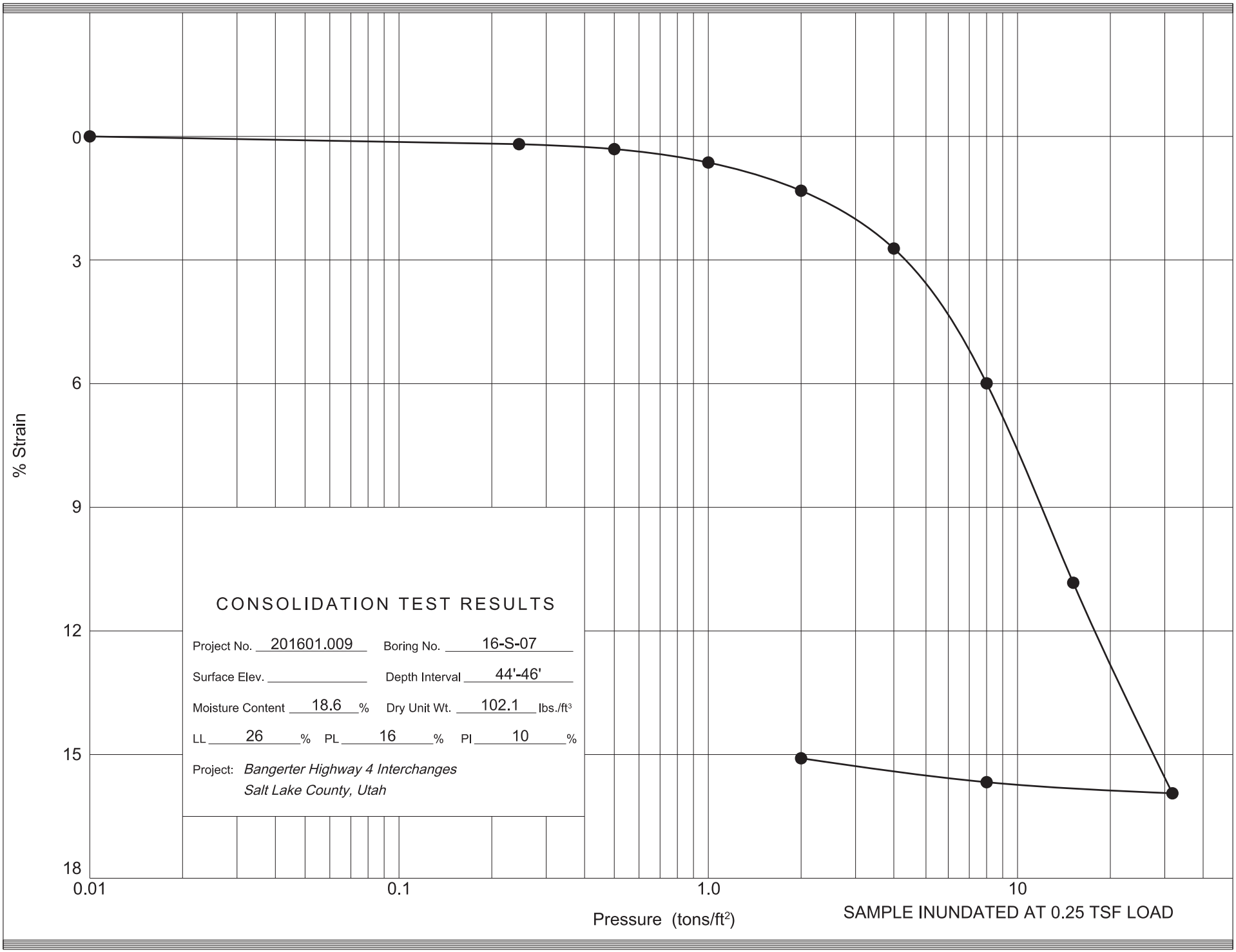
Project No. 201601.009 Boring No. 16-S-07

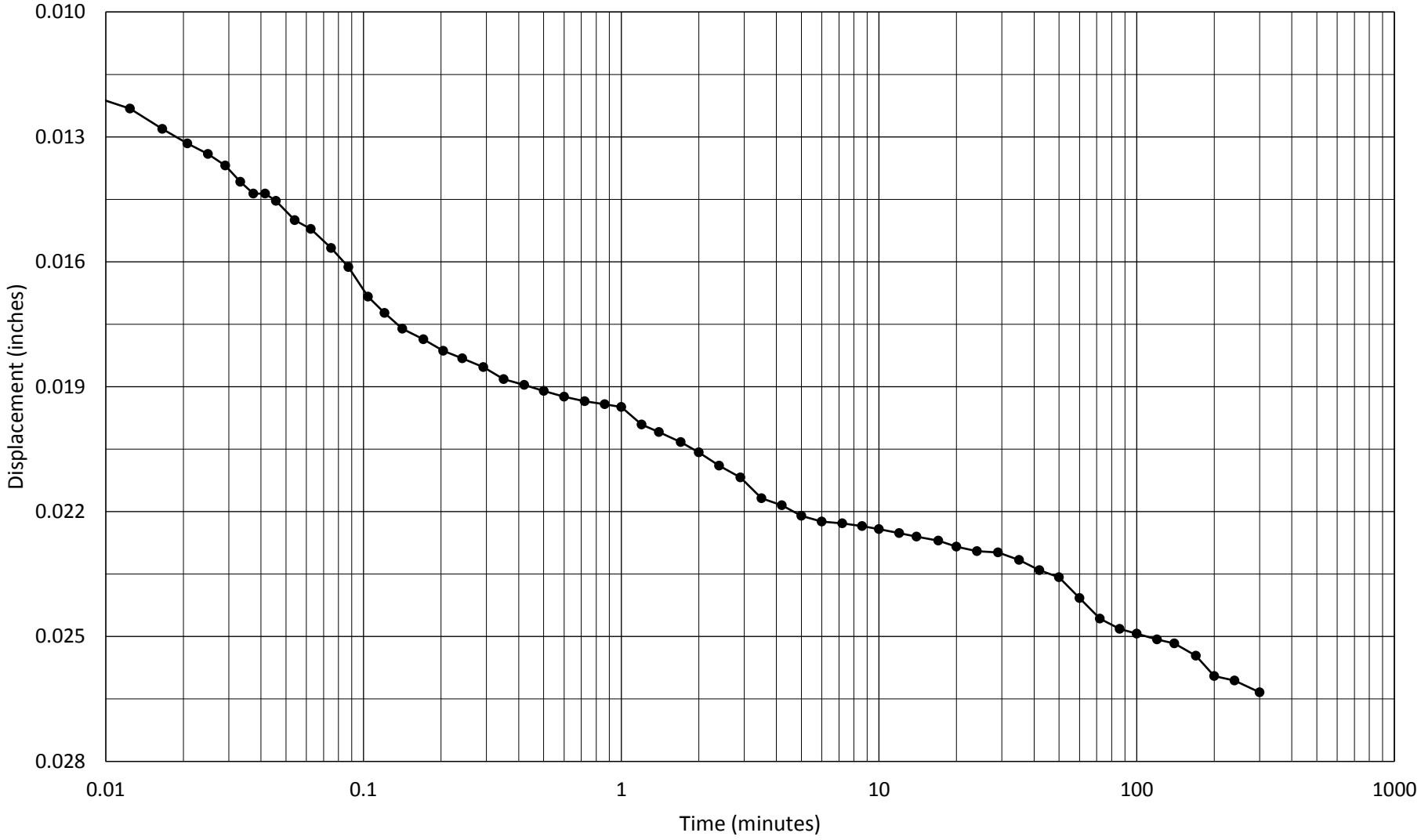
Surface Elev. _____ Depth Interval 44'-46'

Moisture Content 18.6 % Dry Unit Wt. 102.1 lbs./ft³

LL 26 % PL 16 % PI 10 %

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

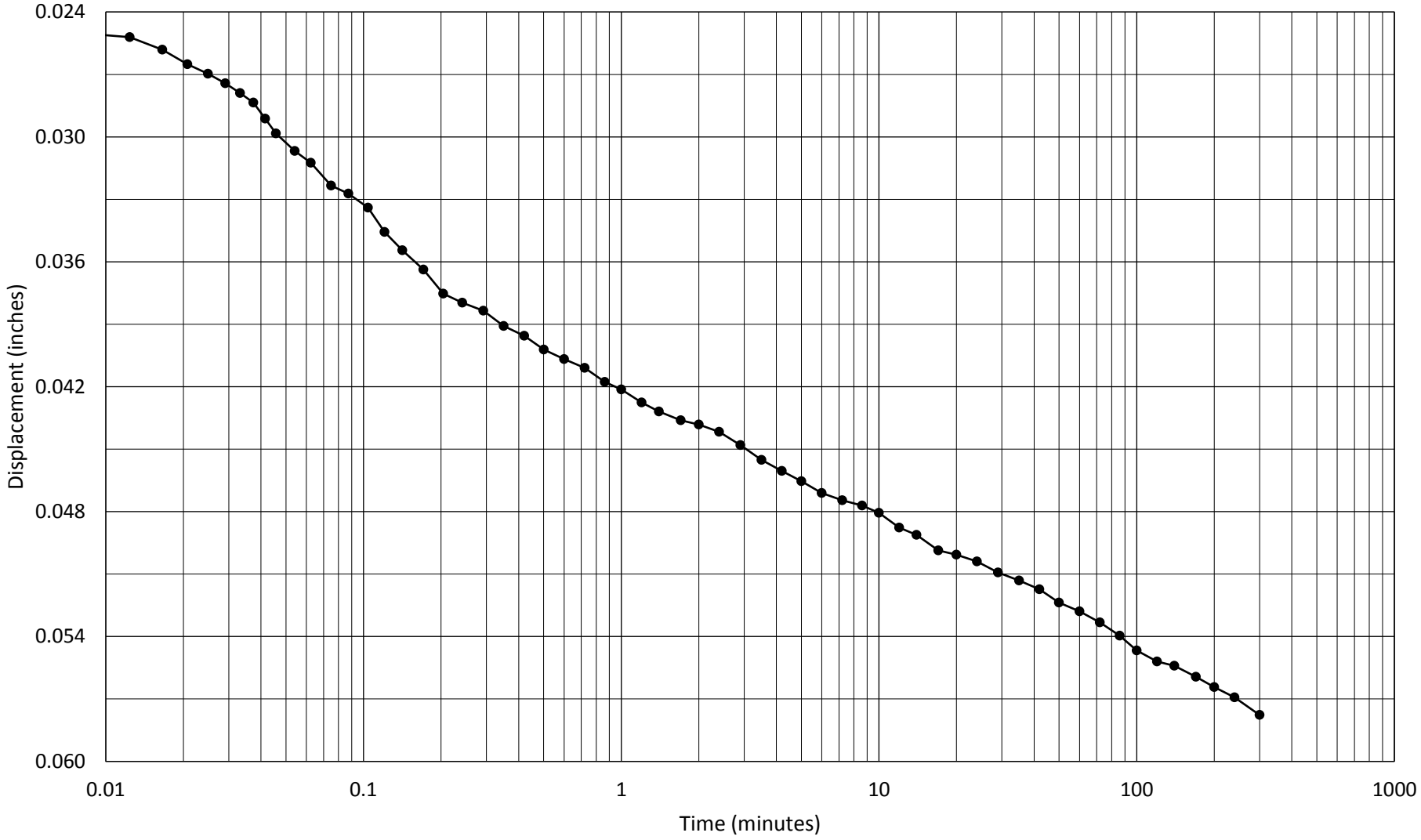

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-07
Surface Elev.
Depth Interval 44'-46'
Moisture Content 18.6 %
Dry Unit Wt. 102.1 lbs./ft³
LL 26 %
PL 16 %
PI 10 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-07
Depth: 44'-46'
Load: 2 to 4 tsf

TIME CONSOLIDATION

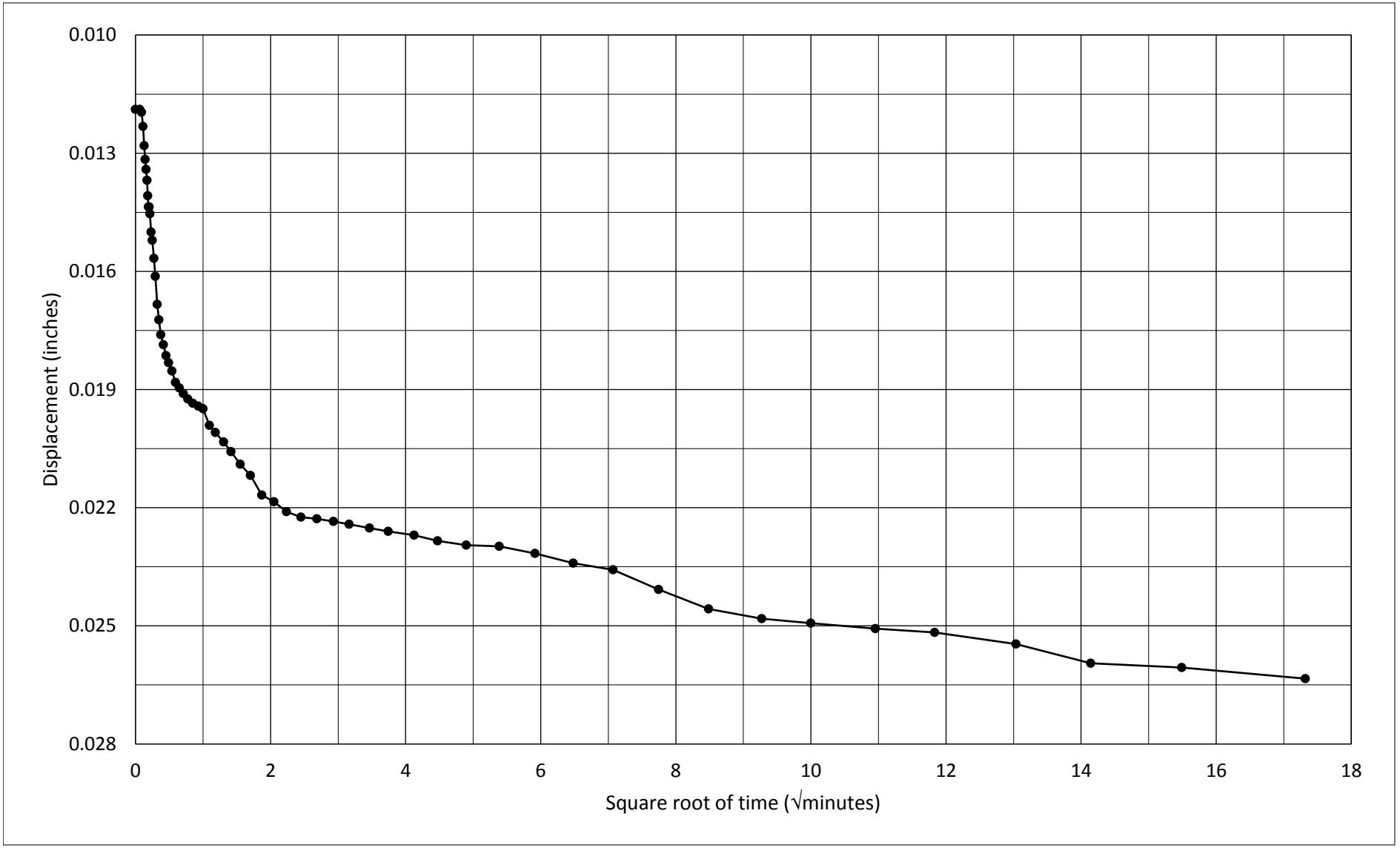
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-07
Depth: 44'-46'
Load: 4 to 8 tsf

TIME CONSOLIDATION

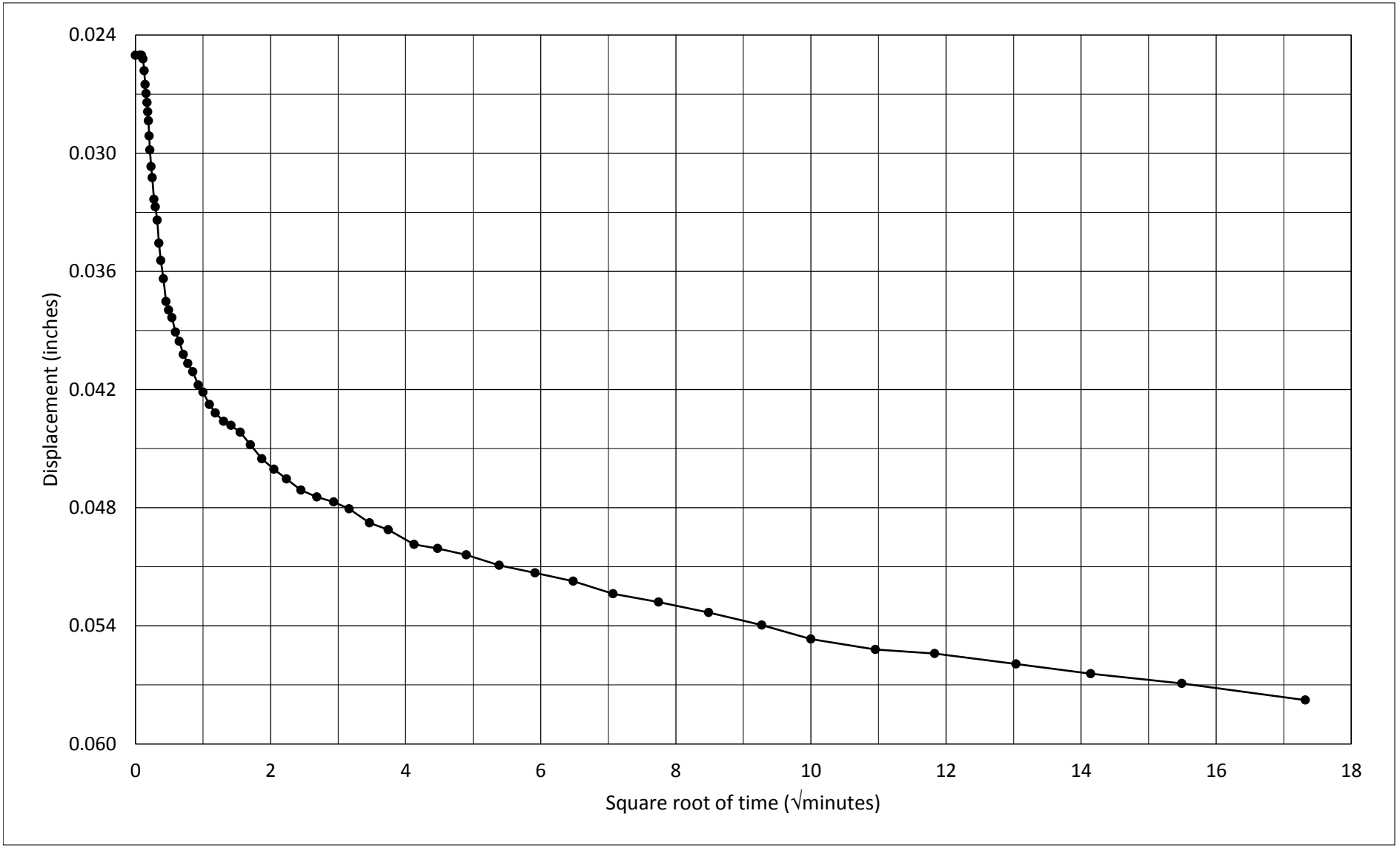
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-07
Depth: 44'-46'
Load: 2 to 4 tsf

TIME CONSOLIDATION

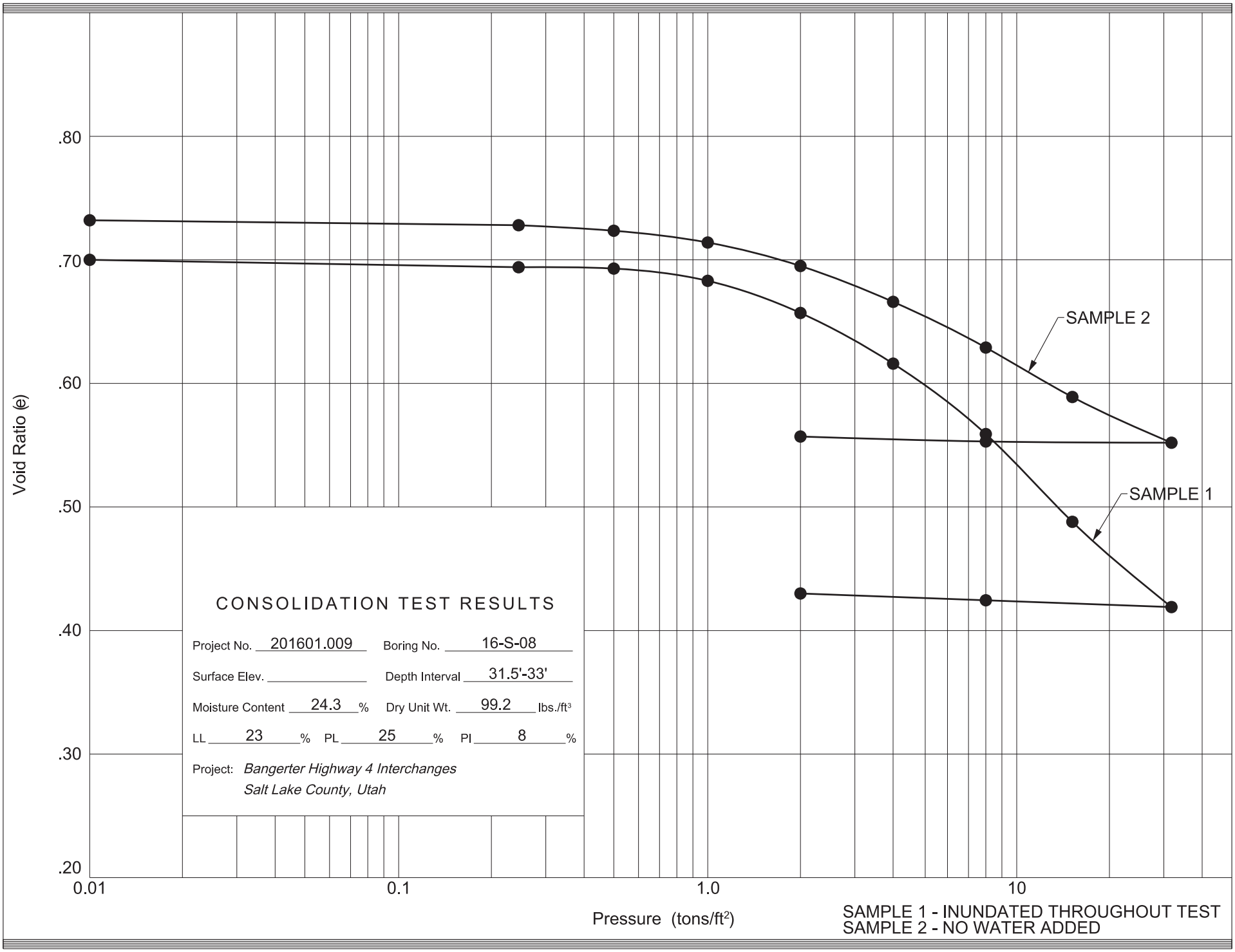
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

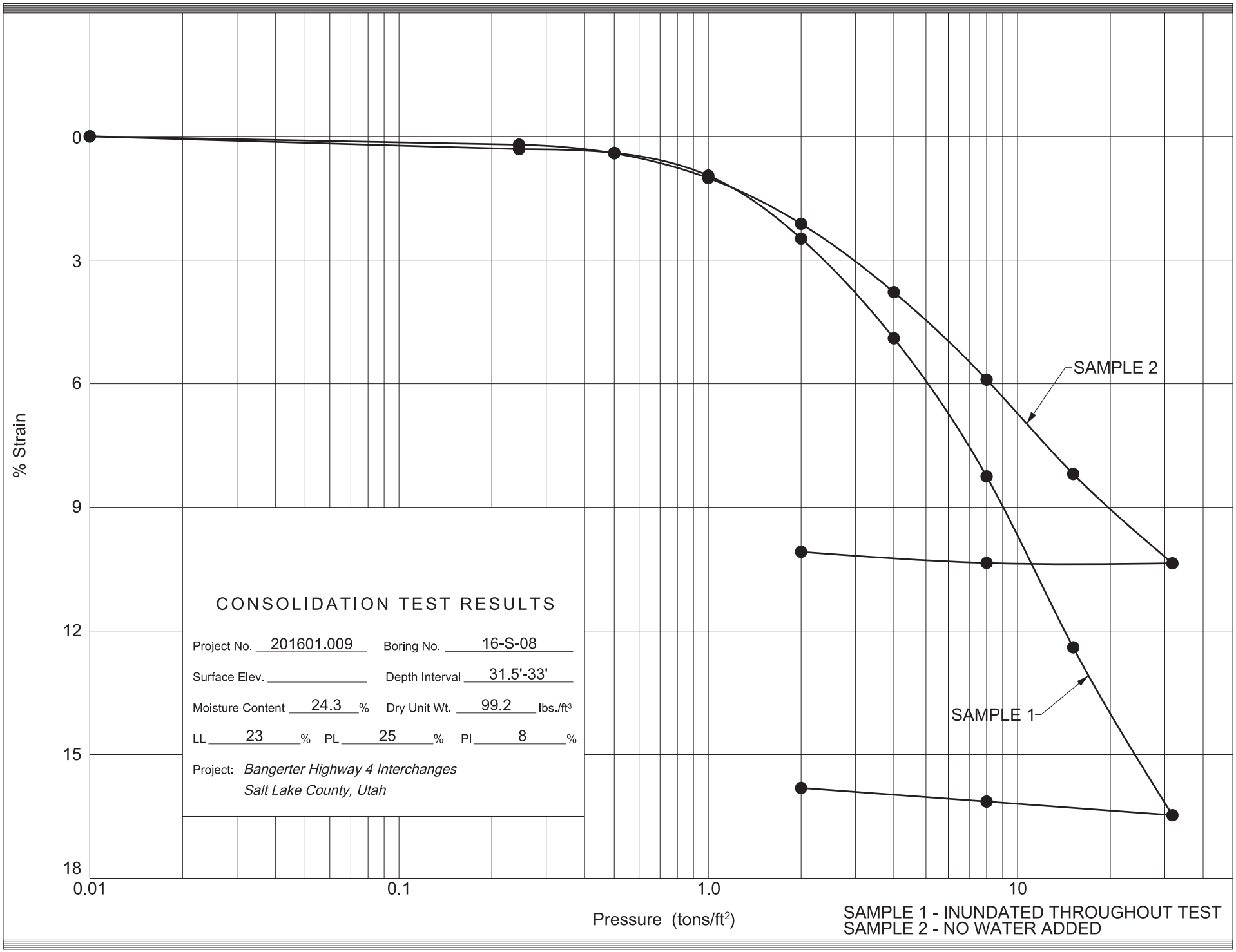


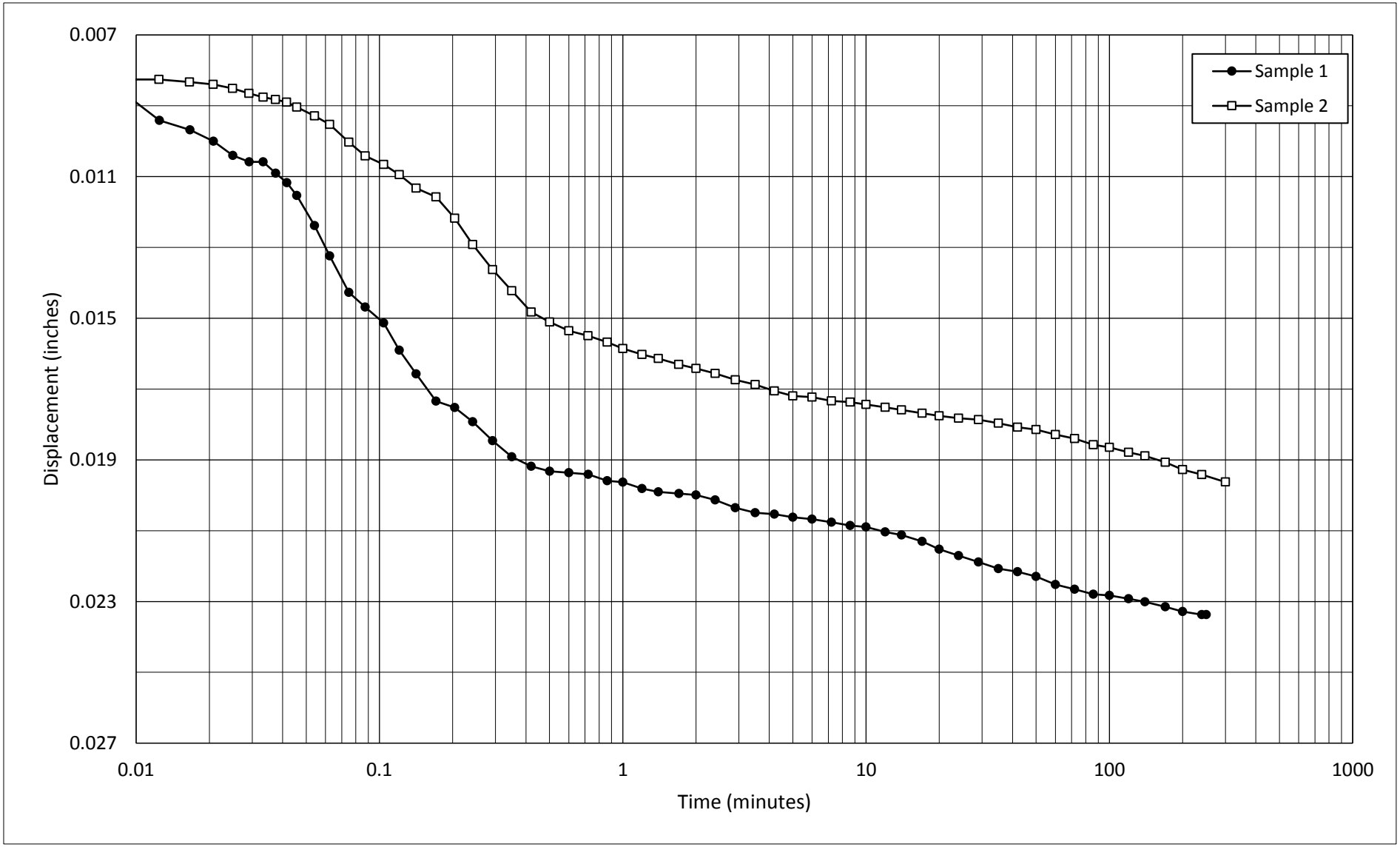
Hole no.: 16-S-07
Depth: 44'-46'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.80
.70
.60
.50
.40
.30
.20
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 2
SAMPLE 1
CONSOLIDATION TEST RESULTS
Project No. 201601.009 Boring No. 16-S-08
Surface Elev. Depth Interval 31.5'-33'
Moisture Content 24.3 % Dry Unit Wt. 99.2 lbs./ft³
LL 23 % PL 25 % PI 8 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED THROUGHOUT TEST
SAMPLE 2 - NO WATER ADDED

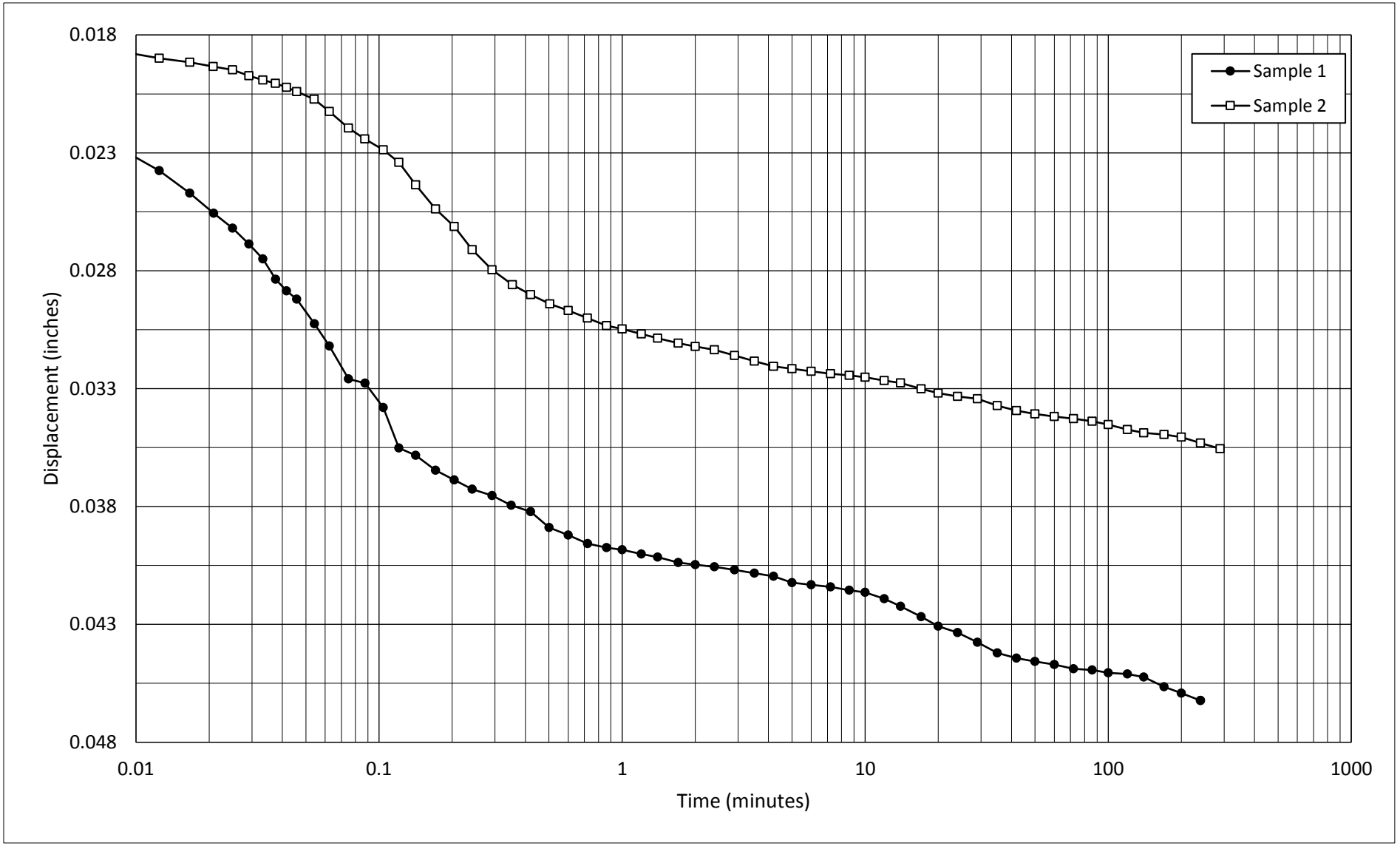

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 2
SAMPLE 1
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-08
Surface Elev.
Depth Interval 31.5'-33'
Moisture Content 24.3 %
Dry Unit Wt. 99.2 lbs./ft³
LL 23 % PL 25 % PI 8 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED THROUGHOUT TEST
SAMPLE 2 - NO WATER ADDED



Hole no.: 16-S-08
Depth: 31.5'-33'
Load: 1 to 2 tsf

TIME CONSOLIDATION

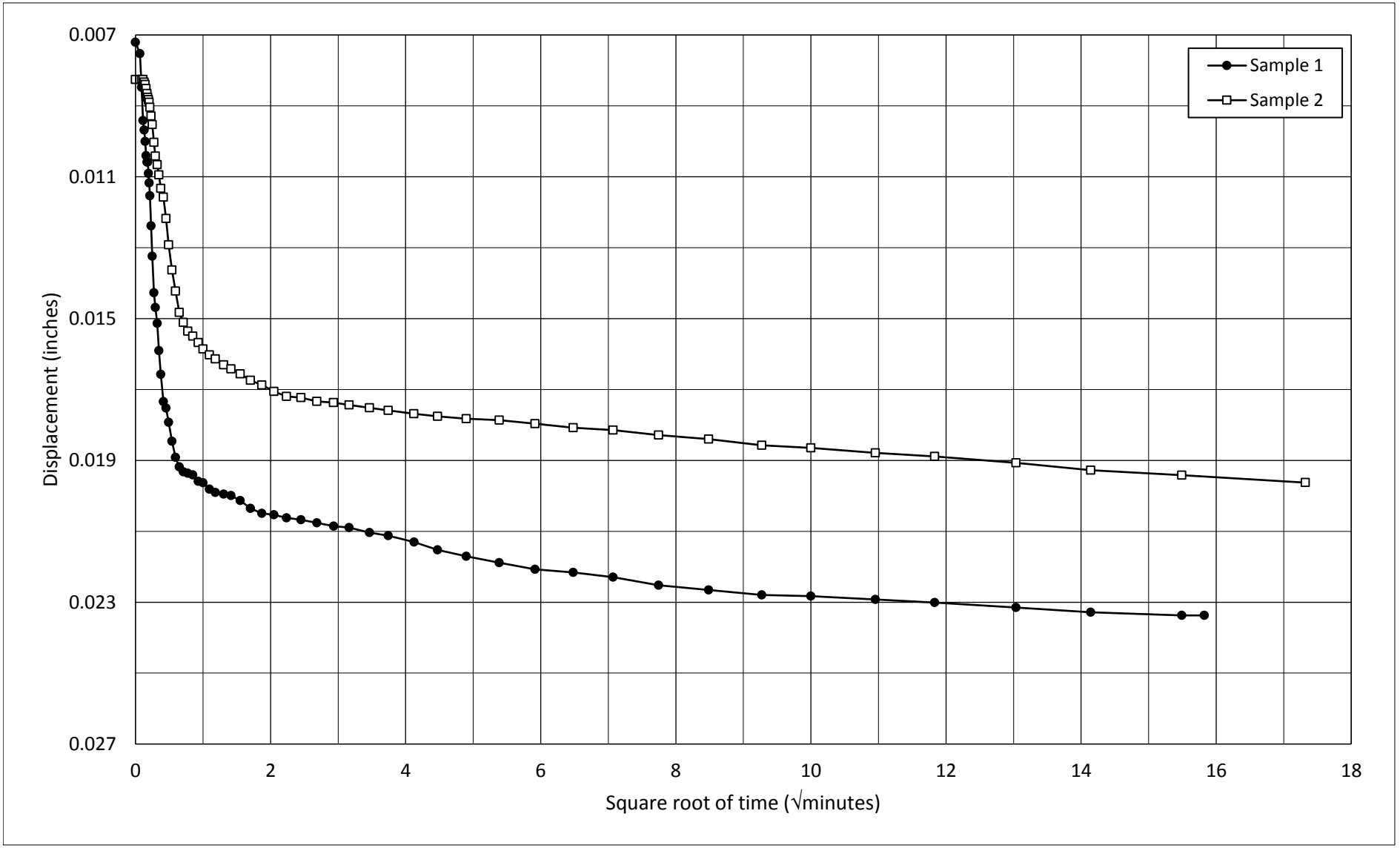
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-08
Depth: 31.5'-33'
Load: 2 to 4 tsf

TIME CONSOLIDATION

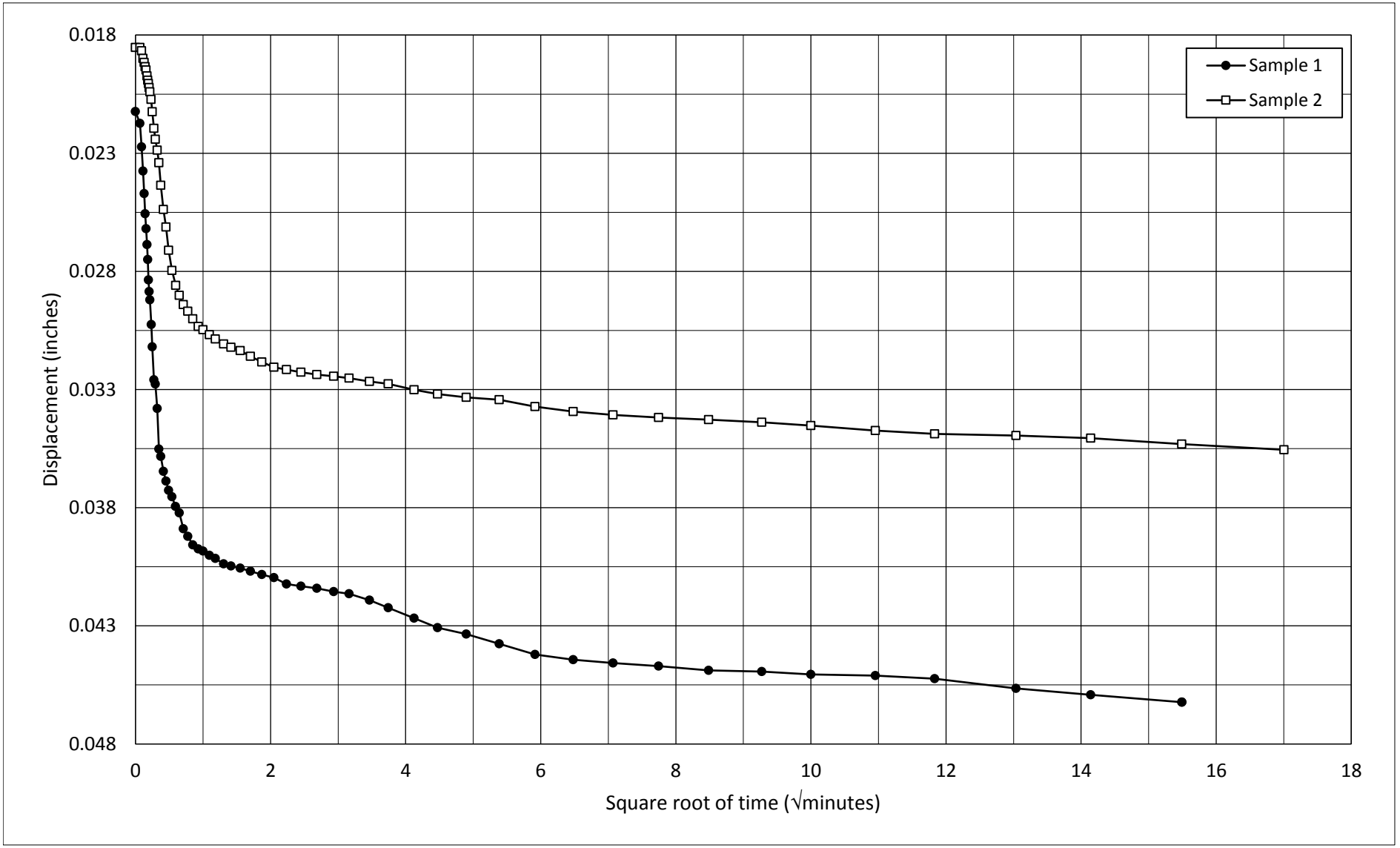
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-08
Depth: 31.5'-33'
Load: 1 to 2 tsf

TIME CONSOLIDATION

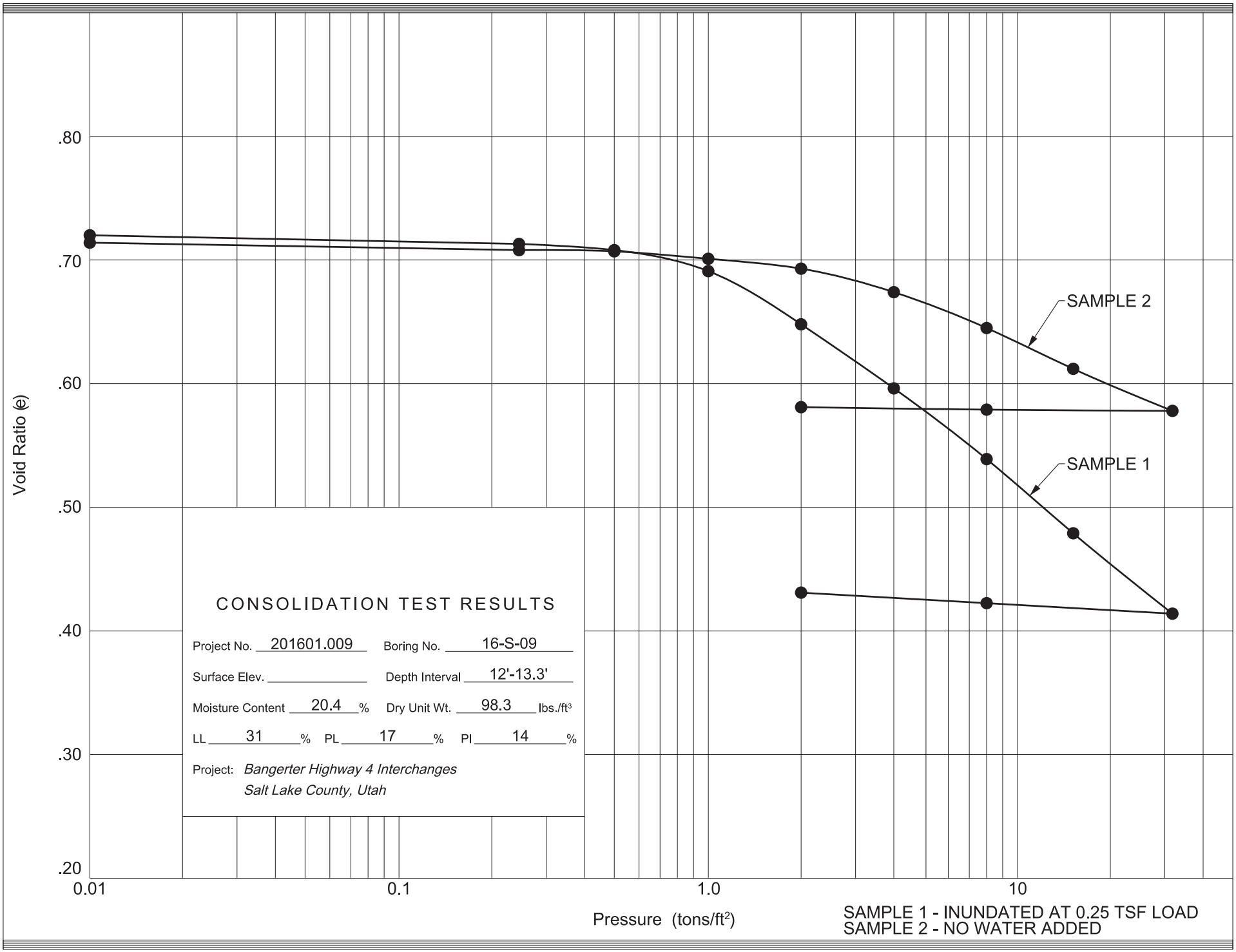
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

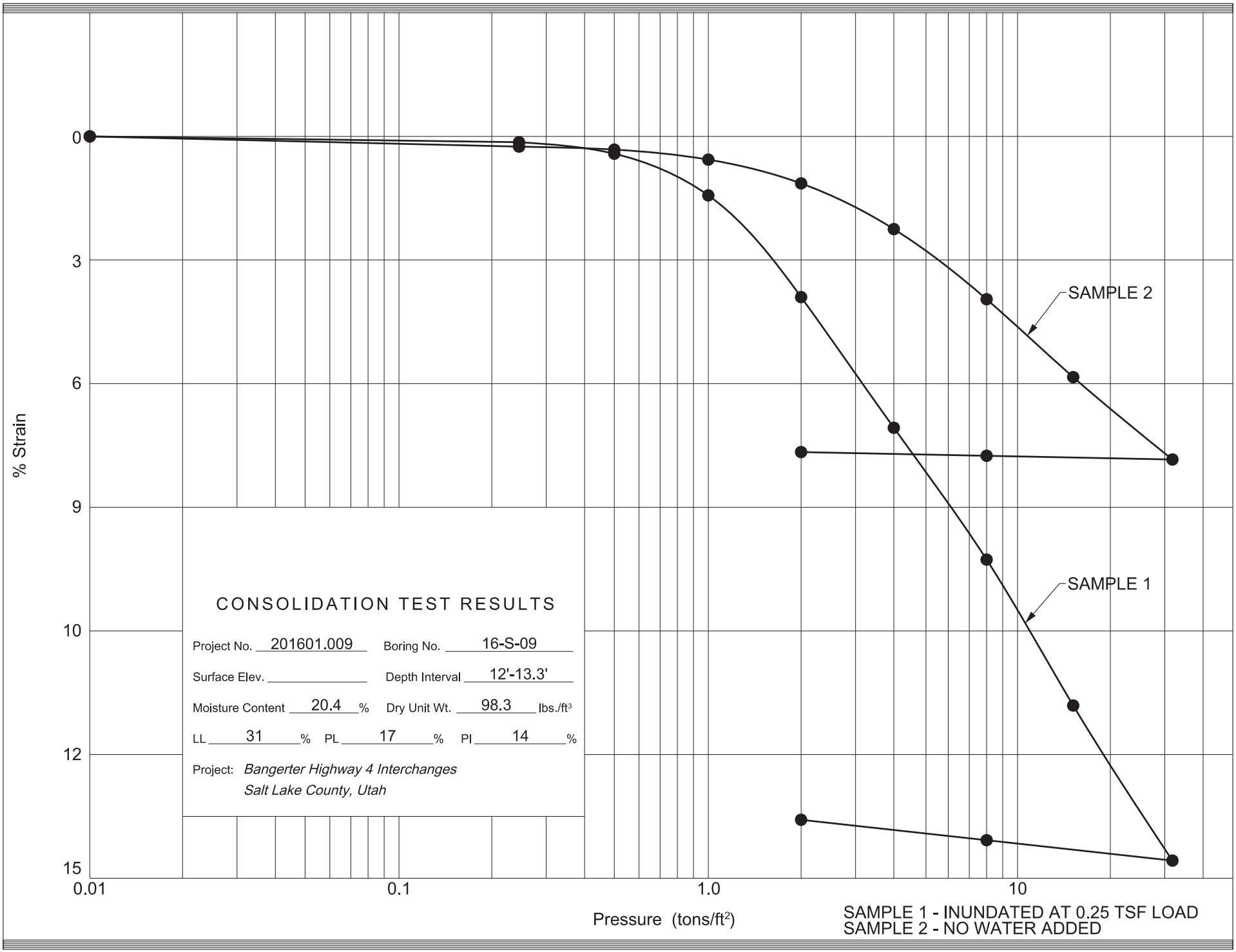


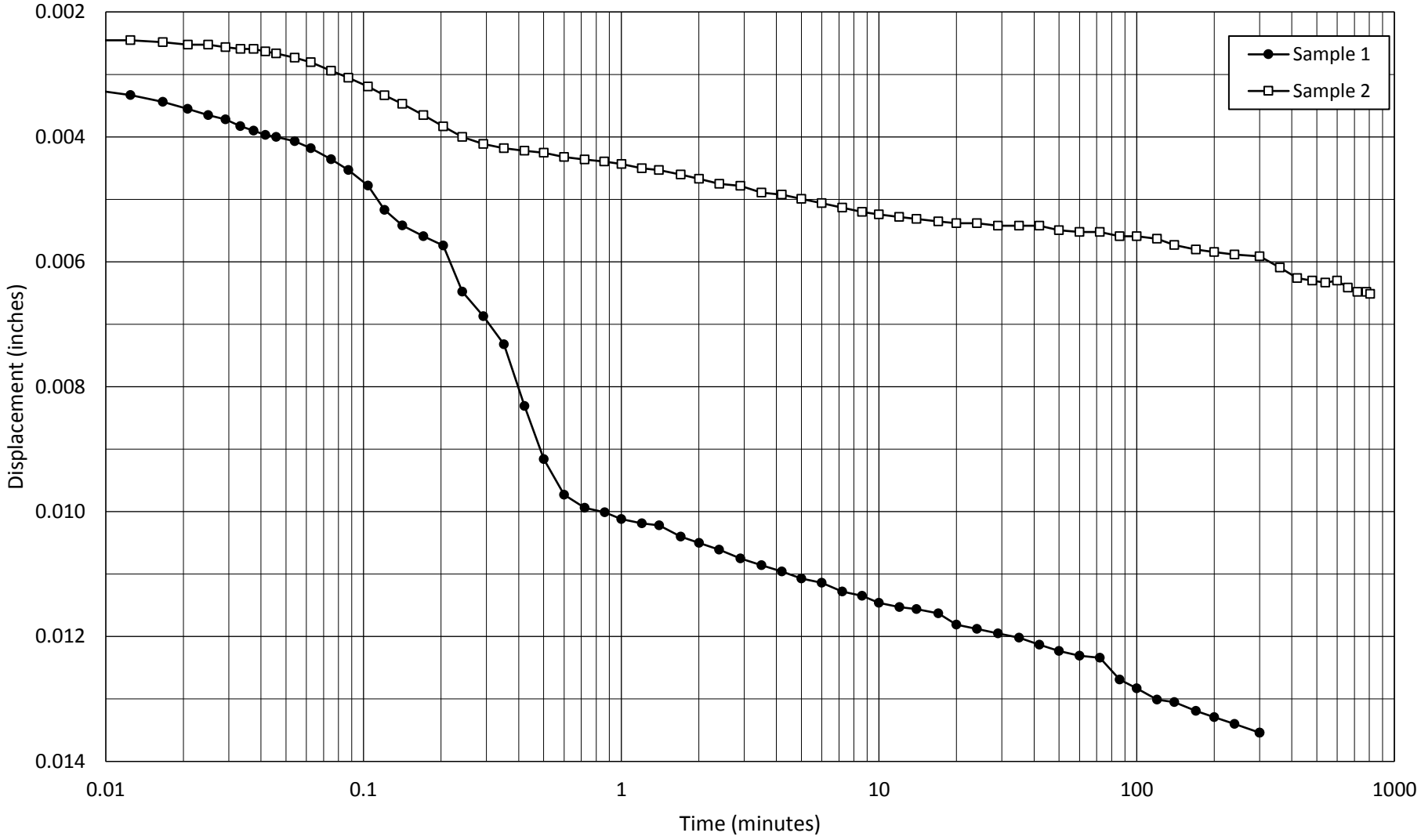
Hole no.: 16-S-08
Depth: 31.5'-33'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.80
.70
.60
.50
.40
.30
.20
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 2
SAMPLE 1
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-09
Surface Elev.
Depth Interval 12'-13.3'
Moisture Content 20.4 %
Dry Unit Wt. 98.3 lbs./ft³
LL 31 % PL 17 % PI 14 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED AT 0.25 TSF LOAD
SAMPLE 2 - NO WATER ADDED


0
3
6
9
10
12
15
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 2
SAMPLE 1
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-09
Surface Elev.
Depth Interval 12'-13.3'
Moisture Content 20.4 %
Dry Unit Wt. 98.3 lbs./ft³
LL 31 % PL 17 % PI 14 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED AT 0.25 TSF LOAD
SAMPLE 2 - NO WATER ADDED

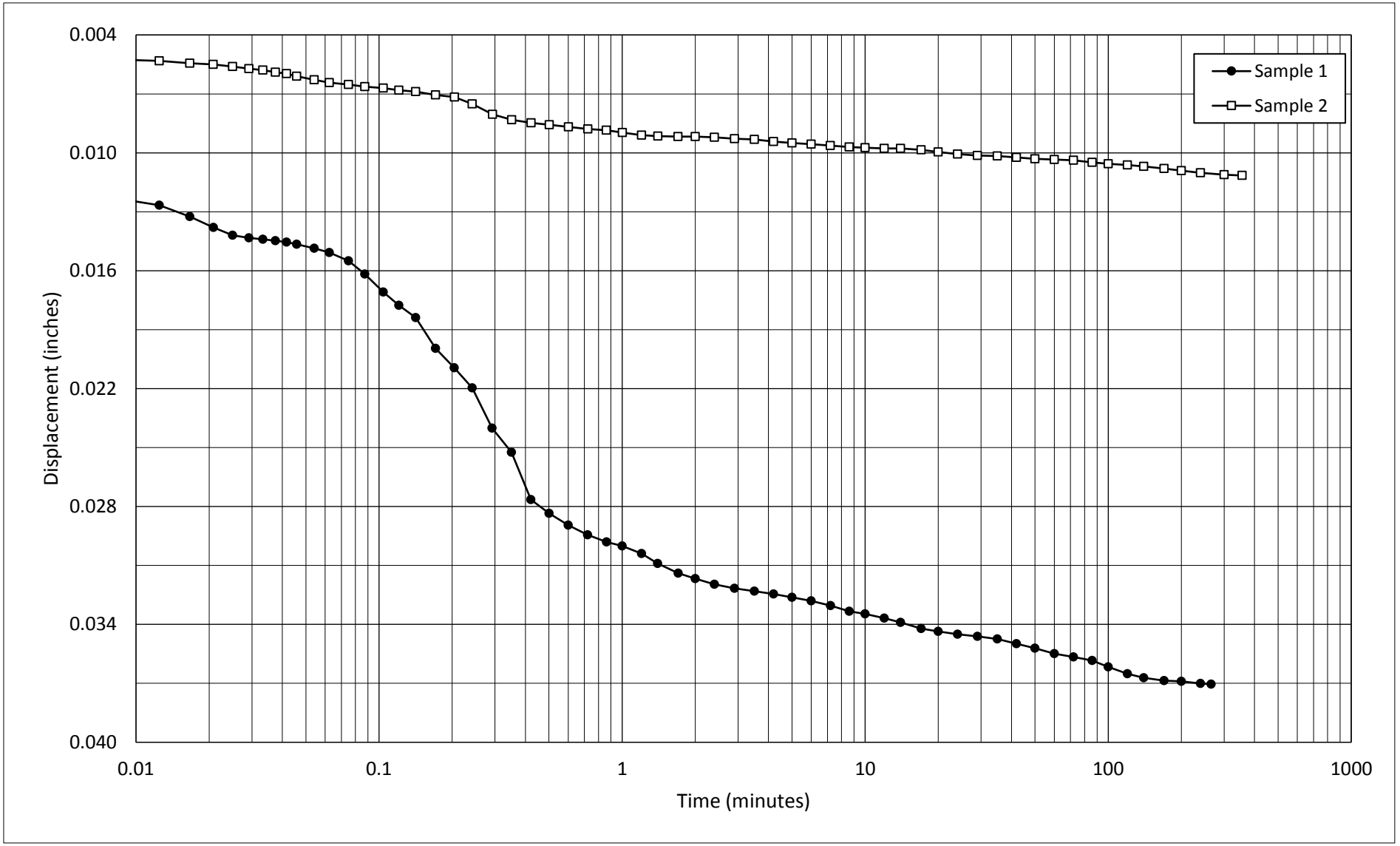


RB&G ENGINEERING, INC.

Hole no.: 16-S-09
Depth: 12'-13.3'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah

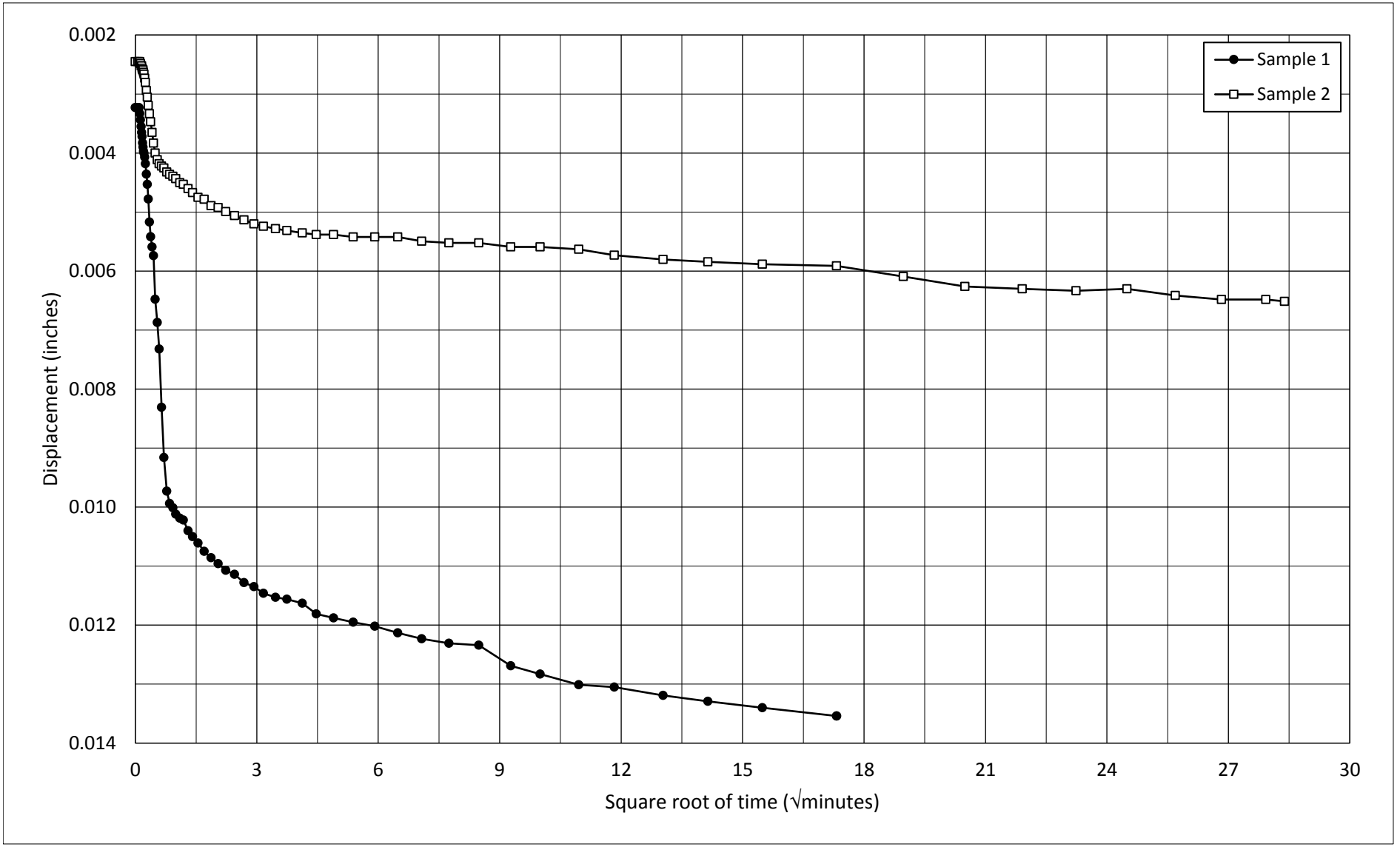


RB&G ENGINEERING, INC.

Hole no.: 16-S-09
Depth: 12'-13.3'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah

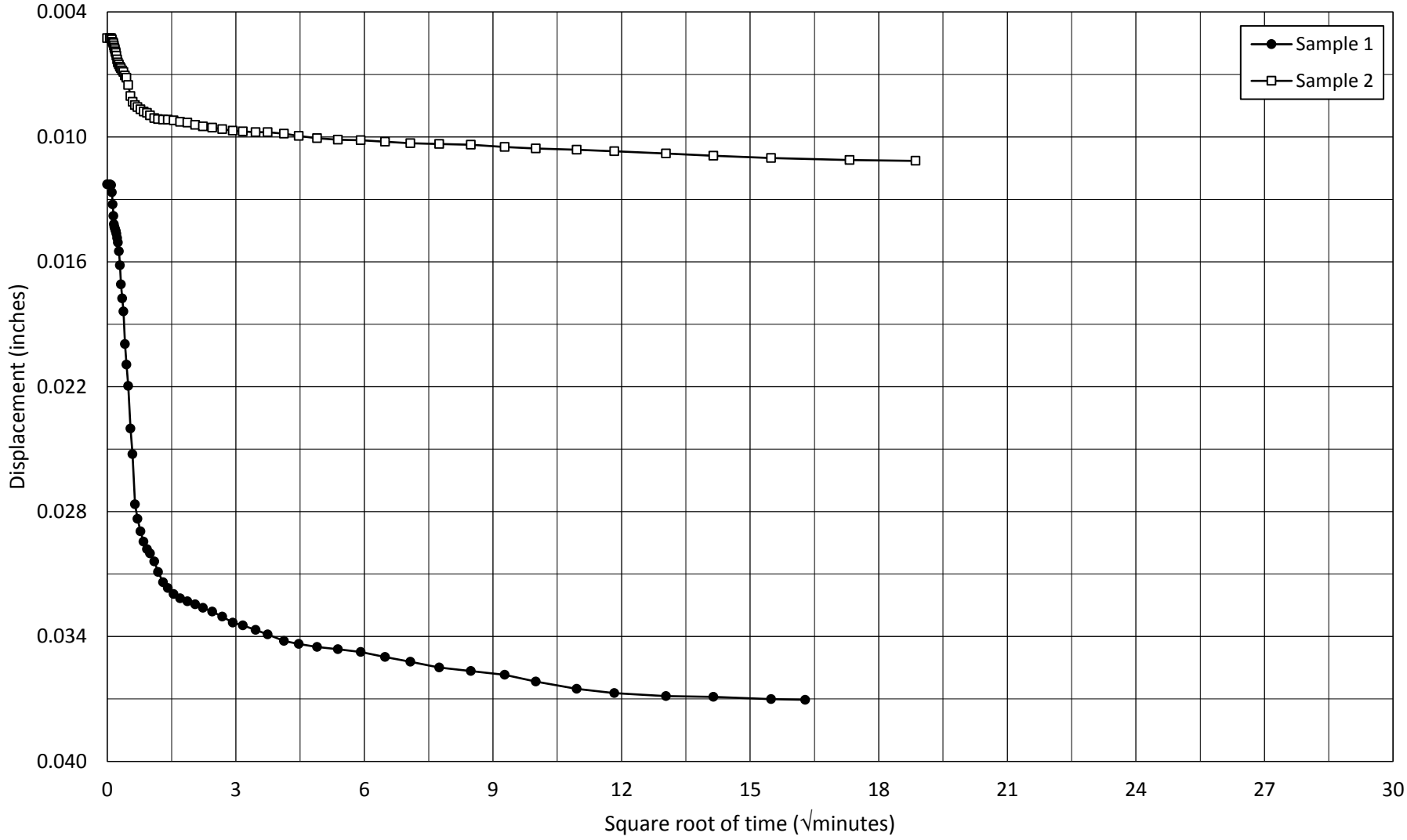


RB&G ENGINEERING, INC.

Hole no.: 16-S-09
Depth: 12'-13.3'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah

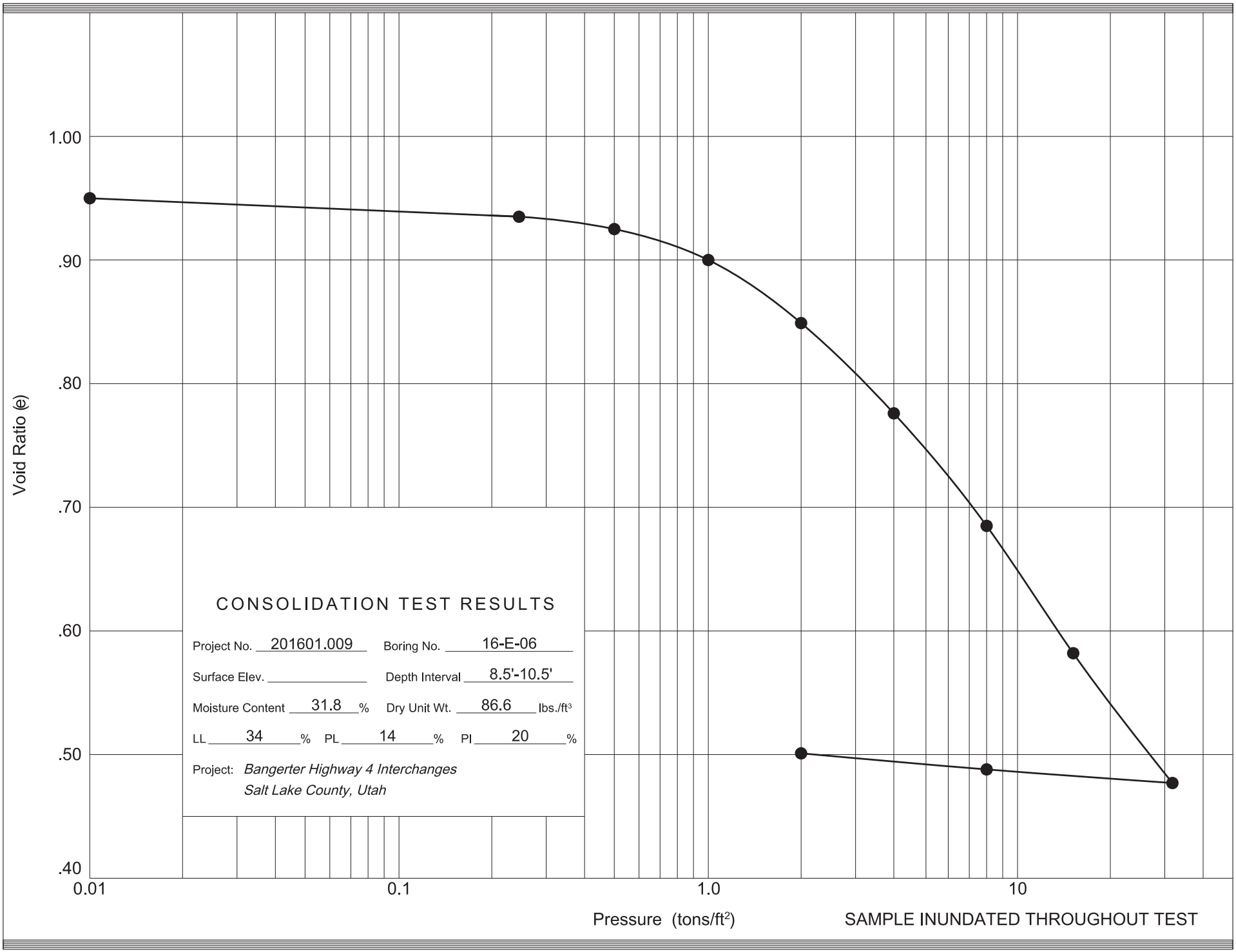


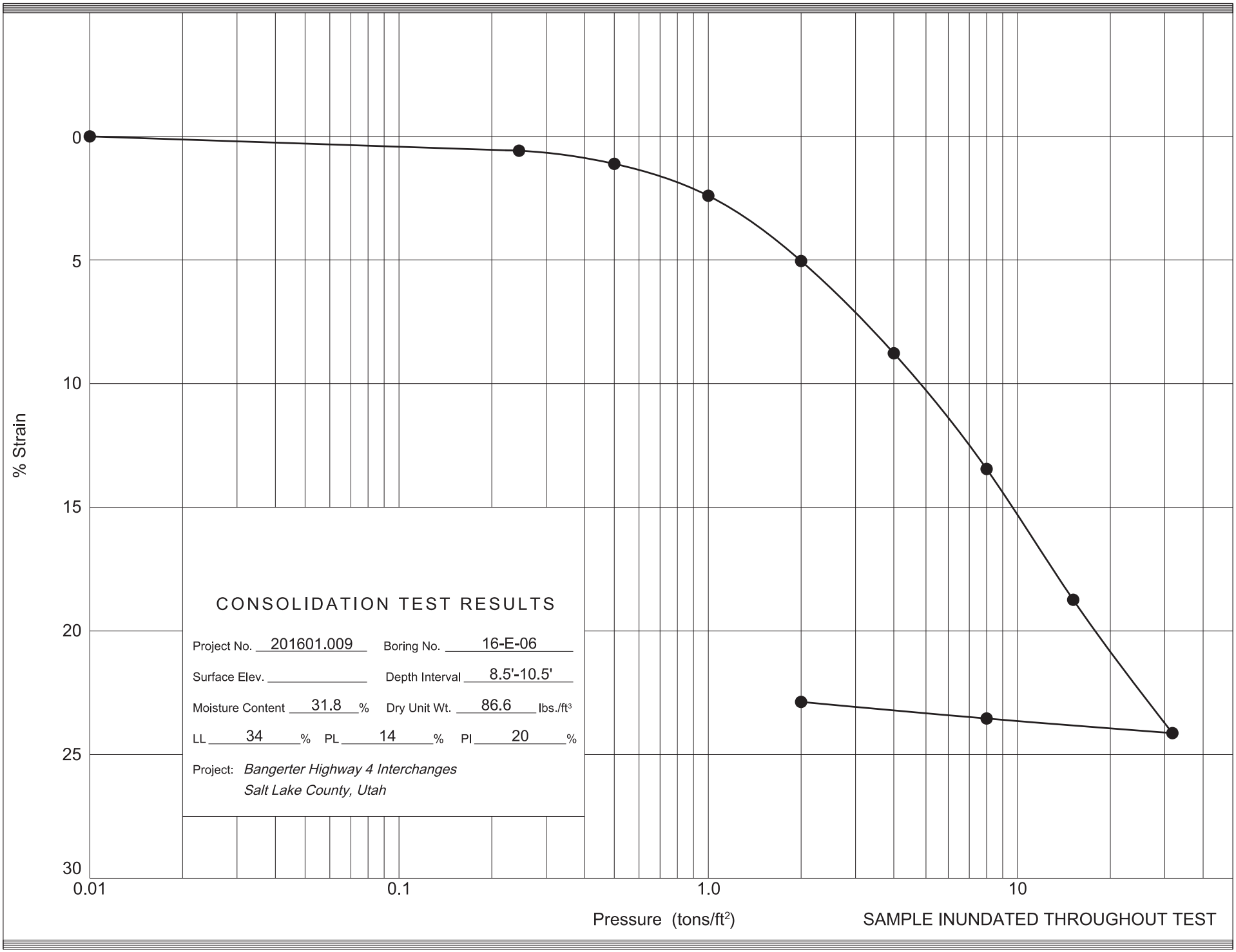
RB&G ENGINEERING, INC.

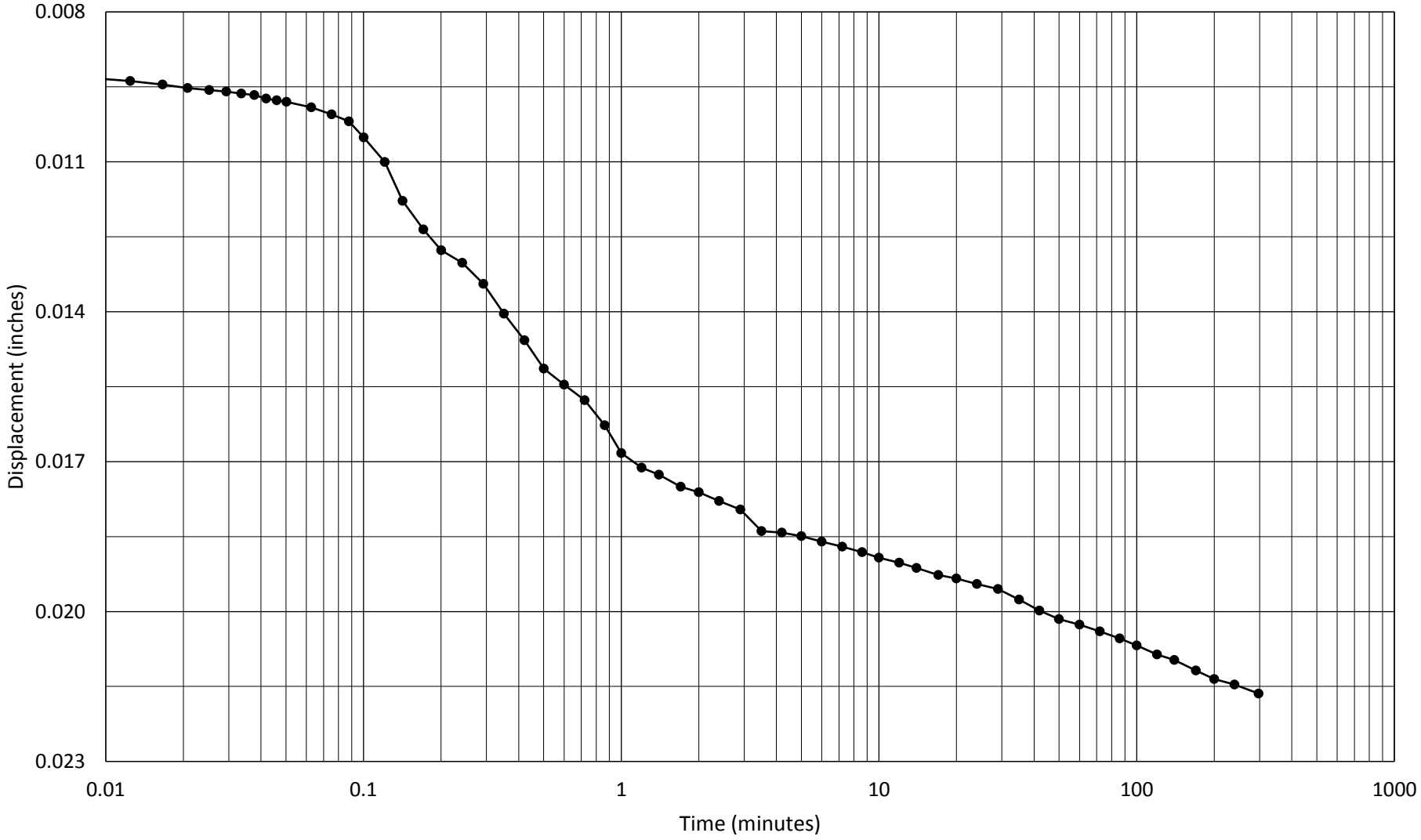
Hole no.: 16-S-09
Depth: 12'-13.3'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


1.00
.90
.80
.70
.60
.50
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-06
Surface Elev.
Depth Interval 8.5'-10.5'
Moisture Content 31.8 %
Dry Unit Wt. 86.6 lbs./ft³
LL 34 % PL 14 % PI 20 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

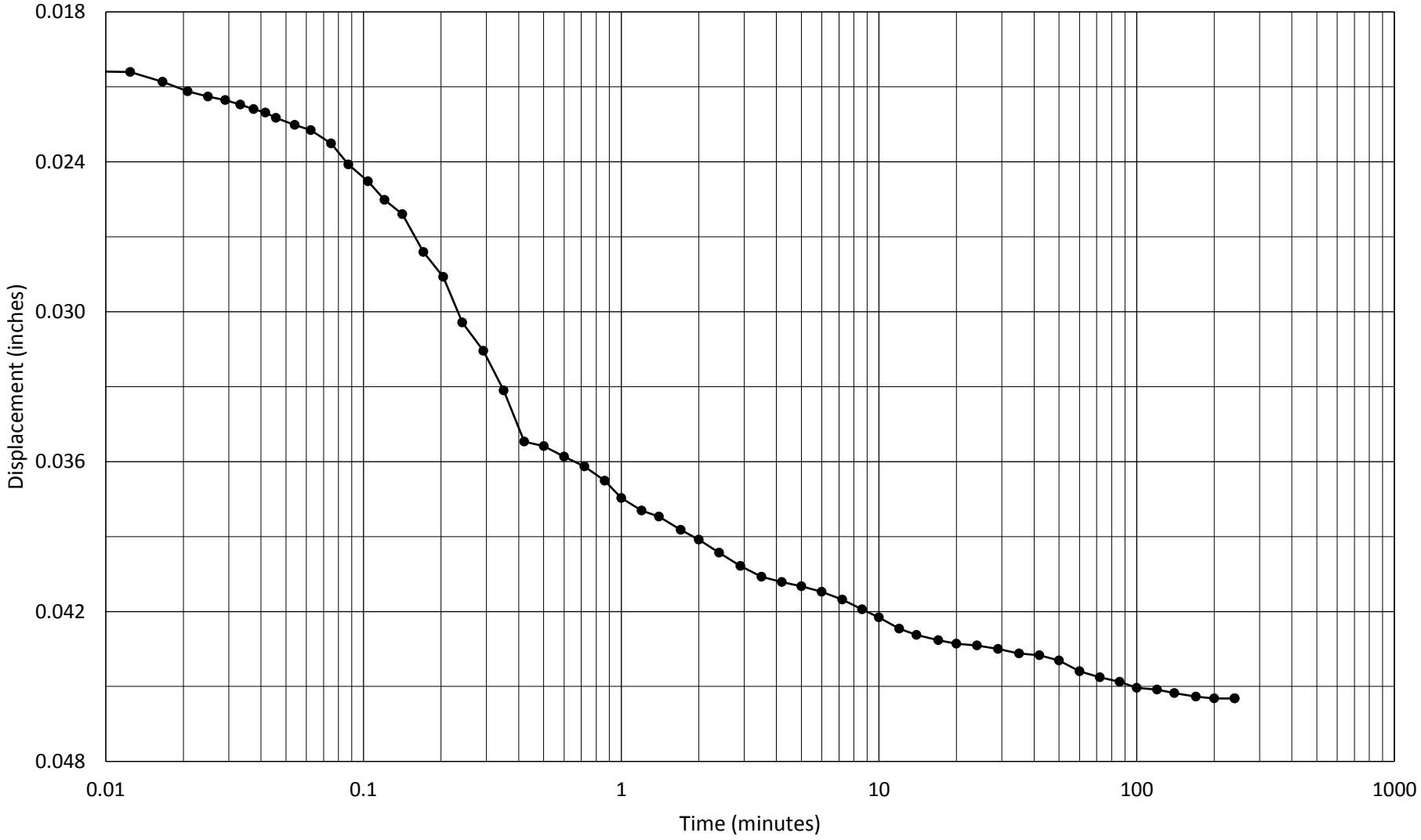

0
5
10
15
20
25
30
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-06
Surface Elev.
Depth Interval 8.5'-10.5'
Moisture Content 31.8 %
Dry Unit Wt. 86.6 lbs./ft³
LL 34 % PL 14 % PI 20 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-06
Depth: 8.5'-10'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

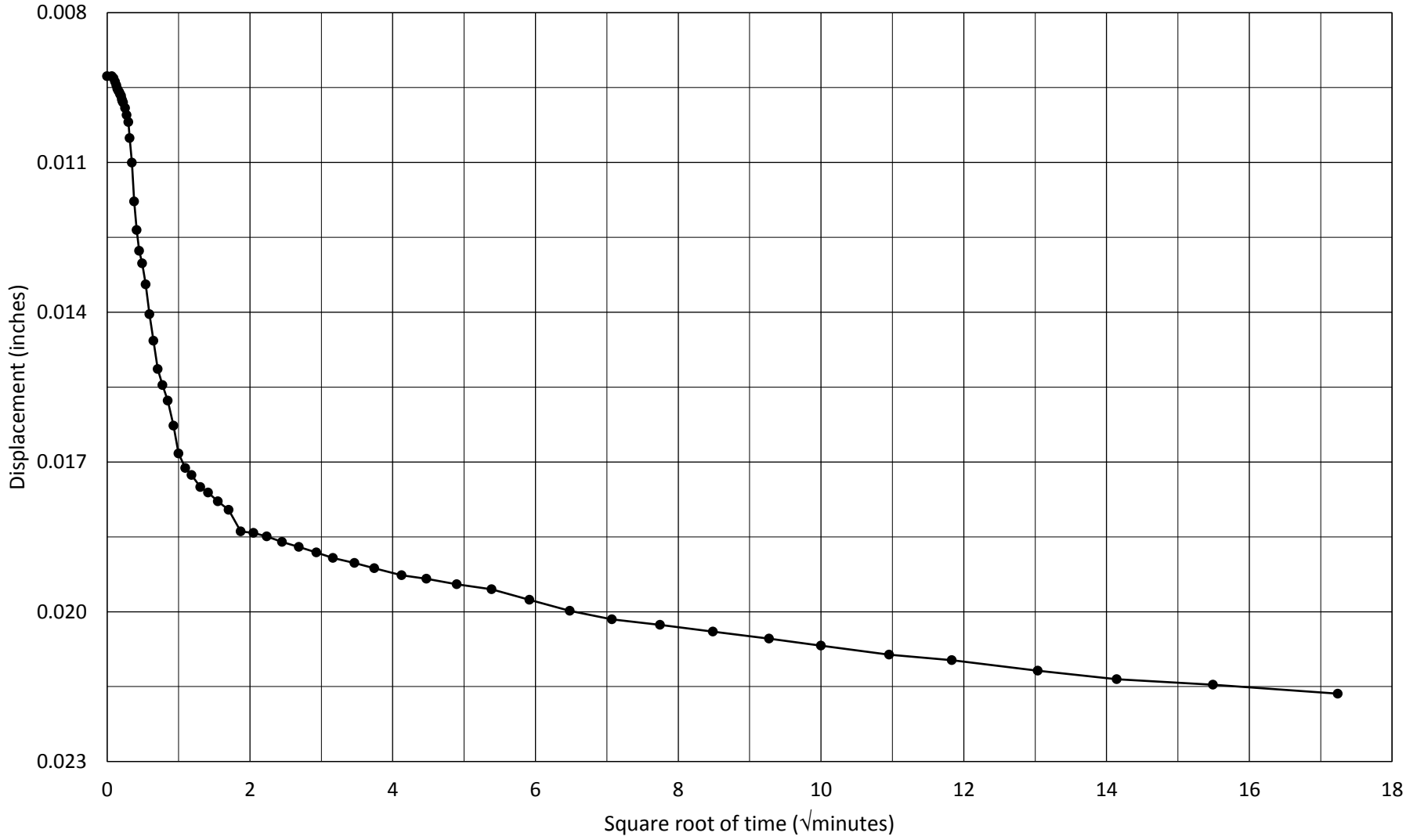
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-06
Depth: 8.5'-10'
Load: 1 to 2 tsf

TIME CONSOLIDATION

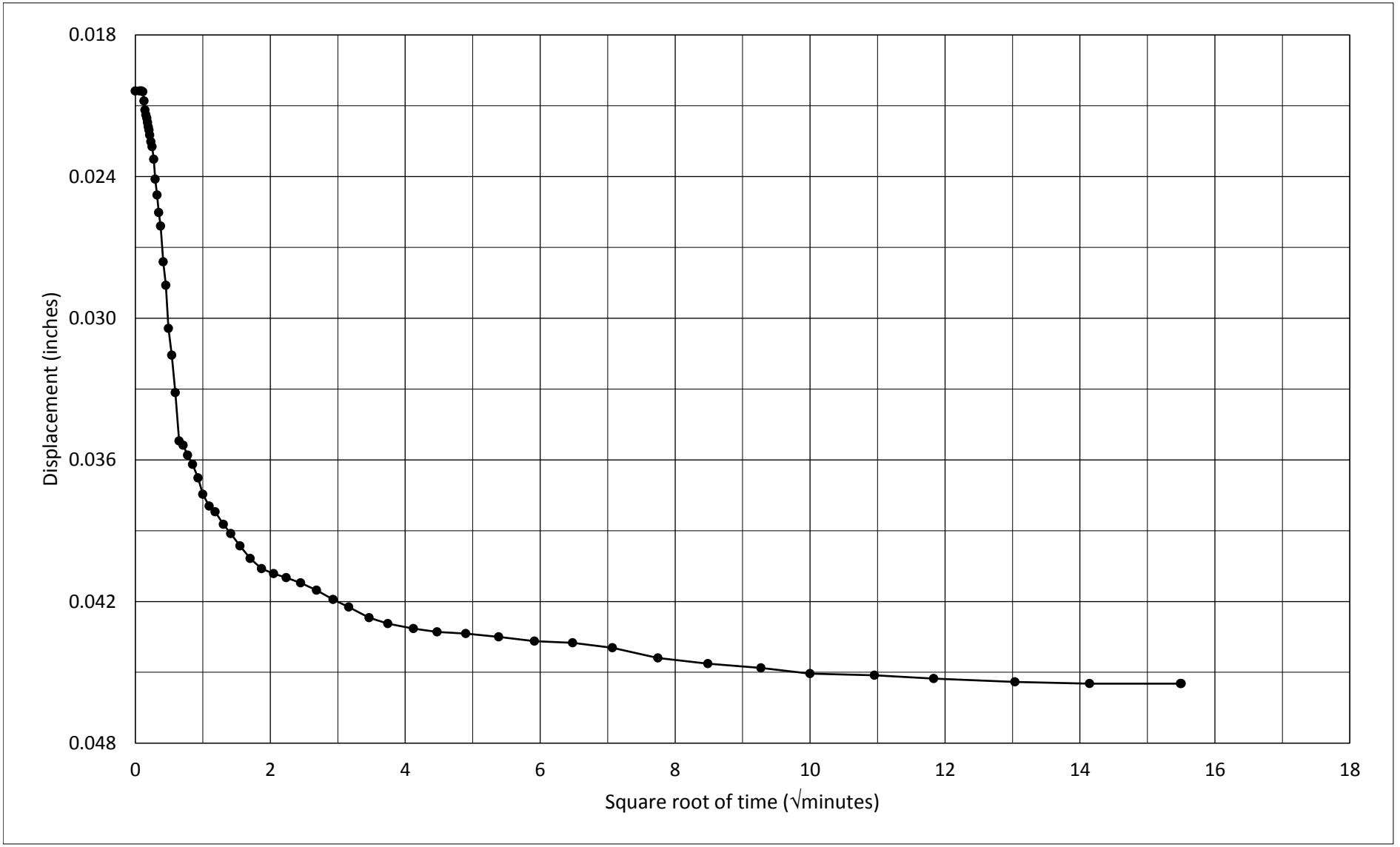
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-06
Depth: 8.5'-10'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

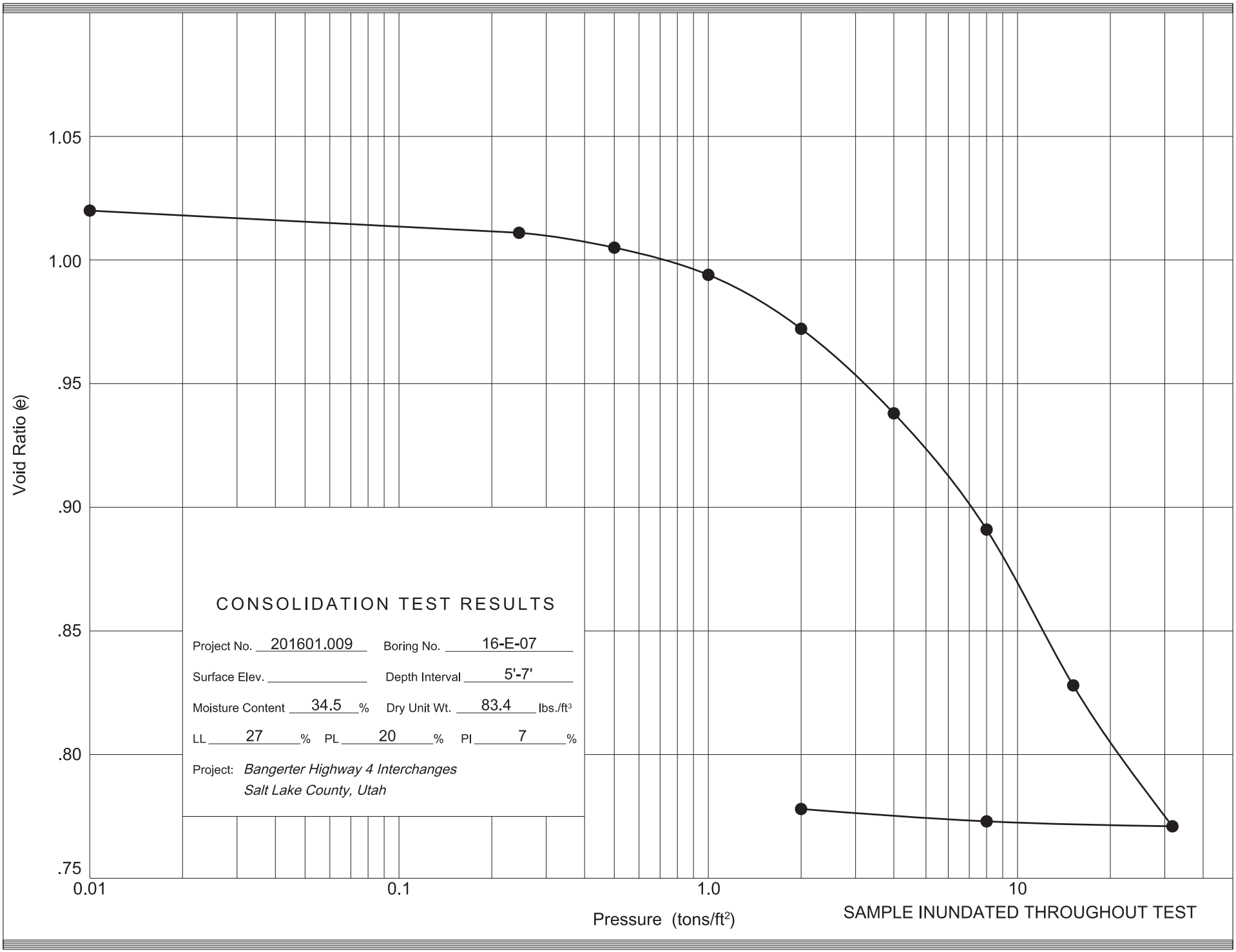
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

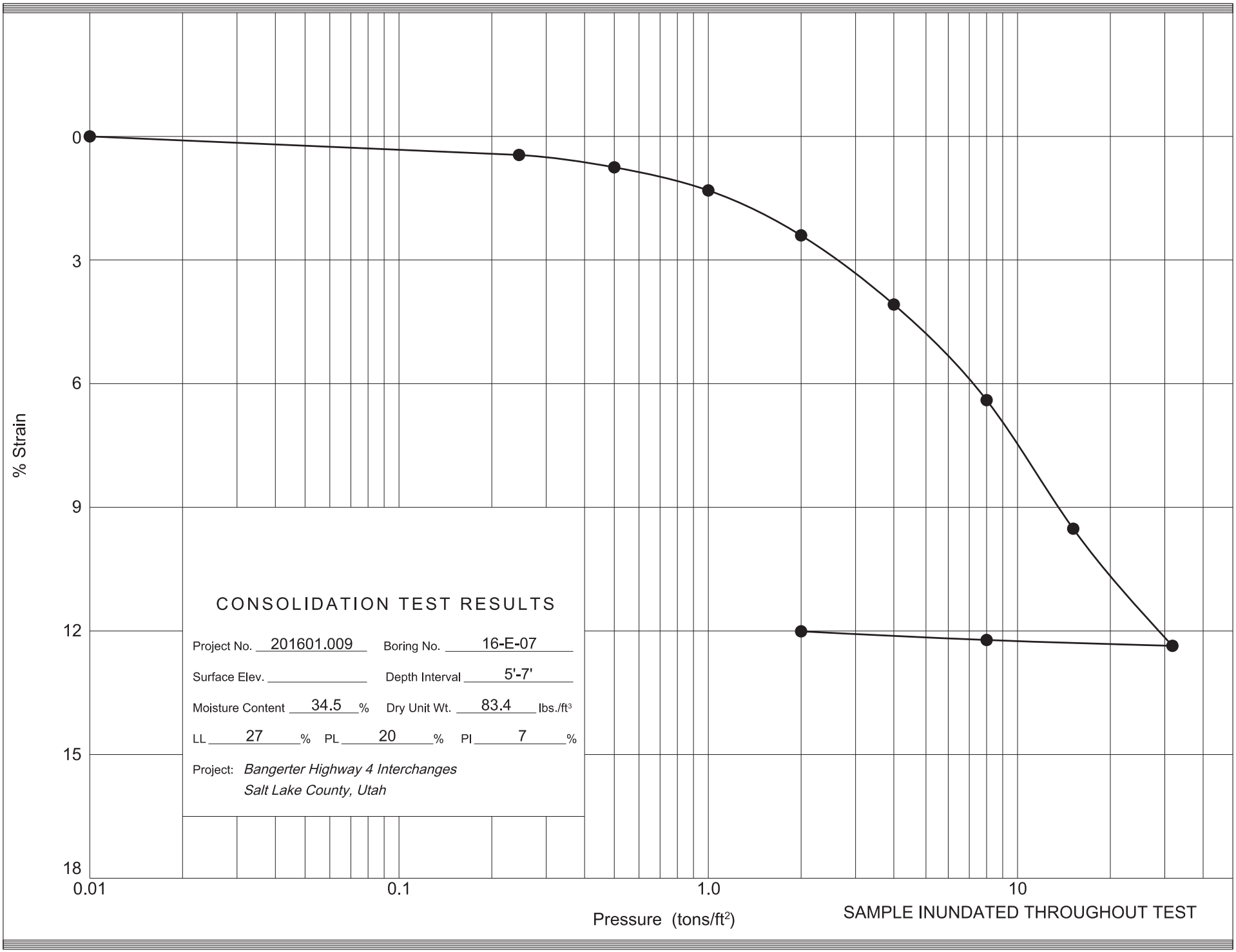


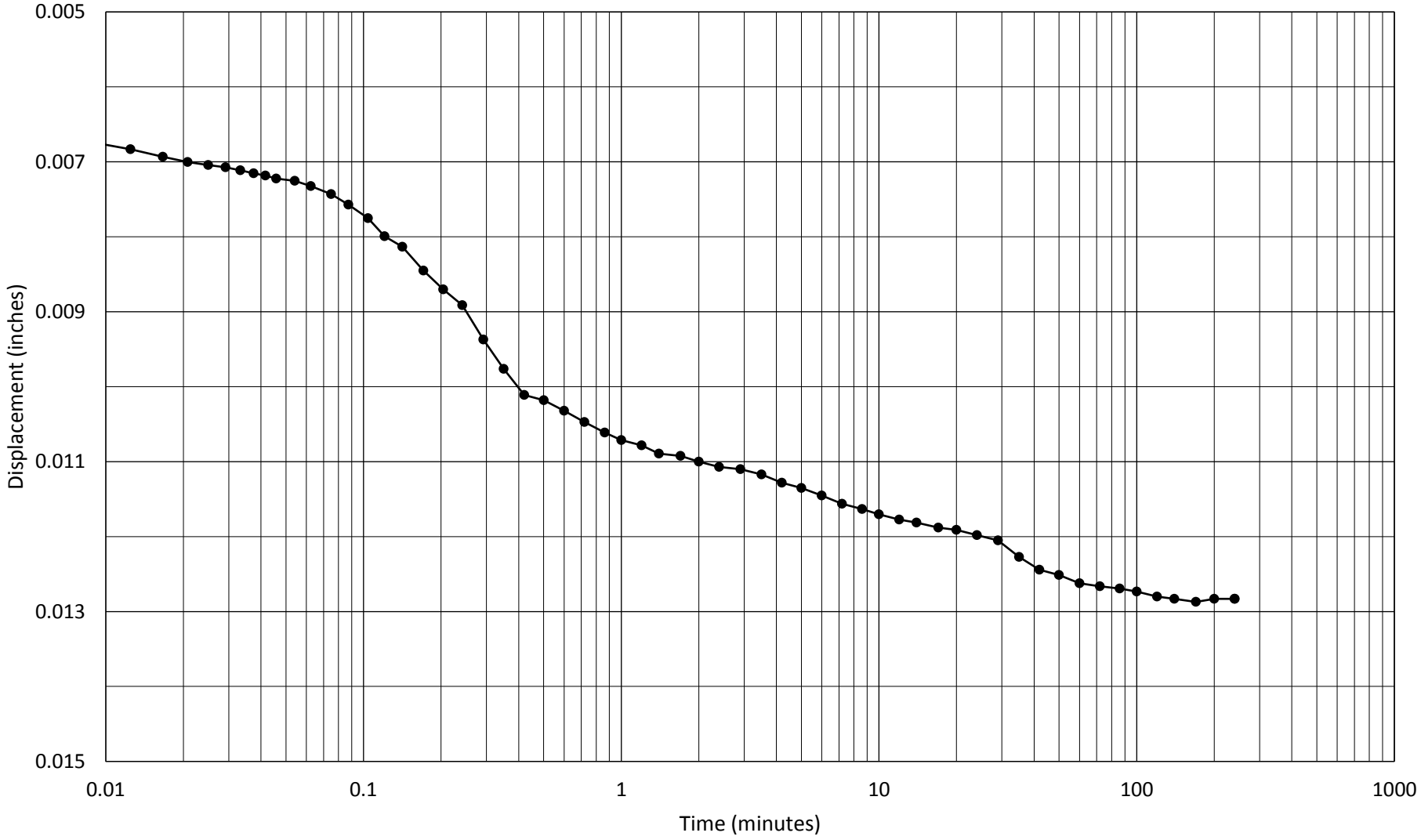
Hole no.: 16-E-06
Depth: 8.5'-10'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


1.05
1.00
.95
.90
.85
.80
.75
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-07
Surface Elev.
Depth Interval 5'-7'
Moisture Content 34.5 %
Dry Unit Wt. 83.4 lbs./ft³
LL 27 %
PL 20 %
PI 7 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

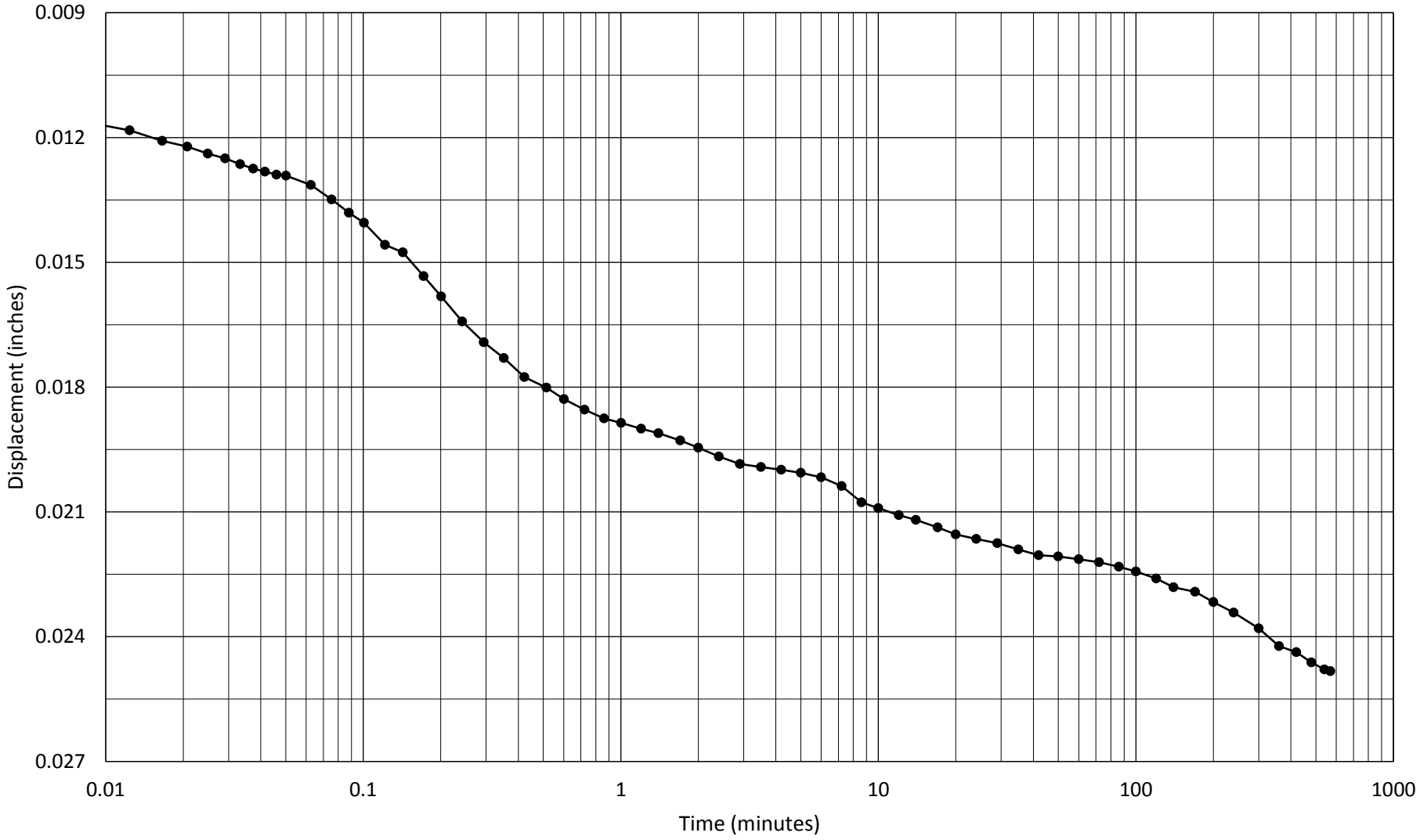

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-07
Surface Elev.
Depth Interval 5'-7'
Moisture Content 34.5 %
Dry Unit Wt. 83.4 lbs./ft³
LL 27 % PL 20 % PI 7 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-07
Depth: 5'-7'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

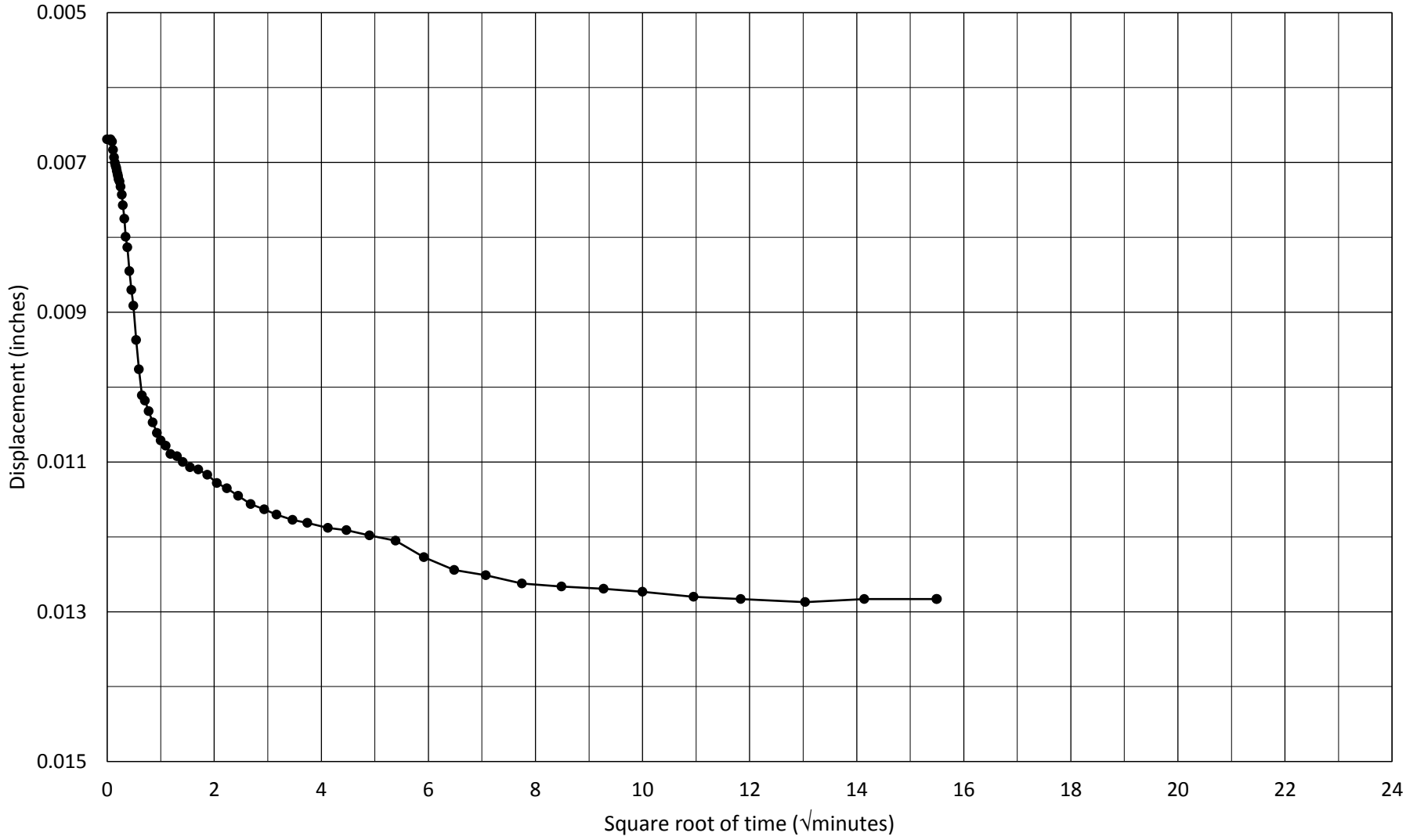
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-07
Depth: 5'-7'
Load: 1 to 2 tsf

TIME CONSOLIDATION

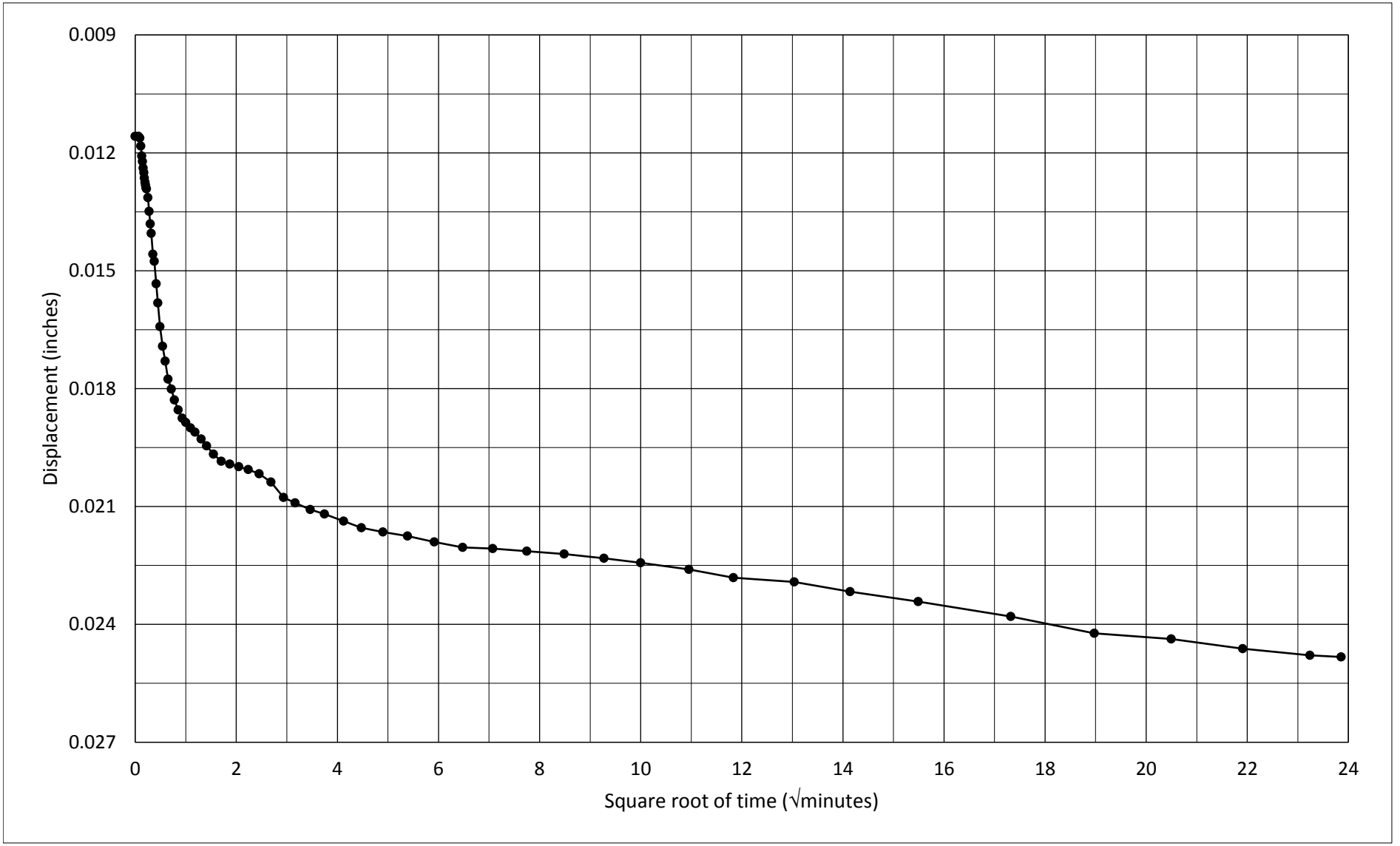
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-07
Depth: 5'-7'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

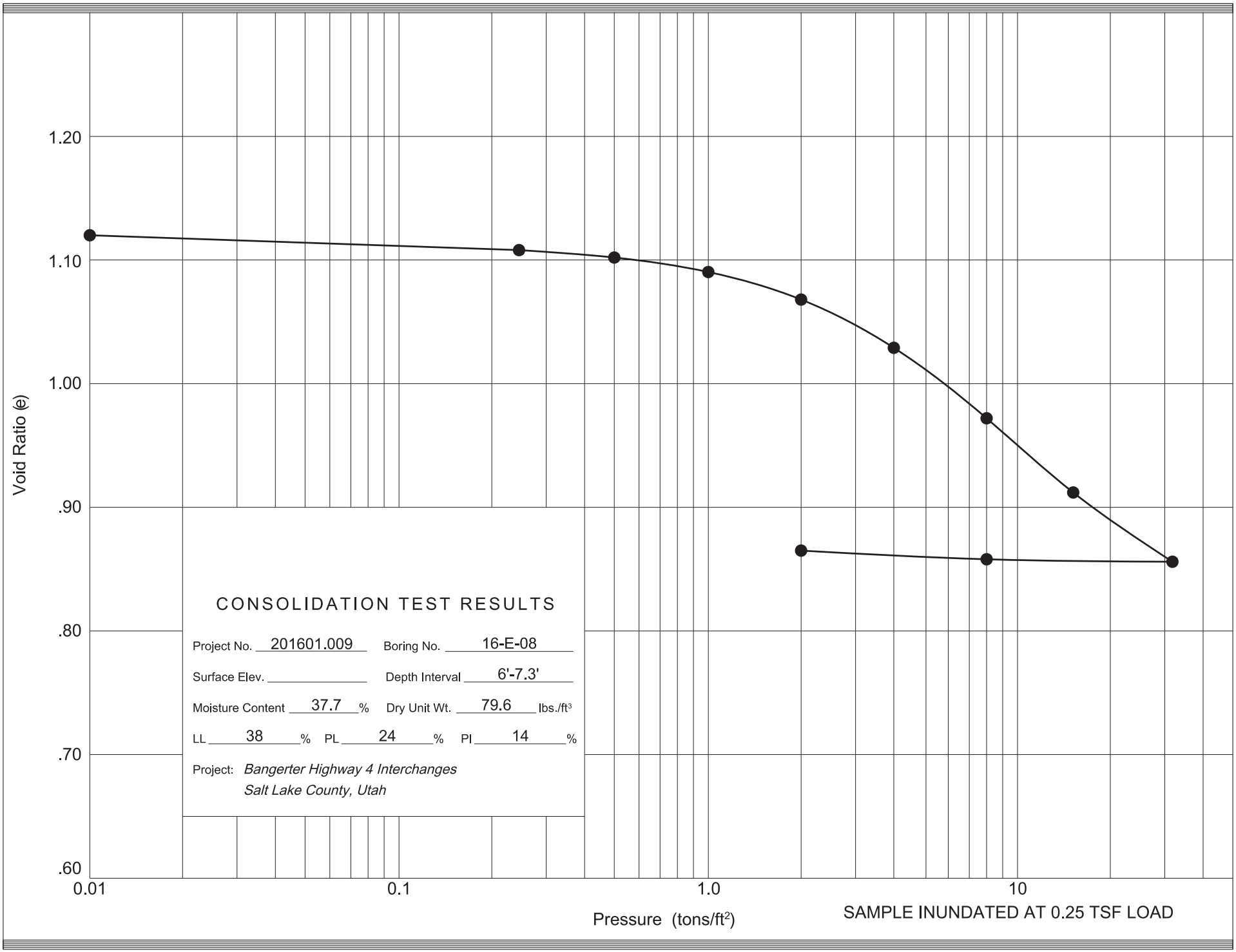
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

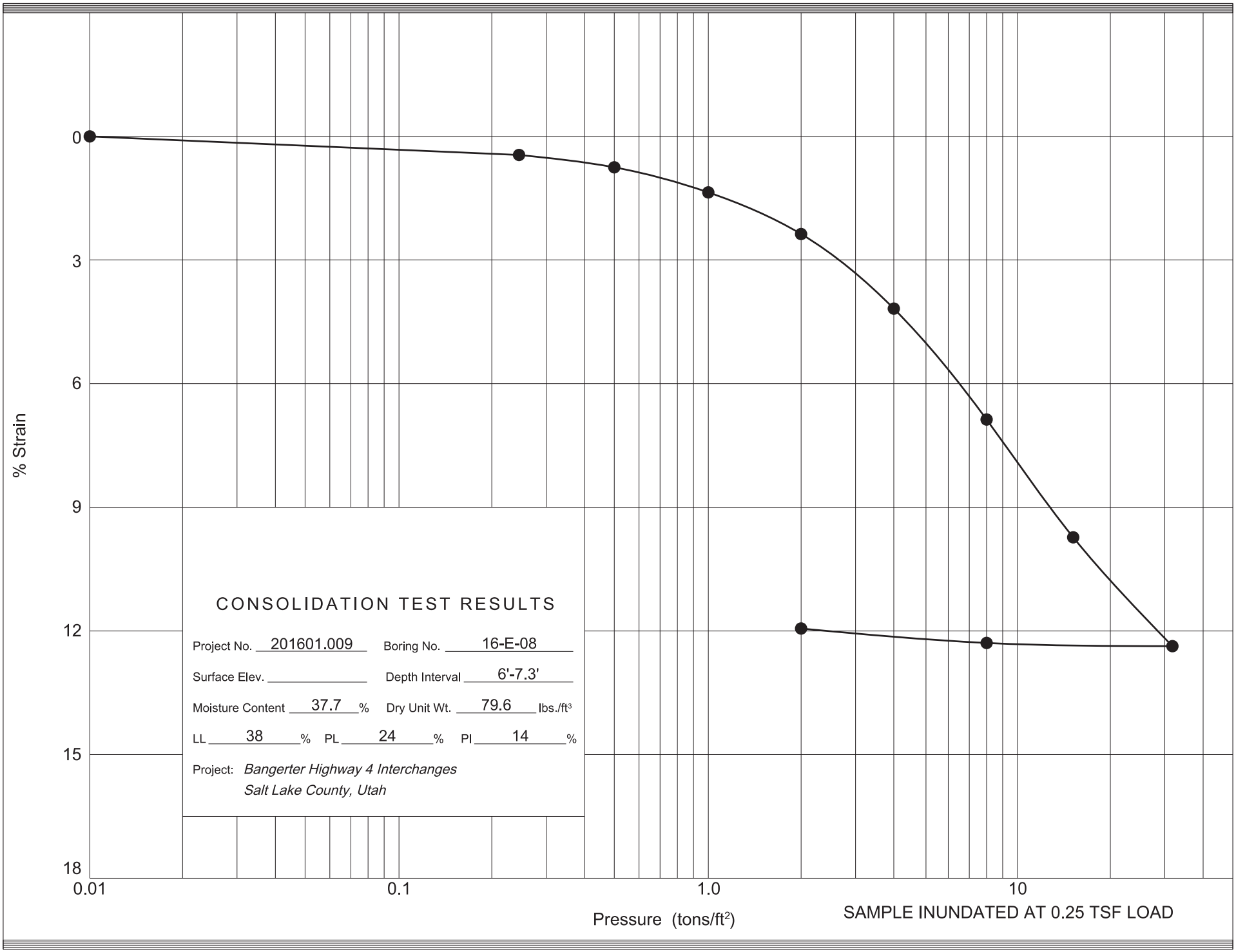


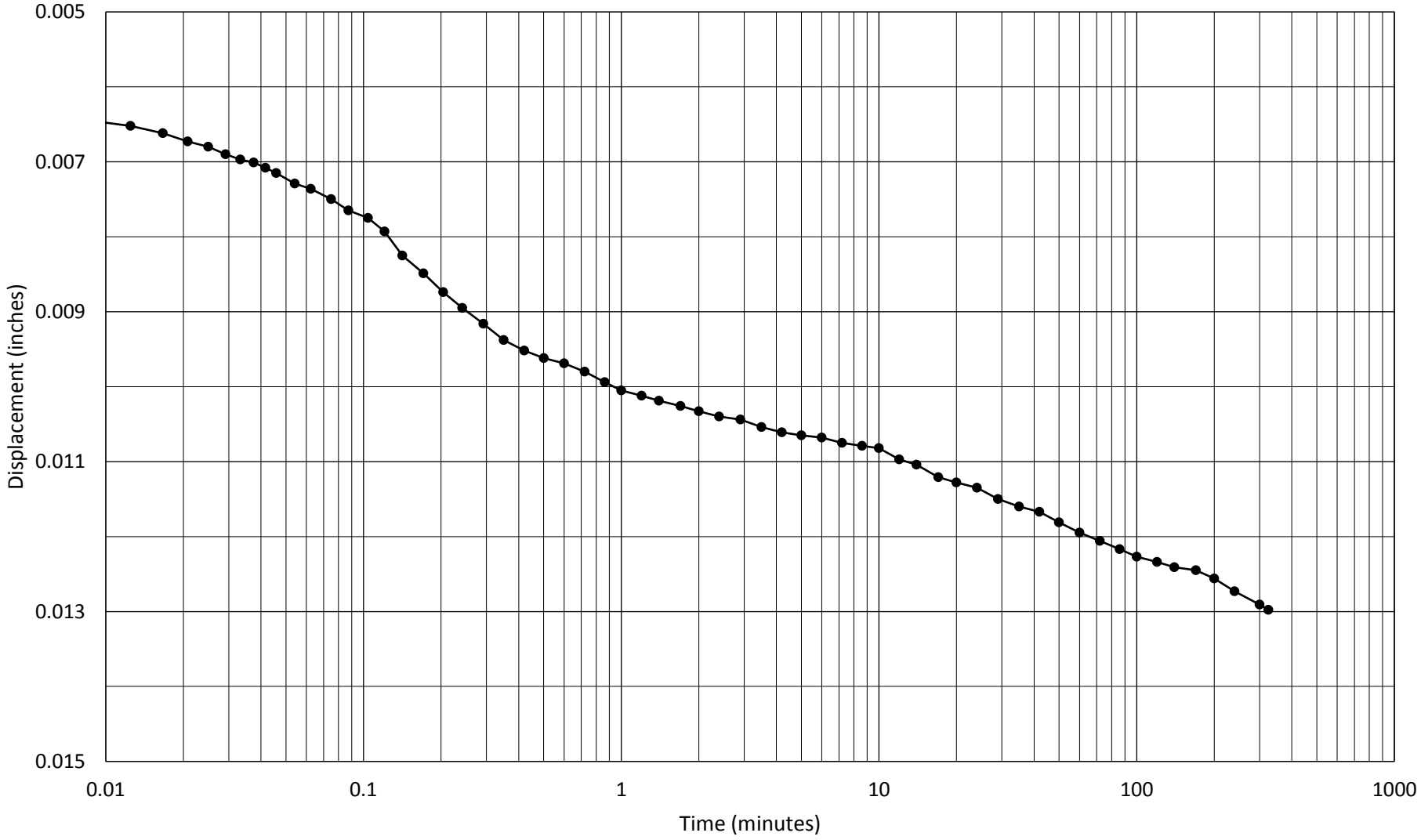
Hole no.: 16-E-07
Depth: 5'-7'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


1.20
1.10
1.00
.90
.80
.70
.60
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-08
Surface Elev.
Depth Interval 6'-7.3'
Moisture Content 37.7 %
Dry Unit Wt. 79.6 lbs./ft³
LL 38 %
PL 24 %
PI 14 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

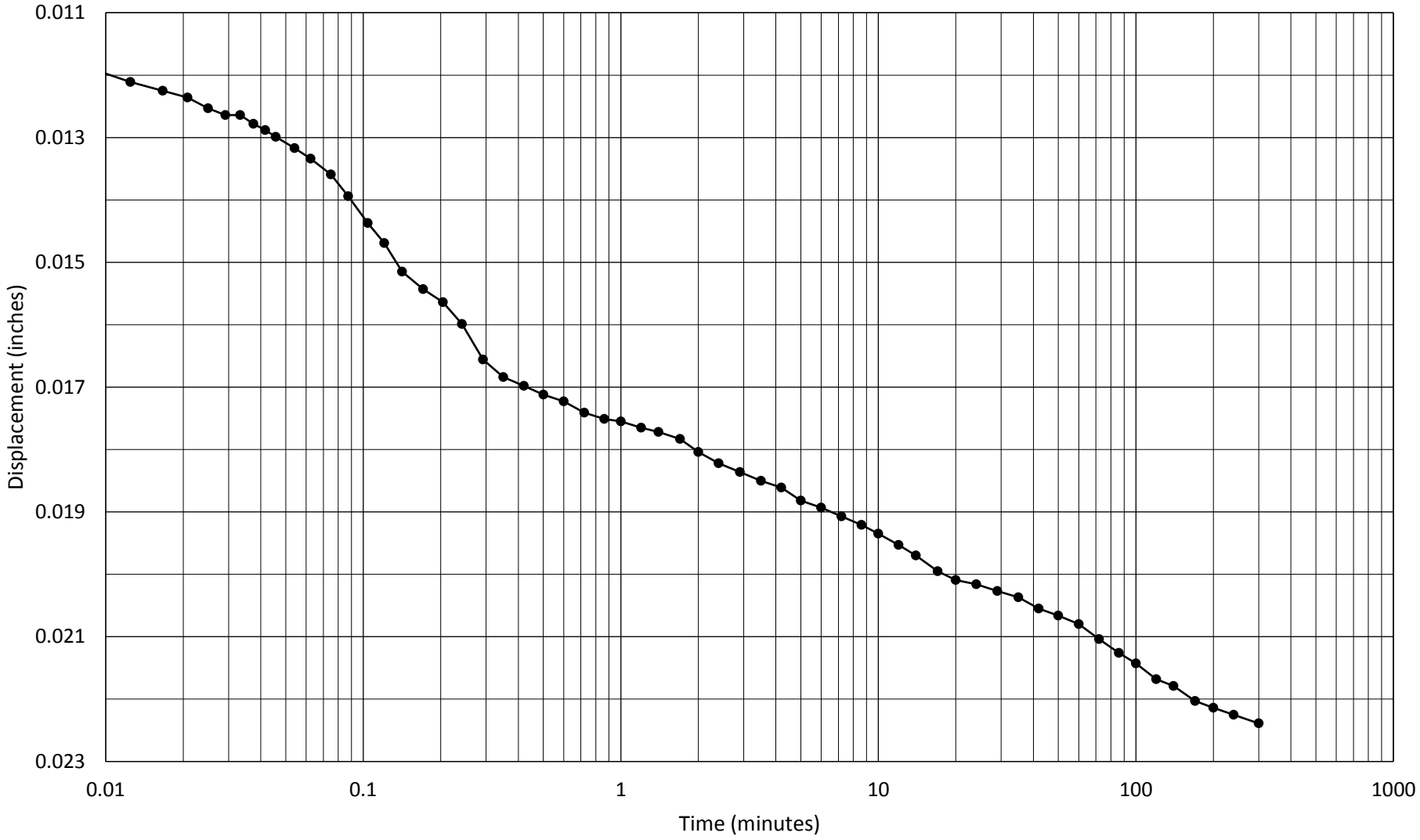

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-08
Surface Elev.
Depth Interval 6'-7.3'
Moisture Content 37.7 %
Dry Unit Wt. 79.6 lbs./ft³
LL 38 %
PL 24 %
PI 14 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-08
Depth: 6'-7.3'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

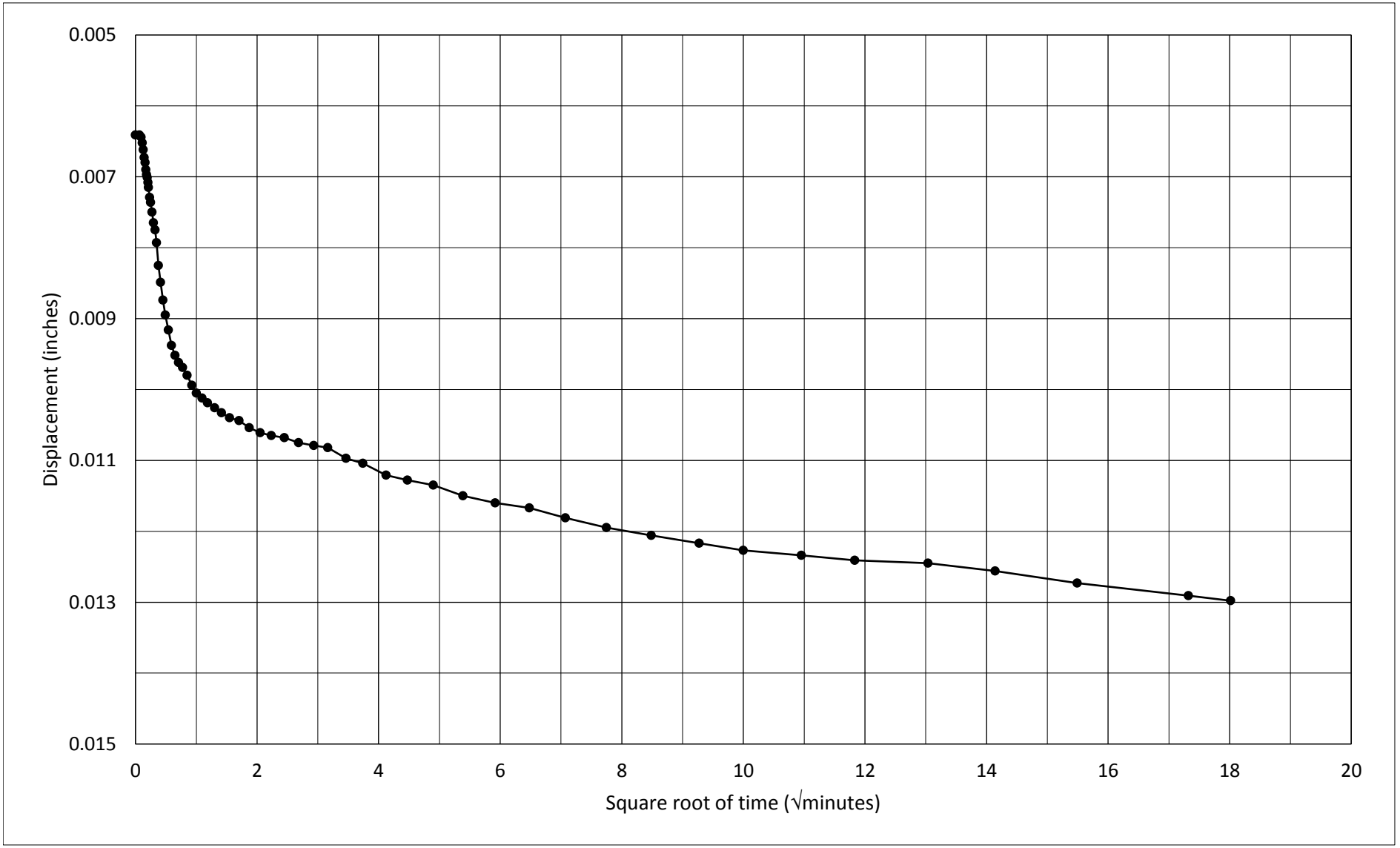
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-08
Depth: 6'-7.3'
Load: 1 to 2 tsf

TIME CONSOLIDATION

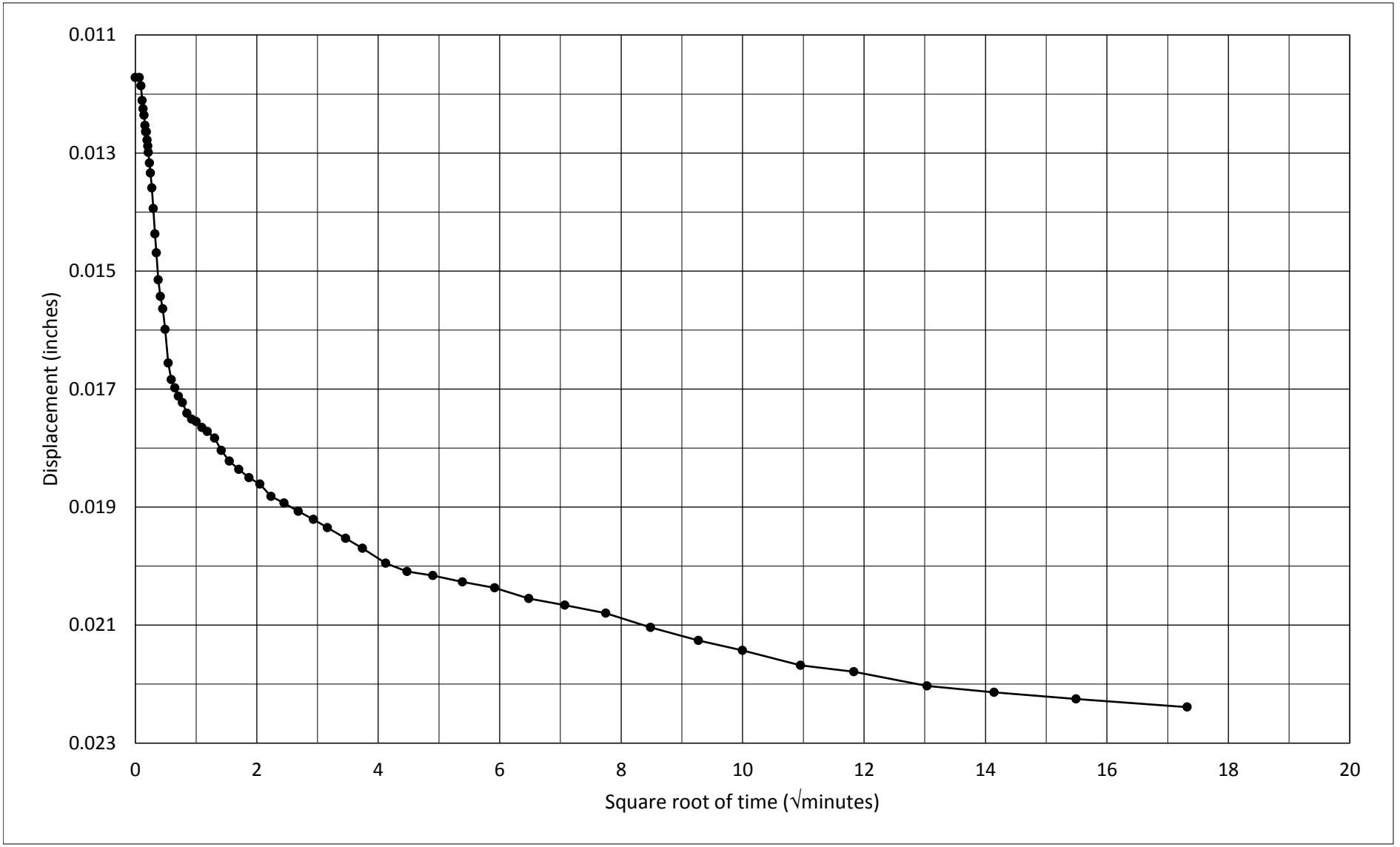
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-08
Depth: 6'-7.3'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

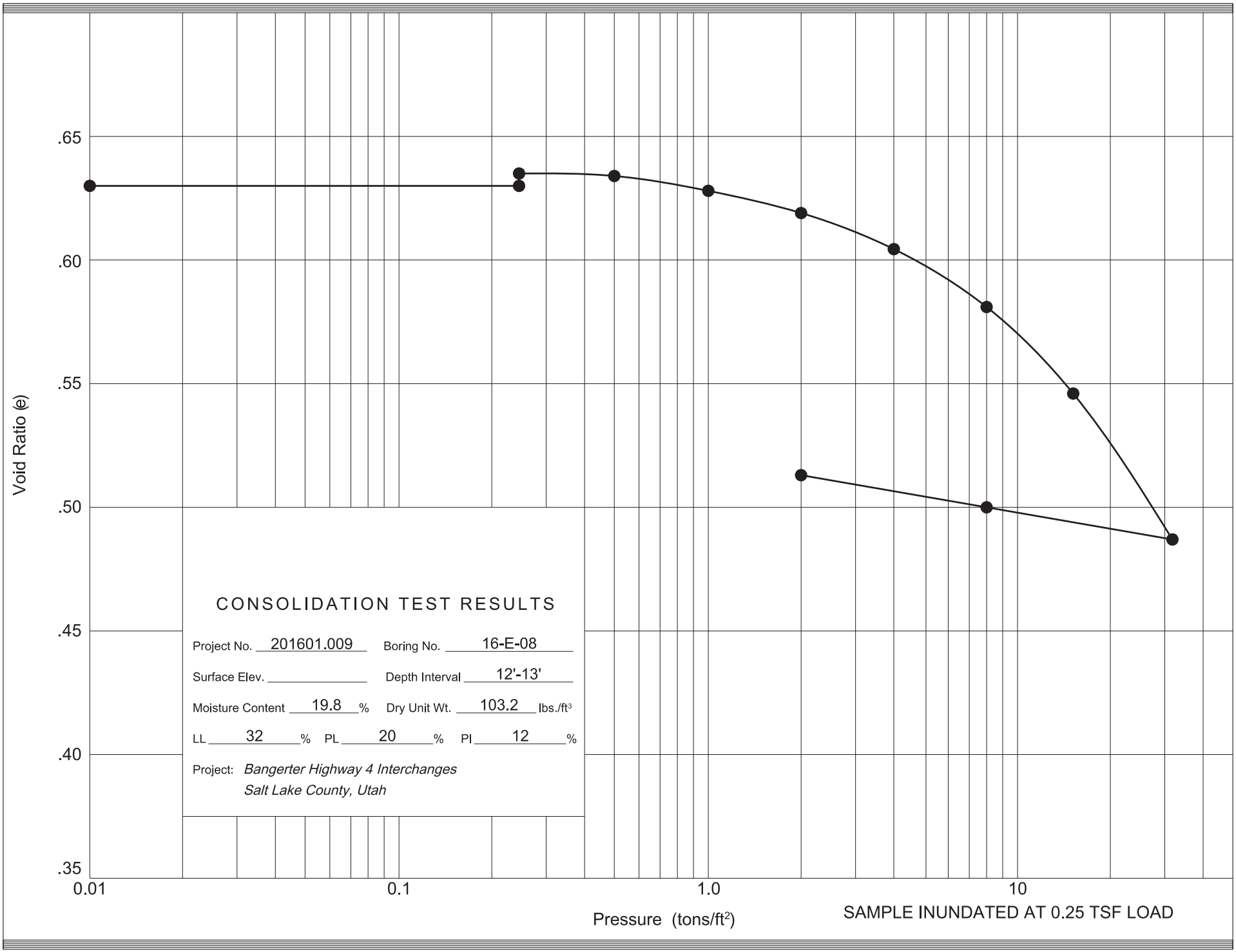
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

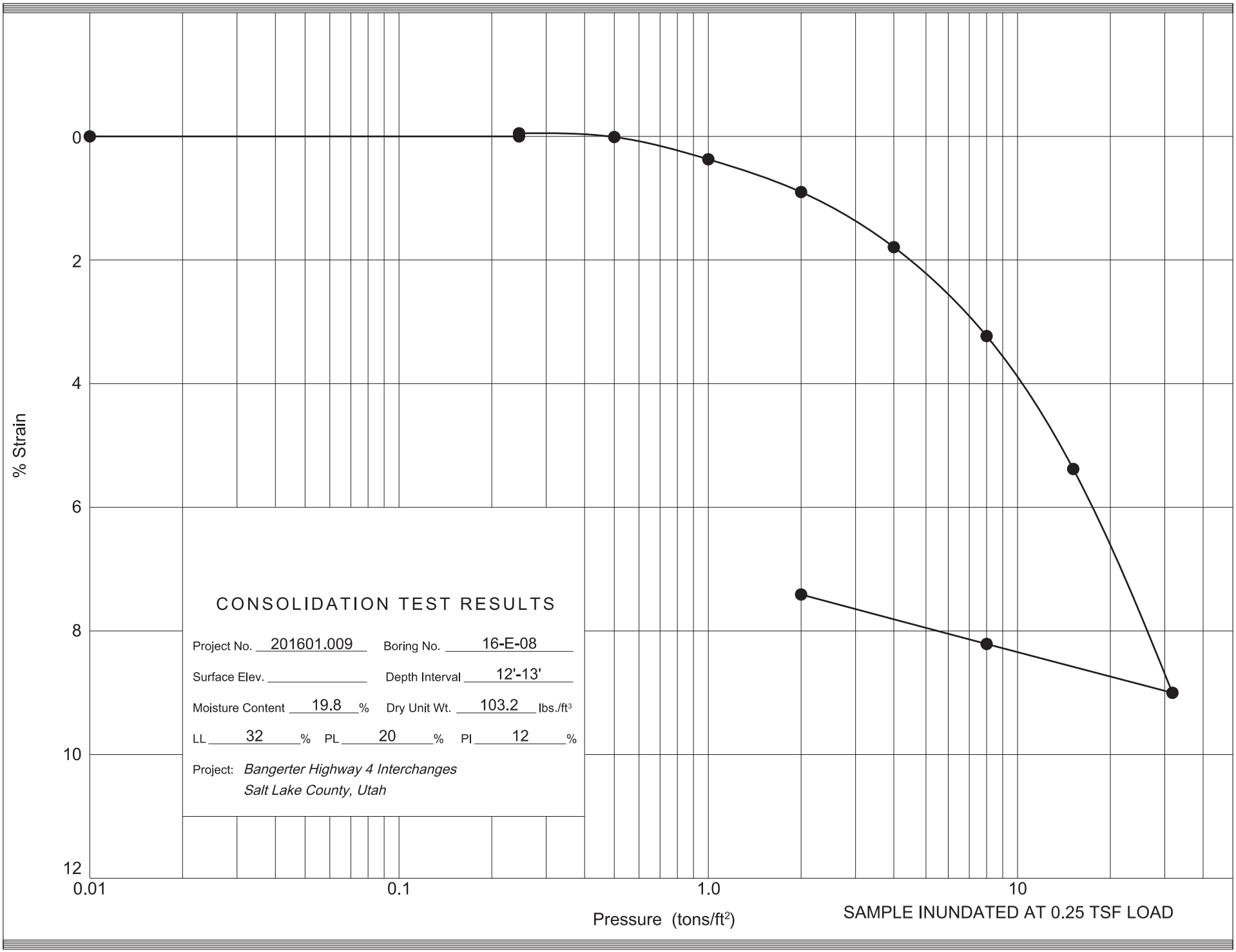


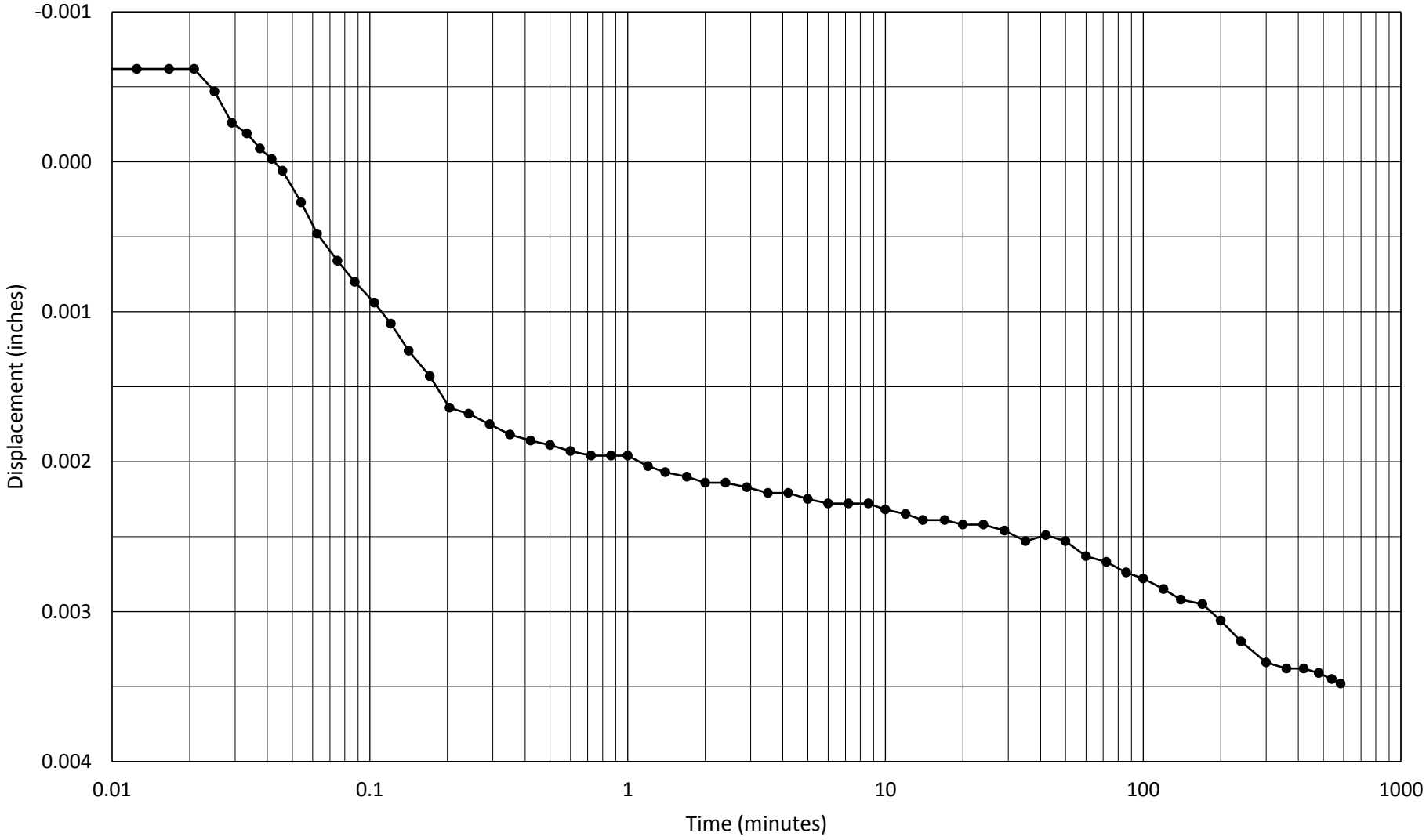
Hole no.: 16-E-08
Depth: 6'-7.3'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.65
.60
.55
.50
.45
.40
.35
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-08
Surface Elev.
Depth Interval 12'-13'
Moisture Content 19.8 %
Dry Unit Wt. 103.2 lbs./ft³
LL 32 %
PL 20 %
PI 12 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

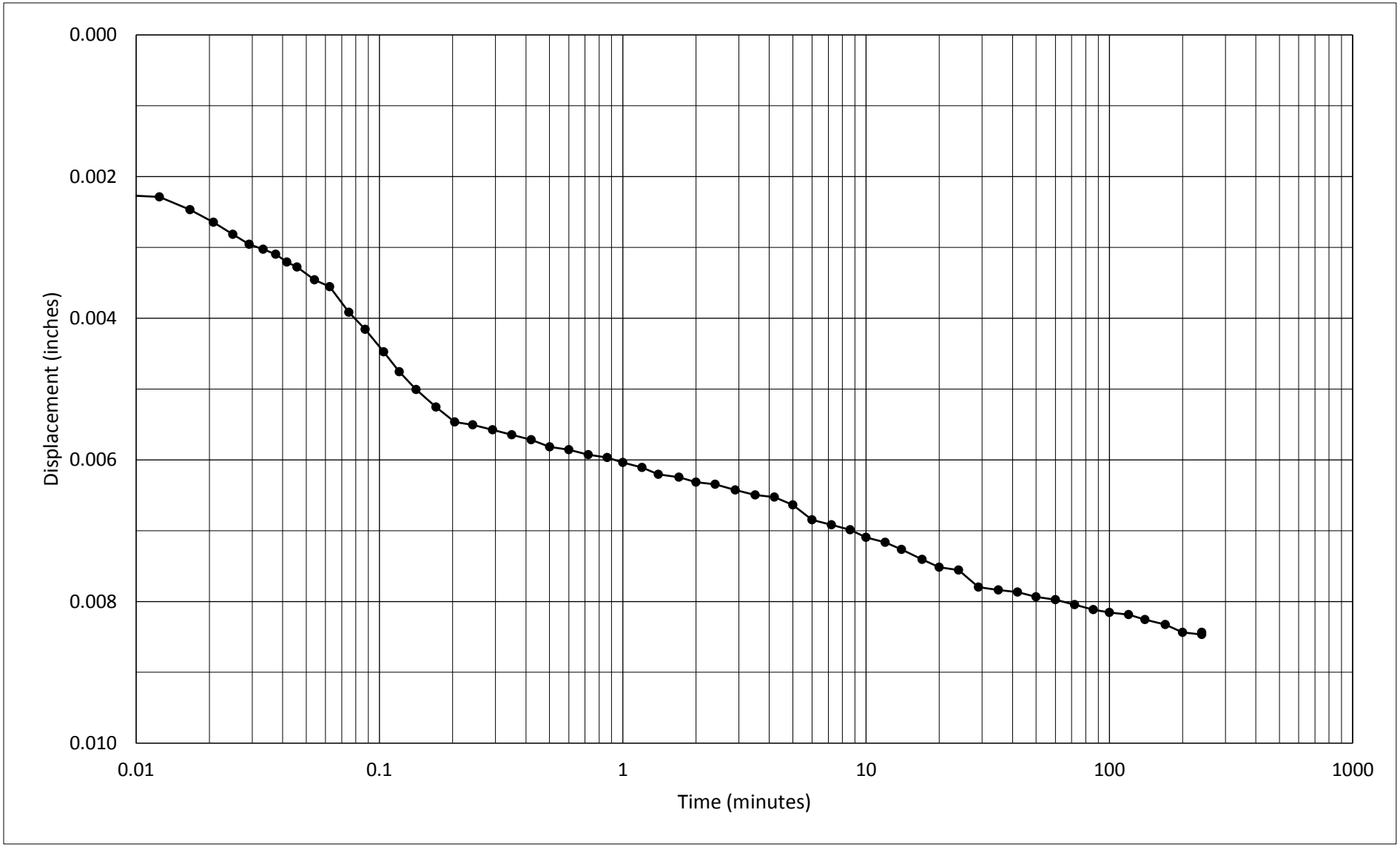

0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-08
Surface Elev.
Depth Interval 12'-13'
Moisture Content 19.8 %
Dry Unit Wt. 103.2 lbs./ft³
LL 32 %
PL 20 %
PI 12 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-08
Depth: 12'-13'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

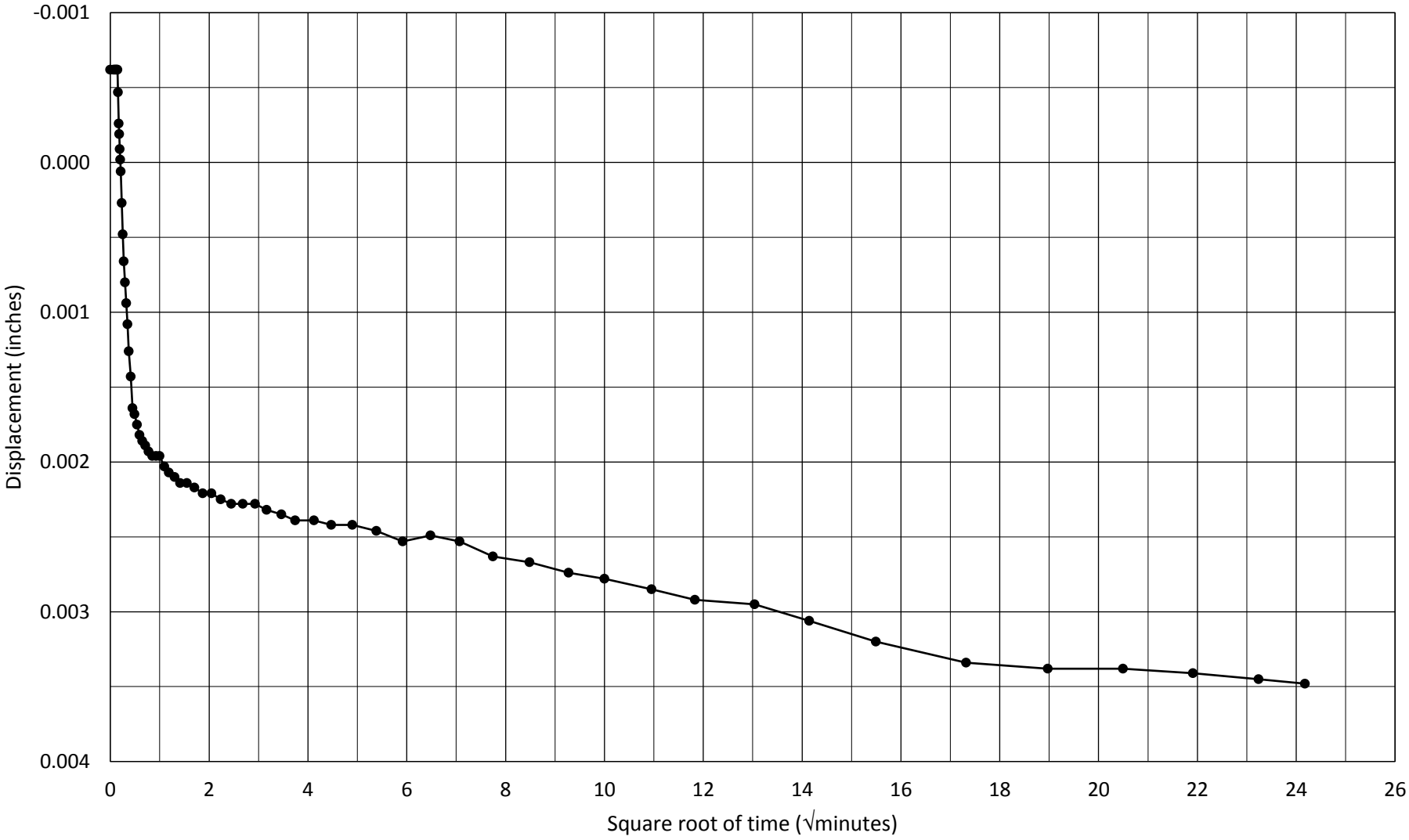
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-08
Depth: 12'-13'
Load: 1 to 2 tsf

TIME CONSOLIDATION

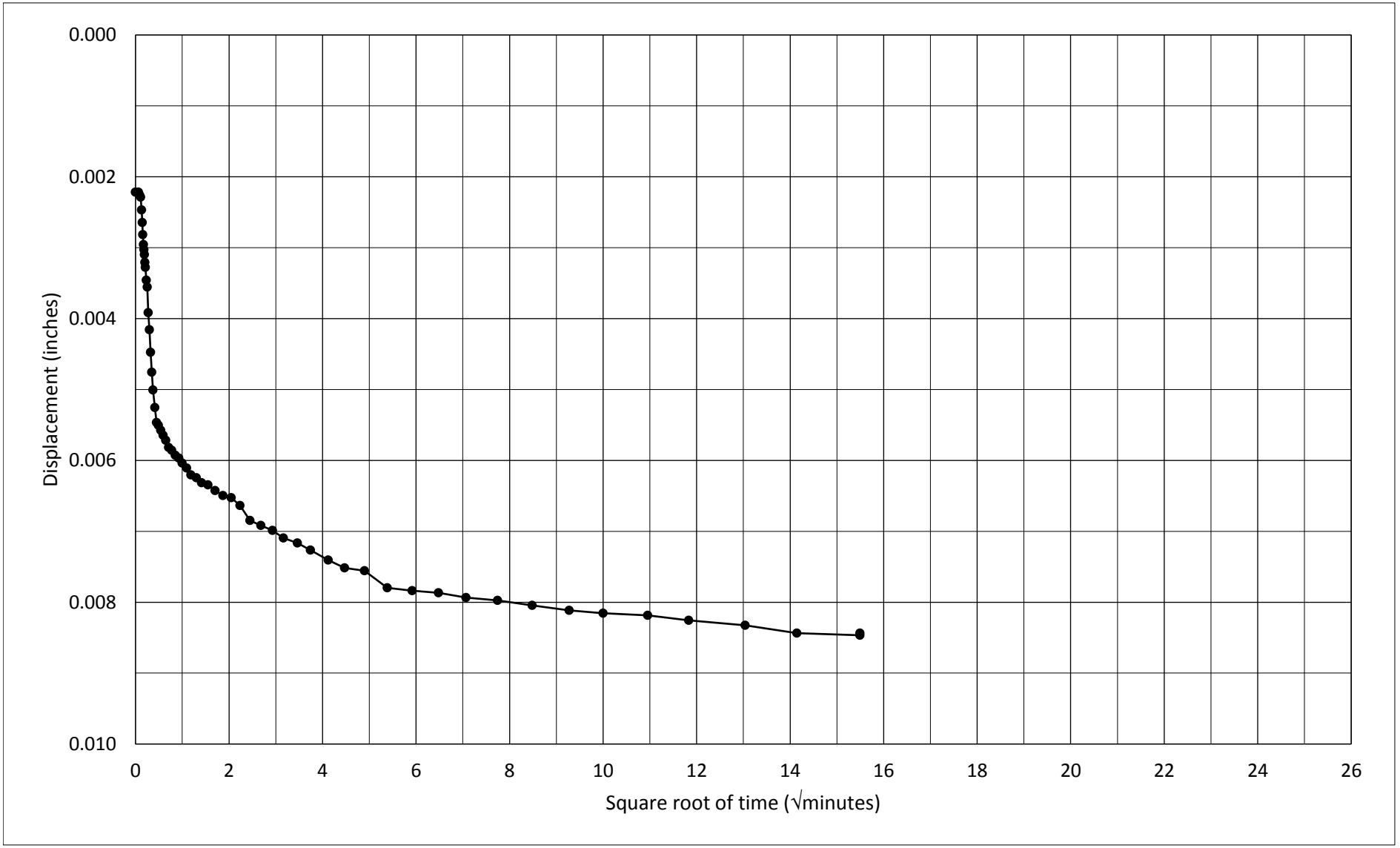
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-08
Depth: 12'-13'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-08
Depth: 12'-13'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah

5400 SOUTH

Boring Logs

DRILL HOLE LOG

BORING NO. 16-E-09

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 1

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 408199 E: 507391 / LAT: 40.651806 LONG: -111.980635

DATE STARTED: 4/22/16

DRILLING METHOD: 08-CME-55 / N.W. CASING TO 18.5'

DATE COMPLETED: 4/22/16

DRILLER: T.K.

GROUND ELEVATION: 4552.2'

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ N.M.

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
							16" CONCRETE								
4550				10	1,3,7,(21)	SP (A-1-b(0))	brown, moist — SAND		11.2		NP	8	88	4	
				5	8,14,13,(57)	GP-GM	brown, moist, dense — GRAVEL W/SILT & SAND possible cobbles								
4545	5			7	6,5,7,(24)	GP-GM	brown, moist, loose								
	10			16	5,4,3,(12) T 0.20	CL (A-6(4))	lt. brown, very moist, soft — SANDY LEAN CLAY sand lenses		28.2	32	13	1	47	52	
4540				13	Pushed T 0.20	CL (A-4(4))	brown, very moist, soft to firm	90.2	22.7	26	10	1	35	64	CT UU 1,143 psf
				16	12,30,13,(63) T 0.22	GM	brown, wet — SILTY GRAVEL W/SAND								
	15					CL	brown, moist — SANDY LEAN CLAY								
				16	4,5,7,(17) T 0.31	CL (A-4(2))	brown, very moist, firm — white stringers, possible pinholes		22.2	25	9	6	37	57	
4535				10	30,60/4"	GC,GP-GM	brown, moist, very dense — INTERBEDDED CLAYEY GRAVEL & SILTY GRAVEL W/SAND LAYERS possible cobbles								
	20			16	26,38,42,(88)	SP-SM (A-1-a(0))	gray-brown, very moist, very dense		11.3		NP	43	50	7	
4530															
	25			8	48,50/4"	SP-SM	gray-brown, wet, very dense — SAND W/SILT & GRAVEL possible cobbles								
4525															
	30			10	25,55,50/3"	SP-SM	gray-brown, wet, very dense								
4520															
	35			15	12,20,20,(37)	SM	gray-brown, wet, dense — SILTY SAND								
4515															
	40			15	5,8,9,(15)	ML (A-4(0))	brown, wet, med. dense — SANDY SILT		24.8		NP	0	39	61	
4510															
	45			16	7,10,11,(17)	SM	brown, very moist, med. dense — SILTY SAND clay lenses								
4505															
	50			15	6,11,12,(18)	SM	brown, very moist, med. dense — SILTY SAND								
4500							BOH								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6" (N_1)$_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- Pushed *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-10

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 1

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 408260 E: 507314 / LAT: 40.651973 LONG: -111.980914

DATE STARTED: 4/11/16

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 30.5'

DATE COMPLETED: 4/11/16

DRILLER: T.K.

GROUND ELEVATION: 4553.2'

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ N.M.

LOGGED BY: C.S., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
							26" CONCRETE								
4550				14	11,21,16,(78)	GP-GM (*A-1-a(0)*)	brown, moist, very dense — GRAVEL W/SILT & SAND (fill)		8.6		NP	46	44	10	
	5			11	7,12,19,(61)	GC	brown, moist, dense — CLAYEY GRAVEL W/SAND asphalt pieces, possible cobbles (fill)								
4545															
	10			9	11,25,23,(79)	GC-GM	brown, moist, very dense — SILTY CLAYEY GRAVEL W/SAND possible cobbles								
				7	Pushed	GC (*A-2-6(0)*)	lt. brown, moist — CLAYEY GRAVEL W/SAND	115.7	11.9	33	15	56	20	24	
4540				2	3,5,7,(17) *T 0.73*	CL	lt. brown, moist, stiff								
	15			15	3,6,11,(24) *T 0.34*	CL (*A-6(5)*)	lt. brown, moist, firm — SANDY LEAN CLAY trace gravels		21.4	34	16	12	37	51	
4535															
	20			10	13,31,45,(86)	SP-SM	brown, moist, very dense — SAND W/SILT & GRAVEL								
4530															
	25			9	42,75/5"	GP-GM	brown, moist, very dense								
4525							GRAVEL W/SILT & SAND possible cobbles								
	30			10	7,40,52,(85)	GP-GM	brown, moist, very dense								
4520															
	35			10	21,27,36,(54)	SP-SM (*A-1-a(0)*)	brown, moist, very dense — SAND W/SILT & GRAVEL		12.1		NP	21	72	7	
4515															
	40			16	10,13,13,(22)	SM	gray, moist, med. dense								
4510							SILTY SAND few clay seams to 0.5" thick								
	45			16	8,13,12,(22)	SM (*A-4(0)*)	brown w/gray & rust, moist, med. dense		24.6		NP	1	60	39	
4505															
	50			12	9,8,9,(13)	ML	brown w/rust, moist, med. dense — SANDY SILT								
4500							BOH								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- Blow Count per 6" (2,3,2,(6))
- $(N_1)_{60}$ Value
- *T 0.45* Torvane (tsf)
- *PP 2.0* Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* Torvane (tsf)
- Pushed *PP 2.0* Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-11

SHEET 1 OF 1

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 408968 E: 507080 / LAT: 40.653913 LONG: -111.981770

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 30'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 4/12/16

DATE COMPLETED: 4/12/16

GROUND ELEVATION: 4548.6'

LOGGED BY: C.S., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
							22" CONCRETE								
4545				13	25,55,38,(99+)	GM	gray, moist SILTY GRAVEL W/SAND								
						SM	brown, sl. moist, v. dense possible cobbles								
				9	13,10,5,(31)	SM	brown, sl. moist SILTY SAND W/GRAVEL								
	5					SC-SM (A-4(0))	brown, moist possible cobbles		16.5	22	5	2	59	39	
				15	15,19,13,(63)	SM	brown, sl. moist, very dense SILTY CLAYEY SAND / SILTY SAND W/GRAVEL								
4540															
	10			15	20,33,30,(99+)	GP-GM	brown, sl. moist, very dense GRAVEL W/SILT & SAND possible cobbles								
				2	5,11,8,(27)	CL	gray & rust, moist, stiff								
4535															
	15			15	Pushed T 1.13	CL (A-6(12))	gray w/rust, moist, very stiff SANDY LEAN CLAY	101.7	23.6	33	16	0	19	81	CT UU 4,923 psf
4530				15	3,4,10,(18) PP 1.8	CL	gray w/rust, moist, stiff								
	20			16	14,29,42,(78)	GC (A-2-6(0))	brown, moist, very dense CLAYEY GRAVEL W/SAND possible cobbles		12.4	32	14	47	39	14	
4525															
	25			9	11,58,50/3"	GM	brown, moist, very dense SILTY GRAVEL W/SAND possible cobbles								
4520															
	30			9	73,50/4"	GP-GM	gray w/red, moist, very dense GRAVEL W/SILT & SAND possible cobbles								
4515															
	35			14	46,58,35,(80)	GP-GM (A-1-a(0))	brown w/gray & rust, moist, very dense		7.8		NP	56	36	8	
4510															
	40			16	7,8,11,(16) T 0.79	SM	gray w/brown & rust, moist, med. dense SILTY SAND clay layers to 2" thick								
4505															
	45			15	6,13,15,(23)	SM (A-2-4(0))	gray w/brown & rust, moist, med. dense		19.9		NP	0	68	32	
4500							SILTY SAND W/GRAVEL (driller's observation)								
	50			12	9,11,13,(18)	SM	rust & brown w/gray, moist, med. dense SILTY SAND								
							BOH								
4495															

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value
- T 0.45 ← Torvane (tsf)
- PP 2.0 ← Pocket Penetrometer (tsf)
- With Liners
- Pushed T 0.45 ← Torvane (tsf)
- Pushed PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-12

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 409281 E: 507106 / LAT: 40.654771 LONG: -111.981680

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 35.5'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ 39.5' **AFTER 24 HOURS:** ▼ 74.7' (6/7/16)

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 5/17/16

DATE COMPLETED: 5/18/16

GROUND ELEVATION: 4531.8'

LOGGED BY: C.S., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4530	0			16	11,16,11,(57)	CL SM	brown, sl. moist SANDY LEAN CLAY brown to dk. brown, sl. moist, dense SILTY SAND W/GRAVEL								
				12	5,12,18,(63)	SP-SM (*A-1-a(0)*)	brown, moist, very dense SAND W/SILT & GRAVEL		11.6		NP	37	58	5	
4525	5			11	11,18,17,(69)	SP (*A-1-a(0)*)	brown, moist, very dense SAND W/GRAVEL possible cobbles		11.6		NP	46	50	4	
	10			6	11,17,6,(38)	GP-GM	brown, moist, med. dense GRAVEL W/SILT & SAND possible cobbles								
4520				5	2,17,27,(72)	GP-GM	brown, moist, dense								
				3	3,9,12,(30)	CL	brown, moist, stiff SANDY LEAN CLAY W/GRAVEL								
4515	15			10	12,21,34,(71)	SP-SM (*A-1-a(0)*)	brown, moist, very dense		11.1		NP	44	49	7	
	20			0	33,60/5"	-	no recovery								
4510				10	17,38,30,(80)	SP-SM	brown, moist, very dense SAND W/SILT & GRAVEL possible cobbles								
4505	25			11	16,28,30,(59)	SP-SM (*A-1-b(0)*)	brown, very moist, very dense		15.4		NP	20	74	6	
4500	30			10	16,44,35,(73)	SP-SM	brown, very moist, very dense								
4495	35			12	18,32,38,(60)	SP (*A-1-a(0)*)	brown, moist, very dense SAND W/GRAVEL possible cobbles		14.6		NP	22	74	4	
4490	40			11	24,29,31,(49)	SP-SM	brown, very moist, dense SAND W/SILT & GRAVEL possible cobbles								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon

Split Spoon Sample

Blow Count per 6"
2,3,2,(6) ← $(N_1)_{60}$ Value
T 0.45 ← Torvane (tsf)
PP 2.0 ← Pocket Penetrometer (tsf)
With Liners

Thin-Walled Tube Sample

Pushed
T 0.45 ← Torvane (tsf)
PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
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Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-12

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 409281 E: 507106 / LAT: 40.654771 LONG: -111.981680

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 35.5'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ 39.5' **AFTER 24 HOURS:** ▼ 74.7' (6/7/16)

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 5/17/16

DATE COMPLETED: 5/18/16

GROUND ELEVATION: 4531.8'

LOGGED BY: C.S., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4485				11	21,36,43,(62)	SP-SM (*A-1-a(0)*)	brown, very moist, very dense		13.5		NP	33	61	6	
	50			8	19,33,34,(48)	SP-SM	brown, very moist, dense SAND W/SILT & GRAVEL possible cobbles								
4480															
	55			4	4,4,5,(6) *T 0.33*	CL	lt. brown-green, moist, firm SANDY LEAN CLAY W/GRAVEL								
4475															
	60			18	Pushed *T 0.58*	CL (*A-6(16)*)	lt. brown-green w/rust, very moist, stiff	90.0	31.5	35	16	0	3	97	CT
4470															
	65			18	2,4,4,(5) *T 0.28*	CL	LEAN CLAY few silt lenses lt. brown-green to brown, very moist, firm		23.7						
4465															
	70			12	11,21,47,(42)	GC (*A-2-4(0)*)	brown, moist, med. dense CLAYEY GRAVEL W/SAND possible cobbles		11.1	23	8	44	40	16	
4460															
	75			0	42,60/4"	-	no recovery								
4455							CLAY W/GRAVEL (driller's observation)								
	80			12	9,10,11,(12) *T 0.33*	SC (*A-6(2)*)	lt. brown, moist, med. dense CLAYEY SAND sand lenses & layers to 4" thick		32.2	31	12	3	51	46	
4450							GRAVEL (driller's observation)								
	85			9	Pushed	ML (*A-4(0)*)	lt. brown w/rust spots, wet	82.0	38.6		NP	0	17	83	UU 1,215 psf
4445				0	8,12,17,(18)	-	no recovery SILT W/SAND								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample

2,3,2,(6) ← Blow Count per 6"
$(N_1)_{60}$ Value
T 0.45 ← Torvane (tsf)
PP 2.0 ← Pocket Penetrometer (tsf)
With Liners

Pushed
T 0.45 ← Torvane (tsf)
PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-E-12

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 409281 E: 507106 / LAT: 40.654771 LONG: -111.981680

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 35.5'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ 39.5' **AFTER 24 HOURS:** ▼ 74.7' (6/7/16)

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 5/17/16

DATE COMPLETED: 5/18/16

GROUND ELEVATION: 4531.8'

LOGGED BY: C.S., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4440				17	6,9,12,(13) *PP 2.5*	ML (*A-4(1)*)	lt. brown & lt. gray w/rust bands, wet, med. dense/very stiff — SILT W/SAND plastic, sand lenses & silty sand layers to 3" thick		30.2	26	3	0	27	73	
4435	95			15	42,33,39,(40)	SM	brown, wet, dense — SILTY SAND clayey sand & gravel layers								
4430	100			13	19,27,33,(33)	SC-SM (*A-2-4(0)*)	brown, moist, dense — SILTY CLAYEY SAND W/GRAVEL		13.4	25	7	34	51	15	
4425	105			11	18,18,20,(21)	SC-SM	lt. brown, moist, med. dense								
4420	110			18	12,7,11,(10) *T 0.59*	CL	rust & lt. brown, moist, stiff — SANDY LEAN CLAY silt layers to 2" thick		28.1						
4415	115			18	Pushed *PP >4.0*	CL (*A-7-6(24)*)	lt. brown, moist, hard — LEAN CLAY	94.7	28.1	46	24	0	8	92	CT UU 12,466 psf
	120			0	75/5"	-	no recovery — GRAVEL (driller's observation) BOH								
4410															
4405	125														
4400	130														

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- Pushed *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-10

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 408522 E: 507122 / LAT: 40.652689 LONG: -111.981611

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 30.5'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ 62.7' **AFTER 24 HOURS:** ▼ 47.5' (5/13/16)

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 3/30/16

DATE COMPLETED: 4/1/16

GROUND ELEVATION: 4555.9'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4555				18	1,4,4,(17)	CL	dk. brown, moist — SANDY LEAN CLAY W/GRAVEL								
	5			9	4,11,18,(61)	GC	dk. brown, moist, dense — CLAYEY GRAVEL W/SAND possible cobbles								
4550				14	22,35,32,(99+)	GP-GM (*A-1-a(0)*)	lt. brown, moist, very dense		8.4		NP	47	43	10	
	10			16	12,23,30,(87)	GP-GM	lt. brown, moist, very dense — GRAVEL W/SILT & SAND possible cobbles								
4545				16	2,2,3,(8) *T 0.42*	CL	lt. green-brown, moist, firm — LEAN CLAY silty sand lenses		32.0						Chem.
	15			18	*T 0.25* Pushed *PP 2.0*	CL ML (*A-7-6(5)*)	lt. green-brown, moist, firm / buff-white-brown, very moist, stiff — SANDY SILT plastic	79.1	36.9	43	15	3	46	51	CT UU 4,439 psf
4540															
4535	20			16	34,28,26,(61)	SM	brown, very moist, very dense — SILTY SAND W/GRAVEL								
4530	25			12	21,35,36,(72)	GP-GM (*A-1-a(0)*)	brown, wet, dense		11.8		NP	49	45	6	
4525	30			5	2,11,50,(57)	GP-GM	brown, wet, dense — GRAVEL W/SILT & SAND possible cobbles								
4520	35			4	60/6"	GP-GM	brown, wet, very dense								
4515	40			9	40,60/5"	GM	brown, wet, very dense — SILTY GRAVEL W/SAND possible cobbles								
4510	45			9	4,8,11,(15)	SM (*A-2-4(0)*)	brown, wet, med. dense — SILTY SAND		29.6		NP	0	68	32	
4505	50			18	4,9,11,(15)	SM (*A-4(0)*)	lt. brown & rusty-brown, wet, med. dense — SILTY SAND silt & clay lenses		30.1		NP	0	57	43	

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- Pushed *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-10

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 408522 E: 507122 / LAT: 40.652689 LONG: -111.981611

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 30.5'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ 62.7' **AFTER 24 HOURS:** ▼ 47.5' (5/13/16)

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 3/30/16

DATE COMPLETED: 4/1/16

GROUND ELEVATION: 4555.9'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4500				18	3,5,11,(12)	SM,ML	lt. brown, wet, med. dense	INTERBEDDED SILTY SAND, SILT W/CLAY & SILT LENSES & LAYERS								
4495	60			18	Pushed *T 0.35* *PP 3.5*	CL-ML (*A-4(4)*)	lt. brown, wet, firm to very stiff	SILTY CLAY W/SAND silty sand lenses	91.6	32.1	28	6	0	20	80	CT UU 11,075 psf
4490	65			18	4,6,8,(10)	ML (*A-4(0)*)	brown to rusty-brown, wet, loose			33.1		NP	1	47	52	
4485	70			18	9,14,12,(18)	ML	brown, wet, med. dense	SANDY SILT clay & sand lenses								
4480	75			18	5,10,10,(13)	ML (*A-4(0)*)	brown, wet, med. dense			32.1		NP	0	38	62	
4475	80			15	Pushed *T 0.38* *PP 1.9*	CL (*A-4(3)*)	lt. gray-brown, wet, firm to stiff	SANDY LEAN CLAY silty sand lenses	95.7	27.1	28	10	0	42	58	CT UU 4,170 psf
4470	85			18	2,2,3,(3) *T 0.49*	CL	lt. brown, moist, firm	LEAN CLAY silty sand lenses								
4465	90			6	42,60/4"	SP-SM	gray-brown, wet, very dense	SAND W/SILT & GRAVEL possible cobbles								
4460	95			0	80/6"	-	no recovery									
4455	100			7	44,58/6"	GP-GM	gray-brown, wet, very dense	GRAVEL W/SILT & SAND possible cobbles								
4450	105							BOH								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-11

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 408555 E: 507300 / LAT: 40.652782 LONG: -111.980969

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 24'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ 66.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 6/6/16

DATE COMPLETED: 6/8/16

GROUND ELEVATION: 4549.8'

LOGGED BY: C.S., M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
							4" ASPHALT								
				10	4,19,30,(99+)	GP-GM (*A-1-a(0)*)	brown, sl. moist, very dense		7.5		NP	57	32	11	
							GRAVEL W/SILT & SAND possible cobbles								
4545	5			6	2,14,17,(65)	GP-GM	brown, moist, dense								
				4	4,6,8,(28)	SC-SM	brown to dk. brown, moist, med. dense								Chem.
							SILTY CLAYEY SAND W/GRAVEL								
4540	10			9	10,17,18,(58)	SP-SM	brown, moist, dense								
							SAND W/SILT & GRAVEL possible cobbles								
				14	Pushed *T 0.58*	CL (*A-6(15)*)	lt. brown & brown, moist, stiff								
							LEAN CLAY	94.1	23.9	38	21	0	22	78	DS Chem.
4535	15			14	4,5,15,(28) *PP 1.5*	CL	lt. brown, moist, stiff								
							SANDY LEAN CLAY trace gravels								
				13	18,27,30,(68)	SP-SM (*A-1-a(0)*)	lt. brown, very moist, very dense		12.8		NP	32	58	10	
4530	20			7	17,23,23,(51)	SP-SM	lt. brown, very moist, dense								
							SAND W/SILT & GRAVEL possible cobbles								
4525	25			10	22,28,32,(61)	SP-SM (*A-1-a(0)*)	lt. brown, moist, dense		9.3		NP	40	53	7	
							SILTY GRAVEL W/SAND								
4520	30			12	14,18,60/3" *T 0.19*	GM	brown, sl. moist								
						SM	brown, sl. moist								
						GM	brown, sl. moist, very dense								
							SILTY SAND sandy silt layers								
							SILTY GRAVEL W/SAND								
4515	35			8	Pushed	SM (*A-2-4(0)*)	lt. brown, moist		13.1		NP	1	82	17	
				14	8,6,7,(12) *T 0.45*	SM	lt. brown, moist								
						ML	lt. brown, moist, med. dense								
							SILTY SAND clay layers to 1" thick								
4510	40			15	2,6,8,(12) *T 0.27*	ML (*A-4(0)*)	lt. brown, moist, med. dense		21.1		NP	0	34	66	
							SANDY SILT clay & sand layers to 3" thick								
4505	45			16	*T 0.35* 7,15,17,(26)	ML	lt. brown to brown-rust, moist, med. dense								
							SILTY SAND few clay lenses								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6" (N_1)$_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf) With Liners
- Pushed *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-11

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 408555 E: 507300 / LAT: 40.652782 LONG: -111.980969

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 24'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ 66.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 6/6/16

DATE COMPLETED: 6/8/16

GROUND ELEVATION: 4549.8'

LOGGED BY: C.S., M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				16	11,15,21,(28)	SM	brown, moist, med. dense								
4495	55			15	12,15,15,(22)	SM (A-2-4(0))	brown, moist, med. dense — SILTY SAND, few clay lenses		19.3		NP	0	66	34	Chem.
4490	60			16	10,13,18,(22)	SM	brown, moist, med. dense								
4485	65			12	Pushed	ML (A-4(0))	SANDY SILT, clay layers to 1" thick — brown, moist		22.2		NP	0	46	54	
			▽	16	5,12,13,(17)	SM (A-4(0))	brown, wet, med. dense — SILTY SAND		27.7		NP	0	58	42	
4480	70			18	4,5,6,(7) T 0.35	CL-ML	lt. brown, very moist, firm — SILTY CLAY								
4475	75			18	Pushed T 0.40	CL (A-6(12))	lt. brown, wet, firm to stiff — LEAN CLAY	88.4	32.5	31	14	0	7	93	CT UU 2,557 psf
4470	80			18	3,6,12,(12) T 0.56	CL	lt. brown, moist & wet, stiff — LEAN CLAY, silty sand lenses								
4465	85			3	60/5"	GC	brown, wet, very dense — CLAYEY GRAVEL W/SAND, possible cobbles								
4460	90			16	40,50,30,(47)	GM	SILTY GRAVEL W/SAND, possible cobbles — lt. brown, wet								
						SM	lt. brown, wet, dense — SILTY SAND W/GRAVEL, possible cobbles								
4455	95						BOH								

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- T 0.45 ← Torvane (tsf)
- PP 2.0 ← Pocket Penetrometer (tsf)
- With Liners
- Pushed
- T 0.45 ← Torvane (tsf)
- PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-12

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 408773 E: 507063 / LAT: 40.653376 LONG: -111.981829

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 38'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ 49.3' (5/13/16)

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 5/10/16

DATE COMPLETED: 5/11/16

GROUND ELEVATION: 4551.3'

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4550			8	3,8,4,(25)	SC-SM (A-2-4(0))	dk. brown, wet, med. dense — SILTY CLAYEY SAND W/GRAVEL		11.0	24	7	28	50	22	
			0	4,2,2,(8)	-	no recovery									
	5					no recovery									
4545			4	4,4,6,(20)	SM	brown, very moist, med. dense — SILTY SAND W/GRAVEL									
	10		7	4,10,21,(51)	GP (A-1-a(0))	brown, wet, dense — GRAVEL W/SAND some silt		9.4		NP	53	43	4		
4540			7	3,2,3,(7) T 0.20	CL (A-6(5))	lt. gray-brown, moist, soft — SANDY LEAN CLAY trace gravel		26.7	31	14	14	27	59		
	15		16	Pushed PP 2.5	ML (A-4(0))	lt. brown, very moist, stiff — SANDY SILT clay lenses	98.5	24.4		NP	0	39	61	CT UU 5,002 psf	
4535			18	10,33,33,(84)	SC-SM	lt. brown, moist, very dense — SILTY CLAYEY SAND W/GRAVEL possible cobbles									
	20		17	27,37,44,(89)	SP-SM (A-1-a(0))	brown, very moist, very dense — SAND W/SILT & GRAVEL possible cobbles		11.6		NP	32	60	8		
4530															
	25		17	26,27,27,(55)	SP-SM	brown, moist, very dense — SAND W/SILT trace gravels									
4525															
	30		1	17,75,75,(99+)	GP-GM (A-1-a(0))	brown, very moist, very dense — GRAVEL W/SILT & SAND possible cobbles		7.3		NP	58	36	6		
4520															
	35		3	70/4"	GP-GM	brown, very moist, very dense									
4515															
	40		14	9,6,5,(9)	SM (A-4(0))	lt. gray-brown, wet, loose — SILTY SAND		27.7		NP	0	61	39		
4510															
	45		11	25,36,17,(40)	GM	lt. gray-brown, wet, med. dense — SILTY GRAVEL W/SAND									
4505															
	50		18	Pushed	SM (A-4(0))	SILTY SAND lt. gray-brown, wet		21.1		NP	2	52	46		
4500					ML (A-4(0))	lt. gray-brown, wet — SANDY SILT clay lenses & seams to 0.5" thick	86.9	27.2		NP	0	31	69	CT	
	55		18	3,4,5,(7)	ML	lt. gray-brown, wet									
4495					SM	lt. gray-brown, wet, loose — SILTY SAND									
						LEAN CLAY W/SAND									

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- T 0.45 ← Torvane (tsf)
- PP 2.0 ← Pocket Penetrometer (tsf)
- With Liners
- Pushed
- T 0.45 ← Torvane (tsf)
- PP 2.0 ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-S-12

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 408773 E: 507063 / LAT: 40.653376 LONG: -111.981829

DATE STARTED: 5/10/16

DRILLING METHOD: 08-CME-55 / H.W.T. CASING TO 38'

DATE COMPLETED: 5/11/16

DRILLER: T.K.

GROUND ELEVATION: 4551.3'

DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ 49.3' (5/13/16)

LOGGED BY: M.H., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4490				16	Pushed *PP 2.0*	CL (*A-4(6)*)	lt. brown, wet, stiff LEAN CLAY W/SAND	89.4	30.3	30	10	0	23	77	
4485	65			0	7,15,21,(26)	-	no recovery								
4480	70			16	11,14,17,(21)	ML (*A-4(0)*)	SANDY SILT brown, wet, med. dense		28.0		NP	0	44	56	
4475	75			2	2,4,7,(8)	CL	lt. brown, wet, stiff								
4470	80			18	Pushed *T 0.53*	CL (*A-6(14)*)	lt. brown, very moist, stiff LEAN CLAY	93.1	29.3	35	16	0	9	91	CT
4465	85			18	3,4,5,(6) *T 0.46*	CL	lt. brown, very moist, firm								
							GRAVEL (driller's observation)								
4460	90			18	5,7,8,(9) *T 0.41*	CL	lt. brown, moist, firm LEAN CLAY								
							GRAVEL (driller's observation)								
4455	95			10	Pushed *T 0.47*	CL (*A-6(8)*)	lt. brown, moist, firm LEAN CLAY W/SAND	88.5	31.1	32	11	5	17	78	CT
4450	100			3	60/4"	GP-GM	brown, wet, very dense GRAVEL W/SILT & SAND possible cobbles								
4445	105						SAND (driller's observation)								
4440	110			18	3,5,7,(7) *T 0.60*	CL (*A-6(6)*)	lt. brown, moist, stiff SANDY LEAN CLAY		27.2	30	12	0	33	67	
							BOH								
4435	115														

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample: 2,3,2,(6) ← Blow Count per 6"; $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Thin-Walled Tube Sample: Pushed
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

Laboratory Test Results – Summary Tables

SUMMARY OF TEST DATA
BANGERTER 4 INTERCHANGES
5400 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	IN-PLACE		UNCONFINED OR UU TRIAXIAL COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO CLASSIFICATION)
		DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
16-S-10	6-7.5		8.4				NP	47	43	10	GP-GM (A-1-a (0))
	12-13.5		32.0								
	15-16.5	79.1	36.9	UU 4,439	43	28	15	3	46	51	ML (A-7-6 (5))
	25-26.5		11.8				NP	49	45	6	GP-GM (A-1-a (0))
	45-46.5		29.6				NP	0	68	32	SM (A-2-4 (0))
	50-51.5		30.1				NP	0	57	43	SM (A-4 (0))
	60-61.5	91.6	32.1	UU 11,075	28	22	6	0	20	80	CL-ML (A-4 (4))
	65-66.5		33.1				NP	1	47	52	ML (A-4 (0))
	75-76.5		32.1				NP	0	38	62	ML (A-4 (0))
	80-81.3	95.7	27.1	UU 4,170	28	18	10	0	42	58	CL (A-4 (3))
16-S-11	0.3-1.8		7.5				NP	57	32	11	GP-GM (A-1-a (0))
	12-13.5	94.1	23.9		38	17	21	0	22	78	CL (A-6 (15))
	18-19.5		12.8				NP	32	58	10	SP-SM (A-1-a (0))
	25-26.5		9.3				NP	40	53	7	SP-SM (A-1-a (0))
	35-35.7		13.1				NP	1	82	17	SM (A-2-4 (0))
	40-41.5		21.1				NP	0	34	66	ML (A-4 (0))
	55-56.5		19.3				NP	0	66	34	SM (A-2-4 (0))
	65-66		22.2				NP	0	46	54	ML (A-4 (0))
	66-67.5		27.7				NP	0	58	42	SM (A-4 (0))
	75-76.5	88.4	32.5	UU 2,557	31	17	14	0	7	93	CL (A-6 (12))
16-S-12	0-1.5		11.0		24	17	7	28	50	22	SC-SM (A-2-4 (0))
	9-10.5		9.4				NP	53	43	4	GP (A-1-a (0))
	12-13.5		26.7		31	17	14	14	27	59	CL (A-6 (5))
	15-16.5	98.5	24.4	UU 5,002			NP	0	39	61	ML (A-4 (0))
	21-22.5		11.6				NP	32	60	8	SP-SM (A-1-a (0))
	30-31.5		7.3				NP	58	36	6	GP-GM (A-1-a (0))
	40-41.5		27.7				NP	0	61	39	SM (A-4 (0))
	50-51.5 (top)		21.1				NP	2	52	46	SM (A-4 (0))

NP=Non-Plastic

SUMMARY OF TEST DATA
BANGERTER 4 INTERCHANGES
5400 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	IN-PLACE		UNCONFINED OR UU TRIAXIAL COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO CLASSIFICATION)
		DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
16-S-12	50-51.5 (bottom)	86.9	27.2				NP	0	31	69	ML (A-4 (0))
	60.61.5	89.4	30.3		30	20	10	0	23	77	CL (A-4 (6))
	70-71.5		28.0				NP	0	44	56	ML (A-4 (0))
	80-81.5	93.1	29.3		35	19	16	0	9	91	CL (A-6 (14))
	95-96	88.5	31.1		32	21	11	5	17	78	CL (A-6 (8))
	110-111.5		27.2		30	18	12	0	33	67	CL (A-6 (6))
16-E-09	1.3-2.8		11.2				NP	8	88	4	SP (A-1-b (0))
	9-10.5		28.2		32	19	13	1	47	52	CL (A-6 (4))
	12-13.5	90.2	22.7	UU 1,143	26	16	10	1	35	64	CL (A-4 (4))
	15-16.5		22.2		25	16	9	6	37	57	CL (A-4 (2))
	21-22.5		11.3				NP	43	50	7	SP-SM (A-1-a (0))
	40-41.5		24.8				NP	0	39	61	ML (A-4 (0))
16-E-10	2.2-3.7		8.6				NP	46	44	10	GP-GM (A-1-a (0))
	12-13.5	115.7	11.9		33	18	15	56	20	24	GC (A-2-6 (0))
	15-16.5		21.4		34	18	16	12	37	51	CL (A-6 (5))
	35-36.5		12.1				NP	21	72	7	SP-SM (A-1-a (0))
	45-46.5		24.6				NP	1	60	39	SM (A-4 (0))
16-E-11	3.4-4.9 (bottom)		16.5		22	17	5	2	59	39	SC-SM (A-4 (0))
	15-16.5	101.7	23.6	UU 4,923	33	17	16	0	19	81	CL (A-6 (12))
	21-22.5		12.4		32	18	14	47	39	14	GC (A-2-6 (0))
	35-36.5		7.8				NP	56	36	8	GP-GM (A-1-a (0))
	45-46.5		19.9				NP	0	68	32	SM (A-2-4 (0))
16-E-12	3-4.5		11.6				NP	37	58	5	SP-SM (A-1-a (0))
	6-7.5		11.6				NP	46	50	4	SP (A-1-a (0))
	15-16.5		11.1				NP	44	49	7	SP-SM (A-1-a (0))

NP=Non-Plastic

SUMMARY OF TEST DATA
BANGERTER 4 INTERCHANGES
5400 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	IN-PLACE		UNCONFINED OR UU TRIAXIAL COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO CLASSIFICATION)
		DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
16-E-12	25-26.5		15.4				NP	20	74	6	SP-SM (A-1-b (0))
	35-36.5		14.6				NP	22	74	4	SP (A-1-a (0))
	45-46.5		13.5				NP	33	61	6	SP-SM (A-1-a (0))
	60-61.5	90.0	31.5		35	19	16	0	3	97	CL (A-6 (16))
	65-66.5		23.7								
	70-71.5		11.1		23	15	8	44	40	16	GC (A-2-4 (0))
	80-81.5		32.2		31	19	12	3	51	46	SC (A-6 (2))
	85-85.7	82.0	38.6	UU 1,215			NP	0	17	83	ML (A-4 (0))
	90-91.5		30.2		26	23	3	0	27	73	ML (A-4 (1))
	100-101.5		13.4		25	18	7	34	51	15	SC-SM (A-2-4 (0))
	110-111.5		28.1								
	115-116.5	94.7	28.1	UU 12,466	46	22	24	0	8	92	CL (A-7-6 (24))

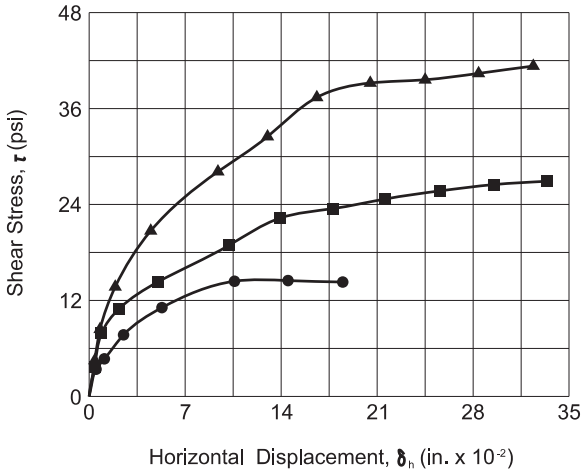
NP=Non-Plastic

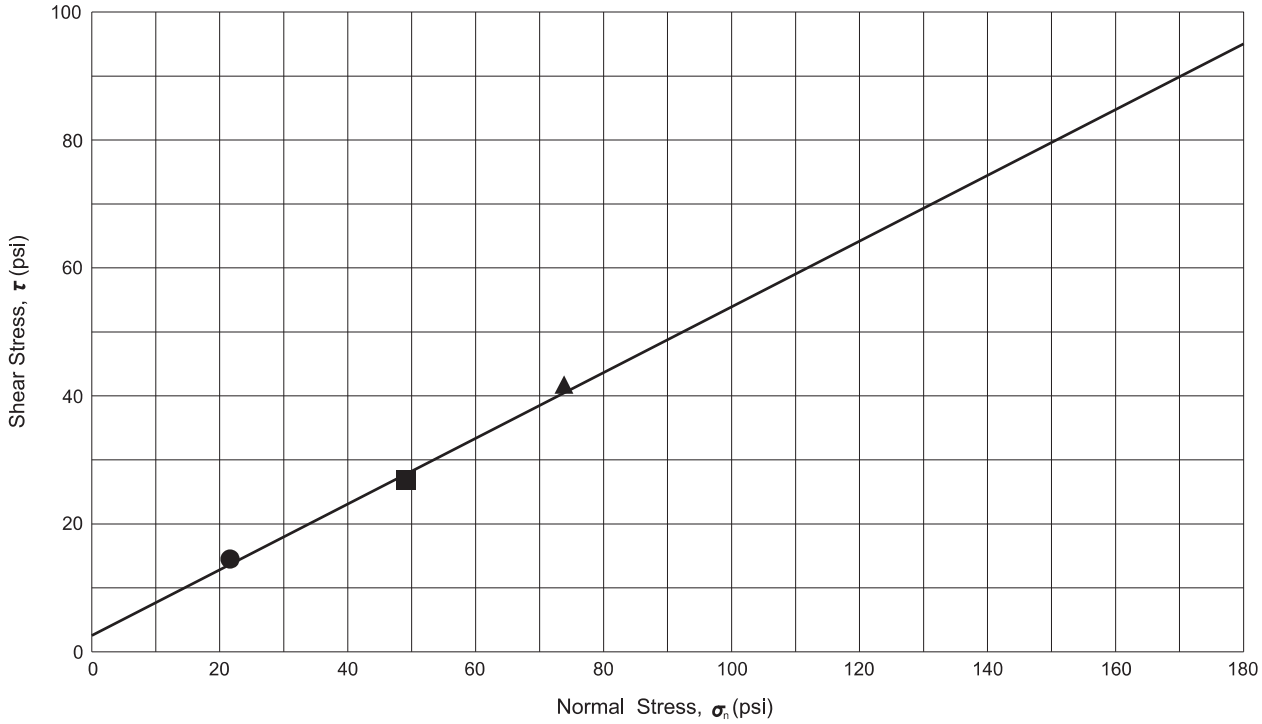
SUMMARY OF ELECTRO-CHEMICAL TEST DATA
BANGERTER 4 INTERCHANGES
5400 SOUTH

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	pH	RESISTIVITY (ohm-cm)	CHLORIDE (mg/kg-dry)	SULFATE (mg/kg-dry)
16-S-10	12-13.5	7.6	600	332	21.4
16-S-11	3-9	8.7	2600		
	12-13.5	8.8	1300		
	55-56.5	8.5	2800	11.3	19.6

NP=Non-Plastic

Laboratory Test Results – Direct Shear





Test No. or Symbol	Sample Size (inches)	Sample Data		Degree of Saturation (%)	Normal Stress σ_n (psi)	Maximum Shear Stress τ (psi)	Strain Rate (inches/ minute)	Shear Strength Parameters	
		Dry Density (pcf)	Moisture Content (%)					Friction Angle (degrees)	Cohesion (psi)
●	2.37	94.0	23.7	~100	21.6	14.5	0.0006	27.2	3
■	2.36	94.0	24.0	~100	49.1	26.9	0.0006		
▲	2.35	94.3	24.0	~100	73.8	41.3	0.0006		

MATERIAL: LEAN CLAY W/SAND, CL

DIRECT SHEAR TEST

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

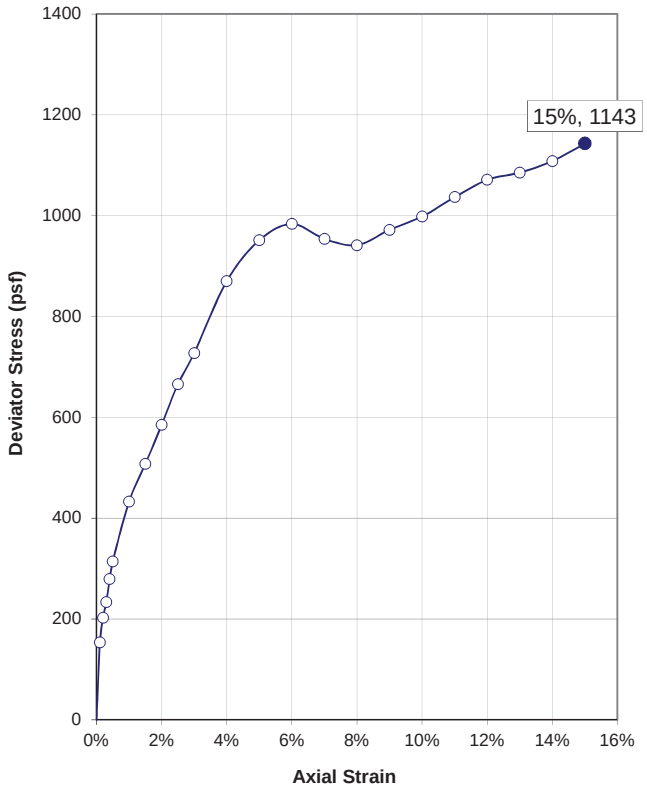
HOLE NO.: 16-S-11

DEPTH: 12'-13.5'

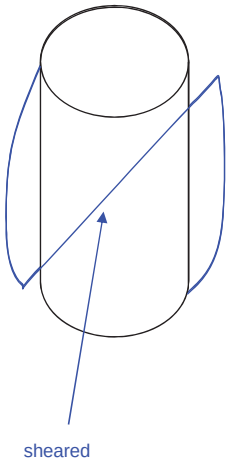
Laboratory Test Results – UU Triaxial Compression

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-09
Project No.	201601-009	**Sample**	1
Location	5400 So.	**Depth / Elev. (ft)**	12'-13.8'
Date	Friday, April 29, 2016	**Sample Description**	Sandy Lean Clay CL
		Sample Type	shelby



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-1	0	
0.1%	153	77	
0.2%	203	101	
0.3%	234	117	
0.4%	279	140	
0.5%	314	157	
1.0%	433	216	
1.5%	508	254	
2.0%	585	293	
2.5%	666	333	
3.0%	727	364	
4.0%	870	435	
5.0%	951	476	
6.0%	984	492	
7.0%	954	477	
8.0%	942	471	
9.0%	972	486	
10.0%	998	499	
11.0%	1037	518	
12.0%	1071	536	
13.0%	1085	543	
14.0%	1108	554	
15.0%	1143	571	



Initial Sample Data

Initial height of specimen	L_o	4.89	(in)	**Moisture content***	w	22.7%	
Initial diameter of specimen	D_o	2.60	(in)	**Dry unit weight**	γ_d	89.0	(pcf)
Height-to-diameter ratio	L_o / D_o	1.88		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	26		**Initial void ratio**	e_o	0.880	
Plastic index	PI	10		**Saturation**	S	69%	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	1143	(psf)	**Major principal stress at failure****	σ_1	2582	(psf)
Shear stress at failure**	c_u	571	(psf)	**Minor principal stress at failure****	σ_3	1439	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

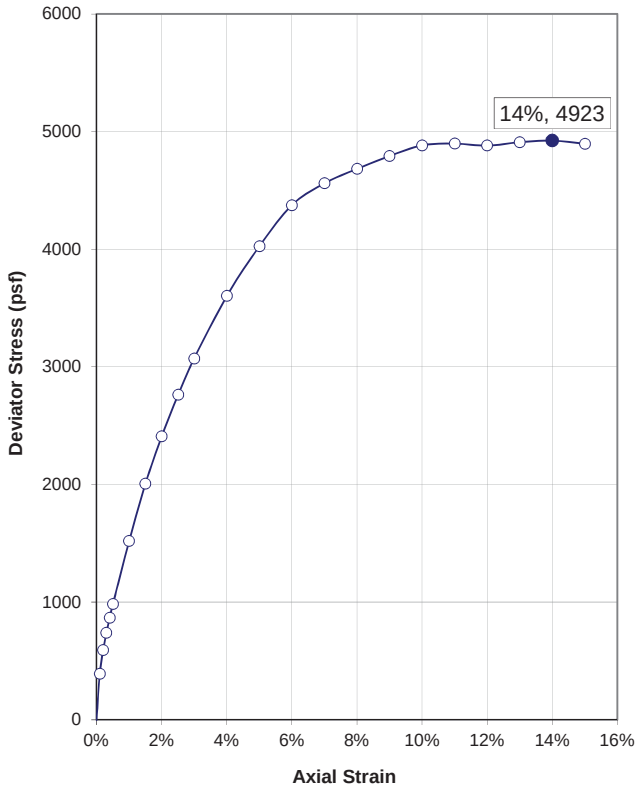
Remarks Confining Pressure 10 psi

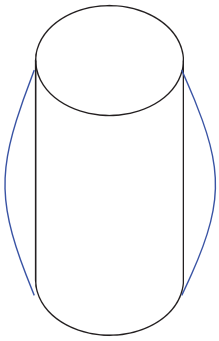
*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

ASTM D 2850

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-11
Project No.	201601-009	**Sample**	1
Location	16-E-11	**Depth / Elev. (ft)**	15'-16.5'
Date	Monday, April 25, 2016	**Sample Description**	Lean Clay w/ Sand CL
		Sample Type	shelby



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-4	-2	
0.1%	392	196	
0.2%	592	296	
0.3%	739	370	
0.4%	867	433	
0.5%	985	493	
1.0%	1520	760	
1.5%	2006	1003	
2.0%	2409	1205	
2.5%	2763	1381	
3.0%	3071	1536	
4.0%	3603	1802	
5.0%	4027	2013	
6.0%	4374	2187	
7.0%	4561	2281	
8.0%	4683	2342	
9.0%	4793	2397	
10.0%	4883	2442	
11.0%	4898	2449	
12.0%	4882	2441	
13.0%	4910	2455	
14.0%	4923	2462	
15.0%	4896	2448	

Initial Sample Data

Initial height of specimen	L_o	5.15	(in)	**Moisture content***	w	23.6%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	105.2	(pcf)
Height-to-diameter ratio	L_o / D_o	1.84		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	33		**Initial void ratio**	e_o	0.589	
Plastic index	PI	16		**Saturation**	S	100%	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	4923	(psf)	**Major principal stress at failure****	σ_1	6791	(psf)
Shear stress at failure**	c_u	2462	(psf)	**Minor principal stress at failure****	σ_3	1868	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		14%					

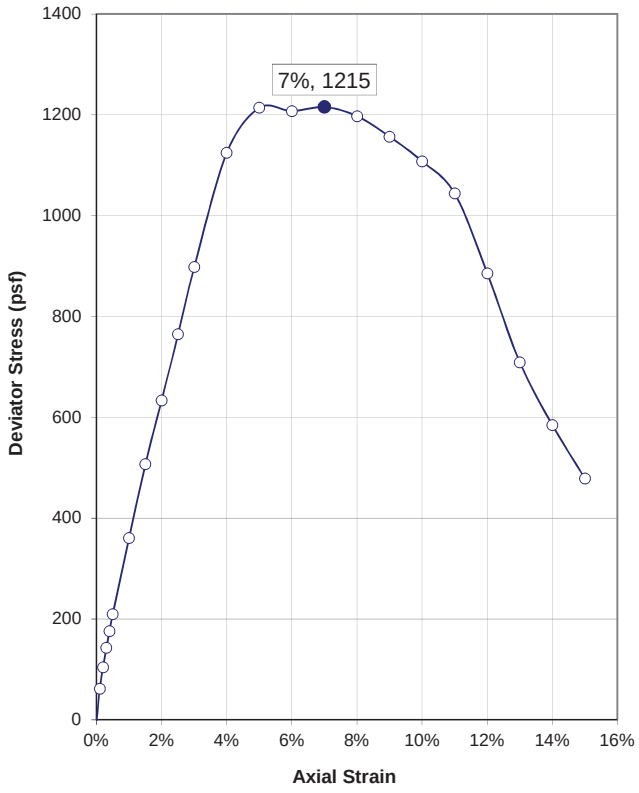
Remarks Confining Pressure 13 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

ASTM D 2850

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-12
Project No.	201601-009	**Sample**	1
Location	16-E-12	**Depth / Elev. (ft)**	85'-85'8"
Date	Friday, July 01, 2016	**Sample Description**	Silt w/ Sand ML
		Sample Type	shelby



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-5	-3	
0.1%	62	31	
0.2%	104	52	
0.3%	143	71	
0.4%	176	88	
0.5%	209	105	
1.0%	360	180	
1.5%	507	254	
2.0%	633	317	
2.5%	765	382	
3.0%	898	449	
4.0%	1125	562	
5.0%	1214	607	
6.0%	1207	604	
7.0%	1215	608	
8.0%	1197	599	
9.0%	1157	578	
10.0%	1108	554	
11.0%	1044	522	
12.0%	886	443	
13.0%	709	355	
14.0%	584	292	
15.0%	479	239	

Initial Sample Data

Initial height of specimen	L_o	4.84	(in)	**Moisture content***	w	38.6%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	82.0	(pcf)
Height-to-diameter ratio	L_o / D_o	1.73		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	NP		**Initial void ratio**	e_o	1.041	
Plastic index	PI	NP		**Saturation**	S	99%	

Test Results

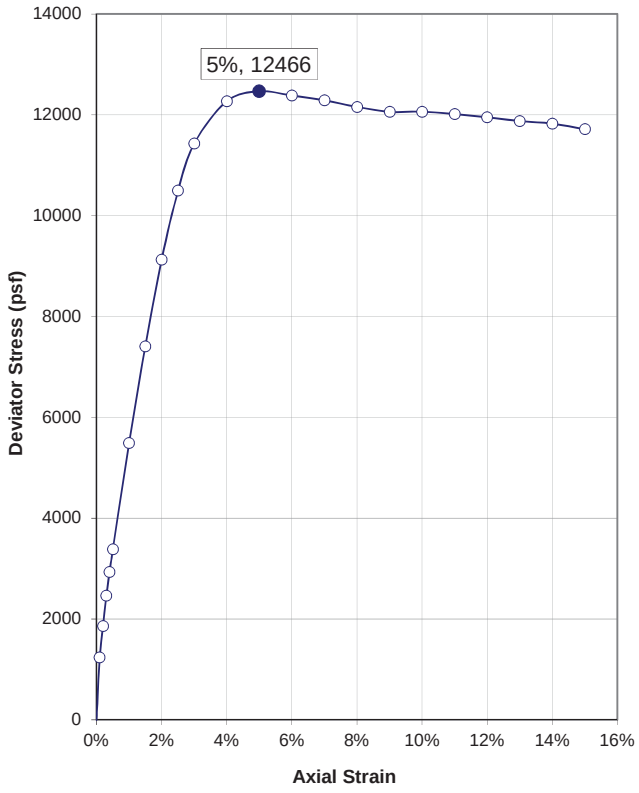
Deviator stress at failure**	$\sigma_{d,f}$	1215	(psf)	**Major principal stress at failure****	σ_1	8128	(psf)
Shear stress at failure**	c_u	608	(psf)	**Minor principal stress at failure****	σ_3	6913	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		7%					

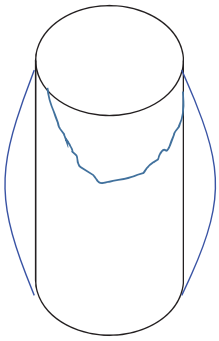
Remarks Confining Pressure 48 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-E-12
Project No.	201601-009	**Sample**	1
Location	16-E-12	**Depth / Elev. (ft)**	115'-116.5'
Date	Thursday, June 16, 2016	**Sample Description**	Lean Clay CL
		Sample Type	shelby



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-5	-3	
0.1%	1234	617	
0.2%	1858	929	
0.3%	2459	1230	
0.4%	2934	1467	
0.5%	3382	1691	
1.0%	5490	2745	
1.5%	7410	3705	
2.0%	9125	4563	
2.5%	10497	5248	
3.0%	11432	5716	
4.0%	12271	6136	
5.0%	12466	6233	
6.0%	12384	6192	
7.0%	12287	6143	
8.0%	12158	6079	
9.0%	12059	6030	
10.0%	12063	6031	
11.0%	12016	6008	
12.0%	11952	5976	
13.0%	11877	5939	
14.0%	11825	5913	
15.0%	11714	5857	

Initial Sample Data

Initial height of specimen	L_o	5	(in)	**Moisture content***	w	28.1%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	97.2	(pcf)
Height-to-diameter ratio	L_o / D_o	1.79		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	46		**Initial void ratio**	e_o	0.721	
Plastic index	PI	24		**Saturation**	S	100%	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	12466	(psf)	**Major principal stress at failure****	σ_1	20961	(psf)
Shear stress at failure**	c_u	6233	(psf)	**Minor principal stress at failure****	σ_3	8495	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		5%					

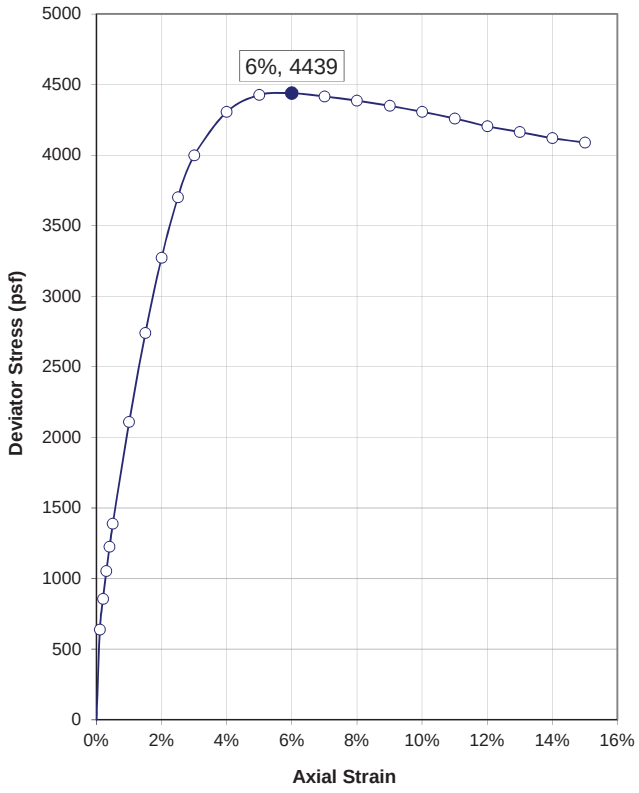
Remarks Confining Pressure 59 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

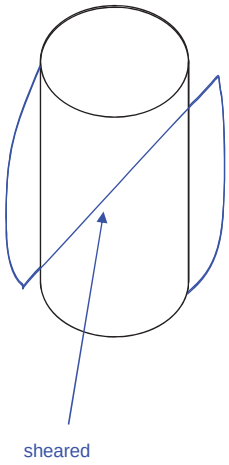
ASTM D 2850

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-S-10
Project No.	201601-009	**Sample**	1
Location	5400 So.	**Depth / Elev. (ft)**	15'-16.5'
Date	Friday, April 29, 2016	**Sample Description**	Silt (plastic) ML (A-7-6(5))
		Sample Type	shelby



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-1	-1	
0.1%	638	319	
0.2%	857	428	
0.3%	1053	526	
0.4%	1226	613	
0.5%	1389	694	
1.0%	2111	1055	
1.5%	2740	1370	
2.0%	3274	1637	
2.5%	3702	1851	
3.0%	3998	1999	
4.0%	4307	2153	
5.0%	4426	2213	
6.0%	4439	2219	
7.0%	4416	2208	
8.0%	4386	2193	
9.0%	4350	2175	
10.0%	4307	2153	
11.0%	4260	2130	
12.0%	4204	2102	
13.0%	4164	2082	
14.0%	4120	2060	
15.0%	4089	2045	



Initial Sample Data

Initial height of specimen	L_o	5.8	(in)	**Moisture content***	w	36.9%	
Initial diameter of specimen	D_o	2.60	(in)	**Dry unit weight**	γ_d	82.7	(pcf)
Height-to-diameter ratio	L_o / D_o	2.23		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	43		**Initial void ratio**	e_o	1.021	
Plastic index	PI	15		**Saturation**	S	97%	

Test Results

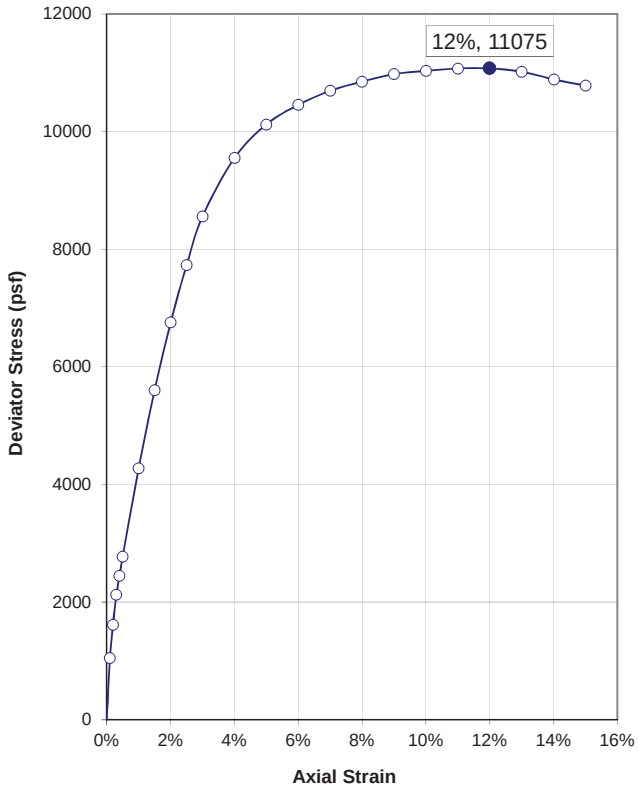
Deviator stress at failure**	$\sigma_{d,f}$	4439	(psf)	**Major principal stress at failure****	σ_1	6309	(psf)
Shear stress at failure**	c_u	2219	(psf)	**Minor principal stress at failure****	σ_3	1870	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		6%					

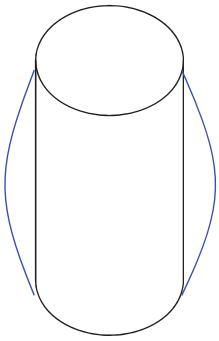
Remarks Confining Pressure 13 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-S-10
Project No.	201601-009	**Sample**	1
Location	5400 So.	**Depth / Elev. (ft)**	60'-61.5'
Date	Wednesday, May 04, 2016	**Sample Description**	Silty Clay w/ Sand CL-ML (A-4(4))
		Sample Type	shelby



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-4	-2	
0.1%	1048	524	
0.2%	1616	808	
0.3%	2125	1062	
0.4%	2449	1224	
0.5%	2772	1386	
1.0%	4278	2139	
1.5%	5603	2801	
2.0%	6758	3379	
2.5%	7732	3866	
3.0%	8558	4279	
4.0%	9553	4777	
5.0%	10122	5061	
6.0%	10457	5228	
7.0%	10694	5347	
8.0%	10851	5425	
9.0%	10979	5489	
10.0%	11035	5518	
11.0%	11074	5537	
12.0%	11075	5537	
13.0%	11019	5509	
14.0%	10886	5443	
15.0%	10782	5391	

Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	32.1%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	93.7	(pcf)
Height-to-diameter ratio	L_o / D_o	1.86		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	28		**Initial void ratio**	e_o	0.785	
Plastic index	PI	6		**Saturation**	S	100%	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	11075	(psf)	**Major principal stress at failure****	σ_1	18130	(psf)
Shear stress at failure**	c_u	5537	(psf)	**Minor principal stress at failure****	σ_3	7055	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		12%					

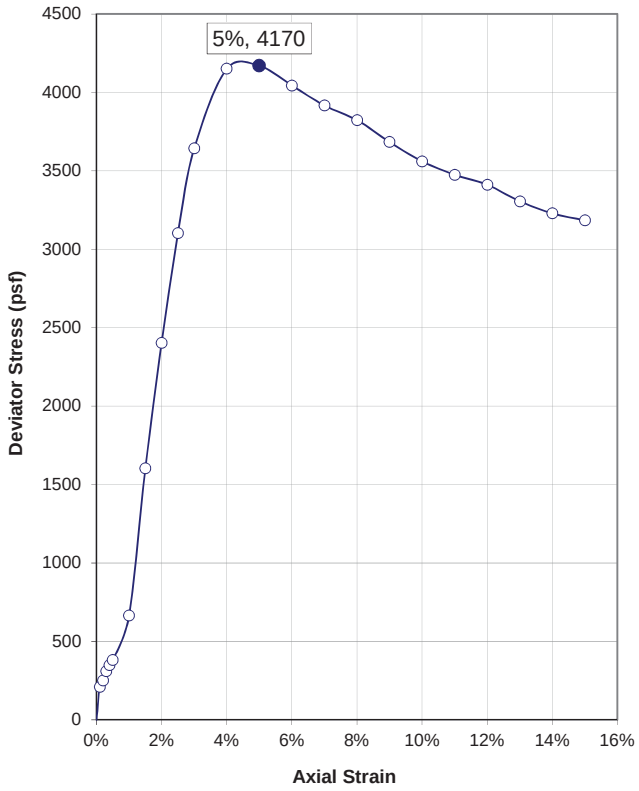
Remarks Confining Pressure 49 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

ASTM D 2850

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-S-10
Project No.	201601-009	**Sample**	1
Location	5400 So.	**Depth / Elev. (ft)**	80'-81.5'
Date	Wednesday, May 04, 2016	**Sample Description**	Sandy Lean Clay CL (A-4(3))
		Sample Type	shelby



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	0	0	
0.1%	209	105	
0.2%	251	125	
0.3%	309	154	
0.4%	348	174	
0.5%	381	190	
1.0%	665	333	
1.5%	1604	802	
2.0%	2404	1202	
2.5%	3103	1551	
3.0%	3645	1822	
4.0%	4151	2075	
5.0%	4170	2085	
6.0%	4044	2022	
7.0%	3916	1958	
8.0%	3823	1912	
9.0%	3684	1842	
10.0%	3560	1780	
11.0%	3474	1737	
12.0%	3412	1706	
13.0%	3306	1653	
14.0%	3229	1614	
15.0%	3184	1592	

Initial Sample Data

Initial height of specimen	L_o	5.61	(in)	**Moisture content***	w	27.1%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	98.2	(pcf)
Height-to-diameter ratio	L_o / D_o	2.00		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	28		**Initial void ratio**	e_o	0.704	
Plastic index	PI	10		**Saturation**	S	100%	

Test Results

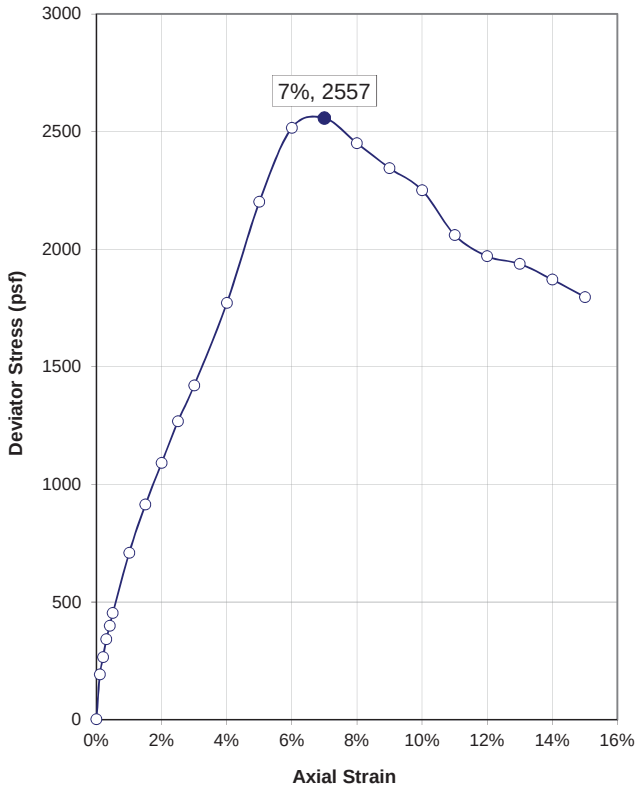
Deviator stress at failure**	$\sigma_{d,f}$	4170	(psf)	**Major principal stress at failure****	σ_1	12368	(psf)
Shear stress at failure**	c_u	2085	(psf)	**Minor principal stress at failure****	σ_3	8199	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		5%					

Remarks Confining Pressure 57 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-S11
Project No.	201601-009	**Sample**	1
Location	16-S11	**Depth / Elev. (ft)**	75 to 76.5'
Date	Monday, June 27, 2016	**Sample Description**	Lean Clay CL
		Sample Type	shelby



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	2	1	
0.1%	193	96	
0.2%	266	133	
0.3%	342	171	
0.4%	400	200	
0.5%	454	227	
1.0%	710	355	
1.5%	916	458	
2.0%	1091	546	
2.5%	1269	634	
3.0%	1421	711	
4.0%	1772	886	
5.0%	2201	1101	
6.0%	2517	1258	
7.0%	2557	1279	
8.0%	2450	1225	
9.0%	2345	1173	
10.0%	2251	1125	
11.0%	2061	1030	
12.0%	1970	985	
13.0%	1938	969	
14.0%	1871	936	
15.0%	1797	899	

Initial Sample Data

Initial height of specimen	L_o	5.57	(in)	**Moisture content***	w	32.5%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	91.2	(pcf)
Height-to-diameter ratio	L_o / D_o	1.99		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	31		**Initial void ratio**	e_o	0.834	
Plastic index	PI	14		**Saturation**	S	100%	

Test Results

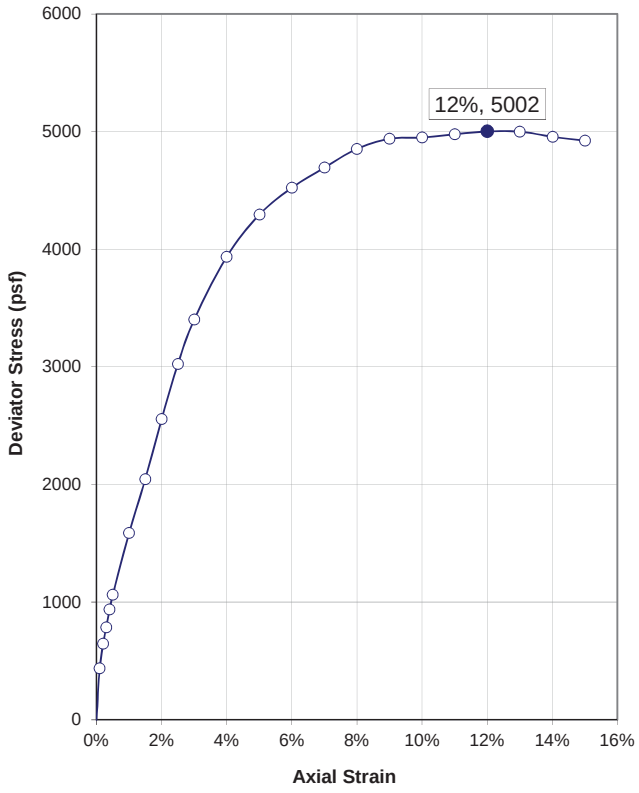
Deviator stress at failure**	$\sigma_{d,f}$	2557	(psf)	**Major principal stress at failure****	σ_1	10604	(psf)
Shear stress at failure**	c_u	1279	(psf)	**Minor principal stress at failure****	σ_3	8047	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		7%					

Remarks Confining Pressure 56 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Bangerter	**Boring No.**	16-S-12
Project No.	201601-009	**Sample**	1
Location	5400 So.	**Depth / Elev. (ft)**	15'-16.5'
Date	Tuesday, June 07, 2016	**Sample Description**	Sandy Silt ML
		Sample Type	shelby



Axial Strain	σ_d (psf)	σ_d / 2 (psf)	Sketch of Specimen After Failure
0.0%	-1	-1	
0.1%	436	218	
0.2%	646	323	
0.3%	787	394	
0.4%	937	468	
0.5%	1064	532	
1.0%	1588	794	
1.5%	2046	1023	
2.0%	2556	1278	
2.5%	3025	1513	
3.0%	3402	1701	
4.0%	3936	1968	
5.0%	4296	2148	
6.0%	4523	2262	
7.0%	4695	2347	
8.0%	4853	2427	
9.0%	4939	2470	
10.0%	4950	2475	
11.0%	4978	2489	
12.0%	5002	2501	
13.0%	5000	2500	
14.0%	4956	2478	
15.0%	4923	2461	

Initial Sample Data

Initial height of specimen	L_o	5.6	(in)	**Moisture content***	w	28.2%	
Initial diameter of specimen	D_o	2.80	(in)	**Dry unit weight**	γ_d	102.1	(pcf)
Height-to-diameter ratio	L_o / D_o	2.00		**Specific gravity of soil solids**	G_s	2.68	*[Estimated value]*
Liquid limit	LL	NP		**Initial void ratio**	e_o	0.639	
Plastic index	PI	NP		**Saturation**	S	100%	

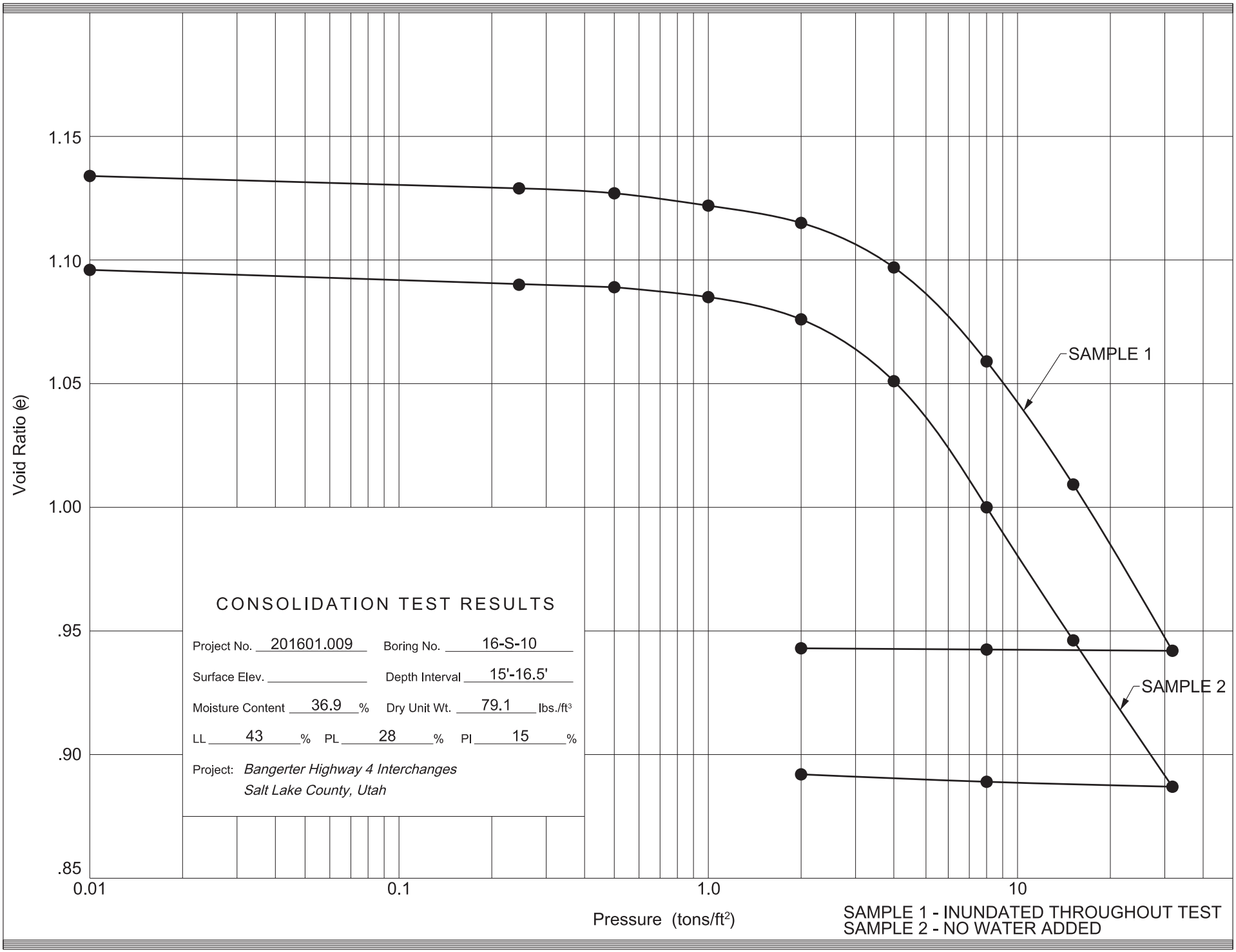
Test Results

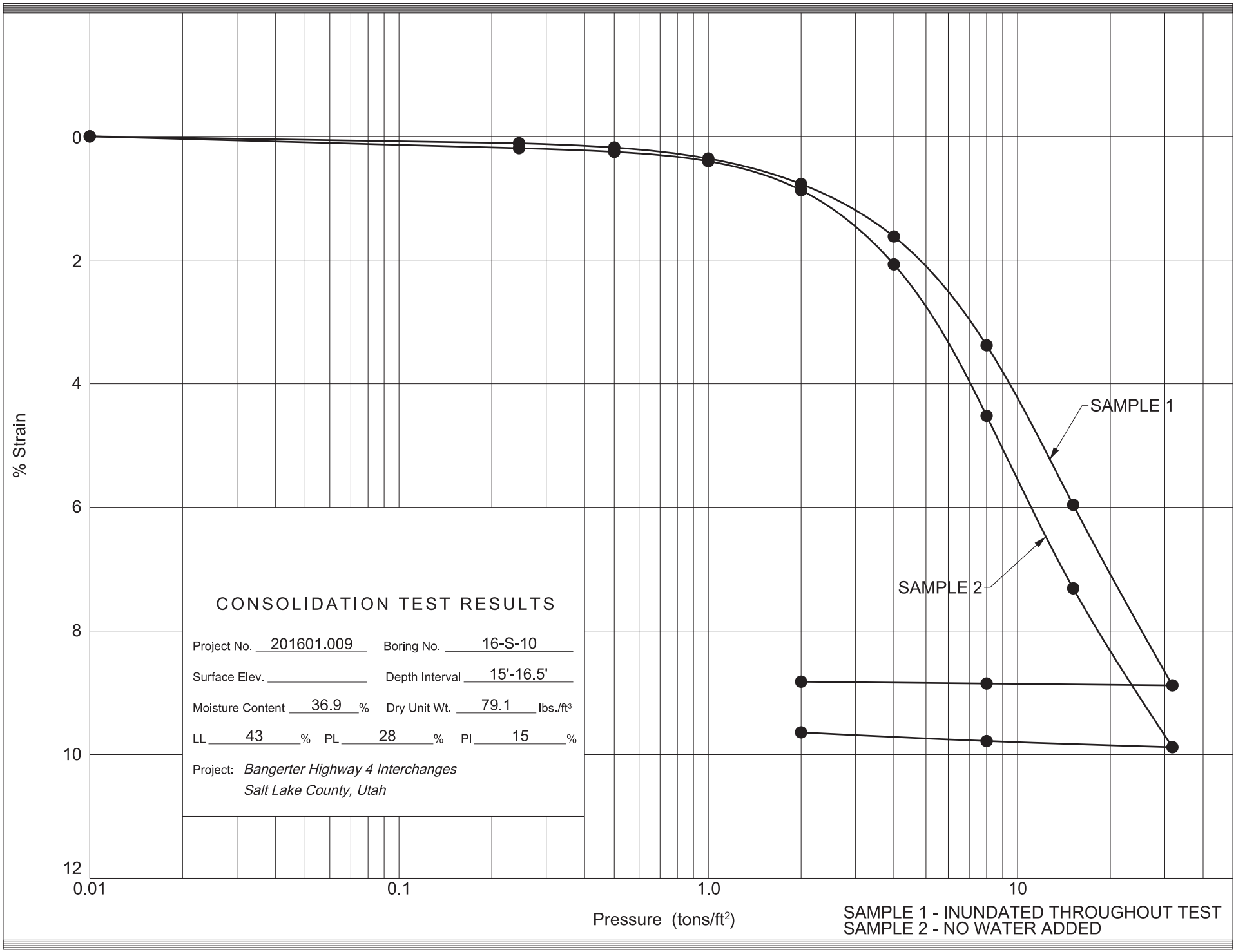
Deviator stress at failure**	$\sigma_{d,f}$	5002	(psf)	**Major principal stress at failure****	σ_1	6872	(psf)
Shear stress at failure**	c_u	2501	(psf)	**Minor principal stress at failure****	σ_3	1870	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		12%					

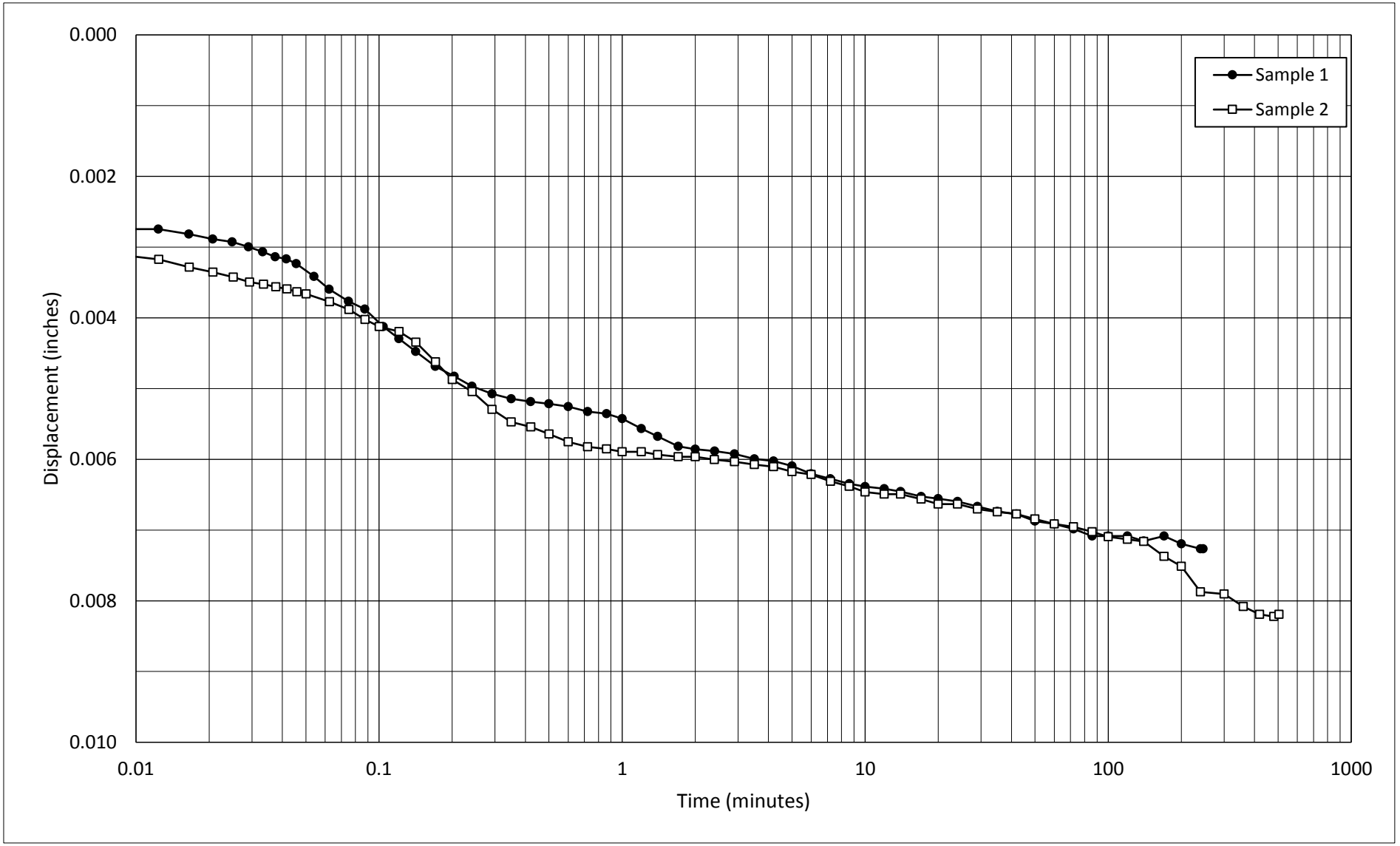
Remarks Confining Pressure 13 psi

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

Laboratory Test Results – Consolidation


1.15
1.10
1.05
1.00
.95
.90
.85
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 1
SAMPLE 2
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-10
Surface Elev.
Depth Interval 15'-16.5'
Moisture Content 36.9 %
Dry Unit Wt. 79.1 lbs./ft³
LL 43 % PL 28 % PI 15 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED THROUGHOUT TEST
SAMPLE 2 - NO WATER ADDED

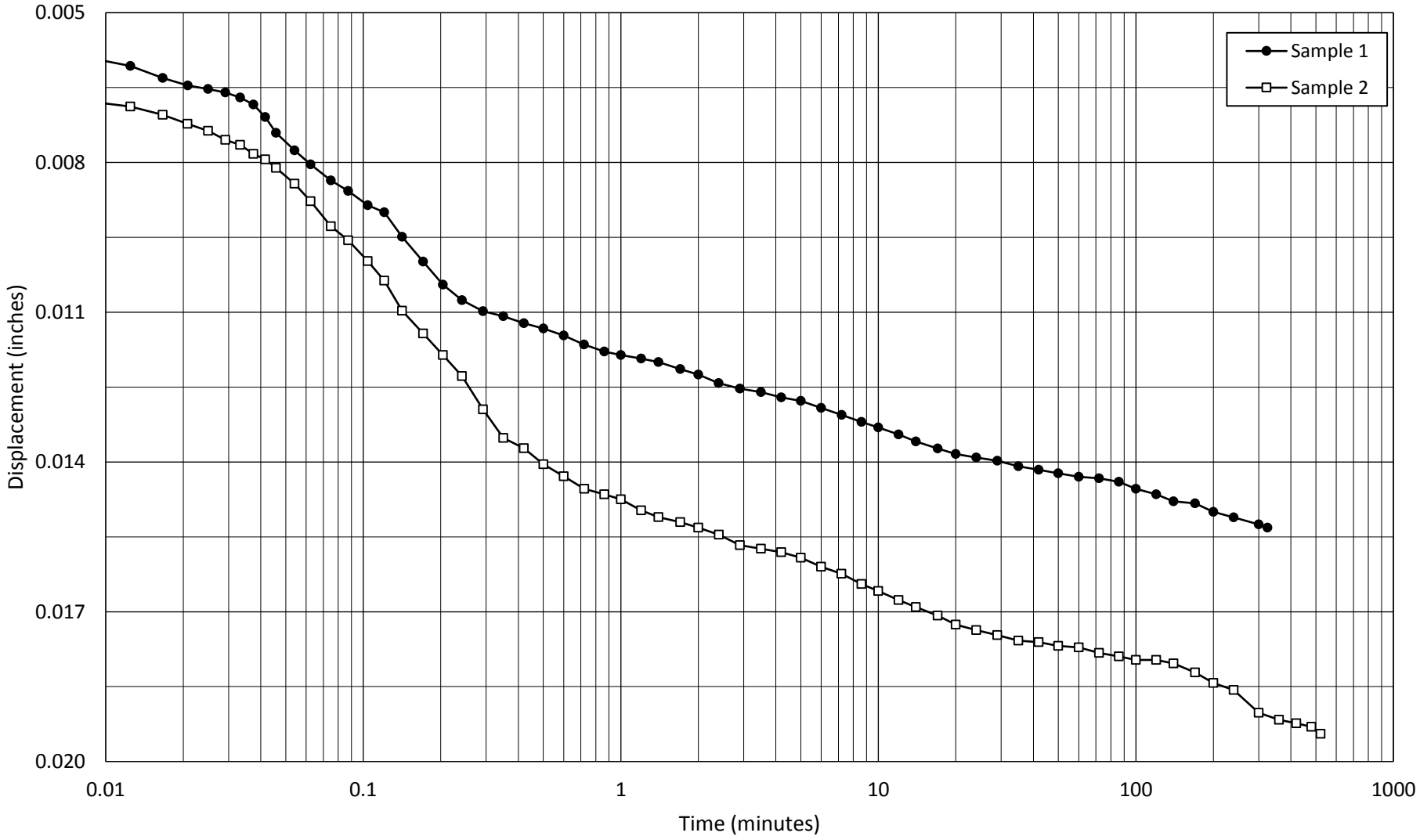

0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 1
SAMPLE 2
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-10
Surface Elev.
Depth Interval 15'-16.5'
Moisture Content 36.9 %
Dry Unit Wt. 79.1 lbs./ft³
LL 43 % PL 28 % PI 15 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED THROUGHOUT TEST
SAMPLE 2 - NO WATER ADDED



Hole no.: 16-S-10
Depth: 15'-16.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

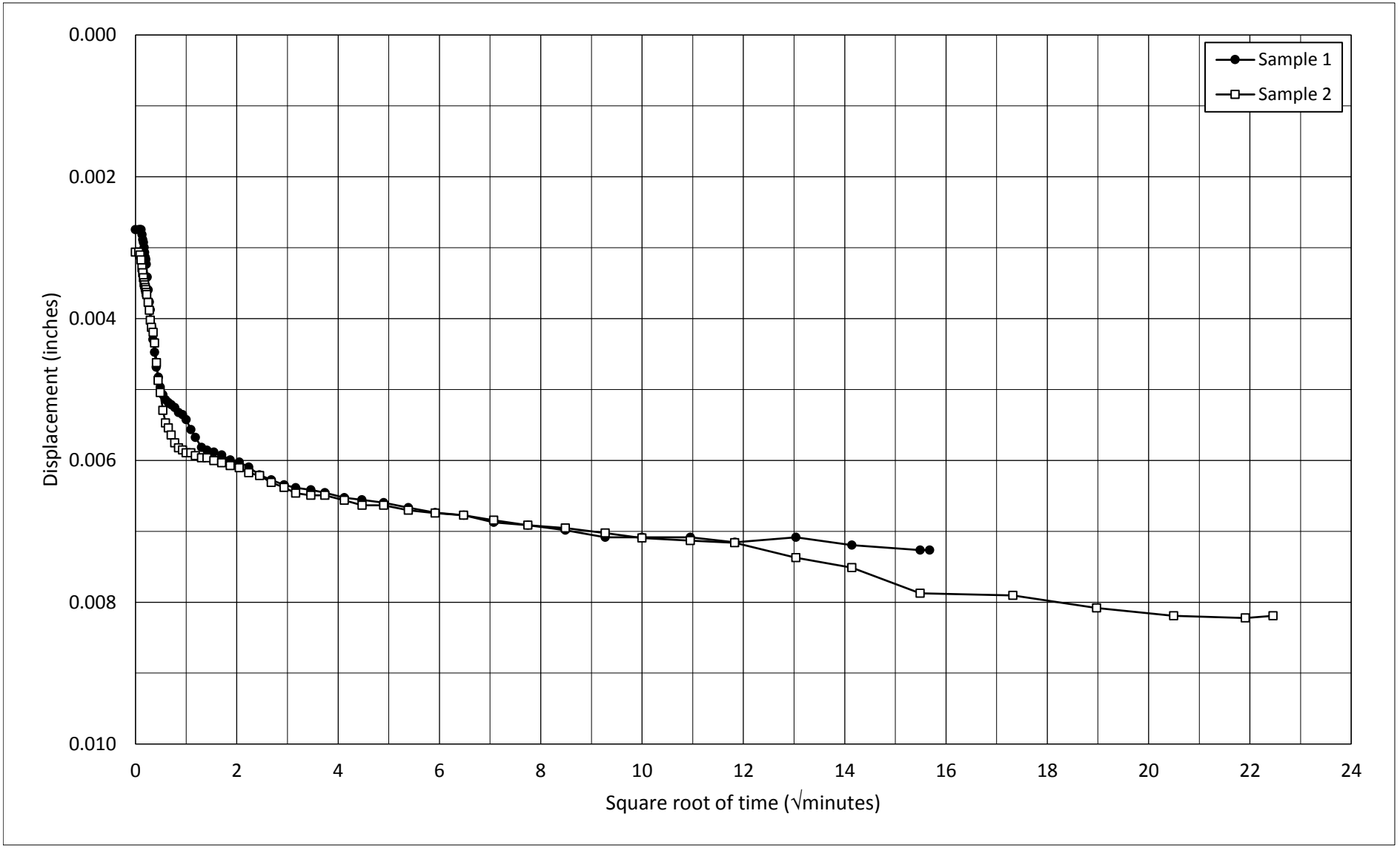
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-10
Depth: 15'-16.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

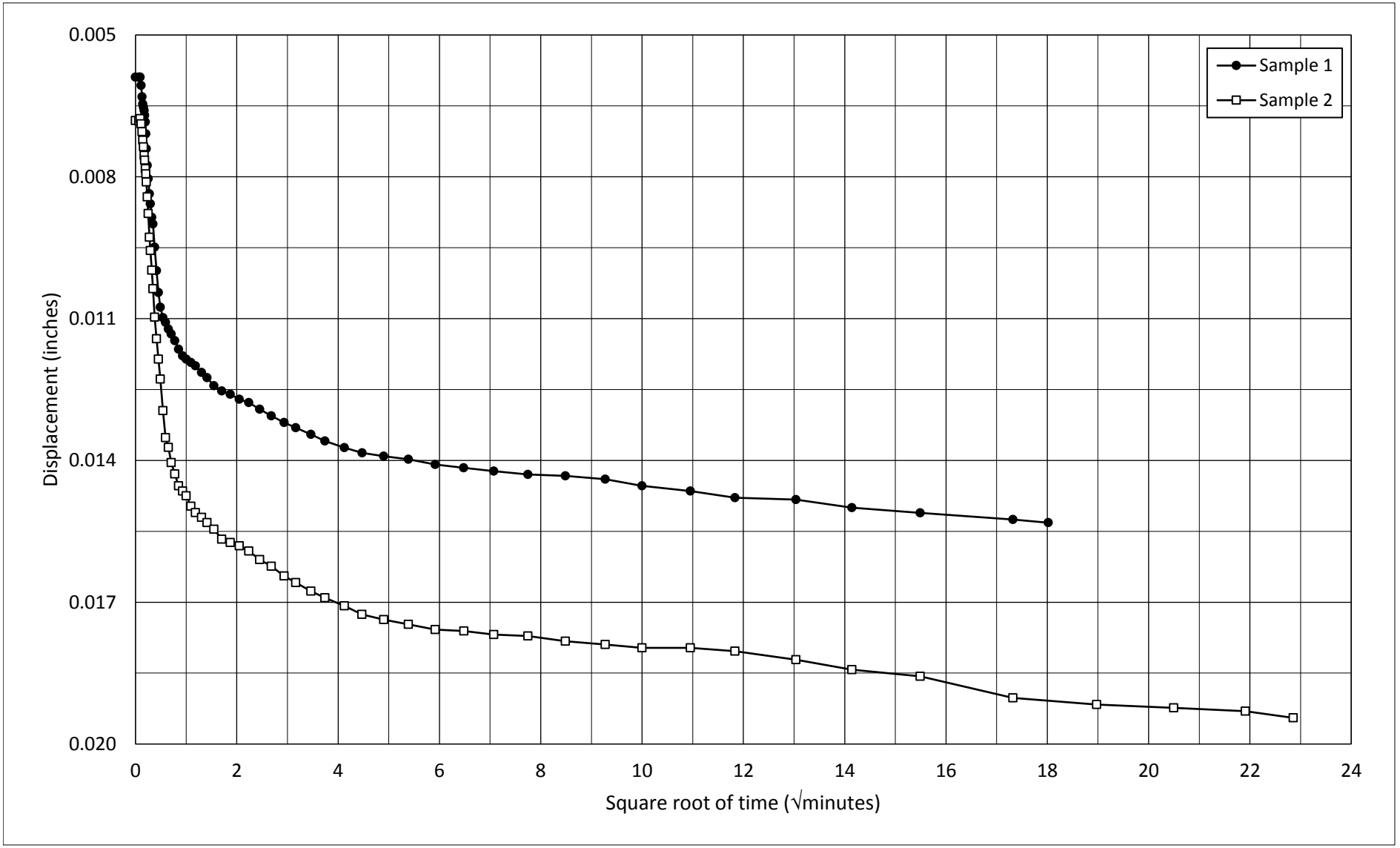
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-10
Depth: 15'-16.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

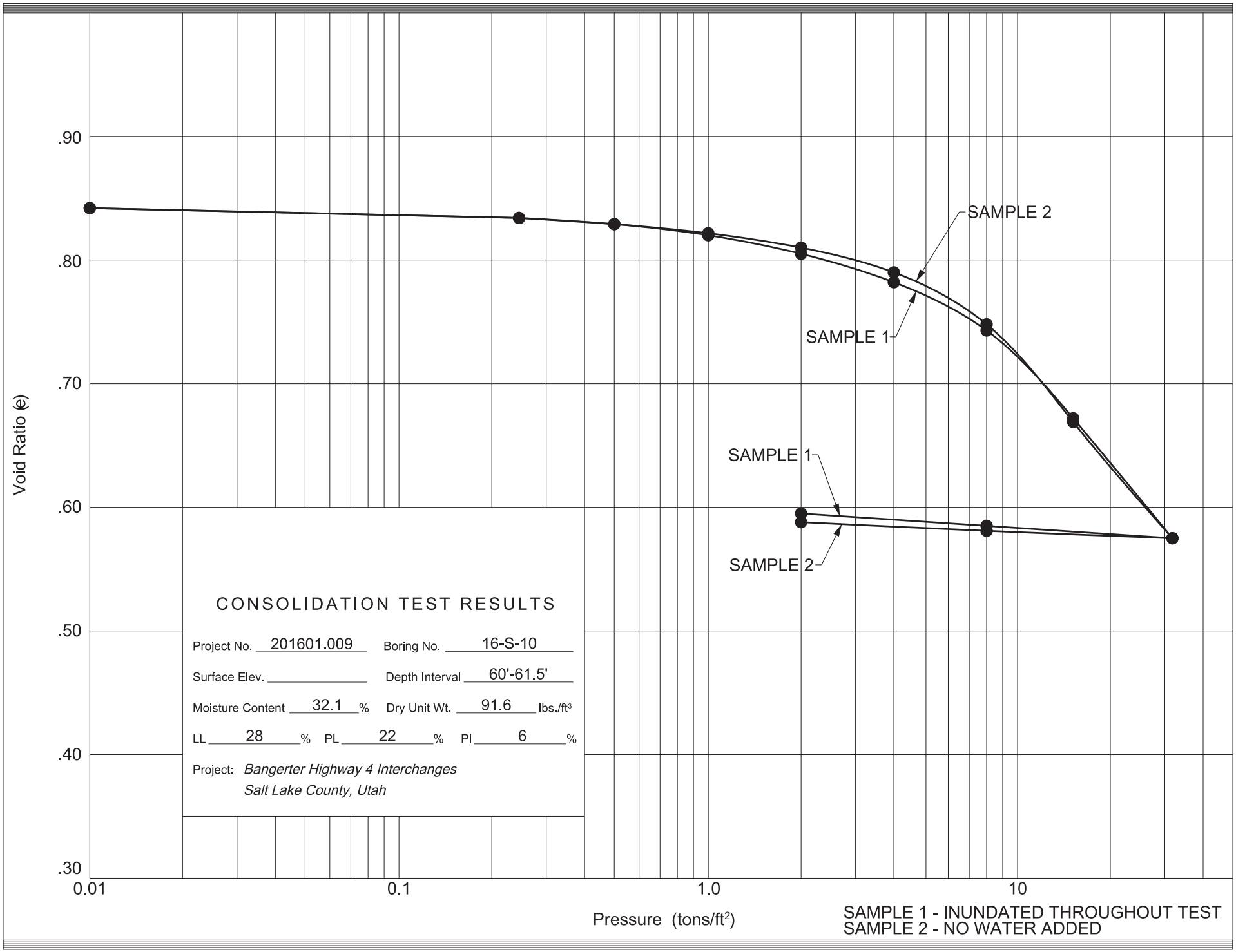
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

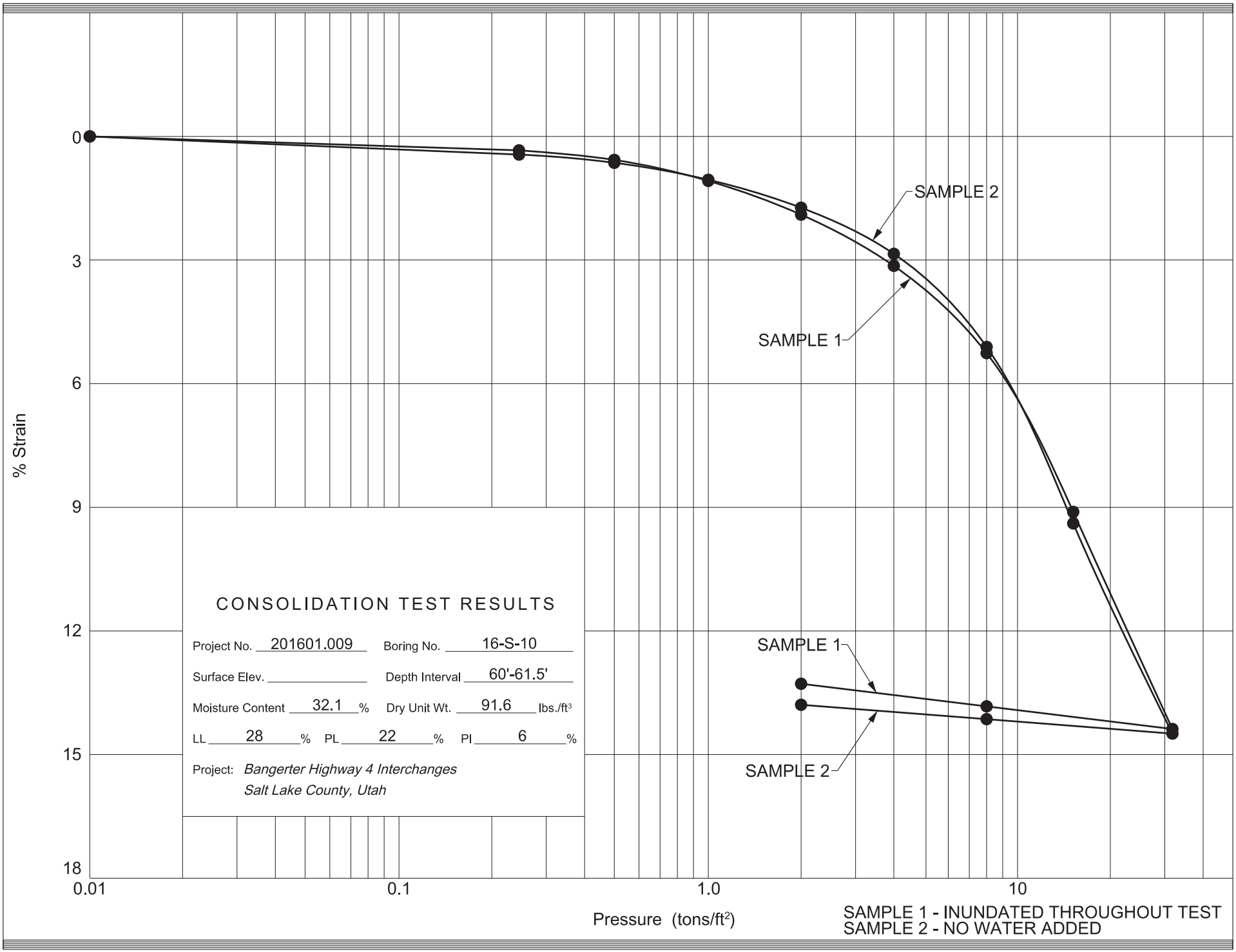


Hole no.: 16-S-10
Depth: 15'-16.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.90
.80
.70
.60
.50
.40
.30
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE 2
SAMPLE 1
SAMPLE 1
SAMPLE 2
CONSOLIDATION TEST RESULTS
Project No. 201601.009 Boring No. 16-S-10
Surface Elev. Depth Interval 60'-61.5'
Moisture Content 32.1 % Dry Unit Wt. 91.6 lbs./ft³
LL 28 % PL 22 % PI 6 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah
SAMPLE 1 - INUNDATED THROUGHOUT TEST
SAMPLE 2 - NO WATER ADDED



CONSOLIDATION TEST RESULTS

Project No. 201601.009 Boring No. 16-S-10

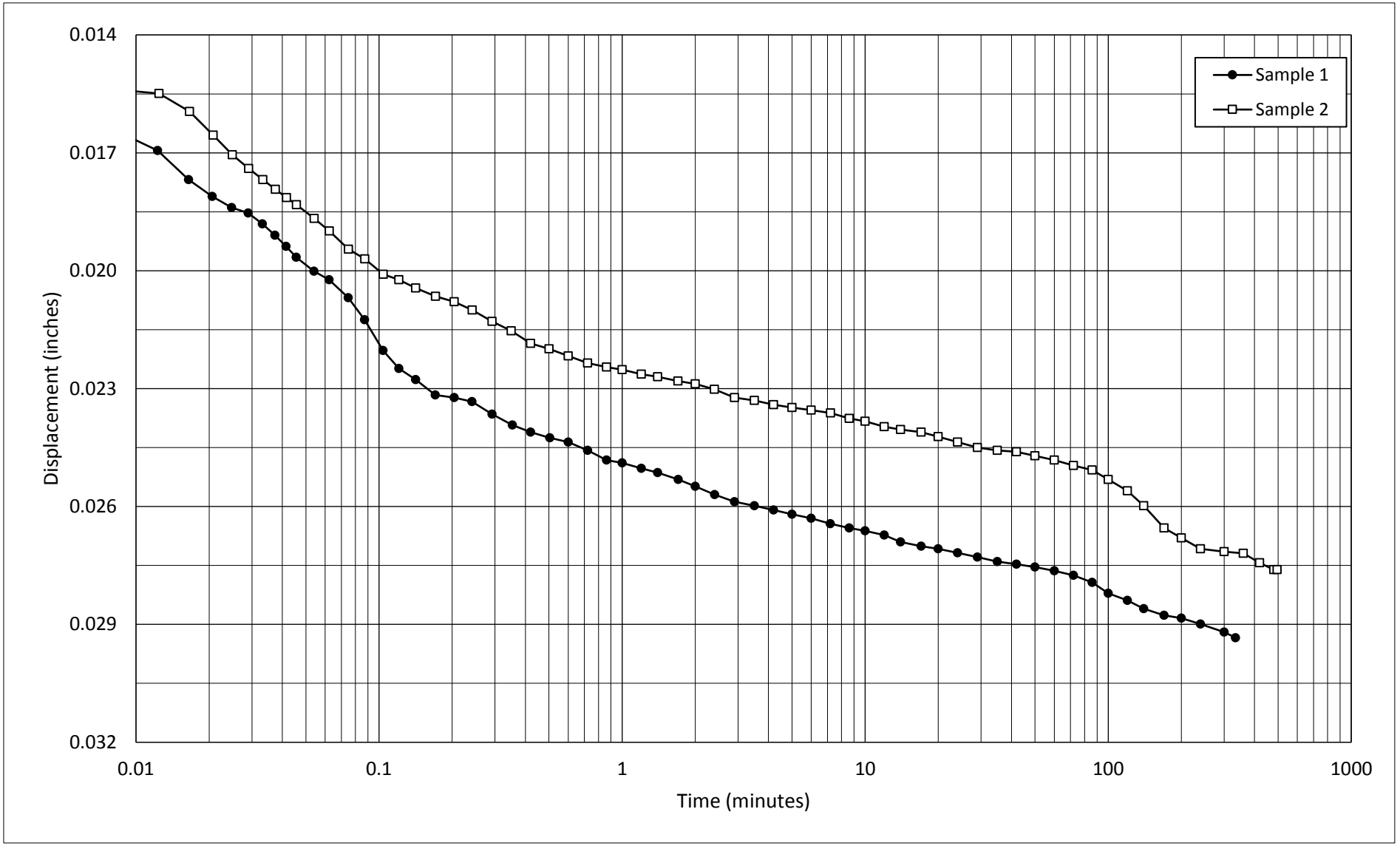
Surface Elev. _____ Depth Interval 60'-61.5'

Moisture Content 32.1 % Dry Unit Wt. 91.6 lbs./ft³

LL 28 % PL 22 % PI 6 %

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

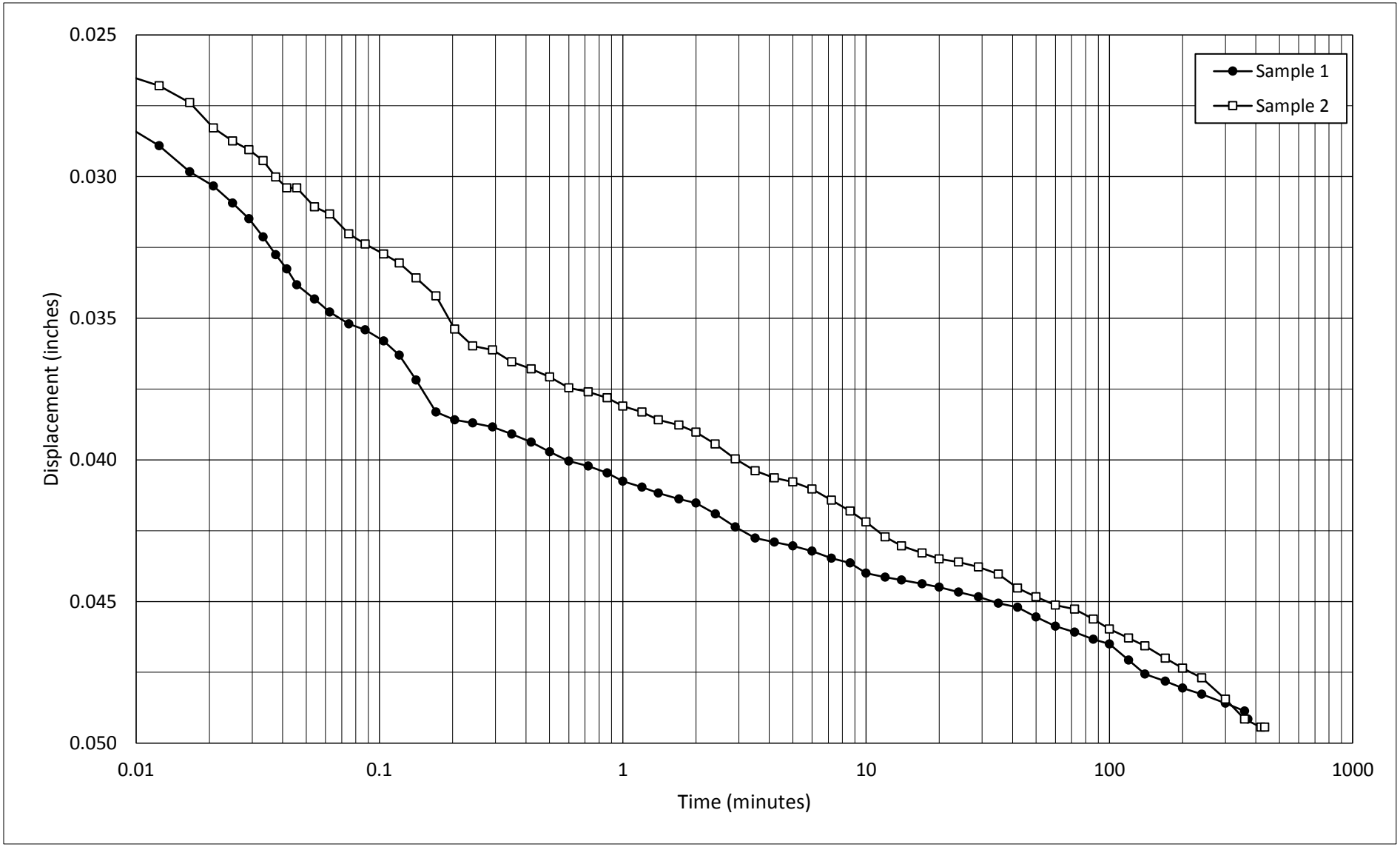
SAMPLE 1 - INUNDATED THROUGHOUT TEST
SAMPLE 2 - NO WATER ADDED



Hole no.: 16-S-10
Depth: 60'-61.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

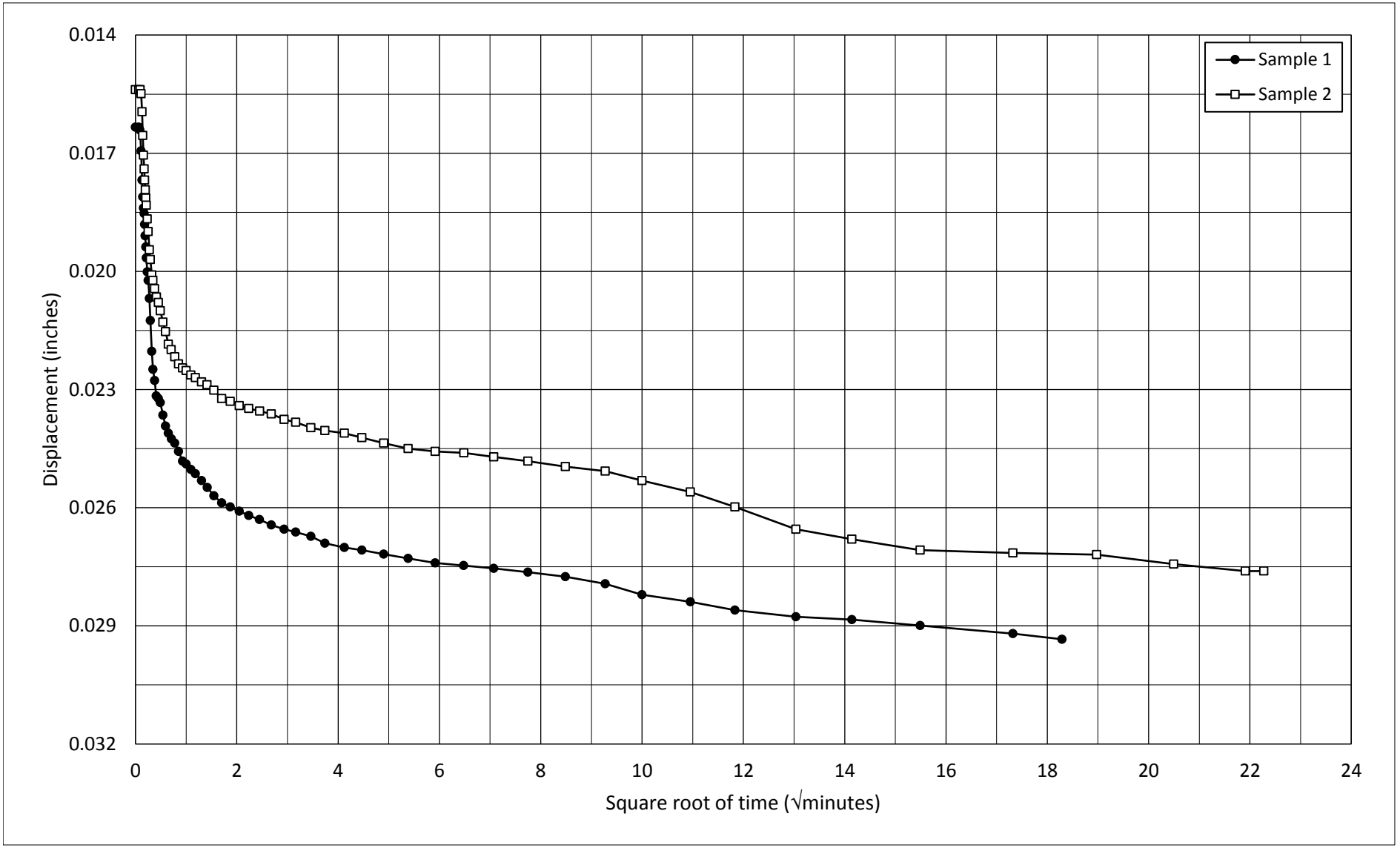
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-10
Depth: 60'-61.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

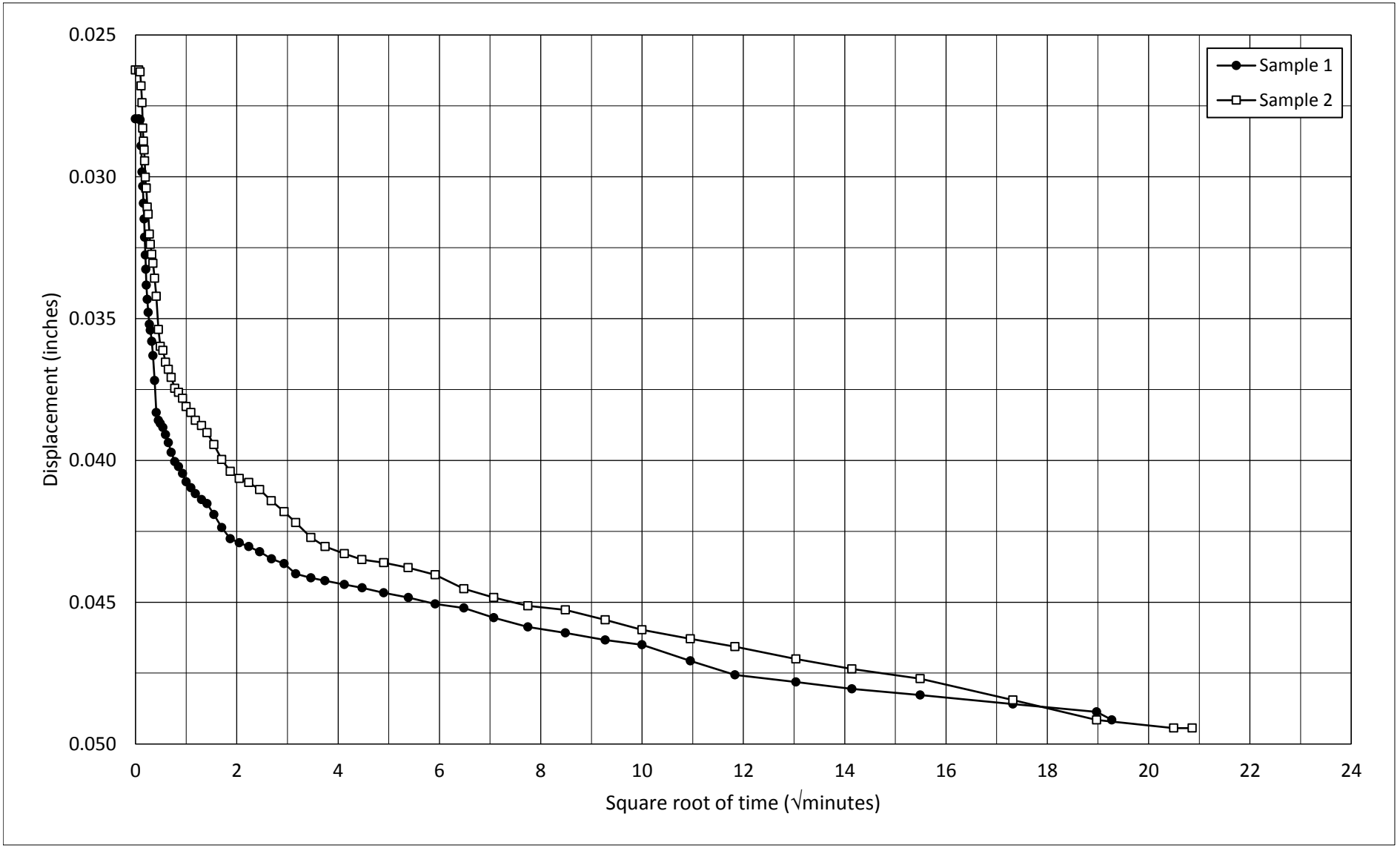
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-10
Depth: 60'-61.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

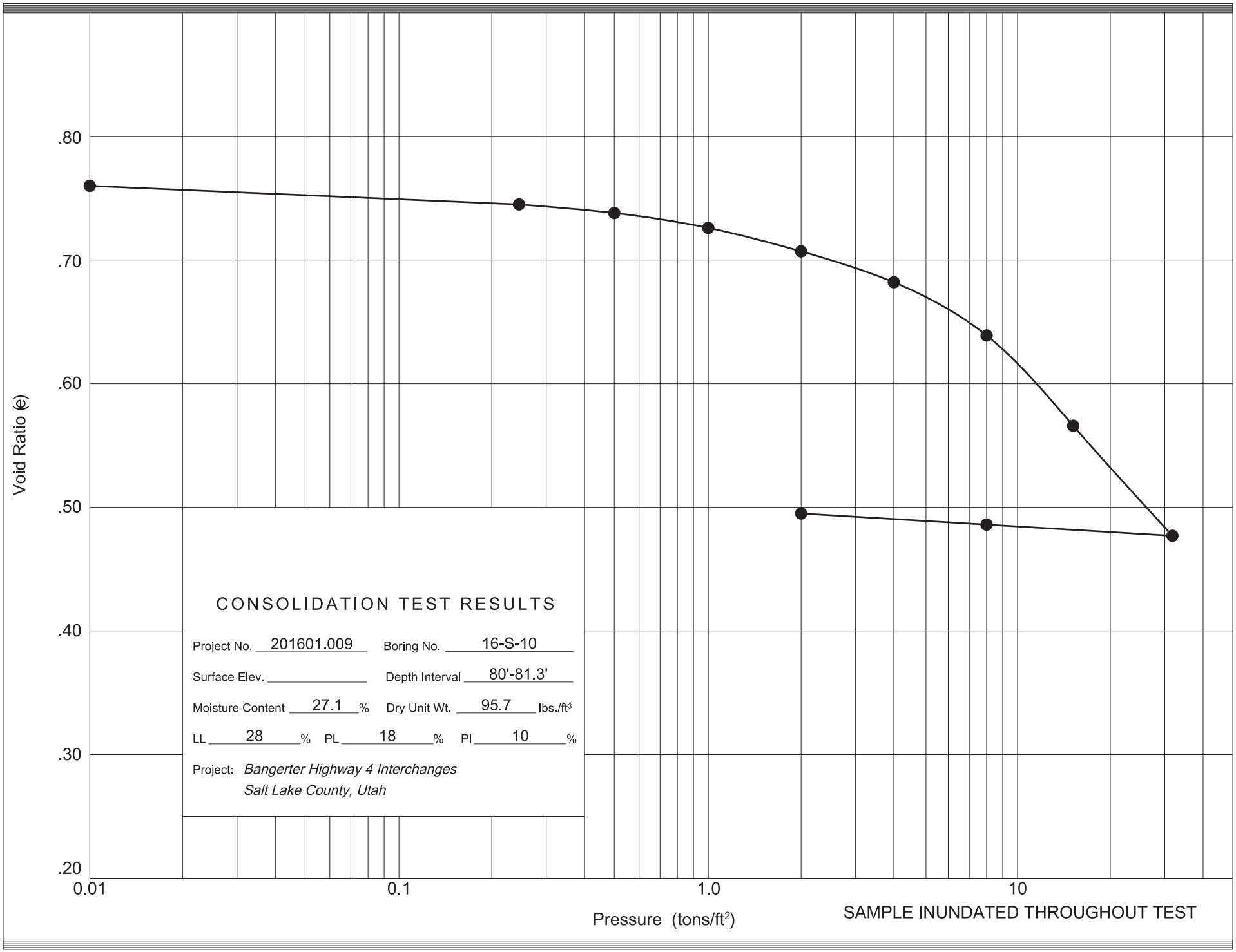
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

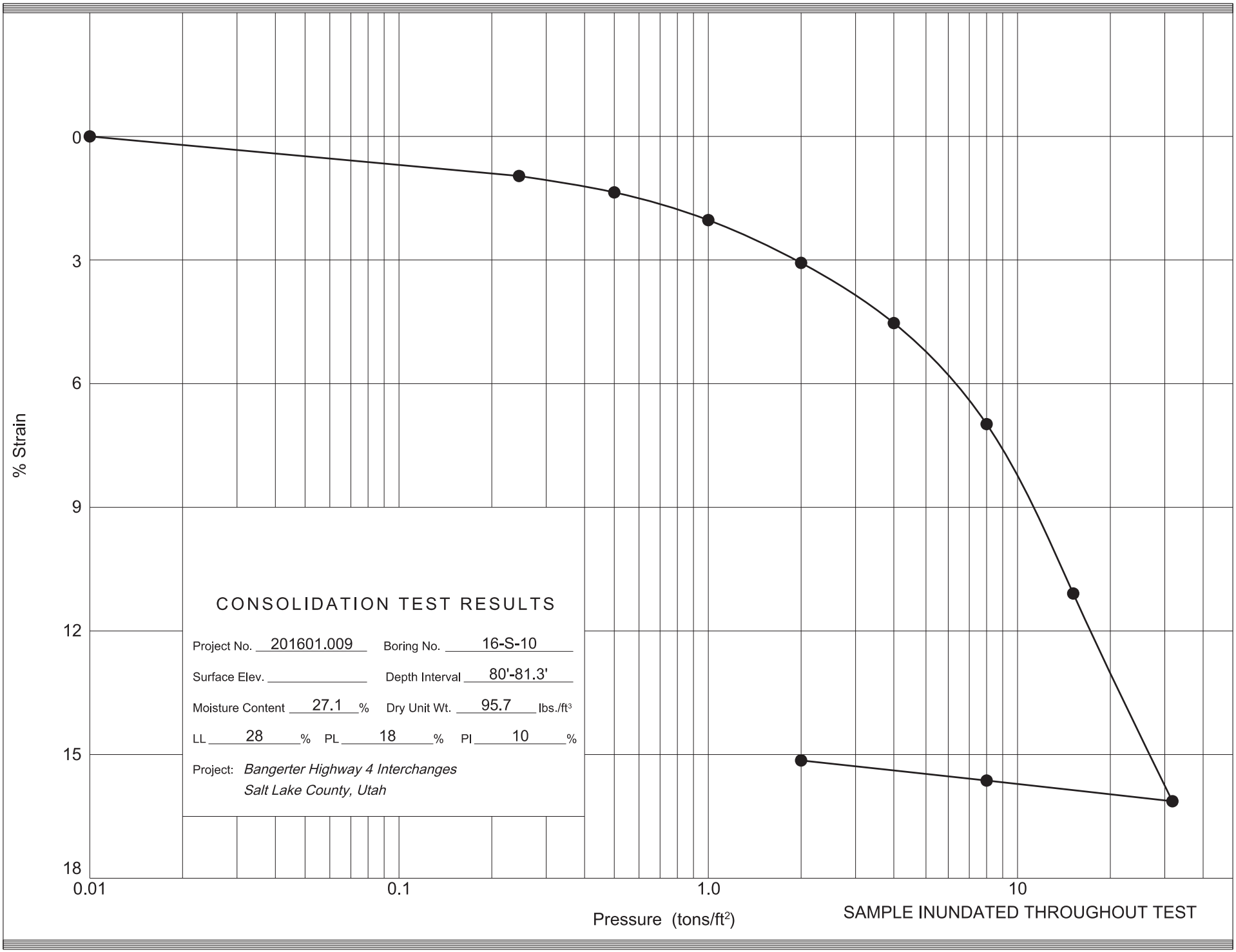


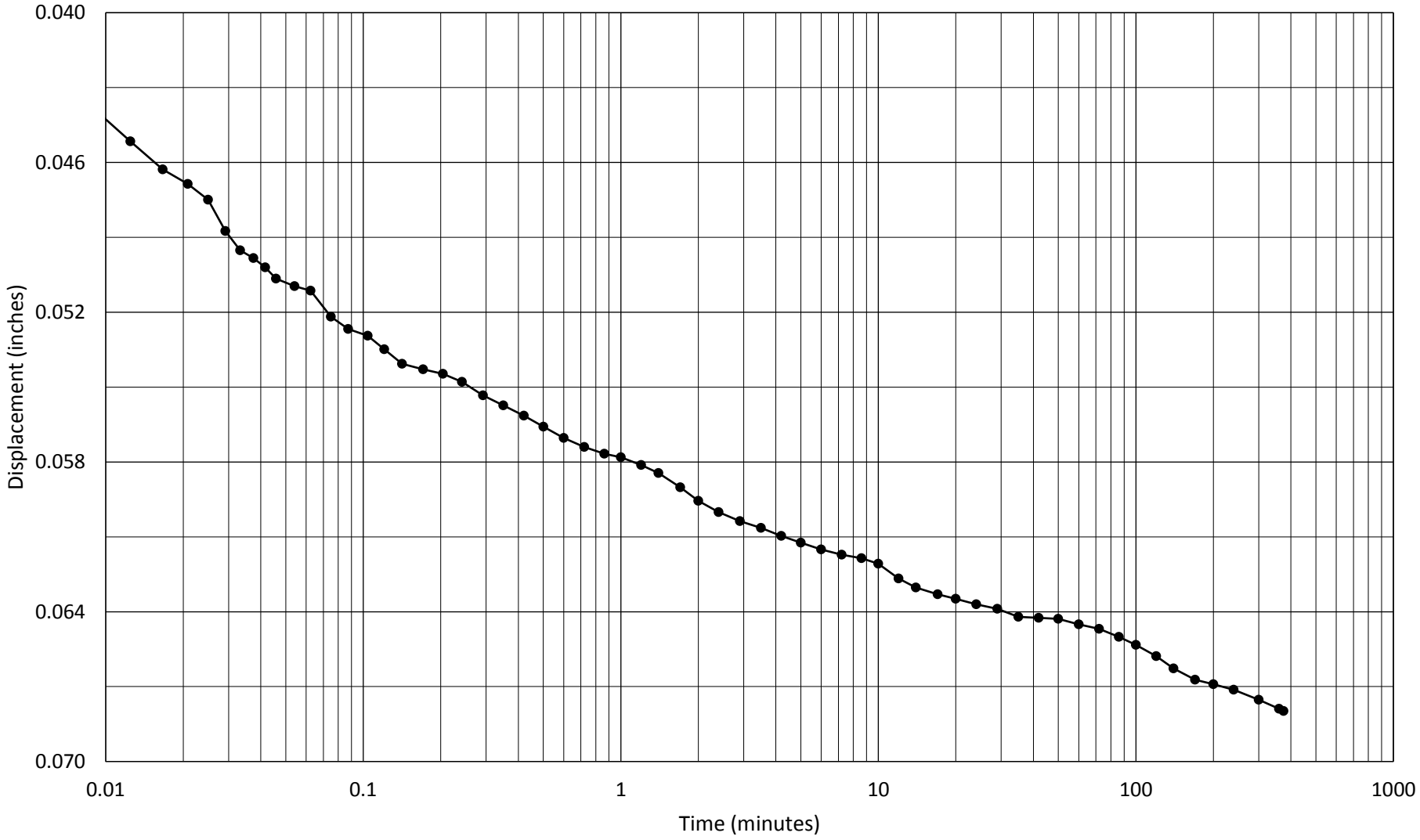
Hole no.: 16-S-10
Depth: 60'-61.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.80
.70
.60
.50
.40
.30
.20
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-10
Surface Elev.
Depth Interval 80'-81.3'
Moisture Content 27.1 %
Dry Unit Wt. 95.7 lbs./ft³
LL 28 %
PL 18 %
PI 10 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

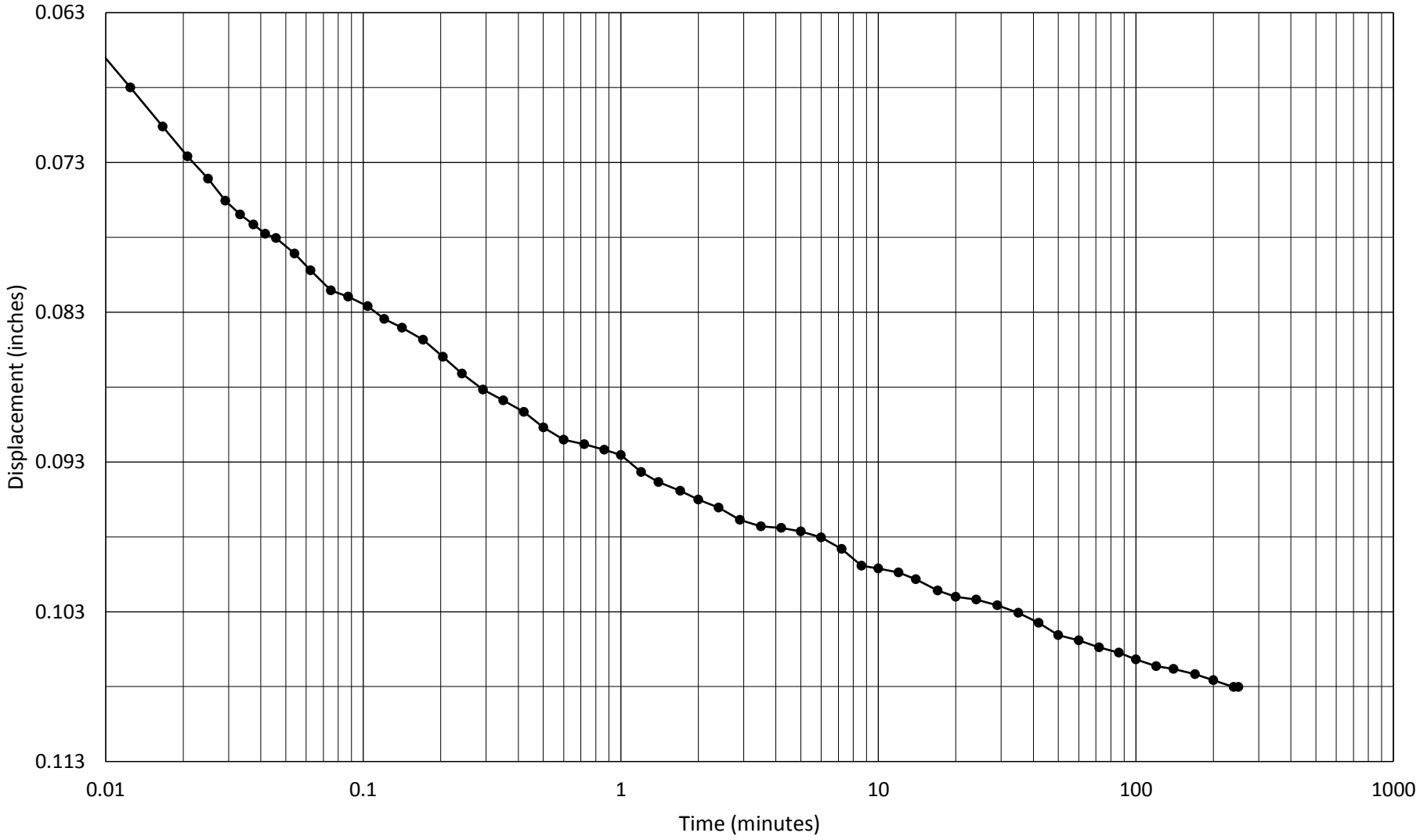

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED THROUGHOUT TEST
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-10
Surface Elev.
Depth Interval 80'-81.3'
Moisture Content 27.1 %
Dry Unit Wt. 95.7 lbs./ft³
LL 28 % PL 18 % PI 10 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-10
Depth: 80'-81.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

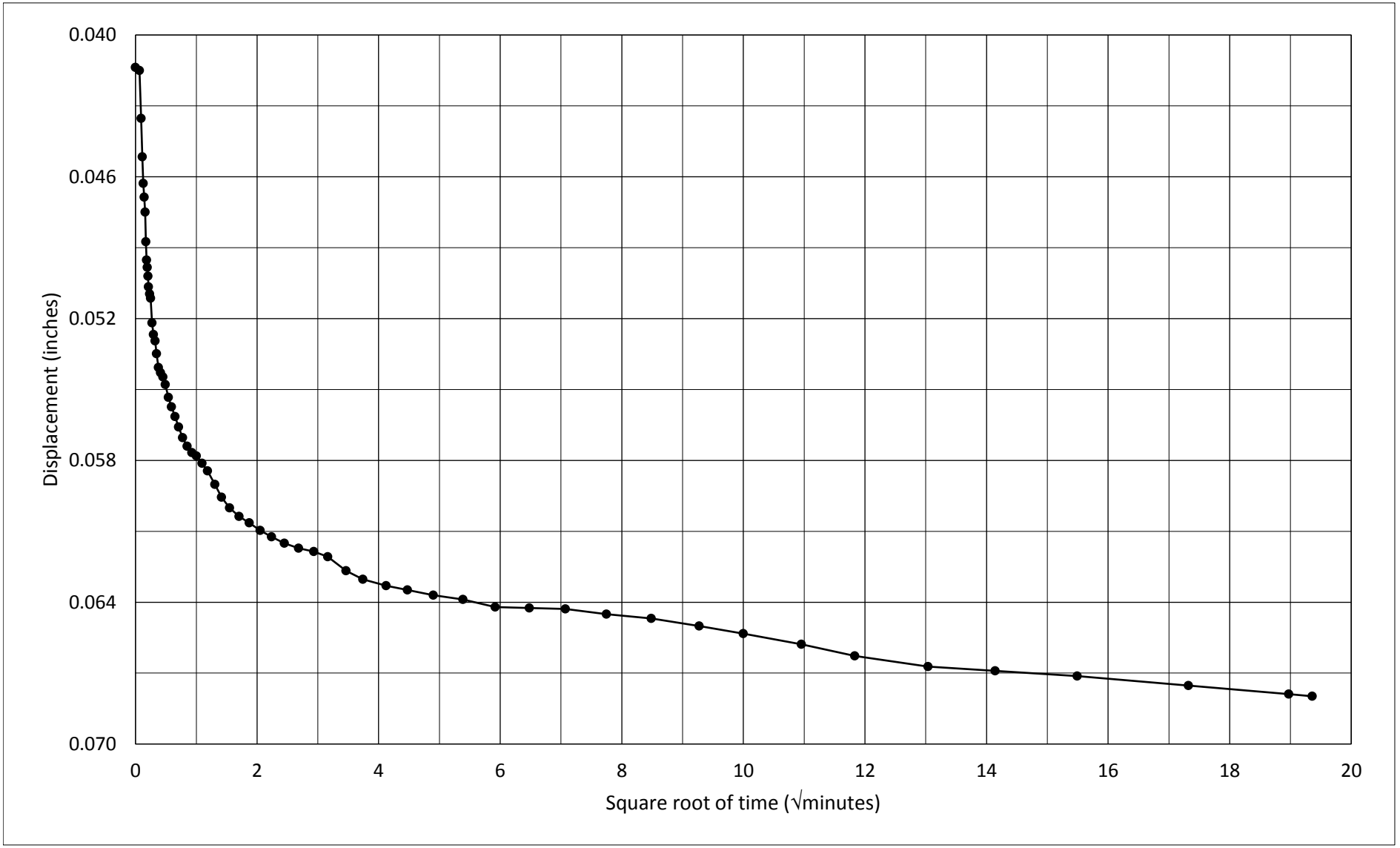
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-10
Depth: 80'-81.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

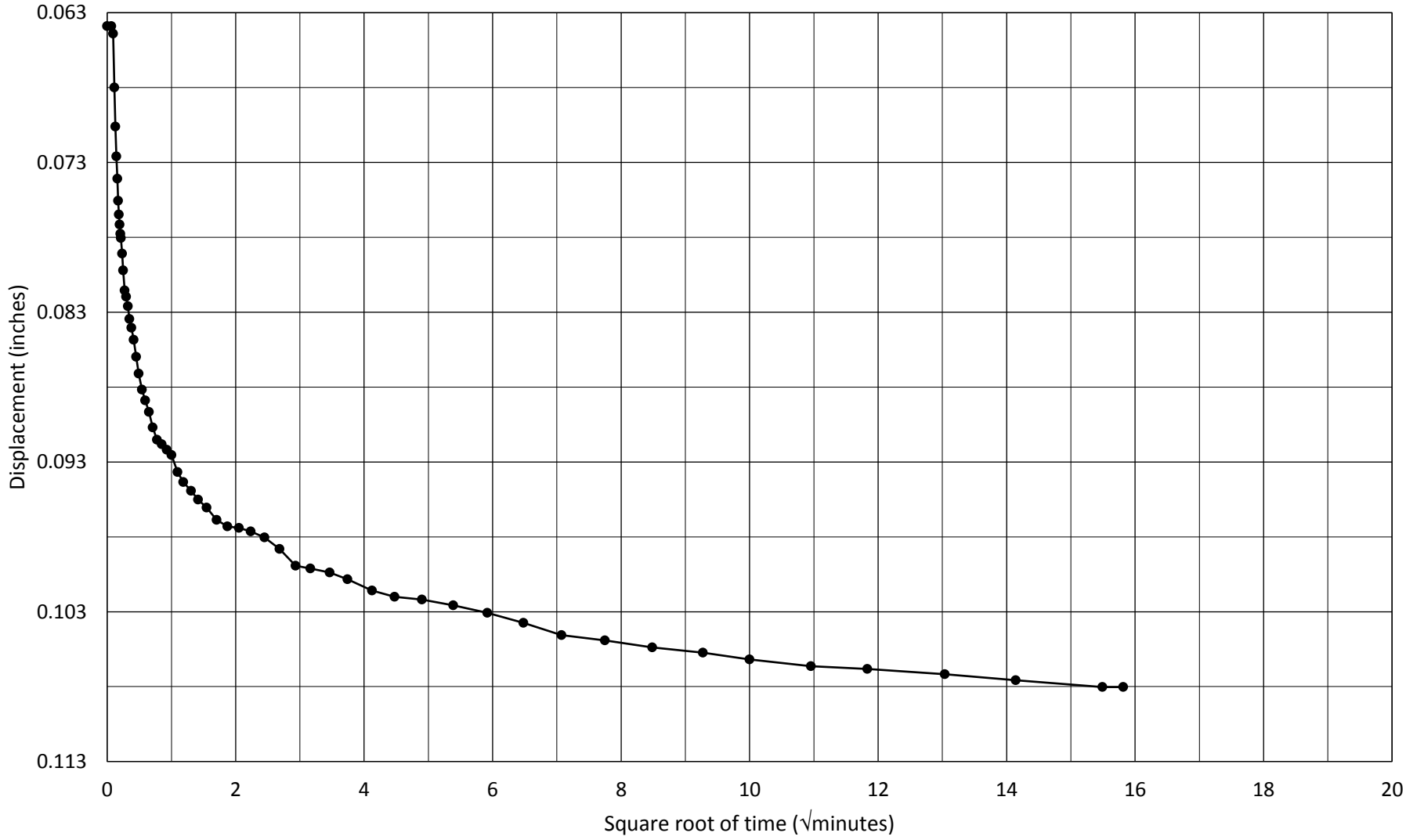
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-10
Depth: 80'-81.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

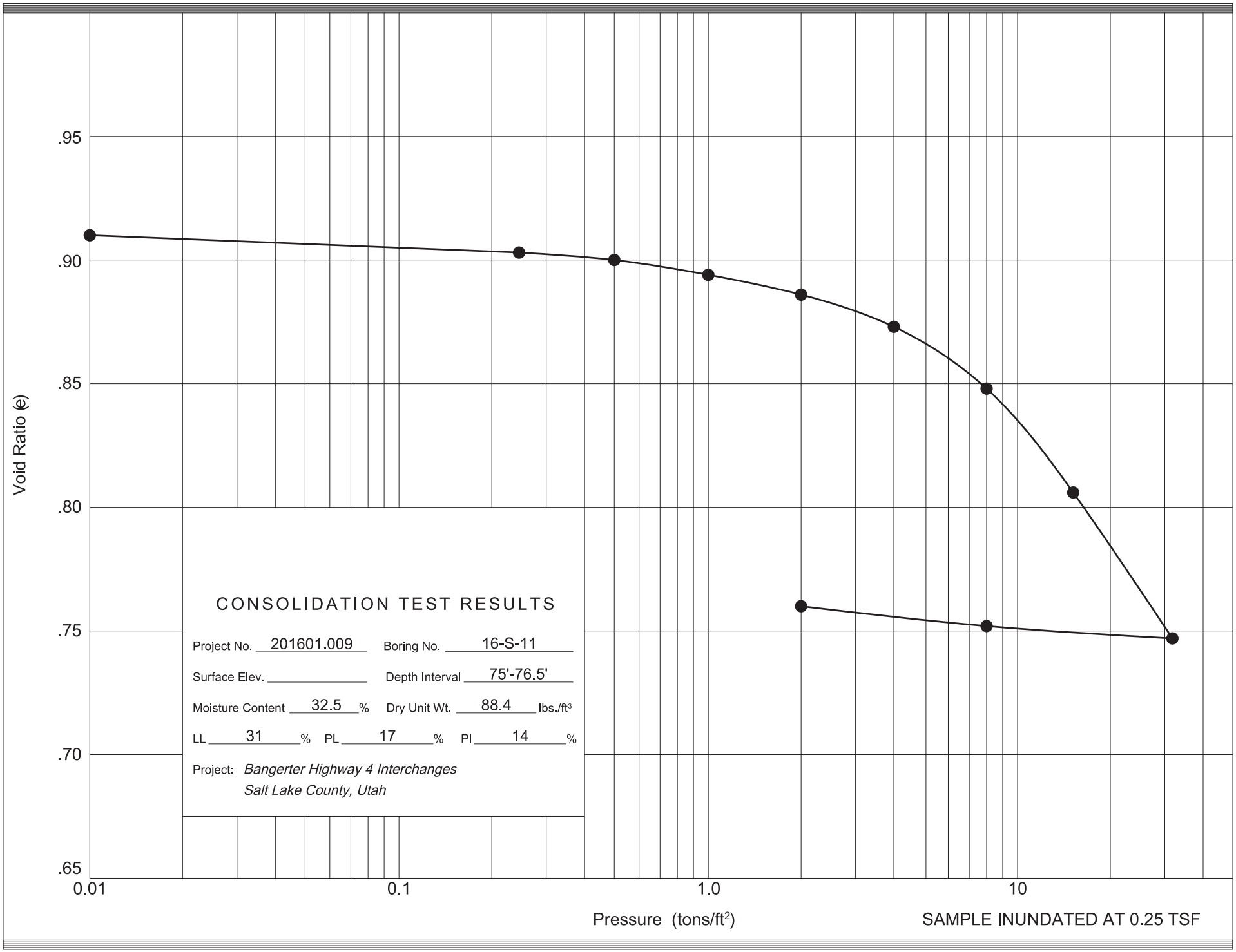
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-10
Depth: 80'-81.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah



CONSOLIDATION TEST RESULTS

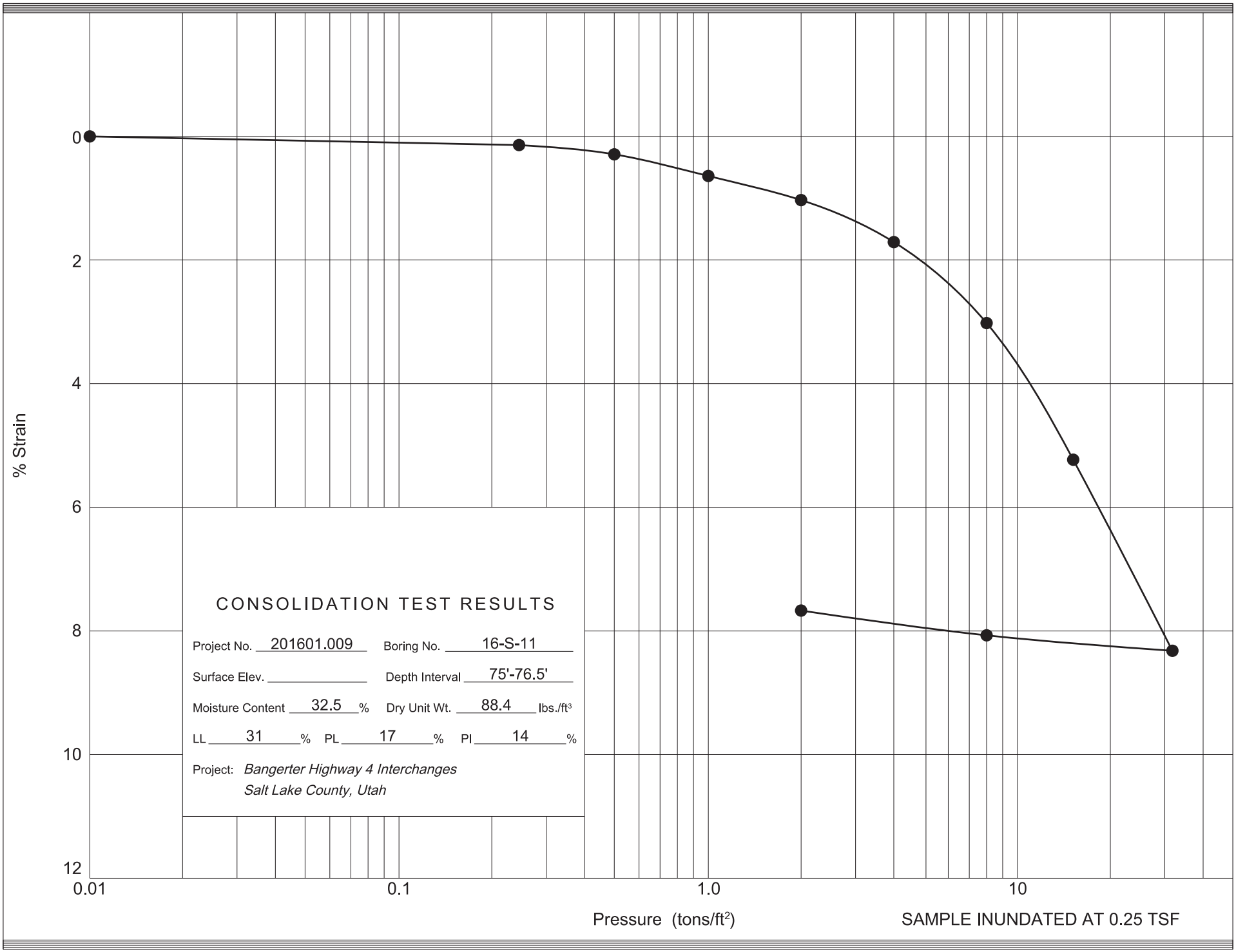
Project No. 201601.009 Boring No. 16-S-11

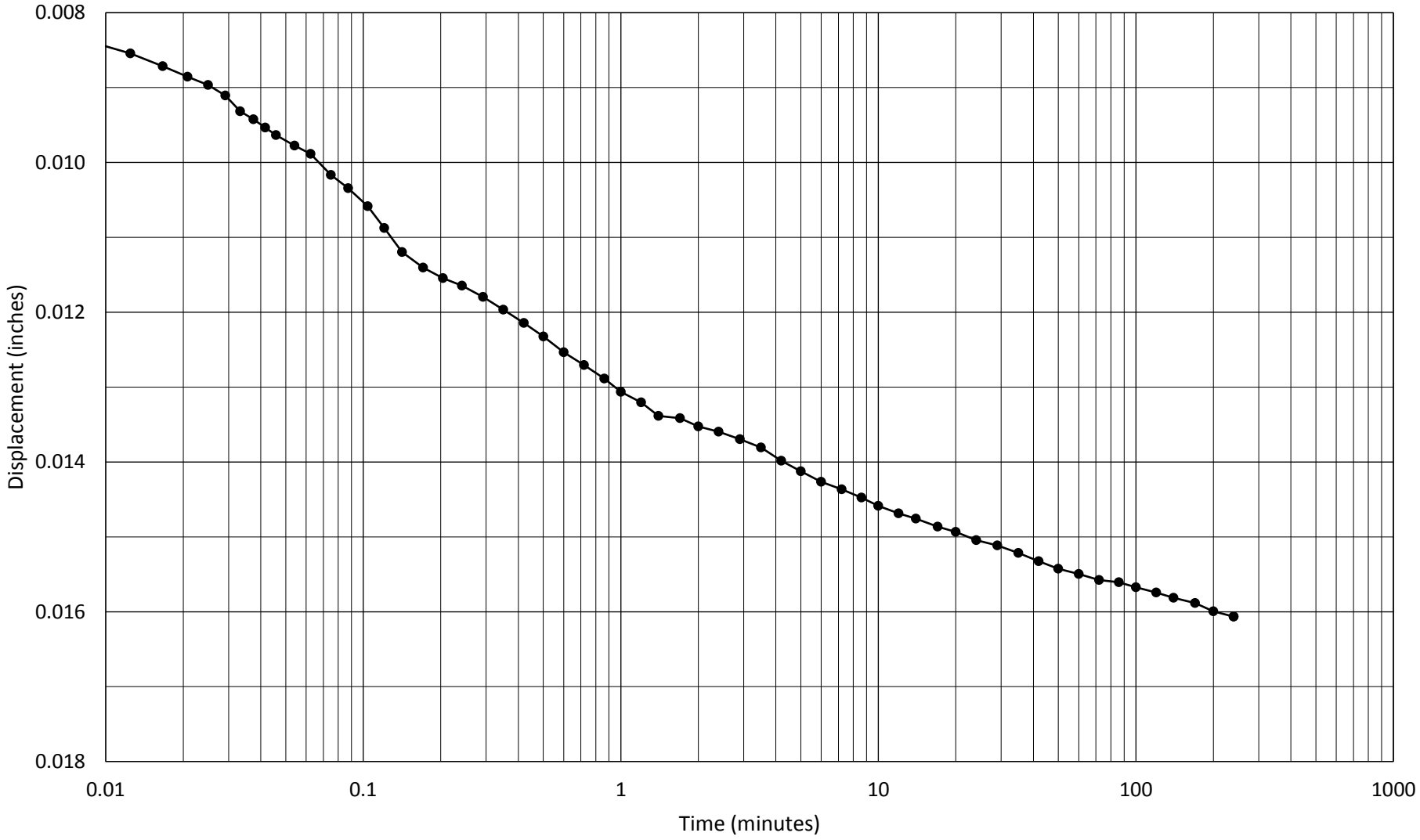
Surface Elev. _____ Depth Interval 75'-76.5'

Moisture Content 32.5 % Dry Unit Wt. 88.4 lbs./ft³

LL 31 % PL 17 % PI 14 %

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

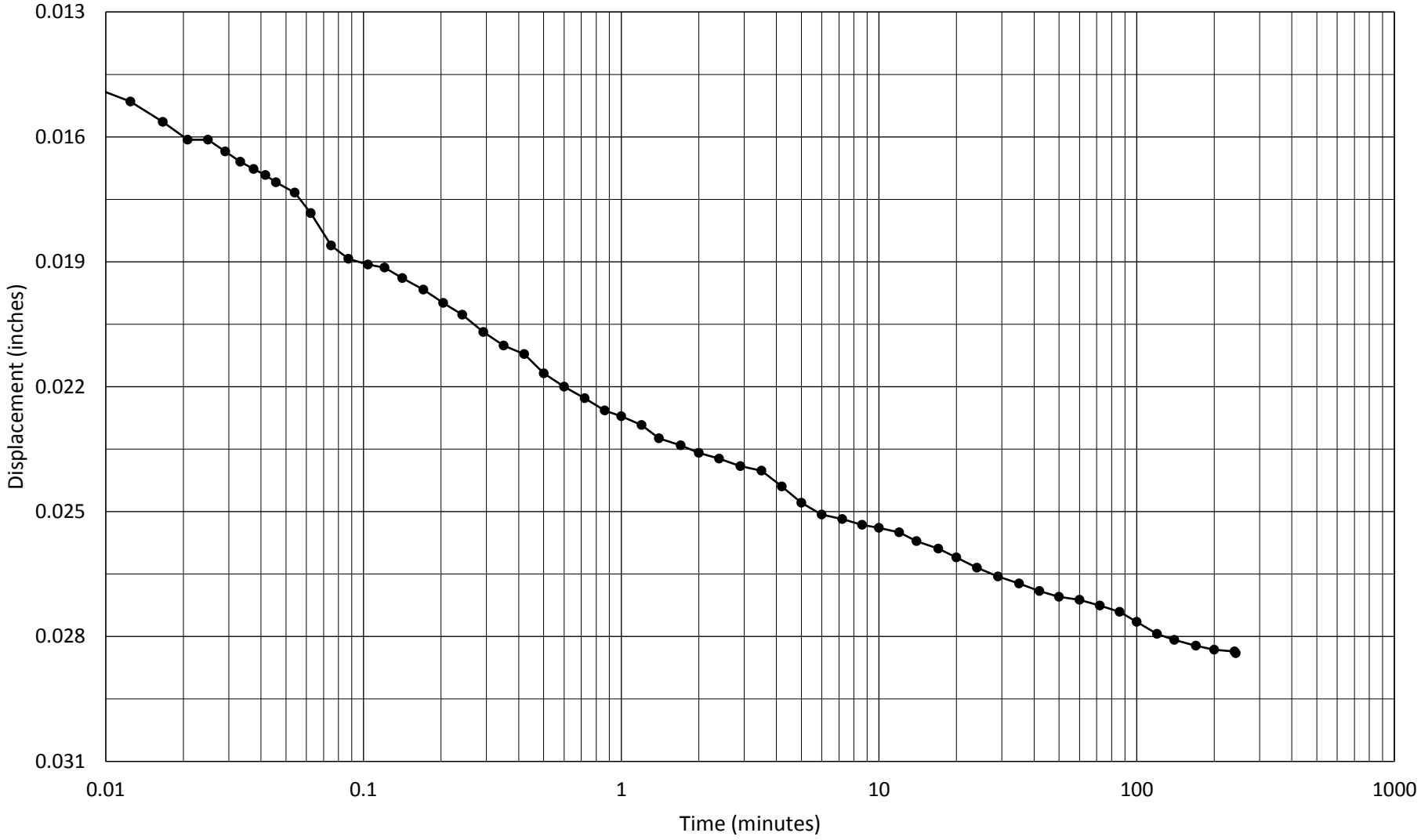

0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-11
Surface Elev.
Depth Interval 75'-76.5'
Moisture Content 32.5 %
Dry Unit Wt. 88.4 lbs./ft³
LL 31 %
PL 17 %
PI 14 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-11
Depth: 75'-76.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

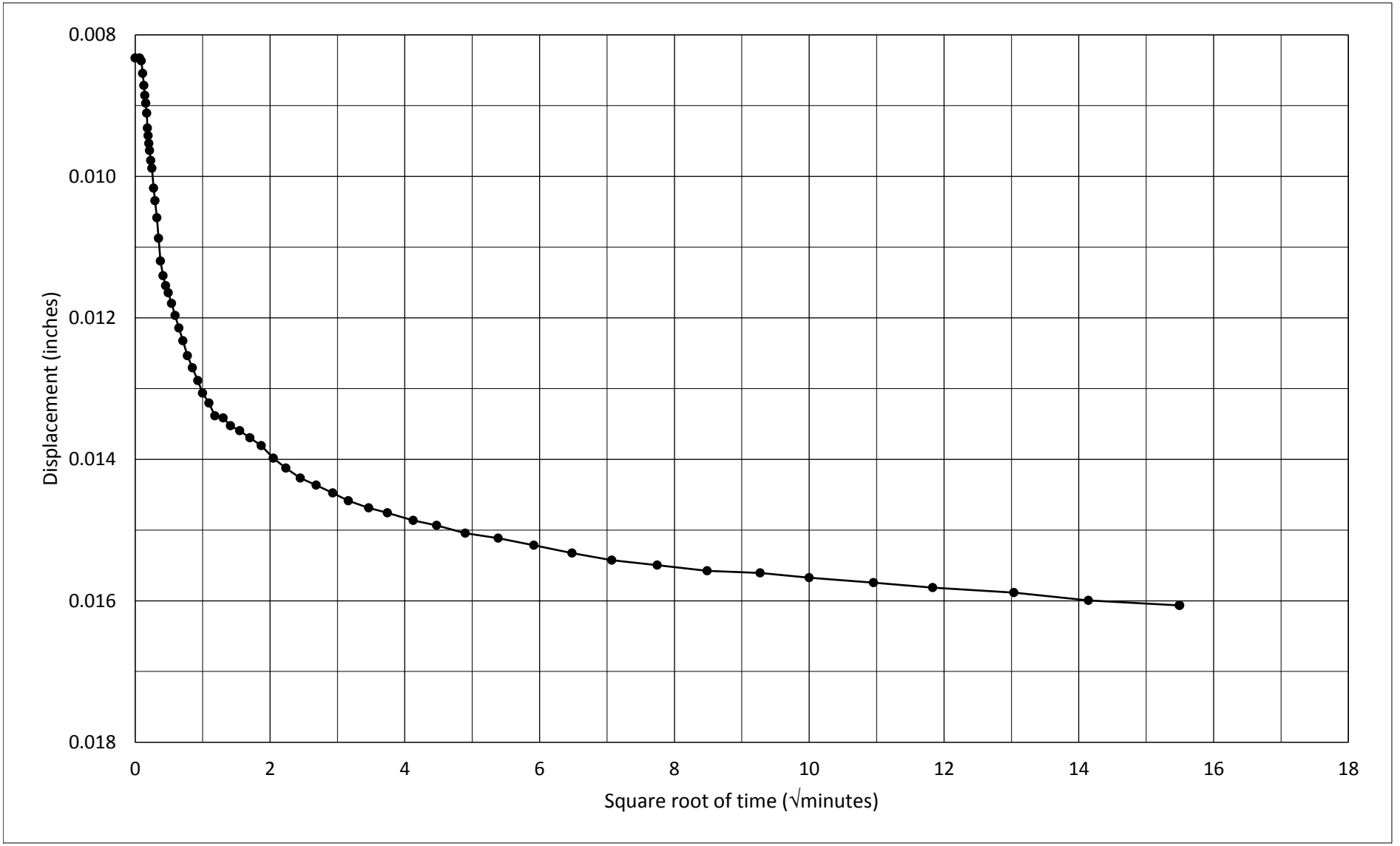
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-11
Depth: 75'-76.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

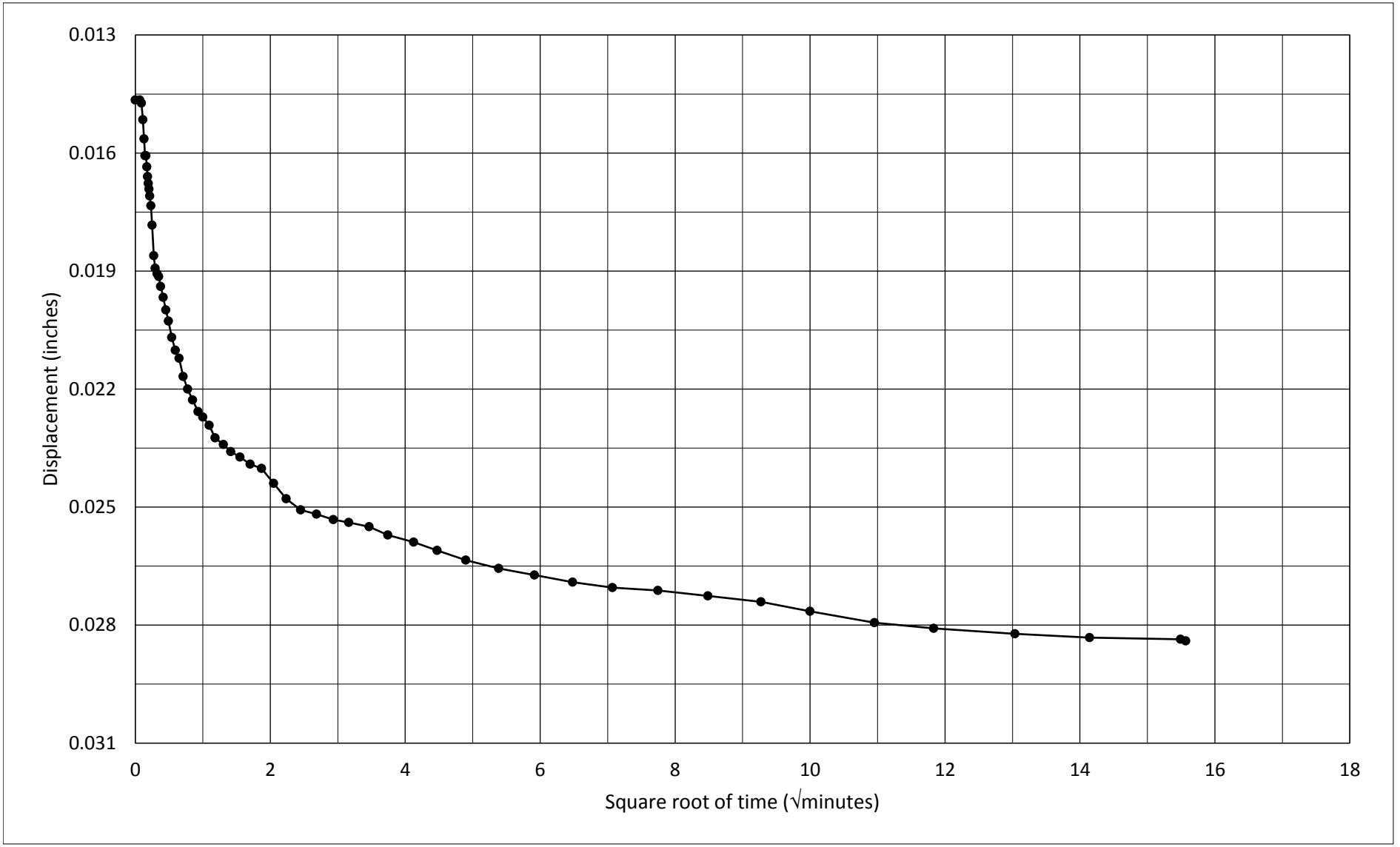
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-11
Depth: 75'-76.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

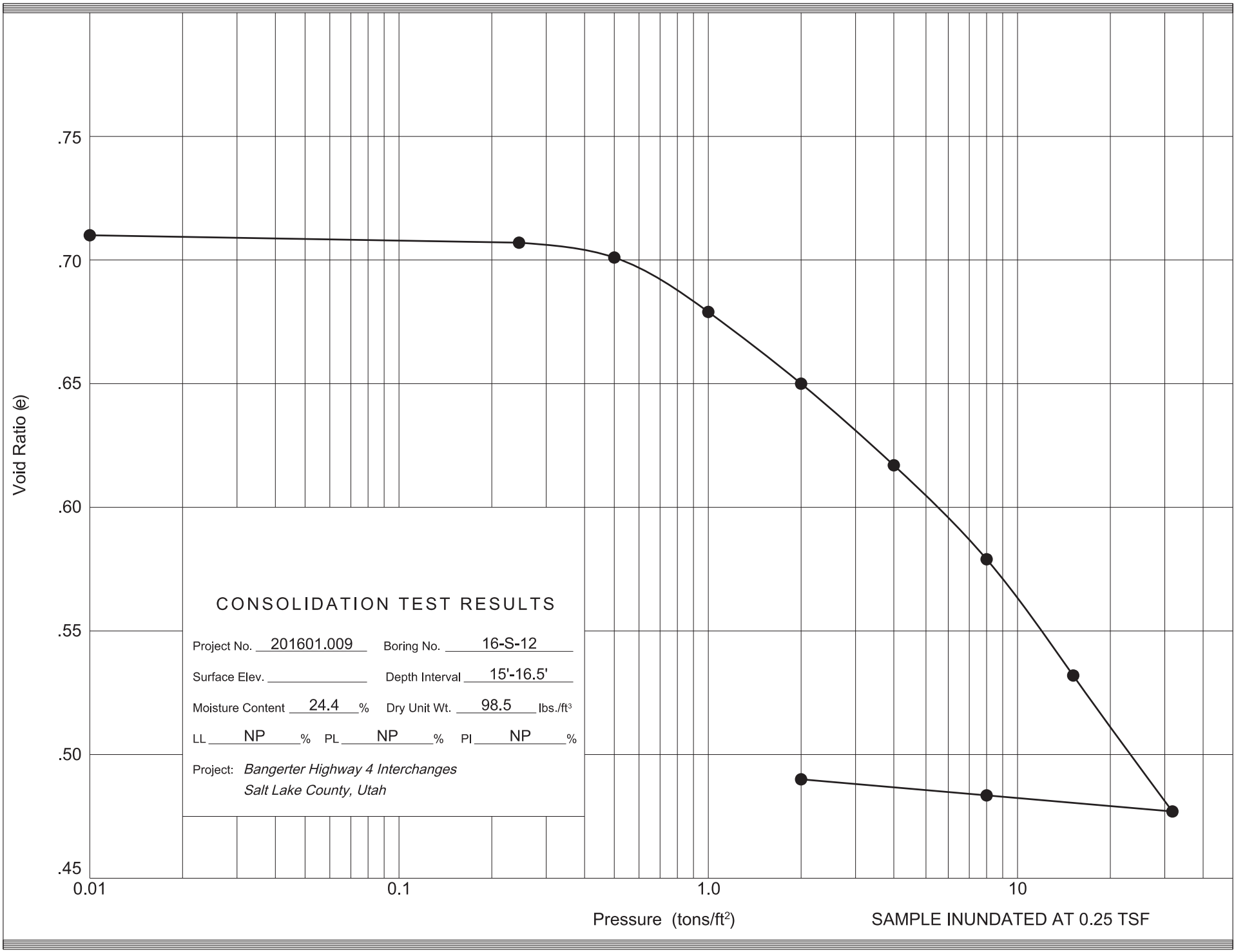
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

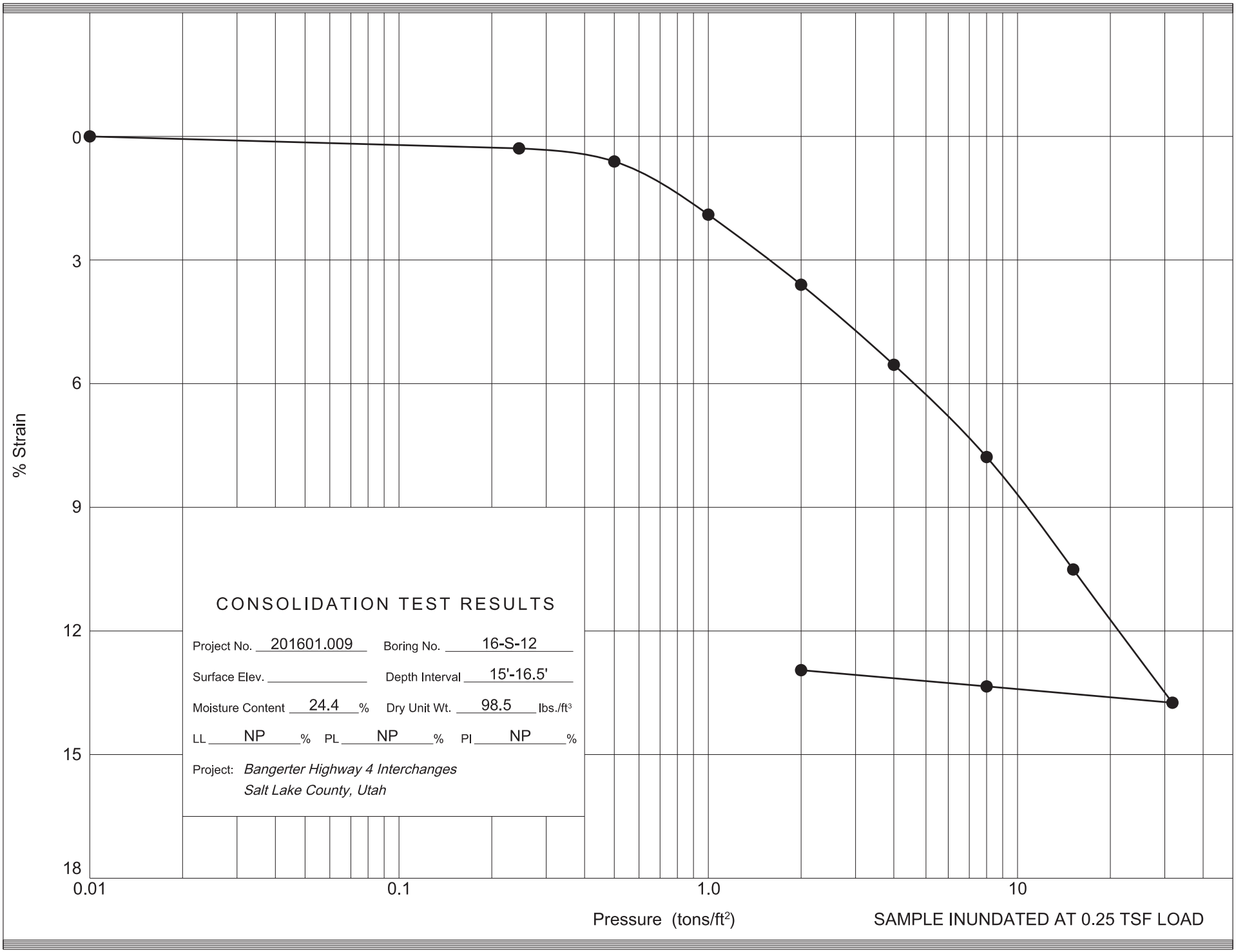


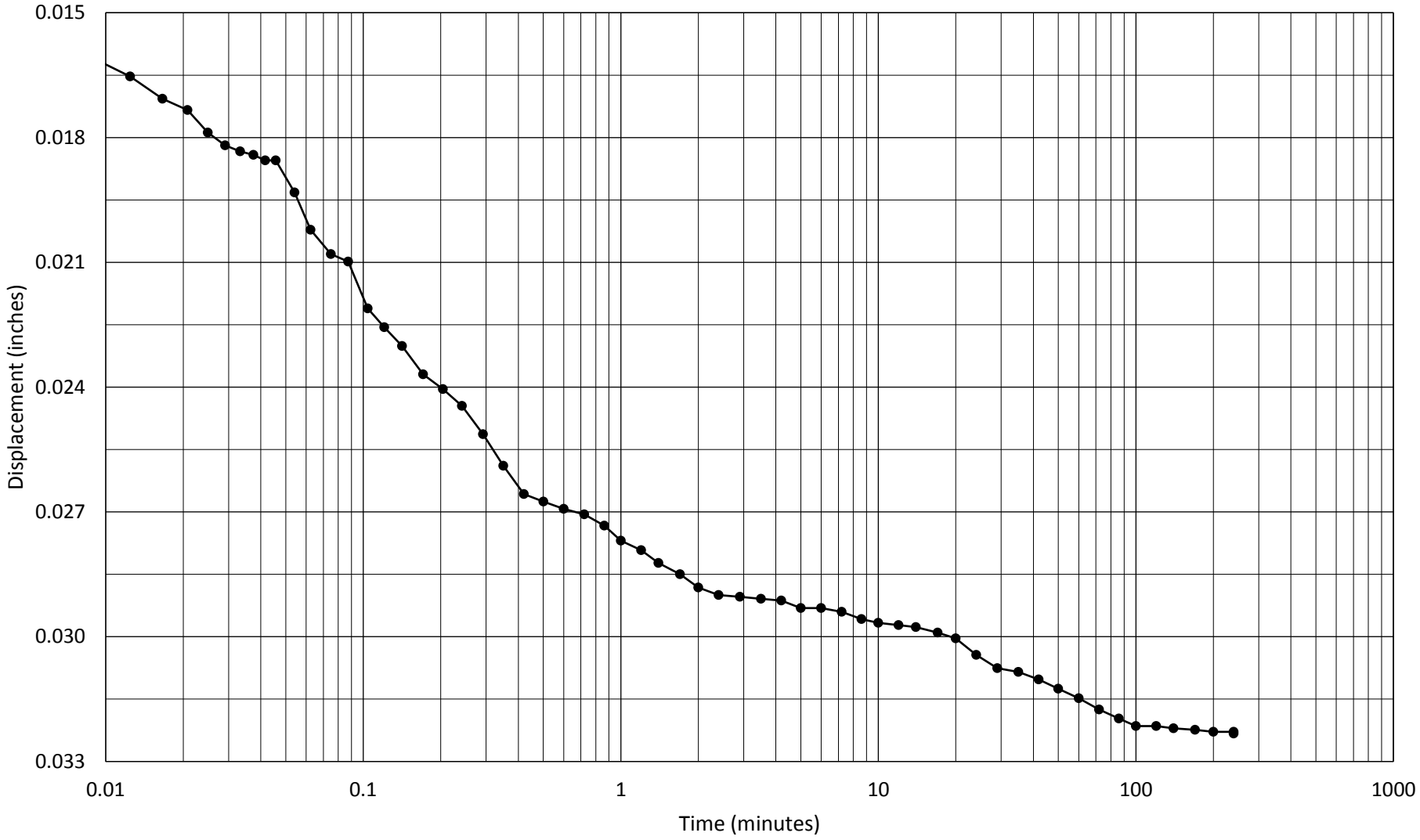
Hole no.: 16-S-11
Depth: 75'-76.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.75
.70
.65
.60
.55
.50
.45
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-12
Surface Elev.
Depth Interval 15'-16.5'
Moisture Content 24.4 %
Dry Unit Wt. 98.5 lbs./ft³
LL NP %
PL NP %
PI NP %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

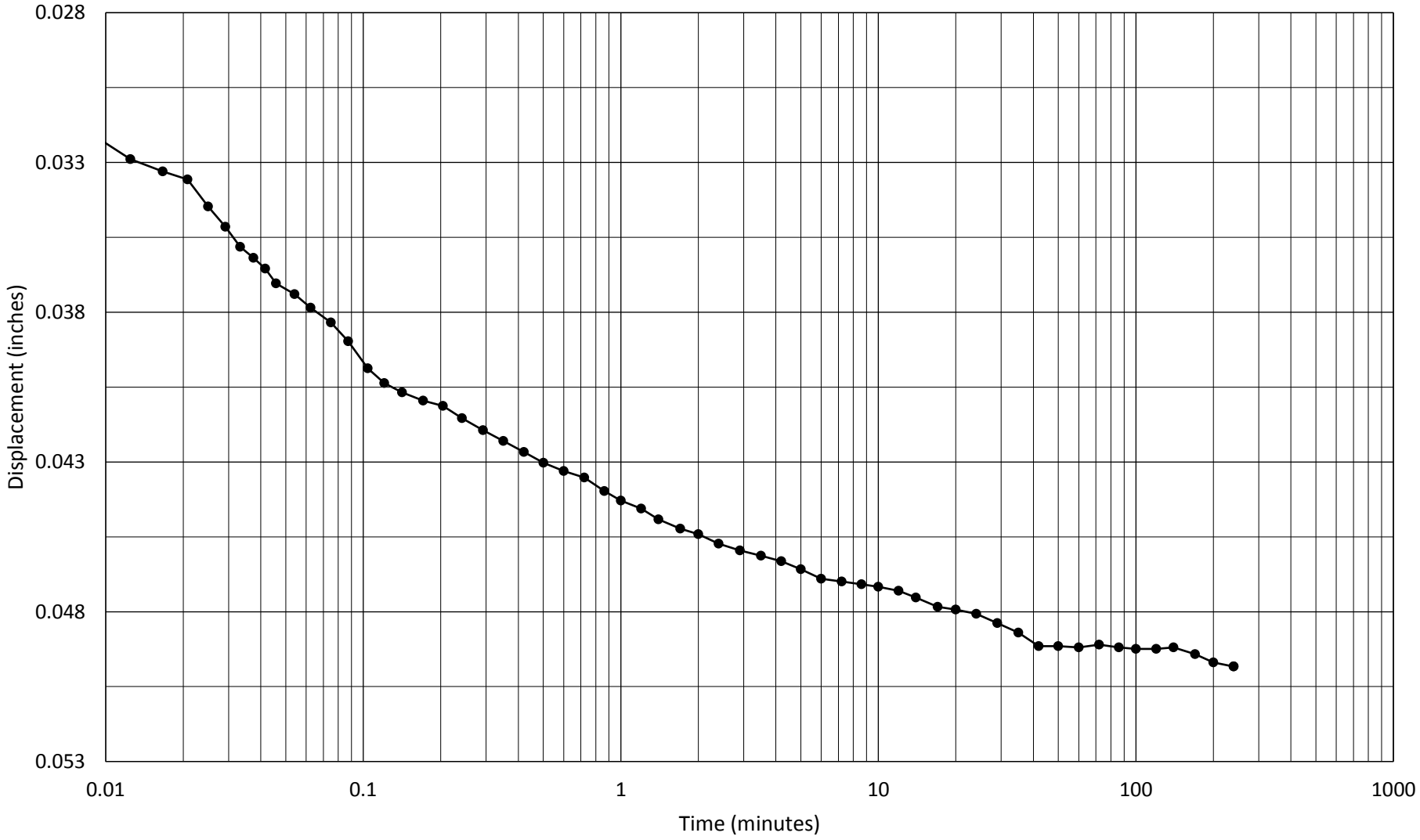

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-12
Surface Elev.
Depth Interval 15'-16.5'
Moisture Content 24.4 %
Dry Unit Wt. 98.5 lbs./ft³
LL NP %
PL NP %
PI NP %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 15'-16.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

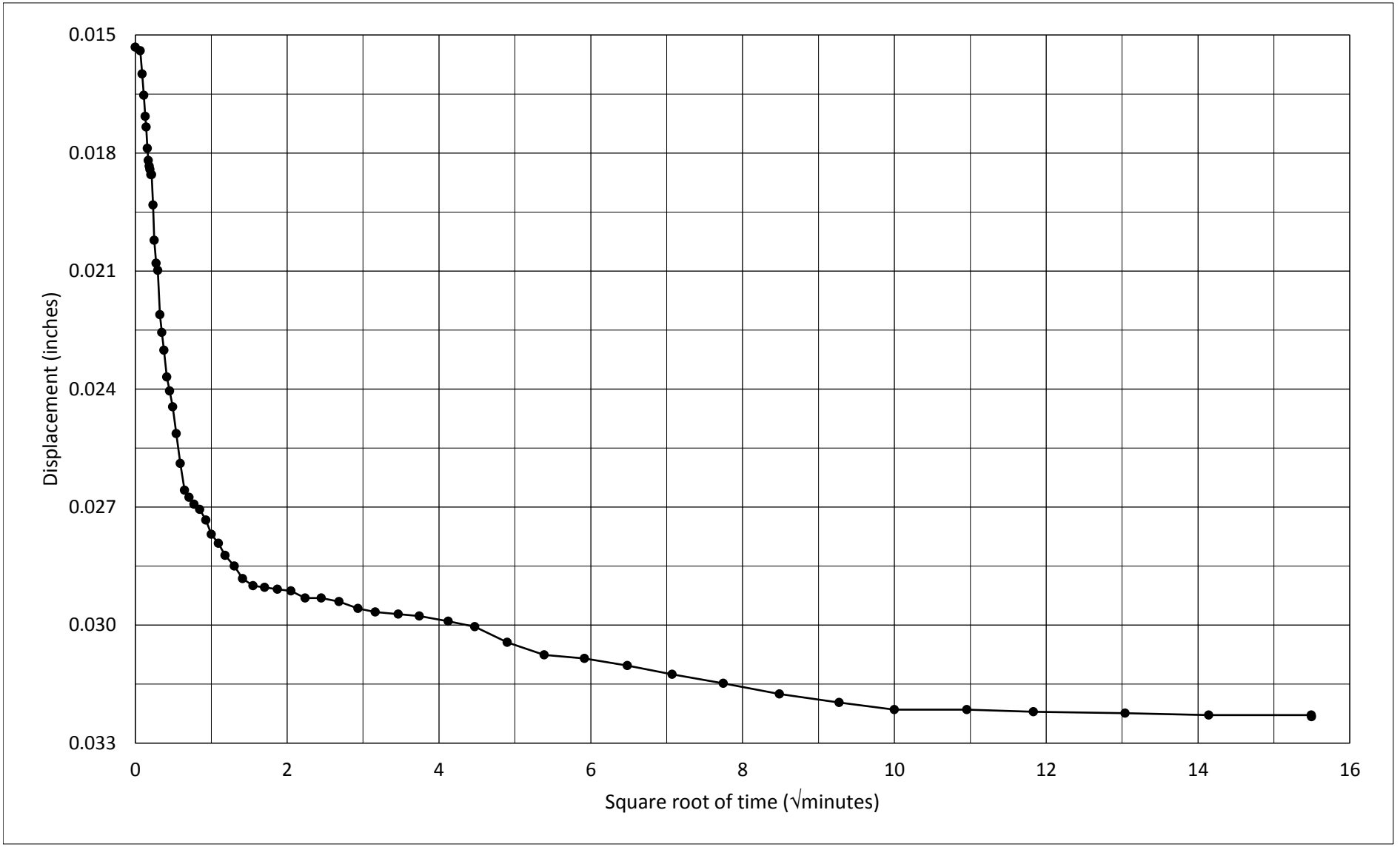
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 15'-16.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

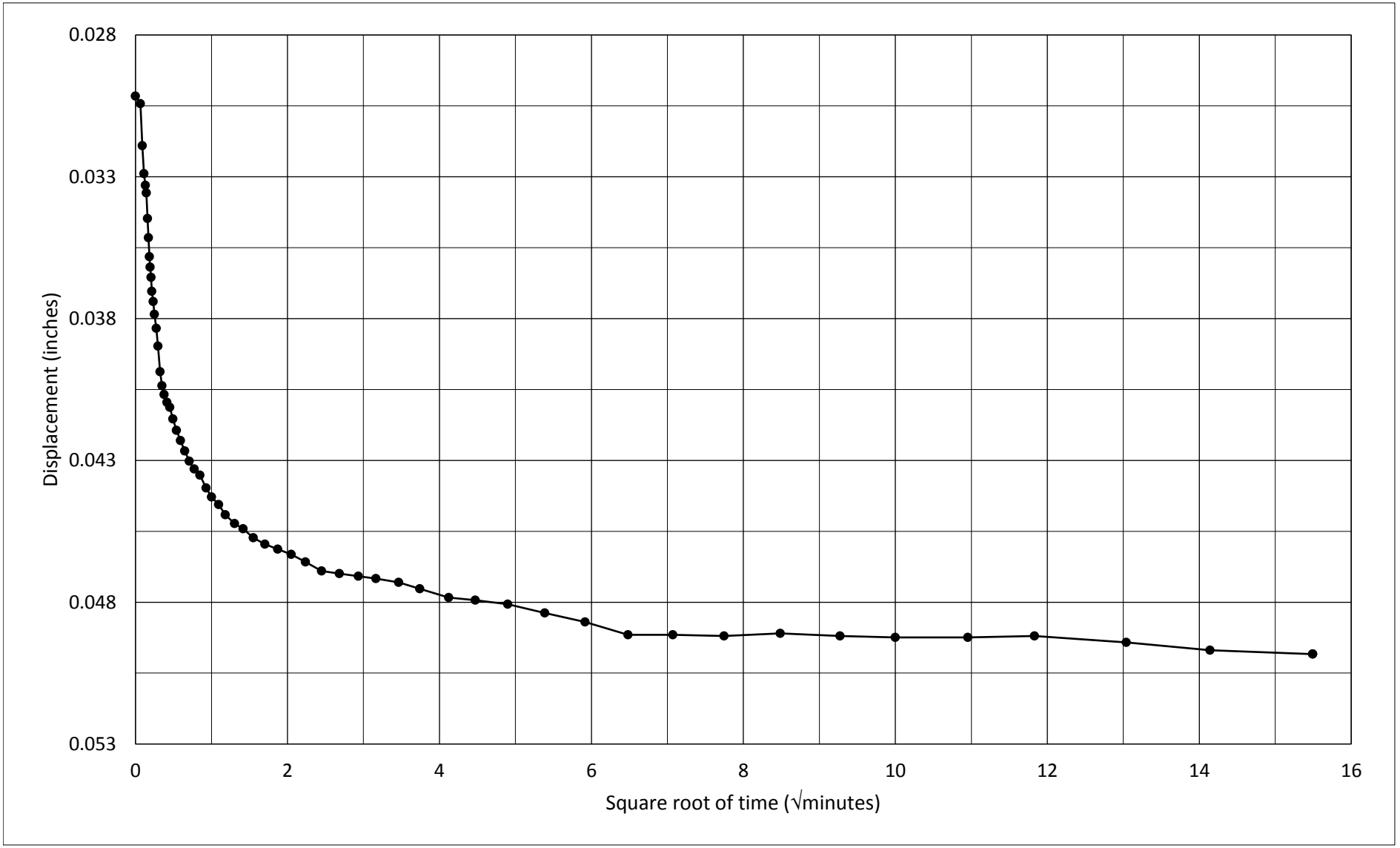
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 15'-16.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

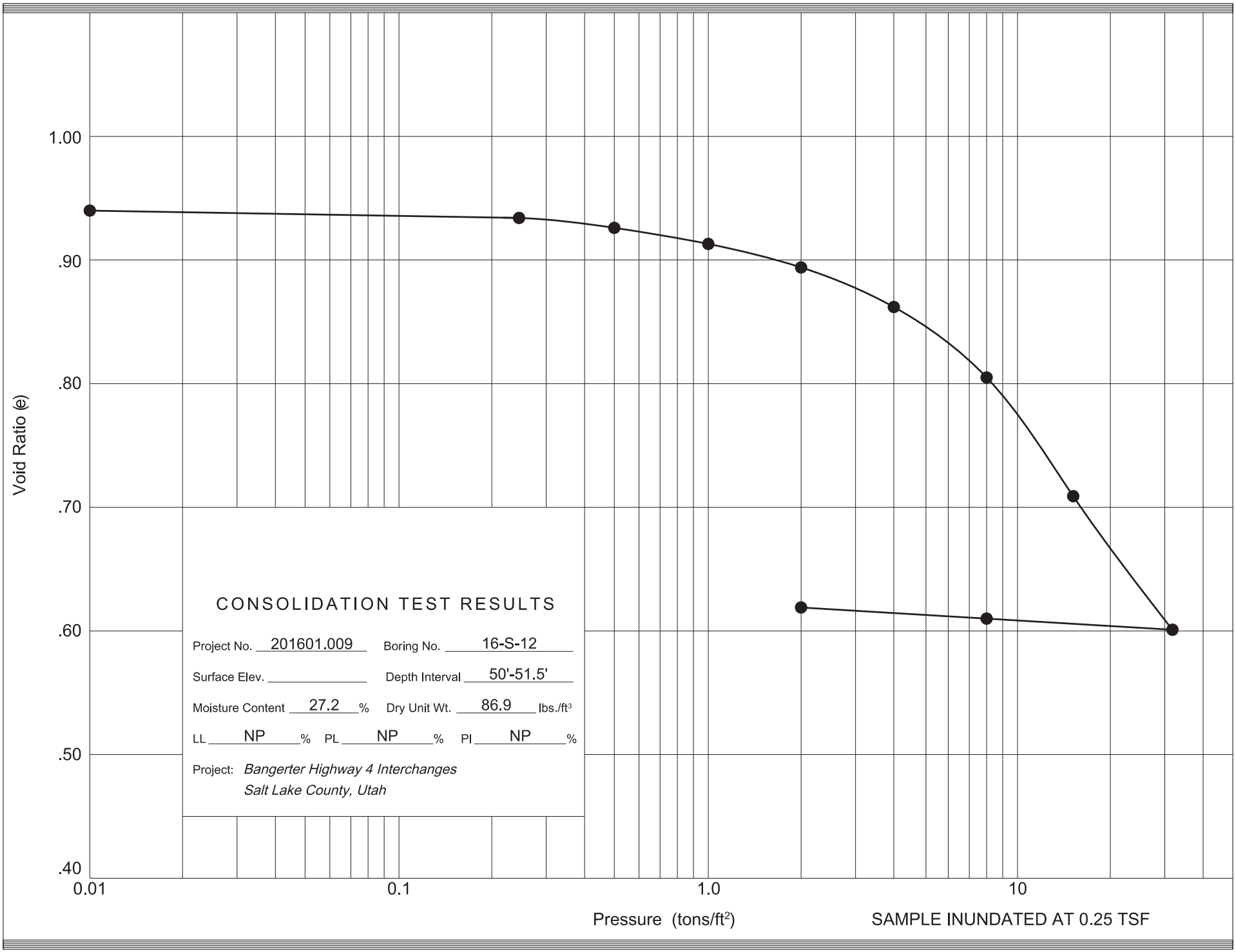
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

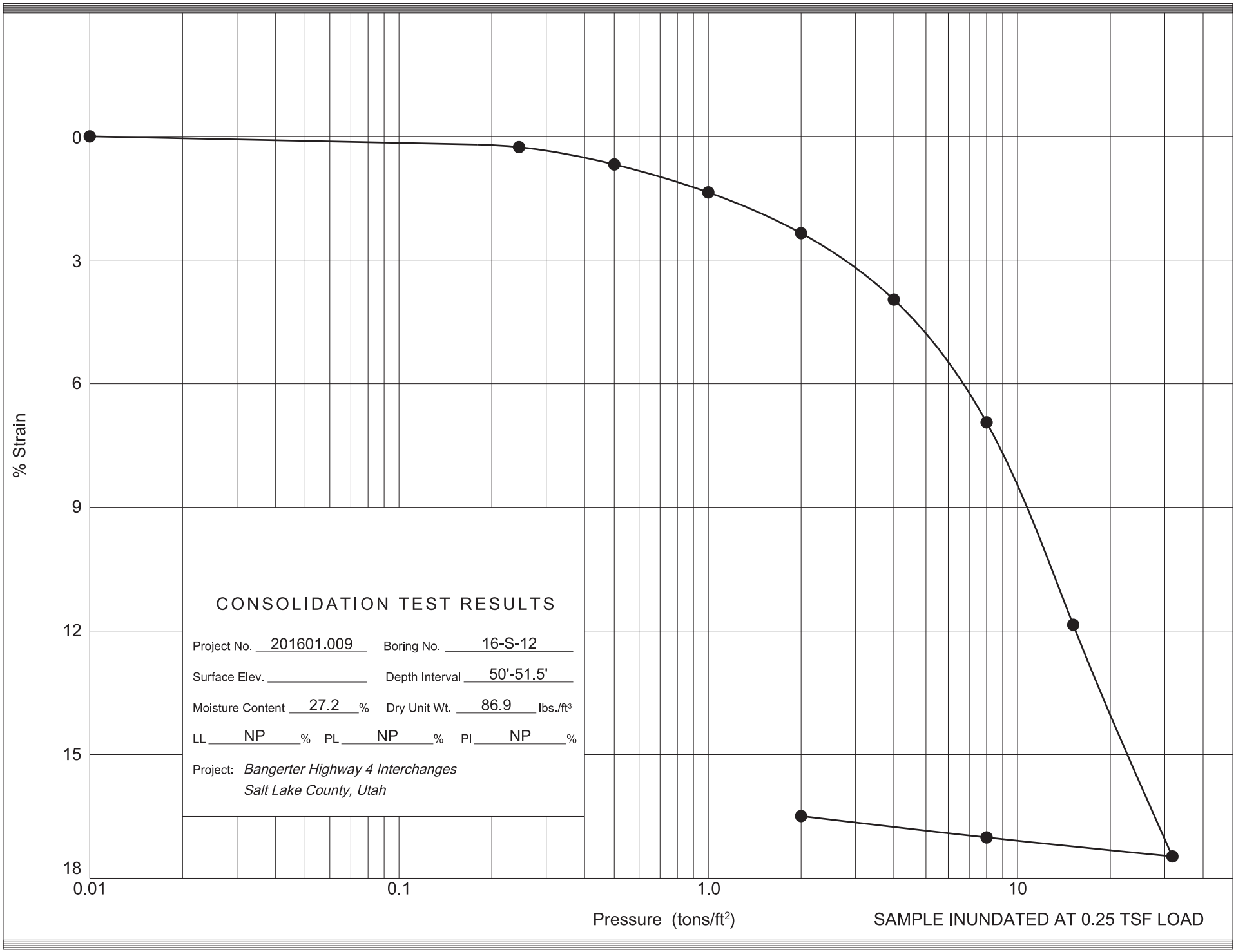


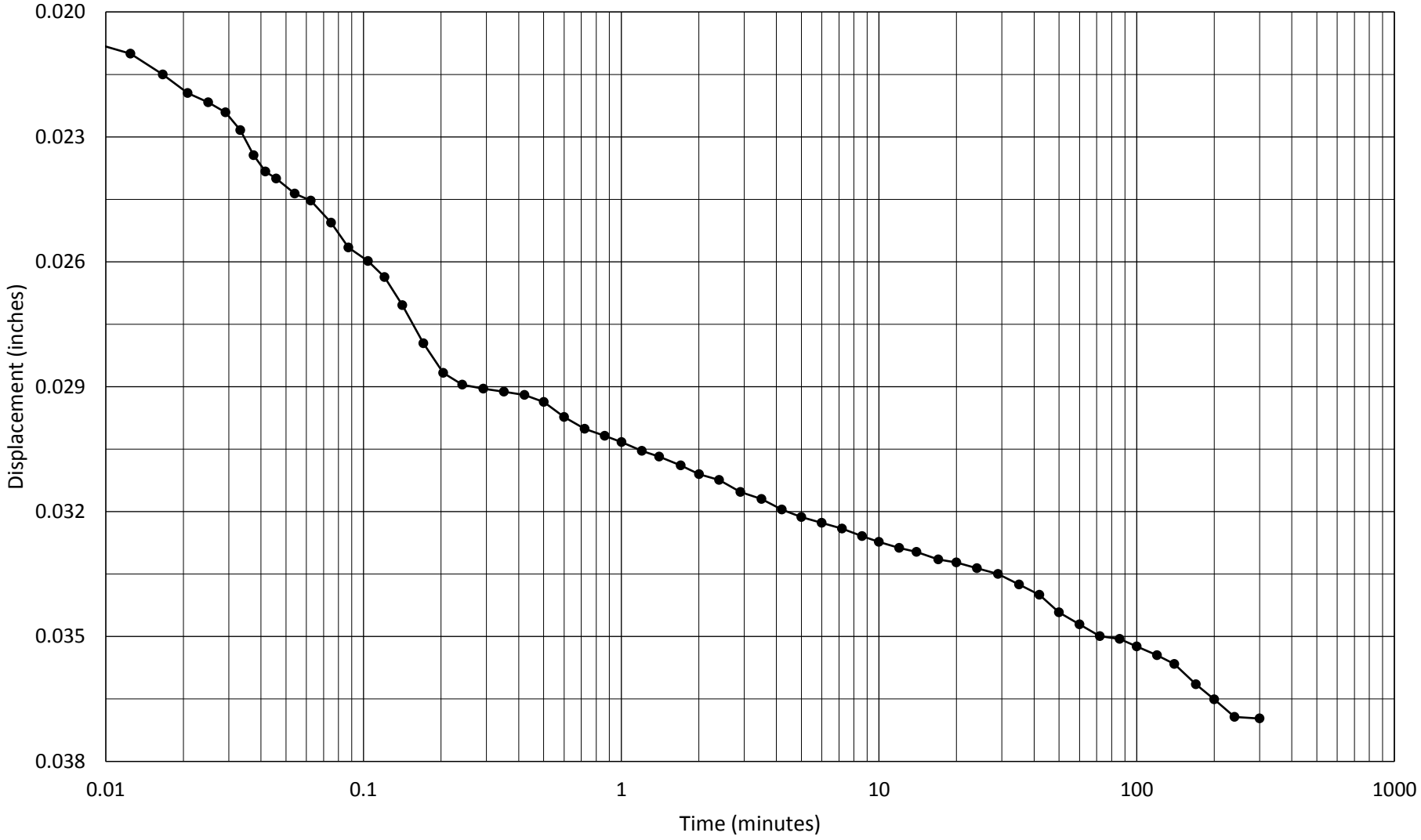
Hole no.: 16-S-12
Depth: 15'-16.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


1.00
.90
.80
.70
.60
.50
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-12
Surface Elev.
Depth Interval 50'-51.5'
Moisture Content 27.2 %
Dry Unit Wt. 86.9 lbs./ft³
LL NP %
PL NP %
PI NP %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

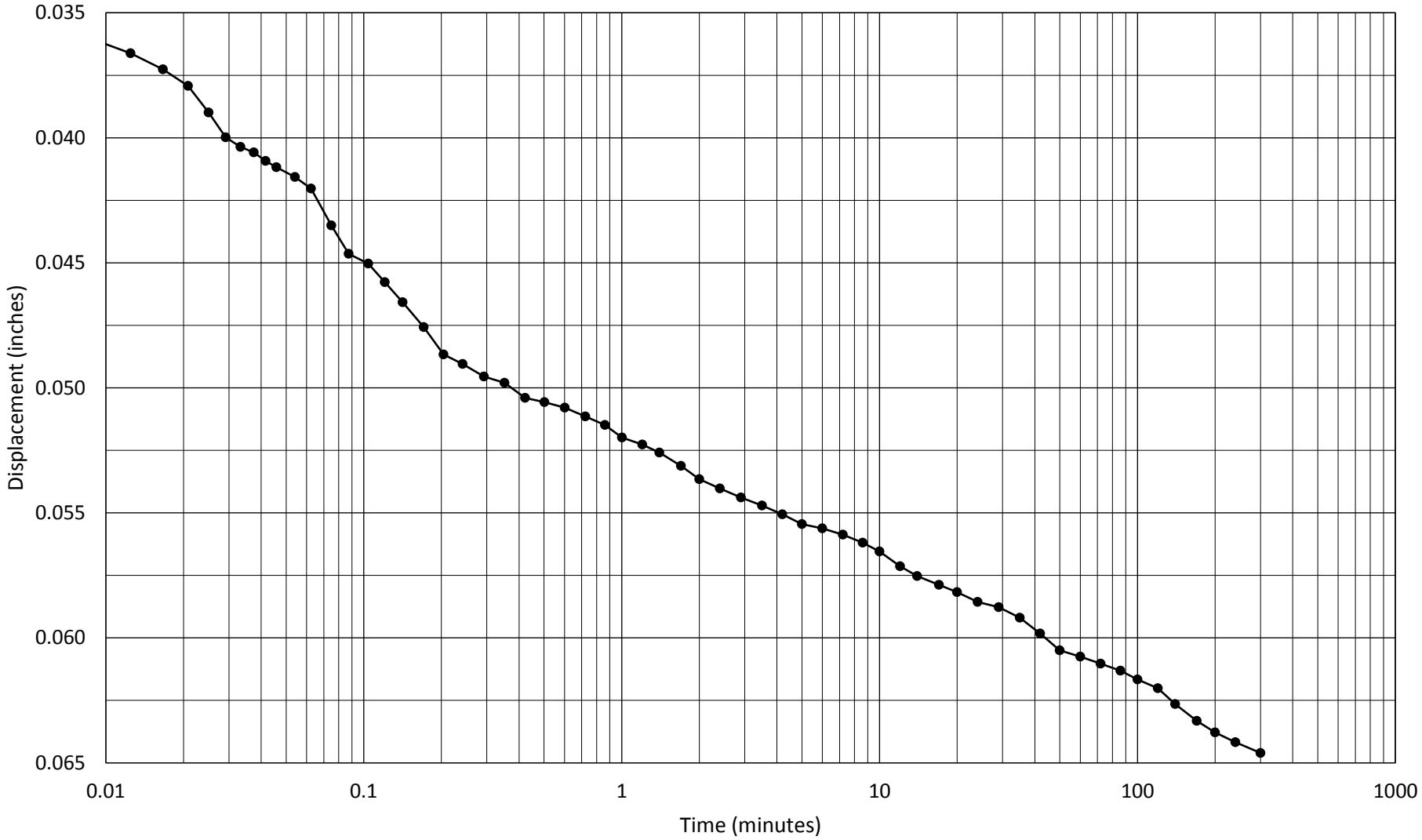

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-12
Surface Elev.
Depth Interval 50'-51.5'
Moisture Content 27.2 %
Dry Unit Wt. 86.9 lbs./ft³
LL NP %
PL NP %
PI NP %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 50'-51.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

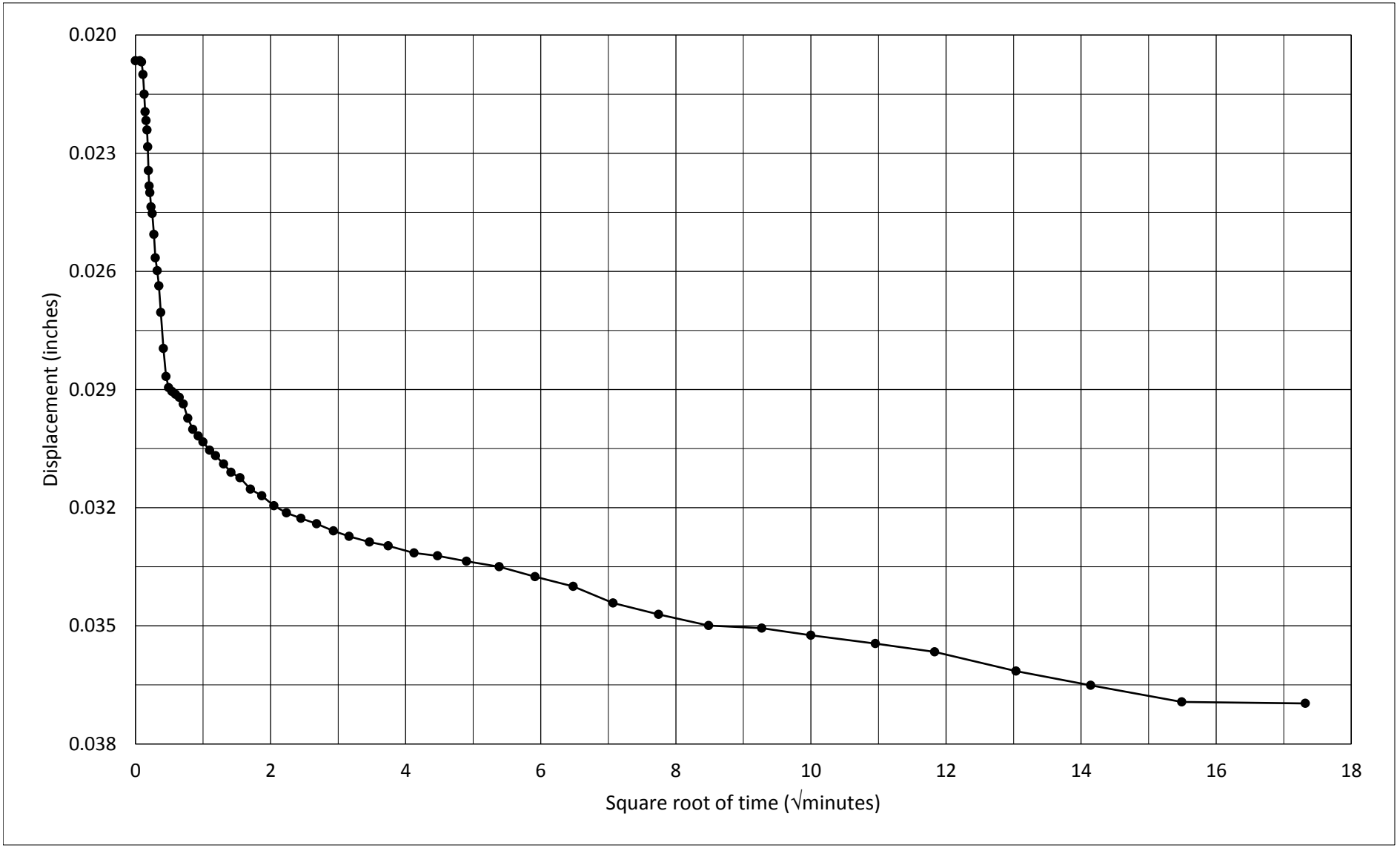
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 50'-51.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

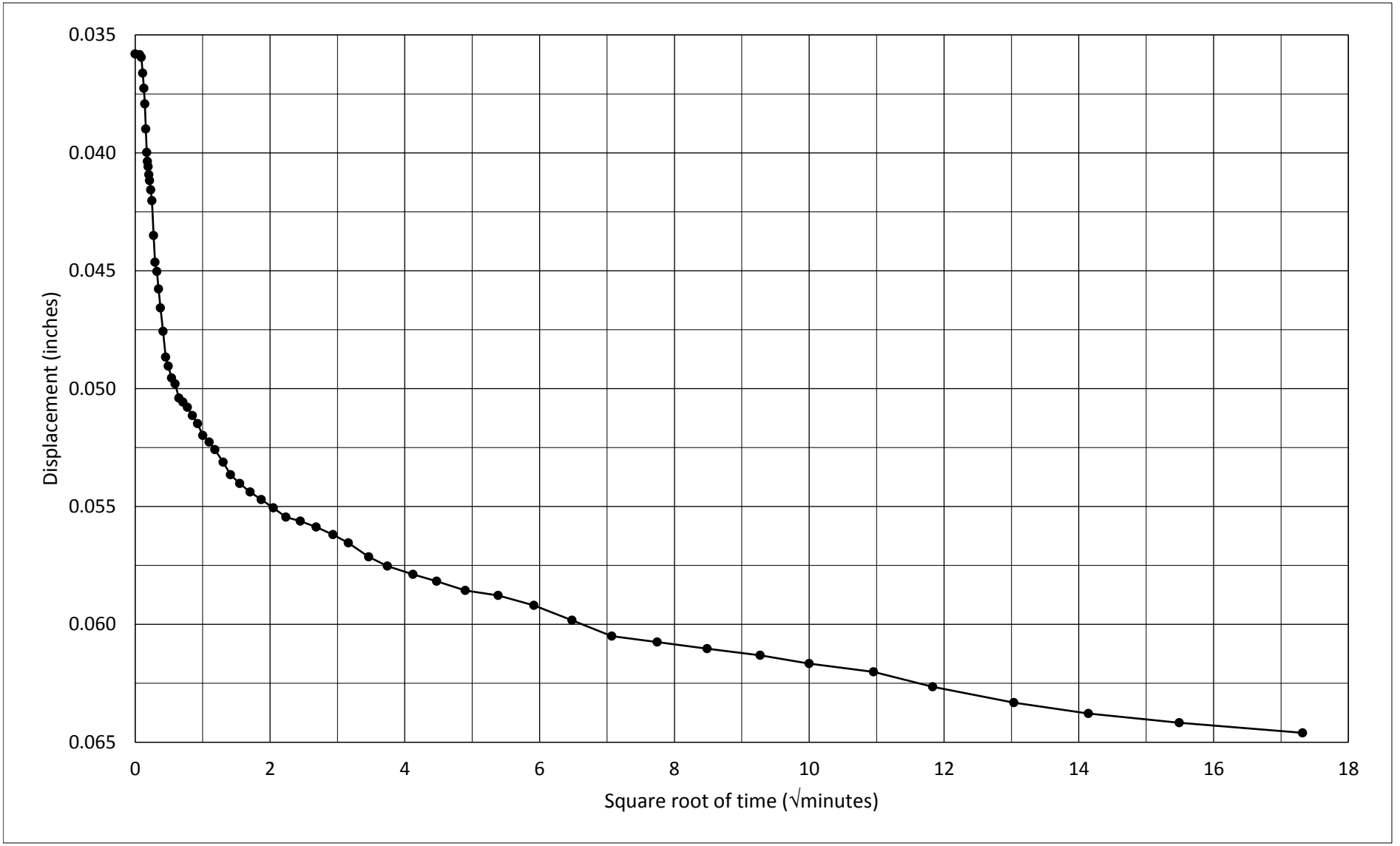
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 50'-51.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

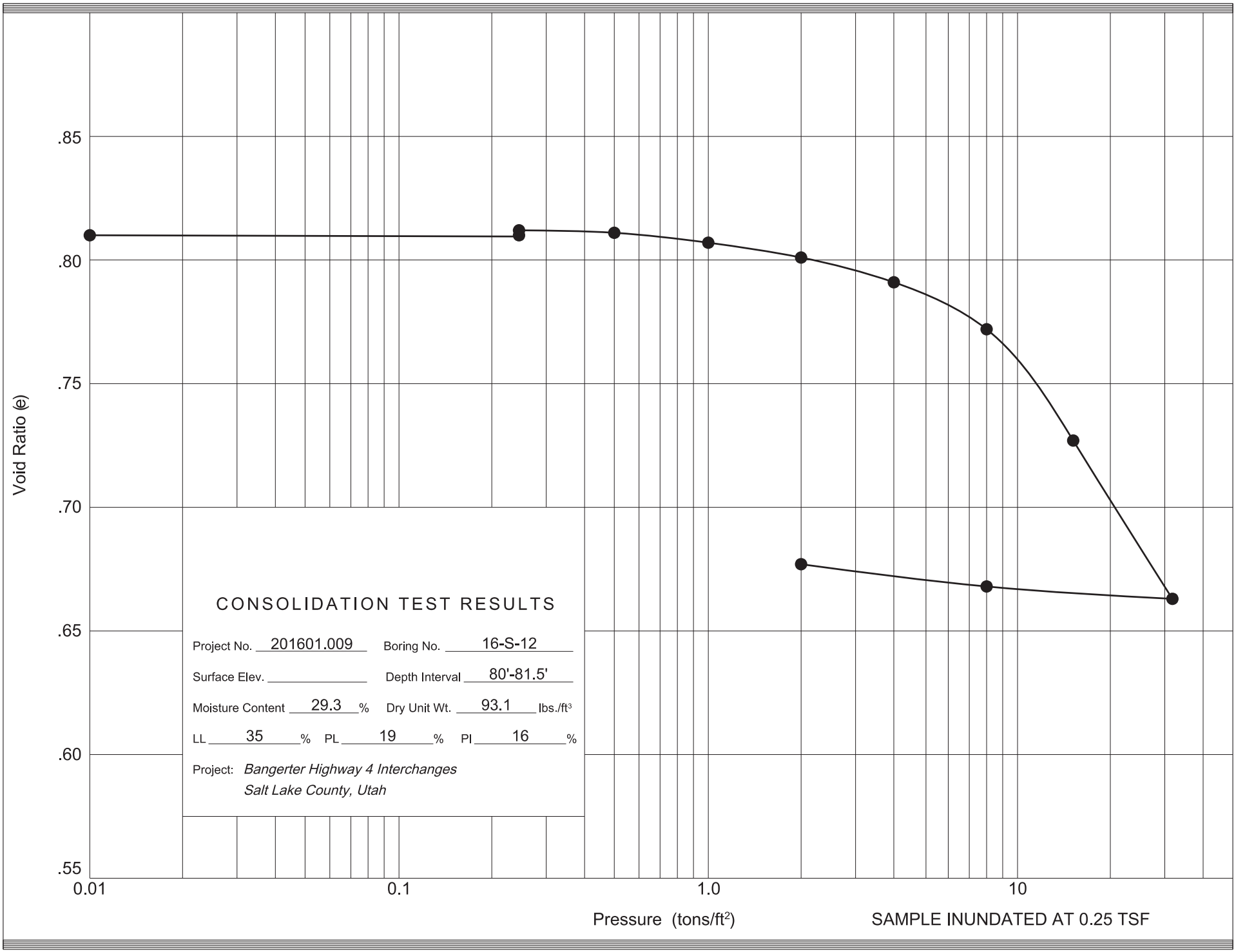
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 50'-51.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah



CONSOLIDATION TEST RESULTS

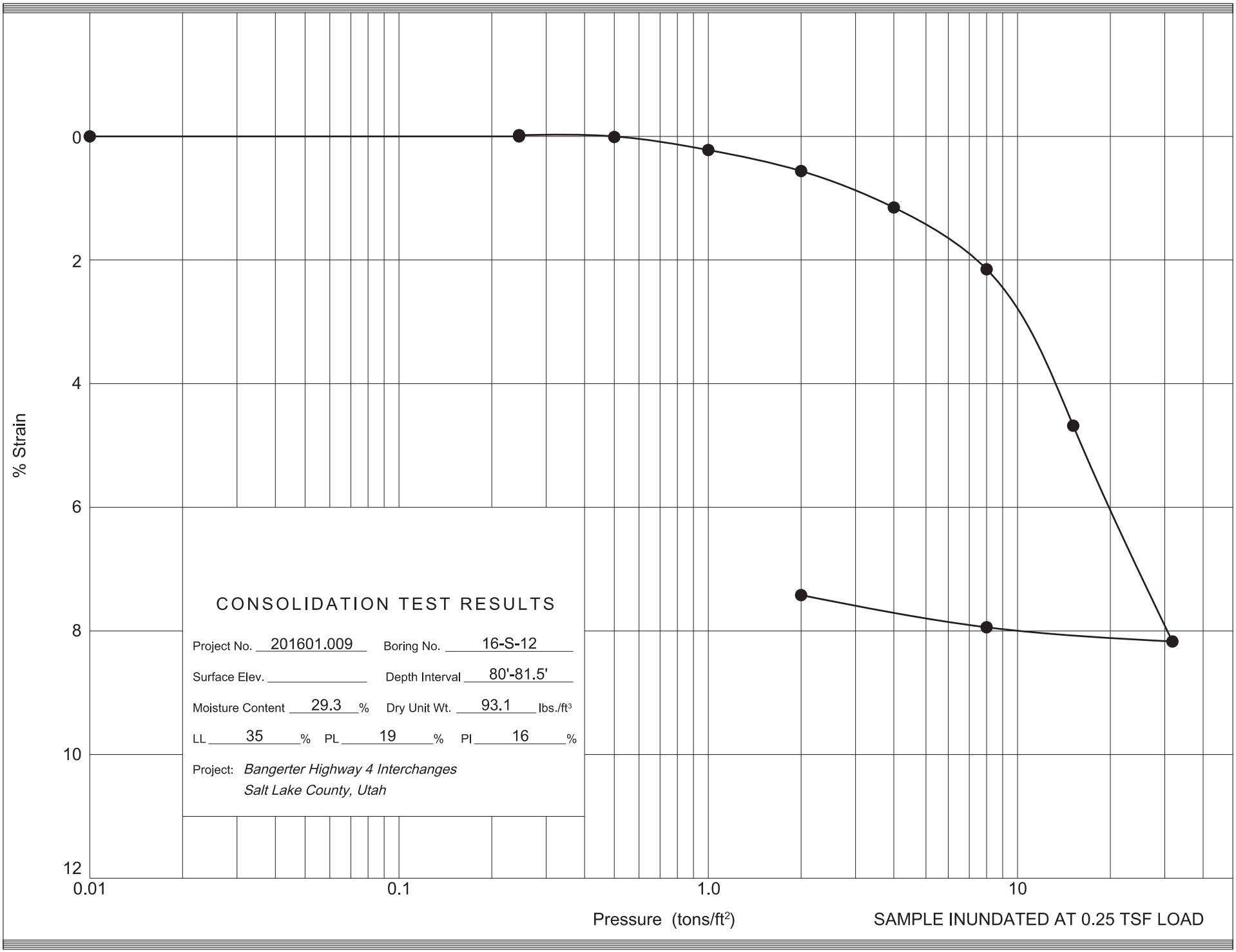
Project No. 201601.009 Boring No. 16-S-12

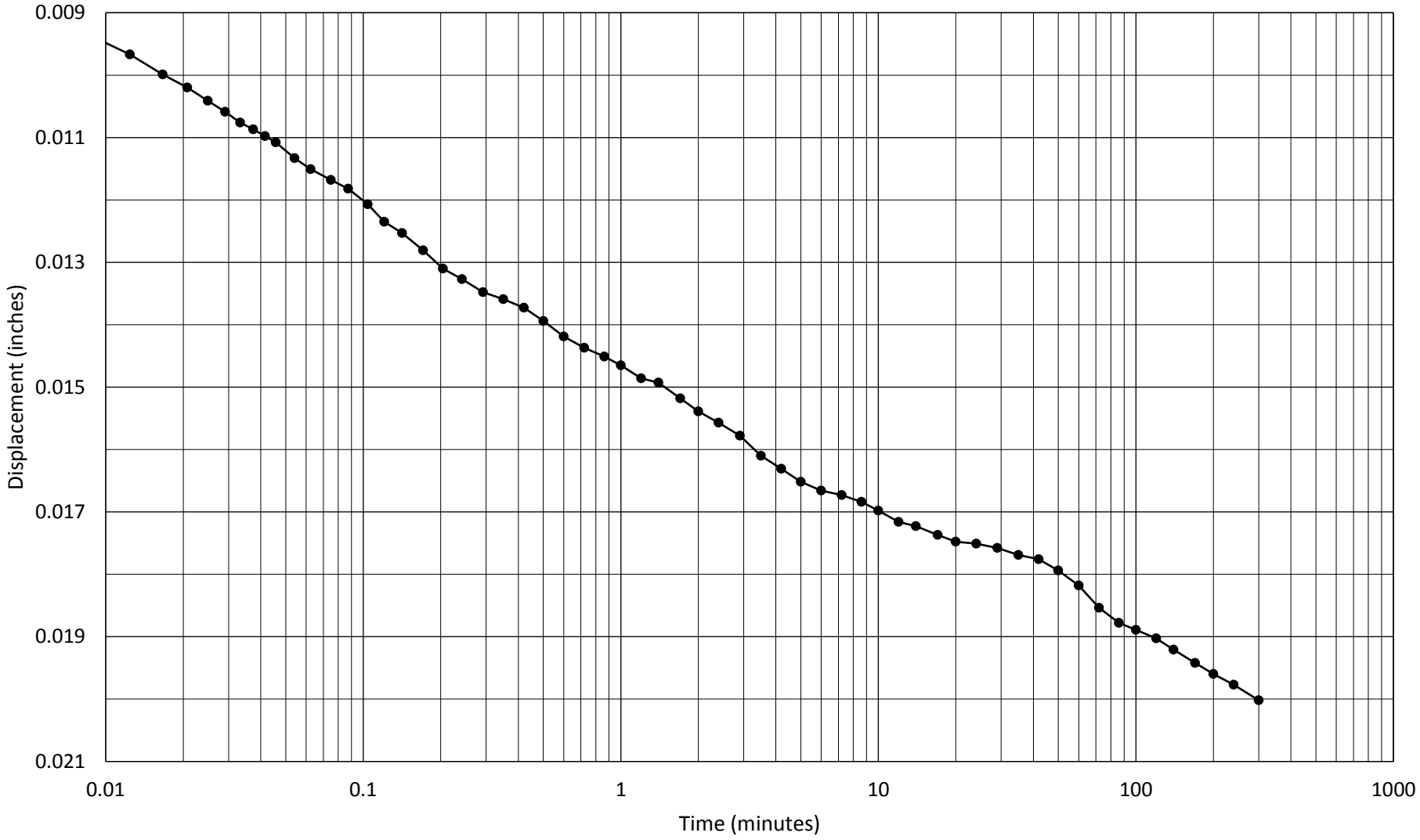
Surface Elev. _____ Depth Interval 80'-81.5'

Moisture Content 29.3 % Dry Unit Wt. 93.1 lbs./ft³

LL 35 % PL 19 % PI 16 %

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

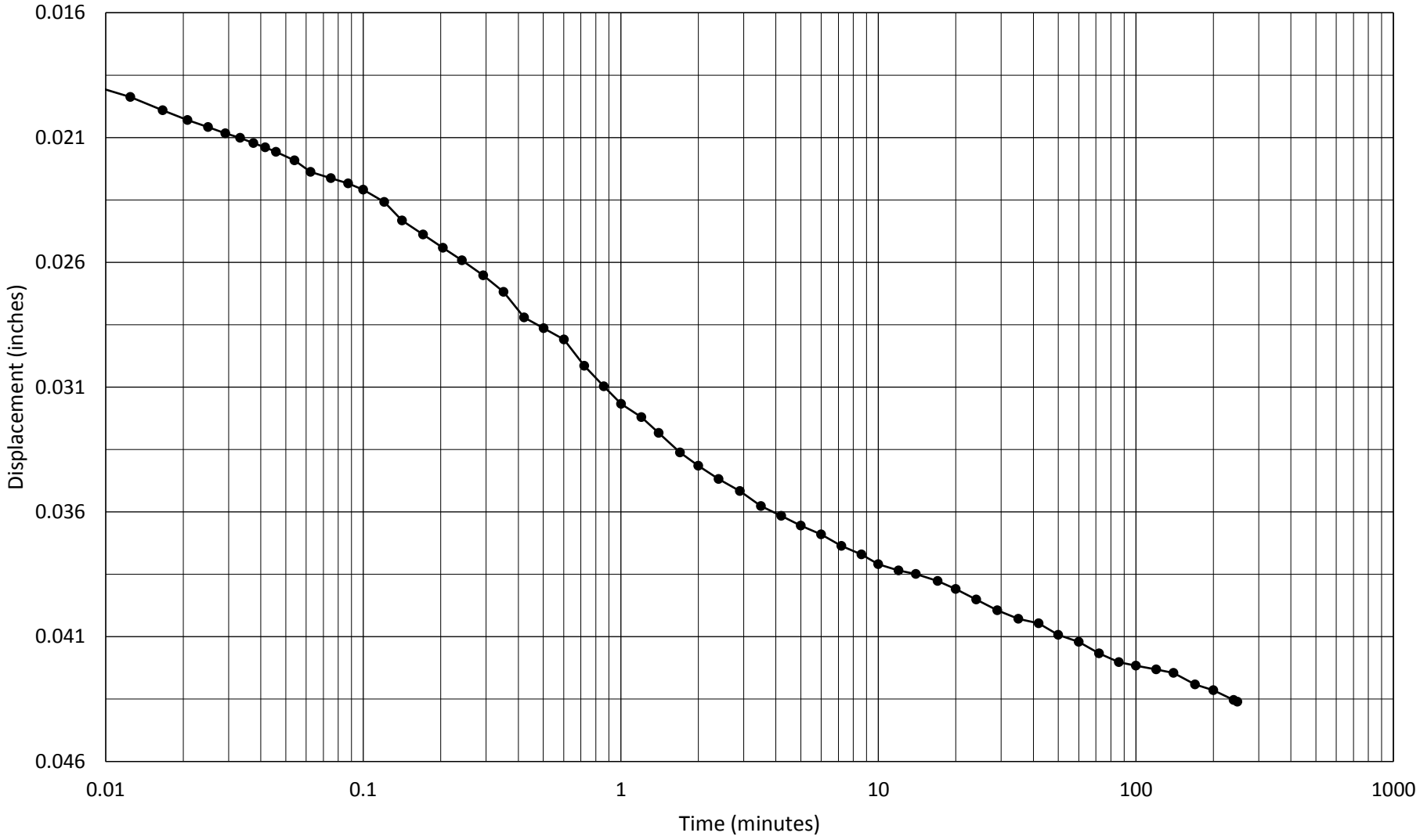

0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-12
Surface Elev.
Depth Interval 80'-81.5'
Moisture Content 29.3 %
Dry Unit Wt. 93.1 lbs./ft³
LL 35 %
PL 19 %
PI 16 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 80'-81.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

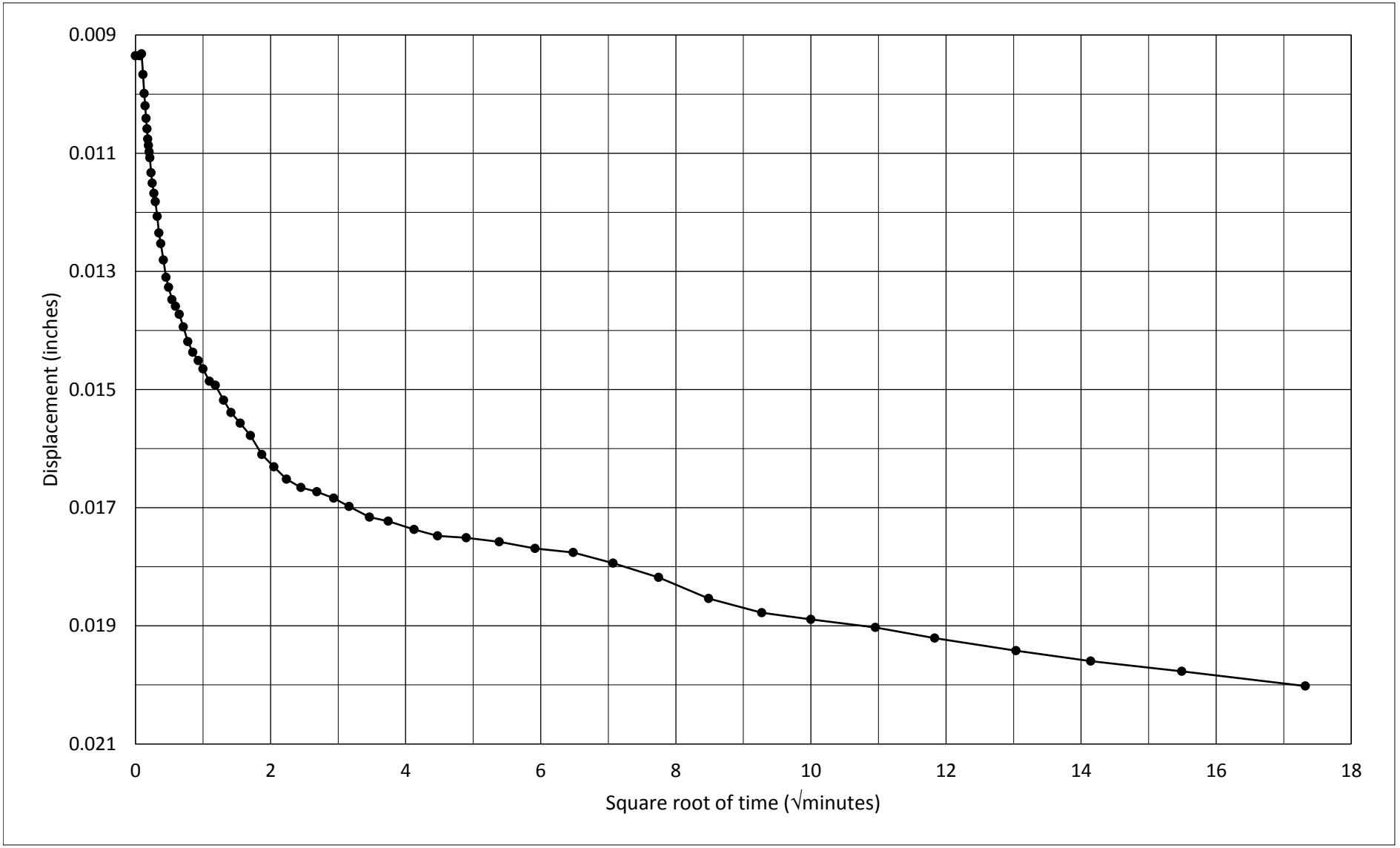
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 80'-81.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

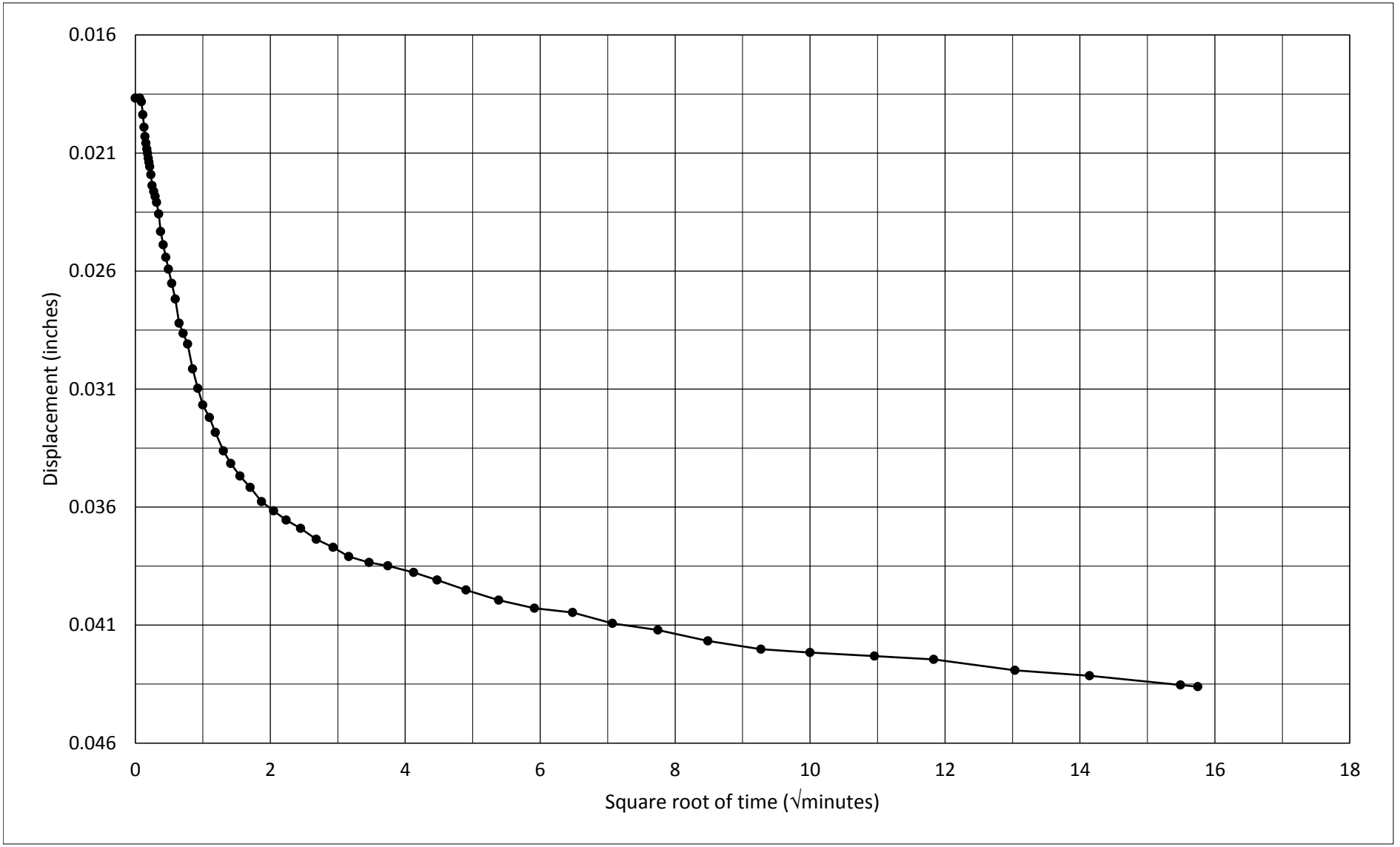
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 80'-81.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

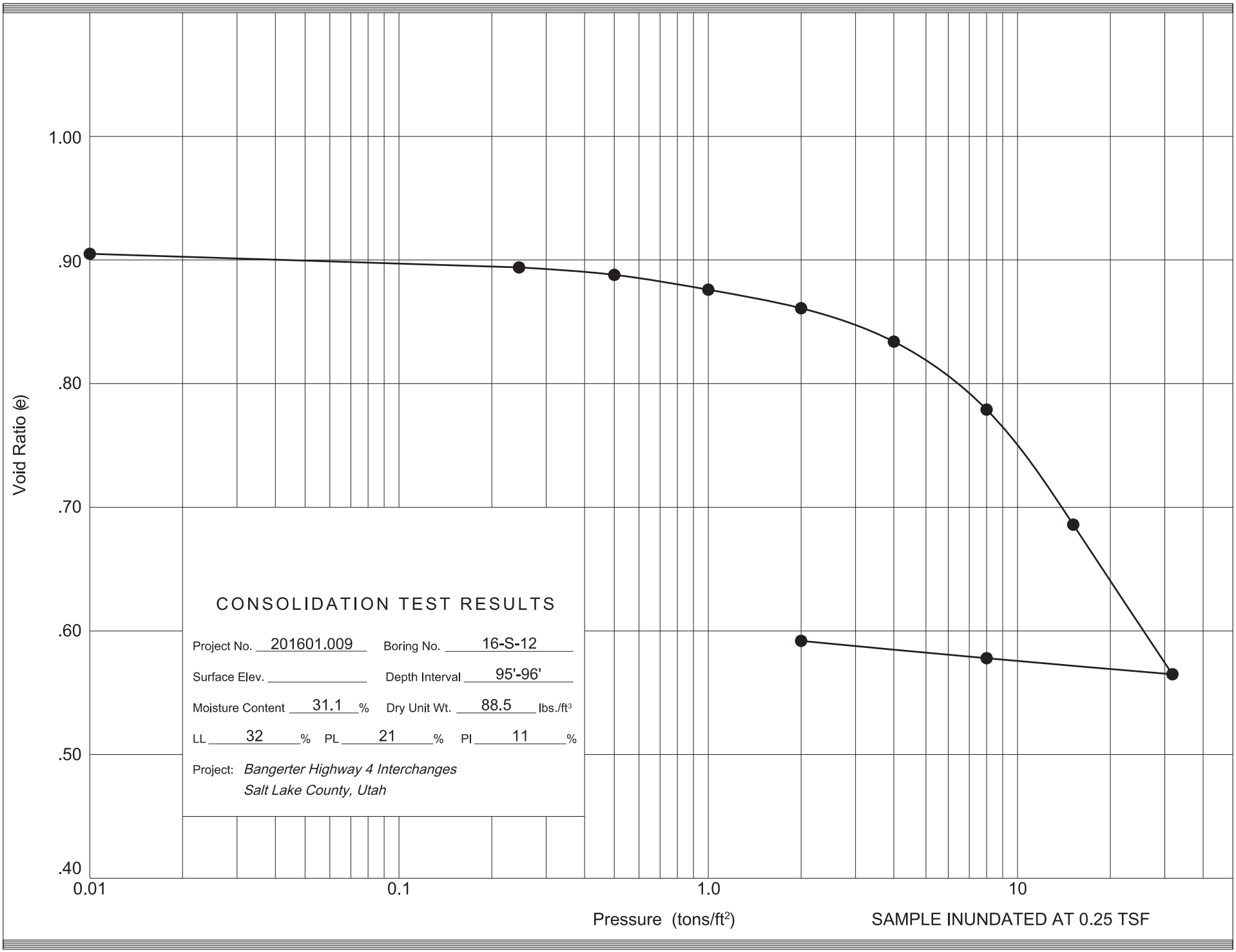
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

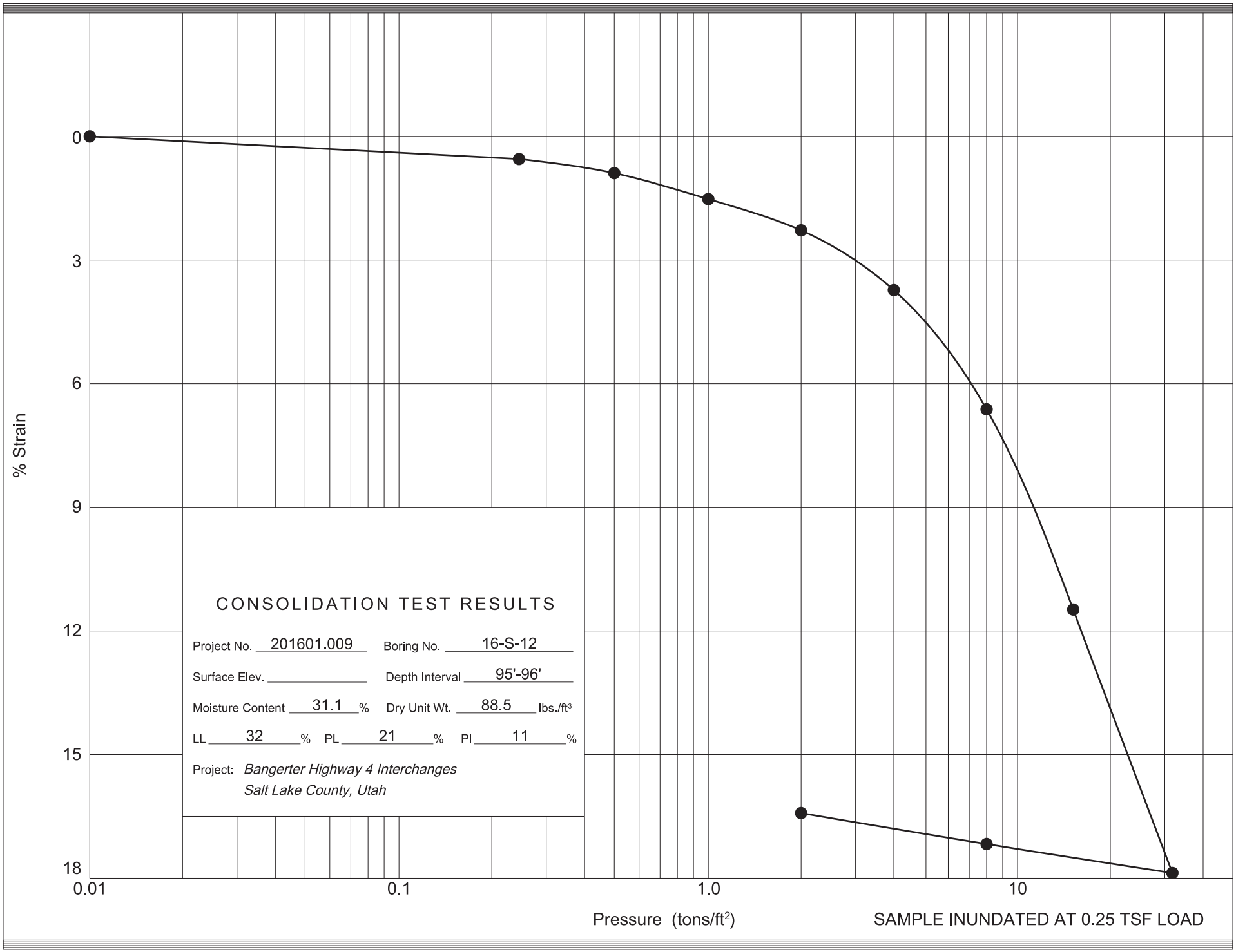


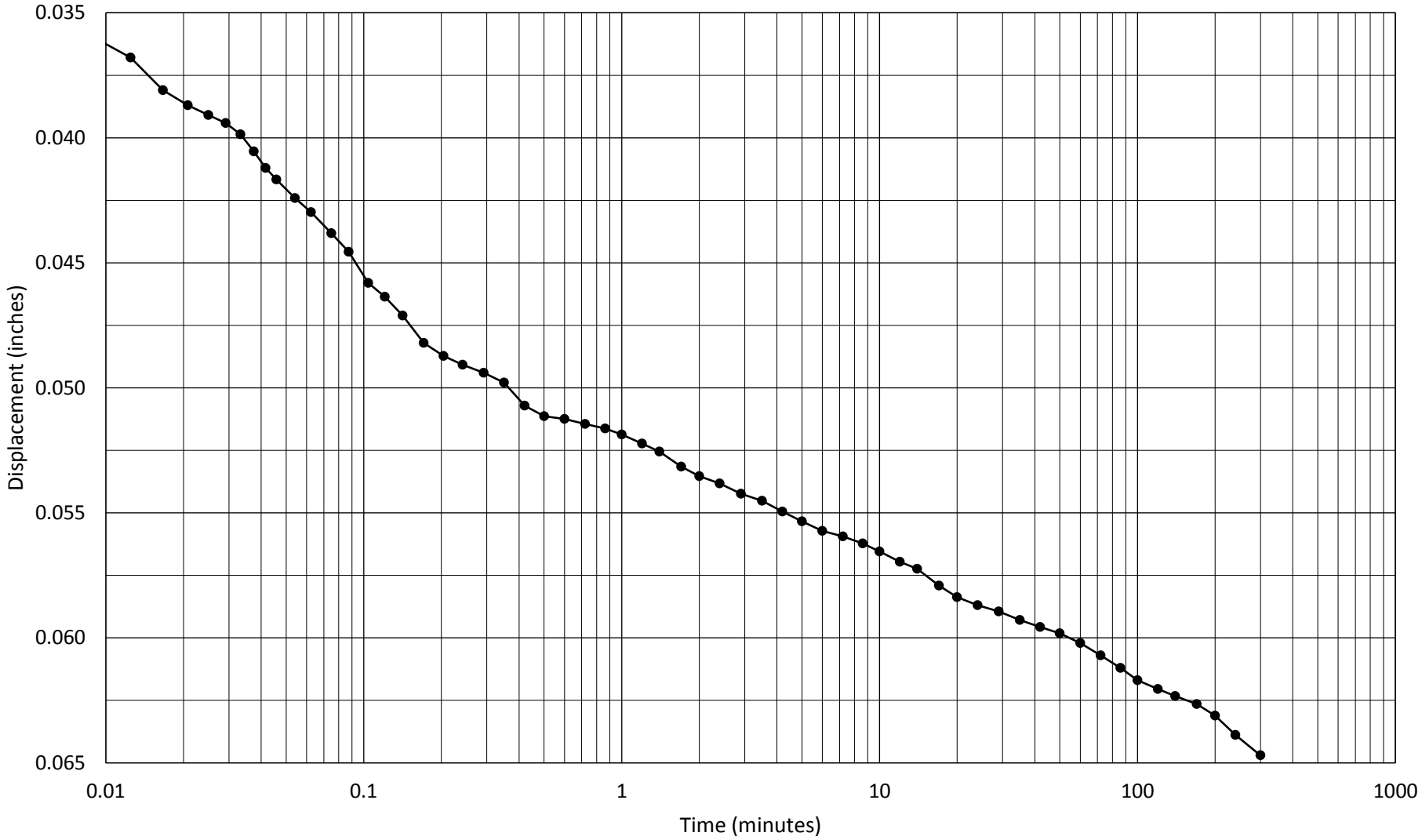
Hole no.: 16-S-12
Depth: 80'-81.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


1.00
.90
.80
.70
.60
.50
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-12
Surface Elev.
Depth Interval 95'-96'
Moisture Content 31.1 %
Dry Unit Wt. 88.5 lbs./ft³
LL 32 %
PL 21 %
PI 11 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

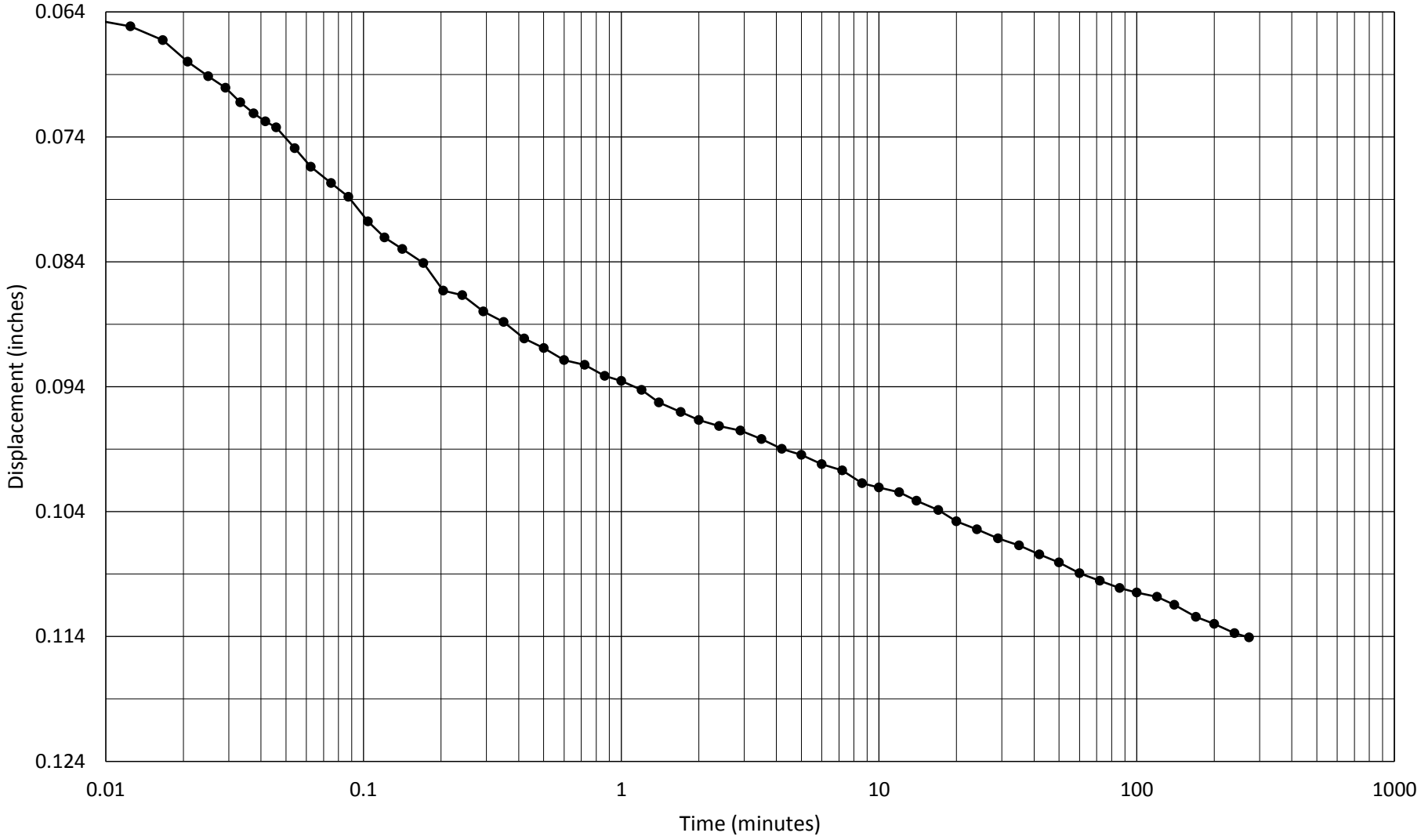

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-S-12
Surface Elev.
Depth Interval 95'-96'
Moisture Content 31.1 %
Dry Unit Wt. 88.5 lbs./ft³
LL 32 %
PL 21 %
PI 11 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 95'-96.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

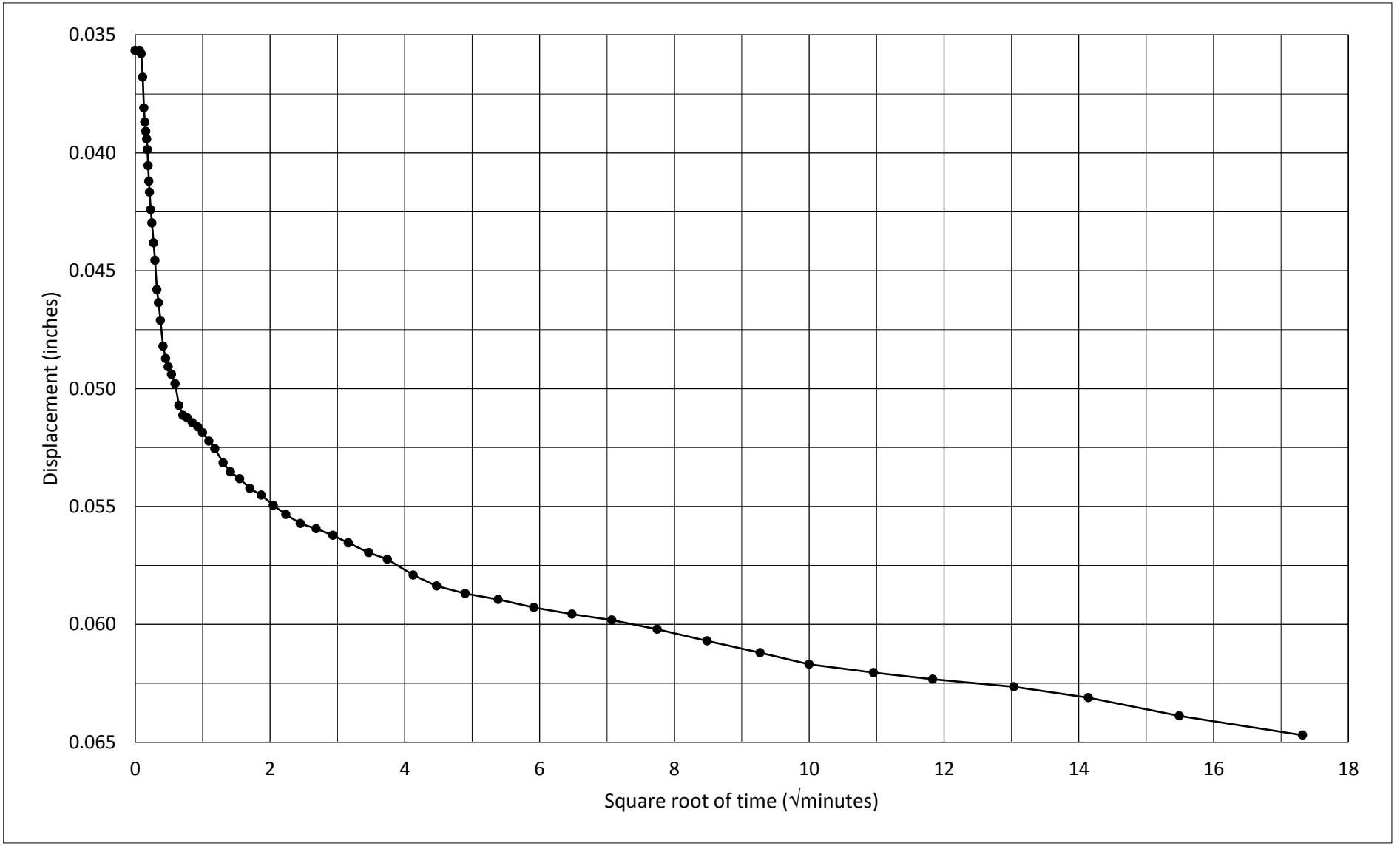
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 95'-96.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

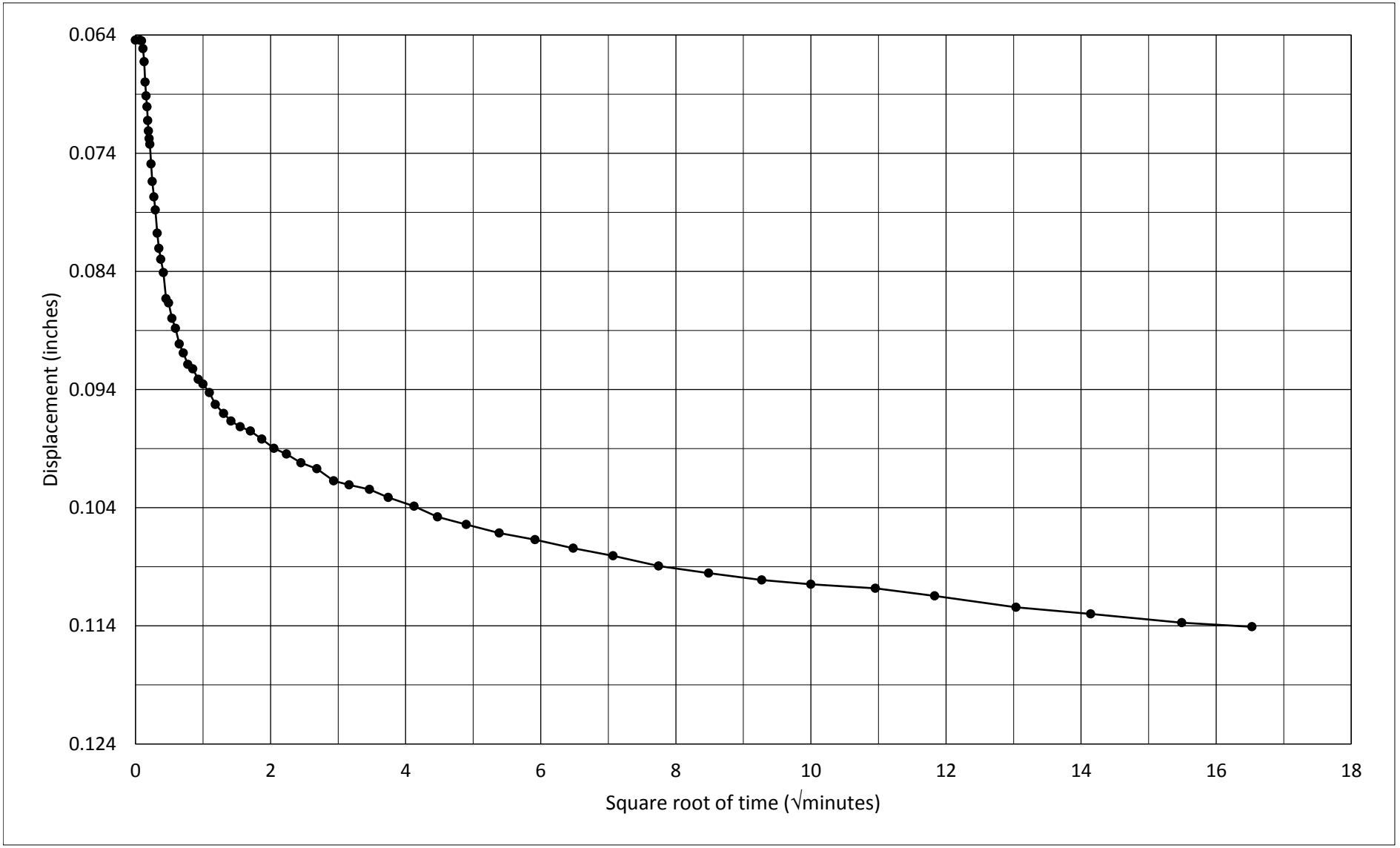
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 95'-96.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

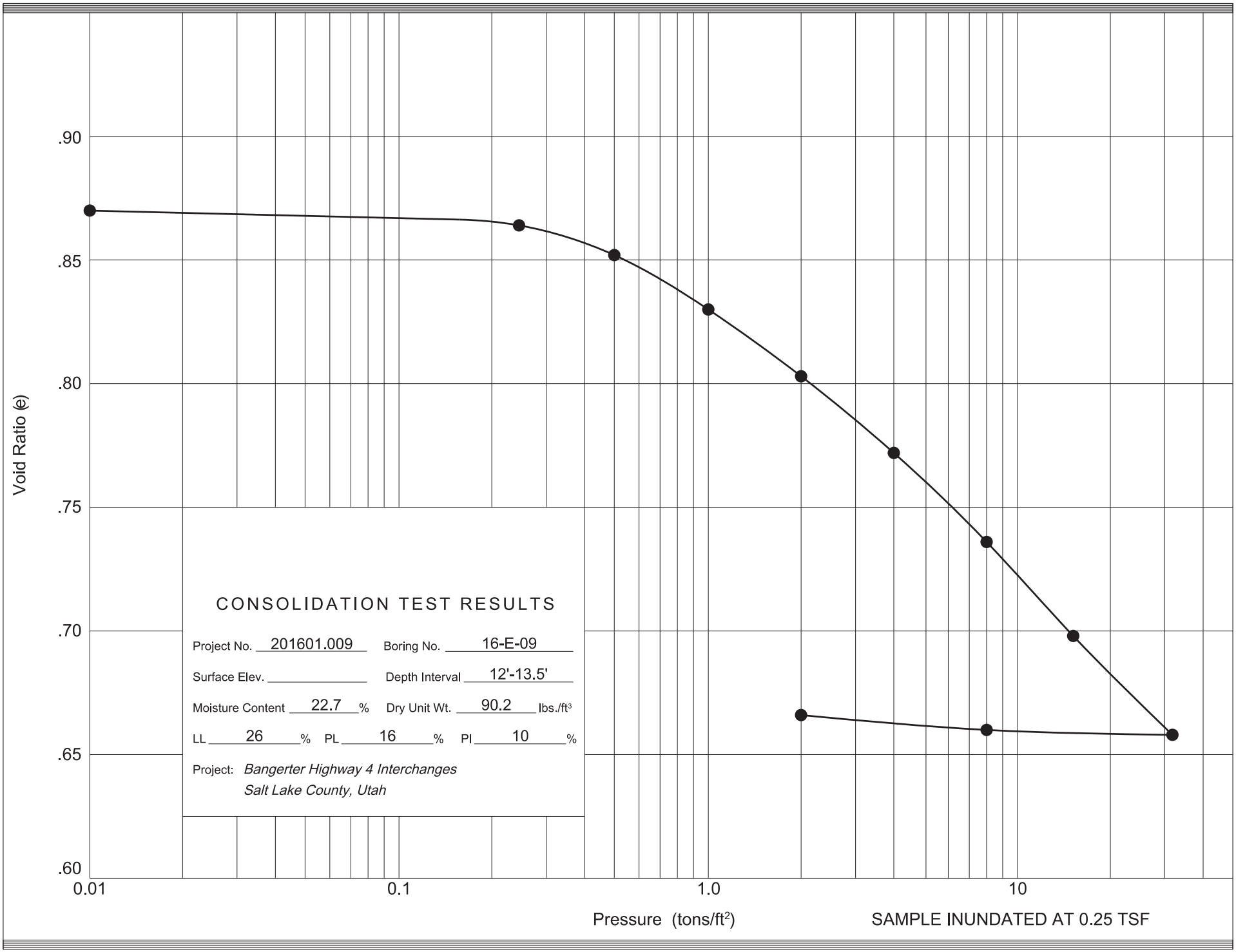
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-S-12
Depth: 95'-96.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah



CONSOLIDATION TEST RESULTS

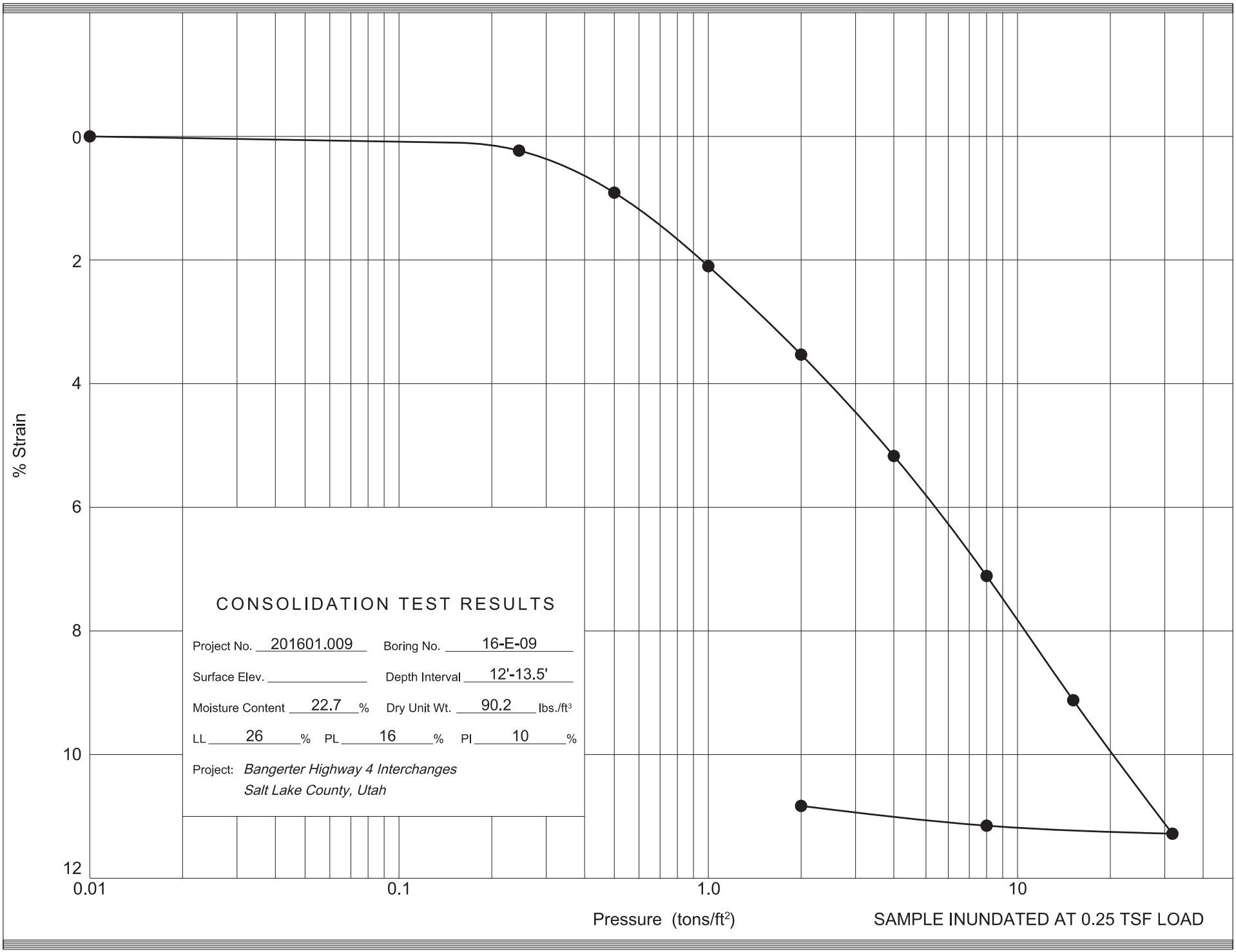
Project No. 201601.009 Boring No. 16-E-09

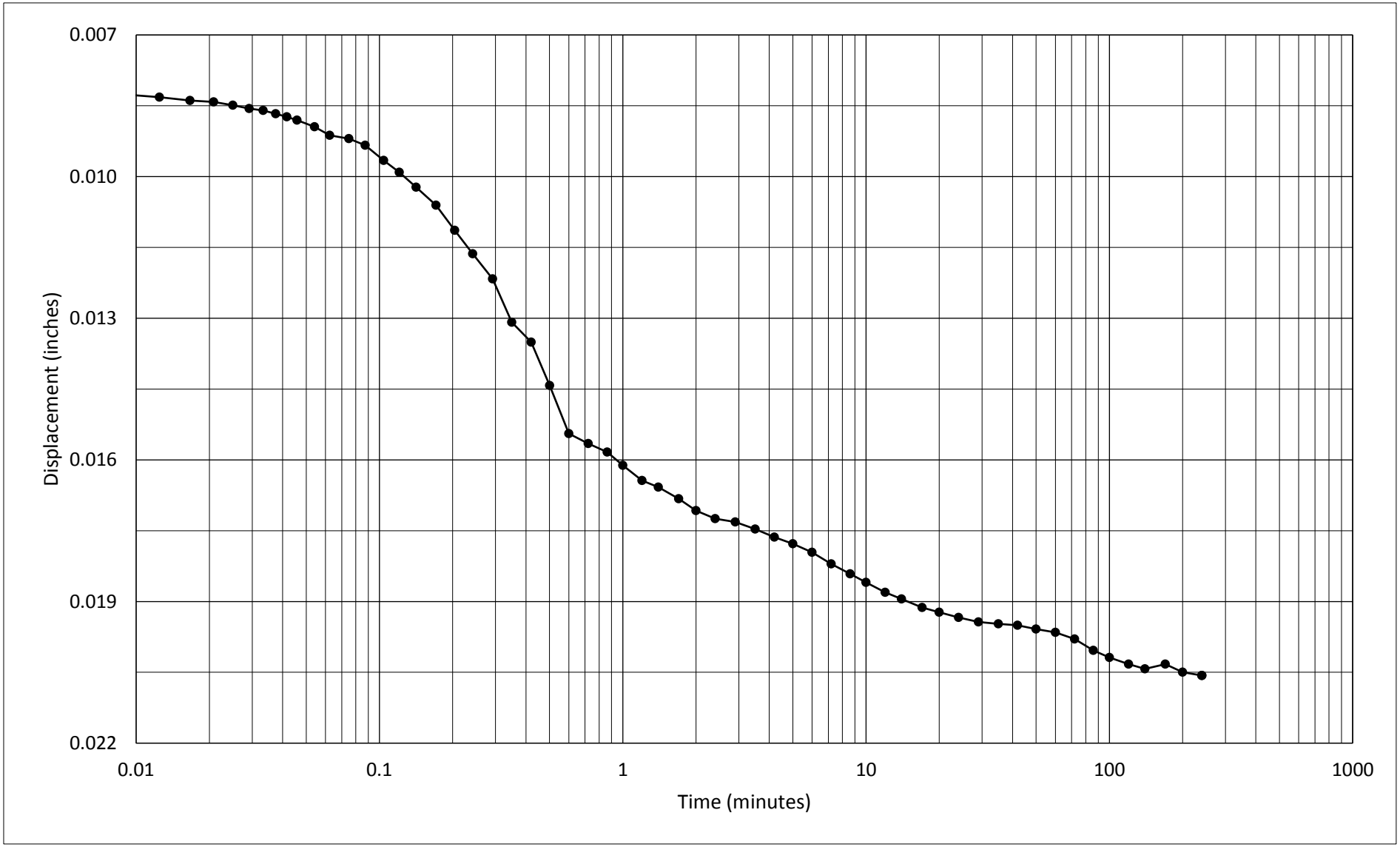
Surface Elev. _____ Depth Interval 12'-13.5'

Moisture Content 22.7 % Dry Unit Wt. 90.2 lbs./ft³

LL 26 % PL 16 % PI 10 %

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

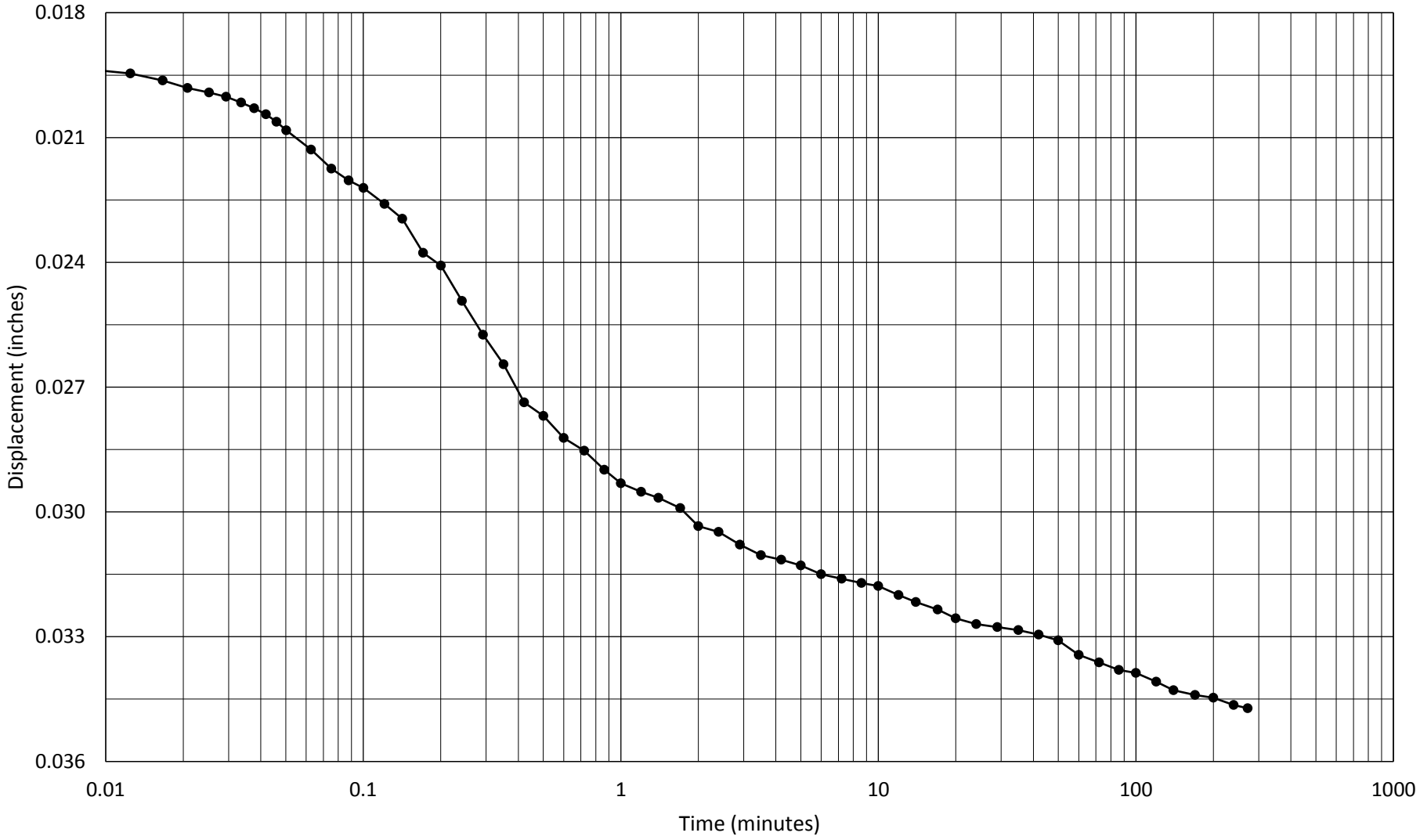

0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-09
Surface Elev.
Depth Interval 12'-13.5'
Moisture Content 22.7 %
Dry Unit Wt. 90.2 lbs./ft³
LL 26 %
PL 16 %
PI 10 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-09
Depth: 12'-13.5'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

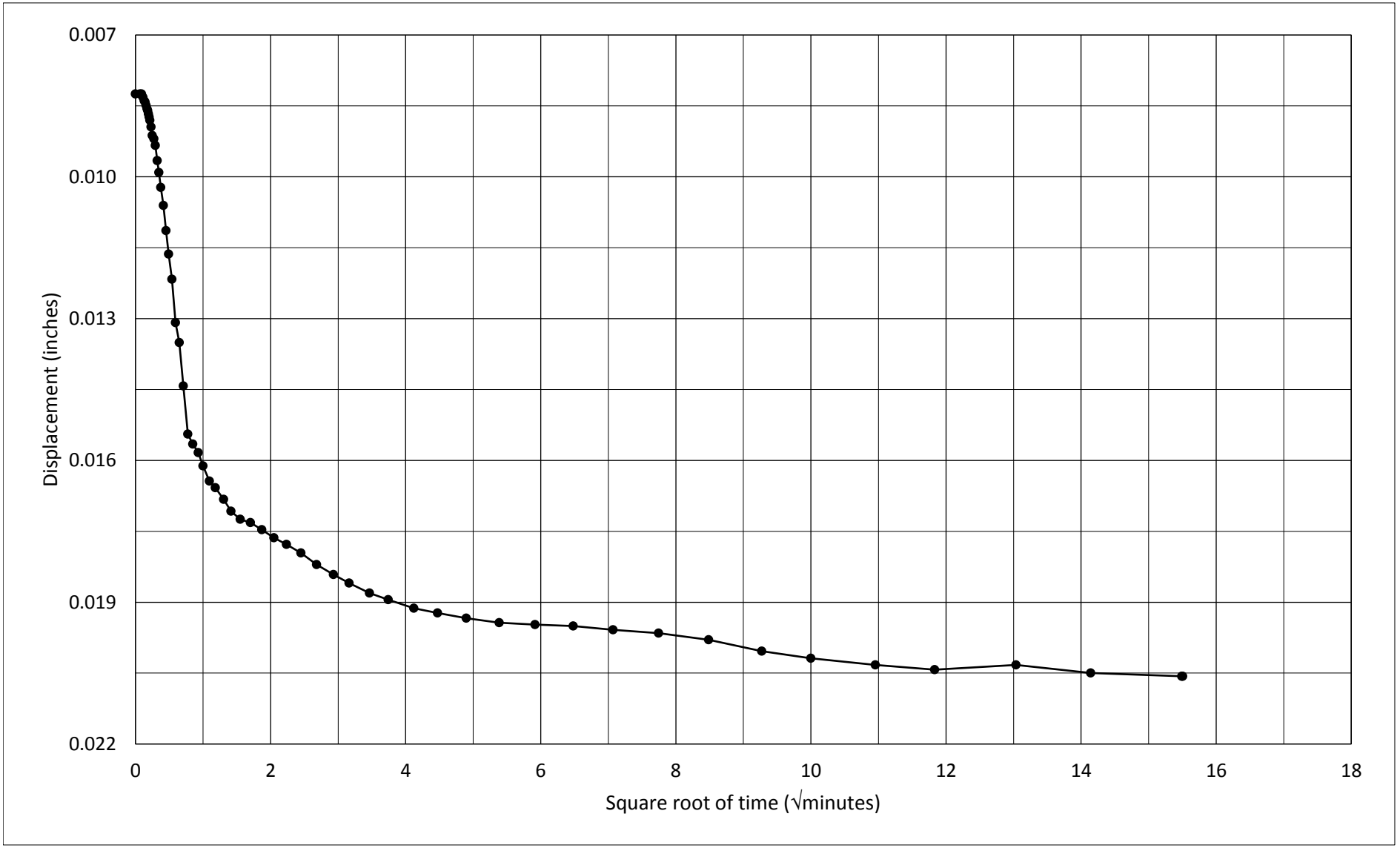
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-09
Depth: 12'-13.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

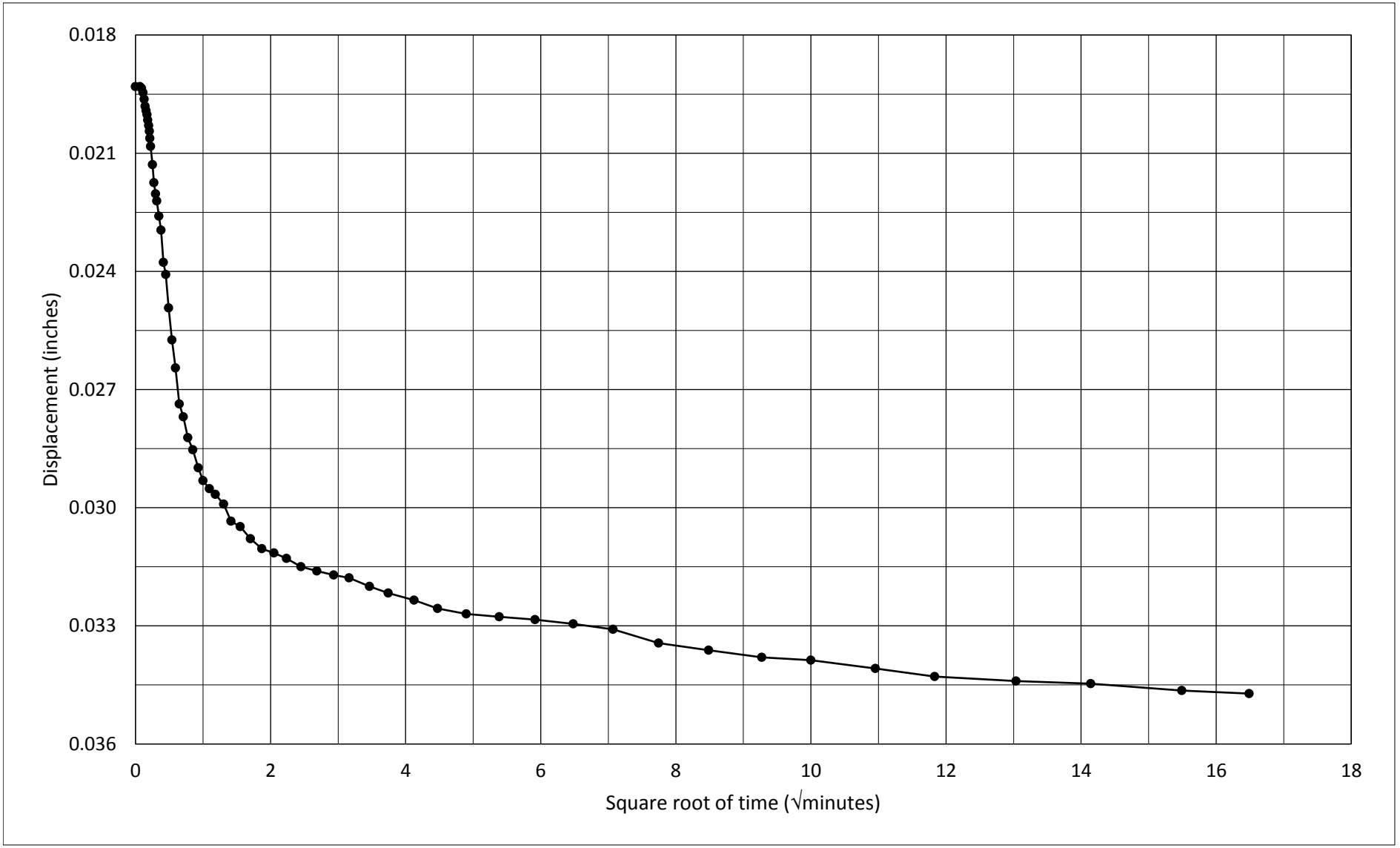
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-09
Depth: 12'-13.5'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

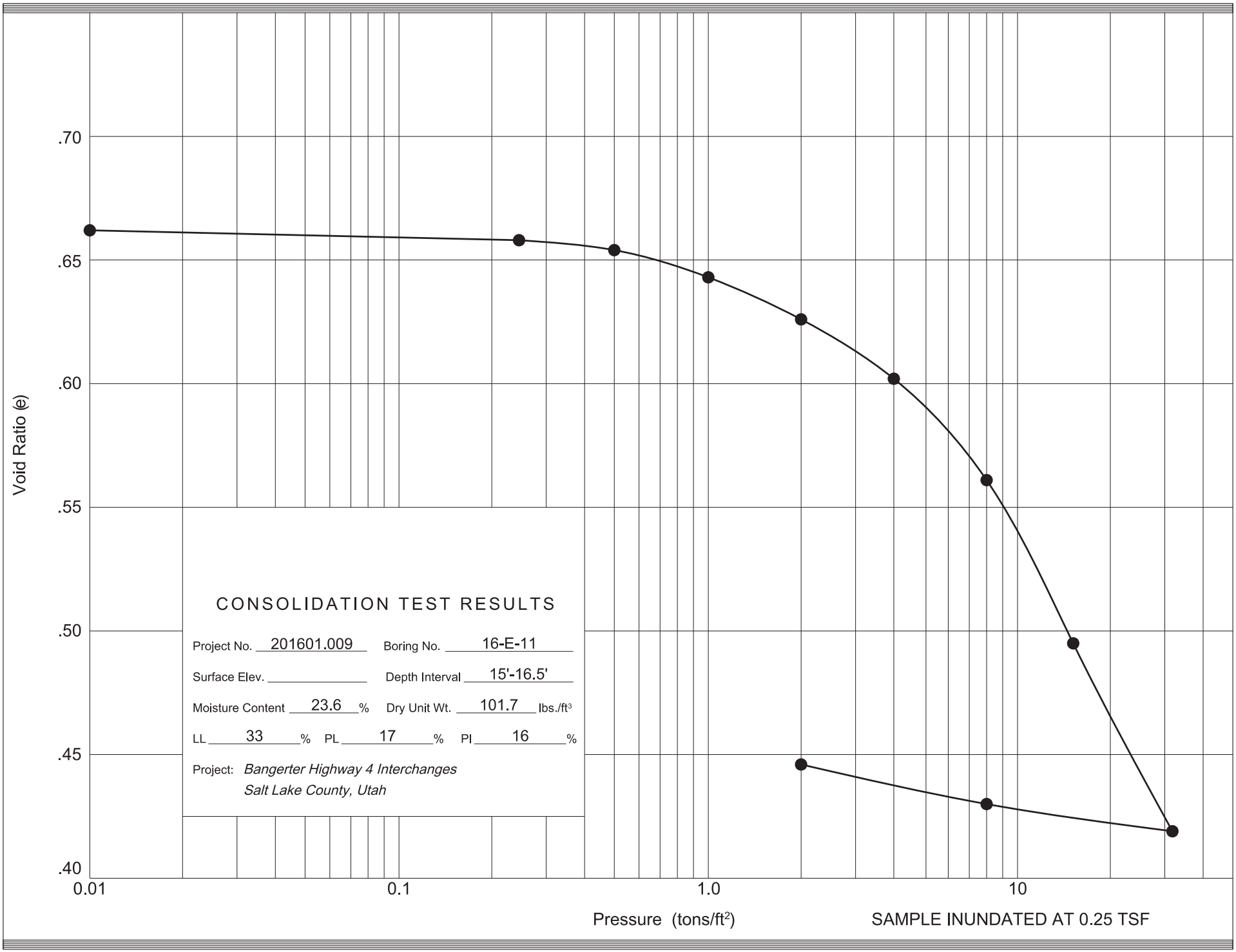
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

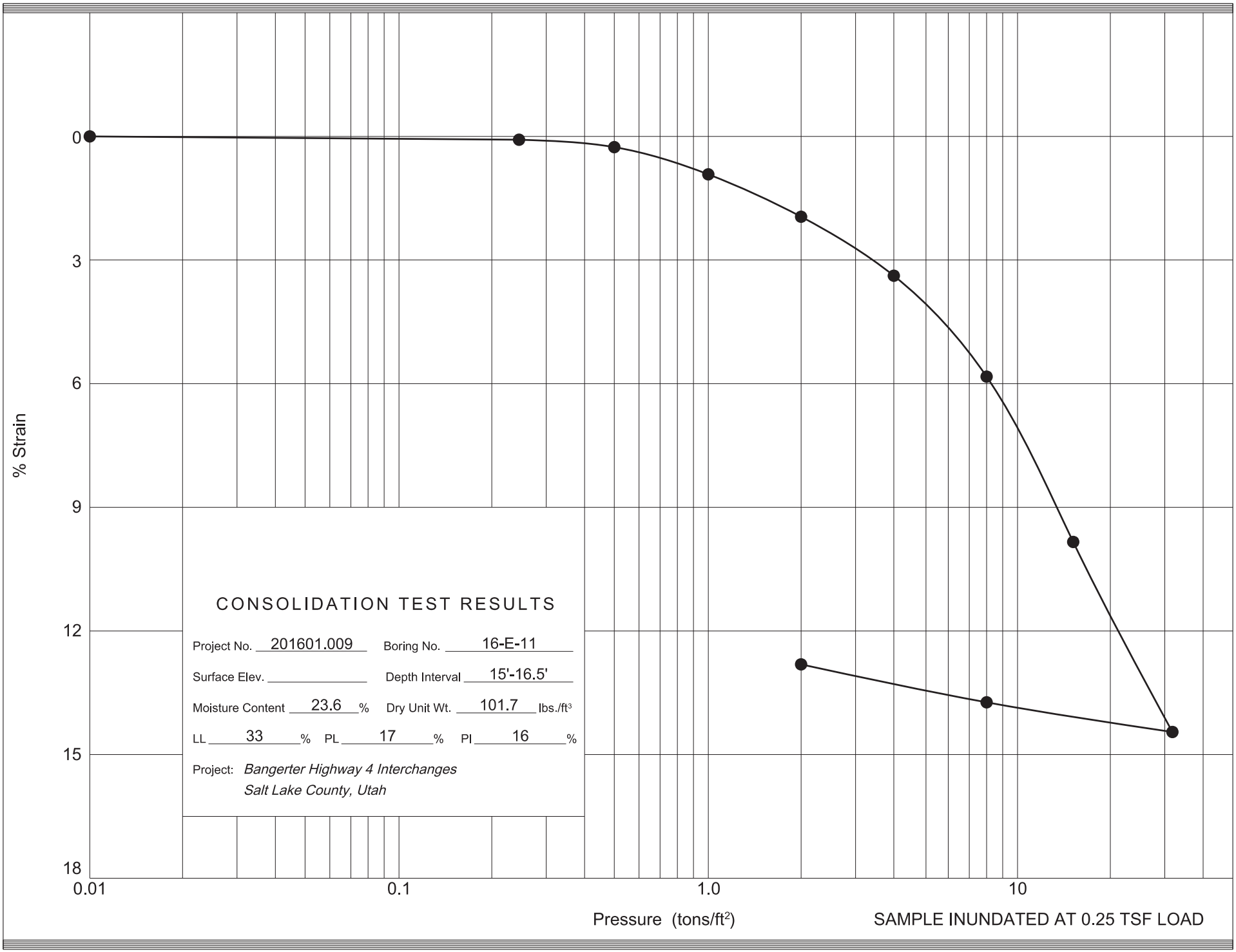


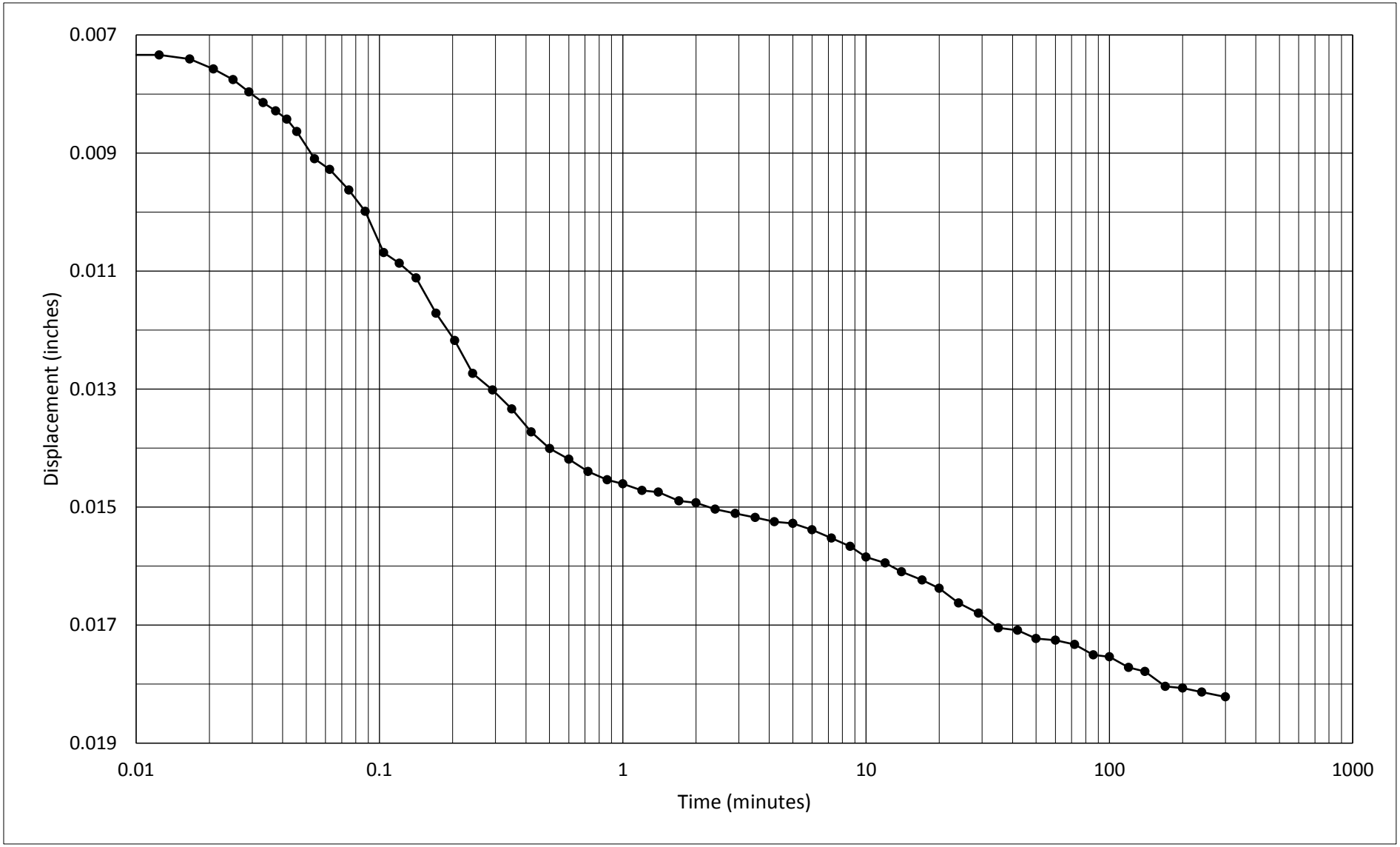
Hole no.: 16-E-09
Depth: 12'-13.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.70
.65
.60
.55
.50
.45
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-11
Surface Elev.
Depth Interval 15'-16.5'
Moisture Content 23.6 %
Dry Unit Wt. 101.7 lbs./ft³
LL 33 %
PL 17 %
PI 16 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

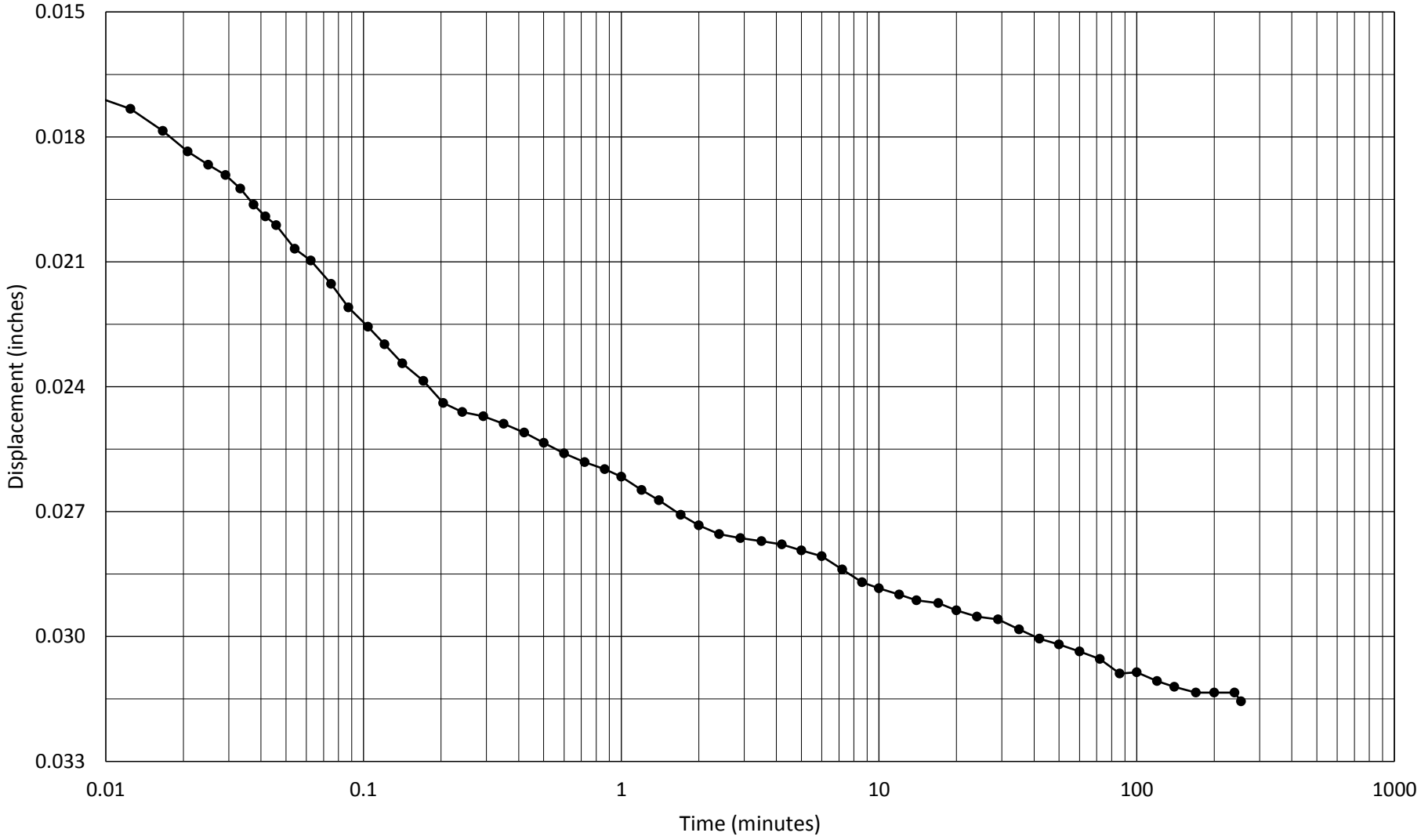

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-11
Surface Elev.
Depth Interval 15'-16.5'
Moisture Content 23.6 %
Dry Unit Wt. 101.7 lbs./ft³
LL 33 %
PL 17 %
PI 16 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-11
Depth: 15'-16.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

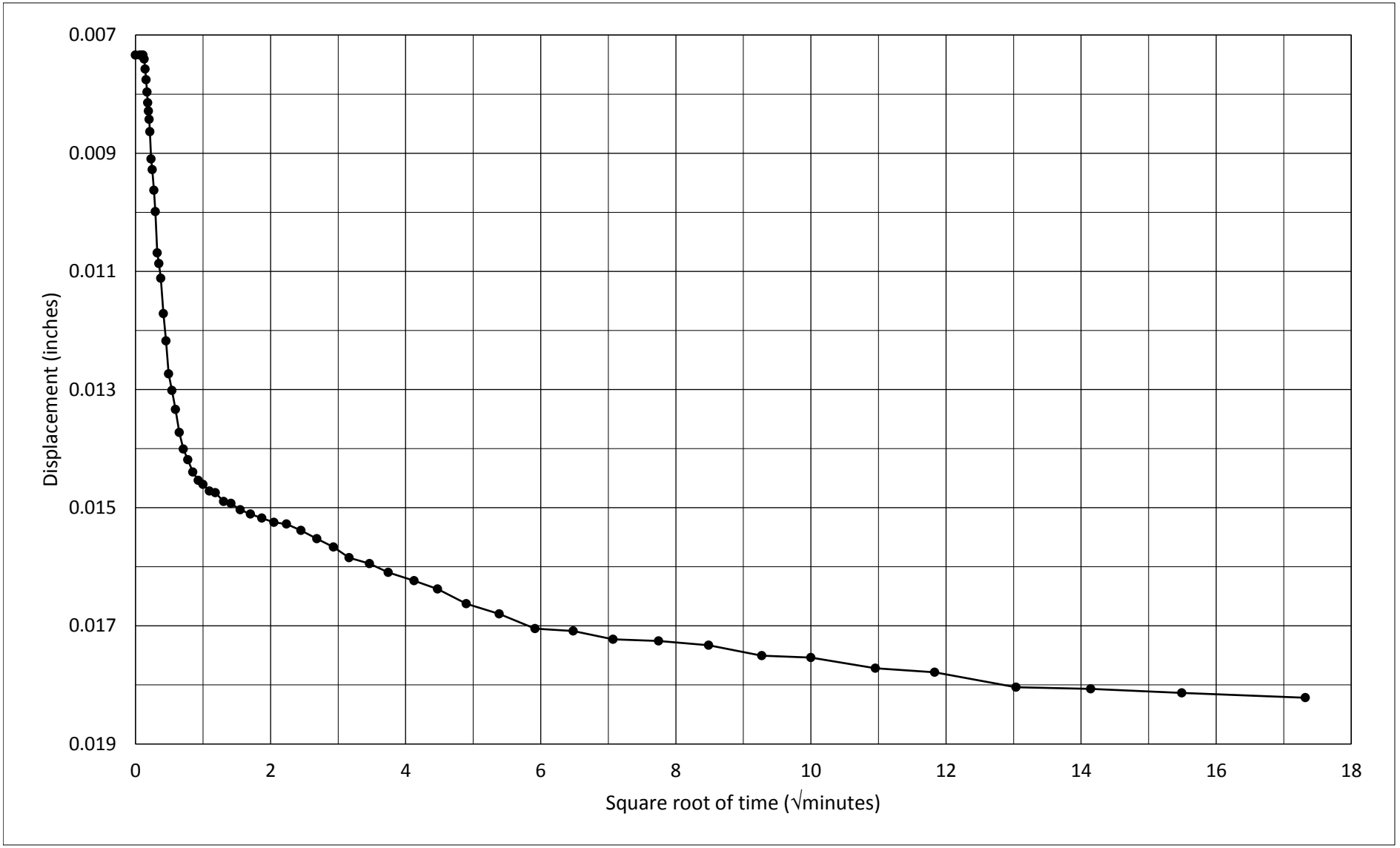
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-11
Depth: 15'-16.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

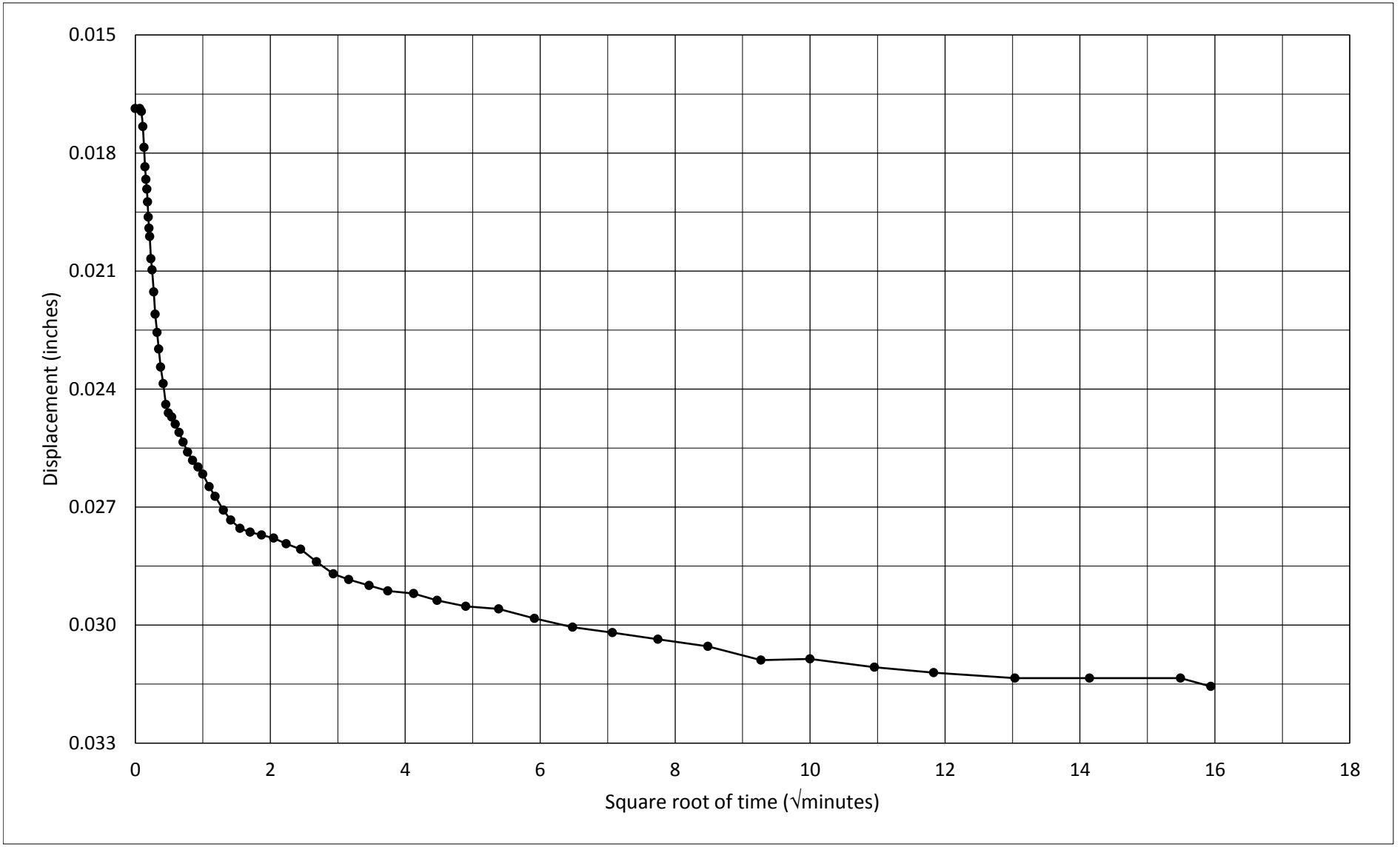
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-11
Depth: 15'-16.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

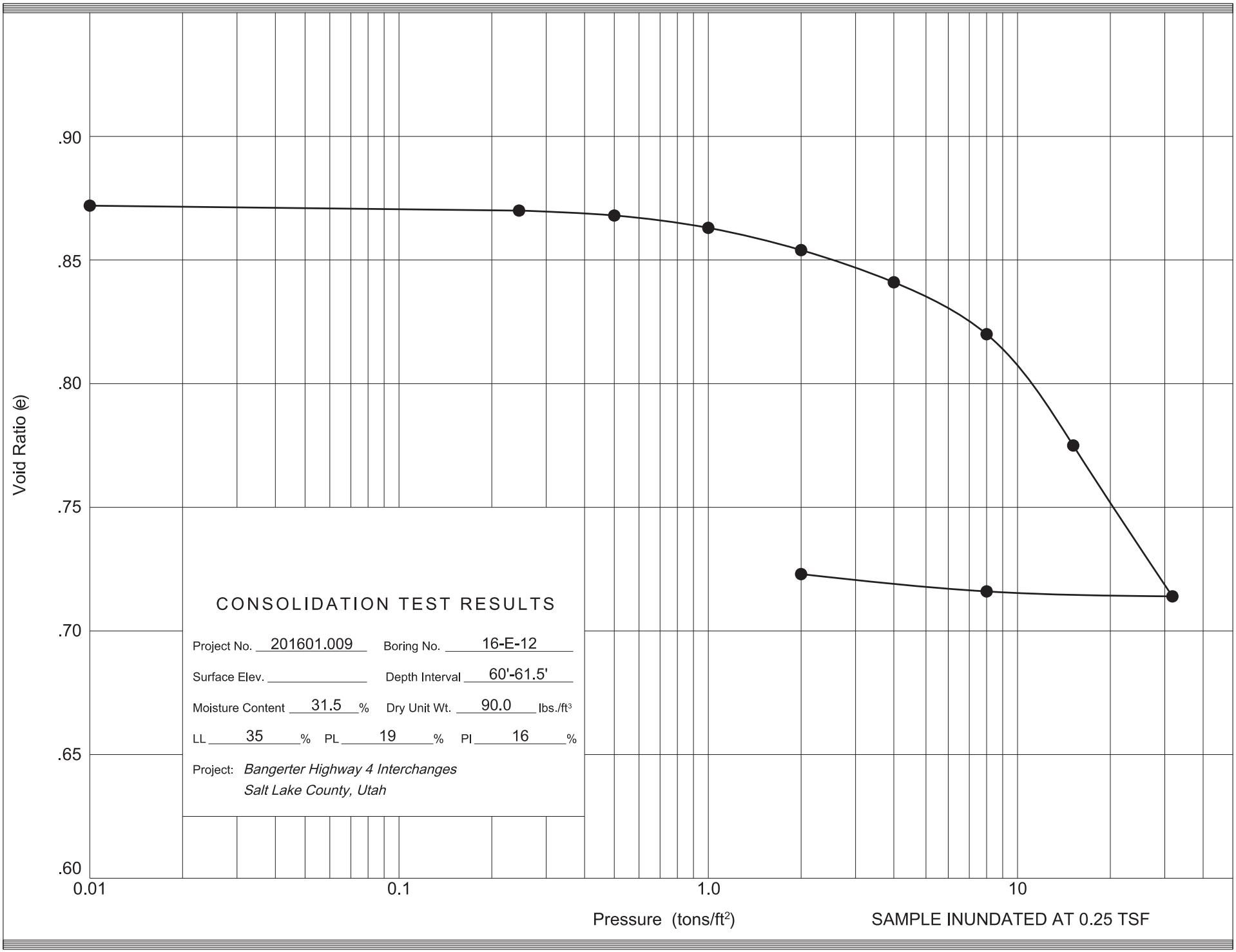
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-11
Depth: 15'-16.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah



CONSOLIDATION TEST RESULTS

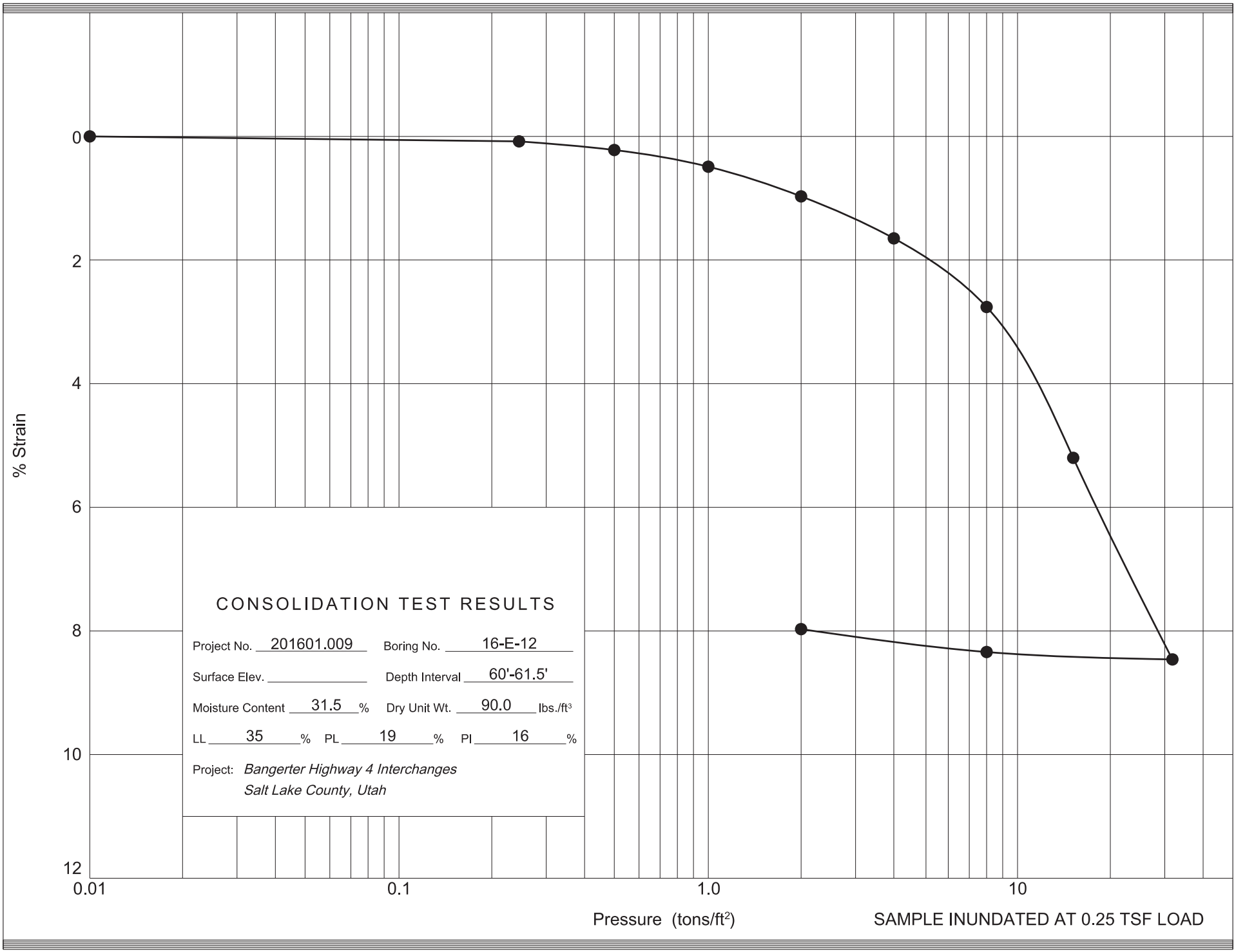
Project No. 201601.009 Boring No. 16-E-12

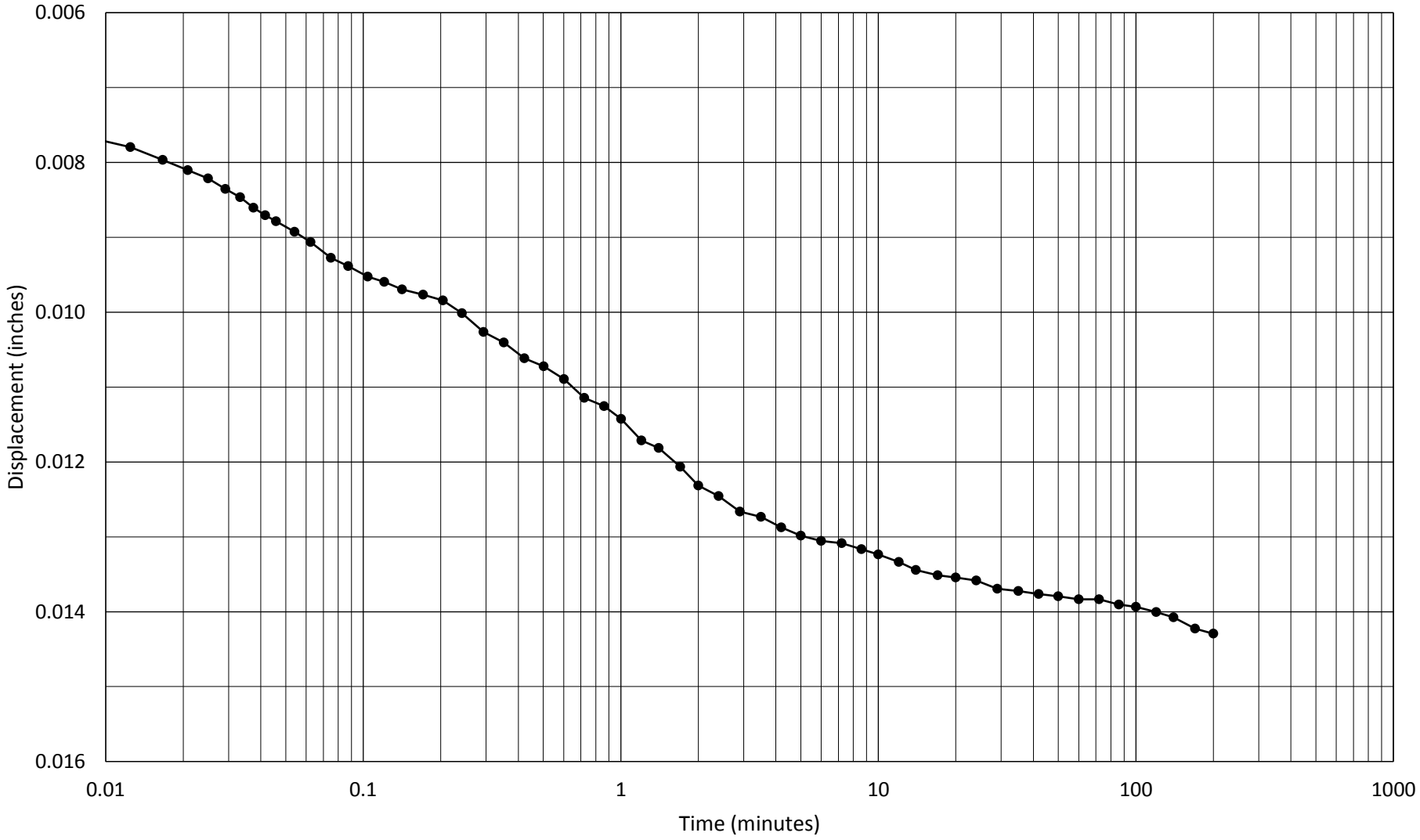
Surface Elev. _____ Depth Interval 60'-61.5'

Moisture Content 31.5 % Dry Unit Wt. 90.0 lbs./ft³

LL 35 % PL 19 % PI 16 %

Project: *Bangerter Highway 4 Interchanges*
Salt Lake County, Utah

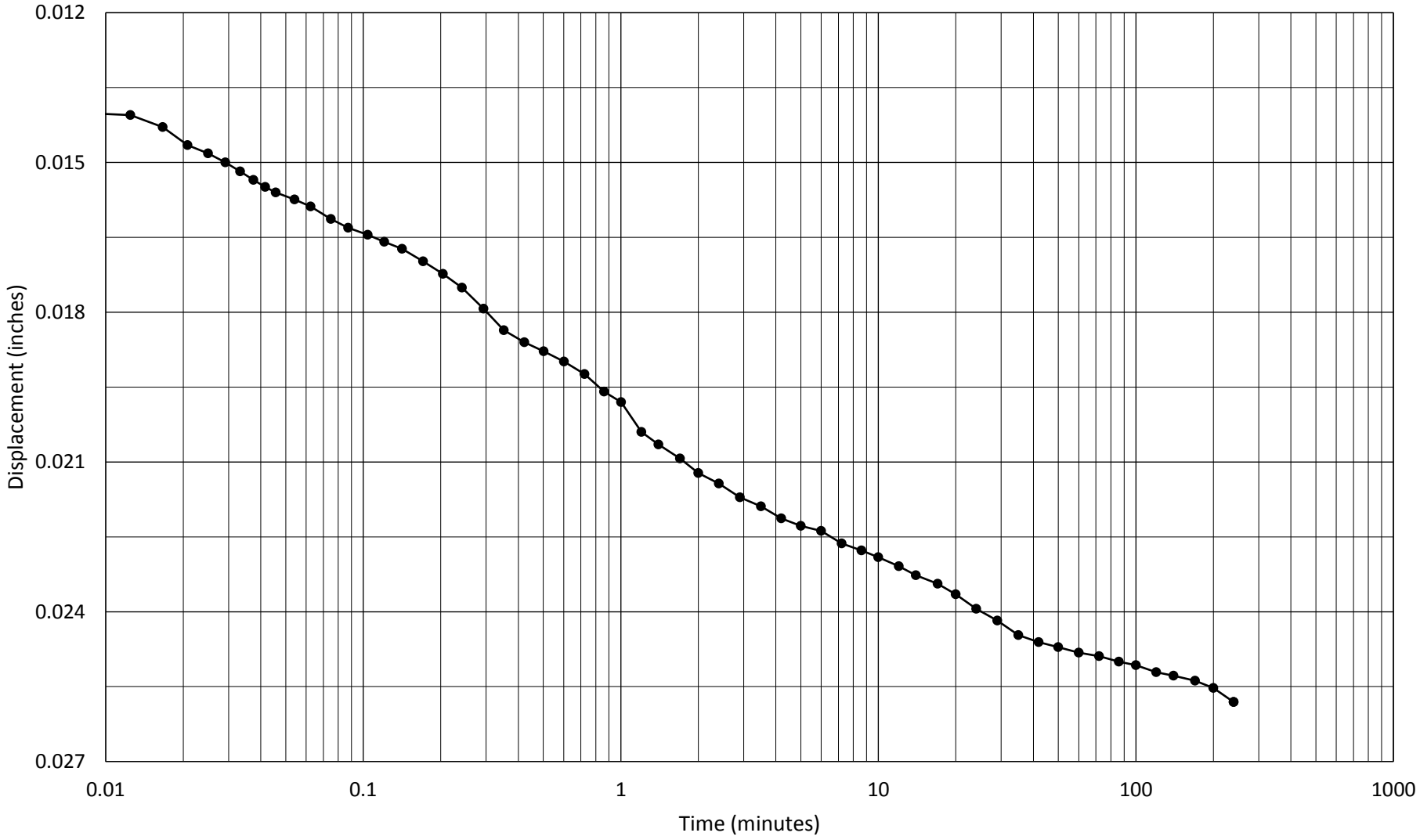

0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-12
Surface Elev.
Depth Interval 60'-61.5'
Moisture Content 31.5 %
Dry Unit Wt. 90.0 lbs./ft³
LL 35 %
PL 19 %
PI 16 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-12
Depth: 60'-61.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

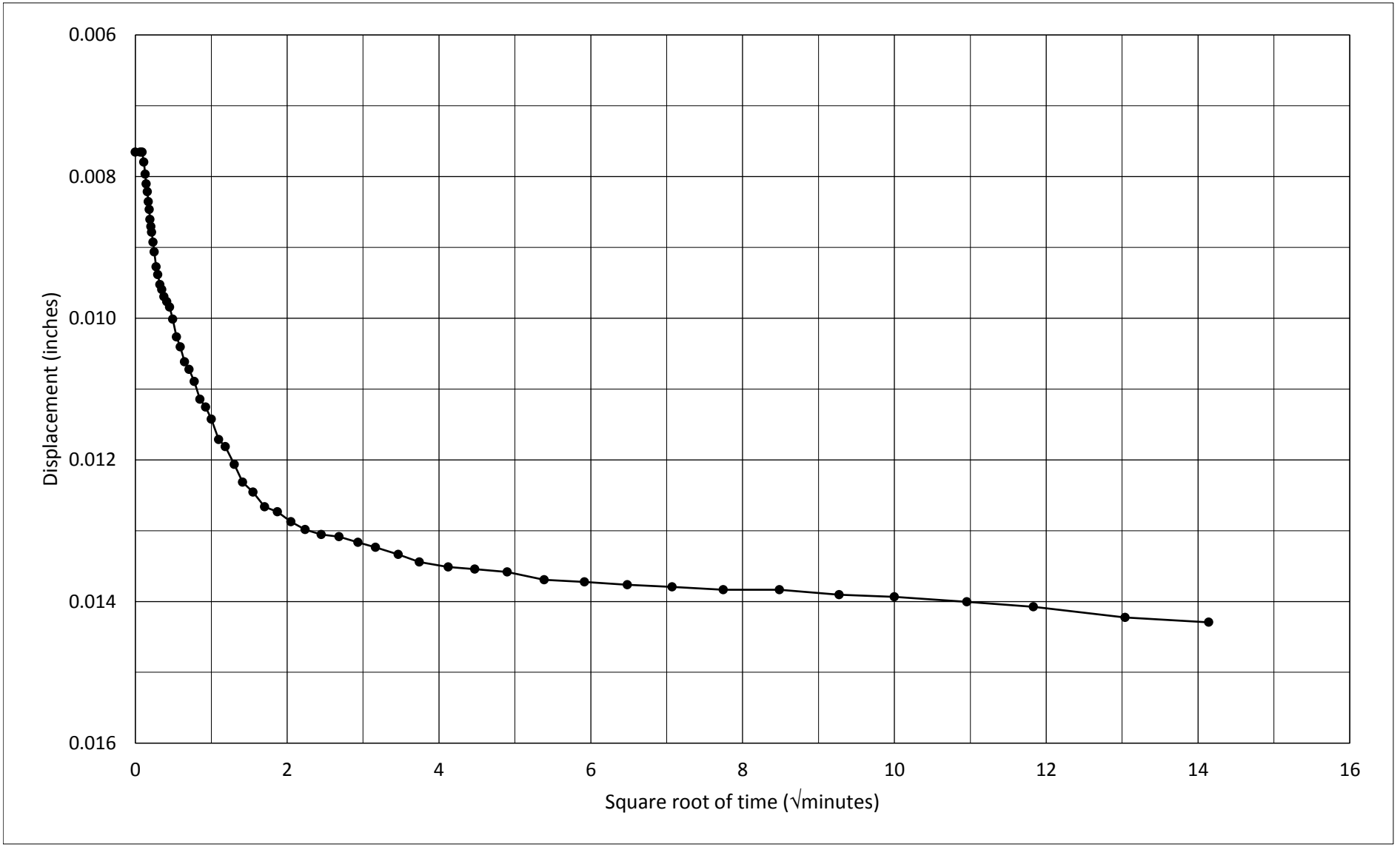
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-12
Depth: 60'-61.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

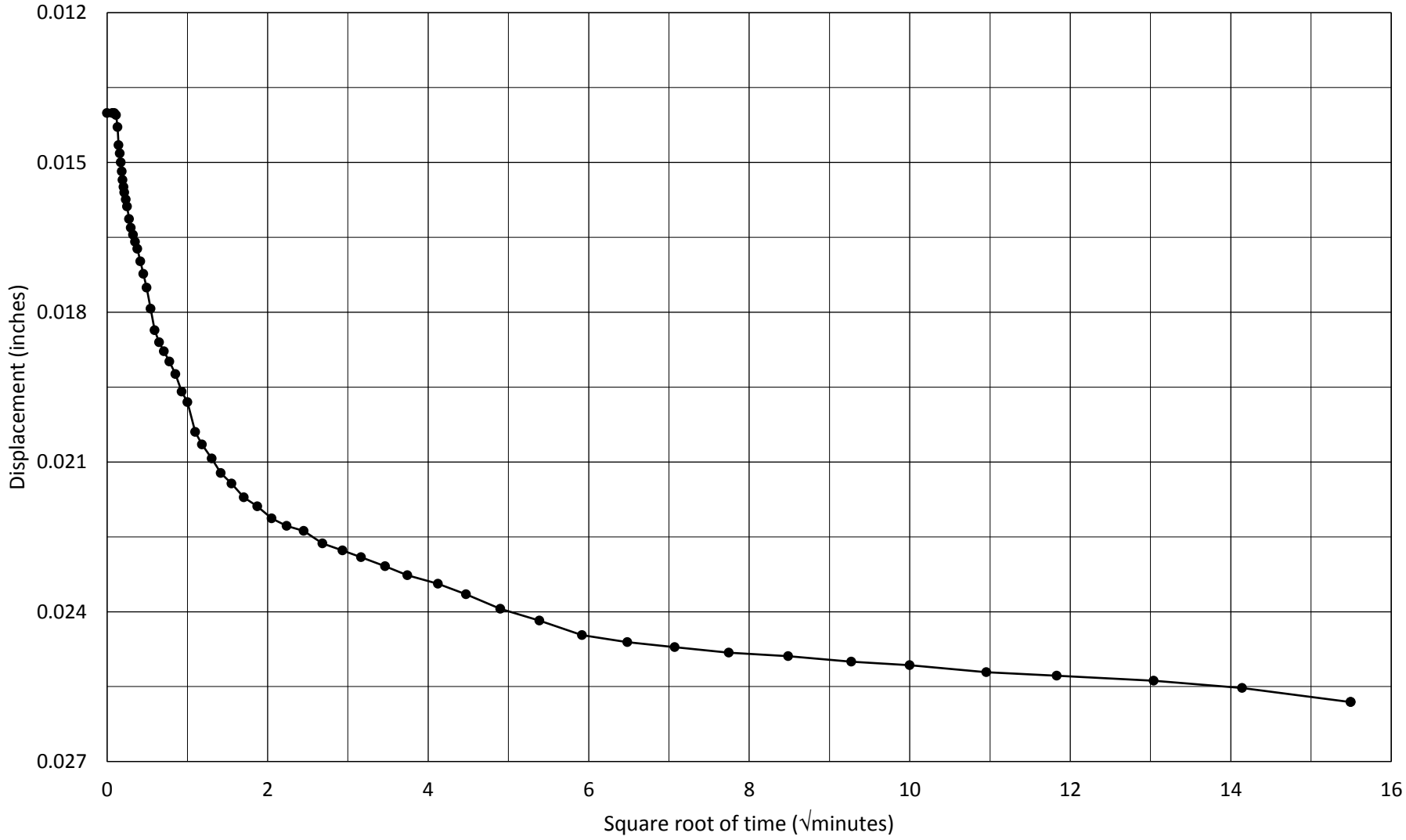
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-12
Depth: 60'-61.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

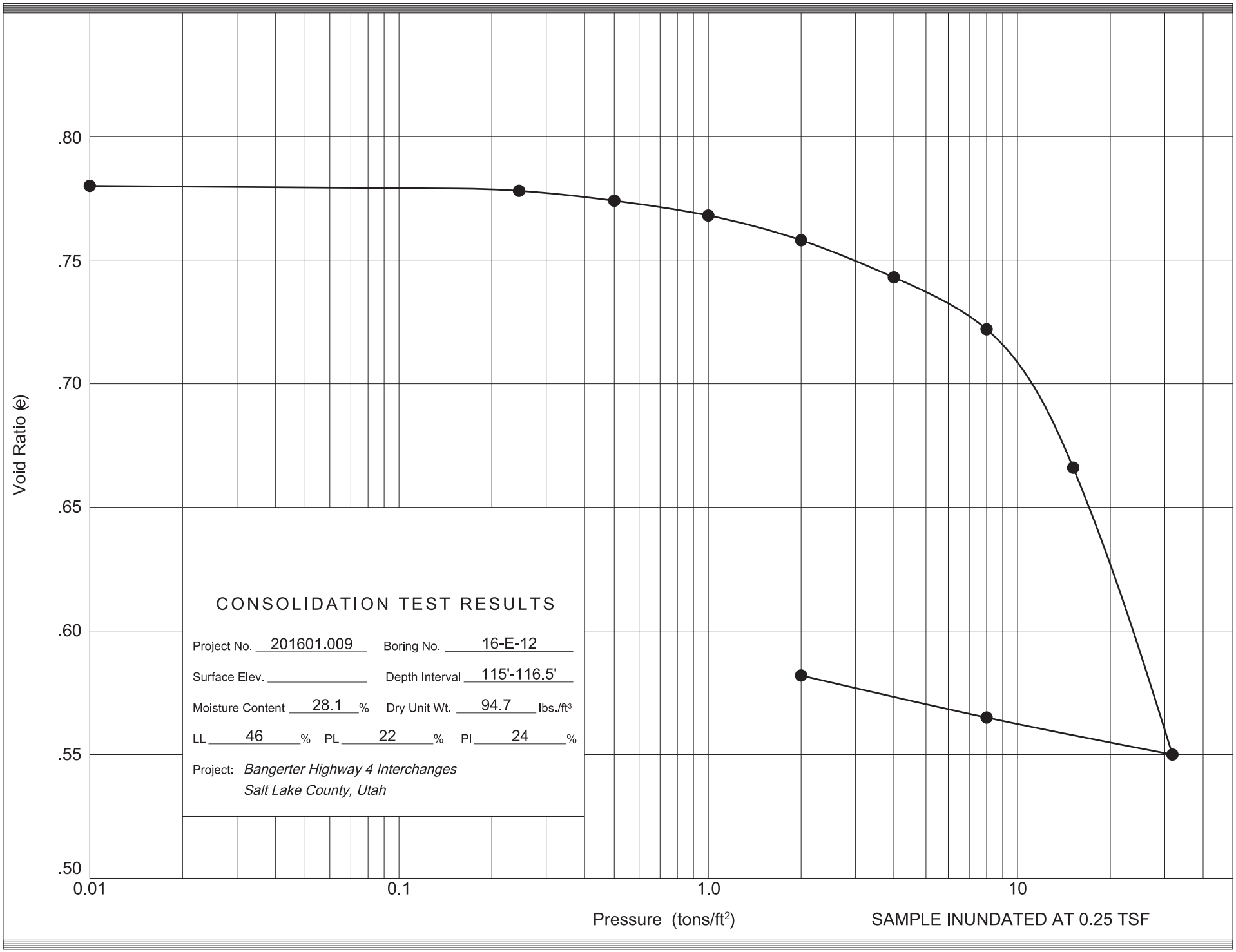
Bangerter Highway
4 Interchanges
Salt Lake County, Utah

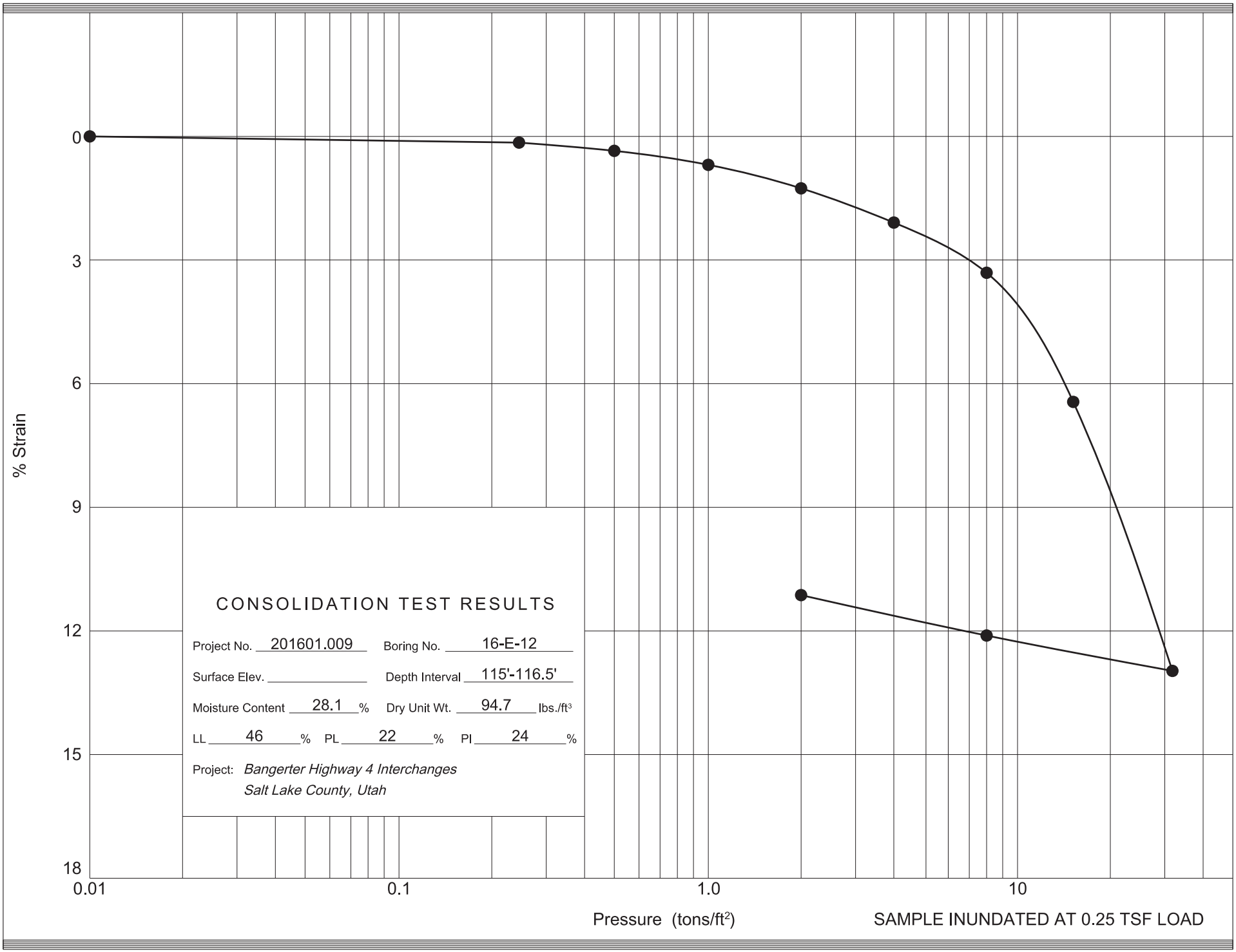


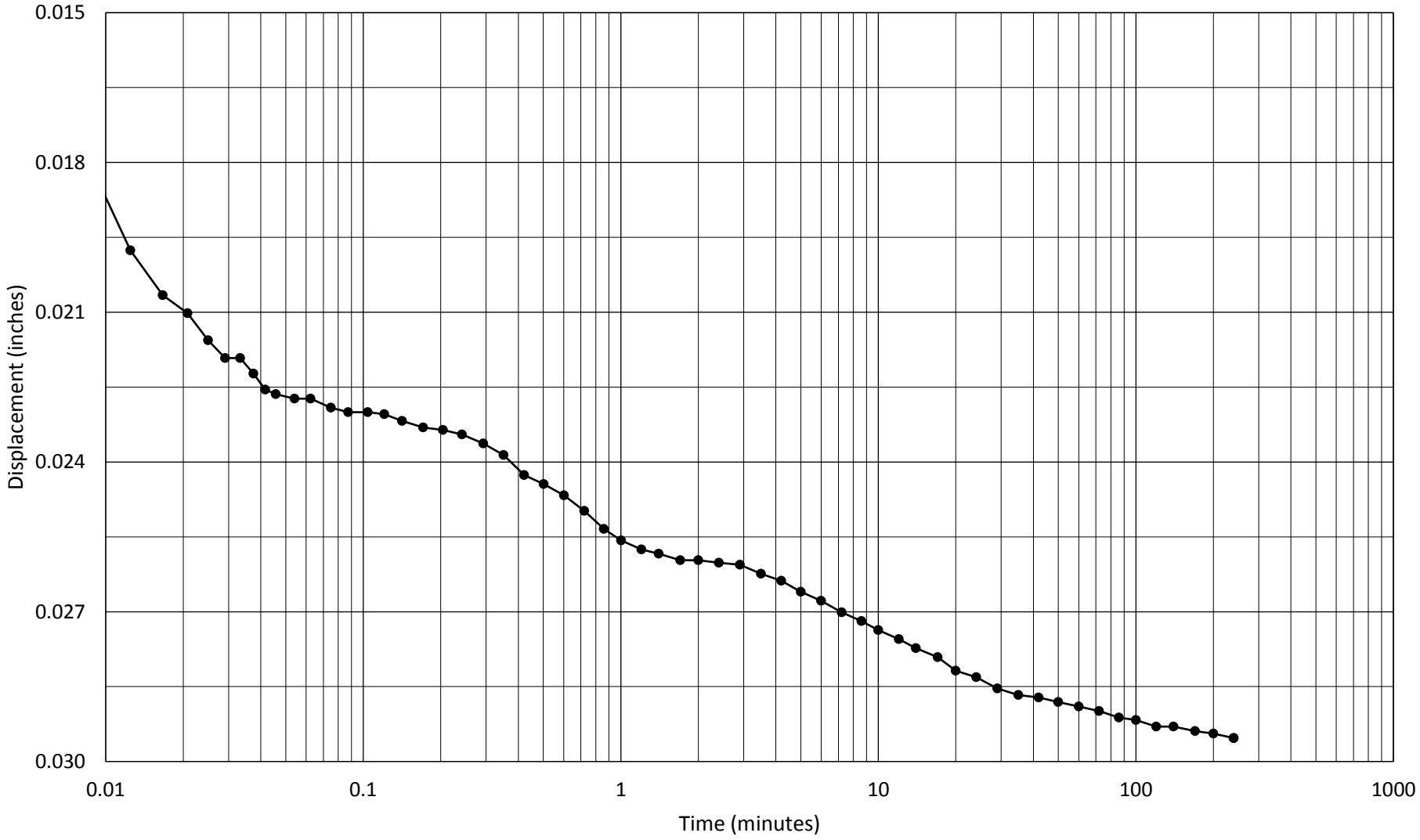
Hole no.: 16-E-12
Depth: 60'-61.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah


.80
.75
.70
.65
.60
.55
.50
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-12
Surface Elev.
Depth Interval 115'-116.5'
Moisture Content 28.1 %
Dry Unit Wt. 94.7 lbs./ft³
LL 46 %
PL 22 %
PI 24 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah

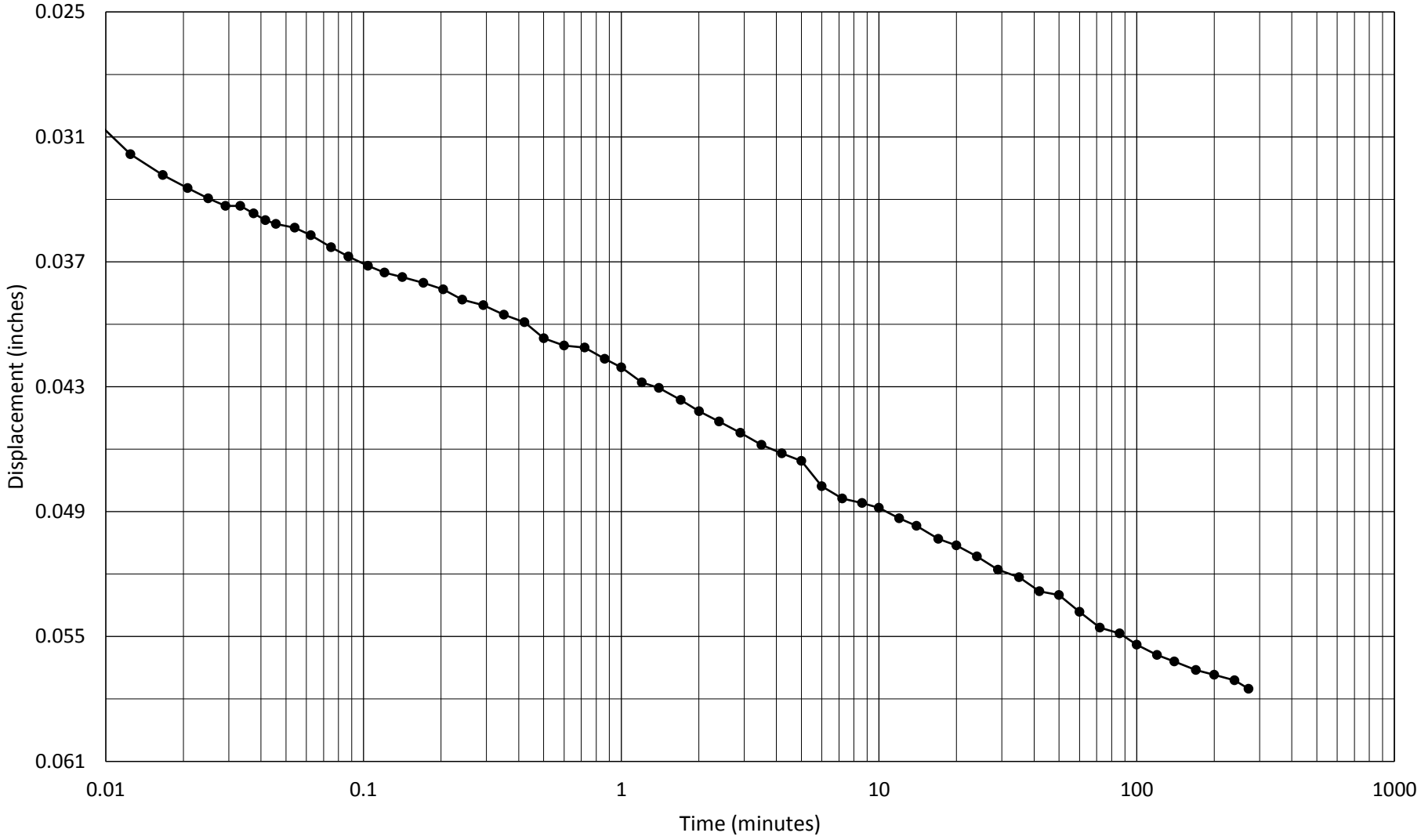

0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
SAMPLE INUNDATED AT 0.25 TSF LOAD
CONSOLIDATION TEST RESULTS
Project No. 201601.009
Boring No. 16-E-12
Surface Elev.
Depth Interval 115'-116.5'
Moisture Content 28.1 %
Dry Unit Wt. 94.7 lbs./ft³
LL 46 %
PL 22 %
PI 24 %
Project: Bangerter Highway 4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-12
Depth: 115'-116.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

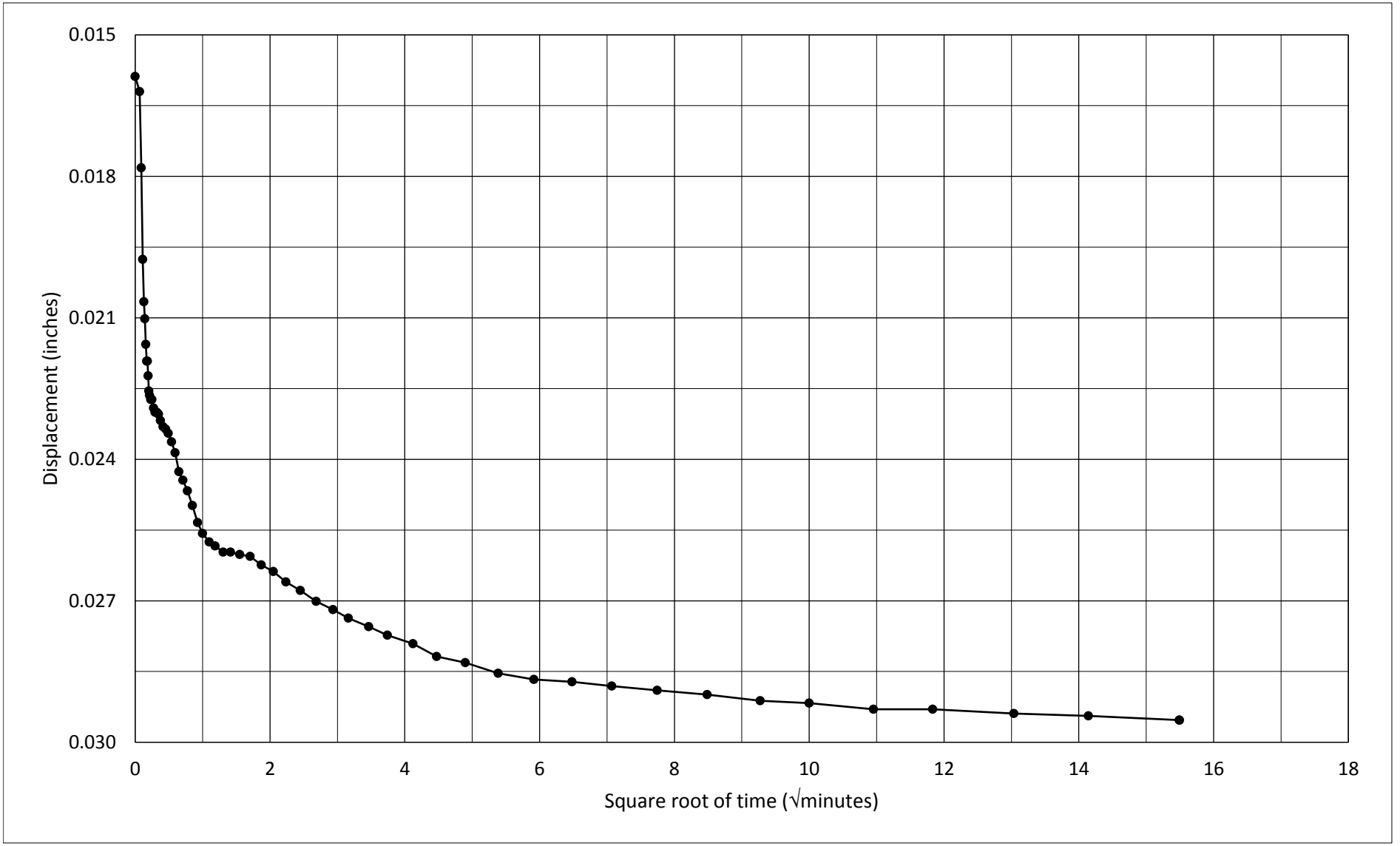
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-12
Depth: 115'-116.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

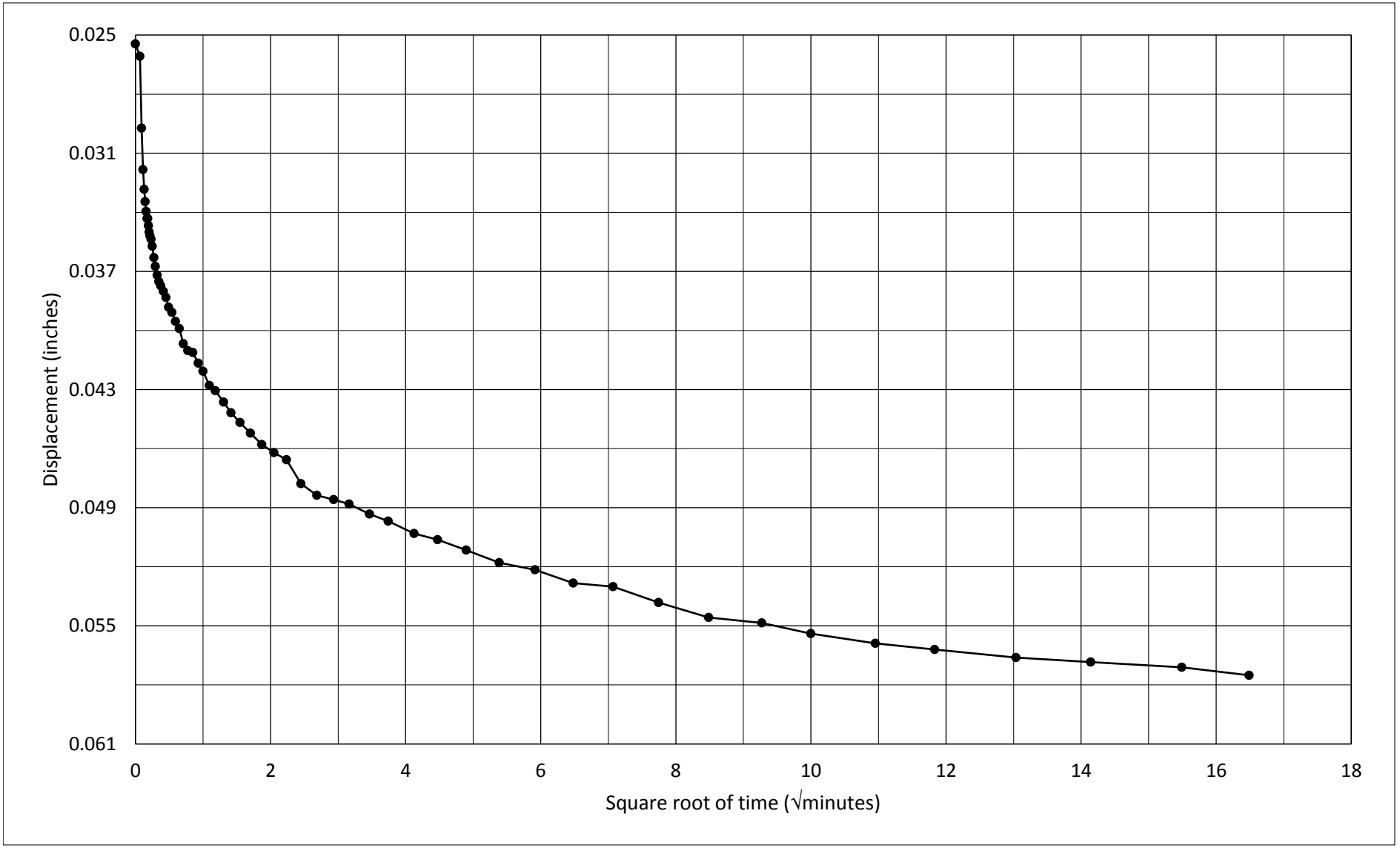
Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-12
Depth: 115'-116.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah



Hole no.: 16-E-12
Depth: 115'-116.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Bangerter Highway
4 Interchanges
Salt Lake County, Utah

11800 SOUTH POND

Boring Logs

DRILL HOLE LOG

BORING NO. 16-D-01

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 1

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 366411 E: 506039 / LAT: 40.537111 LONG: -111.984689

DATE STARTED: 5/6/16

DRILLING METHOD: 08-CME-55 / N.W. CASING TO 50'

DATE COMPLETED: 5/6/16

DRILLER: T.K.

GROUND ELEVATION: 4635.2'

DEPTH TO WATER - INITIAL: ▽ DRY'

AFTER 24 HOURS: ▼ DRY TO 46'

LOGGED BY: C.S., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Permeability (ft/yr)	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				7	3,8,7,(31)	CL	brown to dk. brown, sl. moist, stiff									
4630	5			18	6,12,15,(60) *T 0.50*	CL (*A-6(12)*)	brown, wet to sl. moist, stiff LEAN CLAY W/SAND			49.1 13.2	37	18	9	15	76	
4625	10			18	*T 0.54* 5,10,13,(39)	CL CL SM	brown, wet, stiff brown w/rust, moist, stiff SANDY LEAN CLAY brown, moist, dense SILTY SAND									
4620	15			9	11,19,21,(52)	GM GC	SILTY GRAVEL W/SAND possible cobbles brown, moist brown, moist, dense CLAYEY GRAVEL W/SAND possible cobbles									
4615	20			12	28,22,11,(37) *T 1.2*	GM (*A-1-a(0)*) CL	SILTY GRAVEL W/SAND possible cobbles brown, moist gray to brown, moist, very stiff LEAN CLAY W/SAND			9.3		NP	52	34	14	
4610	25			6	36,30,18,(49)	GP-GM	brown, moist, med. dense GRAVEL W/SILT & SAND possible cobbles									
4605	30			16	5,6,6,(12) *T 0.89*	CL (*A-6(8)*)	LEAN CLAY W/SAND sandy lean clay layers to 2" thick brown, moist, stiff			22.1	29	15	8	20	72	
4600	35			12	8,9,11,(17) *T 0.67*	CL	brown, moist, stiff SANDY LEAN CLAY									
4595	40			13	16,41,62,(83)	GC	brown w/rust, moist, very dense CLAYEY GRAVEL W/SAND possible cobbles CLAY (driller's observation)									
4590	45			13	18,42,44,(65)	GC (*A-2-6(0)*)	brown, moist, dense CLAYEY GRAVEL W/SAND possible cobbles			11.1	29	16	45	41	14	
4585	50			14	4,5,7,(9) *T 0.61*	CL	brown, moist, stiff LEAN CLAY BOH									

Permeability (ft/yr): 190, 99, 480, 1,700, 93, 34, 150, 1,020, 750, 100

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6" ($(N_1)_{60}$ Value)
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-D-02

SHEET 1 OF 1

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N: 366531 E: 506012 / LAT: 40.537442 LONG: -111.984789

DRILLING METHOD: 08-CME-55 / N.W. CASING TO 25'

DRILLER: T.K.

DEPTH TO WATER - INITIAL: ▽ 24.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: S-0154(12)11

DATE STARTED: 5/5/16

DATE COMPLETED: 5/5/16

GROUND ELEVATION: 4622.4'

LOGGED BY: C.S., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Permeability (ft/yr)	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4620	0					CL-ML	dk. brown, sl. moist — SILTY CLAY									
				10	3,6,5,(23) *T 0.88*	GC	brown, moist — CLAYEY GRAVEL									
						CL	brown, moist, stiff — GRAVELLY LEAN CLAY W/SAND	52								
	5			11	5,10,13,(48) *T 1.2*	CL-ML (*A-4(0)*)	brown, moist, very stiff — SANDY SILTY CLAY W/GRAVEL			14.9	20	4	15	29	56	
4615								17								
	10			14	8,12,21,(55)	ML (*A-4(0)*)	brown, moist — SANDY SILT			20.6		NP	0	43	57	
						SM	brown, moist, very dense — SILTY SAND W/GRAVEL									
4610								86								
	15				*T 0.32*	ML	SANDY SILT — brown, moist, firm									
				11	7,24,34,(80)	GM (*A-1-b(0)*)	brown, moist, very dense — SILTY GRAVEL W/SAND possible cobbles			10.7		NP	45	39	16	
4605							INTERBEDDED CLAY & SAND LAYERS (driller's observation)	16,000								
	20			17	2,3,3,(7) *T 0.47*	CL	brown, moist, firm — LEAN CLAY W/SAND									
4600								920								
			▽				GRAVEL W/SILT & SAND TO SILTY GRAVEL W/SAND									
	25			6	13,28,25,(58)	GP-GM/GM	brown, moist, dense — possible cobbles									
4595							BOH									

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

DRILL HOLE LOG

BORING NO. 16-D-03

PROJECT: 4 INTERCHANGES ON BANGERTER HWY (SR-154)

SHEET 1 OF 1

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: S-0154(12)11

LOCATION: N: 367062 E: 506033 / LAT: 40.538898 LONG: -111.984725

DATE STARTED: 5/5/16

DRILLING METHOD: 08-CME-55 / N.W. CASING TO 25'

DATE COMPLETED: 5/5/16

DRILLER: T.K.

GROUND ELEVATION: 4623.7'

DEPTH TO WATER - INITIAL: ▽ 16.5'

AFTER 24 HOURS: ▼ 25.2' (5/13/16)

LOGGED BY: J.P., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Permeability (ft/yr)	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				9	2,4,16,(42)	CL	brown, sl. moist, firm to stiff GRAVELLY LEAN CLAY W/SAND									
4620	5			14	2,7,7,(31) *T 0.55*	ML (*A-4(0)*)	brown, moist, stiff SILT W/SAND plastic, sandy clay layers to 2" thick	210		20.0	21	3	7	21	72	
4615	10			12	6,11,8,(32) *T 0.60*	SM CL	brown, moist, med. dense SILTY SAND clay lenses brown, moist, stiff LEAN CLAY	26 92								
4610	15			9	38,50/5"	GP-GM (*A-1-a(0)*)	brown, moist, very dense GRAVEL W/SILT & SAND possible cobbles	200		10.4		NP	49	40	11	
4605	20			11	29,41,13,(65)	GM GC	brown, moist, dense SILTY GRAVEL W/SAND possible cobbles brown, moist, dense CLAYEY GRAVEL W/SAND possible cobbles	52								
4600	25			18	3,12,11,(25) *T 0.65*	CL (*A-6(8)*)	brown, moist, stiff SANDY LEAN CLAY trace gravels	65		22.5	31	15	12	19	69	
4595	30			12	30,60/6"	GP-GM	brown, moist, very dense GRAVEL W/SILT & SAND possible cobbles									
							BOH									
4590																

DH_LOG_V8-2014-4 BANGERTER4.GPJ US EVAL.GDT 8/1/16

LEGEND:

- 2" OD Split Spoon (SPT)
- 2.5" OD Split Spoon
- 3" OD Split Spoon
- Split Spoon Sample
- Thin-Walled Tube Sample
- 2,3,2,(6) ← Blow Count per 6"
- $(N_1)_{60}$ Value
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)
- With Liners
- Pushed
- *T 0.45* ← Torvane (tsf)
- *PP 2.0* ← Pocket Penetrometer (tsf)

OTHER TESTS

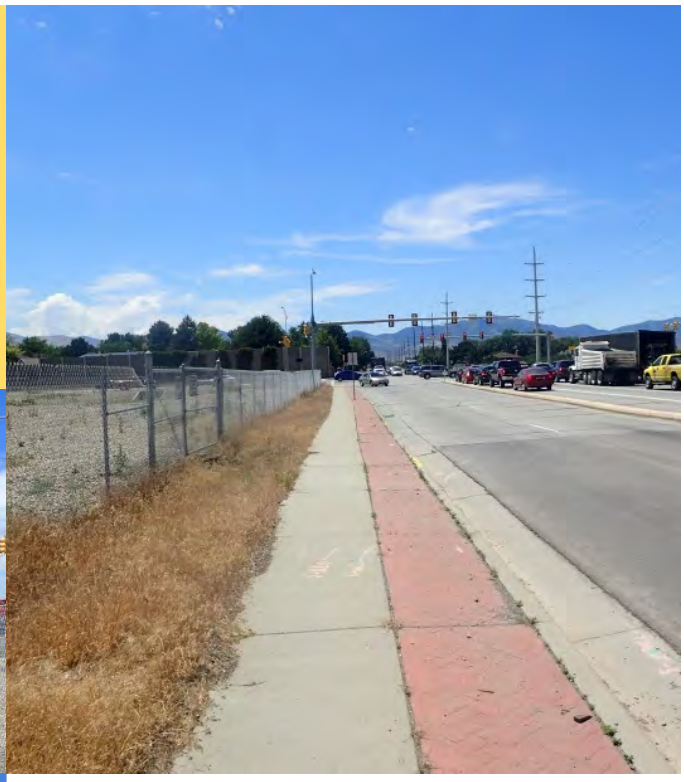
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
Chem. = pH, Resistivity, Sulfate, Chloride
Hyd. = Hydrometer

Laboratory Test Results – Summary Tables

SUMMARY OF TEST DATA
BANGERTER 4 INTERCHANGES
11800 SOUTH POND AREA

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	IN-PLACE		UNCONFINED OR UU TRIAXIAL COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO CLASSIFICATION)
		DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
16-D-01	5-6.5 (top)		49.1								
	5-6.5 (bottom)		13.2		37	19	18	9	15	76	CL (A-6 (12))
	20-21.5		9.3				NP	52	34	14	GM (A-1-a (0))
	30-31.5		22.1		29	14	15	8	20	72	CL (A-6 (8))
	45-46.5		11.1		29	13	16	45	41	14	GC (A-2-6 (0))
16-D-02	5-6.5		14.9		20	16	4	15	29	56	CL-ML (A-4 (0))
	10-11.5		20.6				NP	0	43	57	ML (A-4 (0))
	15-16.5		10.7				NP	45	39	16	GM (A-1-b (0))
16-D-03	5-6.5		20.0		21	18	3	7	21	72	ML (A-4 (0))
	15-16.5		10.4				NP	49	40	11	GP-GM (A-1-a (0))
	25-26.5		22.5		31	16	15	12	19	69	CL (A-6 (8))

NP=Non-Plastic



Phase I Environmental Site Assessment

Bangerter Highway W 9000 S Interchange

Prepared for Utah Department of Transportation

West Jordan, Utah

August 2016

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Appendix B – City Directories
Appendix C – Historic Aerial Photographs
Appendix D – Historic Topographic Maps
Appendix E – Site Photographs
Appendix F – Kennecott South Zone Superfund Site Documents

List of Acronyms

Term	Definition
AAI	all appropriate inquiries
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	constituents of concern
EDR	Environmental Data Resources, Inc.
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
HDR	HDR, Inc.
LUST	leaking underground storage tank
MOU	memorandum of understanding
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PCBs	polychlorinated biphenyls
REC	recognized environmental condition
UDEQ	Utah Department of Environmental Quality
UDOT	Utah Department of Transportation
USC	U.S. Code
UST	underground storage tank

Note: A more complete acronym list is located in the Governmental Database Report, Appendix A.

Executive Summary

In June 2016, HDR, Inc. (HDR) conducted a Phase I Environmental Site Assessment (ESA) of properties at the Bangerter Highway and W 9000S Street intersection (Subject Property) at the request of the Utah Department of Transportation (UDOT). The Subject Property includes several landowners.

HDR conducted this ESA in conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Practice E 1527-13; the ESA satisfies the requirements of Title 40 of the Code of Federal Regulations (CFR) Part 312 (40 CFR 312). Data gap analysis is presented in Section 5 of this ESA. This Phase I ESA summarizes the site reconnaissance conducted on June 30, 2016; reviews environmental database findings; reviews historical data source findings; and summarizes a telephone interview conducted with Doug Bacon of the Utah Department of Environmental Quality (UDEQ).

The Subject Property includes a portion of Bingham Creek, which was part of response actions implemented at the Kennecott South Zone Superfund Site near Copperton, Utah. Response actions in the 1990s, within and adjacent to the Subject Property, included three phases of soil removal activities from the Bingham Creek channel and its banks along residential areas to address lead and arsenic contaminated soils. Contaminated sediments were also removed from Bingham Creek in 1992 during construction of the Jordan Valley Hospital. A Phase II site investigation will be necessary to assess the concentrations of constituents of concern (COCs), arsenic and lead, in the soil along Bingham Creek.

Figure 1 is an area map showing the relative location of the Subject Property. **Figure 2** is a site map of the Subject Property and adjoining land. Photographs of the Subject Property and surrounding properties are presented in Appendix E.

Findings

The following findings have been made on the Subject Property:

- The Subject Property is located along existing four-lane roads and the adjoining properties, which include a residential subdivision and a fallow field. Salt Lake Community College and Jordan Valley Hospital are also located adjacent to the Subject Property.
- Land uses within the immediate area of the Subject Property is urban, including residential subdivisions, a community college, a hospital, small industrial facilities, retail, and small agricultural parcels.
- EDR searched environmental information databases for the Subject Property on June 24, 2016. They searched federal, state, local, tribal, and EDR-proprietary databases as defined by ASTM E 1527-13. The search revealed one National Pollutant Discharge Elimination System (NPDES) permit for stormwater at the Jordan Valley Hospital. The other mapped sites included on the EDR Radius Map Report are in excess of 0.25 miles of the Subject Property.

- The Subject Property includes a portion of Bingham Creek, which was part of response actions implemented at the Kennecott South Zone Superfund Site near Copperton, Utah. Response actions in the 1990s, within and adjacent to the Subject Property, included three phases of soil removal activities from the Bingham Creek channel and its banks along residential areas to address lead and arsenic contaminated soils. Contaminated sediments were also removed from Bingham Creek in 1992 during construction of the Jordan Valley Hospital. Bingham Creek flows through a box culvert under the Subject Property from the Vista West Subdivision towards the Jordan Valley Hospital (northeasterly direction). UDEQ and EPA Region 8 have compiled soil action levels for Bingham Creek. Therefore, a Phase II site investigation will be necessary to assess the concentrations of constituents of concern (COCs), arsenic and lead, in the soil along Bingham Creek.
- During the reconnaissance visit, HDR observed transmission lines (no transformers) along the north side of W 9000 S and along the east side of the Salt Lake Community College campus. HDR did not observe any hazardous materials on the Subject Property. The only debris was trash (bottles, aluminum cans, fast food wrappers, etc.) along the Bangerter Highway (see photographs in Appendix E).

Opinions

HDR concludes that the historically contaminated soils along Bingham Creek are a “recognized environmental condition” (REC) within the Subject Property, as enumerated in the Findings section above. The following statement is required by ASTM E 1527-13 as a declaration of whether RECs were found:

> *HDR has performed a Phase I ESA in conformance with the scope and limitations of ASTM E 1527-13 of multiple Parcels at the intersection of the Bangerter Highway and W 9000 S Street and adjoining properties (Subject Property). Any exceptions to or deletions from these practices are described in this report. This report revealed that the historically contaminated soils along Bingham Creek are a REC in connection with the Subject Property.*

Recommendations

HDR developed recommendations through the investigative procedures described in the Scope of Services, Significant Assumptions, and Limitations sections of this report (see Section 1.3). These findings should be reviewed within the context of the limitations provided in the Limitations section.

HDR makes following recommendations:

- **Recommendation 1**: Conduct a Phase II site investigation to determine concentrations of lead and arsenic in the soil along Bingham Creek, which was part of response actions implemented at the Kennecott South Zone Superfund Site near Copperton, Utah.
- **Recommendation 2** If this report is 6 months old or older when property acquisition

occurs, the City of Boise should reevaluate the recommendations in this report. The applicable ASTM standard (1527-13) requires a reevaluation of site conditions if a Phase I ESA is older than 180 days (6 months).

1 Introduction

In June 2016, HDR, Inc. (HDR) conducted a Phase I Environmental Site Assessment (ESA) along the Bangerter Highway and W 9000 S intersection in West Jordan, Utah 84088 (Subject Property) at the request of the Utah Department of Transportation (UDOT). **Figure 1** is an area map showing the relative location of the Subject Property. The Subject Property includes UDOT-owned right-of-way property and multiple parcels of land along the Bangerter Highway and W 9000 S Street (**Figure 2**).

1.1 Purpose

The purpose of this Phase I ESA is to evaluate the Subject Property for indications of recognized environmental conditions (RECs). The American Society for Testing and Materials (ASTM) Practice E 1527-13 defines the following categories of RECs:

> *REC*: *The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions (*see definition below*).*

ASTM E 1527-13 defines release as a "release of any hazardous substance or petroleum product." This definition has the same meaning as the definition of "release" in Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 U.S. Code (U.S.C.) § 9601(22)).

> *Historical REC (HREC): A past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).*
>
> *Controlled REC (CREC): A recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).*

Additional conditions that are not included under the definitions of a REC, but are defined by ASTM Practice 1527-13, include the following:

De minimis: A condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be de minimis conditions are not recognized environmental conditions nor controlled recognized environmental conditions.

Business Environmental Risk: A risk which can have a material environmental or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate, not necessarily limited to those environmental issues required to be investigated in this practice.

Consideration of business environmental risk issues may involve addressing one or more non-scope considerations.

1.2 Report Users

UDOT authorized HDR to conduct a Phase I ESA of the Subject Property. HDR prepared this Phase I ESA for UDOT, and only UDOT has the right to rely on the contents of this Phase I ESA without written authorization.

1.3 Scope of Services, Significant Assumptions, and Limitations

The services HDR performed for this project consisted of the following:

- Provide a description of the Subject Property, including current land uses (Section 2.2)
- Provide a general description of the topography, soil, geology, and groundwater flow direction (Section 2.4)
- Review reasonably ascertainable and reviewable regulatory information published by federal, state, local, tribal, health, and/or environmental agencies pertaining to the Subject Property (sections 4.1 and 4.2)
- Review historical data sources for the Subject Property, including aerial photographs, topographic maps, fire insurance maps, city directories, and other readily available development data (Section 4.4)
- Interview persons with knowledge of the development history of the Subject Property (Section 4.6)
- Conduct an area reconnaissance and an environmental review—including a visual review of adjoining properties—with a focus on indications of hazardous substances, petroleum products, polychlorinated biphenyls (PCBs), wells, storage tanks, solid waste disposal pits and sumps, and utilities (Section 4.7)
- Determine data gaps in the information obtained and comment on their significance in identifying RECs for the Subject Property (Section 5)
- Prepare a written report of methods, findings, opinions, and conclusions (Section 6)

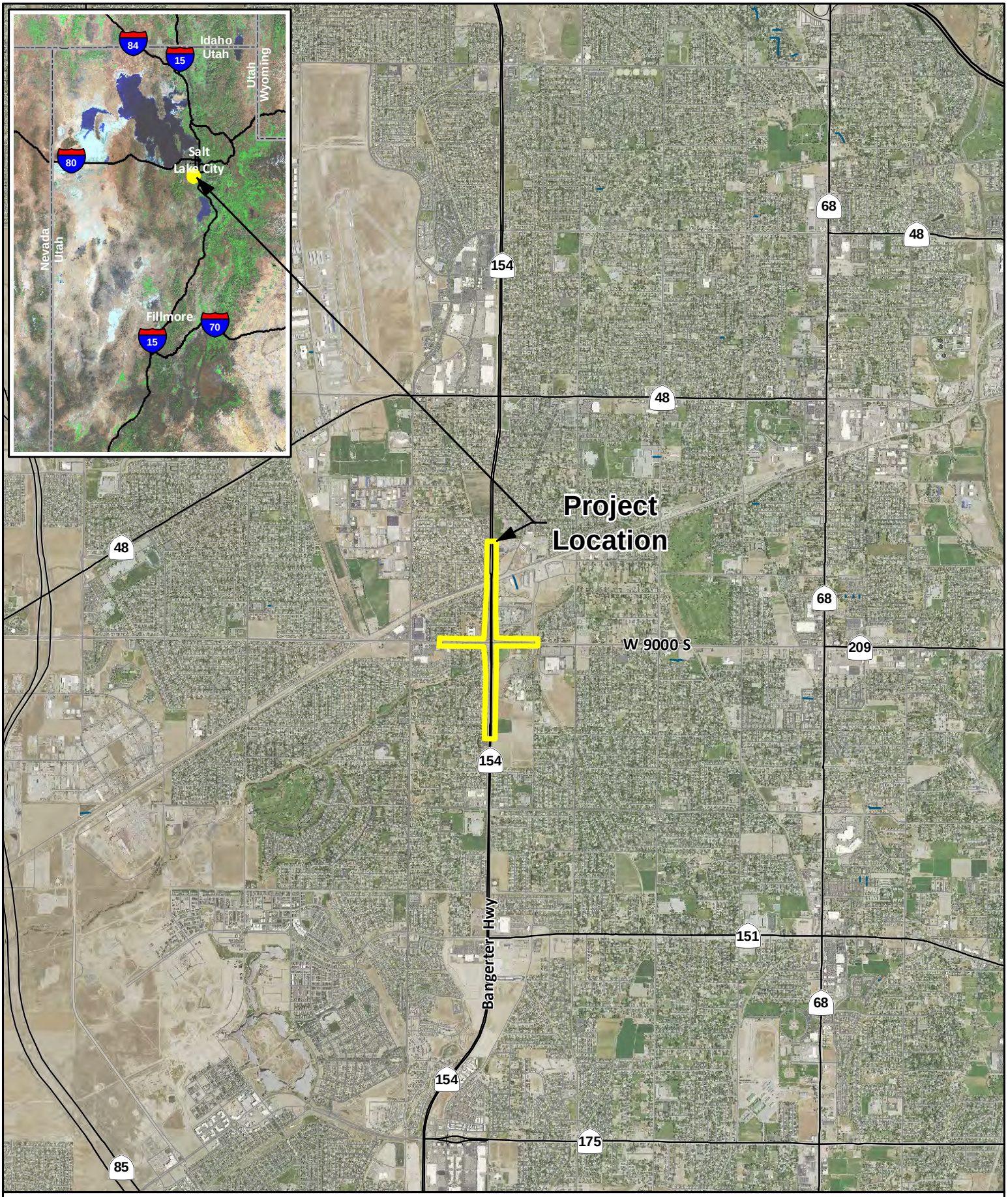

Figure 1. Vicinity Map
UDOT, 9000 South and Bangerter Highway

Imagery: 2014 NAIP, 1 Meter Resolution
Source: USDA/NRCS Digital Gateway
Other Data Sources: Utah Automated Geographic Reference Center (AGRC); USGS

0 4,000 8,000
Feet

Map Date: 7/6/2016
Document: Q:\UDOT\Bangerter\Work_in_Progress\map_docs\Vicinity.mxd

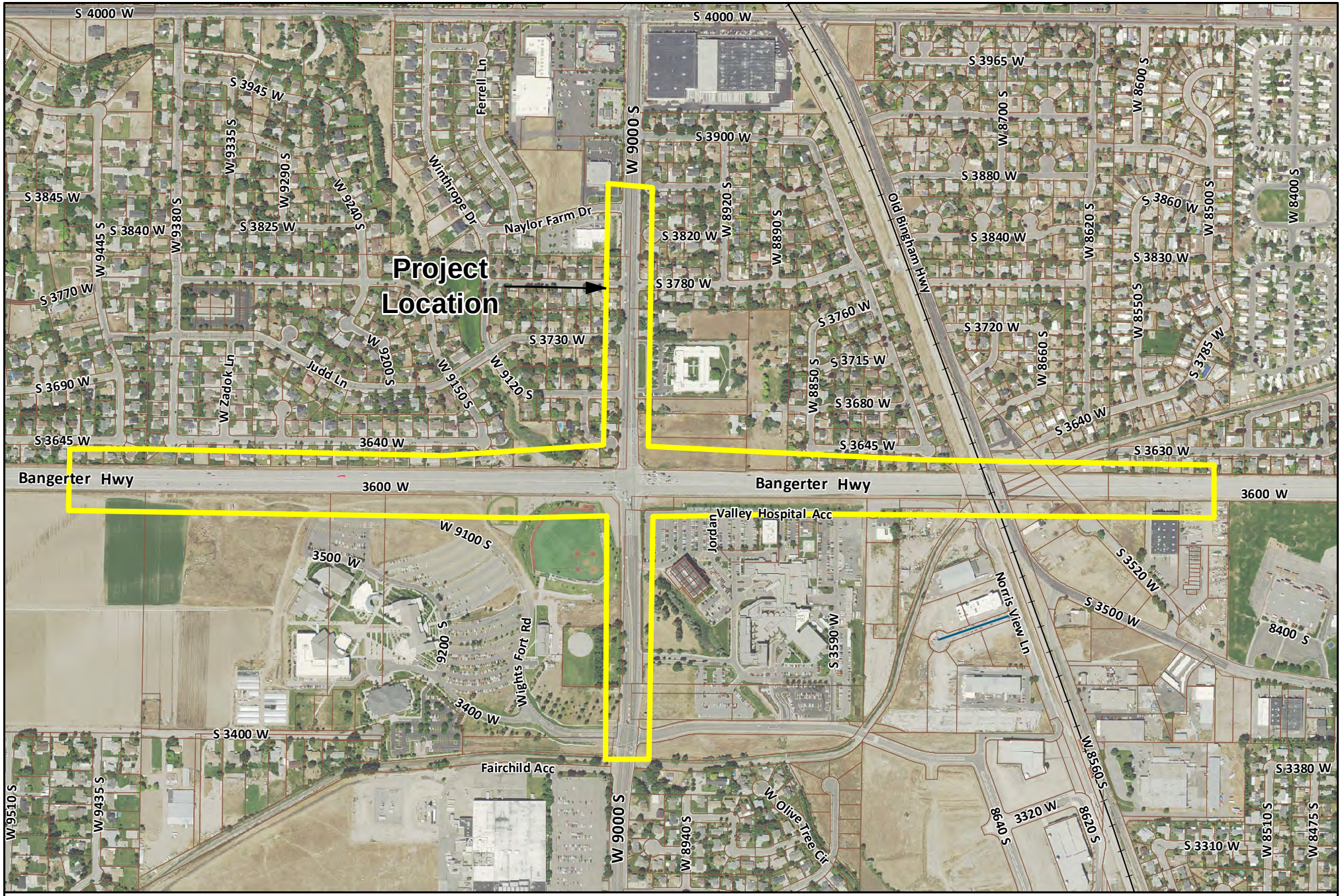

Figure 2. 9000 South and Bangerter Highway
UDOT

Imagery: 2014 NAIP, 1 Meter Resolution
Source: USDA/NRCS Digital Gateway
Other Data Sources: Utah Automated Geographic Reference Center (AGRC); USGS

Map Date: 7/6/2016
Document: Q:\UDOT\Bangerter\Work_in_Progress\map_docs\Site_land.mxd

0 700 1,400
Feet

The goal of this scope of services is to help identify conditions on the Subject Property that may indicate risks regarding hazardous materials storage, disposal, or other impacts. The resulting report may qualify the user for relief from liabilities as one of three "defenses" identified in the 2002 Brownfields Amendments to CERCLA Section 9607 (All Appropriate Inquiry subsections). These three defenses include the following:

1. The "innocent landowner" defense to potential liabilities under 42 U.S.C. § 9601
2. The "contiguous project corridor owner" defense pursuant to 42 U.S.C. § 9607q
3. The "bona fide prospective purchaser" defense pursuant to 42 U.S.C. §9607r

Federal regulations (42 U.S.C §9601(35)(A) and (B),§9607(b)(3), §9607(q); and §9607(r)), promulgated by the U.S. Environmental Protection Agency (EPA), require that liability release be based (in part) on completing all appropriate inquiries (AAI) prior to purchasing a property. Those inquiries are documented by Phase I reports, or ESAs. EPA has agreed that the recently-developed ASTM guidance (ASTM Practice E 1527-13: 3.2.6) specifies and interprets AAI requirements.

A user is defined by ASTM Practice E 1527-13 as the party seeking to use Practice E 1527 to complete an ESA of the Subject Property, and may include a potential purchaser of land in the project area, a potential tenant of the Subject Property, an owner of land in the project area, a lender, or a project area manager. Investigative areas not included in the standard ASTM ESA scope include asbestos, lead-based paint, lead in drinking water, radon or urea formaldehyde, wetland issues, regulatory compliance, cultural and historic resources, industrial hygiene, health and safety, ecological resources, endangered species, and high voltage power lines.

Indoor air quality from sources such as mold and asbestos is not included in the ASTM standard except to the extent that indoor air impacts are caused by releases of hazardous substances into subsurface soil or groundwater (vapor intrusion).

The potential for vapor encroachment or intrusion into structures in the Subject Property are considered and identified from on-site or off-site sources based on the experience of the environmental professional.

The scope of services for ESA projects also does not include completing soil borings, installing groundwater monitoring wells, or collecting soil or groundwater samples. State and national policies and standards relevant to vapor intrusion are in flux and subject to change.

HDR has made the following assumptions in preparing the scope of this assessment:

- Data gathered from public information sources (i.e., libraries or public regulatory agencies) are accurate and reliable.
- Site operations reflect site conditions relative to potential releases and no intentional concealment of environmental conditions or releases has occurred.
- Interview information is directly reported as gathered by the assessor and is limited by the accuracy of the interviewee's recollection and experience.

- Published geologic information and site observations made by the environmental professional are used to estimate likely contaminant migration pathways in the subsurface. These estimates by the environmental professional are limited in accuracy and are generally cross-referenced with existing information about similar sites and environmental releases in the area.
- Regulatory information is limited to sites identified after the late 1980s because reliable records were not kept by regulatory agencies prior to that time frame.

The findings and conclusions presented in this report are based on the procedures described in ASTM Practice E 1527-13, informal discussions with various agencies, a review of the available literature cited in this report, conditions noted at the time of this Phase I ESA, and HDR's interpretation of the information obtained as part of this Phase I ESA. The findings and conclusions are limited to the specific project and properties described in this report, and by the accuracy and completeness of the information provided by others.

An ESA cannot entirely eliminate uncertainty regarding the potential for RECs. Conducting this assessment is intended to reduce, but not eliminate, uncertainty regarding the potential for RECs in connection with the Subject Property within reasonable limits of time and cost. In conducting its services, HDR used a degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession practicing in the same locality. This Phase I ESA conforms to the level of documentation required in ASTM Practice E 1527-13. HDR may omit discussion of certain records (i.e., sources deemed, in HDR's professional opinion, to be inapplicable or of limited value to the specific needs of this client) in accordance with ASTM; however, if the lack of available documentation results in a data gap, this data gap is identified and its significance is discussed.

2 Site Description

2.1 Location and Legal Description

The Subject Property is comprised of UDOT-owned right-of-way property along the Bangerter Highway and W 9000 S intersection and multiple adjoining parcels (private property and City owned property) in West Jordan, Utah, 84088. The various portions of the Subject Property are located in Section 5 of Township 03 South, Range 01 West in Salt Lake County (**Figure 2**).

2.2 Site and Vicinity Characteristics

The Subject Property is comprised of single-family residential lots and one residual lot, owned by the City of West Jordan, which consists of Bingham Creek and its banks (Figure 2 includes parcels). The Subject Property also includes UDOT right-of-way along the east and west side of Bangerter Highway and the north and south side of W 9000 S Street. Primary access to the Subject Property is the Bangerter Highway or W 9000 S Street. The residential lots (Vista West subdivision) in the southwest corner of the intersection of Bangerter and W 9000 S can be accessed by heading south from W 9000 S on Winthrope Drive. The Subject Property is located within a mixed residential and commercial area, which includes the Jordan Valley Hospital northwest of the intersection, the Salt Lake Community College campus in the southeast corner of the intersection, and a currently fallow pasture on the northwest corner of the intersection.

2.3 Description of Structures, Roads, and Other Site Improvements

The Subject Property is developed except the fallow pasture located on the northwest corner of the intersection of the Bangerter Highway and W 9000 S Street. Development includes residential subdivisions, athletic fields and parking lots associated with the Salt Lake Community College Jordan Campus, and medical facilities and parking lots associated with the Jordan Valley Medical Center.

2.4 Area Geology and Hydrogeology

West Jordan, Utah, is located between the Jordan River and the Oquirrh Mountains within the Jordan River Basin. The Subject Property is located within the historic floodplain of Bingham Creek, which consists of Post-Lake Bonneville (Holocene) alluvial deposits ranging from silty, fine- to coarse-grained sand, and pebbles and cobbles. The area to the north and south of the historic floodplain along Bingham Creek consists of Bonneville Lake Cycle (late Pleistocene) fine-grained lacustrine deposits. The area to the west consists of late Pleistocene gravel of lacustrian and/or alluvial origin.

Depth to groundwater varies near the Subject Property; however, in general, it is at least 80 feet below land surface. The groundwater gradient is towards the Jordan River to the east (Stolp 2007).

Based on the Natural Resource Conservation Service (NRCS) Soil Survey for Salt Lake County, the dominant soils in the area is characterized in Table 1.

Table 1. Dominant Soils at Subject Property

Soil Component Name (surface texture)	Red Rock Silt Loam
Characteristics	The Red Rock Silt Loam occurs along the historic floodplain of Bingham Creek, with a typical profile of silt loam from 0-4 inches, silty clay loam from 4-28 inches, clay loam from 28-40 inches, silt loam from 40 to 45 inches, and silty clay loam from 45 to 60 inches. The parent material is alluvium.
Soil drainage class	Well drained. Moderately low to moderately high transmissivity (0.06 to 0.20 inches per hour). The available water storage is high.
Depth to bedrock	More than 80 inches
Soil Component Name (surface texture)	Bingham Gravelly Loam
Characteristics	The Bingham Gravelly Loam occurs to the south of the historic floodplain of Bingham Creek, with a typical profile of gravelly loam from 0-6 inches, gravelly sandy clay loam from 6-12 inches, gravelly fine sand loam from 12-18 inches, very gravelly sand loam from 18 to 27 inches, and extremely gravelly sand from 27 to 60 inches. The parent material is fine-loamy slope alluvium derived from quartzite and/or limestone over sandy and gravelly lacustrine deposits derived from quartzite and/or limestone.
Soil drainage class	Well drained. Moderately high to high transmissivity (0.60 to 2.00 inches per hour). The available water storage is very low.
Depth to bedrock	More than 80 inches
Soil Component Name (surface texture)	Butterfield Soils
Characteristics	The Butterfield soils occur to the north of the historic floodplain of Bingham Creek, with a typical profile of gravelly silt loam from 0-5 inches, very gravelly silt loam from 5-10 inches, extremely gravelly loam from 10-22 inches, very gravelly loam from 22 to 50 inches, and unweathered bedrock from 50 to 60 inches. The parent material is colluvium and/or residuum.
Soil drainage class	Well drained. Very low to moderately high transmissivity (0.00 to 0.20 inches per hour). The available water storage is very low.
Depth to bedrock	50 inches

3 User-Provided Information

UDOT, as the user of this ESA, is aware that the Subject Property includes a portion of Bingham Creek, which was part of response actions implemented at the Kennecott South Zone Superfund Site near Copperton in Salt Lake County, Utah. UDOT has indicated that a Phase 2 ESA will be necessary for the project in the area of Bingham Creek in order to assess potential exposure to workers and also to determine management of excavated soils.

4 Records Review

4.1 Environmental Records Review

HDR contracted Environmental Data Resources, Inc. (EDR) to complete a database search of federal, state, and tribal environmental records for the area around the Subject Property.

EDR searched environmental information databases for the Subject Property on June 24, 2016. They searched federal, state, local, tribal, and EDR-proprietary databases as defined by ASTM E 1527-13. The database search yielded no results. A complete copy of the EDR environmental database report is included in Appendix A.

4.1.1 Utah LUST Database

The LUST database search indicated the following closed, leaking underground storage tank (LUST) site is within 0.5 miles of the Subject Property:

- Salt Lake Community College Jordan Campus
  9100 S 3400 W West Jordan, UT 84088
  Southeast and adjacent to Subject Property
  Notification Date: 06/05/2003
  Closed Date: 08/25/2015

4.1.2 UST Database

The UST database search indicated the following underground storage tanks (UST) are within 0.25 miles of the Subject Property.

- Jordan Valley Hospital
  3580 W 9000 S West Jordan, UT 84088
  Northeast and adjacent to Subject Property
  Total Tanks: 2
  Closed Tanks: 1
- Wasatch Cabinet and Furniture Company
  3412 W 8600 S West Jordan, UT 84088
  Northeast of Subject Property
  Total Tanks: 1
  Closed Tanks: 1

4.1.3 INST CONTROL Database

The INST CONTROL database search, which includes remediation sites that have institutional controls restricting use, identified no property within a 0.5-mile search radius.

While this database did not identify properties in the search radius, the Subject Property includes a portion of Bingham Creek, which was part of the Kennecott South Zone Superfund Site and restrictions on land use and construction activities have been implemented (described in Section 4.4 and 4.5).

4.1.4 BROWNFIELDS and US BROWNFIELDS

Idaho and EPA both maintain Brownfields databases. Searches of these databases did not identify any sites within the 0.5-mile search radius.

4.1.5 NPDES

The National Pollutant Discharge Elimination System (NPDES), which is the permit system mandated by § 402 of the Clean Water Act to control pollutants in waters of the U.S., including storm water. The Jordan Valley Cancer Center (part of the Jordan Valley Hospital complex) holds a NPDES for non construction stormwater. The UDEQ permit is UTR371675 and the receiving water body is the Utah Lake Distribution Canal.

4.1.6 EPA CERCLIS

CERCLIS Search, which retrieves Superfund data from the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database in Envirofacts, identified no sites within a 0.5-mile search radius. The EDR report did not include information about Bingham Creek, which was part of response actions implemented at the Kennecott South Zone Superfund Site near Copperton, Utah. A portion of Bingham Creek is located within the Subject Property. See sections 4.4 and 4.5 for additional information.

4.2 Additional Regulatory Information

On July 5, 2016, Doug Bacon, Environmental Scientist at the Utah Department of Environmental Quality (UDEQ), Division of Environmental Response and Remediation, provided HDR with a brief history of Bingham Creek, which was part of response actions implemented at the Kennecott South Zone Superfund Site near Copperton, Utah.

From approximately 1904 until 1932, multiple companies mined and milled lead and/or copper ores in Bingham Canyon. The residual tailings material from the milling operation, which contained lead and arsenic, was disposed of in waste piles near the mills or directly into Bingham Creek. Runoff and flooding transported the tailings down Bingham Creek and deposited them along the banks of the channel. During construction activities at the Jordan Valley Hospital in 1992 Kennecott and its contractors excavated the tailings in Bingham Creek and its banks on hospital property and transported them off-site. Between 1991 and 1997 Kennecott and Arco complete three Phases of sediment removal in Bingham Creek along residential areas.

Bingham Creek flows through a box culvert under the Subject Property from the Vista West Subdivision towards the Jordan Valley Hospital. Earthwork along Bingham Creek is subject to action levels for arsenic and lead. Mr. Bacon provided HDR with a December 2015 UDEQ guidance memorandum regarding soil and groundwater action levels specific to this portion of Bingham Creek within the Subject Property. Appendix F contains documents regarding response actions along Bingham Creek as part of the Kennecott South Zone Superfund Site.

4.3 Historical Use Information

The objective of reviewing historical use information is to develop a history of previous land uses at, and in the vicinity of, the Subject Property, and to assess these uses for potential hazardous materials impacts that may affect the Subject Property. HDR reviewed those

historical sources that were reasonably ascertainable and likely to provide useful information, as defined by the ASTM standard: fire insurance maps, city directory information, historical aerial photographs, and historical topography maps.

4.3.1 Fire Insurance Maps

Private fire insurance companies produce fire insurance maps to indicate uses of the project area on specified dates. HDR requested fire insurance maps from EDR, the copyright holder for the Sanborn map collection. However, no Sanborn fire insurance map coverage exists for the Subject Property.

4.3.2 City Directory Information

Business directories, including city, cross-reference, and telephone directories, are available for the area around the Subject Property. The Subject Property is located in a densely-developed urban area, which corresponds to a high number of recorded addresses. HDR reviewed the city directories provided by EDR, which are presented in Appendix B. The city directories reflect current land use, which is mostly associated with the Jordan Valley Hospital, the Salt Lake Community College, and residential. HDR did not identify city directory information within the Subject Property or adjoining areas that would indicate historic or current industrial uses that could present environmental concerns.

4.3.3 Historical Aerial Photographs

Historical aerial photographs are valuable for the environmental assessor to review features of properties in and near the Subject Property over time. HDR reviewed historical aerial photographs as provided by EDR from 1937 through 2011. HDR discovered no indications of RECs during the historical aerial photograph review. The aerial photographs show that the segment of Bingham Creek near the Subject Property remained in the same main channel since 1937. Descriptions of the photographs are provided in the following paragraphs. Copies of aerial photographs are provided in Appendix C.

- 1937 – The Subject Property appears to be undeveloped and within the floodplain of Bingham Creek. Some of the adjacent parcels to the north and south of the Subject Property are cultivated fields and/or grazing areas. Some dirt paths exist along Bingham Creek. The Utah Lake Distributing Canal just to the east of the Subject Property, the Old Bingham Highway to the north, and the adjacent Denver and Rio Grande Western railroad tracks are visible. The present day location of Wight's Fort Cemetery appears to be already enclosed.
- 1946 – The Subject Property and the surrounding areas appear much as described for the 1937 photograph. Agricultural development continues in the surrounding areas. A small pond is visible just to the northwest of Wight's Fort Cemetery, near the present day Jordan Valley Hospital. W 9000 S appears to be a gravel road that does not cross Bingham Creek.
- 1952 – The Subject Property and the surrounding areas appear much as described for the 1946 photograph. W 9000 S connects across Bingham Creek. The southeast portion

of the parcel that is now occupied by the Jordan Valley hospital contains at least one structure and is further improved for agricultural purposes.

- 1958 – The Subject Property and the surrounding areas appear much as described for the 1952 photograph, with the exception of several small structures located at the southwest corner of the present day Jordan Valley Hospital parcel.
- 1965 – The Subject Property and the surrounding areas appear much as described for the 1958 photograph, with the exception of additional new small structures that are outside of the study area.
- 1971 – The Subject Property and the surrounding areas appear much as described for the 1965 photograph. Residential development continues east of the Subject Property.
- 1977 - The Subject Property and the surrounding areas appear much as described for the 1971 photograph. Residential development continues east of the Subject Property and a new subdivision is visible north of the Old Bingham highway. The small structures located in the southwest corner of the present day Jordan Valley Hospital, first visible in the 1958 photograph, are no longer present.
- 1981 – The Vista West subdivision is under development, including the residences directly west of the present day Bangerter Highway south of W 9000 S along the Bingham Creek floodplain. The parcel located between the present day Jordan Valley Hospital and the Utah Lake Distribution Canal appears to be in the early stages of residential or commercial development, and residential development continues outside of the study area.
- 1993 – The Vista West subdivision has expanded since the 1981 photograph and the Jordan Valley Hospital is now under construction. The nursing home/assisted living facility west of the present day Bangerter Highway, north of W 9000 S, is complete and the subdivision to the north and west of the facility has expanded. Significant earthwork is visible where the overpass of the Old Bingham Highway and the not-yet-present Bangerter Highway is under construction. The water tank just to the south of the Wight's Fort Cemetery is also visible.
- 1997- The Subject Property and the immediate vicinity appears much like in the 1993 photograph, except that the Bangerter Highway is now visible and construction at the hospital is now complete. Bingham Creek is routed underneath the Bangerter highway between the Vista West subdivision and the hospital. The small pond between the hospital and Wight's Fort Cemetery appears to have been removed.
- 2006 - The Subject Property and the immediate vicinity appears much like in the 1993 photograph, except that the campus of Salt Like City Community College campus is now present and the Vista West subdivision expanded just west of the Bangerter Highway. The Jordan Valley Hospital expanded its parking lot in the southwest corner of the parcel. Commercial and residential development in the surrounding area continues.

- 2009 - The Subject Property and the surrounding areas appear much as described for the 2006 photograph, with the exception of the addition of homes within the Vista West subdivision north of Bingham Creek.
- 2011 - The Subject Property and the surrounding areas appear much as described for the 2009 photograph. Commercial and residential development in the surrounding area continues.

4.3.4 Historical Topographic Maps

Historic topographic maps augment information gathered in the historic aerial photograph review (Appendix D). HDR discovered no indications of RECs during the historical topographic review. A summary of the maps follows:

- 1925 and 1928 – No information is contained on these two topographic maps.
- 1951 (1:24000) – The map shows one structure on the Subject Property just north of present day W 9000 S, where Bangerter exists now, and a small pond and a structure on the present day Jordan Valley Hospital parcel just north of W 9000 S. Bingham Creek, Provo Reservoir Canal, Utah Lake Distribution Canal, Denver and Rio Grande Western railroad tracks, the old Bingham Highway, and the Wight's Fort Cemetery are included in the immediate vicinity of the Subject Property.
- 1963 (1:24000) – The Subject Property and the immediate vicinity are mostly unchanged from the 1951 topographic map.
- 1969 (1:24000) – The Subject Property and the immediate vicinity are mostly unchanged from the 1963 topographic map. The map shows some additional structures north of W 9000 S near the present day Jordan Valley Hospital, and additional structures throughout the extent of the topographic map surrounding the Subject Property. Bingham Creek downstream of the present day Jordan Valley Hospital is shown as a ditch.
- 1975 (1:24000) – The Subject Property and the immediate vicinity are mostly unchanged from the 1969 topographic map. The map shows some additional structures north of W 9000 S near the present day Jordan Valley Hospital, and a subdivision north of the Old Bingham Highway. There are additional structures throughout the extent of the topographic map surrounding the Subject Property.
- 1999 (1:24000) – The maps shows Vista West subdivision, the Jordan Valley Hospital, and the Bangerter Highway near the Subject Property. The larger area within the extent of the topographic map shows significant development since the 1975 topographic map.
- 2014 (1:24000) – This map focuses on roads, creeks, ditches, hospitals, and schools, and includes less detail than the 1999 topographic map. The primary, notable addition visible in this map is the Vista West subdivision expansion along the Bangerter Highway and the Salt Lake Community College.

4.4 Environmental Liens, Activity Use Limitations and Additional Information

According to UDEQ and the City of West Jordan, the Subject Property will be required to conduct soil sampling along Bingham Creek prior to commencing earthwork activities. The primary constituents of concern are lead and arsenic. These constituents are associated with historic mining activities near Copperton, located approximately 7 miles west and upstream of the Subject Property. During the early days of mining, wastes from mining and processing activities were discharged directly into the Bingham Creek channel (EPA 2010). UDEQ compiled a guidance memorandum dated December 29, 2015, that outlines the soil and groundwater action levels that would be associated with earthwork along the Bingham Creek floodplain.

4.5 Summary of Previous Environmental Investigations

Bingham Creek and the surrounding historic floodplain, which cross the Subject Property, have been part of a large-scale environmental investigation and remedial action as part of the Kennecott South Zone Superfund Site near Copperton. This portion of Bingham Creek has been characterized for concentrations of lead and arsenic since 1990. Kennecott removed up to 18 inches of contaminated soil from residential areas along Bingham Creek between 1991 and 1997. In 1992 Kennecott removed sediments from Bingham Creek on the Jordan Valley Hospital property. Removal of sediments was based on measured concentrations of lead and arsenic. Contaminated sediments were removed from Bingham Creek channel and its banks. The site chronology, response actions, and technical assessments are described in more detail in the Second Five Year Report Kennecott South Zone (EPA 2010) and the DERR-1996-002882 report attached in Appendix F.

4.6 Interviews

4.6.1 Subject Property Owner

HDR did not conduct interviews with residential property owners in the adjacent subdivisions. HDR did interview city and government personnel about the Subject Property (described below).

4.6.2 City of West Jordan

HDR conducted a telephone interview with Nate Nelson, Engineer with the City of West Jordan. He is familiar with the Subject Property and the issue of contaminated soils along Bingham Creek. Mr. Nelson said that the City of West Jordan does not require a permit or oversight of the sampling activities, but that a Land Disturbance Permit will be required for clean-up related activities if they are necessary. Mr. Nelson confirmed that groundwater levels near the Subject Property are typically at least 80 feet deep.

4.6.3 Utah Department of Environmental Quality

HDR conducted a telephone interview with Doug Bacon, who has had direct involvement as the project manager for UDEQ for the Kennecott South Zone Superfund Site near Copperton in Salt Lake County, Utah. He provided a brief overview of the history of Bingham Creek and the response actions that were completed. In September 1995, UDEQ, EPA, and Kennecott

entered into a memorandum of understanding (MOU). Under this MOU, Kennecott agreed to complete numerous cleanup projects, including the creek area within the Subject Property. Along the Bingham Creek residential areas, removal generally involved removing up to 18 inches of soil from the creek channel and along its banks and replacing it with clean soil. Mr. Bacon referred HDR to the following documents for additional information regarding Bingham Creek in and adjacent to the Subject Property and its history as part of the Kennecott South Zone Superfund Site near Copperton:

- Technical Memorandum, Compilation of soil and groundwater action levels. December 29, 2015
- U.S. Environmental Protection Agency. 2010. Report, Kennecott South Zone. CERCLIS ID: UTD000826404. US EPA Region 8 Denver Colorado 9/29/10
- DERR-1996-002882 (Soil characterization and removal action at Jordan Valley Hospital)

4.7 Site Reconnaissance

Manuel Rauhut of HDR visited the Subject Property on June 30, 2016. He made the following observations during the reconnaissance visit (select photographs taken during the site reconnaissance are provided in Appendix E).

- The Subject Property is located along the Bangerter Highway and W 9000 S Street. The four quadrants on each side of the intersection are developed, but the land use in each quadrant is different (refer to **Figure 2**):
    - Northwest Quadrant:
      The area directly adjacent to Bangerter and W 9000 S is a pasture or hayfield that appears to be no longer irrigated. The area to the north of this field is a residential subdivision and the area to the west includes a residential area and horse pasture. West of that is a nursing home/assisted living facility.
    - Northeast Quadrant:
      The northeast quadrant is occupied by the Jordan Valley Hospital, which includes multiple large buildings surrounded by parking lots. Bingham Creek, which is routed through a box culvert under the intersection from the south west quadrant, daylights approximately 550 feet east of the Bangerter Highway and 130 feet north of W 9000 S. At the time of the site visit, there was water in the creek.
      The area north of the hospital includes a small junk yard or vehicle and boat storage facility, and railroad tracks. North of the railroad tracks is a small topsoil, mulch, sand, and gravel operation.
    - Southeast Quadrant:
      The Salt Lake Community College campus occupies most of the southeast quadrant. A stormwater retention basin is located near the intersection. South of that, along Bangerter Highway, are large and small baseball fields, a parking lot, and some open space. South of the campus are cultivated fields. Along W 9000 S, north of the campus, is a 130-foot diameter water tank and the Wight's Fort

Cemetery. The Utah Lake Distribution Canal is located along the west side of the campus. The Fairchild semiconductor plant to the east of the campus appears to be closed.

- Southwest Quadrant:
  The Vista West subdivision occupies most of the southwest quadrant. Bingham Creek flows through the subdivision. During the site visit, Bingham Creek was dry west of Judd Lane (3720 W), but a little water was flowing to the east. Bingham Creek is routed through a box culvert under Bangerter Highway towards the hospital.

- No hazardous materials were observed by HDR on the Subject Property at the time of the site visit. The only debris was trash (bottles, aluminum cans, fast food wrappers, etc.) along Bangerter.
- No surface staining or other evidence of a hazardous materials release was visually observed by HDR on the Subject Property at the time of the site visit.
- There are transmission lines (no transformers) along the north side of W 9000 S and along the east side of the Salt Lake Community College campus.
- The adjacent property north of the hospital was either a junk yard or a storage facility for boats, and various vehicles. HDR did not enter the facility, but based on observations, there were no obvious spills or storage of hazardous substances.

4.7.1 Known Current and Past Uses of the Site and Adjoining Properties

Subject Property. Based on a review of historical aerial photography, the Subject Property transitioned from mostly agricultural use to urban development, including a college campus, a hospital, and residential subdivisions.

Adjoining Property.

- Northeast – The area to the northeast of the intersection, north of the hospital, consists of mostly small, commercial development and additional subdivisions beyond that.
- Southeast – East of Salt Lake Community College is the Fairchild Semiconductor Plant. This Plant was a Resource Conservation and Recovery Act Large Quantity Generator (RCRA-LQG), but has been closed since 2014. The facility is approximately 0.3 miles to the east and is at a lower elevation than the Subject Property. Beyond the community college and the former Fairchild Semiconductor plant, most of the development consists of residential subdivisions.
- Southwest – The adjoining properties to the southwest are mostly residential subdivisions in addition to schools, churches, and a Wal-Mart.
- Northwest – The adjoining properties to northwest are mostly residential subdivisions.

The layout of the Subject Property and surrounding properties is shown in **Figure 2**. Site photographs are presented in Appendix E.

4.8 Utilities and PCBs

There are transmission lines (no transformers) along the north side of W 9000 S and along the east side of the Salt Lake Community College campus.

5 Data Gap Analysis

The ASTM E 1527-13 standards require a listing of "data gaps," including data failure, encountered during the investigative process that may affect the validity of the conclusions drawn by the environmental professional. The ASTM E 1527-13: 12.7 standard also requires that the environmental professional estimate the relative importance of the data gaps. Generally, gaps in available data are related to the availability of historical data sources for specific sites of concern. The environmental professional uses multiple historical data sources as a method to provide coverage for data gaps. Historical information is collected on a recurring basis, and the passage of time between data sets may or may not constitute a significant gap in data coverage.

- For this project, HDR did not identify any data gaps, as defined by ASTM E 1527-13 that would affect the findings presented in Section 6.0.

6 Findings, Opinions, and Conclusions

In June 2016, HDR conducted a Phase I ESA of properties at the Bangerter Highway and W 9000S Street intersection (Subject Property), which UDOT is evaluating. The Subject Property includes the intersection of the Bangerter Highway and W 9000S Street and several properties adjacent to the Bangerter Highway, north and south of the intersection (Table 1 and **Figure 2**).

HDR performed the ESA in general conformance with the scope and limitations of ASTM Practice E 1527-13. Any exceptions to, or deletions from, this practice are described previously in this report.

6.1 Findings

The following findings have been made on the Subject Property:

- The Subject Property is located along existing four-lane roads and the adjoining properties, which include a residential subdivision and a fallow field. Salt Lake Community College and Jordan Valley Hospital are also located adjacent to the Subject Property.
- Land uses within the immediate area of the Subject Property is urban, including residential subdivisions, a community college, a hospital, small industrial facilities, retail, and small agricultural parcels.
- EDR searched environmental information databases for the Subject Property on June 24, 2016. They searched federal, state, local, tribal, and EDR-proprietary databases as defined by ASTM E 1527-13. The search revealed one National Pollutant Discharge Elimination System (NPDES) permit for stormwater at the Jordan Valley Hospital. The other mapped sites included on the EDR Radius Map Report are in excess of 0.25 miles of the Subject Property.
- The Subject Property includes a portion of Bingham Creek, which was part of response actions implemented at the Kennecott South Zone Superfund Site near Copperton, Utah. Response actions in the 1990s, within and adjacent to the Subject Property, included three phases of soil removal activities from the Bingham Creek channel and its banks along residential areas to address lead and arsenic contaminated soils. Contaminated sediments were also removed from Bingham Creek in 1992 during construction of the Jordan Valley Hospital. Bingham Creek flows through a box culvert under the Subject Property from the Vista West Subdivision towards the Jordan Valley Hospital (northeasterly direction). UDEQ and EPA Region 8 have compiled soil action levels for Bingham Creek. Therefore, a Phase II site investigation will be necessary to assess the concentrations of constituents of concern (COCs), arsenic and lead, in the soil along Bingham Creek.
- During the reconnaissance visit, HDR observed transmission lines (no transformers) along the north side of W 9000 S and along the east side of the Salt Lake Community College campus. HDR did not observe any hazardous materials on the Subject Property.

The only debris was trash (bottles, aluminum cans, fast food wrappers, etc.) along the Bangerter Highway (see photographs in Appendix E).

6.2 Opinions

HDR concludes that the historically contaminated soils along Bingham Creek are a “recognized environmental condition” (REC) within the Subject Property, as enumerated in the Findings section (Section 6.1). The following statement is required by ASTM E 1527-13 as a declaration of whether RECs were found:

> *HDR has performed a Phase I ESA in conformance with the scope and limitations of ASTM E 1527-13 of multiple Parcels at the intersection of the Bangerter Highway and W 9000 S Street and adjoining properties (Subject Property). Any exceptions to or deletions from these practices are described in this report. This report revealed that the historically contaminated soils along Bingham Creek are a REC in connection with the Subject Property.*

7 Recommendations

HDR developed recommendations through the investigative procedures described in the Scope of Services, Significant Assumptions, and Limitations sections of this report (see Section 1.3). These findings should be reviewed within the context of the limitations provided in the Limitations section.

HDR makes following recommendations:

- **Recommendation 1**: Conduct a Phase II site investigation to determine concentrations of lead and arsenic in the soil along Bingham Creek, which was part of response actions implemented at the Kennecott South Zone Superfund Site near Copperton, Utah
- **Recommendation 2** If this report is 6 months old or older when property acquisition occurs, the UDOT should reevaluate the recommendations in this report. The applicable ASTM standard (1527-13) requires a reevaluation of site conditions if a Phase I ESA is older than 180 days (6 months).

8 Qualifications of Environmental Professionals

8.1 Signatures and Qualifications

We declare that, to the best of our professional knowledge and belief, we meet the definition of environmental professional as defined in Section 312.10 of Title 40 of the Code of Federal Regulations (CFR) Part 312.

We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquires in conformance with standards and practices set forth in 40 CFR Part 312.

Project Manager
Michael R. Murray, PhD

8.1.1 Qualifications of Environmental Professionals

The following HDR personnel performed this Phase I ESA:

Mr. Michael R. Murray, Ph.D., HDR's qualified environmental professional, as defined by ASTM Practice E 1527-13, has 25 years of experience in ESAs, soil and groundwater investigations and remediation, wastewater/biosolids land application, wetland delineation and mitigation, statistical analysis and design, mine site closures, hazardous materials management, biological assessments, database management, research, project management, and teaching. Dr. Murray's responsibilities have included technical lead, project planning, field supervision, schedule and cost control, public relations, and expert witness support. He has conducted over 100 ESAs.

Mr. Manuel B. Rauhut, PE, HDR's qualified environmental professional, as defined by ASTM Practice E 1527-13, has 10 years of experience in ESAs, soil and groundwater investigations, well construction, and wetland delineations and mitigation. Mr Rauhut's responsibilities have included project planning, field supervision, public relations, and expert witness support. He has conducted over 10 ESAs.

9 References

ASTM Practice E 1527-13. 2013. *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.*

EDR. *The EDR Radius Map ™ Report with GeoCheck, UDOT Bangerter, West Jordan, UT 84088*. Inquiry No. 4657552.2s. June 24, 2016.

Natural Resources Conservation Service. 2016. Custom Soil Resource Report for Salt Lake Area, Utah. Available online at: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed July 2016.

Stolp, B.J., 2007, Hydrogeologic setting and ground-water flow simulations of the Salt Lake Valley Regional Study Area, Utah, Section 2 of Paschke, S.S., ed., Hydrogeologic settings and ground-water flow simulations for regional studies of the transport of anthropogenic and natural contaminants to public-supply wells—studies begun in 2001: Reston, Va., U.S. Geological Survey Professional Paper 1737–A, pp. 2–1 – 2–22.

Utah Department of Environmental Quality (UDEQ). Technical Memorandum, Compilation of soil and groundwater action levels. December 29, 2015.

US Environmental Protection Agency. 2010. Report, Kennecott South Zone. CERCLIS ID: UTD000826404. US EPA Region 8 Denver Colorado 9/29/10

Utah Geological Survey and Utah Department of Natural Resources, 2000. Geologic Map of the Midvale Quadrangle, Salt Lake County, Utah. Fitzhugh D. Davis, 2000

A

Environmental Database Search Results

UDOT Bengerter
3584 W 9000
West Jordan, UT 84088

Inquiry Number: 4657552.2s
June 24, 2016

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

3584 W 9000
WEST JORDAN, UT 84088

COORDINATES

Latitude (North):	40.5878380 - 40° 35' 16.21''
Longitude (West):	111.9772080 - 111° 58' 37.94''
Universal Tranverse Mercator:	Zone 12
UTM X (Meters):	417302.7
UTM Y (Meters):	4493252.5
Elevation:	4596 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	6010284 MIDVALE, UT
Version Date:	2014
West Map:	6008625 COPPERTON, UT
Version Date:	2014

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140630
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
3584 W 9000
WEST JORDAN, UT 84088

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	JORDAN VALLEY CANCER	3584 W. 9000 S.	UT NPDES		TP
A2	SAVANNAH TRANSPORT I	3454 WEST 8600 SOUTH	RCRA NonGen / NLR, FINDS, ECHO	Lower	1 ft.
3	BUTTERFIELD DENNIS A	3520 OLD BINGHAM HW	EDR Hist Auto	Lower	1 ft.
4		3520 WEST 8600 SOUTH	RCRA NonGen / NLR	Lower	1 ft.
A5		3454 W 8600 S	EDR Hist Auto	Lower	1 ft.
B6	ROME CABLE WEST	8600 S 3295 W	UT UST	Lower	1 ft.
B7		3295 WEST 8600 SOUTH	RCRA NonGen / NLR	Lower	1 ft.
A8	VACANT COMMERCIAL BU	3450 WEST 8600 SOUTH	UT UST	Lower	1 ft.
A9	SONOCO PRODUCTS COMP	3450 W 8600 S	EDR Hist Auto	Lower	1 ft.
C10	LEGACY CLEANERS CLEA	3961 W 9000 S	EDR Hist Cleaner	Higher	1 ft.
C11		3963 W 9000 S	EDR Hist Auto	Higher	1 ft.
12	S.L. COMMUNITY COLLE	9100 S 3400 W	UT LUST	Lower	1 ft.
13	FAIRCHILD SEMICONDUC	3333 W 9000 S	RCRA-LQG, TRIS, RAATS, ICIS, CA HAZNET	Lower	1 ft.
D14	JORDAN VALLEY HOSPIT	3580 W 9000 S	UT UST, UT Financial Assurance	Lower	1 ft.
C15	SMITH'S FOOD & DRUG	9000 SOUTH 4000 WEST	RCRA-CESQG, FINDS, ECHO	Higher	1 ft.
C16	WEST JORDAN CHEVRON	3967 W 9000 S	UT UST, UT Financial Assurance	Higher	1 ft.
D17	JORDAN VALLEY HOSPIT	3580 W 9000 S	UT AST	Lower	1 ft.
B18		3392 WEST 8600 SOUTH	RCRA NonGen / NLR, CA HAZNET	Lower	28, 0.005, NNE
19		8689 S 3720 W	EDR Hist Cleaner	Lower	145, 0.027, NNW
20	MECHANIC ON WHEELS	3932 DANSERE CIR	EDR Hist Auto	Higher	232, 0.044, NW
21	MUIR PRESSURE WASHIN	8693 SOUTH NEWCASTLE	RCRA NonGen / NLR, FINDS, ECHO	Lower	271, 0.051, NNW
22	WASATCH CABINET & FU	3412 W 8600 S	UT UST	Lower	399, 0.076, NNE
23	C & C CARPET CLEANIN	3686 W 8620 SOUTH ST	EDR Hist Cleaner	Lower	576, 0.109, NNW
E24	UTAH BOYS RANCH DRY	4080 W 9000 S	EDR Hist Cleaner	Higher	614, 0.116, West
E25	SMITHS #158	4080 W 9000 S	UT UST, UT Financial Assurance	Higher	614, 0.116, West
26		3520 GALAXY PARK PL	EDR Hist Auto	Lower	621, 0.118, NNE
27	WELBY RAILYARD	4200 WEST OLD BINGHA	SEMS	Higher	672, 0.127, West
F28	WASTE MANAGEMENT OF	8652 S 4000 W	UT UST, UT Financial Assurance	Higher	968, 0.183, NW
F29	WASTE MANAGEMENT OF	8652 SOUTH 4000 WEST	RCRA-CESQG, FINDS, ECHO	Higher	968, 0.183, NW
G30	DYNO NOBEL INC. (FKA	3000 WEST 8600 SOUTH	RCRA NonGen / NLR, FINDS, ECHO	Lower	1125, 0.213, NE
G31	WEST JORDAN PLANT	3000 W 8600 S	UT LUST, UT UST	Lower	1125, 0.213, NE
H32	XPRESS MART	2729 W 9000 S	UT LUST, UT UST, UT Financial Assurance	Lower	2573, 0.487, East
H33	WEST JORDAN TOP STOP	2729 WEST 9000 SOUTH	SEMS-ARCHIVE	Lower	2573, 0.487, East

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 8 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
JORDAN VALLEY CANCER 3584 W. 9000 S. WEST JORDAN, UT 84088	UT NPDES Permit: UTR371675	N/A

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-SQG ---------- RCRA - Small Quantity Generators

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List

US INST CONTROL ---------- Sites with Institutional Controls

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State- and tribal - equivalent CERCLIS

UT SHWS ---------- This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State and tribal landfill and/or solid waste disposal site lists

UT SWF/LF ---------- List of Landfills

State and tribal leaking storage tank lists

UT LAST ---------- Leaking Aboveground Storage Tank Sites
INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST ---------- Underground Storage Tank Listing
INDIAN UST ---------- Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

UT INST CONTROL ---------- Sites with Institutional Controls

State and tribal voluntary cleanup sites

UT VCP ---------- Voluntary Cleanup Sites List
INDIAN VCP ---------- Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

UT BROWNFIELDS ---------- Brownfields Assessment Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
ODI ---------- Open Dump Inventory

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ---------- Delisted National Clandestine Laboratory Register
UT CDL ---------- Methamphetamine Contaminated Properties Listing

US CDL ---------- National Clandestine Laboratory Register

Local Land Records

LIENS 2 ---------- CERCLA Lien Information

Records of Emergency Release Reports

HMIRS ---------- Hazardous Materials Information Reporting System
UT SPILLS ---------- Spills Data
UT SPILLS 90 ---------- SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS ---------- Formerly Used Defense Sites
DOD ---------- Department of Defense Sites
SCRD DRYCLEANERS ---------- State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ---------- Financial Assurance Information
EPA WATCH LIST ---------- EPA WATCH LIST
2020 COR ACTION ---------- 2020 Corrective Action Program List
TSCA ---------- Toxic Substances Control Act
SSTS ---------- Section 7 Tracking Systems
ROD ---------- Records Of Decision
RMP ---------- Risk Management Plans
PRP ---------- Potentially Responsible Parties
PADS ---------- PCB Activity Database System
FTTS ---------- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ---------- Material Licensing Tracking System
COAL ASH DOE ---------- Steam-Electric Plant Operation Data
COAL ASH EPA ---------- Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ---------- PCB Transformer Registration Database
RADINFO ---------- Radiation Information Database
HIST FTTS ---------- FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ---------- Incident and Accident Data
CONSENT ---------- Superfund (CERCLA) Consent Decrees
INDIAN RESERV ---------- Indian Reservations
FUSRAP ---------- Formerly Utilized Sites Remedial Action Program
UMTRA ---------- Uranium Mill Tailings Sites
LEAD SMELTERS ---------- Lead Smelter Sites
US AIRS ---------- Aerometric Information Retrieval System Facility Subsystem
US MINES ---------- Mines Master Index File
DOCKET HWC ---------- Hazardous Waste Compliance Docket Listing
UXO ---------- Unexploded Ordnance Sites
UT DRYCLEANERS ---------- Registered Drycleaners
UT EWA ---------- Enforceable Written Assurances
UT FUDS ---------- Formerly Used Defense Sites
UT MMRP ---------- Military Munitions Response Program
UT TIER 2 ---------- Tier 2 Facility Listing
UT UIC ---------- UIC Site Location Listing
UT UOPF ---------- Used Oil Permitted Facilities
FUELS PROGRAM ---------- EPA Fuels Program Registered Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ---------- EDR Proprietary Manufactured Gas Plants

EXECUTIVE SUMMARY

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

UT RGA LF..... Recovered Government Archive Solid Waste Facilities List
UT RGA LUST..... Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS list

SEMS: SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

A review of the SEMS list, as provided by EDR, and dated 03/07/2016 has revealed that there is 1 SEMS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WELBY RAILYARD	4200 WEST OLD BINGHA	W 1/8 - 1/4 (0.127 mi.)	27	39

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has

determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

A review of the SEMS-ARCHIVE list, as provided by EDR, and dated 03/07/2016 has revealed that there is 1 SEMS-ARCHIVE site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
WEST JORDAN TOP STOP	2729 WEST 9000 SOUTH	E 1/4 - 1/2 (0.487 mi.)	H33	46

Federal RCRA generators list

RCRA-LQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

A review of the RCRA-LQG list, as provided by EDR, and dated 12/09/2015 has revealed that there is 1 RCRA-LQG site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
FAIRCHILD SEMICONDUC	***3333 W 9000 S***	***0 - 1/8 (0.000 mi.)***	***13***	***16***

RCRA-CESQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-CESQG list, as provided by EDR, and dated 12/09/2015 has revealed that there are 2 RCRA-CESQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SMITH'S FOOD & DRUG	***9000 SOUTH 4000 WEST***	***0 - 1/8 (0.000 mi.)***	***C15***	***30***
WASTE MANAGEMENT OF	***8652 SOUTH 4000 WEST***	***NW 1/8 - 1/4 (0.183 mi.)***	***F29***	***41***

State and tribal leaking storage tank lists

UT LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Environmental Quality's Potential Leaking UST Sites.

A review of the UT LUST list, as provided by EDR, and dated 01/20/2016 has revealed that there are 3

UT LUST sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
S.L. COMMUNITY COLLE Facility ID: 4002261 Date Closed: 08/25/2015	9100 S 3400 W	0 - 1/8 (0.000 mi.)	12	16
WEST JORDAN PLANT Facility ID: 4000434 Date Closed: 09/19/1990	***3000 W 8600 S***	***NE 1/8 - 1/4 (0.213 mi.)***	***G31***	***45***
XPRESS MART Facility ID: 4000973 Date Closed: 09/17/1998 Date Closed: 05/15/2014	***2729 W 9000 S***	***E 1/4 - 1/2 (0.487 mi.)***	***H32***	***45***

State and tribal registered storage tank lists

UT UST: The Underground Storage Tank database contains a listing of Facility, Owner, Location & Tanks not Closed or Removed. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environmental Quality's Facilities with at Least One Non-exempt Tank.

A review of the UT UST list, as provided by EDR, and dated 01/20/2016 has revealed that there are 8 UT UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WEST JORDAN CHEVRON Facility ID: 4002319	***3967 W 9000 S***	***0 - 1/8 (0.000 mi.)***	***C16***	***32***
SMITHS #158 Facility ID: 4002380	***4080 W 9000 S***	***W 0 - 1/8 (0.116 mi.)***	***E25***	***38***
WASTE MANAGEMENT OF Facility ID: 4001727	***8652 S 4000 W***	***NW 1/8 - 1/4 (0.183 mi.)***	***F28***	***40***

Lower Elevation	Address	Direction / Distance	Map ID	Page
ROME CABLE WEST Facility ID: 4000814	8600 S 3295 W	0 - 1/8 (0.000 mi.)	B6	13
VACANT COMMERCIAL BU Facility ID: 4002353	3450 WEST 8600 SOUTH	0 - 1/8 (0.000 mi.)	A8	14
JORDAN VALLEY HOSPIT Facility ID: 4001895	***3580 W 9000 S***	***0 - 1/8 (0.000 mi.)***	***D14***	***30***
WASATCH CABINET & FU Facility ID: 4001343	3412 W 8600 S	NNE 0 - 1/8 (0.076 mi.)	22	37
WEST JORDAN PLANT Facility ID: 4000434	***3000 W 8600 S***	***NE 1/8 - 1/4 (0.213 mi.)***	***G31***	***45***

UT AST: The Aboveground Storage Tank database contains registered ASTs. The data come from the Department of Environmental Quality's Facilities with at Least One Non-exempt Tank.

A review of the UT AST list, as provided by EDR, and dated 03/09/2016 has revealed that there is 1 UT AST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
JORDAN VALLEY HOSPIT Facility Id: 4001895 Tank Status: Currently In Use	3580 W 9000 S	0 - 1/8 (0.000 mi.)	D17	32

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 12/09/2015 has revealed that there are 6 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SAVANNAH TRANSPORT I	***3454 WEST 8600 SOUTH***	***0 - 1/8 (0.000 mi.)***	***A2***	***9***
Not reported	3520 WEST 8600 SOUTH	0 - 1/8 (0.000 mi.)	4	11
Not reported	3295 WEST 8600 SOUTH	0 - 1/8 (0.000 mi.)	B7	13
Not reported	***3392 WEST 8600 SOUTH***	***NNE 0 - 1/8 (0.005 mi.)***	***B18***	***33***
MUIR PRESSURE WASHIN	***8693 SOUTH NEWCASTLE***	***NNW 0 - 1/8 (0.051 mi.)***	***21***	***36***
DYNO NOBEL INC. (FKA	***3000 WEST 8600 SOUTH***	***NE 1/8 - 1/4 (0.213 mi.)***	***G30***	***43***

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Auto list, as provided by EDR, has revealed that there are 6 EDR Hist Auto

sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	3963 W 9000 S	0 - 1/8 (0.000 mi.)	C11	15
MECHANIC ON WHEELS	3932 DANSERE CIR	NW 0 - 1/8 (0.044 mi.)	20	36

Lower Elevation	Address	Direction / Distance	Map ID	Page
BUTTERFIELD DENNIS A	3520 OLD BINGHAM HW	0 - 1/8 (0.000 mi.)	3	11
Not reported	3454 W 8600 S	0 - 1/8 (0.000 mi.)	A5	12
SONOCO PRODUCTS COMP	3450 W 8600 S	0 - 1/8 (0.000 mi.)	A9	15
Not reported	3520 GALAXY PARK PL	NNE 0 - 1/8 (0.118 mi.)	26	38

EDR Hist Cleaner: EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Cleaner list, as provided by EDR, has revealed that there are 4 EDR Hist Cleaner sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LEGACY CLEANERS CLEA	3961 W 9000 S	0 - 1/8 (0.000 mi.)	C10	15
UTAH BOYS RANCH DRY	4080 W 9000 S	W 0 - 1/8 (0.116 mi.)	E24	38

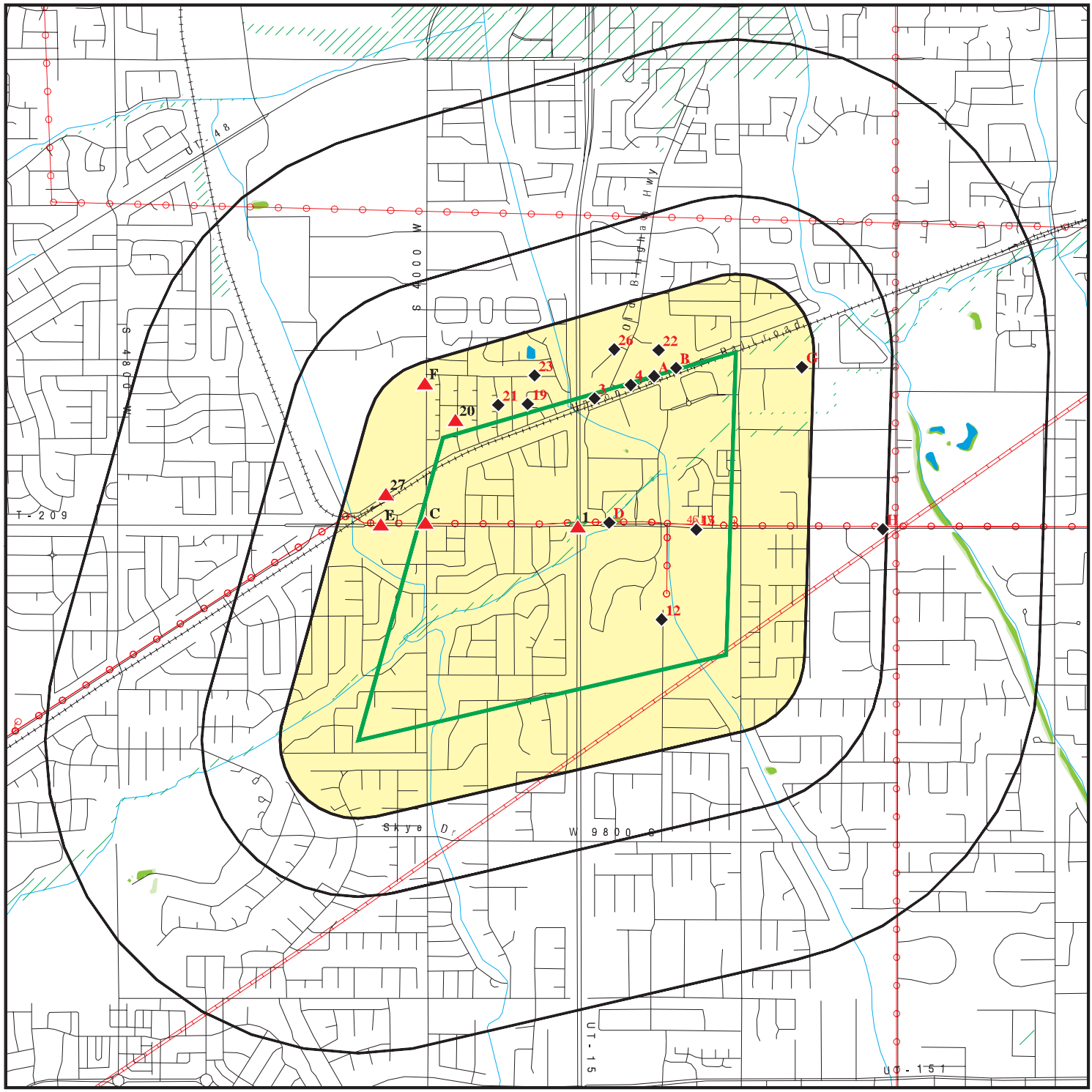
Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	8689 S 3720 W	NNW 0 - 1/8 (0.027 mi.)	19	35
C & C CARPET CLEANIN	3686 W 8620 SOUTH ST	NNW 0 - 1/8 (0.109 mi.)	23	37

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 4 records.

Site Name	Database(s)
90TH SOUTH BATTERY DUMP	SEMS-ARCHIVE
WELBY RAILYARD	UT VCP
DISCOVERY SUBDIVISION	UT VCP
UTAH UDOT #231	UT RGA LUST

OVERVIEW MAP - 4657552.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: UDOT Bengerter	CLIENT: HDR
ADDRESS: 3584 W 9000 West Jordan UT 84088	CONTACT: Manuel Rauhut
LAT/LONG: 40.587838 / 111.977208	INQUIRY #: 4657552.2s
	DATE: June 24, 2016 1:55 pm

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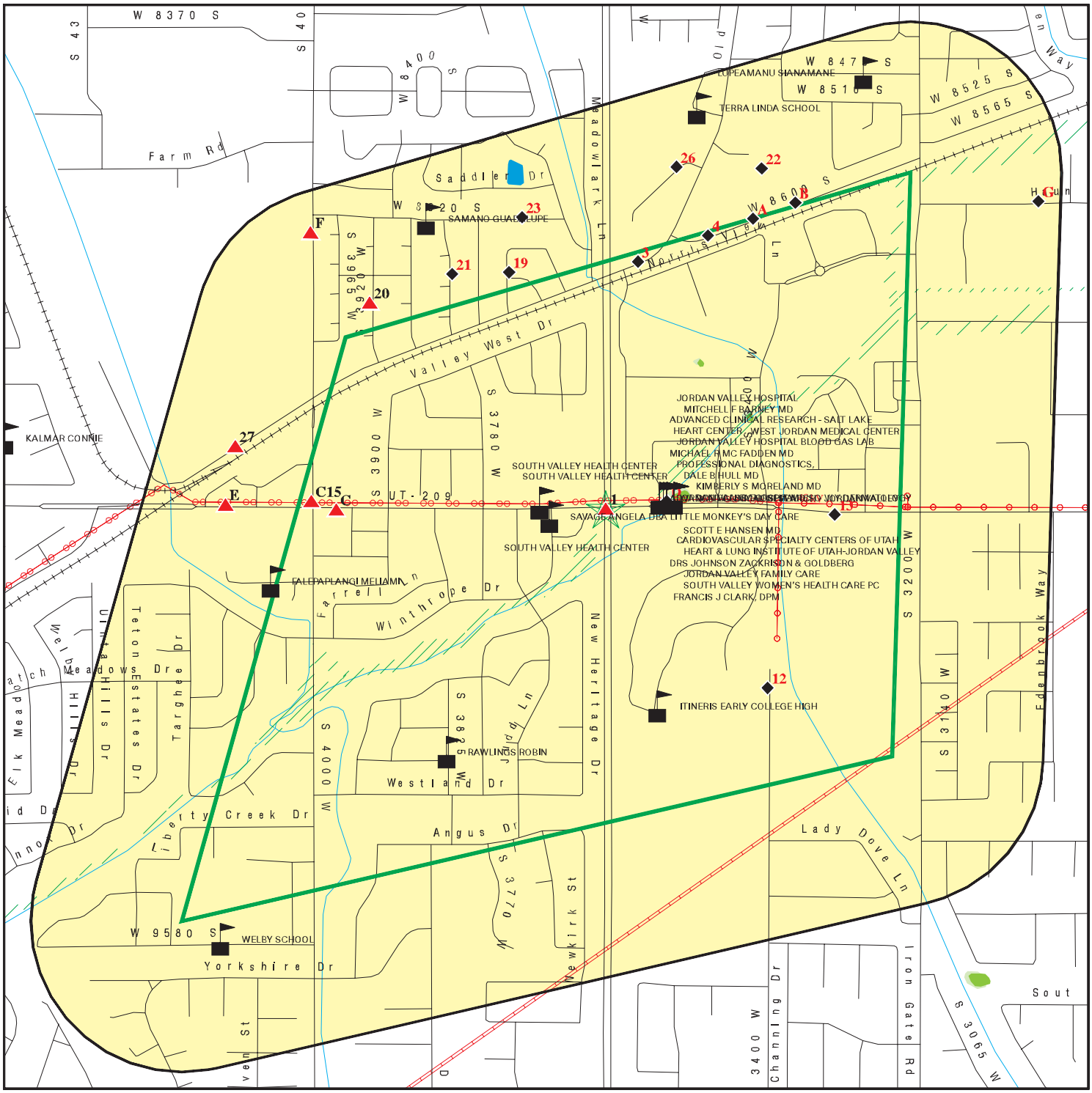
DETAIL MAP - 4657552.2S



0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: UDOT Bengerter	CLIENT: HDR
ADDRESS: 3584 W 9000	CONTACT: Manuel Rauhut
West Jordan UT 84088	INQUIRY #: 4657552.2s
LAT/LONG: 40.587838 / 111.977208	DATE: June 24, 2016 1:56 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	1	0	NR	NR	1
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	1	NR	NR	1
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		1	0	NR	NR	NR	1
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		1	1	NR	NR	NR	2
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
UT SHWS	N/A		N/A	N/A	N/A	N/A	N/A	N/A
State and tribal landfill and/or solid waste disposal site lists								
UT SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
UT LAST	0.500		0	0	0	NR	NR	0
UT LUST	0.500		1	1	1	NR	NR	3
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
UT UST	0.250		6	2	NR	NR	NR	8
UT AST	0.250		1	0	NR	NR	NR	1
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
UT INST CONTROL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
UT VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
UT BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
UT CDL	TP		NR	NR	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
UT SPILLS	TP		NR	NR	NR	NR	NR	0
UT SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		5	1	NR	NR	NR	6
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
UT DRYCLEANERS	0.250		0	0	NR	NR	NR	0
UT EWA	TP		NR	NR	NR	NR	NR	0
UT Financial Assurance	TP		NR	NR	NR	NR	NR	0
UT FUDS	TP		NR	NR	NR	NR	NR	0
CA HAZNET	TP		NR	NR	NR	NR	NR	0
UT MMRP	TP		NR	NR	NR	NR	NR	0
UT NPDES	TP	1	NR	NR	NR	NR	NR	1
UT TIER 2	TP		NR	NR	NR	NR	NR	0
UT UIC	TP		NR	NR	NR	NR	NR	0
UT UOPF	TP		NR	NR	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		6	NR	NR	NR	NR	6
EDR Hist Cleaner	0.125		4	NR	NR	NR	NR	4
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
UT RGA LF	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
UT RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		1	25	6	2	0	0	34

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

1
Target Property
Actual: 4596 ft.

JORDAN VALLEY CANCER CENTER
3584 W. 9000 S.
WEST JORDAN, UT 84088

UT NPDES **S118164115**
N/A

NPDES:

Permit:	UTR371675
NonConstruction Storm Water:	STORMWATER
Facility Oper Name:	Layton Construction
Facility Oper Address:	9090 S. Sandy Parkway
Facility Oper City:	SANDY
Facility Oper State:	UT
Facility Oper Zip:	84070
Facility Oper Phone #:	801-971-8086
Status Of Owner/Oper:	GENERAL_CONTRACTOR
Facility Oper Contact Person:	Seth Kissell
Facility Oper Contact Title:	Not reported
Facility Oper Contact Phone:	801-971-8086
Facility Site Contact Person:	Not reported
Facility Site Contact Title:	Not reported
Facility Site Contact Phone:	Not reported
Muni Operating Storm Sewer System:	West Jordan
Receiving Water Body:	Utah Lake Distribution Canal
Primary SIC Code:	Not reported
Group 1:	Not reported
Group 2:	Not reported
Group 3:	Not reported
Group 4:	Not reported
Group 5:	Not reported
Primary Sector:	Not reported
Secondary Sector:	Not reported
Third Sector:	Not reported
Fourth Sector:	Not reported
Certification Name:	Seth Kissell
Date Signed:	07/06/2015
Amount Paid:	$150.00
Date Noi Received:	07/06/2015
Date Noi Complete:	Not reported
Date Coverage Issued/Renewed:	Not reported
Date Coverage Effective:	07/06/2015
Date Coverage Expires:	07/06/2016
Inactivated:	Not reported
No Exposure:	0
Not Received:	Not reported
Permit Type:	CONSTRUCTION
Permit Name:	Not reported
DMR Cognizant Official:	Not reported
DMR Cognizant Official Tele:	Not reported
Facility Site Lat:	40.590445
Facility Site Long:	-111.976137

Permit:	UTR371675
NonConstruction Storm Water:	STORMWATER
Facility Oper Name:	RW JVCC, LLC
Facility Oper Address:	9980 S. 300 W. #310
Facility Oper City:	SANDY
Facility Oper State:	UT
Facility Oper Zip:	84070
Facility Oper Phone #:	801-501-0727
Status Of Owner/Oper:	MAIN

JORDAN VALLEY CANCER CENTER (Continued) **S118164115**

Facility Oper Contact Person:	Chas Johnson
Facility Oper Contact Title:	Not reported
Facility Oper Contact Phone:	801-501-0727
Facility Site Contact Person:	Not reported
Facility Site Contact Title:	Not reported
Facility Site Contact Phone:	Not reported
Muni Operating Storm Sewer System:	West Jordan
Receiving Water Body:	Utah Lake Distribution Canal
Primary SIC Code:	Not reported
Group 1:	Not reported
Group 2:	Not reported
Group 3:	Not reported
Group 4:	Not reported
Group 5:	Not reported
Primary Sector:	Not reported
Secondary Sector:	Not reported
Third Sector:	Not reported
Fourth Sector:	Not reported
Certification Name:	Seth Kissell
Date Signed:	07/06/2015
Amount Paid:	$150.00
Date Noi Received:	07/06/2015
Date Noi Complete:	Not reported
Date Coverage Issued/Renewed:	Not reported
Date Coverage Effective:	07/06/2015
Date Coverage Expires:	07/06/2016
Inactivated:	Not reported
No Exposure:	0
Not Received:	Not reported
Permit Type:	CONSTRUCTION
Permit Name:	Not reported
DMR Cognizant Official:	Not reported
DMR Cognizant Official Tele:	Not reported
Facility Site Lat:	40.590445
Facility Site Long:	-111.976137

A2 **SAVANNAH TRANSPORT INC.** **RCRA NonGen / NLR** **1001962162**
3454 WEST 8600 SOUTH **FINDS** **UTR000005462**
< 1/8 **WEST JORDAN, UT 84088** **ECHO**
1 ft.

Site 1 of 4 in cluster A

Relative:
Lower

Actual:
4532 ft.

RCRA NonGen / NLR:

Date form received by agency:	02/04/2000
Facility name:	Not reported
Facility address:	3454 WEST 8600 SOUTH WEST JORDAN, UT 84088
EPA ID:	UTR000005462
Mailing address:	SAME AS ABOVE WEST JORDAN, UT 84088
Contact:	PAUL NEERINGS
Contact address:	3454 WEST 8600 SOUTH WEST JORDAN, UT 84088
Contact country:	US
Contact telephone:	(801) 563-0100
Contact email:	Not reported
EPA Region:	Not reported
Classification:	Non-Generator

SAVANNAH TRANSPORT INC. (Continued) **1001962162**

Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: HOYT MOORE
Owner/operator address: 4490 NW 17TH STREET
TOPEKA, KS 66618
Owner/operator country: Not reported
Owner/operator telephone: (785) 235-3131
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: Yes
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

FINDS:

Registry ID: 110005211564

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:
Envid: 1001962162
Registry ID: 110005211564
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110005211564

3 **BUTTERFIELD DENNIS AUTO** **EDR Hist Auto** **1014160770**
3520 OLD BINGHAM HWY **N/A**
< 1/8 **WEST JORDAN, UT 84088**
1 ft.

Relative: Lower

Actual: 4550 ft.

EDR Historical Auto Stations:

Name:	BUTTERFIELD DENNIS AUTO
Year:	2000
Type:	AUTOMOBILE REPAIRING & SERVICE
Name:	BUTTERFIELD DENNIS AUTO REPAIR
Year:	2000
Address:	3520 OLD BINGHAM HWY
Name:	BUTTERFIELD DENNIS AUTO REPAIR
Year:	2002
Address:	3520 OLD BINGHAM HWY
Name:	DENNIS BUTTERFIELD AUTO REPAIR
Year:	2003
Address:	3520 OLD BINGHAM HWY
Name:	DENNIS BUTTERFIELD AUTO REPAIR
Year:	2004
Address:	3520 OLD BINGHAM HWY
Name:	DENNIS BUTTERFIELD AUTO REPAIR
Year:	2005
Address:	3520 OLD BINGHAM HWY
Name:	DENNIS BUTTERFIELD AUTO REPAIR
Year:	2006
Address:	3520 OLD BINGHAM HWY
Name:	DENNIS BUTTERFIELD AUTO REPAIR
Year:	2007
Address:	3520 OLD BINGHAM HWY
Name:	DENNIS BUTTERFIELD AUTO REPAIR
Year:	2008
Address:	3520 OLD BINGHAM HWY
Name:	DENNIS BUTTERFIELD AUTO REPAIR
Year:	2009
Address:	3520 OLD BINGHAM HWY

---

4 **RCRA NonGen / NLR** **1010335820**
3520 WEST 8600 SOUTH **UTD980954622**
< 1/8 **WEST JORDAN, UT 99999**
1 ft.

Relative: Lower

Actual: 4537 ft.

RCRA NonGen / NLR:

Date form received by agency:	02/22/2007
Facility name:	Not reported
Facility address:	3520 WEST 8600 SOUTH WEST JORDAN, UT 99999
EPA ID:	UTD980954622
Mailing address:	700 EAST SALT LAKE CITY, UT 84106
Contact:	CHARLES STRATFORD

(Continued) **1010335820**

Contact address: 3555 SOUTH 700 EAST
SALT LAKE CITY, UT 84106
Contact country: US
Contact telephone: (801) 582-7748
Contact email: Not reported
EPA Region: Not reported
Land type: Facility is not located on Indian land. Additional information is not known.
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 07/30/1985
Site name: PARACELSUS LABS
Classification: Not a generator, verified

Violation Status: No violations found

Evaluation Action Summary:
Evaluation date: 06/17/1985
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

A5 **EDR Hist Auto** **1015440026**
3454 W 8600 S **N/A**
< 1/8 **WEST JORDAN, UT 84088**
1 ft.

Site 2 of 4 in cluster A

Relative:
Lower

Actual:
4532 ft.

EDR Historical Auto Stations:
Name: DISCOVERY COLLISION & PAINTING
Year: 2007
Address: 3454 W 8600 S

Name: DISCOVERY COLLISION & PAINTING
Year: 2008
Address: 3454 W 8600 S

Name: DISCOVERY COLLISION & PAINTING

(Continued) **1015440026**

Year: 2010
Address: 3454 W 8600 S

Name: DISCOVERY COLLISION & PAINTING
Year: 2011
Address: 3454 W 8600 S

Name: DISCOVERY COLLISION & PAINTING
Year: 2012
Address: 3454 W 8600 S

B6 **ROME CABLE WEST** **UT UST** **U000559398**
8600 S 3295 W **N/A**
< 1/8 **WEST JORDAN, UT 84084**
1 ft.

Site 1 of 3 in cluster B

Relative: Lower

Actual: 4523 ft.

UST:
Facility ID: 4000814
Owner Name: SOUTHWIRE COMPANY
Owner Address: 8600 S 3295 W
Owner City,St,Zip: WEST JORDAN, UT 84084
Owner Phone: Not reported
Total Tanks: 1
Closed Tanks: 1

B7 **RCRA NonGen / NLR** **1000237802**
3295 WEST 8600 SOUTH **UTD981552383**
< 1/8 **WEST JORDAN, UT 84088**
1 ft.

Site 2 of 3 in cluster B

Relative: Lower

Actual: 4523 ft.

RCRA NonGen / NLR:
Date form received by agency: 03/27/2007
Facility name: Not reported
Facility address: 3295 WEST 8600 SOUTH
WEST JORDAN, UT 84088
EPA ID: UTD981552383
Mailing address: WEST 8600 SOUTH
WEST JORDAN, UT 84088
Contact: ROLAND DENBOW
Contact address: 3295 WEST 8600 SOUTH
WEST JORDAN, UT 84088
Contact country: US
Contact telephone: (801) 568-2352
Contact email: Not reported
EPA Region: Not reported
Land type: Facility is not located on Indian land. Additional information is not known.
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: SOUTHWIRE COMPANY
Owner/operator address: ONE SOUTHWIRE DRIVE
CARROLLTON, GA 30119
Owner/operator country: Not reported

(Continued) **1000237802**

Owner/operator telephone: (800) 444-1700
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 05/02/2006
Site name: SOUTHWIRE COMPANY
Classification: Not a generator, verified

Date form received by agency: 10/20/1987
Site name: SOUTHWIRE COMPANY
Classification: Small Quantity Generator

Violation Status: No violations found

Evaluation Action Summary:
Evaluation date: 09/04/1996
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

A8 **VACANT COMMERCIAL BUILDING** **UT UST** **U003936142**
3450 WEST 8600 SOUTH **N/A**
< 1/8 **WEST JORDAN, UT 84088**
1 ft.

Site 3 of 4 in cluster A

Relative:
Lower

Actual:
4531 ft.

UST:
Facility ID: 4002353
Owner Name: SANDY BRADSHAW
Owner Address: 1045 OBERLAND DR.
Owner City,St,Zip: MIDWAY, UT 84049
Owner Phone: (435) 735-8631
Total Tanks: 1
Closed Tanks: 1

A9 **SONOCO PRODUCTS COMPANY** **EDR Hist Auto** **1014192194**
3450 W 8600 S **N/A**
< 1/8 **WEST JORDAN, UT 84088**
1 ft.

Site 4 of 4 in cluster A

Relative: EDR Historical Auto Stations:
Lower
Name: SONOCO PRODUCTS COMPANY
Year: 2000
Actual: Type: GASOLINE STATIONS
4531 ft.

C10 **LEGACY CLEANERS CLEANERS** **EDR Hist Cleaner** **1014142901**
3961 W 9000 S **N/A**
< 1/8 **WEST JORDAN, UT 84088**
1 ft.

Site 1 of 4 in cluster C

Relative: EDR Historical Cleaners:
Higher
Name: LEGACY CLEANERS CLEANERS
Year: 2007
Actual: Type: CLEANERS
4624 ft.

Name: LEGACY CLEANERS
Year: 2010
Address: 3961 W 9000 S

Name: LEGACY CLEANERS
Year: 2011
Address: 3961 W 9000 S

Name: LEGACY CLEANERS
Year: 2012
Address: 3961 W 9000 S

C11 **EDR Hist Auto** **1015466033**
3963 W 9000 S **N/A**
< 1/8 **WEST JORDAN, UT 84088**
1 ft.

Site 2 of 4 in cluster C

Relative: EDR Historical Auto Stations:
Higher
Name: TEAM ONE CHEVRON
Year: 2008
Actual: Address: 3963 W 9000 S
4624 ft.

Name: TEAM ONE CHEVRON
Year: 2010
Address: 3963 W 9000 S

12 **S.L. COMMUNITY COLLEGE JORDAN CAMPUS** **UT LUST** **U003727644**
9100 S 3400 W **N/A**
< 1/8 **WEST JORDAN, UT 84088**
1 ft.

Relative: Lower

Actual: 4565 ft.

LUST:

Facility ID:	4002261
Release Id:	LSQ
Closed Date:	**08/25/2015**
Notification Date:	06/05/2003
Owner Name:	UTAH STATE FUEL NETWORK
Owner Address:	PO BOX 141152
Owner City:	SALT LAKE CITY
Owner State:	UT
Owner Zip:	84114
Owner City,St,Zip:	SALT LAKE CITY, UT 84114
Project Manager:	Hong Lei Tao

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13 **FAIRCHILD SEMICONDUCTOR** **RCRA-LQG** **1000260445**
3333 W 9000 S **TRIS** **84088NTNLS3333W**
< 1/8 **WEST JORDAN, UT 84088** **RAATS**
1 ft. **ICIS**
CA HAZNET

Relative: Lower

Actual: 4553 ft.

RCRA-LQG:

Date form received by agency:	04/24/2014
Facility name:	Not reported
Facility address:	3333 WEST 9000 SOUTH WEST JORDAN, UT 840888838
EPA ID:	UTD073008237
Contact:	JAMES G MATTHEWS
Contact address:	3333 WEST 9000 SOUTH WEST JORDAN, UT 840888838
Contact country:	US
Contact telephone:	801 5627596
Contact email:	JAMES.MATTHEWS@FAIRCHILDSEMI.COM
EPA Region:	Not reported
Land type:	Private
Classification:	Large Quantity Generator
Description:	Handler: generates 1,000 kg or more of hazardous waste during any calendar month; or generates more than 1 kg of acutely hazardous waste during any calendar month; or generates more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month; or generates 1 kg or less of acutely hazardous waste during any calendar month, and accumulates more than 1 kg of acutely hazardous waste at any time; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates more than 100 kg of that material at any time

Owner/Operator Summary:

Owner/operator name:	FAIRCHILD SEMICONDUCTOR
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

Owner/Operator Type: Operator
Owner/Op start date: 03/11/1997
Owner/Op end date: Not reported

Owner/operator name: FAIRCHILD SEMICONDUCTOR
Owner/operator address: WEST 9000 SOUTH
W JORDAN, UT 84088
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 03/11/1997
Owner/Op end date: Not reported

Owner/operator name: FAIRCHILD SEMICONDUCTOR
Owner/operator address: WEST 9000 SOUTH
W JORDAN, UT 84088
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 03/11/1997
Owner/Op end date: Not reported

Owner/operator name: FAIRCHILD SEMICONDUCTOR
Owner/operator address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088
Owner/operator country: Not reported
Owner/operator telephone: (801) 562-7596
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 03/11/1997
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Universal Waste Summary:
Waste type: Batteries
Accumulated waste on-site: Yes
Generated waste on-site: Not reported

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

Waste type: Lamps
Accumulated waste on-site: Yes
Generated waste on-site: Not reported

Waste type: Pesticides
Accumulated waste on-site: Yes
Generated waste on-site: Not reported

Waste type: Thermostats
Accumulated waste on-site: Yes
Generated waste on-site: Not reported

Historical Generators:
Date form received by agency: 06/11/2013
Site name: FAIRCHILD SEMICONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 02/14/2012
Site name: FAIRCHILD SEMICONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 03/15/2010
Site name: FAIRCHILD SEMICONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 02/22/2010
Site name: FAIRCHILD SEMICONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 01/25/2008
Site name: FAIRCHILD SEMICONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 02/27/2006
Site name: FAIRCHILD SEMICONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 02/25/2004
Site name: FAIRCHILD SEMICONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 02/11/2002
Site name: FAIRCHILD SEMICONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 05/21/2001
Site name: FAIRCHILD SEMICONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 05/21/2001
Site name: FAIRCHILD SEMICONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 08/03/1998
Site name: FAIRCHILD SEMICONDUCTOR
Classification: Large Quantity Generator

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

Date form received by agency: 02/21/1996
Site name: NATIONAL SEMICONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 02/22/1994
Site name: NATIONAL SEMICONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 03/09/1992
Site name: NATIONAL SEMI CONDUCTOR
Classification: Large Quantity Generator

Date form received by agency: 02/06/1990
Site name: NATIONAL SEMICONDUCTOR CORP.
Classification: Large Quantity Generator

Date form received by agency: 08/18/1980
Site name: FAIRCHILD SEMICONDUCTOR
Classification: Large Quantity Generator

Biennial Reports:

Last Biennial Reporting Year: 2013

Annual Waste Handled:

Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Amount (Lbs): 248088.2

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.
Amount (Lbs): 11208

Waste code: D004
Waste name: ARSENIC
Amount (Lbs): 3853

Waste code: D008
Waste name: LEAD
Amount (Lbs): 30

Waste code: D011
Waste name: SILVER
Amount (Lbs): 2789

Waste code: D035

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

Waste name: METHYL ETHYL KETONE
Amount (Lbs): 695

Waste code: D039
Waste name: TETRACHLOROETHYLENE
Amount (Lbs): 177

Waste code: F003
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Amount (Lbs): 241501.2

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 02/22/1989
Date achieved compliance: 07/14/1989
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 07/05/1989
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: LDR - General
Date violation determined: 01/04/1989
Date achieved compliance: 06/13/1989
Violation lead agency: EPA
Enforcement action: INITIAL 3008(A) COMPLIANCE
Enforcement action date: 03/24/1989
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: EPA
Proposed penalty amount: 4500
Final penalty amount: 4500
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: LDR - General
Date violation determined: 01/04/1989
Date achieved compliance: 06/13/1989
Violation lead agency: EPA
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 05/26/1989

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: EPA
Proposed penalty amount: 3375
Final penalty amount: 3375
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 10/03/1985
Date achieved compliance: 10/10/1986
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 09/19/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 03/11/1985
Date achieved compliance: 06/21/1985
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/17/1985
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 07/28/2015
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 05/12/2010
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 08/09/2005
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/15/1999
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 06/17/1994
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 05/19/1994
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 02/22/1989
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 07/14/1989
Evaluation lead agency: State

Evaluation date: 01/04/1989
Evaluation: NON-FINANCIAL RECORD REVIEW
Area of violation: LDR - General
Date achieved compliance: 06/13/1989
Evaluation lead agency: EPA

Evaluation date: 10/03/1985
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 10/10/1986
Evaluation lead agency: State

Evaluation date: 03/11/1985
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 06/21/1985
Evaluation lead agency: State

TRIS:

Click this hyperlink while viewing on your computer to access
6 additional US_TRIS: record(s) in the EDR Site Report.

ICIS:

Enforcement Action ID: 08-2000-0324
FRS ID: 110000469181
Program ID: RCRAINFO UTD073008237
Action Name: NATIONAL SEMICONDUCTOR CORPORATION
Full Address: 3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State: Utah
Facility Name: FAIRCHILD SEMICONDUCTOR
Facility Address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088-8853
Enforcement Action Type: EPCRA 325 Action For Penalty
Facility County: SALT LAKE
EPA Region #: 8

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

Enforcement Action ID:	08-2000-0324
FRS ID:	110000469181
Program ID:	NEI NEI42049
Action Name:	NATIONAL SEMICONDUCTOR CORPORATION
Full Address:	3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State:	Utah
Facility Name:	FAIRCHILD SEMICONDUCTOR
Facility Address:	3333 WEST 9000 SOUTH WEST JORDAN, UT 84088-8853
Enforcement Action Type:	EPCRA 325 Action For Penalty
Facility County:	SALT LAKE
EPA Region #:	8

Enforcement Action ID:	08-2000-0324
FRS ID:	110000469181
Program ID:	FRS 110000469181
Action Name:	NATIONAL SEMICONDUCTOR CORPORATION
Full Address:	3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State:	Utah
Facility Name:	FAIRCHILD SEMICONDUCTOR
Facility Address:	3333 WEST 9000 SOUTH WEST JORDAN, UT 84088-8853
Enforcement Action Type:	EPCRA 325 Action For Penalty
Facility County:	SALT LAKE
EPA Region #:	8

Enforcement Action ID:	08-2000-0324
FRS ID:	110000469181
Program ID:	E-PLAN FATR2012LDSS9142406TY
Action Name:	NATIONAL SEMICONDUCTOR CORPORATION
Full Address:	3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State:	Utah
Facility Name:	FAIRCHILD SEMICONDUCTOR
Facility Address:	3333 WEST 9000 SOUTH WEST JORDAN, UT 84088-8853
Enforcement Action Type:	EPCRA 325 Action For Penalty
Facility County:	SALT LAKE
EPA Region #:	8

Enforcement Action ID:	08-2000-0324
FRS ID:	110000469181
Program ID:	E-GGRT 1009579
Action Name:	NATIONAL SEMICONDUCTOR CORPORATION
Full Address:	3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State:	Utah
Facility Name:	FAIRCHILD SEMICONDUCTOR
Facility Address:	3333 WEST 9000 SOUTH WEST JORDAN, UT 84088-8853
Enforcement Action Type:	EPCRA 325 Action For Penalty
Facility County:	SALT LAKE
EPA Region #:	8

Enforcement Action ID:	08-2000-0324
FRS ID:	110000469181
Program ID:	CIM 490000000717
Action Name:	NATIONAL SEMICONDUCTOR CORPORATION
Full Address:	3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

State: Utah
Facility Name: FAIRCHILD SEMICONDUCTOR
Facility Address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088-8853
Enforcement Action Type: EPCRA 325 Action For Penalty
Facility County: SALT LAKE
EPA Region #: 8

Enforcement Action ID: 08-2000-0324
FRS ID: 110000469181
Program ID: BR UTD073008237
Action Name: NATIONAL SEMICONDUCTOR CORPORATION
Full Address: 3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State: Utah
Facility Name: FAIRCHILD SEMICONDUCTOR
Facility Address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088-8853
Enforcement Action Type: EPCRA 325 Action For Penalty
Facility County: SALT LAKE
EPA Region #: 8

Enforcement Action ID: 08-2000-0324
FRS ID: 110000469181
Program ID: TRIS 84088NTNLS3333W
Action Name: NATIONAL SEMICONDUCTOR CORPORATION
Full Address: 3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State: Utah
Facility Name: FAIRCHILD SEMICONDUCTOR
Facility Address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088-8853
Enforcement Action Type: EPCRA 325 Action For Penalty
Facility County: SALT LAKE
EPA Region #: 8

Enforcement Action ID: 08-1989-0061
FRS ID: 110000469181
Program ID: TRIS 84088NTNLS3333W
Action Name: NATIONAL SEMICONDUCTOR CORPORATION
Full Address: 3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State: Utah
Facility Name: FAIRCHILD SEMICONDUCTOR
Facility Address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088-8853
Enforcement Action Type: RCRA 3008A AO For Comp And/Or Penalty
Facility County: SALT LAKE
EPA Region #: 8

Enforcement Action ID: 08-1989-0061
FRS ID: 110000469181
Program ID: RCRAINFO UTD073008237
Action Name: NATIONAL SEMICONDUCTOR CORPORATION
Full Address: 3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State: Utah
Facility Name: FAIRCHILD SEMICONDUCTOR
Facility Address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088-8853
Enforcement Action Type: RCRA 3008A AO For Comp And/Or Penalty

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

Facility County: SALT LAKE
EPA Region #: 8

Enforcement Action ID: 08-1989-0061
FRS ID: 110000469181
Program ID: NEI NEI42049
Action Name: NATIONAL SEMICONDUCTOR CORPORATION
Full Address: 3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State: Utah
Facility Name: FAIRCHILD SEMICONDUCTOR
Facility Address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088-8853
Enforcement Action Type: RCRA 3008A AO For Comp And/Or Penalty
Facility County: SALT LAKE
EPA Region #: 8

Enforcement Action ID: 08-1989-0061
FRS ID: 110000469181
Program ID: FRS 110000469181
Action Name: NATIONAL SEMICONDUCTOR CORPORATION
Full Address: 3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State: Utah
Facility Name: FAIRCHILD SEMICONDUCTOR
Facility Address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088-8853
Enforcement Action Type: RCRA 3008A AO For Comp And/Or Penalty
Facility County: SALT LAKE
EPA Region #: 8

Enforcement Action ID: 08-1989-0061
FRS ID: 110000469181
Program ID: E-PLAN FATR2012LDSS9142406TY
Action Name: NATIONAL SEMICONDUCTOR CORPORATION
Full Address: 3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State: Utah
Facility Name: FAIRCHILD SEMICONDUCTOR
Facility Address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088-8853
Enforcement Action Type: RCRA 3008A AO For Comp And/Or Penalty
Facility County: SALT LAKE
EPA Region #: 8

Enforcement Action ID: 08-1989-0061
FRS ID: 110000469181
Program ID: E-GGRT 1009579
Action Name: NATIONAL SEMICONDUCTOR CORPORATION
Full Address: 3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State: Utah
Facility Name: FAIRCHILD SEMICONDUCTOR
Facility Address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088-8853
Enforcement Action Type: RCRA 3008A AO For Comp And/Or Penalty
Facility County: SALT LAKE
EPA Region #: 8

Enforcement Action ID: 08-1989-0061
FRS ID: 110000469181

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

Program ID: BR UTD073008237
Action Name: NATIONAL SEMICONDUCTOR CORPORATION
Full Address: 3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State: Utah
Facility Name: FAIRCHILD SEMICONDUCTOR
Facility Address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088-8853
Enforcement Action Type: RCRA 3008A AO For Comp And/Or Penalty
Facility County: SALT LAKE
EPA Region #: 8

Enforcement Action ID: 08-1989-0061
FRS ID: 110000469181
Program ID: CIM 490000000717
Action Name: NATIONAL SEMICONDUCTOR CORPORATION
Full Address: 3333 WEST 9000 SOUTH WEST JORDAN UT 84088-8853
State: Utah
Facility Name: FAIRCHILD SEMICONDUCTOR
Facility Address: 3333 WEST 9000 SOUTH
WEST JORDAN, UT 84088-8853
Enforcement Action Type: RCRA 3008A AO For Comp And/Or Penalty
Facility County: SALT LAKE
EPA Region #: 8

Program ID: BR UTD073008237
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: CIM 490000000717
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: E-GGRT 1009579
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: E-PLAN FATR2012LDSS9142406TY
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

Program ID: FRS 110000469181
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: NEI NEI42049
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: RCRAINFO UTD073008237
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: TRIS 84088NTNLS3333W
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: BR UTD073008237
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: CIM 490000000717
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: E-GGRT 1009579
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: E-PLAN FATR2012LDSS9142406TY

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: FRS 110000469181
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: NEI NEI42049
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: RCRAINFO UTD073008237
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

Program ID: TRIS 84088NTNLS3333W
Facility Name: FAIRCHILD SEMICONDUCTOR
Address: 3333 WEST 9000 SOUTH
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3674

HAZNET:
envid: 1000260445
Year: 2009
GEPAID: UTD073008237
Contact: GREG MATTHEWS/STAFF ENGINEER
Telephone: --
Mailing Name: Not reported
Mailing Address: 3333 W 9000 S
Mailing City,St,Zip: WEST JORDAN, UT 840888853
Gen County: Not reported
TSD EPA ID: CAD059494310
TSD County: Not reported
Waste Category: Not reported
Disposal Method: Discharge To Sewer/Potw Or Npdes(With Prior Storage--With Or Without Treatment)
Tons: 0.533
Cat Decode: Not reported
Method Decode: Discharge To Sewer/Potw Or Npdes(With Prior Storage--With Or Without

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

Treatment)
Facility County: 99

envid: 1000260445
Year: 1997
GEPAID: UTD073008237
Contact: FAIRCHILD SEMICONDUCTOR, CORP
Telephone: 0000000000
Mailing Name: Not reported
Mailing Address: 3333 W 9000 S
Mailing City,St,Zip: WEST JORDAN, UT 840888853
Gen County: Not reported
TSD EPA ID: CAD009452657
TSD County: Not reported
Waste Category: Not reported
Disposal Method: Recycler
Tons: .0000
Cat Decode: Not reported
Method Decode: Recycler
Facility County: 99

envid: 1000260445
Year: 1997
GEPAID: UTD073008237
Contact: FAIRCHILD SEMICONDUCTOR, CORP
Telephone: 0000000000
Mailing Name: Not reported
Mailing Address: 3333 W 9000 S
Mailing City,St,Zip: WEST JORDAN, UT 840888853
Gen County: Not reported
TSD EPA ID: CAD009452657
TSD County: Not reported
Waste Category: Liquids with halogenated organic compounds >= 1,000 Mg./L
Disposal Method: Recycler
Tons: 1.6263
Cat Decode: Liquids with halogenated organic compounds >= 1,000 Mg./L
Method Decode: Recycler
Facility County: 99

envid: 1000260445
Year: 1996
GEPAID: UTD073008237
Contact: FAIRCHILD SEMICONDUCTOR, CORP
Telephone: 0000000000
Mailing Name: Not reported
Mailing Address: 3333 W 9000 S
Mailing City,St,Zip: WEST JORDAN, UT 840888853
Gen County: Not reported
TSD EPA ID: CAD009452657
TSD County: Not reported
Waste Category: Unspecified oil-containing waste
Disposal Method: Recycler
Tons: 1.6500
Cat Decode: Unspecified oil-containing waste
Method Decode: Recycler
Facility County: 99

FAIRCHILD SEMICONDUCTOR (Continued) **1000260445**

envid: 1000260445
Year: 1996
GEPAID: UTD073008237
Contact: FAIRCHILD SEMICONDUCTOR, CORP
Telephone: 0000000000
Mailing Name: Not reported
Mailing Address: 3333 W 9000 S
Mailing City,St,Zip: WEST JORDAN, UT 840888853
Gen County: Not reported
TSD EPA ID: CAD009452657
TSD County: Not reported
Waste Category: Other organic solids
Disposal Method: Recycler
Tons: .2225
Cat Decode: Other organic solids
Method Decode: Recycler
Facility County: 99

Click this hyperlink while viewing on your computer to access
40 additional CA_HAZNET: record(s) in the EDR Site Report.

D14 **JORDAN VALLEY HOSPITAL** **UT UST** **U003150858**
3580 W 9000 S **UT Financial Assurance** **N/A**
< 1/8 **WEST JORDAN, UT 84088**
1 ft.

Site 1 of 2 in cluster D

Relative: Lower

Actual: 4579 ft.

UST:
Facility ID: 4001895
Owner Name: JORDAN VALLEY HOSPITAL
Owner Address: PO BOX 458
Owner City,St,Zip: WEST JORDAN, UT 84088
Owner Phone: (801) 562-4213
Total Tanks: 2
Closed Tanks: 1

UT Financial Assurance 2:
Region: 2
Facility ID: 4001895
Mechanism: PST Fund

C15 **SMITH'S FOOD & DRUG PHOTO LAB** **RCRA-CESQG** **1004788960**
9000 SOUTH 4000 WEST **FINDS** **UTR000003491**
< 1/8 **WEST JORDAN, UT 84088** **ECHO**
1 ft.

Site 3 of 4 in cluster C

Relative: Higher

Actual: 4627 ft.

RCRA-CESQG:
Date form received by agency: 10/23/1997
Facility name: Not reported
Facility address: 9000 SOUTH 4000 WEST
WEST JORDAN, UT 84088
EPA ID: UTR000003491
Mailing address: SOUTH 4000 WEST
WEST JORDAN, UT 84088
Contact: ALAN OLSEN

SMITH'S FOOD & DRUG PHOTO LAB (Continued) **1004788960**

Contact address: 9000 SOUTH 4000 WEST
WEST JORDAN, UT 84088
Contact country: US
Contact telephone: (801) 974-1500
Contact email: Not reported
EPA Region: Not reported
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: SMITH'S FOOD & DRUG CENTER INC.
Owner/operator address: 1775 WEST 1500 SOUTH
SALT LAKE CITY, UT 84104
Owner/operator country: Not reported
Owner/operator telephone: (801) 974-1400
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

FINDS:

Registry ID: 110005210119

Environmental Interest/Information System

SMITH'S FOOD & DRUG PHOTO LAB (Continued) **1004788960**

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:
Envid: 1004788960
Registry ID: 110005210119
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110005210119

C16 **WEST JORDAN CHEVRON** **UT UST** **U003859928**
3967 W 9000 S **UT Financial Assurance** **N/A**
< 1/8 **WEST JORDAN, UT 84088**
1 ft.

Site 4 of 4 in cluster C

Relative: Higher

Actual: 4625 ft.

UST:
Facility ID: 4002319
Owner Name: C & C Retail Operations LLC
Owner Address: 1929 Bella Vista Dr
Owner City,St,Zip: FARMINGTON, UT 84025
Owner Phone: (801) 628-1147
Total Tanks: 3
Closed Tanks: 0

UT Financial Assurance 2:
Region: 2
Facility ID: 4002319
Mechanism: Self-insurance

D17 **JORDAN VALLEY HOSPITAL** **UT AST** **A100356674**
3580 W 9000 S **N/A**
< 1/8 **WEST JORDAN, UT**
1 ft.

Site 2 of 2 in cluster D

Relative: Lower

Actual: 4579 ft.

AST:
Facility Id: 4001895
Owner Name: JORDAN VALLEY HOSPITAL

Tank Id: 3
Tank Status: Currently In Use
Tank Capacity: 4000
Substance Stored: Diesel

B18
NNE
< 1/8
0.005 mi.
28 ft.

Relative:
Lower

Actual:
4524 ft.

3392 WEST 8600 SOUTH
WEST JORDAN, UT 84088

Site 3 of 3 in cluster B

RCRA NonGen / NLR **1010336303**
CA HAZNET **UTD988068870**

RCRA NonGen / NLR:

Date form received by agency:	02/22/2007
Facility name:	Not reported
Facility address:	3392 WEST 8600 SOUTH WEST JORDAN, UT 84088
EPA ID:	UTD988068870
Mailing address:	WEST 8600 SOUTH WEST JORDAN, UT 84088
Contact:	JIM FORREST
Contact address:	3392 WEST 8600 SOUTH WEST JORDAN, UT 84088
Contact country:	US
Contact telephone:	(801) 569-0401
Contact email:	Not reported
EPA Region:	Not reported
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	RICHARD J. GARDINER
Owner/operator address:	DATA NOT REQUESTED DATA NOT REQUESTED, UT 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(999) 999-9999
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency:	08/03/2001
Site name:	R-CUBED COMPOSITES INC
Classification:	Not a generator, verified

Date form received by agency: 10/02/1990

(Continued) **1010336303**

Site name: R-CUBED COMPOSITES INC
Classification: Small Quantity Generator

Violation Status: No violations found

HAZNET:
envid: 1010336303
Year: 2001
GEPAID: UTD988068870
Contact: JIM FORREST
Telephone: 8015690401
Mailing Name: Not reported
Mailing Address: 3392 WEST 8600 SOUTH
Mailing City,St,Zip: WEST JORDAN, UT 840880000
Gen County: Not reported
TSD EPA ID: CAD044429835
TSD County: Not reported
Waste Category: Laboratory waste chemicals
Disposal Method: Disposal, Other
Tons: 0
Cat Decode: Laboratory waste chemicals
Method Decode: Disposal, Other
Facility County: 99

envid: 1010336303
Year: 2001
GEPAID: UTD988068870
Contact: JIM FORREST
Telephone: 8015690401
Mailing Name: Not reported
Mailing Address: 3392 WEST 8600 SOUTH
Mailing City,St,Zip: WEST JORDAN, UT 840880000
Gen County: Not reported
TSD EPA ID: CAD044429835
TSD County: Not reported
Waste Category: Laboratory waste chemicals
Disposal Method: Disposal, Other
Tons: 0
Cat Decode: Laboratory waste chemicals
Method Decode: Disposal, Other
Facility County: 99

envid: 1010336303
Year: 2001
GEPAID: UTD988068870
Contact: JIM FORREST
Telephone: 8015690401
Mailing Name: Not reported
Mailing Address: 3392 WEST 8600 SOUTH
Mailing City,St,Zip: WEST JORDAN, UT 840880000
Gen County: Not reported
TSD EPA ID: CAT080013352
TSD County: Not reported
Waste Category: Waste oil and mixed oil
Disposal Method: Recycler
Tons: 0.68
Cat Decode: Waste oil and mixed oil
Method Decode: Recycler

(Continued) **1010336303**

Facility County: 99

envid: 1010336303
Year: 2001
GEPAID: UTD988068870
Contact: JIM FORREST
Telephone: 8015690401
Mailing Name: Not reported
Mailing Address: 3392 WEST 8600 SOUTH
Mailing City,St,Zip: WEST JORDAN, UT 840880000
Gen County: Not reported
TSD EPA ID: CAD097030993
TSD County: Not reported
Waste Category: Liquids with pH <= 2
Disposal Method: Recycler
Tons: 0.22
Cat Decode: Liquids with pH <= 2
Method Decode: Recycler
Facility County: 99

envid: 1010336303
Year: 2001
GEPAID: UTD988068870
Contact: JIM FORREST
Telephone: 8015690401
Mailing Name: Not reported
Mailing Address: 3392 WEST 8600 SOUTH
Mailing City,St,Zip: WEST JORDAN, UT 840880000
Gen County: Not reported
TSD EPA ID: CAD044429835
TSD County: Not reported
Waste Category: Laboratory waste chemicals
Disposal Method: Disposal, Other
Tons: 0
Cat Decode: Laboratory waste chemicals
Method Decode: Disposal, Other
Facility County: 99

Click this hyperlink while viewing on your computer to access
10 additional CA_HAZNET: record(s) in the EDR Site Report.

19
NNW
< 1/8
0.027 mi.
145 ft.

8689 S 3720 W
WEST JORDAN, UT 84088

EDR Hist Cleaner **1015102240**
N/A

Relative:
Lower

Actual:
4574 ft.

EDR Historical Cleaners:

Name: ACCENT CARPET CLEANING SYSTEMS
Year: 2008
Address: 8689 S 3720 W

Name: ACCENT CARPET CLEANING SYSTEMS
Year: 2009
Address: 8689 S 3720 W

20
NW
< 1/8
0.044 mi.
232 ft.

MECHANIC ON WHEELS
3932 DANSERE CIR
WEST JORDAN, UT 84088

EDR Hist Auto **1014177183**
N/A

Relative:
Higher

Actual:
4600 ft.

EDR Historical Auto Stations:
Name: MECHANIC ON WHEELS
Year: 1991
Type: AUTOMOBILE REPAIRING & SERVICE

21
NNW
< 1/8
0.051 mi.
271 ft.

MUIR PRESSURE WASHING
8693 SOUTH NEWCASTLE ROAD
WEST JORDAN, UT 84088

RCRA NonGen / NLR **1001125896**
FINDS **UTR000002220**
ECHO

Relative:
Lower

Actual:
4583 ft.

RCRA NonGen / NLR:
Date form received by agency: 07/03/2007
Facility name: Not reported
Facility address: 8693 SOUTH NEWCASTLE ROAD
WEST JORDAN, UT 84088
EPA ID: UTR000002220
Mailing address: SAME AS ABOVE
WEST JORDAN, UT 84088
Contact: CLINT MUIR
Contact address: 8693 SOUTH NEWCASTLE ROAD
WEST JORDAN, UT 84088
Contact country: US
Contact telephone: (801) 280-0608
Contact email: Not reported
EPA Region: Not reported
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: CLINT M. MUIR
Owner/operator address: 8693 SOUTH NEWCASTLE ROAD
WEST JORDAN, UT 84088
Owner/operator country: Not reported
Owner/operator telephone: (801) 280-0608
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No

MUIR PRESSURE WASHING (Continued) **1001125896**

Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 10/30/1996
Site name: MUIR PRESSURE WASHING
Classification: Not a generator, verified

Violation Status: No violations found

FINDS:

Registry ID: 110005209210

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:
Envid: 1001125896
Registry ID: 110005209210
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110005209210

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22 **WASTACH CABINET & FURNITURE CO.** **UT UST** **U003150829**
NNE **3412 W 8600 S** **N/A**
< 1/8 **WEST JORDAN, UT 84084**
0.076 mi.
399 ft.

Relative:
Lower

Actual:
4527 ft.

UST:
Facility ID: 4001343
Owner Name: WASATCH CABINET & FURNITURE CO
Owner Address: 3412 W 8600 S
Owner City,St,Zip: WEST JORDAN, UT 84084
Owner Phone: (801) 255-7117
Total Tanks: 1
Closed Tanks: 1

---

23 **C & C CARPET CLEANING CARPET & RUG** **EDR Hist Cleaner** **1014157848**
NNW **3686 W 8620 SOUTH ST** **N/A**
< 1/8 **WEST JORDAN, UT 84084**
0.109 mi.
576 ft.

Relative:
Lower

Actual:
4568 ft.

EDR Historical Cleaners:
Name: C & C CARPET CLEANING CARPET & RUG
Year: 1991
Type: CARPET AND RUG CLEANERS

E24
West
< 1/8
0.116 mi.
614 ft.

UTAH BOYS RANCH DRY
4080 W 9000 S
WEST JORDAN, UT 84088

EDR Hist Cleaner

1014159386
N/A

Site 1 of 2 in cluster E

Relative:
Higher

Actual:
4645 ft.

EDR Historical Cleaners:

Name:	UTAH BOYS RANCH DRY
Year:	2007
Type:	CLEANERS
Name:	UTAH BOYS RANCH DRY CLEANER
Year:	2010
Address:	4080 W 9000 S

E25
West
< 1/8
0.116 mi.
614 ft.

SMITHS #158
4080 W 9000 S
WEST JORDAN, UT 84088

UT UST
UT Financial Assurance

U004044584
N/A

Site 2 of 2 in cluster E

Relative:
Higher

Actual:
4645 ft.

UST:

Facility ID:	4002380
Owner Name:	SMITHS FOOD & DRUG CENTERS INC
Owner Address:	PO BOX 305103
Owner City,St,Zip:	NASHVILLE, TN 37230
Owner Phone:	(801) 977-1048
Total Tanks:	3
Closed Tanks:	0

UT Financial Assurance 2:

Region:	2
Facility ID:	4002380
Mechanism:	Insurance

26
NNE
< 1/8
0.118 mi.
621 ft.

3520 GALAXY PARK PL
WEST JORDAN, UT 84088

EDR Hist Auto

1014171004
N/A

Relative:
Lower

Actual:
4538 ft.

EDR Historical Auto Stations:

Name:	DENNIS BUTTERFIELD AUTO
Year:	2007
Type:	AUTOMOBILE REPAIRING & SERVICE
Name:	BUTTERFIELD DENNIS AUTO REPAIR
Year:	2005
Address:	3520 GALAXY PARK PL
Name:	BUTTERFIELD DENNIS AUTO REPAIR
Year:	2007
Address:	3520 GALAXY PARK PL
Name:	BUTTERFIELD DENNIS AUTO REPAIR
Year:	2008
Address:	3520 GALAXY PARK PL

(Continued) **1014171004**

Name: DENNIS BUTTERFIELD AUTO REPAIR
Year: 2011
Address: 3520 GALAXY PARK PL

Name: DENNIS BUTTERFIELD AUTO REPAIR
Year: 2012
Address: 3520 GALAXY PARK PL

---

27 **WELBY RAILYARD** **SEMS** **1001475667**
West **4200 WEST OLD BINGHAM HIGHWAY** **UTSFN7577532**
1/8-1/4 **WEST JORDAN, UT 84088**
0.127 mi.
672 ft.

Relative:
Higher

Actual:
4633 ft.

SEMS:
Site ID: 801697
EPA ID: UTSFN7577532
Federal Facility: N
NPL: Not on the NPL
Non NPL Status: Other Cleanup Activity: State-Lead Cleanup

Following information was gathered from the prior CERCLIS update completed in 10/2013:
Site ID: 0801697
EPA ID: UTSFN7577532
Facility County: SALT LAKE
Short Name: WELBY RAILYARD
Congressional District: Not reported
IFMS ID: Not reported
SMSA Number: Not reported
USGC Hydro Unit: Not reported
Federal Facility: Not a Federal Facility
DMNSN Number: 0.00000
Site Orphan Flag: Not reported
RCRA ID: Not reported
USGS Quadrangle: Not reported
Site Init By Prog: S
NFRAP Flag: Not reported
Parent ID: Not reported
RST Code: Not reported
EPA Region: 08
Classification: Not reported
Site Settings Code: Not reported
NPL Status: Not on the NPL
DMNSN Unit Code: Not reported
RBRAC Code: Not reported
RResp Fed Agency Code: Not reported
Non NPL Status: Other Cleanup Activity: State-Lead Cleanup
Non NPL Status Date: 01/08/09
Site Fips Code: 49035
CC Concurrence Date: / /
CC Concurrence FY: Not reported
Alias EPA ID: Not reported
Site FUDS Flag: Not reported

CERCLIS Site Contact Name(s):
Contact ID: 13002897.00000
Contact Name: Ryan Dunham

WELBY RAILYARD (Continued) **1001475667**

Contact Tel: (303) 312-6627
Contact Title: Site Assessment Manager (SAM)
Contact Email: Not reported

Alias Comments: Not reported
Site Description: Entered into agreement with UDEQ VCP as of July 6, 2006

CERCLIS Assessment History:

Action Code: 001
Action: DISCOVERY
Date Started: / /
Date Completed: 08/12/98
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: PRELIMINARY ASSESSMENT
Date Started: / /
Date Completed: 12/07/00
Priority Level: Higher priority for further assessment
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: SITE INSPECTION
Date Started: 05/09/02
Date Completed: 03/02/05
Priority Level: Low priority for further assessment
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

F28 **WASTE MANAGEMENT OF UTAH INC.** **UT UST** **U003150845**
NW **8652 S 4000 W** **UT Financial Assurance** **N/A**
1/8-1/4 **WEST JORDAN, UT 84088**
0.183 mi.
968 ft. **Site 1 of 2 in cluster F**

Relative:
Higher

Actual:
4603 ft.

UST:
Facility ID: 4001727
Owner Name: WASTE MANAGEMENT OF UTAH INC
Owner Address: 8652 S 4000 W
Owner City,St,Zip: WEST JORDAN, UT 84088
Owner Phone: (801) 569-8200
Total Tanks: 3

WASTE MANAGEMENT OF UTAH INC. (Continued) **U003150845**

Closed Tanks: 0

UT Financial Assurance 2:
Region: 2
Facility ID: 4001727
Mechanism: Insurance

F29 **WASTE MANAGEMENT OF UTAH** **RCRA-CESQG** **1004605902**
NW **8652 SOUTH 4000 WEST** **FINDS** **UTD078556537**
1/8-1/4 **WEST JORDAN, UT 84088** **ECHO**
0.183 mi.
968 ft. **Site 2 of 2 in cluster F**

Relative:
Higher

Actual:
4603 ft.

RCRA-CESQG:
Date form received by agency: 05/03/1994
Facility name: Not reported
Facility address: 8652 SOUTH 4000 WEST
WEST JORDAN, UT 84088
EPA ID: UTD078556537
Mailing address: SOUTH 4000 WEST
WEST JORDAN, UT 84088
Contact: DAVE PECK
Contact address: 8652 SOUTH 4000 WEST
WEST JORDAN, UT 84088
Contact country: US
Contact telephone: (801) 569-8200
Contact email: Not reported
EPA Region: Not reported
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: WASTE MANAGEMENT INC
Owner/operator address: 8652 SOUTH 4000 WEST
WEST JORDAN, UT 84084
Owner/operator country: Not reported
Owner/operator telephone: (801) 569-8200
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:

WASTE MANAGEMENT OF UTAH (Continued) **1004605902**

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Violation Status: No violations found

FINDS:

Registry ID: 110001882865

Environmental Interest/Information System

AFS (Aerometric Information Retrieval System (AIRS) Facility Subsystem) replaces the former Compliance Data System (CDS), the National Emission Data System (NEDS), and the Storage and Retrieval of Aerometric Data (SAROAD). AIRS is the national repository for information concerning airborne pollution in the United States. AFS is used to track emissions and compliance data from industrial plants. AFS data are utilized by states to prepare State Implementation Plans to comply with regulatory programs and by EPA as an input for the estimation of total national emissions. AFS is undergoing a major redesign to support facility operating permits required under Title V of the Clean Air Act.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

The CIM (Utah - Common Identifier Mechanism) is Utah's Department of Environmental Quality (UDEQ) mechanism for compliance and permitting operations.

ECHO:

Envid:	1004605902
Registry ID:	110001882865
DFR URL:	http://echo.epa.gov/detailed_facility_report?fid=110001882865

G30 **DYNO NOBEL INC. (FKA IRECO)** **RCRA NonGen / NLR** **1000176801**
NE **3000 WEST 8600 SOUTH** **FINDS** **UTD980960835**
1/8-1/4 **WEST JORDAN, UT 84088** **ECHO**
0.213 mi.
1125 ft. **Site 1 of 2 in cluster G**

Relative:
Lower

Actual:
4491 ft.

RCRA NonGen / NLR:

Date form received by agency:	12/12/2011
Facility name:	Not reported
Facility address:	3000 WEST 8600 SOUTH WEST JORDAN, UT 84084
EPA ID:	UTD980960835
Mailing address:	8600 SOUTH WEST JORDAN, UT 84084
Contact:	THAYNE GROSSENBACK
Contact address:	3000 WEST 8600 SOUTH WEST JORDAN, UT 84084
Contact country:	US
Contact telephone:	(801) 566-1821
Contact email:	THAYNE.GROSSENBACH@AM.DYNONOBEL.COM
EPA Region:	Not reported
Land type:	Private
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	JJ LAND COMPANY, LC
Owner/operator address:	1650 NORTH CENTERVILLE, UT 84014
Owner/operator country:	US
Owner/operator telephone:	(801) 295-2228
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	10/31/1997
Owner/Op end date:	Not reported

Owner/operator name:	IRECO INCORPORATED
Owner/operator address:	DATA NOT REQUESTED DATA NOT REQUESTED, UT 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(999) 999-9999
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	DYNO NOBEL INC.
Owner/operator address:	8600 SOUTH WEST JORDAN, UT 84088
Owner/operator country:	US
Owner/operator telephone:	(801) 566-1821
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	08/01/2010
Owner/Op end date:	Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No

DYNO NOBEL INC. (FKA IRECO) (Continued) **1000176801**

Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 04/11/1986
Site name: IRECO INCORPORATED, W. JORDAN
Classification: Small Quantity Generator

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 08/31/1989
Date achieved compliance: 09/30/1989
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 12/07/2011
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 08/31/1989
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 09/30/1989
Evaluation lead agency: State

FINDS:

Registry ID: 110005200763

Environmental Interest/Information System
NCDB (National Compliance Data Base) supports implementation of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TSCA). The system tracks inspections in

DYNO NOBEL INC. (FKA IRECO) (Continued) **1000176801**

regions and states with cooperative agreements, enforcement actions, and settlements.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:

Envid:	1000176801
Registry ID:	110005200763
DFR URL:	http://echo.epa.gov/detailed_facility_report?fid=110005200763

G31 **WEST JORDAN PLANT** **UT LUST** **U003167807**
NE **3000 W 8600 S** **UT UST** **N/A**
1/8-1/4 **WEST JORDAN, UT 84084**
0.213 mi.
1125 ft. **Site 2 of 2 in cluster G**

Relative:
Lower

Actual:
4491 ft.

LUST:

Facility ID:	4000434
Release Id:	FBY
Closed Date:	**09/19/1990**
Notification Date:	01/10/1989
Owner Name:	IRECO INCORPORATED
Owner Address:	ELEVENTH FLOOR CROSSROADS TOWER
Owner City:	SALT LAKE CITY
Owner State:	UT
Owner Zip:	84144
Owner City,St,Zip:	SALT LAKE CITY, UT 84144
Project Manager:	[Paul Zahn]

UST:

Facility ID:	4000434
Owner Name:	IRECO INCORPORATED
Owner Address:	ELEVENTH FLOOR CROSSROADS TOWER
Owner City,St,Zip:	SALT LAKE CITY, UT 84144
Owner Phone:	(801) 364-4800
Total Tanks:	3
Closed Tanks:	3

H32 **XPRESS MART** **UT LUST** **U003150851**
East **2729 W 9000 S** **UT UST** **N/A**
1/4-1/2 **WEST JORDAN, UT 84088** **UT Financial Assurance**
0.487 mi.
2573 ft. **Site 1 of 2 in cluster H**

Relative:
Lower

Actual:
4489 ft.

LUST:

Facility ID:	4000973
Release Id:	KMT
Closed Date:	**09/17/1998**
Notification Date:	06/15/1998

XPRESS MART (Continued) **U003150851**

Owner Name: DHINGRA II LLC
Owner Address: 2729 W 9000 S
Owner City: WEST JORDAN
Owner State: UT
Owner Zip: 84088
Owner City,St,Zip: WEST JORDAN, UT 84088
Project Manager: [Bruce Hagans]

Facility ID: 4000973
Release Id: LIN
Closed Date: 05/15/2014
Notification Date: 01/19/2001
Owner Name: DHINGRA II LLC
Owner Address: 2729 W 9000 S
Owner City: WEST JORDAN
Owner State: UT
Owner Zip: 84088
Owner City,St,Zip: WEST JORDAN, UT 84088
Project Manager: Hong Lei Tao

UST:
Facility ID: 4000973
Owner Name: DHINGRA II LLC
Owner Address: 2729 W 9000 S
Owner City,St,Zip: WEST JORDAN, UT 84088
Owner Phone: (801) 859-7727
Total Tanks: 5
Closed Tanks: 1

UT Financial Assurance 2:
Region: 2
Facility ID: 4000973
Mechanism: PST Fund

H33 **WEST JORDAN TOP STOP #C-27** **SEMS-ARCHIVE** **1001814582**
East **2729 WEST 9000 SOUTH** **UT0008970500**
1/4-1/2 **WEST JORDAN, UT 84088**
0.487 mi.
2573 ft. **Site 2 of 2 in cluster H**

Relative:
Lower

Actual:
4489 ft.

SEMS-ARCHIVE:
Site ID: 801731
EPA ID: UT0008970500
Federal Facility: N
NPL: Not on the NPL
Non NPL Status: NFRAP-Site does not qualify for the NPL based on existing information

Following information was gathered from the prior CERCLIS update completed in 10/2013:
Site ID: 0801731
Federal Facility: Not a Federal Facility
NPL Status: Not on the NPL
Non NPL Status: NFRAP-Site does not qualify for the NPL based on existing information

CERCLIS-NFRAP Site Contact Details:
Contact Sequence ID: 13385197.00000
Person ID: 13002897.00000

WEST JORDAN TOP STOP #C-27 (Continued) **1001814582**

CERCLIS-NFRAP Assessment History:

Action:	PRELIMINARY ASSESSMENT
Date Started:	/ /
Date Completed:	10/09/01
Priority Level:	Low priority for further assessment
Action:	ARCHIVE SITE
Date Started:	/ /
Date Completed:	02/15/07
Priority Level:	Not reported
Action:	SITE REASSESSMENT
Date Started:	/ /
Date Completed:	01/20/05
Priority Level:	NFRAP-Site does not qualify for the NPL based on existing information
Action:	DISCOVERY
Date Started:	/ /
Date Completed:	09/20/99
Priority Level:	Not reported

Count: 4 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
WEST JORDAN	S107596880	WELBY RAILYARD	4300 WEST & 9000 SOUTH		UT VCP
WEST JORDAN	S107867969	DISCOVERY SUBDIVISION	8400 SOUTH 6900 WEST		UT VCP
WEST JORDAN	S116256408	UTAH UDOT #231	3840 W 78OO S		UT RGA LUST
WEST JORDAN	1009463073	90TH SOUTH BATTERY DUMP	3580 W 90TH ST/HWY 40	84088	SEMS-ARCHIVE

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: N/A
Last EDR Contact: 04/05/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: N/A
Last EDR Contact: 04/05/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: N/A
Last EDR Contact: 04/05/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/13/2015
Date Data Arrived at EDR: 01/06/2016
Date Made Active in Reports: 05/20/2016
Number of Days to Update: 135

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/08/2016
Next Scheduled EDR Contact: 07/18/2016
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/05/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/05/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 34

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/28/2015
Date Data Arrived at EDR: 05/29/2015
Date Made Active in Reports: 06/11/2015
Number of Days to Update: 13

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/16/2016
Next Scheduled EDR Contact: 08/29/2016
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 09/11/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 53

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/25/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 09/11/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 53

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/25/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 03/28/2016
Date Data Arrived at EDR: 03/30/2016
Date Made Active in Reports: 05/20/2016
Number of Days to Update: 51

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Annually

State- and tribal - equivalent CERCLIS

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: Department of Environmental Quality
Telephone: 801-536-4100
Last EDR Contact: 04/28/2016
Next Scheduled EDR Contact: 08/15/2016
Data Release Frequency: N/A

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: List of Landfills

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 01/15/2016
Date Data Arrived at EDR: 01/20/2016
Date Made Active in Reports: 03/14/2016
Number of Days to Update: 54

Source: Department of Environmental Quality
Telephone: 801-538-6170
Last EDR Contact: 04/11/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Semi-Annually

State and tribal leaking storage tank lists

LAST: Leaking Aboveground Storage Tank Sites

A listing of leaking aboveground storage tank locations.

Date of Government Version: 03/09/2016
Date Data Arrived at EDR: 03/11/2016
Date Made Active in Reports: 05/04/2016
Number of Days to Update: 54

Source: Department of Environmental Quality
Telephone: 801-536-4141
Last EDR Contact: 06/06/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Varies

LUST: Sites with Leaking Underground Storage Tanks

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 01/20/2016
Date Data Arrived at EDR: 01/21/2016
Date Made Active in Reports: 03/14/2016
Number of Days to Update: 53

Source: Department of Environmental Quality
Telephone: 801-536-4115
Last EDR Contact: 04/21/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Quarterly

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/13/2015
Date Data Arrived at EDR: 10/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 118
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 01/07/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 41
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/27/2015
Date Data Arrived at EDR: 10/29/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 67
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 10/09/2015
Date Data Arrived at EDR: 02/12/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 112
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 12/11/2015
Date Data Arrived at EDR: 02/19/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 105
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 02/05/2016
Date Data Arrived at EDR: 04/29/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 35
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/26/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Semi-Annually

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 02/17/2016
Date Data Arrived at EDR: 04/27/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 37
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 02/25/2016
Date Data Arrived at EDR: 04/27/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/11/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Varies

UST: List of Sites with Underground Storage Tanks
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 01/20/2016
Date Data Arrived at EDR: 01/21/2016
Date Made Active in Reports: 03/14/2016
Number of Days to Update: 53

Source: Department of Environmental Quality
Telephone: 801-536-4115
Last EDR Contact: 04/21/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Quarterly

AST: Listing of Aboveground Storage Tanks
Aboveground storage tank site locations.

Date of Government Version: 03/09/2016
Date Data Arrived at EDR: 03/11/2016
Date Made Active in Reports: 05/04/2016
Number of Days to Update: 54

Source: Department of Environmental Quality
Telephone: 801-536-4100
Last EDR Contact: 06/06/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 12/03/2015
Date Data Arrived at EDR: 02/04/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 120

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 11/05/2015
Date Data Arrived at EDR: 11/13/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 52

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 02/05/2016
Date Data Arrived at EDR: 04/29/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 35

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/26/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Semi-Annually

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/29/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 67

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 01/07/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 41

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 02/25/2016
Date Data Arrived at EDR: 04/27/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 37

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 01/26/2016
Date Data Arrived at EDR: 02/05/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 119

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/23/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 65

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

INST CONTROL: Sites with Institutional Controls
Sites included on the Brownfields Sites listing that have institutional controls in place.

Date of Government Version: 02/02/2016
Date Data Arrived at EDR: 02/04/2016
Date Made Active in Reports: 03/14/2016
Number of Days to Update: 39

Source: Department of Environmental Quality
Telephone: 801-536-4100
Last EDR Contact: 05/06/2016
Next Scheduled EDR Contact: 08/15/2016
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 04/01/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Varies

VCP: Voluntary Cleanup Sites List
The purpose of the program is to encourage the voluntary cleanup of sites where there has been a contaminant release threatening public health and the environment, thereby removing the stigma attached to these sites which blocks economic redevelopment. Voluntary cleanup of these sites will hopefully result in clearing the pathway for returning these properties to beneficial use.

Date of Government Version: 02/17/2016
Date Data Arrived at EDR: 02/23/2016
Date Made Active in Reports: 03/14/2016
Number of Days to Update: 20

Source: Department of Environmental Quality
Telephone: 801-536-4100
Last EDR Contact: 05/31/2016
Next Scheduled EDR Contact: 08/29/2016
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Brownfields Assessment Sites
A Brownfields site means real property, the expansion, redevelopment or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant, controlled substance or petroleum product.

Date of Government Version: 05/01/2015
Date Data Arrived at EDR: 06/04/2015
Date Made Active in Reports: 07/06/2015
Number of Days to Update: 32

Source: Department of Environmental Quality
Telephone: 801-536-4100
Last EDR Contact: 05/31/2016
Next Scheduled EDR Contact: 08/29/2016
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/22/2015
Date Data Arrived at EDR: 12/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 57
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/22/2016
Next Scheduled EDR Contact: 10/03/2016
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/15/2016
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137
Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/21/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 02/18/2016
Date Data Arrived at EDR: 03/07/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 88
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/01/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: No Update Planned

CDL: Methamphetamine Contaminated Properties Listing

Utah Administrative Rule 19-6-901 Illegal Drug Operations Site Reporting and Decontamination Act requires local health departments to maintain a list of properties believed to be contaminated by the illegal manufacture of drugs. The following properties were reported to the Salt Lake Valley Health Department by a complaint or report from a law enforcement agency and the Department has determined that reasonable evidence exists that the property is contaminated.

Date of Government Version: 02/19/2016
Date Data Arrived at EDR: 02/24/2016
Date Made Active in Reports: 03/14/2016
Number of Days to Update: 19

Source: Salt Lake Valley Health Department
Telephone: 801-468-2750
Last EDR Contact: 05/25/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Varies

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 02/18/2016
Date Data Arrived at EDR: 03/07/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 88

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/31/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 04/26/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/24/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/02/2015
Number of Days to Update: 68

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Annually

SPILLS: Spills Data

Incidents reported to the Division of Environmental Response and Remediation

Date of Government Version: 02/10/2016
Date Data Arrived at EDR: 02/12/2016
Date Made Active in Reports: 03/14/2016
Number of Days to Update: 31

Source: Department of Environmental Quality
Telephone: 801-536-4100
Last EDR Contact: 04/18/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Semi-Annually

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 07/31/2011
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/11/2013
Number of Days to Update: 39

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Varies

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 06/10/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/15/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/15/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/20/2016
Next Scheduled EDR Contact: 08/29/2016
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/01/2015
Date Data Arrived at EDR: 09/03/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 05/18/2016
Next Scheduled EDR Contact: 08/29/2016
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/09/2016
Next Scheduled EDR Contact: 08/22/2016
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/12/2016
Next Scheduled EDR Contact: 08/22/2016
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/15/2015
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 14

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 133

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/24/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/25/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 06/07/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 08/01/2015
Date Data Arrived at EDR: 08/26/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/25/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 05/12/2016
Next Scheduled EDR Contact: 08/22/2016
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 10/15/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 33

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/12/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 01/23/2015
Date Data Arrived at EDR: 02/06/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 04/08/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 05/20/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 05/20/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 03/18/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 28

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 05/06/2016
Next Scheduled EDR Contact: 08/22/2016
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 06/09/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 06/10/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 04/26/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/07/2015
Date Data Arrived at EDR: 07/09/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 69
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/08/2016
Next Scheduled EDR Contact: 07/18/2016
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 05/04/2016
Next Scheduled EDR Contact: 08/15/2016
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/02/2015
Number of Days to Update: 46

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/24/2015
Date Made Active in Reports: 09/30/2015
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 05/27/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/15/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 03/11/2016
Date Data Arrived at EDR: 03/15/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 80

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 05/09/2016
Next Scheduled EDR Contact: 08/22/2016
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 05/23/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 11/25/2014
Date Data Arrived at EDR: 11/26/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 04/07/2016
Next Scheduled EDR Contact: 07/18/2016
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 06/22/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 06/22/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/09/2016
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 44

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 06/02/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 06/03/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 06/03/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Varies

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/20/2015
Date Data Arrived at EDR: 09/09/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 55

Source: EPA
Telephone: (303) 312-6312
Last EDR Contact: 06/08/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 03/01/2016
Date Data Arrived at EDR: 03/03/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 33

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 05/25/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 10/25/2015
Date Data Arrived at EDR: 01/29/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 67

Source: Department of Defense
Telephone: 571-373-0407
Last EDR Contact: 06/20/2016
Next Scheduled EDR Contact: 10/03/2016
Data Release Frequency: Varies

DRYCLEANERS: Registered Drycleaners

A listing of registered drycleaners.

Date of Government Version: 01/20/2016
Date Data Arrived at EDR: 01/22/2016
Date Made Active in Reports: 03/14/2016
Number of Days to Update: 52

Source: Department of Environmental Quality
Telephone: 801-536-4437
Last EDR Contact: 04/18/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Varies

EWA: Enforceable Written Assurances

EWA contains locations of potential Enforceable Written Assurance sites. EWAs will generally ensure to property owners or prospective property owners that there is no unacceptable risk to human health or the environment. EWA locations are based on coordinates derived from maps and GPS data. These locations represent sites, not contaminated areas.

Date of Government Version: 03/18/2016
Date Data Arrived at EDR: 03/23/2016
Date Made Active in Reports: 05/04/2016
Number of Days to Update: 42

Source: Department of Environmental Quality
Telephone: 801-536-4167
Last EDR Contact: 03/23/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 01/15/2016
Date Data Arrived at EDR: 01/19/2016
Date Made Active in Reports: 03/14/2016
Number of Days to Update: 55

Source: Department of Environmental Quality
Telephone: 801-538-6794
Last EDR Contact: 04/25/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

Financial assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay

Date of Government Version: 03/09/2016
Date Data Arrived at EDR: 03/11/2016
Date Made Active in Reports: 05/04/2016
Number of Days to Update: 54

Source: Department of Environmental Quality
Telephone: 801-536-4141
Last EDR Contact: 06/06/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Varies

FUDS: Formerly Used Defense Sites

Formerly used defense sites.

Date of Government Version: 01/26/2016
Date Data Arrived at EDR: 01/28/2016
Date Made Active in Reports: 03/14/2016
Number of Days to Update: 46

Source: Utah AGRC
Telephone: 801-538-3665
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

MMRP: Military Munitions Response Program

Environment.MMRP contains locations of Military Munitions Response Program sites. MMRP manages the environmental, health and safety issues presented by unexploded ordnances (UXO), discarded military munitions (DMM) and munitions constituents (MC). Locations are based on coordinates derived from maps and GPS data. These locations represent sites, not contaminated areas.

Date of Government Version: 03/18/2016
Date Data Arrived at EDR: 03/24/2016
Date Made Active in Reports: 05/04/2016
Number of Days to Update: 41

Source: Department of Environmental Quality
Telephone: 801-539-4164
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Varies

NPDES: Permitted Facilities Listing

A listing of Division of Water Quality permits.

Date of Government Version: 03/15/2016
Date Data Arrived at EDR: 03/18/2016
Date Made Active in Reports: 05/04/2016
Number of Days to Update: 47

Source: Department of Environmental Quality
Telephone: 801-538-6146
Last EDR Contact: 06/13/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Varies

TIER 2: Tier 2 Facility Listing

TIER 2 contains locations of Tier II facilities under the Emergency Planning and Community Right-to-Know Act (EPCRA). Qualifying facilities report on hazardous and toxic chemicals and are labeled either tier I or tier II. Locations are based on coordinates derived from maps and GPS data. These locations represent sites, not contaminated areas.

Date of Government Version: 03/18/2016
Date Data Arrived at EDR: 03/24/2016
Date Made Active in Reports: 05/04/2016
Number of Days to Update: 41

Source: Department of Environmental Quality
Telephone: 801-536-4152
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Varies

UIC: UIC Site Location Listing
A listing of underground injection control wells.

Date of Government Version: 03/01/2016
Date Data Arrived at EDR: 03/03/2016
Date Made Active in Reports: 05/04/2016
Number of Days to Update: 62

Source: Department of Natural Resources
Telephone: 801-538-5329
Last EDR Contact: 06/02/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Quarterly

UOPF: Used Oil Permitted Facilities
DSHW Permitted Used Oil Facilities contains locations in Utah of all Used Oil Facilities: Marketers, Porcessoors, Transfer, Transport and Off-specification Permitted by UDEQ Division of Hazardous Waste (DSHW) ? Used Oil Section.

Date of Government Version: 04/22/2015
Date Data Arrived at EDR: 06/24/2015
Date Made Active in Reports: 07/06/2015
Number of Days to Update: 12

Source: Department of Environmental Quality
Telephone: 801-538-9408
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/22/2016
Date Data Arrived at EDR: 02/24/2016
Date Made Active in Reports: 05/20/2016
Number of Days to Update: 86

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 05/25/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information
ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/20/2015
Date Data Arrived at EDR: 09/23/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 103

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 06/22/2016
Next Scheduled EDR Contact: 10/03/2016
Data Release Frequency: Quarterly

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Utah.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/16/2014
Number of Days to Update: 199

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Utah.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/03/2014
Number of Days to Update: 186

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 05/01/2016
Date Data Arrived at EDR: 05/06/2016
Date Made Active in Reports: 06/17/2016
Number of Days to Update: 42

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/06/2016
Next Scheduled EDR Contact: 08/15/2016
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/24/2015
Date Made Active in Reports: 08/18/2015
Number of Days to Update: 25

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/18/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 04/14/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 50

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/13/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.
Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.
Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.
Daycare Centers: Child Care Provider List
Source: Department of Health
Telephone: 801-538-9299

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Utah Geological Survey
Telephone: 801-537-3300

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

UDOT BENGERTER
3584 W 9000
WEST JORDAN, UT 84088

TARGET PROPERTY COORDINATES

Latitude (North):	40.587838 - 40° 35' 16.22''
Longitude (West):	111.977208 - 111° 58' 37.95''
Universal Tranverse Mercator:	Zone 12
UTM X (Meters):	417302.7
UTM Y (Meters):	4493252.5
Elevation:	4596 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	6010284 MIDVALE, UT
Version Date:	2014
West Map:	6008625 COPPERTON, UT
Version Date:	2014

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

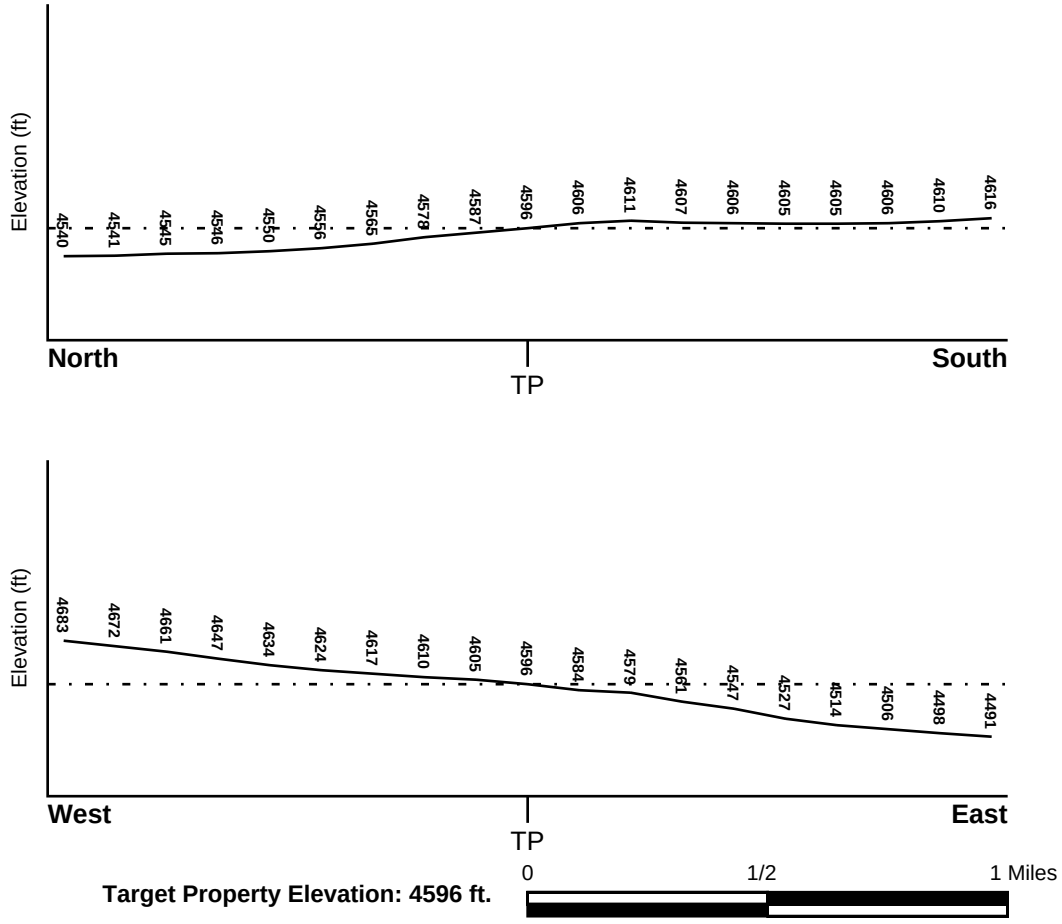
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 4596 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
SALT LAKE, UT	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 49035C - FEMA DFIRM Flood data

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
MIDVALE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

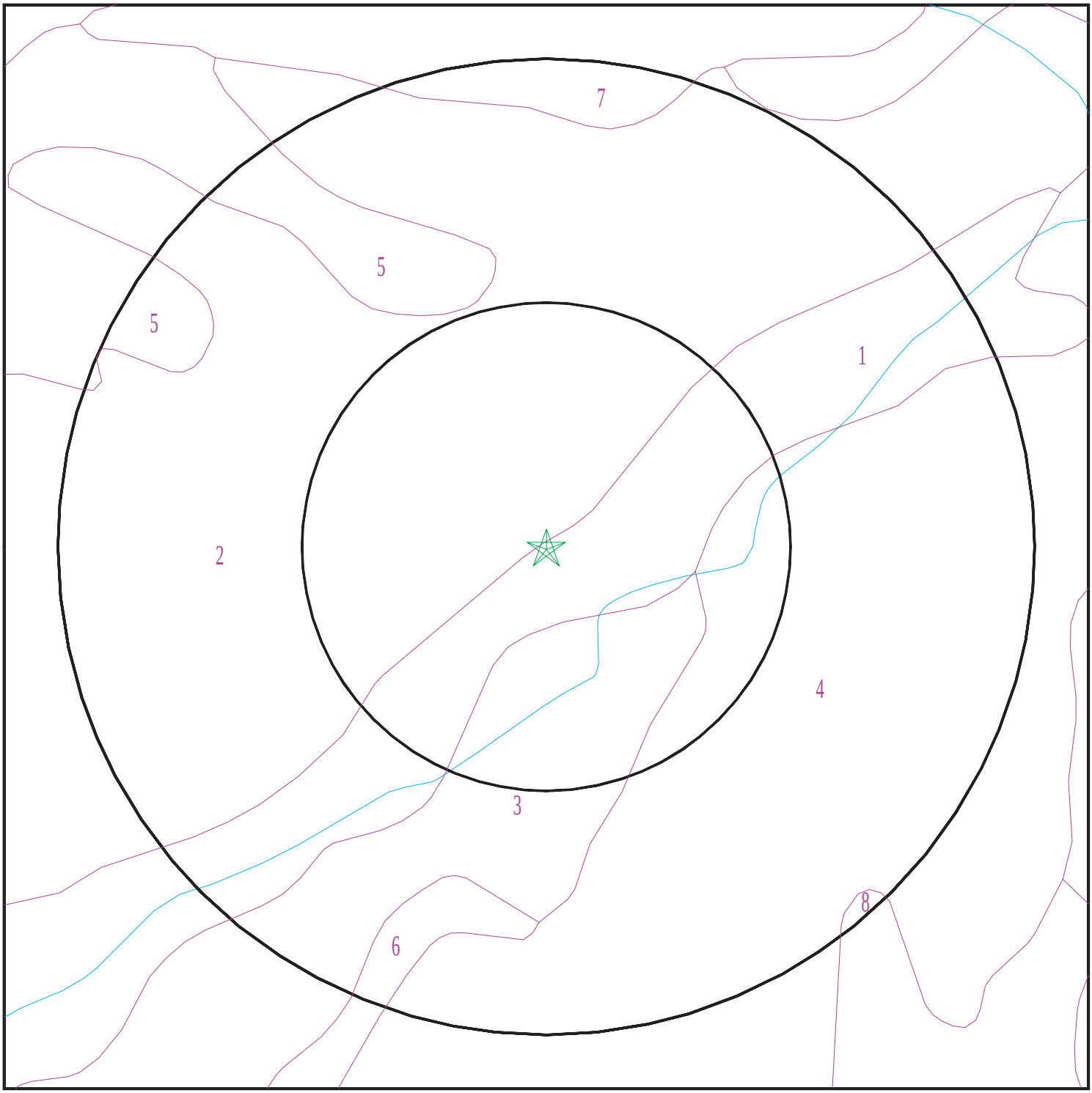
Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 4657552.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	UDOT Bengerter	CLIENT:	HDR
ADDRESS:	3584 W 9000 West Jordan UT 84088	CONTACT:	Manuel Rauhut
LAT/LONG:	40.587838 / 111.977208	INQUIRY #:	4657552.2s
		DATE:	June 24, 2016 1:56 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: RED ROCK

Soil Surface Texture: silt loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	3 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 4.23 Min: 1.41	Max: 7.8 Min: 7.4
2	3 inches	20 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 7.8 Min: 7.4
3	20 inches	27 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.9

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
4	27 inches	40 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.23 Min: 1.41	Max: 8.4 Min: 7.9
5	40 inches	44 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 4.23 Min: 1.41	Max: 9 Min: 8.5
6	44 inches	59 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 9 Min: 8.5

Soil Map ID: 2

Soil Component Name: BUTTERFIELD

Soil Surface Texture: gravelly silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 127 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	gravelly silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14.11 Min: 4.23	Max: 8.4 Min: 7.4
2	5 inches	9 inches	very gravelly silt loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14.11 Min: 4.23	Max: 8.4 Min: 7.4
3	9 inches	22 inches	extremely gravelly loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4.23 Min: 1.41	Max: 8.4 Min: 7.4
4	22 inches	50 inches	very gravelly loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4.23 Min: 1.41	Max: 8.4 Min: 7.4
5	50 inches	59 inches	unweathered bedrock	Not reported	Not reported	Max: 1.41 Min: 0	Max: Min:

Soil Map ID: 3

Soil Component Name: BINGHAM

Soil Surface Texture: gravelly loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	5 inches	9 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 42.34 Min: 14.11	Max: 7.3 Min: 6.6
2	14 inches	22 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 42.34 Min: 14.11	Max: 9 Min: 8.5
3	22 inches	35 inches	cobbly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 42.34 Min: 14.11	Max: 9 Min: 8.5
4	35 inches	59 inches	very cobbly loamy sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 141.14 Min: 42.34	Max: 9 Min: 8.5
5	0 inches	5 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 42.34 Min: 14.11	Max: 7.3 Min: 6.6
6	9 inches	14 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 42.34 Min: 14.11	Max: 9 Min: 8.5

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 4

Soil Component Name: BINGHAM

Soil Surface Texture: loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	5 inches	9 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14.11 Min: 4.23	Max: 7.3 Min: 6.6
2	14 inches	22 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 42.34 Min: 14.11	Max: 9 Min: 8.5
3	22 inches	35 inches	cobbly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 42.34 Min: 14.11	Max: 9 Min: 8.5
4	35 inches	59 inches	very cobbly loamy sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 141.14 Min: 42.34	Max: 9 Min: 8.5
5	0 inches	5 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14.11 Min: 4.23	Max: 7.3 Min: 6.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
6	9 inches	14 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 42.34 Min: 14.11	Max: 9 Min: 8.5

Soil Map ID: 5

Soil Component Name: BLUFFDALE

Soil Surface Texture: sandy loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42.34 Min: 14.11	Max: 8.4 Min: 7.9
2	16 inches	22 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 9 Min: 7.9

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	31 inches	40 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 9 Min: 8.5
4	40 inches	61 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 9 Min: 8.5
5	9 inches	16 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 9 Min: 7.9
6	22 inches	31 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 9 Min: 8.5

Soil Map ID: 6

Soil Component Name: BINGHAM

Soil Surface Texture: gravelly loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 42.34 Min: 14.11	Max: 7.3 Min: 6.6
2	5 inches	9 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 42.34 Min: 14.11	Max: 7.3 Min: 6.6
3	9 inches	14 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 42.34 Min: 14.11	Max: 9 Min: 8.5
4	14 inches	22 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 42.34 Min: 14.11	Max: 9 Min: 8.5
5	22 inches	35 inches	cobbly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 42.34 Min: 14.11	Max: 9 Min: 8.5
6	35 inches	59 inches	very cobbly loamy sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 141.14 Min: 42.34	Max: 9 Min: 8.5

Soil Map ID: 7

Soil Component Name: BLUFFDALE

Soil Surface Texture: silty clay loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Moderately well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.23 Min: 1.41	Max: 8.4 Min: 7.9
2	16 inches	22 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 9 Min: 7.9
3	31 inches	40 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 9 Min: 8.5
4	40 inches	61 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 9 Min: 8.5
5	9 inches	16 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 9 Min: 7.9
6	22 inches	31 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 9 Min: 7.9

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 8

Soil Component Name: HANS

Soil Surface Texture: silt loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	33 inches	42 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 4.23 Min: 1.41	Max: 9 Min: 8.5
2	0 inches	7 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 4.23 Min: 1.41	Max: 8.4 Min: 7.9
3	7 inches	14 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.9

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
4	14 inches	20 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.9
5	20 inches	33 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.42	Max: 9 Min: 8.5
6	42 inches	59 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 4.23 Min: 1.41	Max: 9 Min: 8.5

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 0.001 miles
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
B9	USGS40001189340	1/4 - 1/2 Mile SSE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
20	USGS40001189434	1/2 - 1 Mile NNW
26	USGS40001189352	1/2 - 1 Mile East
H34	USGS40001189492	1/2 - 1 Mile NNE
I41	USGS40001189366	1/2 - 1 Mile West
J45	USGS40001189347	1/2 - 1 Mile West
46	USGS40001189317	1/2 - 1 Mile SE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

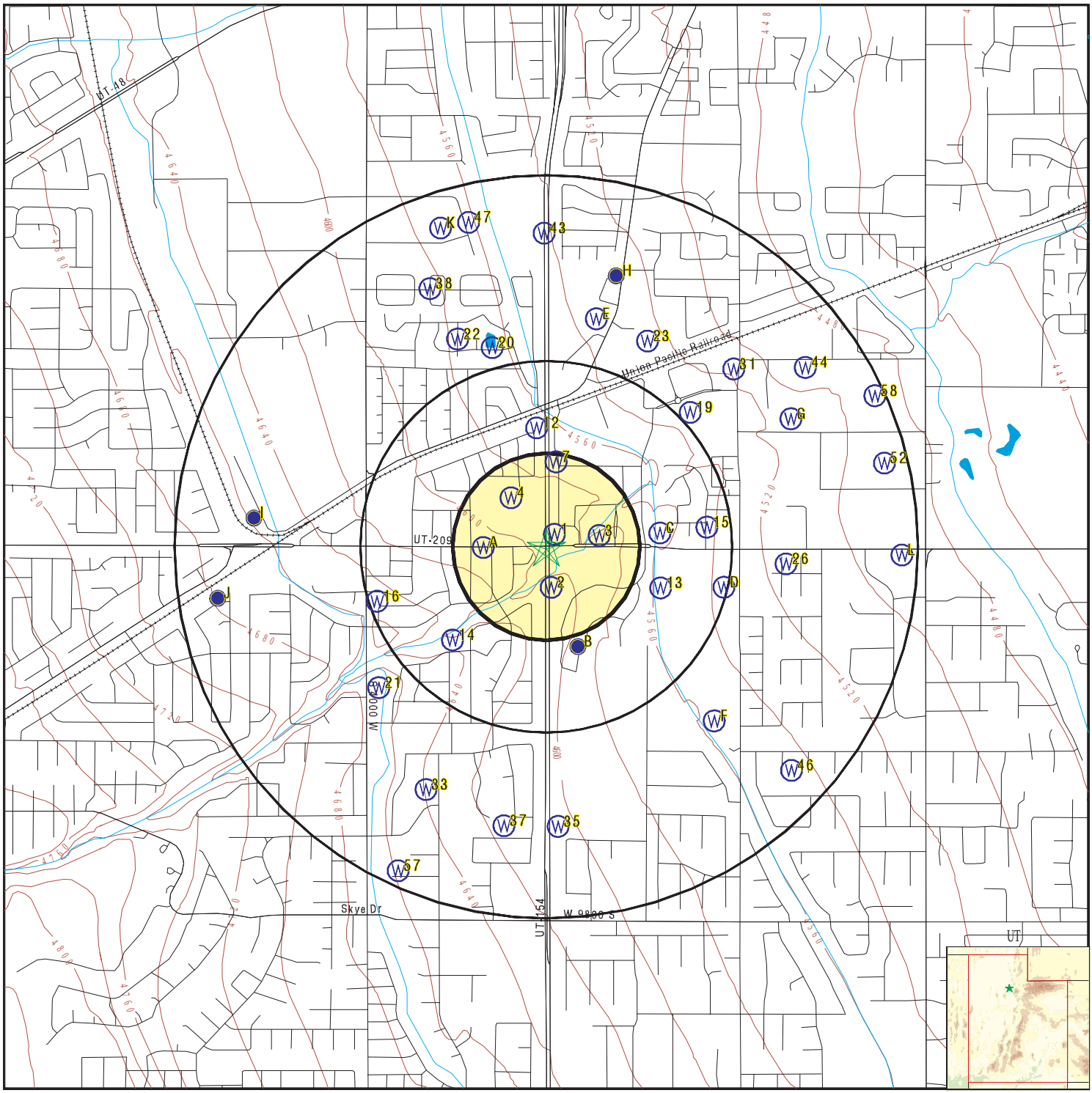
MAP ID	WELL ID	LOCATION FROM TP
1	UTDNR1000181044	0 - 1/8 Mile NNE
2	UTDNR1000181791	0 - 1/8 Mile South
3	UTDNR1000187956	1/8 - 1/4 Mile ENE
4	UTDNR1000185691	1/8 - 1/4 Mile NW
A5	UTDNR1000181779	1/8 - 1/4 Mile West
A6	UTDNR1000181583	1/8 - 1/4 Mile West
7	UTDNR1000000329	1/8 - 1/4 Mile North
B8	UTDNR1000181657	1/4 - 1/2 Mile South
C10	UTDNR1000185313	1/4 - 1/2 Mile East
C11	UTDNR1000186538	1/4 - 1/2 Mile East
12	UTDNR1000181467	1/4 - 1/2 Mile North
13	UTDNR1000011026	1/4 - 1/2 Mile ESE
14	UTDNR1000186050	1/4 - 1/2 Mile SW
15	UTDNR1000182996	1/4 - 1/2 Mile East
16	UTDNR1000007853	1/4 - 1/2 Mile WSW
D17	UTDNR1000011028	1/4 - 1/2 Mile East
D18	UTDNR1000011027	1/4 - 1/2 Mile ESE
19	UTDNR1000185914	1/2 - 1 Mile NE
21	UTDNR1000181117	1/2 - 1 Mile SW
22	UTDNR1000011947	1/2 - 1 Mile NNW
23	UTDNR1000185566	1/2 - 1 Mile NNE
E24	UTDNR1000183293	1/2 - 1 Mile NNE
E25	UTDNR1000278331	1/2 - 1 Mile NNE
F27	UTDNR1000181435	1/2 - 1 Mile SE
F28	UTDNR1000262473	1/2 - 1 Mile SE
F29	UTDNR1000262481	1/2 - 1 Mile SE
F30	UTDNR1000001183	1/2 - 1 Mile SE
31	UTDNR1000183825	1/2 - 1 Mile NE
G32	UTDNR1000184484	1/2 - 1 Mile ENE
33	UTDNR1000186171	1/2 - 1 Mile SSW
35	UTDNR1000000328	1/2 - 1 Mile South

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
H36	UTDNR1000182181	1/2 - 1 Mile NNE
37	UTDNR1000186331	1/2 - 1 Mile South
38	UTDNR1000185973	1/2 - 1 Mile NNW
G39	UTDNR1000184507	1/2 - 1 Mile ENE
G40	UTDNR1000186385	1/2 - 1 Mile ENE
I42	UTDNR1000187893	1/2 - 1 Mile West
43	UTDNR1000188332	1/2 - 1 Mile North
44	UTDNR1000185094	1/2 - 1 Mile NE
47	UTDNR1000185836	1/2 - 1 Mile NNW
J48	UTDNR1000183289	1/2 - 1 Mile West
J49	UTDNR1000183288	1/2 - 1 Mile West
K50	UTDNR1000184292	1/2 - 1 Mile NNW
K51	UTDNR1000184532	1/2 - 1 Mile NNW
52	UTDNR1000185820	1/2 - 1 Mile ENE
L53	UTDNR1000003443	1/2 - 1 Mile East
L54	UTDNR1000003444	1/2 - 1 Mile East
L55	UTDNR1000003445	1/2 - 1 Mile East
L56	UTDNR1000003446	1/2 - 1 Mile East
57	UTDNR1000186423	1/2 - 1 Mile SSW
58	UTDNR1000183805	1/2 - 1 Mile ENE
L59	UTDNR1000001832	1/2 - 1 Mile East

PHYSICAL SETTING SOURCE MAP - 4657552.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- Oil, gas or related wells

SITE NAME:	UDOT Bengerter	CLIENT:	HDR
ADDRESS:	3584 W 9000 West Jordan UT 84088	CONTACT:	Manuel Rauhut
LAT/LONG:	40.587838 / 111.977208	INQUIRY #:	4657552.2s
		DATE:	June 24, 2016 1:56 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
NNE
0 - 1/8 Mile
Lower

UT WELLS **UTDNR1000181044**

Fid:	181043	Wrnum:	59-1282
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLDIS
Priority:	Not Reported	Uses:	Not Reported
Cfs:	.015	Acft:	0
Location:	S2435 E10 N4 05 3S 1W SL	Win:	0
Owner:	JAMES ATWOOD		
Source:	Underground Water Well		
Wrlink:	59-1282		
Val:	T	Site id:	UTDNR1000181044

2
South
0 - 1/8 Mile
Higher

UT WELLS **UTDNR1000181791**

Fid:	181790	Wrnum:	59-1694
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	APPLCERT
Priority:	19630322	Uses:	IS
Cfs:	1	Acft:	0
Location:	S530 W2665 E4 05 3S 1W SL	Win:	497
Owner:	DEE'S INCORPORATED		
Source:	Underground Water Well		
Wrlink:	59-1694		
Val:	V	Site id:	UTDNR1000181791

3
ENE
1/8 - 1/4 Mile
Lower

UT WELLS **UTDNR1000187956**

Fid:	187955	Wrnum:	59-598
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	APPLNPR
Priority:	19471007	Uses:	IS
Cfs:	.015	Acft:	0
Location:	N200 W1975 E4 05 3S 1W SL	Win:	494
Owner:	JAMES M. ATWOOD		
Source:	Underground Water Well		
Wrlink:	59-598		
Val:	V	Site id:	UTDNR1000187956

4
NW
1/8 - 1/4 Mile
Lower

UT WELLS **UTDNR1000185691**

Fid:	185690	Wrnum:	59-4624
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	APPLCERT
Priority:	19780322	Uses:	DIS
Cfs:	.015	Acft:	0
Location:	S1910 W600 N4 05 3S 1W SL	Win:	493
Owner:	HENRY H AND MAYE W DEASON		
Source:	Underground Water Well		
Wrlink:	59-4624		
Val:	V	Site id:	UTDNR1000185691

A5
West
1/8 - 1/4 Mile
Higher

UT WELLS **UTDNR1000181779**

Fid:	181778	Wrnum:	59-1683
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLLAP
Priority:	19630130	Uses:	Not Reported
Cfs:	.015	Acft:	0
Location:	S2616 E1657 NW 05 3S 1W SL	Win:	0
Owner:	CHARLES L. ALLISON		
Source:	Underground Water Well		
Wrlink:	59-1683		
Val:	T	Site id:	UTDNR1000181779

A6
West
1/8 - 1/4 Mile
Higher

UT WELLS **UTDNR1000181583**

Fid:	181582	Wrnum:	59-1611
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLLAP
Priority:	19610529	Uses:	Not Reported
Cfs:	2	Acft:	0
Location:	S2616 E1607 NW 05 3S 1W SL	Win:	0
Owner:	CHARLES L. ALLISON		
Source:	Underground Water Well		
Wrlink:	59-1611		
Val:	T	Site id:	UTDNR1000181583

7
North
1/8 - 1/4 Mile
Lower

UT WELLS **UTDNR1000000329**

Fid:	328	Wrnum:	0057009M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	S1406 E46 N4 05 3S 1W SL	Win:	23066
Owner:	JORDAN VALLEY WATER CONSERVANCY		
Source:	Non-Production Well: Unknown		
Wrlink:	0057009M00		
Val:	V	Site id:	UTDNR1000000329

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

B8
South
1/4 - 1/2 Mile
Higher

UT WELLS **UTDNR1000181657**

Fid:	181656	Wrnum:	59-1671
Chexnum:	Not Reported	Type:	Abandonded Well
Summary st:	P	Status:	APPLCERT
Priority:	19620426	Uses:	MO
Cfs:	0	Acft:	66.13
Location:	N1276 E168 S4 05 3S 1W SL	Win:	66
Owner:	KENNECOTT UTAH COPPER LLC		
Source:	Underground Water Well		
Wrlink:	59-1671		
Val:	V	Site id:	UTDNR1000181657

B9
SSE
1/4 - 1/2 Mile
Lower

FED USGS **USGS40001189340**

Org. Identifier:	USGS-UT		
Formal name:	USGS Utah Water Science Center		
Monloc Identifier:	USGS-403502111582701		
Monloc name:	(C- 3- 1) 5dcb- 1		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	16020204	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	40.5838367
Longitude:	-111.9749372	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	4600.00
Vert measure units:	feet	Vertacc measure val:	20
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley Fill		
Aquifer type:	Not Reported		
Construction date:	19610721	Welldepth:	373
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

C10
East
1/4 - 1/2 Mile
Lower

UT WELLS **UTDNR1000185313**

Fid:	185312	Wrnum:	59-4259
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	APPLCERT
Priority:	19760719	Uses:	DIS
Cfs:	.043	Acft:	0
Location:	N251 W1127 E4 05 3S 1W SL	Win:	495
Owner:	HARVEY PULLEY		
Source:	Underground Water Well		
Wrlink:	59-4259		
Val:	V	Site id:	UTDNR1000185313

C11
East
1/4 - 1/2 Mile
Lower

UT WELLS **UTDNR1000186538**

Fid:	186537	Wrnum:	59-5311
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLLAP
Priority:	19760719	Uses:	I
Cfs:	.057	Acft:	0
Location:	N200 W1100 E4 05 3S 1W SL	Win:	0
Owner:	HARVEY PULLEY		
Source:	Underground Water Well		
Wrlink:	59-5311		
Val:	T	Site id:	UTDNR1000186538

12
North
1/4 - 1/2 Mile
Lower

UT WELLS **UTDNR1000181467**

Fid:	181466	Wrnum:	59-1551
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	APPLCERT
Priority:	19690229	Uses:	DI
Cfs:	.015	Acft:	0
Location:	S921 W226 N4 05 3S 1W SL	Win:	496
Owner:	DAVID I & GAYLE P. GARDNER		
Source:	Underground Water Well		
Wrlink:	59-1551		
Val:	V	Site id:	UTDNR1000181467

13
ESE
1/4 - 1/2 Mile
Lower

UT WELLS **UTDNR1000011026**

Fid:	11025	Wrnum:	9759003M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	N2100 W1100 SE 05 3S 1W SL	Win:	15220
Owner:	FAIRCHILD SEMICONDUCTOR C/O CH2M HILL		
Source:	Non-Production Well: Unknown		
Wrlink:	9759003M00		
Val:	V	Site id:	UTDNR1000011026

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
14 **SW** **1/4 - 1/2 Mile** **Higher**	**UT WELLS**	**UTDNR1000186050**

Fid:	186049	Wrnum:	59-4947
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLLAP
Priority:	19830526	Uses:	DIS
Cfs:	.05	Acft:	0
Location:	N1300 E1200 SW 05 3S 1W SL	Win:	0
Owner:	SUSAN D. BALVIN		
Source:	Underground Water Well		
Wrlink:	59-4947		
Val:	T	Site id:	UTDNR1000186050

---

15 **East** **1/4 - 1/2 Mile** **Lower**	**UT WELLS**	**UTDNR1000182996**

Fid:	182995	Wrnum:	59-2411
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	UGWCDIS
Priority:	1921	Uses:	Not Reported
Cfs:	.222	Acft:	0
Location:	N302 W445 E4 05 3S 1W SL	Win:	0
Owner:	ERNEST G. ERICKSON		
Source:	Underground Water Well		
Wrlink:	59-2411		
Val:	T	Site id:	UTDNR1000182996

---

16 **WSW** **1/4 - 1/2 Mile** **Higher**	**UT WELLS**	**UTDNR1000007853**

Fid:	7852	Wrnum:	1359007M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	S750 E126 W4 05 3S 1W SL	Win:	0
Owner:	UTAH GEOTHERMAL		
Source:	Non-Production Well: Closed Loop Heat Exchange		
Wrlink:	1359007M00		
Val:	V	Site id:	UTDNR1000007853

D17 **East** **1/4 - 1/2 Mile** **Lower**	**UT WELLS**	**UTDNR1000011028**

Fid:	11027	Wrnum:	9759003M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	N2200 W200 SE 05 3S 1W SL	Win:	15219
Owner:	FAIRCHILD SEMICONDUCTOR C/O CH2M HILL		
Source:	Non-Production Well: Unknown		
Wrlink:	9759003M00		
Val:	V	Site id:	UTDNR1000011028

D18
ESE
1/4 - 1/2 Mile
Lower

UT WELLS **UTDNR1000011027**

Fid:	11026	Wrnum:	9759003M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	N2000 W200 SE 05 3S 1W SL	Win:	15218
Owner:	FAIRCHILD SEMICONDUCTOR C/O CH2M HILL		
Source:	Non-Production Well: Unknown		
Wrlink:	9759003M00		
Val:	V	Site id:	UTDNR1000011027

19
NE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000185914**

Fid:	185913	Wrnum:	59-4831
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLLAP
Priority:	19810721	Uses:	IO
Cfs:	1	Acft:	0
Location:	S720 W674 NE 05 3S 1W SL	Win:	0
Owner:	SOUTHWIRE COMPANY		
Source:	Underground Water Well		
Wrlink:	59-4831		
Val:	T	Site id:	UTDNR1000185914

20
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS40001189434**

Org. Identifier:	USGS-UT		
Formal name:	USGS Utah Water Science Center		
Monloc Identifier:	USGS-403544111584801		
Monloc name:	(C- 2- 1)32ccd- 1		
Monloc type:	Well		
Monloc desc:	NAWQA ULUS POLY 31		
Huc code:	16020204	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	40.5956056
Longitude:	-111.9799667	Sourcemap scale:	24000

Horiz Acc measure:	.5	Horiz Acc measure units:	seconds
Horiz Collection method:	Global positioning system (GPS), uncorrected		
Horiz coord refsys:	NAD83	Vert measure val:	4562
Vert measure units:	feet	Vertacc measure val:	2.5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Basin and Range basin-fill aquifers		
Formation type:	Valley Fill		
Aquifer type:	Unconfined single aquifer		
Construction date:	19990511	Welldepth:	153.5
Welldepth units:	ft	Wellholedepth:	153.5
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 21

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
2001-07-18	146.32		2001-06-27	147.49	
2001-05-14	146.84		2001-04-10	145.10	
2001-03-12	143.44		2001-02-15	142.01	
2001-02-08	141.61		2001-01-09	139.88	
2000-12-14	138.82		2000-11-17	137.91	
2000-11-01	137.60		2000-10-11	139.62	
2000-08-17	141.90		2000-07-05	145.33	
2000-06-09	146.14		2000-05-05	145.34	
2000-03-30	143.19		2000-03-28	143.19	
2000-02-04	139.47		1999-11-29	135.56	
1999-10-21	135.17				

21
SW
1/2 - 1 Mile
Higher

UT WELLS **UTDNR1000181117**

Fid:	181116	Wrnum:	59-1302
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	APPLNPR
Priority:	19570131	Uses:	DI
Cfs:	.015	Acft:	0
Location:	N635 E145 SW 05 3S 1W SL	Win:	492
Owner:	WILLIAM H. BOOTH		
Source:	Underground Water Well		
Wrlink:	59-1302		
Val:	V	Site id:	UTDNR1000181117

22
NNW
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000011947**

Fid:	11946	Wrnum:	9959003M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	N350 E1300 SW 32 2S 1W SL	Win:	19168
Owner:	U S GEOLOGICAL SURVEY		
Source:	Non-Production Well: Unknown		
Wrlink:	9959003M00		
Val:	V	Site id:	UTDNR1000011947

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

23
NNE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000185566**

Fid:	185565	Wrnum:	59-4553
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLLAP
Priority:	19850626	Uses:	O
Cfs:	1	Acft:	0
Location:	N300 W1270 SE 32 2S 1W SL	Win:	0
Owner:	REPUBLIC REALTY: UTAH PARTNERSHIP		
Source:	Underground Water Well		
Wrlink:	59-4553		
Val:	T	Site id:	UTDNR1000185566

E24
NNE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000183293**

Fid:	183292	Wrnum:	59-2680
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	UGWC
Priority:	1927	Uses:	S
Cfs:	.018	Acft:	.21
Location:	N620 E640 S4 32 2S 1W SL	Win:	0
Owner:	DEARING FAMILY TRUST		
Source:	Underground Water Well		
Wrlink:	59-2680		
Val:	V	Site id:	UTDNR1000183293

E25
NNE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000278331**

Fid:	278330	Wrnum:	59-2680
Chexnum:	a38715	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	20130211	Uses:	DI
Cfs:	0	Acft:	1.45
Location:	N620 E640 S4 32 2S 1W SL	Win:	0
Owner:	DEARING FAMILY TRUST		
Source:	Underground Water Well (existing)		
Wrlink:	a38715		
Val:	V	Site id:	UTDNR1000278331

26
East
1/2 - 1 Mile
Lower

FED USGS **USGS40001189352**

Org. Identifier:	USGS-UT		
Formal name:	USGS Utah Water Science Center		
Monloc Identifier:	USGS-403514111575101		
Monloc name:	(C- 3- 1) 4cba- 1		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	16020204	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	40.58717
Longitude:	-111.964937	Sourcemap scale:	24000
Horiz Acc measure:	10	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	4511.00
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19740514	Welldepth:	195
Welldepth units:	ft	Wellholedepth:	195
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1974-05-14	85.00	

F27
SE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000181435**

Fid:	181434	Wrnum:	59-1536
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	19590804	Uses:	M
Cfs:	5	Acft:	0
Location:	N177 E4952 SW 05 3S 1W SL	Win:	0
Owner:	JORDAN VALLEY WATER CONSERVANCY DISTRICT		
Source:	Underground Water Well		
Wrlink:	59-1536		
Val:	V	Site id:	UTDNR1000181435

F28
SE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000262473**

Fid:	262472	Wrnum:	59-1536
Chexnum:	a24622	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	20000719	Uses:	M
Cfs:	5	Acft:	0
Location:	N177 E4952 SW 05 3S 1W SL	Win:	0
Owner:	JORDAN VALLEY WATER CONSERVANCY DISTRICT		
Source:	Underground Water Wells (26)		
Wrlink:	a24622		
Val:	V	Site id:	UTDNR1000262473

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

F29
SE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000262481**

Fid:	262480	Wrnum:	59-1210
Chexnum:	a24623	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	20000719	Uses:	M
Cfs:	3.55	Acft:	850
Location:	N177 E4952 SW 05 3S 1W SL	Win:	0
Owner:	JORDAN VALLEY WATER CONSERVANCY DISTRICT		
Source:	Underground Water Wells (3)		
Wrlink:	a24623		
Val:	V	Site id:	UTDNR1000262481

F30
SE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000001183**

Fid:	1182	Wrnum:	0259006M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	N0 W500 SE 05 3S 1W SL	Win:	26088
Owner:	NATIONAL TANK & MONITORING FOR JORDAN VALLEY WATER		
Source:	Non-Production Well: Unknown		
Wrlink:	0259006M00		
Val:	V	Site id:	UTDNR1000001183

31
NE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000183825**

Fid:	183824	Wrnum:	59-3089
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	UGWCDIS
Priority:	1920	Uses:	Not Reported
Cfs:	.033	Acft:	0
Location:	S110 W50 NE 05 3S 1W SL	Win:	0
Owner:	CONTINENTAL COPPER AND STEEL INDUSTRIES INCORPORATED		
Source:	Underground Water Well		
Wrlink:	59-3089		
Val:	T	Site id:	UTDNR1000183825

G32
ENE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000184484**

Fid:	184483	Wrnum:	59-3600
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	APPLCERT
Priority:	19690611	Uses:	DIS
Cfs:	.045	Acft:	0
Location:	S880 E552 NW 04 3S 1W SL	Win:	491
Owner:	ROBERT HOPES		
Source:	Underground Water Well		
Wrlink:	59-3600		
Val:	V	Site id:	UTDNR1000184484

33
SSW
1/2 - 1 Mile
Higher

UT WELLS **UTDNR1000186171**

Fid:	186170	Wrnum:	59-5068
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLREJ
Priority:	19841016	Uses:	D
Cfs:	.2	Acft:	10
Location:	S820 E800 NW 08 3S 1W SL	Win:	0
Owner:	BOB MASCARO		
Source:	Underground Water Well		
Wrlink:	59-5068		
Val:	T	Site id:	UTDNR1000186171

H34
NNE
1/2 - 1 Mile
Lower

FED USGS **USGS40001189492**

Org. Identifier:	USGS-UT		
Formal name:	USGS Utah Water Science Center		
Monloc Identifier:	USGS-403554111582101		
Monloc name:	(C- 2- 1)32dca- 1		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	16020204	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	40.598281
Longitude:	-111.9732707	Sourcemap scale:	Not Reported
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	4520.00
Vert measure units:	feet	Vertacc measure val:	20
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley Fill		
Aquifer type:	Not Reported		
Construction date:	19330101	Welldepth:	163
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

35
South
1/2 - 1 Mile
Higher

UT WELLS **UTDNR1000000328**

Fid:	327	Wrnum:	0057009M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	S1319 E39 N4 08 3S 1W SL	Win:	23067
Owner:	JORDAN VALLEY WATER CONSERVANCY		
Source:	Non-Production Well: Unknown		
Wrlink:	0057009M00		
Val:	V	Site id:	UTDNR1000000328

H36
NNE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000182181**

Fid:	182180	Wrnum:	59-2030
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	UGWCDIS
Priority:	1927	Uses:	Not Reported
Cfs:	.026	Acft:	0
Location:	N1280 E830 S4 32 2S 1W SL	Win:	0
Owner:	JORDAN SCHOOL DISTRICT BOARD OF EDUCATION		
Source:	Underground Water Well		
Wrlink:	59-2030		
Val:	T	Site id:	UTDNR1000182181

37
South
1/2 - 1 Mile
Higher

UT WELLS **UTDNR1000186331**

Fid:	186330	Wrnum:	59-5185
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	APPLCERT
Priority:	19860701	Uses:	DIS
Cfs:	.015	Acft:	0
Location:	S1300 W730 N4 08 3S 1W SL	Win:	28281
Owner:	SCOTT T. DOXEY		
Source:	Underground Water Well		
Wrlink:	59-5185		
Val:	V	Site id:	UTDNR1000186331

38
NNW
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000185973**

Fid:	185972	Wrnum:	59-4882
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLLAP
Priority:	19820420	Uses:	DIS
Cfs:	.1	Acft:	0
Location:	N1070 E915 SW 32 2S 1W SL	Win:	0
Owner:	DOROTHY SEELY		
Source:	Underground Water Well		
Wrlink:	59-4882		
Val:	T	Site id:	UTDNR1000185973

G39
ENE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000184507**

Fid:	184506	Wrnum:	59-3621
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLLAP
Priority:	19700603	Uses:	IS
Cfs:	.015	Acft:	0
Location:	S800 E855 NW 04 3S 1W SL	Win:	0
Owner:	FRED PEINE		
Source:	Underground Water Well		
Wrlink:	59-3621		
Val:	T	Site id:	UTDNR1000184507

G40
ENE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000186385**

Fid:	186384	Wrnum:	59-5228
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLREJ
Priority:	19870529	Uses:	DIS
Cfs:	.05	Acft:	0
Location:	S800 E855 NW 04 3S 1W SL	Win:	0
Owner:	FRED PEINE		
Source:	Underground Water Well		
Wrlink:	59-5228		
Val:	T	Site id:	UTDNR1000186385

I41
West
1/2 - 1 Mile
Higher

FED USGS **USGS40001189366**

Org. Identifier:	USGS-UT		
Formal name:	USGS Utah Water Science Center		
Monloc Identifier:	USGS-403520111592901		
Monloc name:	(C- 3- 1) 6acd- 1		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	16020204	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	40.5888365
Longitude:	-111.99216	Sourcemap scale:	24000

Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	4637.50
Vert measure units:	feet	Vertacc measure val:	20
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley Fill		
Aquifer type:	Not Reported		
Construction date:	19610701	Welldepth:	160
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

I42
West
1/2 - 1 Mile
Higher

UT WELLS **UTDNR1000187893**

Fid:	187892	Wrnum:	59-5884
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	UGWC
Priority:	1934	Uses:	I
Cfs:	0	Acft:	1.24
Location:	N500 W1610 E4 06 3S 1W SL	Win:	502
Owner:	DEARING FAMILY TRUST/ DEARING FAMILY, LLC		
Source:	Underground Water Well		
Wrlink:	59-5884		
Val:	V	Site id:	UTDNR1000187893

43
North
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000188332**

Fid:	188331	Wrnum:	59-927
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLDIS
Priority:	19510223	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	N1840 E2545 SW 32 2S 1W SL	Win:	0
Owner:	STATE OF UTAH UTAH TECHNICAL COLLEGE		
Source:	Underground Water Well		
Wrlink:	59-927		
Val:	T	Site id:	UTDNR1000188332

44
NE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000185094**

Fid:	185093	Wrnum:	59-4063
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLLAP
Priority:	19740627	Uses:	DIS
Cfs:	.045	Acft:	0
Location:	S100 E967 NW 04 3S 1W SL	Win:	0
Owner:	CANDIDA F. AND LOUISA ABEYTA		
Source:	Underground Water Well		
Wrlink:	59-4063		
Val:	T	Site id:	UTDNR1000185094

J45
West
1/2 - 1 Mile
Higher

FED USGS **USGS40001189347**

Org. Identifier:	USGS-UT		
Formal name:	USGS Utah Water Science Center		
Monloc Identifier:	USGS-403510111593501		
Monloc name:	(C- 3- 1) 6dbc- 2		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	16020204	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	40.5860588
Longitude:	-111.9938267	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	4670.00
Vert measure units:	feet	Vertacc measure val:	20
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley Fill		
Aquifer type:	Not Reported		
Construction date:	19090101	Welldepth:	120
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

46
SE
1/2 - 1 Mile
Lower

FED USGS **USGS40001189317**

Org. Identifier:	USGS-UT		
Formal name:	USGS Utah Water Science Center		
Monloc Identifier:	USGS-403445111575001		
Monloc name:	(C- 3- 1)16bcb- 1		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	16020204	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	40.5791145
Longitude:	-111.9646591	Sourcemap scale:	24000

Horiz Acc measure:	10	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	4607.00
Vert measure units:	feet	Vertacc measure val:	20
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	265
Welldepth units:	ft	Wellholedepth:	266
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1978-01-05	187.00	

47
NNW
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000185836**

Fid:	185835	Wrnum:	59-4765
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	APPLCERT
Priority:	19800208	Uses:	I
Cfs:	.026	Acft:	0
Location:	N2005 E1475 SW 32 2S 1W SL	Win:	30154
Owner:	ROBERT E. JENSEN		
Source:	Underground Water Well		
Wrlink:	59-4765		
Val:	V	Site id:	UTDNR1000185836

J48
West
1/2 - 1 Mile
Higher

UT WELLS **UTDNR1000183289**

Fid:	183288	Wrnum:	59-2676
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	UGWCDIS
Priority:	1909	Uses:	Not Reported
Cfs:	.067	Acft:	0
Location:	S3445 E448 N4 06 3S 1W SL	Win:	0
Owner:	SOUTHERN PACIFIC TRANSPORTATION COMPANY		
Source:	Underground Water Well		
Wrlink:	59-2676		
Val:	T	Site id:	UTDNR1000183289

J49
West
1/2 - 1 Mile
Higher

UT WELLS **UTDNR1000183288**

Fid:	183287	Wrnum:	59-2675
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	UGWCDIS
Priority:	1909	Uses:	Not Reported
Cfs:	.067	Acft:	0
Location:	S3404 E422 N4 06 3S 1W SL	Win:	0
Owner:	SOUTHERN PACIFIC TRANSPORTATION COMPANY		
Source:	Underground Water Well		
Wrlink:	59-2675		
Val:	T	Site id:	UTDNR1000183288

K50
NNW
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000184292**

Fid:	184291	Wrnum:	59-3451
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLLAP
Priority:	19680322	Uses:	Not Reported
Cfs:	.015	Acft:	0
Location:	N1930 E1075 SW 32 2S 1W SL	Win:	0
Owner:	LARRY L. HANSEN		
Source:	Underground Water Well		
Wrlink:	59-3451		
Val:	T	Site id:	UTDNR1000184292

K51
NNW
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000184532**

Fid:	184531	Wrnum:	59-3642
Chexnum:	Not Reported	Type:	Underground
Summary st:	T	Status:	APPLLAP
Priority:	19751126	Uses:	DIS
Cfs:	.015	Acft:	0
Location:	N1930 E1075 SW 32 2S 1W SL	Win:	0
Owner:	LARRY L. HANSEN		
Source:	Underground Water Well		
Wrlink:	59-3642		
Val:	T	Site id:	UTDNR1000184532

52
ENE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000185820**

Fid:	185819	Wrnum:	59-4749
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	APPLCERT
Priority:	19790921	Uses:	DIS
Cfs:	.015	Acft:	0
Location:	N1184 E2086 W4 04 3S 1W SL	Win:	489
Owner:	FAROOQ A. AND BRANDIE L. KHAN		
Source:	Underground Water Well		
Wrlink:	59-4749		
Val:	V	Site id:	UTDNR1000185820

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

L53
East
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000003443**

Fid:	3442	Wrnum:	0659002M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	S109 E2257 W4 04 3S 1W SL	Win:	427116
Owner:	VINCNT JEFFERIES, WASATCH ENVIRONMENTAL INC.		
Source:	Non-Production Well: Monitor		
Wrlink:	0659002M00		
Val:	V	Site id:	UTDNR1000003443

L54
East
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000003444**

Fid:	3443	Wrnum:	0659002M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	S163 E2276 W4 04 3S 1W SL	Win:	427118
Owner:	VINCNT JEFFERIES, WASATCH ENVIRONMENTAL INC.		
Source:	Non-Production Well: Monitor		
Wrlink:	0659002M00		
Val:	V	Site id:	UTDNR1000003444

L55
East
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000003445**

Fid:	3444	Wrnum:	0659002M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	S120 E2294 W4 04 3S 1W SL	Win:	427115
Owner:	VINCNT JEFFERIES, WASATCH ENVIRONMENTAL INC.		
Source:	Non-Production Well: Monitor		
Wrlink:	0659002M00		
Val:	V	Site id:	UTDNR1000003445

L56
East
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000003446**

Fid:	3445	Wrnum:	0659002M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	S105 E2310 W4 04 3S 1W SL	Win:	427117
Owner:	VINCNT JEFFERIES, WASATCH ENVIRONMENTAL INC.		
Source:	Non-Production Well: Monitor		
Wrlink:	0659002M00		
Val:	V	Site id:	UTDNR1000003446

57
SSW
1/2 - 1 Mile
Higher

UT WELLS **UTDNR1000186423**

Fid:	186422	Wrnum:	59-5244
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	APPLCERT
Priority:	19870923	Uses:	I
Cfs:	.015	Acft:	0
Location:	N721 E419 W4 08 3S 1W SL	Win:	0
Owner:	LYNN WALKER		
Source:	Underground Water Well		
Wrlink:	59-5244		
Val:	V	Site id:	UTDNR1000186423

58
ENE
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000183805**

Fid:	183804	Wrnum:	59-3070
Chexnum:	Not Reported	Type:	Underground
Summary st:	P	Status:	UGWCCERT
Priority:	1934	Uses:	DIS
Cfs:	0	Acft:	1.568
Location:	S460 W720 N4 04 3S 1W SL	Win:	437349
Owner:	DEARING FAMILY TRUST/ DEARING FAMILY, LLC		
Source:	Underground Water Well		
Wrlink:	59-3070		
Val:	V	Site id:	UTDNR1000183805

L59
East
1/2 - 1 Mile
Lower

UT WELLS **UTDNR1000001832**

Fid:	1831	Wrnum:	0359014M00
Chexnum:	Not Reported	Type:	Underground
Summary st:	A	Status:	APPLAPP
Priority:	Not Reported	Uses:	Not Reported
Cfs:	0	Acft:	0
Location:	S124 E2467 W4 04 3S 1W SL	Win:	27418
Owner:	VINCENT JEFFERIES		
Source:	Non-Production Well: Unknown		
Wrlink:	0359014M00		
Val:	V	Site id:	UTDNR1000001832

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: UT Radon

Radon Test Results

Zipcode	Maximum	Average	Num Tests	Test Term
84088	24.7	4.6	163	Short Term
84088	2.9	1.4	6	Long Term

Federal EPA Radon Zone for SALT LAKE County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for SALT LAKE COUNTY, UT

Number of sites tested: 52

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area	1.670 pCi/L	83%	15%	2%
Basement	2.960 pCi/L	56%	41%	4%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Utah Geological Survey
Telephone: 801-537-3300

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Rights Database
Source: Department of Natural Resources, Division of Water Rights
Telephone: 801-538-7408

OTHER STATE DATABASE INFORMATION

Utah Oil, Gas and Mining Database
Source: Department of Natural Resources
Telephone: 801-538-5340
The Well Data file contains one record of basic information for each well in the Utah Division of Oil, Gas and Mining database.

RADON

State Database: UT Radon
Source: Department of Environmental Quality
Telephone: 801-536-4250
Test Results by Zip Code

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

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B

City Directories

UDOT Bengerter
3584 W 9000
West Jordan, UT 84088

Inquiry Number: 4657552.5
June 27, 2016

The EDR-City Directory Abstract

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Abstract is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at five year intervals.

Business directories including city, cross reference and telephone directories were reviewed, if available, at approximately five year intervals for the years spanning 1926 through 2013. This report compiles information gathered in this review by geocoding the latitude and longitude of properties identified and gathering information about properties within 660 feet of the target property.

A summary of the information obtained is provided in the text of this report.

RECORD SOURCES

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RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. An "X" indicates where information was identified in the source and provided in this report.

Year	Source	TP	Adjoining	Text Abstract	Source Image
2013	Cole Information Services	-	X	X	-
	Cole Information Services	X	X	X	-
2008	Cole Information Services	-	X	X	-
	Cole Information Services	X	X	X	-
2007	Polk City Directories	-	X	X	X
	Polk City Directories	X	X	X	X
2001	Polk Directories	-	-	-	-
2000	R. L. Polk Co.	-	X	X	X
1995	R. L. Polk Co., Publishers	-	X	X	X
1991	R. L. Polk Co., Publishers	-	-	-	-
1990	R.L. Polk Co	-	-	-	-
1985	R. L. Polk Co., Publishers	-	X	X	X
1981	R. L. Polk Co., Publishers	-	-	-	-
1980	R. L. Polk Co., Publishers	-	X	X	X
1976	R. L. Polk Company, Publishers	-	-	-	-

EXECUTIVE SUMMARY

Year	Source	TP	Adjoining	Text Abstract	Source Image
1975	R. L. Polk Co., Publishers	-	X	X	X
1971	R.L. Polk Co., Publishers	-	-	-	-
1970	R. L. Polk Co., Publishers	-	X	X	X
1965	R. L. Polk Co., Publishers	-	-	-	-
1961	R.L. Polk Co., Publishers	-	-	-	-
1956	R.L. Polk Co., Publishers	-	-	-	-
1951	R.L. Polk Co., Publishers	-	-	-	-
1946	R.L. Polk Co., Publishers	-	-	-	-
1941	R.L. Polk Co., of Utah, Publishers	-	-	-	-
1936	R.L. Polk Co., of Utah, Publishers	-	-	-	-
1931	R. L. Polk Co., Publishers	-	-	-	-
1926	R. L. Polk Co., Publishers	-	-	-	-

FINDINGS

TARGET PROPERTY INFORMATION

ADDRESS

3584 W 9000
West Jordan, UT 84088

FINDINGS DETAIL

Target Property research detail.

W 9000 S

3584 W 9000 S

Year	Uses	Source	
2007	audiologists	Polk City Directories	Image pg. A1
	CENTER OF ORTHOPEDIC	Polk City Directories	Image pg. A1
	DIAGNOSTIC SLEEP physicians	Polk City Directories	Image pg. A1
	JORDAN VALLEY	Polk City Directories	Image pg. A1
	JORDAN VALLEY AUDIOLOGIST	Polk City Directories	Image pg. A1
	JORDAN VALLEY SURGCL	Polk City Directories	Image pg. A1
	MC FADDEN MICHAEL R MD	Polk City Directories	Image pg. A1
	physicians & surgeons	Polk City Directories	Image pg. A1
	REHAB physicians & surgeons	Polk City Directories	Image pg. A1
	SOUTH VALLEY ENT physicians	Polk City Directories	Image pg. A1
	SPECLSTS physicians & surgeons	Polk City Directories	Image pg. A1
	surgeons	Polk City Directories	Image pg. A1

W 9000 S

3584 W 9000 S

Year	Uses	Source
2013	ALLRED BRYCE DEE PLASTIC SURGEON MD	Cole Information Services
	BUCHI KENNETH N MD	Cole Information Services
	CENTER OF ORTHOPEDIC & REHABILITATIO	Cole Information Services
	CLARK FRANCIS J PODIATRIST	Cole Information Services
	CORE	Cole Information Services
	FARRUKH IMAD S MD	Cole Information Services
	FINE STEPHANIE G MD	Cole Information Services
	JORDAN RIVER WOMENS HEALTH	Cole Information Services
	JORDAN VALLEY HOSPITAL	Cole Information Services

FINDINGS

Year	Uses	Source
2013	JORDAN VALLEY SURGICAL SPECIALISTS	Cole Information Services
	KHACHATRYAN ARMEN MD	Cole Information Services
	MACINTYRE JAMES G MD	Cole Information Services
	MARSHALL S CHARLES JR MD	Cole Information Services
	MCFADDEN MICHAEL MD	Cole Information Services
	MCFADDEN MICHAEL R MD	Cole Information Services
	MCFAUL ROBERT B DO	Cole Information Services
	PHYSICIAN GROUP OF UTAH INC	Cole Information Services
	SESSIONS WADE M MD	Cole Information Services
	SLAWSON E DOUGLAS MD	Cole Information Services
	SOUTH VALLEY ENT	Cole Information Services
	ZELUFF GARY R MD	Cole Information Services
2008	BRYCE DEE ALLRED MD PC	Cole Information Services
	CENTER OF ORTHOPEDICS REHAB	Cole Information Services
	CLARK & WATNER DPM	Cole Information Services
	DR GARNER B MEADS	Cole Information Services
	E DOUGLAS SLAWSON MD	Cole Information Services
	FARRUKH S IMAD MD	Cole Information Services
	GASTROENTEROLOGY	Cole Information Services
	JORDAN VALLEY SURGICAL SPECIALISTS	Cole Information Services
	KATHLEEN K BOYNTON MD	Cole Information Services
	KENNETH N BUCHI MD	Cole Information Services
	MARSHALL S CHARLES JR	Cole Information Services
	ORTHOPEDICS CENTER	Cole Information Services
	SOUTH VALLEY ENT	Cole Information Services
	SOUTH VLY EAR NOSE THROAT ASSOCS	Cole Information Services
	WEST JORDAN MULTI SPECIALTY CLINIC	Cole Information Services

FINDINGS

ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

W 9000 S

3570 W 9000 S

Year	Uses	Source	
2007	0 Forsha Douglass W	Polk City Directories	Image pg. A1
	SOUTH RIDGE PROF PLAZA	Polk City Directories	Image pg. A1
	nonclassified establishments	Polk City Directories	Image pg. A1
	JORDAN VALLEY FAMILY	Polk City Directories	Image pg. A1
	HEALTH physicians & surgeons	Polk City Directories	Image pg. A1
	THOMAS MARK C MD	Polk City Directories	Image pg. A1
	physicians & surgeons	Polk City Directories	Image pg. A1
	FAMILY PLAZA PHARMACY	Polk City Directories	Image pg. A1
	pharmacies	Polk City Directories	Image pg. A1
	WEST JORDAN MEDICAL	Polk City Directories	Image pg. A1
	CTR physicians & surgeons	Polk City Directories	Image pg. A1
	JOHNSON CYNTHIA K	Polk City Directories	Image pg. A1
	midwives	Polk City Directories	Image pg. A1
	MAIR ANNA physicians	Polk City Directories	Image pg. A1
	assistants	Polk City Directories	Image pg. A1
	SHIFRAR JACOLIN D midwives	Polk City Directories	Image pg. A1
	SOUTH VALLEY WOMENS	Polk City Directories	Image pg. A1
	HLTH CARE physicians & surgeons	Polk City Directories	Image pg. A1
	SOUTH VALLEY	Polk City Directories	Image pg. A1
	DERMATOLOGY CTR physicians	Polk City Directories	Image pg. A1
	& surgeons	Polk City Directories	Image pg. A1
2000	Arlen K	R. L. Polk Co.	Image pg. A3
	Barney Mitchell F	R. L. Polk Co.	Image pg. A3
	Brooks G R	R. L. Polk Co.	Image pg. A3
	FAMILY PLAZA PHARMACY drug	R. L. Polk Co.	Image pg. A3
	store	R. L. Polk Co.	Image pg. A3
	Forsha Douglass W	R. L. Polk Co.	Image pg. A3
	Hansen Scott E	R. L. Polk Co.	Image pg. A3
	Hull Dale B	R. L. Polk Co.	Image pg. A3
	Jarretta Arlan K	R. L. Polk Co.	Image pg. A3
	Jones Randall K	R. L. Polk Co.	Image pg. A3

FINDINGS

Year	Uses	Source	
2000	W 9000 S	R. L. Polk Co.	Image pg. A3
	Kimberley S	R. L. Polk Co.	Image pg. A3
	King Michelle	R. L. Polk Co.	Image pg. A3
	Kirstein Judith L	R. L. Polk Co.	Image pg. A3
	Langer Kathleen	R. L. Polk Co.	Image pg. A3
	Mitchell F	R. L. Polk Co.	Image pg. A3
	Moreland Kimberley S	R. L. Polk Co.	Image pg. A3
	Muije Liz	R. L. Polk Co.	Image pg. A3
	Richards John L	R. L. Polk Co.	Image pg. A3
	Shifrar Jacotin D	R. L. Polk Co.	Image pg. A3
	SOUTHRIDGE PROF PLZ nrsdntl	R. L. Polk Co.	Image pg. A3
	bidg optrs	R. L. Polk Co.	Image pg. A3
	Not Verified	R. L. Polk Co.	Image pg. A3
	Williams Robert D	R. L. Polk Co.	Image pg. A3
	JORDAN VALLEY FAMILY	R. L. Polk Co.	Image pg. A3
	HEALTH medical clinic	R. L. Polk Co.	Image pg. A3
	INTERMTN LSR PC	R. L. Polk Co.	Image pg. A3
	electromdcl eqpt	R. L. Polk Co.	Image pg. A3
	SURGICAL ASSOCIATES PC	R. L. Polk Co.	Image pg. A3
	medical clinic	R. L. Polk Co.	Image pg. A3
	THOMAS MARK C phys	R. L. Polk Co.	Image pg. A3
	PRIMARY CARE FAMILY	R. L. Polk Co.	Image pg. A3
	THERAPY indvdl family svcs	R. L. Polk Co.	Image pg. A3
	WEST JORDAN MEDICAL	R. L. Polk Co.	Image pg. A3
	CENTER medical clinic	R. L. Polk Co.	Image pg. A3
	SOUTH VALLEY WOMEN	R. L. Polk Co.	Image pg. A3
	HEALTH CARE medical	R. L. Polk Co.	Image pg. A3
	clinic	R. L. Polk Co.	Image pg. A3
	JORDAN VALLEY HOSPITAL gnl	R. L. Polk Co.	Image pg. A3
	mdl srli hsptl	R. L. Polk Co.	Image pg. A3
	Not Verified	R. L. Polk Co.	Image pg. A3
	Allred Bryce D	R. L. Polk Co.	Image pg. A3
	ALLRED BRYCE DEE ofcs hith	R. L. Polk Co.	Image pg. A3
	prnrs	R. L. Polk Co.	Image pg. A3
	Beams Keily D	R. L. Polk Co.	Image pg. A3
	Colosimo Lauri	R. L. Polk Co.	Image pg. A3
	Fine Stephanie	R. L. Polk Co.	Image pg. A3
	Gardener Gregory	R. L. Polk Co.	Image pg. A3

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Year	Uses	Source	
2000	Goldberg Kenneth W	R. L. Polk Co.	Image pg. A3
	Johnson Kevin B	R. L. Polk Co.	Image pg. A3
	Kelly Patrick	R. L. Polk Co.	Image pg. A3
	Landgren Robert	R. L. Polk Co.	Image pg. A3
	Litzinger Marcia	R. L. Polk Co.	Image pg. A3
	Richards Christina	R. L. Polk Co.	Image pg. A3
	Smith David J	R. L. Polk Co.	Image pg. A3
	Zackrison David R	R. L. Polk Co.	Image pg. A3
	GASTROENTEROLOGY	R. L. Polk Co.	Image pg. A3
	medical clinic	R. L. Polk Co.	Image pg. A3
	SOUTH VALLEY CLINIC	R. L. Polk Co.	Image pg. A3
	medical clinic	R. L. Polk Co.	Image pg. A3
	HEALTHSOUTH	R. L. Polk Co.	Image pg. A3
	REHABILITATION CENTER	R. L. Polk Co.	Image pg. A3
	spty otpnt cins	R. L. Polk Co.	Image pg. A3
	GRANT LILLIAN phys	R. L. Polk Co.	Image pg. A3
	SOUTH VALLEY	R. L. Polk Co.	Image pg. A3
	DERMATOLOGY CENTER	R. L. Polk Co.	Image pg. A3
	medical clinic	R. L. Polk Co.	Image pg. A3
	MEADS GARNER B JR phys	R. L. Polk Co.	Image pg. A3
	CLARK FRANCIS J podtrst	R. L. Polk Co.	Image pg. A3

3580 W 9000 S

Year	Uses	Source	
2007	VALLEY RADIOLOGY physicians	Polk City Directories	Image pg. A1
	Plummer Janice A	Polk City Directories	Image pg. A1
	Kasten Donna	Polk City Directories	Image pg. A1
	physicians & surgeons	Polk City Directories	Image pg. A1
	JORDAN VALLEY EMERGENCY	Polk City Directories	Image pg. A1
	surgeons	Polk City Directories	Image pg. A1
	FILLOUX RUTH H MD physicians	Polk City Directories	Image pg. A1
	surgeons	Polk City Directories	Image pg. A1

3590 W 9000 S

Year	Uses	Source	
2007	ADVANCED CLINICAL	Polk City Directories	Image pg. A1
	RESEARCH medical research	Polk City Directories	Image pg. A1
	LITZINGER MARCIA MD	Polk City Directories	Image pg. A1
	physicians & surgeons	Polk City Directories	Image pg. A1

FINDINGS

Year	Uses	Source	
2007	ROBISON FAMILY DENTAL	Polk City Directories	Image pg. A1
	dentists	Polk City Directories	Image pg. A1
	STEVENS CRAIG N MD physicians	Polk City Directories	Image pg. A1
	& surgeons	Polk City Directories	Image pg. A1
	4D Wapner Francis J	Polk City Directories	Image pg. A1
	BOYNTON KATHLEEN K MD	Polk City Directories	Image pg. A1
	physicians & surgeons	Polk City Directories	Image pg. A1
	BRYCE DEE ALLRED PC	Polk City Directories	Image pg. A1
	physicians & surgeons	Polk City Directories	Image pg. A1
	BUCHI KENNETH N MD	Polk City Directories	Image pg. A1
	physicians & surgeons	Polk City Directories	Image pg. A1
	FINE STEPHANIE MD	Polk City Directories	Image pg. A1
	physicians & surgeons	Polk City Directories	Image pg. A1
	FIRST MED URGENT CARE	Polk City Directories	Image pg. A1
	health serv	Polk City Directories	Image pg. A1
	OWENS CRYSTAL D MD	Polk City Directories	Image pg. A1
	physicians & surgeons	Polk City Directories	Image pg. A1
	NEUROLOGY ASSOC clinics	Polk City Directories	Image pg. A1
	KOTTER FOOT & ANKLE CTR	Polk City Directories	Image pg. A1
	physicians & surgeons	Polk City Directories	Image pg. A1
	Goldberg Kennethi W	Polk City Directories	Image pg. A1
	JORDAN VALLEY INTERNAL	Polk City Directories	Image pg. A1
	MDCN physicians & surgeons	Polk City Directories	Image pg. A1
	MDCN physicians & surgeons	Polk City Directories	Image pg. A1
	MC FADDEN MICHAEL R MD	Polk City Directories	Image pg. A1
	physicians & surgeons	Polk City Directories	Image pg. A1
1995	Aizad Tazeem M D	R. L. Polk Co., Publishers	Image pg. A6
	Allred Bryce Dee	R. L. Polk Co., Publishers	Image pg. A6
	Clark Francis J	R. L. Polk Co., Publishers	Image pg. A6
	Colosimo Lauri Rpt	R. L. Polk Co., Publishers	Image pg. A6
	Forsha Douglass W	R. L. Polk Co., Publishers	Image pg. A6
	Gardner Gregory Rpt	R. L. Polk Co., Publishers	Image pg. A6
	Goswami Sheel	R. L. Polk Co., Publishers	Image pg. A6
	Grant Lillian	R. L. Polk Co., Publishers	Image pg. A6
	Hall Teresa Rpt	R. L. Polk Co., Publishers	Image pg. A6
	Jarrett Arlen K	R. L. Polk Co., Publishers	Image pg. A6
	Johnson Kevin	R. L. Polk Co., Publishers	Image pg. A6
	Kelly Patrick Rpt	R. L. Polk Co., Publishers	Image pg. A6

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Year	Uses	Source	
1995	Meads Jr Gamer B	R. L. Polk Co., Publishers	Image pg. A6
	Miller Katrina	R. L. Polk Co., Publishers	Image pg. A6
	Rizzardi Barbara	R. L. Polk Co., Publishers	Image pg. A6
	Smith Veon G Dsw	R. L. Polk Co., Publishers	Image pg. A6
	Thomas Mark C	R. L. Polk Co., Publishers	Image pg. A6
	Wapner Francis J	R. L. Polk Co., Publishers	Image pg. A6
	Zackrison David R	R. L. Polk Co., Publishers	Image pg. A6

3680 W 9000 S

Year	Uses	Source	
2007	Weenig David R & Cynthia B	Polk City Directories	Image pg. A1
2000	+JUDD LN SEGINS	R. L. Polk Co.	Image pg. A3
	Weenig Dave	R. L. Polk Co.	Image pg. A3
1995	Oakeson C	R. L. Polk Co., Publishers	Image pg. A6

3706 W 9000 S

Year	Uses	Source	
2007	Ballard Charles W m	Polk City Directories	Image pg. A1
	Cameron Janice	Polk City Directories	Image pg. A1
	Castro Jose	Polk City Directories	Image pg. A1
	Chavez Fred	Polk City Directories	Image pg. A1
	Clifford David	Polk City Directories	Image pg. A1
	Ehninger Adeline E	Polk City Directories	Image pg. A1
	Garamendi Raymond	Polk City Directories	Image pg. A1
	Leydecker Helen	Polk City Directories	Image pg. A1
	Morgan Judy	Polk City Directories	Image pg. A1
	Slaymaker Robert	Polk City Directories	Image pg. A1
	SOUTH VALLEY CARE CTR LLC	Polk City Directories	Image pg. A1
	nursing & convalescent homes	Polk City Directories	Image pg. A1
	Summers Dorothea	Polk City Directories	Image pg. A1
2000	Anderson B F	R. L. Polk Co.	Image pg. A3
	Bath Marty	R. L. Polk Co.	Image pg. A3
	Cech F A	R. L. Polk Co.	Image pg. A3
	Clark Grace	R. L. Polk Co.	Image pg. A3
	Henline Barbara	R. L. Polk Co.	Image pg. A3
	Hiillis A	R. L. Polk Co.	Image pg. A3
	Neslen H E	R. L. Polk Co.	Image pg. A3
	DIOldham Grant	R. L. Polk Co.	Image pg. A3
	liphant H	R. L. Polk Co.	Image pg. A3

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Year	Uses	Source	
2000	Perry Betty	R. L. Polk Co.	Image pg. A3
	THERATX spty otpnt cins	R. L. Polk Co.	Image pg. A3
	Thomas Judy	R. L. Polk Co.	Image pg. A3
	Uran Lucille	R. L. Polk Co.	Image pg. A3
	Williams Mary	R. L. Polk Co.	Image pg. A3
1995	Anderson Mattie	R. L. Polk Co., Publishers	Image pg. A6
	Bethea Bonita	R. L. Polk Co., Publishers	Image pg. A6
	Child S B	R. L. Polk Co., Publishers	Image pg. A6
	Dale E L	R. L. Polk Co., Publishers	Image pg. A6
	Greenhalgh J H	R. L. Polk Co., Publishers	Image pg. A6
	Haglund John E	R. L. Polk Co., Publishers	Image pg. A6
	Hettrick Audrey	R. L. Polk Co., Publishers	Image pg. A6
	Jensen A	R. L. Polk Co., Publishers	Image pg. A6
	Listen Grant C	R. L. Polk Co., Publishers	Image pg. A6
	Moessner Philip E	R. L. Polk Co., Publishers	Image pg. A6
	Montgomery Kent H	R. L. Polk Co., Publishers	Image pg. A6
	Neslen H Edward	R. L. Polk Co., Publishers	Image pg. A6
	Oldham Grant	R. L. Polk Co., Publishers	Image pg. A6
	Randle Lear	R. L. Polk Co., Publishers	Image pg. A6
	Santistevan Anita	R. L. Polk Co., Publishers	Image pg. A6
	Smith Julius	R. L. Polk Co., Publishers	Image pg. A6
	Stevens Jessie	R. L. Polk Co., Publishers	Image pg. A6
	Vaughn J H	R. L. Polk Co., Publishers	Image pg. A6

W 9000 S

3570 W 9000 S

Year	Uses	Source
2013	STEP BY STEP PEDIATRICS	Cole Information Services
	SOUTH VALLEY DERMATOLOGY CENTER	Cole Information Services
	SOUTH RIDGE PROF PLAZA	Cole Information Services
	WEST JORDAN MEDICAL CENTER	Cole Information Services
	ZACKRISON DAVID R MD	Cole Information Services
	JORDAN VALLEY MEDICAL CENTER	Cole Information Services
	FAMILY PLAZA PHARMACY	Cole Information Services
	HEART & LUNG INSTITUTE OF UTAH INC	Cole Information Services
2008	MITCHELL F BARNEY MD FACOG	Cole Information Services
	JACOLIN DHLER NP CNM SHFRAR MS	Cole Information Services

FINDINGS

Year	Uses	Source
2008	SO VALLEY DERMATOLOGY	Cole Information Services
	HOLLY J MOLBERG MD	Cole Information Services
	JORDAN VALLEY FAMILY HEALTH	Cole Information Services
	MICHELLE NP KING	Cole Information Services
	SOUTH VALLEY WOMENS HEALTH CARE	Cole Information Services
	MARIA A ONEIDA MD	Cole Information Services
	FAMILY PLAZA PHARMACY	Cole Information Services
	WEST JORDAN MEDICAL CENTER	Cole Information Services
	JONI HOUGAARD MD	Cole Information Services
	AMY NP LADUE	Cole Information Services
	DENNIS HAMP DO	Cole Information Services
	ADVANCED CLINCL RES ACR INC	Cole Information Services
	KIMBERLY S MORELAND	Cole Information Services
	APOTHECARY SHOPPE INC	Cole Information Services
	FORSHA DOUGLASS W MD	Cole Information Services
	JUDITH L KIRSTEIN MD	Cole Information Services

3580 W 9000 S

Year	Uses	Source
2013	PIONEER VALLEY HOSPITAL	Cole Information Services
	24 7 DAY A LOCKSMITH	Cole Information Services
	JORDAN VALLEY HOSPITAL	Cole Information Services
2008	JORDAN VALLEY MEDICAL CENTER INC	Cole Information Services

3590 W 9000 S

Year	Uses	Source
2013	REISER REBECCA MD	Cole Information Services
	BUCHANAN TOM MD	Cole Information Services
	HYPERBARIC & WOUND CARE CENTER AT	Cole Information Services
	JORDAN VALLEY NEUROLOGY ASSOCIATES	Cole Information Services
	ROBISON FAMILY DENTAL	Cole Information Services
	JARROD DAVIES	Cole Information Services
	ADVANCED CLINICAL RESEARCH	Cole Information Services
2008	NEUROLOGY ASSOCIATES	Cole Information Services
	MICHAEL R MCFADDEN MD FACS	Cole Information Services
	HOM ANNA	Cole Information Services
	MEDICAL ARTS PLZ	Cole Information Services

Year	Uses	Source
2008	INTERNAL MEDICINE	Cole Information Services
	DAVID R ZACKRISON MD	Cole Information Services
	KENNETH W GOLDBERG MD	Cole Information Services
	JOHNSON KEVIN B	Cole Information Services
	ROBISON FAMILY DENTAL PC	Cole Information Services
	SOUTH VALLEY DERMATOLOGY	Cole Information Services
	SMITH DAVID J	Cole Information Services
	KOTTER FOOT & ANKLE CENTER	Cole Information Services
	SLAWSON & FINEMAN MDS	Cole Information Services
	LITZINGER MARCIA MD	Cole Information Services

3706 W 9000 S

Year	Uses	Source
2013	ENSIGN IT	Cole Information Services
	COPPER RIDGE HEALTHCARE	Cole Information Services
2008	SOUTH VALLEY HEALTH CARE CENTER	Cole Information Services

W 9000 SOUTH ST

3580 W 9000 SOUTH ST

Year	Uses	Source	
1985	Jordan Valley Holy Cross Hosp	R. L. Polk Co., Publishers	Image pg. A8

3590 W 9000 SOUTH ST

Year	Uses	Source	
1985	Medical Arts Plaza	R. L. Polk Co., Publishers	Image pg. A8

3600 W 9000 SOUTH ST

Year	Uses	Source	
1970	Lehmitz Glen W	R. L. Polk Co., Publishers	Image pg. A13

3660 W 9000 SOUTH ST

Year	Uses	Source	
1985	Five D Cabinet Shop	R. L. Polk Co., Publishers	Image pg. A8
1980	Five D Cabinet Shop cabt mkrs	R. L. Polk Co., Publishers	Image pg. A10
1975	Fire D Cabinet Shop cabt mkrs	R. L. Polk Co., Publishers	Image pg. A12

3680 W 9000 SOUTH ST

Year	Uses	Source	
1980	Oakeson	R. L. Polk Co., Publishers	Image pg. A10

FINDINGS

WINTHROPE CIR

3655 WINTHROPE CIR

Year	Uses	Source	
2007	No Current Listing	Polk City Directories	Image pg. A2
2000	Condie Mark G	R. L. Polk Co.	Image pg. A4
1995	Condie Mark G	R. L. Polk Co., Publishers	Image pg. A7
1985	Porter James	R. L. Polk Co., Publishers	Image pg. A9

3657 WINTHROPE CIR

Year	Uses	Source	
2007	Hess Michael F	Polk City Directories	Image pg. A2
2000	Hess Lori L G A	R. L. Polk Co.	Image pg. A4
1985	Hawkins Kenneth F	R. L. Polk Co., Publishers	Image pg. A9

3659 WINTHROPE CIR

Year	Uses	Source	
2007	Gedicks Christopher W Ea	Polk City Directories	Image pg. A2
	Gedicks Kelly L	Polk City Directories	Image pg. A2
2000	Calton Patrick E & Virginia El A	R. L. Polk Co.	Image pg. A4
1995	Maddux Henry	R. L. Polk Co., Publishers	Image pg. A7
1985	Tenney Dan H	R. L. Polk Co., Publishers	Image pg. A9

3665 WINTHROPE CIR

Year	Uses	Source	
2008	FINESSE PAINTING	Cole Information Services	
2007	Rasband Charles W III & Earlene W	Polk City Directories	Image pg. A2
2000	Rasband Charles W & Earlene IE+	R. L. Polk Co.	Image pg. A4
1995	Rasband Charles W	R. L. Polk Co., Publishers	Image pg. A7
1985	Harper Ron H	R. L. Polk Co., Publishers	Image pg. A9

3666 WINTHROPE CIR

Year	Uses	Source	
2007	Larsen Steven L & Linda L	Polk City Directories	Image pg. A2
2000	Larsen Eric D	R. L. Polk Co.	Image pg. A4
	Larsen Richard + A	R. L. Polk Co.	Image pg. A4
1995	Larsen Steven L	R. L. Polk Co., Publishers	Image pg. A7
1985	Larsen Steven L	R. L. Polk Co., Publishers	Image pg. A9

FINDINGS

3681 WINTHROPE CIR

Year	Uses	Source	
2007	Pearson Lena C	Polk City Directories	Image pg. A2
	Pearson Bruce E r 1 a	Polk City Directories	Image pg. A2
2000	Pearson Bruce E	R. L. Polk Co.	Image pg. A4
1995	Terry Leroy	R. L. Polk Co., Publishers	Image pg. A7
1985	Terry Leroy	R. L. Polk Co., Publishers	Image pg. A9

3682 WINTHROPE CIR

Year	Uses	Source	
2007	Arnold Chad C E	Polk City Directories	Image pg. A2
	Arnold Carol J	Polk City Directories	Image pg. A2
2000	Arnold Chad C m A	R. L. Polk Co.	Image pg. A4
1995	Arnold Chad	R. L. Polk Co., Publishers	Image pg. A7
1985	Tate Russ	R. L. Polk Co., Publishers	Image pg. A9

WINTHROPE DR

9012 WINTHROPE DR

Year	Uses	Source	
2000	Gammon Kent D	R. L. Polk Co.	Image pg. A4
1995	Gammon Kent	R. L. Polk Co., Publishers	Image pg. A7
1985	Vacant	R. L. Polk Co., Publishers	Image pg. A9
1980	Phelps	R. L. Polk Co., Publishers	Image pg. A11

9013 WINTHROPE DR

Year	Uses	Source	
2007	Hansen Arianna	Polk City Directories	Image pg. A2
	Hansen Lynette	Polk City Directories	Image pg. A2
2000	Not Verified	R. L. Polk Co.	Image pg. A4
1985	Brown Bud R	R. L. Polk Co., Publishers	Image pg. A9
1980	Boyle David E	R. L. Polk Co., Publishers	Image pg. A11

9024 WINTHROPE DR

Year	Uses	Source	
2007	Harris Matt N & Jennifer S ma	Polk City Directories	Image pg. A2
2000	Harris Jennifer S	R. L. Polk Co.	Image pg. A4
	Harris Matthew N	R. L. Polk Co.	Image pg. A4
1985	Vacant	R. L. Polk Co., Publishers	Image pg. A9
1980	Janney Dale T	R. L. Polk Co., Publishers	Image pg. A11

FINDINGS

9036 WINTHROPE DR

Year	Uses	Source	
2007	Neal Mitzi G Ua	Polk City Directories	Image pg. A2
	Neal Natae A	Polk City Directories	Image pg. A2
2000	Matheny Teresa J m 1 A	R. L. Polk Co.	Image pg. A5
1995	Malheny Teresa	R. L. Polk Co., Publishers	Image pg. A7
1985	Empey Bruce	R. L. Polk Co., Publishers	Image pg. A9
1980	Empey Bruce	R. L. Polk Co., Publishers	Image pg. A11

9041 WINTHROPE DR

Year	Uses	Source	
1980	Burton Mark H	R. L. Polk Co., Publishers	Image pg. A11

9048 WINTHROPE DR

Year	Uses	Source	
2007	Holman Scott F & Vicki L 143a	Polk City Directories	Image pg. A2
2000	Holman Scott F	R. L. Polk Co.	Image pg. A5
	Holman Vicki L	R. L. Polk Co.	Image pg. A5
1985	Burton Mark H	R. L. Polk Co., Publishers	Image pg. A9

9057 WINTHROPE DR

Year	Uses	Source	
2007	Morris Penny T E 1 a	Polk City Directories	Image pg. A2
2000	Morris David W	R. L. Polk Co.	Image pg. A5
	Morris M	R. L. Polk Co.	Image pg. A5
1985	Austin Douglas	R. L. Polk Co., Publishers	Image pg. A9
1980	Austin Douglas	R. L. Polk Co., Publishers	Image pg. A11

9060 WINTHROPE DR

Year	Uses	Source	
2008	FAR BEYOND FLOWERS	Cole Information Services	
2007	Young Kimball M & Carol LO	Polk City Directories	Image pg. A2
	Love Carol	Polk City Directories	Image pg. A2
2000	Zimmerman C	R. L. Polk Co.	Image pg. A5
	LOVE IN BLOOM florists	R. L. Polk Co.	Image pg. A5
1985	Zimmerman George	R. L. Polk Co., Publishers	Image pg. A9
1980	Raty Dallas L	R. L. Polk Co., Publishers	Image pg. A11

FINDINGS

TARGET PROPERTY: ADDRESS NOT IDENTIFIED IN RESEARCH SOURCE

The following Target Property addresses were researched for this report, and the addresses were not identified in the research source.

Address Researched	Address Not Identified in Research Source
3584 W 9000	2001, 2000, 1995, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926

ADJOINING PROPERTY: ADDRESSES NOT IDENTIFIED IN RESEARCH SOURCE

The following Adjoining Property addresses were researched for this report, and the addresses were not identified in research source.

Address Researched	Address Not Identified in Research Source
3570 W 9000 S	2013, 2008, 2001, 1995, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3570 W 9000 S	2007, 2001, 2000, 1995, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3580 W 9000 S	2013, 2008, 2001, 2000, 1995, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3580 W 9000 S	2007, 2001, 2000, 1995, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3580 W 9000 SOUTH ST	2013, 2008, 2007, 2001, 2000, 1995, 1991, 1990, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3590 W 9000 S	2013, 2008, 2001, 2000, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3590 W 9000 S	2007, 2001, 2000, 1995, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3590 W 9000 SOUTH ST	2013, 2008, 2007, 2001, 2000, 1995, 1991, 1990, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3600 W 9000 SOUTH ST	2013, 2008, 2007, 2001, 2000, 1995, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3655 WINTHROPE CIR	2013, 2008, 2001, 1991, 1990, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3657 WINTHROPE CIR	2013, 2008, 2001, 1995, 1991, 1990, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3659 WINTHROPE CIR	2013, 2008, 2001, 1991, 1990, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3660 W 9000 SOUTH ST	2013, 2008, 2007, 2001, 2000, 1995, 1991, 1990, 1981, 1976, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3665 WINTHROPE CIR	2013, 2008, 2001, 1991, 1990, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3665 WINTHROPE CIR	2013, 2007, 2001, 2000, 1995, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3666 WINTHROPE CIR	2013, 2008, 2001, 1991, 1990, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926

FINDINGS

Address Researched	Address Not Identified in Research Source
3680 W 9000 S	2013, 2008, 2001, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3680 W 9000 SOUTH ST	2013, 2008, 2007, 2001, 2000, 1995, 1991, 1990, 1985, 1981, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3681 WINTHROPE CIR	2013, 2008, 2001, 1991, 1990, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3682 WINTHROPE CIR	2013, 2008, 2001, 1991, 1990, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3706 W 9000 S	2013, 2008, 2001, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
3706 W 9000 S	2007, 2001, 2000, 1995, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
9012 WINTHROPE DR	2013, 2008, 2007, 2001, 1991, 1990, 1981, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
9013 WINTHROPE DR	2013, 2008, 2001, 1995, 1991, 1990, 1981, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
9024 WINTHROPE DR	2013, 2008, 2001, 1995, 1991, 1990, 1981, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
9036 WINTHROPE DR	2013, 2008, 2001, 1991, 1990, 1981, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
9041 WINTHROPE DR	2013, 2008, 2007, 2001, 2000, 1995, 1991, 1990, 1985, 1981, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
9048 WINTHROPE DR	2013, 2008, 2001, 1995, 1991, 1990, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
9057 WINTHROPE DR	2013, 2008, 2001, 1995, 1991, 1990, 1981, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
9060 WINTHROPE DR	2013, 2008, 2001, 1995, 1991, 1990, 1981, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926
9060 WINTHROPE DR	2013, 2007, 2001, 2000, 1995, 1991, 1990, 1985, 1981, 1980, 1976, 1975, 1971, 1970, 1965, 1961, 1956, 1951, 1946, 1941, 1936, 1931, 1926

Source Page Images Appendix

Polk City Directories Now on the Internet @ www.citydirectory.com

W 9000 S Cont'd

1925 CHURCH OF JESUS CHRIST OF LDS churches 801-562-8271
1995 JACKSON JEFF MD physicians & surgeons 801-566-9888
OKUBO DAVID MD physicians & surgeons 801-566-9888
2125 WEST JORDAN SEVENTH DAY ADVNST churches ..801-566-7100
2195 Vanhorn Amber [3]
2590 SCONECUTTER restaurants 801-585-1007
2640 Ninetieth South [2]
REAM'S FOODS grocers-retail 801-561-9361
SUZANNE'S ATM automated teller mach 801-233-8616
2650 WELLS FARGO BANK banks 801-569-1147
2655 Boam Derek [7]
BUZZARD TRAVIS L MD physicians & surgeons
IHC HEALTH CTR physicians & surgeons
IHC INSTA CARE clinics 801-256-6399
INTERMOUNTAIN KIDS CARE physicians & surgeons 801-568-9933
INTERMOUNTAIN MEDICAL GROUP physicians & surgeons
© Przybyla Eva
2664 RYAN DAVIS INSURANCE insurance 801-562-8666
2666 BESTE INSURANCE Insurance 801-562-2442
Klinetop Bill [13] 801-562-2442
Robinson Paul [13] ..801-562-2442
Shepherd Dean [13] 801-562-2442
2668 FILE U FANCY manicuring 801-561-8622
Fisher Rebecca [8]▲ 801-561-8622
2674 ISABELL'S CATERING caterers 801-255-9504
2676 PUPPY PALACE pet supl & foods-retail 801-256-9663
2678 SALON beauty salons 801-561-8080
2680 TREASURE ISLAND THRIFT thrift shops 801-566-5850
2686 AMERICAN DANCE ACADEMY dancing instruction ..801-352-7246
2688 PAPA MURPHY'S TAKE 'N' BAKE pizza 801-566-6667
• ZIP CODE 84088 CAR-RT R009
2729 BUDGET TRUCK RENTAL truck renting & lease 801-566-3827
TOP STOP AUTO auto rpr & serv 801-567-1401
TOP STOP CONVENIENCE STORES convenience stores 801-566-9280
2751 ALLEN BRANDON MD physicians & surgeons 801-352-5900
© Gardener Gregory 801-255-4999
GARDENER-KELLY REHABILITATION phys therapists 801-255-4999
JORDAN MEDICAL ARTS FAMILY clinics 801-352-5900
2764 JACK'S SPOT FREE WASH car washing & polishing ..801-569-3399
2770 Tew Boyd N & Karen A [30]▲ 801-566-1010
2780 Fuhriman Robert W & Charrisse G [12]▲ 801-568-3210
2785 BACH CORPORATIONS real estate mgmt 801-566-2224
CONELCO CONRAD ELECTRIC CO electric contractors 801-253-3265
2810 Hanger Jay R & Cheryl A [23]▲
2820 Gasparro George V & Mary A [13]▲ 801-562-4351
2880 Henschke Joanne E [4]▲ 801-255-7007
2900 © Brewster P
2901 CHURCH OF JESUS CHRIST OF LDS churches 801-562-8243
2922 © Melara Kayo▲
© Ramos Nino 801-562-0672
2930 HOPE LUTHERAN CHURCH-W JORDAN churches ..801-569-1111
HOPE LUTHERAN PRE-SCHOOL schools 801-569-1111
3232 Peatross Scott A [11]▲ 801-565-8023
Peatross Allen S 801-565-8023
3245 Jensen Carl [8]▲ 801-569-8379
Roberts Patti J [14]▲
Roberts Jean
3282 Taylor Dennis K [4]▲ 801-255-5610
Taylor Kelby 801-255-5610
3324 © Higashi Leona 801-255-9340
• ZIP CODE 84088 CAR-RT R001

W 9000 S Cont'd

3333 FAIRCHILD SEMICONDUCTOR semiconductor- mfrs' equip/supl 801-562-7000
• ZIP CODE 84088 CAR-RT R009
3344 © Bustamante Michael D 801-565-4736
3366 Pulley Harvey D & Dixie L [44]▲ 801-255-7274
Taylor Julie P [11] 801-561-0615
Taylor Dennis K 801-561-0615
3410 Barlow Hyrum W Sr & Colleen P [34]▲ 801-255-6904
3434 JORDAN VALLEY HOSPITAL hospitals 801-568-7829
Lunt Deann [8]▲
• ZIP CODE 84088 CAR-RT R001
3556 Hollingsworth Sonny [2]▲ 801-567-9780
LEI PAUL MD physicians & surgeons
3570 © Forsha Douglass W
SOUTH RIDGE PROF PLAZA nonclassified establishments 801-569-9440
100 JORDAN VALLEY FAMILY HEALTH physicians & surgeons 801-569-1999
110 THOMAS MARK C MD physicians & surgeons 801-569-8929
150 FAMILY PLAZA PHARMACY pharmacies 801-569-0175
200 WEST JORDAN MEDICAL CTR physicians & surgeons 801-566-9211
210 JOHNSON CYNTHIA K midwives 801-569-2626
210 MAIR ANNA physicians assistants 801-569-2626
210 SHIFRAR JACOLIN D midwives 801-569-2626
210 SOUTH VALLEY WOMEN'S HLTH CARE physicians & surgeons 801-569-2626
220 SOUTH VALLEY DERMATOLOGY CTR physicians & surgeons 801-569-1456
3580 FILLOUX RUTH H MD physicians & surgeons 801-561-8888
JORDAN VALLEY EMERGENCY physicians & surgeons 801-562-4244
© Kasten Donna
Plummer Janice A [13]▲
VALLEY RADIOLOGY physicians & surgeons 801-561-8888
3584 JORDAN VALLEY AUDIOLOGIST audiologists 801-566-8304
SOUTH VALLEY ENT physicians & surgeons 801-566-8304
200 JORDAN VALLEY DIAGNOSTIC SLEEP physicians & surgeons
304 JORDAN VALLEY SURGCL SPECLSTS physicians & surgeons 801-562-3150
401 MC FADDEN MICHAEL R MD physicians & surgeons 801-566-0204
405 CENTER OF ORTHOPEDIC & REHAB physicians & surgeons
3590 ADVANCED CLINICAL RESEARCH medical research 801-352-9338
LITZINGER MARCIA MD physicians & surgeons 801-352-8367
ROBISON FAMILY DENTAL dentists 801-748-1399
STEVENS CRAIG N MD physicians & surgeons 801-501-4310
© Wapner Francis J
100 BOYNTON KATHLEEN K MD physicians & surgeons 801-563-5121
100 BRYCE DEE ALLRED PC physicians & surgeons 801-569-2456
100 BUCHI KENNETH N MD physicians & surgeons 801-233-8233
105 FINE STEPHANIE MD physicians & surgeons
105 FIRST MED URGENT CARE health serv 801-233-6483
105 OWENS CRYSTAL D MD physicians & surgeons 801-233-6483
120 NEUROLOGY ASSOC clinics 801-352-8373
215 KOTTER FOOT & ANKLE CTR physicians & surgeons 801-566-7297
240 Goldberg Kenneth W [6]
240 JORDAN VALLEY INTERNAL MDCN physicians & surgeons 801-569-2354

W 9000 S Cont'd

330 MC FADDEN MICHAEL R MD physicians & surgeons 801-255-8633
3680 Weenig David R & Cynthia B [13]▲ 801-569-1000
3706 Ballard Charles W [3] 801-282-0016
Cameron Janice [3]
© Castro Jose
Chavez Fred [3] 801-260-1909
Clifford David [3] 801-282-8871
Ehninger Adeline [4] 801-282-8078
Garamendi Raymond [7] 801-282-8839
Leydecker Helen [3] 801-280-1857
© Morgan Judy 801-282-3421
© Slaymaker Robert 801-282-5072
SOUTH VALLEY CARE CTR LLC nursing & convalescent homes 801-280-2273
© Summers Dorothea 801-280-3709
3742 ABRAXAS PET RESORT pet washing & grooming 801-280-3090
Dalebout Dennis A & Joan W [24]▲ 801-280-3090
3863 WALGREENS pharmacies 801-280-1245
3927 INTERIOR IMPRESSIONS gift shops 801-280-5340
3931 BIG LOTS variety stores 801-280-6975
3961 BLOCKBUSTER VIDEO video tapes & discs 801-260-1213
© Diaz Saul L
Diaz Leanta
EVERGREEN DENTAL dentists 801-260-1131
© Hixenbaugh Sarah J
LEGACY CLEANERS cleaners 801-280-4114
LITTLE CAESARS PIZZA pizza 801-280-3600
NEIGHBORHOOD DOLLAR variety stores 801-282-8911
A FANTASTIC SAM'S beauty salons 801-280-2391
B DESERT SUN tanning salons 801-280-3300
C EXPRESS MAIL & COPY copying & duplicating serv 801-282-3411
C Leach Jonathan E [10]
C Leach Nicole
C May Lori T [8]
C May Rocky P
C © Thomas Sindi
C291 © Wood Martin L
C297 © Hales Marlee
C300 © Adams Stacie K
D SUBWAY SANDWICHES & SALADS restaurants 801-282-8468
I COZAD REYMAN T DDS dentists
3963 MC DONALD'S restaurants 801-282-1700
TEAM ONE CHEVRON serv stations- gasoline & oil 801-260-0800
4080 SMITH'S FOOD & DRUG CTR grocers-retail 801-280-5545
UTAH BOY'S RANCH DRY CLEANER cleaners ..801-280-5511
4114 WENDY'S restaurants 801-282-9097
4139 Diamond James L Jr & Florence A [38]▲ 801-280-2018
HIGHTOWER ROOFING roofing contractors 801-280-3181
• ZIP CODE 84088 CAR-RT C023
4834 SALT LAKE COUNTY LIBRARY SYST libraries-public 801-944-7684
5503 © Azar Douglas 801-282-8782
© Balbuena Martha ..801-282-5591
© Barney Robert
© Blackburn Amanda 801-676-9277
© Chacin Ernesto ..801-282-5922
Chamberlain Cynthia N [6]
Chamberlain Cyndi
© Clewis Scott 801-282-2171
© Combs Dan 801-601-8915
Cowan David & Natalie [3] 801-282-8087
© Dominguez Angelica 801-282-0683
© Edwards Diane ..801-280-8374
© Edwards Sheree ..801-601-8925
© Ellis Sonja
Furniss Mike & Karla [3] 801-282-0313
© Guevara Cody 801-282-8954
© Hardy Lisa

W 9000 S Cont'd

© Hongpharky No 801-676-9414
© Hooton Derrek 801-282-8469
© Joeseph K 801-260-0871
© Kennan Janelle ..801-601-8387
© Kone Josh
Lavea Lotonuu [3] 801-282-0625
© Lewisrich Leslie
© Lomu Barbara 801-280-2393
Marsh Frank [3]
© McFalls Jerry
© Moreno Maricela ..801-601-8804
Moyer Adam [3]
© Munoz Vilma 801-280-4602
© Nichols Barbara ..801-282-0624
© Nofsinger William 801-601-8344
Ortiz Jordan A [3]
Ortiz Darek
© Paschall Gregg & Rebecca 801-280-6773
© Peterson Angela ..801-282-5982
© Portman K 801-282-2433
Portman C 801-282-2433
© Reading Penny ..801-280-8316
Schilling D [3]
© Segura Maria M ..801-282-6760
Shipley Brandie [3] ..801-566-4395
Shipley Kathleen 801-566-4395
© Shopay Nichole ..801-282-3472
A101 Pelch Justin A [4]
A101 Pelch Holly
A201 Young Paul T [4]
A201 Young Michelle R
A204 © Coe Josh & Sarah A 801-282-8316
A302 © Davis Christy F
B103 Maravi Anita [2] 801-282-1387
B104 © Emerson Matthew
B104 Emerson Holly L
B201 © Baird Richard J & Sherri N
B201 Gilden Kimberly A [2]
B203 © Willis Sarah J
B301 Getz William A [2] 801-280-8881
B303 © Willard Sara 801-260-1644
B303 Willard Howard L 801-260-1644
C101 © Nelson Jeffrey D
C104 © Hutchinson Lyndsie 801-282-8650
C104 Hutchinson Spencer 801-282-8650
C301 Thomas Stephanie [2] 801-280-1496
C302 © Kuurtel M
D101 Tompkins Laretta [2] 801-280-4327
D102 Hatfield Cindy S [5] 801-280-4452
D104 © Ward Tereah
D201 © Holmes Annette J
D202 © Gonzalez Roberto H
D203 © Wallace Anne M
D204 © Timpson Stephanie A
D302 © Shosted Vanessa M
D303 Simons Travis [2] 801-260-6813
D303 Simons Michele L 801-260-6813
D304 © Kelley Barbara J
D304 Kelley Lauren M
E101 © Dejesus Luis B
E101 Dejesus Starla
E104 Taylor Diane R [2] 801-260-2180
E104 Taylor Jerry D ..801-260-2180
E203 Hansen Kim [10]
E204 © Ansari Jalal S
E301 Finch Jacob D [2] 801-280-7988
E301 Finch Melissa M 801-280-7988
E302 Medina Natalie R [4]
E304 Gotberg Jennifer [2]
F101 Rich Leslie L [2]
F104 © Gilbert James
F201 Patrick Ian D [2]
F201 Patrick Crystal M
F203 © Powell Dallin T
F301 © Graham Diane B
F301 Graham C B
F302 Yates Shauna E [2]
F302 Yates Barbara A
F304 © Patrick Mary A
G102 © Jorgensen Aaron M
G202 Jenson Danielle L [4] 801-282-0794
G202 Jenson Angela D 801-282-0794
G203 Bond Adam S [2] 801-601-8823
G203 Bond Emilee M 801-601-8823
G302 Gastunas Tavie D [4]
H102 © Hutto Mindy
H104 Torres Monica [3] 801-808-5381

W 9000 S Cont'd

H104 Torres Brittney M 801-808-5381
H104 Torres-Ramirze Michelle [3] 801-808-5381
H303 Hansen Mathew R [2] 801-260-1060
H303 Hansen Marina 801-260-1060
I102 © Menatti Melissa
I104 © Brundle Heather
I201 © Lay Krista
I204 Madrid Marcus S [3]
I204 Madrid Leeann
I302 © Rafferty Mandy
I304 © Cressall Tyler W
I304 Cressall Margene E
J101 Hancock William & Tamara S [4] 801-280-5094
J102 Perry Carol G [7] 801-282-5427
J103 Steiner Paul & Misty [3] 801-282-0793
J104 © Elespe Irene 801-280-6445
J104 Elespe Andrea ..801-280-6445
J201 © Rivers David A & Susan F 801-280-5417
J203 © Mecham Rebecca S
J303 © Morgan Tamara A
K101 © Winn Lisa ..801-282-1468
K102 © Ferrer Spencer A
K102 Ferrer Normita
K103 © Orourke Sean W
K103 Orourke Stacy L
K201 © Morrill Scott R & Kandi 801-282-1639
K202 © Anderson Christy M 801-601-8772
K202 Anderson Emily D 801-601-8772
K203 © Blackett Matthew J
K203 Blackett Lynzi R
K301 Christensen Justin C [2]
K302 Sanchez Adelso A [4] 801-280-6845
K302 Sanchez Andres 801-280-6845
K303 © Cullen Fredrick T 801-576-6658
K304 © Stradley Steven S
K304 Stradley Sarah J
L101 Shaughnessy Karen [2]
L102 Tindall Sunshine B [2] 801-282-5021
L104 © Soliz Gabriela 801-282-5132
L201 © Williams Joshua T & Trina 801-280-6901
L202 © Hawea-Tehira Lee A
L301 © Paredes Daniel 801-282-5367
L301 Paredes Kathryn A 801-282-5367
L302 Armstrong Christopher J [4]
L302 Armstrong Sara
L303 © Terry Jeffrey B
L303 Terry Shauni
L304 © Owens Gentry S
M101 © McQueen Lisa B
M103 © Crowther Nicole T 801-601-8511
M103 Crowther Spencer A 801-601-8511
M104 © Madsen Cinnamon & Soren S 801-678-9374
M204 © Hotchkiss Jared T
M204 Hotchkiss Jenny
M304 Burns Susan B [2] 801-282-9991
M304 Burns B S 801-282-9991
N203 © Moeai Martha I
N203 Moeai Matthew
N204 © Zaharias Don B & Rosemary P
N302 Snarr Robert B [2]
N302 Snarr Rebecca D
N304 © Marcy Lorena
P101 Howell Joseph R II [3]
P103 Heilman David [2] 801-282-6918
P103 Heilman Sarah K 801-282-6918
P104 © Leblanc Scott 801-280-2628
P104 Leblanc Jannalyn 801-280-2628
P201 © Broos Freddy L & Melanie J
P202 © Marques Alberto C 801-561-5432
P202 Marques Iris 801-561-5432
P304 Kramer Robert D & Wynell E [2]
Q101 © Preece David O 801-260-1017
Q101 Preece Amanda 801-260-1017
Q102 Solomona Talato [4] 801-282-4165

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1445 Jorgensen Kenneth F & Shauna B 19▲
NORTH STAR INSPECTIONS real estate inspection 801-571-6510
1448 Finley Marc W & Shauna S 22▲
1457 Hampton Michael S & Marilynn S 13▲
1462 Lorence John L & Dana L 11▲
1469 Smelser James M & Mary D 14▲ 801-572-4051
1474 Draper Jimmie E 2▲
Draper Beckey L
Johnson Gregory L & Debbie J 27▲ 801-571-7024
1477 Nielson Marlell A & Sandra R 29▲ 801-571-4387
1478 Vasica John T 26▲ 801-572-1549
1483 Dillin Luci 3▲ 801-576-6462
Dillin Rachael L 801-576-6462
BUSINESSES 1 HOUSEHOLDS 12

WINTERWOOD DR (SANDY)
• ZIP CODE 84092 CAR-RT C005
9745 Hofeling Norvell N & Elva D 13▲ 801-571-0490
9746 Millard Charles B & Michelle E 4▲
9758 Macgregor Matthew D & Alona A 20▲ 801-495-3626
9770 Milne Linda D & Clair G 28▲ 801-571-5155
9782 Foster Steven H & Diane C 11▲
Keubitl Edward V 3▲
9796 Wilcox Dustin L 9▲
Wilcox April M
9799 Rieff Ronald L & Shauna K 12▲ 801-523-9202
HOUSEHOLDS 8

WINTHROPE CIR (WEST JORDAN)
• ZIP CODE 84088 CAR-RT R001
3655 No Current Listing
3657 Hess Michael F 11▲
3659 Gedicks Christopher W 4▲ 801-282-6546
Gedicks Kelly L 801-282-6548
3665 Rasband Charles W III & Earlene W 18▲ 801-280-8428
3666 Larsen Steven L & Linda L 28▲ 801-280-5013
3681 Pearson Bruce E 13▲ 801-280-2799
Pearson Lena C 801-280-2799
3682 Arnold Chad C 14▲ 801-280-8499
Arnold Carol J 801-280-8499
HOUSEHOLDS 7

WINTHROPE DR (WEST JORDAN)
• ZIP CODE 84088 CAR-RT R001
3792 - 9012 No Current Listing (2 Hses)
9013 Hansen Arianna 12▲
Hansen Lynette
9024 Harris Matt N & Jennifer S 7▲
9036 Neal Mitzi G 2▲
Neal Natae A
9048 Holman Scott F & Vicki L 14▲
9057 Morris Penny T 16▲ 801-280-1253
9060 Love Carol 8▲ 801-280-8022
Young Kimball M & Carol L 2▲
9069 Sermon Bradley W & Leslie T 27▲ 801-280-0490
WEBSMITH Internet serv 801-280-0490
9072 Kinder Robert C 4▲ 801-280-6233
9081 Langston Troy C & Jennifer H 5▲ 801-280-8879
9090 Aguirre Damon L 4▲ 801-562-5343
Aguirre Charmel 801-562-5343
Nicholson Bobby C & Keren W 27▲ 801-280-1639
Ⓦ Williams Miriam
BUSINESSES 1 HOUSEHOLDS 15

WISTERIA WAY (WEST JORDAN)-FROM 5293 MORNING LAUREL LN SOUTH
• ZIP CODE 84088 CAR-RT C004
5102 Ⓦ Lund Justin▲
5122 Ⓦ Gill Christopher B▲
Littlefield Jennifer L 2▲
Littlefield Heather M
5166 Sheen Christian T 2▲ 801-280-3877
+ WINTER BERRY DR ENDS
+ MOUNTAIN IRIS WAY INTERSECTS
9016 Ⓦ Nelson Michael S▲
Nelson Steven D
9017 Grandy Trenton G & Dana A 4▲
+ MOUNTAIN IRIS WAY INTERSECTS
9034 Cervinski Bernard P 4▲ 801-280-5826
Cervinski Ben 801-280-5826
9042 Ziolkowski Jay E & Kristy A 3▲
9052 Dummar Robert A & Amber M 6▲ 801-282-2287

WISTERIA WAY Cont'd

9053 Ⓦ Dejesus Emmanuel L & Josephine G▲ 801-676-9203
9067 Froisland Bret L & Shannon 9▲ 801-260-1642
9068 Gomez Jack O & Endomihia C 5▲ 801-282-6295
+ MORNING LAUREL LN ENDS
9079 Walker Ryan J 9▲ 801-260-1051
Walker Amy A 801-260-1051
9082 Wilde C D 4▲ 801-282-5622
Wilde Damon 801-282-5622
9091 Garcia Mario Y & Donalynn S 4▲ 801-282-4665
9096 England Corbin R 6▲
England Casey L
9103 Sosa Edwin G & Stacy L 4▲ 801-280-3875
9108 Ⓦ Smith David W▲ 801-280-0103
Smith Denise E 801-280-0103
9118 Smith Tyler W & Mikki R 5▲ 801-282-6309
9119 Stevenson Rhonda S 3▲
Stevenson Ronni
9132 Wardle Benjamin D & Bonnie D 10▲ 801-280-5095
9144 Latimer Richard M & Jennifer 3▲ 801-280-5793
Ⓦ Stewart William J▲
9153 Prince David R Jr 4▲ 801-282-1446
Prince Cl L 801-282-1446
9156 Prime David A & Angela D 3▲ 801-260-1364
9167 Adams Dorian L & Laura H 4▲ 801-282-6552
9168 Johnson Cindy R 4▲ 801-282-9969
Johnson Theros M 801-282-9969
9179 Carling Gordon & Carol J 4▲ 801-282-2017
9182 McPhee Douglas J & Alice C 4▲ 801-282-8325
9187 Hamilton Rance W & Christine 4▲ 801-280-4144
9194 Ince Thomas J & Jean 4▲
9201 Ⓦ Martinez Michael▲ 801-676-9221
Martinez Ashley 801-676-9221
9206 Ⓦ Orcutt Charles R Sr▲
Orcutt Christina T
9213 Robinson Christopher G & Kristine G 3▲ 801-260-1902
9216 Larsen Brandon R 5▲ 801-282-0914
Larsen Rachel A 801-282-0914
9227 Hauptman Robert P 9▲ 801-280-3651
Hauptman Betty A 801-280-3651
+ SNOW BELL DR ENDS
9232 Greene David A & Christine G 2▲ 801-566-1124
9239 Smith Stephen H & Lisa 10▲ 801-282-6233
9244 Farnsworth Brandon R 3▲
9253 Rodocker Todd A 4▲
Rodocker Holly
9256 Logan Matthew S 6▲
9274 Birch Darin L & Michelle D 9▲
9277 Ⓦ Taylor Troy A & Nicole▲ 801-352-8271
9282 Hernon Jenevieve P & Judah P 8▲ 801-280-4407
9287 Littlefield Avery D 3▲
Littlefield Erin K
9294 Mason Daniel W 8▲
Mason Bonnie
9297 Heugly David L & Valarie S 3▲
9308 Ⓦ Olsen Lorrain▲ 801-302-9526
- 9316 Olsen David L (2 Hses) 801-302-9526
9317 Jacobsen Todd M & Tina M 14▲ 801-280-6889
9324 Randazzo Frank A & Leeann B 9▲
9327 Gale Marvin H & Claudia H 3▲
Garcia Edgardo J & Lisa M 11▲ 801-282-6310
9338 Baumgartner Kirk E & Tracy P 6▲ 801-280-7174
9346 Groesbeck Gavin K 2▲
HOUSEHOLDS 55

WITFIELD CT (WEST JORDAN)-FROM 1439 W 8380 S
• ZIP CODE 84088 CAR-RT R002
8329 Ⓦ Monte Todd J▲
Monte Carmen
8334 Williams Michael D & Deanne M 13▲
8341 Lloyd Ronald K & Sheri K 12▲ 801-561-1760
8342 No Current Listing
8351 Tatton Brett M 13▲
Tatton Brian R

WITFIELD CT Cont'd

8354 Casper David R & Mary J 13▲
HOUSEHOLDS 6

WOLF POINT CIR (SANDY)-FROM 753 MEADOW HILL DR
• ZIP CODE 84070 CAR-RT C013
11251 Hoffmann Richard M & Kathy L 11▲
11252 Ⓦ Gallegos Steve J▲ 801-304-4733
11257 Webster John D & Cindy E 18▲ 801-571-6519
11260 Ⓦ Knight Chelsea M
Pace Steven F & Charlotte K 19▲ 801-571-2587
STEVE PACE TRUCKING trucking 801-571-2587
11263 Rasmussen Byron L & Natalie M 7▲ 801-545-8921
11274 Gruendell Craig J & Kathryn L 18▲ 801-572-6476
GRUENDELL GARDENING lawn & grounds maintenance 801-572-2789
11275 Mason Bart L & Karen M 9▲ 801-501-7337
BUSINESSES 2 HOUSEHOLDS 8

WOLFE GROVE CIR (MIDVALE)-FROM 8225 ALLEN ST
• ZIP CODE 84047 CAR-RT C002
539 - 540 No Current Listing (2 Hses)
541 Ⓦ Paraboschi Hanna ..801-352-7517
Ⓦ Spitzenberg Apolonia
Ⓦ Valdez Stephanie
542 H Ⓦ Bergstrom Cassandra L Ⓦ Sierra Azusena
548 Casaus Mary E 8 801-566-1674
551 Ⓦ Farnsworth David ..801-566-2597
Ⓦ Jones Lisa K
558 Vadidia Juan 2
568 Ⓦ Anderson Breana A
Ⓦ Avila Alma 801-352-0248
Ⓦ Jose Ruiz 801-569-4687
569 A Ⓦ Barnett Jamey D Velazquez Victorina 2 ..801-566-0551
589 No Current Listing
HOUSEHOLDS 17

WOLLEMI PINE WAY (WEST JORDAN)-FROM 3299 BRYNWOOD PINE BAY SOUTH
+ VIRGINIA PINE LN CONTINUES
• ZIP CODE 84088 CAR-RT R013
8808 Allred Nona M & Stuart W 14▲ 801-255-7509
8812 Ⓦ Perry Luke S & Tennille 801-601-8729
8816 Bethers Forrest R 8▲
8820 Ⓦ Lujan Leona L
Poulsen Keith K 2▲
8824 Lynch Ronda 2▲
8828 Ⓦ Roberts Gary J▲
8836 Ⓦ Bellows Jessica M▲
8840 Porter Chailse 2▲
8844 Montano Ashley G 3▲ 801-569-9781
8848 Decker Kenneth P 3
Decker Mildred E
+ BRYNWOOD PINE BAY ENDS
+ MONTEREY PINE LN ENDS
+ S 3235TH W BEGINS
HOUSEHOLDS 11

WOOD ST (MIDVALE)-FROM 54 W WASATCH ST SOUTH
• ZIP CODE 84047 CAR-RT C009
8036 Cupp Jeffrey R 11▲
Cupp Cathleen D
8041 TYLER PUBLIC LIBRARY libraries-public 801-944-7641
8048 Perkes George A & Linda M 16▲ 801-561-5765
8060 Ⓦ Luis Roibal
8062 Ⓦ Royval Armando
8071 Ⓦ Olsen Dena
8088 Sund Marian 34▲ 801-255-0717
8091 Ⓦ Beatty Ray L
8095 Hartlerode Carol 3 ..801-566-4316
8098 SMITH'S PILOT CAR SVC transportation 801-561-5065
+ COLUMBIA DR INTERSECTS
8123 Lieb Karl T & Michele 11▲ 801-553-6480
+ COLUMBIA DR INTERSECTS
8131 Vandam Joan T 14▲ 801-255-7284
8136 Olson Gerald L & Marilyn D 39▲ 801-255-5567
8139 Yates Adoyle D & Pamm 31▲ 801-561-2876
8146 Bohler Jenae B 2▲
8149 Blake Robert G & Velma L 30▲ 801-255-6900
8158 Bentley Arthur D & Jean K 32▲ 801-255-5748
8161 Thomas Ray P & Arla B 45▲ 801-255-4836
8166 Taylor Clinton R & Nadine S 20▲ 801-255-2447

WOOD ST Cont'd

8169 Cummings Mike B 4▲
Cummings Laura R
8176 Mann Brian D 14▲ ..801-566-1154
Mann Rhonda L 801-566-1154
8181 Blaimer Ludwig M & Martha M 37▲ 801-255-6219
8188 Smith Merlene N & Derald T 42▲ 801-255-5352
8191 Lamb Leah A 13▲
8202 Kynaston Eugene A & Lynda E 45▲ 801-255-8414
Ⓦ Stylette Lyndas
8203 Shingleton Roger W 3
8221 Williams Brenda J 13▲ 801-563-0237
8224 No Current Listing
8244 Jenkins Marceline T 11▲ 801-255-1037
8252 Madsen Amber L 2▲
8253 Ivie Joel R & Shelli L 17▲ 801-566-2993
+ MARQUETTE DR INTERSECTS
8259 Smith Bryan J & Traci A 10▲ 801-352-9450
8263 Parkin Robert H & Janice R 17▲ 801-568-1633
8264 Roberts James W & Joan N 28▲ 801-561-0091
+ MARQUETTE DR INTERSECTS
8274 Markel Harold L & Muriel K 42▲ 801-255-8286
8275 Loulias Michael P 17▲ 801-566-9736
8285 Oliverson Ray H & Helen J 45▲ 801-255-2336
8286 Rayback Jonathan M & Teresa W 3▲ 801-561-5175
8294 Hart Don S & Shirley L 49▲ 801-255-6156
8297 Hogenson Brent H & Mary A 24▲ 801-255-7070
8308 Haake Leonard H III & Elaine C 35▲ 801-255-5067
8311 Kelley Kreig B 22▲ 801-561-2638
Kelley Jolue D 801-561-2638
Ⓦ Mano Amy J
8324 Topalian Charles E & Elizabeth R 12▲ 801-255-4837
8325 Hobbs Andy F & Barbara W 11▲ 801-568-2469
8338 Serdar Jack & Carolyn D 11▲ 801-255-9097
8341 Morrison Steve J 3▲
Morrison Genelle M
8352 Kofford Lloyd N & Margaret A 45▲ 801-255-0345
8355 Nystrom Albert D & Nena N 45▲ 801-255-2353
+ PRINCETON DR INTERSECTS
BUSINESSES 2 HOUSEHOLDS 48

WOOD GLEN RD (SANDY)
• ZIP CODE 84092 CAR-RT C002
1542 Jeffery Mark J 11▲ 801-495-1032
1543 Ⓦ Stibolt Thomas B▲
Ⓦ Villanueva Jose▲ ..801-523-8324
1554 Mast Roger J 16▲
Mast Jason R
1555 Matsu Brent T & Venna M 13▲ 801-572-6319
1564 Murphy Richard P 14▲
1565 Kent Carol A & Donald T 21▲ 801-572-2527
1576 HOME SELLERS CONSULTANTS real estate 801-495-9033
McGavin Carl R & Kathleen L 23▲ 801-572-1115
1577 Ⓦ Nielsen Brett G▲
1588 Shick Robert S Jr & Colleen M 18▲ 801-571-1991
1589 Lofgreen Linda M & Louis R 12▲ 801-572-8211
1600 Johnson Corinne P & Richard T 23▲
1601 Harris David E & Julie A 18▲
1612 Booth M E 2▲
1613 Gronkowski Andre A 2▲
1624 Murphy John C & Margaret M 11▲ 801-571-7898
1625 Andrus John W & Joanna A 5▲ 801-576-9482
1636 Enriquez Bernard R & Leslie L 14▲
1637 Asay Suzanne R & Dale A 12▲ 801-553-9592
1650 Hudson Brian P & Denise M 11▲ 801-571-8020
1651 Scaglione Albert M Jr 2▲
1677 Ⓦ Jeong Betty▲ 801-501-0636
1678 Spehler John P & Monica J 6▲ 801-619-9876
1688 Taylor Michael J & Sandra S 21▲ 801-572-3683
1689 Peterson Kris W 21▲ 801-572-4800
Peterson Rae D 801-572-4800

WOOD GLEN RD Cont'd

Ⓦ Turner Aleasha M▲
1698 Adams Steve B & Laura L 8▲ 801-523-0467
1701 Garretson David H & Renae A 13▲ 801-572-0992
1708 Shino Paul J 14▲
1713 Ⓦ Kalasky James▲
1720 Wipple Richard E & Jane T 8▲ 801-501-8248
1725 Jones Mathew S & Marjean C 21▲
PENCIL PORTRAITS BY MARJ art instruction & schools 801-572-2662
1737 Ⓦ Brown Stephen J▲
Brown Laura M
Mero Paul T & Sarah A 8▲ 801-553-3595
Ⓦ Williams Mark W▲
Williams Janie
1749 Richards Daniel D & Marcia L 17▲ 801-571-2274
1761 Bricker Christopher D & Jana L 11▲ 801-523-3828
1775 Mayo Richard R & Melissa A 6▲ 801-553-9233
BUSINESSES 2 HOUSEHOLDS 38

WOOD HOLLOW DR (RIVERTON)-FROM 1801 TRAVERSE CIR
• ZIP CODE 84065 CAR-RT R012
15594 Vawdrey Paul A & Lynette I 18▲ 801-254-4533
15615 Bronson Lawrence T & Tammy K 11▲ 801-446-9164
15630 Scott Brandon W & Robyn K 5▲
15631 Gayler Kenneth W & Lisa R 15▲ 801-254-5861
15645 Powell Jim R & Rosemarie D 12▲ 801-254-5424
15660 Bingham Lenard W & Sherry L 10▲ 801-302-8628
15663 Ⓦ Christensen Eleisha
Ⓦ Young Chad P▲ ..801-302-2026
Young Eleisha 801-302-2026
15681 Park Lucy T 8▲
15688 Zeeh Delia R & Stuart L 15▲ 801-254-9917
15701 Gerard Raymond M & Donna L 14▲ 801-253-4517
15710 Brangle Thomas W & Janette L 11▲ 801-446-6786
+ RIVER VIEW DR INTERSECTS
15731 Land Thomas R & Michelle 14▲ 801-446-9321
15742 Ⓦ Aldred Elizabeth
Allred Merlin S 6▲ 801-446-2067
Allred Nicholas 801-446-2067
Sudbury Ralph 5 ..801-253-4830
15751 Visser Dan M & Nora 15▲ 801-254-8363
15771 Mumford Robert L & Caree L 14▲ 801-637-3841
Munford Austin 4▲
15782 Cozzens Blane A & Sherrie J 18▲ 801-254-6515
15791 Jensen George P Jr & Zelda T 22▲ 801-254-5565
HOUSEHOLDS 21

WOOD MESA DR (WEST JORDAN)-FROM 5099 WOOD SPRING DR SOUTH
+ WOODWORTH RD CONTINUES
• ZIP CODE 84084 CAR-RT C017
7551 Ⓦ Rivera Renato Sr▲
Rivera Lesa L
Sandoval Susan 4▲
7561 McGrath Darren S & Lisa D 8▲
+ WOOD SPRING DR INTERSECTS
7575 Nguyen Henry N 9▲
7578 Bennett Ted D & Elizabeth T 22▲
7589 Redmond David B 13▲ 801-260-1045
7596 Erickson Kit R 9▲
Erickson Shandi H
7611 Ⓦ Tenney Chad▲ 801-282-8576
7614 Byers Dale S & Susan S 14▲ 801-282-6766
7625 Christensen Carl F & Heather F 9▲ 801-280-8109
7628 Ostler Clayton L 9▲
Ostler Mirian
+ W 7640TH S BEGINS
7639 Wallin Stuart L & Heidi L 9▲ 801-282-4730
HOUSEHOLDS 12

WOOD PARK LN (SOUTH JORDAN)-FROM 4843 SKYE DR SOUTH
• ZIP CODE 84095 CAR-RT R011
9582 Church Brian D & Mirlan L 5▲ 801-282-1721
9587 McArthur Richard B 8▲
9592 Nilson Michael K & Thyra J 11▲ 801-282-0338
9597 Ⓦ Barney Jennifer K▲
Barney Matthew

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W 8970 S (W J)
Jewkew Lisa C
2059NAnderson Scott 567-1261
2077 Not Verified
+S 2070 W ENDS
· ZIP CODE 84088 CAR-RT C020
4426NRobb Richard..... 282-5818
HOUSEHOLDS 8

E 9000 S (SANDY)-
+STATE ST INTERSECTS
· ZIP CODE 84070 CAR-RT C003

32 QUICK-THRU SAFETY EMISSIONS auto svcs 562-4327
50NBrinkerhoff Mildred 304-9137
NClapp Hilda..... 352-7251
NDeverle Hanksa John. 566-8533
NHanks John D..... 566-8533
NHendrickson Rilla..... 569-0640
NMcKnight Yvonne..... 565-9252
NMitchell Margaret 561-9813
Moser Joan 562-0876
NNebeker Eva L 352-8242
NNourse Sarah L..... 567-9255
NParker Tom R..... 352-7155
NRobbins Charles 566-7229
SANDY REGIONAL HOME nrsng prsnl care 561-9839
NSoffe Gweneth L..... 568-1770
NSpainhower M L..... 566-2166
NStephenson Robert..... 566-5160
NTyson C..... 567-1609
NVinson Shirley 561-9375
+TINY WOOD DR BEGINS
166 Ostergaard Darlene 255-4786
172 Osborne David M
178 Not Verified
182 Porter Layne 255-4786
Porter Jimmie 255-4786
186 Graham Lester E 255-0996
Graham Lois P..... 255-0996
192NMcAdams Sherri 255-3445
228 Harrington Jeffrey A .....
..... 561-5452
244 Not Verified
252NTaylor Sherman L & Shelly 352-9068
268 Cowan Michael L 586-1760
Cowan Robin L..... 566-1760
276 Stevens Ruth K 562-2469
284NAngus Aubrey J..... 233-8334
+HARRISON ST ENDS
+S 255 W BEGINS
316NJenson Danny L 255-4172
330 Webster Kevin W & Moya .....
..... 566-4632
358 Not Verified
372 Thomas Diana L
388NRitzman Paul V..... 255-2138
+RAILROAD CROSSES
416 Christlieb Duane 561-7386
428 Johnson Tiffany L
448 Sorenson Alicia J
+SANDY PKWY INTERSECTS
462 Granquist Naomi S 255-3225
488 Brown Bessie P 255-4006
496NHomer J 255-4843
508NFehr Keith G..... 569-9128
520 Peterson Irene M 561-7186
530NPeterson I M..... 561-7188
Whipple Leroy B 561-7188
562 Roper Flora N 255-4587
576NPeck..... 566-2401
588 Goff Buddy D 255-6026
Goff Tracey..... 255-6026
+S 700 E INTERSECTS
· ZIP CODE 84094 CAR-RT C005
735 100 RINDLESSACH HOMES operative bldrs..... 965-9400
741 B AMERICAN EMPLOYMENT help supply svcs..... 255-9222
765NAshton Richard I..... 562-3200
765 Not Verified
BUSINESSES 4 HOUSEHOLDS 49

W 9000 S (SANDY)-FROM 8963 STATE ST EAST
· ZIP CODE 84070 CAR-RT C016

36 JAVA HUT misc food stores 567-9144
51 NELSON L R CONSULTNG ENGINEER eng svcs..... 352-2040
56 BURGER KING eating places 255-8401
57 SECURITY LENDING CORP loan brokers..... 265-8900
67NRobinson Clay M..... 255-3165
ROBINSON CLAY CO mble hme site optrs 255-0228
Wall Roy H 255-0228
Wall Jani R..... 255-0228
91 LONE PEAK SPRINKLER & LANDSCAPE plumb-htg-a'c 783-8313
NOrton Nathan..... 561-5295
111 FRANCOIS D HAIR DESIGN ACADEMY beauty shops 561-2244
115 UNITED FURNITURE WAREHOUSE furniture stores..... 566-3055
129 ARBY'S eating places
140 COMMUNITY FIRST NATIONAL BANK natl commrcl banks 586-9700
NEastmond M D..... 566-4000
SPENCER TERRY R.... 566-1884
1 RED ROCK ADVERTISING advertsng agencies 377-5550
3 SOLUTIONS FINANCIAL CORP busn svcs 352-7500
5 ASCENT NETWORKING optr intgtd sys dgn 567-9910
6 LITTLE D SCOTT & ASSOCIATES atty 562-1459
7 PUSEY ROBERT D atty 566-9286

W 9000 S (S)
8 ESTMOND M DIRK ATTORNEY AT LAW atty 566-4000
9 ANSWERING SERVICE busn svcs 569-6801
153 SINCLAIR OIL CORPORATION gas stations..... 566-4134
+RAILROAD CROSSES
+S 220 E INTERSECTS
200 BUTTERFIELD FORD new used car dlrs 566-2441
203 EAGLE HARDWARE STORE 567-9007
FAST TRAK FOODS eating places 568-2781
219 WALLPAPER WAREHOUSE pnt gls wlpr strs..... 561-5172
239 SA SPA DEPOT OF UTAH misc rtl strs 561-2084
247 FITNESS EQUIPMENT OUTLET sptg gds/sks sls 352-7181
+S 260 E BEGINS
+S 280 E ENDS
+S 300 E INTERSECTS
· ZIP CODE 84070 CAR-RT C010
355 DAKOTA SPAS physcl fitnss facltn 233-8816
375 K & K CUSTOM AUTO BODY REPAIR pnt & body rpr 352-1343
+S 450 W ENDS
+S 400 E INTERSECTS
425 MAVERIK COUNTRY STORES gas stations..... 569-2139
+S 440 E INTERSECTS
+BRENTMAR CIR ENDS
+GREENWOOD DR BEGINS
+S 500 E ENDS
500 CARPET GIANT floor coverings 565-1010
+S 530 E BEGINS
559 Not Verified
567 PORTER LAYNE NURSERY flwrs flrsts sopls 569-8780
+MINGO PARK DR ENDS
620 TANNER TRANSMISSIONS auto rpr 566-3918
+S 700 E INTERSECTS
+E 9000 S BEGINS
BUSINESSES 31 HOUSEHOLDS 5

W 9000 S (WEST JORDAN)-
+S 1000 W ENDS
+S 1075 W ENDS
· ZIP CODE 84088 CAR-RT R004

1070NLopez Maria M 255-9006
1085 Not Verified
1091NBurton Lavar C..... 256-0523
1100 COMPUTER WORLD comptr softwre str..... 562-2880
Dole James N 255-9609
Dole Christopher P 255-9609
+DAMASCUS WAY ENDS
1109NTaylor Allen A..... 565-1816
1125 Clark Brende H & Lamar .....
..... 255-6261
1187 Harrison Merlin D & Janice .....
..... 255-5431
+GALILEE WAY ENDS
1227 NAIL EXPRESS misc rtl strs 561-0908
1231NRoach Charles W..... 255-2390
1272 KELLIE & CO beauty shops 255-3223
1276 BRINE INSURANCE ins agts'svcs 566-1829
1285 CONOCO gas stations..... 569-8236
+S 1300 W INTERSECTS
· ZIP CODE 84088 CAR-RT R011
1330 NEW CHINA RESTAURANT THE eating places 562-1600
1333 ANDERSON LUMBER COMPANY lmbr bldng mtrls..... 561-9000
1373 MOBIL WIRELESS COMMUNICATIONS radio telephon comm..... 566-6919
1375 ALLIED SECURITY dctv srvmrd car sv..... 352-0370
1377 POST DATED CHECK LOANS fnctns rltd dep bkg 569-0757
1379 PET CORNER misc rtl strs 566-6896
PETS A LOT misc rtl strs 352-1261
1387 A V & S CORP eating places 562-9400
1389 NAIL STATION beauty shops 567-0703
1391 ALOHA TAN misc prsnl svcs 565-9676
1393 ABRECO DOCUMENT SHREDDING svc ind mach..... 352-1384
EVANS DONNA INSURANCE SERVICES ins agts'svcs 566-6935
· ZIP CODE 84088 CAR-RT R004
MAIL PLUS OF WEST JORDAN busn svcs 566-9569
· ZIP CODE 84088 CAR-RT R011
TABLE TOP VENDING merch mach operatrs 561-4707
193 KING KING & DURFEY attys 568-6839
325 PRIME FLUID PRODUCTS indus equip 565-8900
357 RELIABLE BUILDING busn svcs 558-6737
378 INSTRUMENT SERVICE AND CONTRLS repair svcs 254-5164
1394 302NNagle Lorri
1405 CLOWARD RUSSELL R ins agts'svcs..... 561-1516
FARMERS INSURANCE GROUP ins agts'svcs 566-3334
GARDNER JOE INSURANCE ins agts'svcs 561-1567
NSmith Daniel W..... 566-3334
TIMOTHY NED K ins agts'svcs 561-8868
1407 CAFE KIM eating places 561-1990
1410 ARBY'S eating places

W 9000 S (W J)
R T M VENTURES eating places 569-3500
1411 MATERNAL INSTINCTS-BREASTFEEDING misc rtl strs 568-7020
1435 KEYBANK NATIONAL ASSOCIATION commrcial banks 535-1091
1475 GRANITE FURNITURE COMPANY furniture stores..... 566-4444
1486-1510 Not Verified (2 Hses)
· ZIP CODE 84088 CAR-RT R004
1519 COLUMBIACARE CLINIC W JORDAN medical clinic.. 565-1162
· ZIP CODE 84088 CAR-RT R011
NGoodwin Leslie..... 565-1637
NLash Kevin 565-1637
NRalston Julie..... 565-1637
1553NDewey Steve C..... 561-7300
NHolmes Jason 561-7300
NLater David M..... 561-7300
SHOPKO OPTICAL optmtrst 561-7300
1589 BALTER J M CO womens clothng strs 565-0565
1590 BURGER KING eating places 256-9546
· ZIP CODE 84088 CAR-RT R004
1593 COUNTRYWIDE mtg bkrs corrspndn..... 565-9294
· ZIP CODE 84088 CAR-RT R011
1595 PAYLESS SHOESOURCE shoe stores 561-1092
1597 ANN'S COPYPAK & IDEA FACTORY duplctng svcs 565-1818
1605 SUN CITY misc apprl accy st 255-1531
1617 LITTLE CAESARS PIZZA eating places..... 565-0101
1629 SEGULL BOOK & TAPE STORE book stores..... 568-0444
1633 FABRIC CENTER sewing ndlwk 561-8726
1646 GEM DRYWALL CORPORATION plstrng dwall instl 561-2319
1649 TACO BELL eating places 255-0199
1650NJones Paul W..... 255-9017
JONES EXCAVATING CO excavation work 255-2642
1652 HOGI YOGI OF WEST JORDAN eating places 566-5695
1653 ALBERTSON'S STORE grocery stores..... 561-4523
1654 INFOTECH SOLUTIONS comptr softwre str..... 255-2751
S O S STAFFING SERVICES help supply svcs 569-1993
1658 VILLAGE BAKER eating places 565-0055
1662NBladen B K..... 255-6581
B GAILEY CRAIG dntst 566-7269
1669 GENERAL NUTRITION CENTER W misc food stores 566-5190
1670 BLOCKBUSTER VIDEO video tape rental..... 567-0825
1680 KENTUCKY FRIED CHICKEN eating places..... 566-1741
+REDWOOD RD INTERSECTS
· ZIP CODE 84088 CAR-RT R006
1735 KNIGHT BROTHERS CONSTRUCTION spcl trd cntrs 561-5992
1775 NORWEST MORTGAGE mtg bkrs corrspndn..... 567-9808
· ZIP CODE 84088 CAR-RT R008
1780 MAIL BOXES busn svcs. 562-1899
126 COMFORT CONTROL plumb-htg-a'c 253-4434
134 FABRIC OF TIME sewing ndlwk 233-9060
211 IMAGE IN ME gmes tys chlrn vh 488-8851
301 MAXAM busn consltng 271-9698
314 ROYALTY SERVICES crpt uphistry clng 562-1228
333 DIAMOND DOOR CO lmbr bldng mtrls 587-1622
· ZIP CODE 84088 CAR-RT R006
1781 BACK ON TRACK CHIROPRACTIC ofcs clns chrpretr 562-0502
BOND CHIROPRACTIC chrpretr 562-0363
FORBES CHIROPRACTIC CLINIC ofcs clns chrpretr 562-5600
Jacques Francois 562-0502
1793 DENTAL FIRST ofcs clns of dntst 566-8540
NHicks Kenneth S..... 566-8540
+SHULSEN LN ENDS
1805NCruz Debbie..... 352-0186
LASTING IMPRESSIDNS HAIR & NAIL SALON beauty shops 565-8197
LOOK SALON beauty shops 352-0186
· ZIP CODE 84088 CAR-RT R008
1820 A WEST JORDAN fdrl savngs instttn..... 562-4606
· ZIP CODE 84088 CAR-RT R006
1823 AMOR ANIMAL HOSPITAL vtnrry svcs spclte..... 561-9595
1835 INSPECTIONS & EMISSIONS auto svcs..... 565-1786
1847 Not Verified
1847 DANNYS CONSTRUCTION CO sngl-fam hsng cnstr..... 568-9727
NEason Richard 566-9055
NJed L..... 566-7701
NMorrison L J..... 566-7701
SAFETY MANAGEMENT SERVICES eng svcs 587-0456
STUTZNEGGER KIB dntst 255-7243

W 9000 S
6 J C PAYROLL acctng auditng bkp 566-5225
1875 YOUTH CARE gnl mdl srgl hsptl 562-1717
1925 Not Verified
1995 NUFOCUS schs edctl svcs 566-5646
+S 2040 W INTERSECTS
2195NEnger Mike..... 569-8141
2640 FIRST SECURITY BANK NA natl commrcl banks 246-4500
LOLAN'S BAKERY retail bakeries 561-9103
REAMS FOOD MARKET grocery stores 566-3747
REAMS BARGIAN ANNEX grocery stores 561-9361
REAMS PHARMACY drug store 561-9131
2655NBeam Derek..... 256-6343
WEST JORDAN OFFICE gnl mdl srgl hsptl 256-6343
2664 B-LINE STAFFING SERVICES help supply svcs..... 256-9739
COPY CONNECTION duplctng svcs 566-9460
2666 ALLSTATE INSURANCE COMPANY ins agts'svcs 552-2442
NKinetop Bill 562-2442
NRobinson Paul..... 562-2442
NShepherd Dean..... 562-2442
2668 FILE U FANCY beauty shops 561-8822
NFisher Rebecca..... 561-8822
2676 DOMINOS PIZZA eating places 562-4432
2678 CORLETTAS FLORAL florists 569-1777
2680 HAIRLINE misc prsnl svcs 566-8638
2688 PAPA'S MJV eating places 566-6667
+S 2700 W INTERSECTS
· ZIP CODE 84088 CAR-RT R009
2714 MAVERIK COUNTRY STORE grocery stores 569-0103
MAVERIK COUNTRY STORES gas stations 569-0103
2729 TOP STOP AUTOMOTIVE auto rpr 567-1401
2750 Not Verified
2751NAdam Walter 352-5900
NBarker Alan..... 352-5900
NBurleigh William 352-5900
GRANGER MEDICAL CLINIC medical clinic 965-3500
2752 OLD GARDEN SHED ret nsrs gdn strs..... 566-5410
SCHMIDT'S PLANTS AND PROD L C ornmntl nurs prdcts 567-9935
2764 JACKS SPOT FREE WASH carwashes..... 569-3399
2770 Tew Boyd N & Karen 566-1010
2780NBreiling Robert P
R1 Crosby Earl 561-5459
R1 Crosby Joyce S..... 561-5459
2785 BACH PROPERTY MANAGEMENT nrsdntl bldg optrs..... 566-2224
NDumas Terry L..... 255-3499
STONEBRIDGE REALTY real est agts'mgrs 566-6700
SUBURBAN PROPERTY MAINTENANCE lndscpe cnsltng pln 255-3499
2810 Hanger Paul R 559-1183
Hanger Virginia B..... 569-1183
2820 Gasparro George V .....
..... 562-4351
Gasparro Vito B..... 562-4351
+JULIE ANN WAY INTERSECTS
2880NWigger Paul A..... 569-3990
2900NCarmichael Sean 561-3854
2922 Not Verified
2930 HOPE LUTHERAN CHURCH religious orgs..... 569-1111
+EDENBROOK WAY BEGINS
3232 England Emily
· ZIP CODE 84088 CAR-RT R001
NPowell Fred..... 352-0912
· ZIP CODE 84088 CAR-RT R009
3248NJensen Carl..... 569-8379
3282 Erickson Ernest G 561-8609
Erickson Laura G..... 561-8609
3324 Clark Connie .....
Peatross Allen S 352-1769
Peatross Miriam B..... 352-1769
· ZIP CODE 84088 CAR-RT R001
3333 FAIRCHILD SEMICONDUCTOR CORP clctng acctng eqpm 562-7000
FOOD MANAGEMENT CORPORATION mgmt cnsltng svcs 562-7470
· ZIP CODE 84088 CAR-RT R009
3344 Pulley Melvin J 255-3951
Pulley Larraine C..... 255-3951
3360NPullmer Merlen D..... 569-1488
Pulley Harvey E 255-7274
Pulley Dixie L..... 255-7274
3410 Barlow Hyrum W & Colleen .....
..... 255-6904
3434NBennion Mervin E..... 561-8765
NLunt Deann..... 565-8565
· ZIP CODE 84088 CAR-RT R001
3570NArden K..... 569-2626
Barney Mitchell F 569-2626
NBrooks G R..... 569-1260
FAMILY PLAZA PHARMACY drug store 569-0175
Forsha Douglass W 569-1456
NHansen Scott E..... 569-2626
NHull Dale B 569-2626
NJarretta Arlen K..... 569-2626
NJones Randall K..... 569-1260

W 9000 S
NKimberley S..... 569-2626
NKing Michelle..... 569-1999
NKirstein Judith L..... 569-1999
NLanger Kathleen..... 569-2626
NMitchell F..... 569-2626
NMoreland Kimberley S 569-2626
NMuije Liz..... 569-2626
NRichards John L..... 569-1999
NShifrar Jacolin D..... 569-2626
SOUTHRIDGE PROF PLZ nrsdntl bldg optrs 263-5400
3570 Not Verified
Williams Robert O 569-1999
100 JORDAN VALLEY FAMILY HEALTH medical clinic 569-1999
110 INTERMTN LSR PC electromdcl eqpt .. 255-7638
110 SURGICAL ASSOCIATES PC medical clinic 569-1260
110 THOMAS MARK C phys 569-8929
120 PRIMARY CARE FAMILY THERAPY indvdl family svcs 566-2898
200 WEST JORDAN MEDICAL CENTER medical clinic 566-9211
210 SOUTH VALLEY WOMEN HEALTH CARE medical clinic 569-2626
3580 JORDAN VALLEY HOSPITAL gnl mdl srgl hsptl 561-8888
3590 Not Verified
3590NAllred Bryce D..... 569-2456
ALLRED BRYCE DEE ofcs hlth prnrs 569-2456
NBeams Kelly D..... 569-2384
NColosimo Lauri..... 255-4999
NFine Stephanie..... 561-1100
NGardener Gregory..... 255-4999
NGoldberg Kenneth W.. 569-2384
NJohnson Kevin B..... 569-2384
NKelly Patrick..... 255-4999
NLandgren Robert..... 255-4999
NLitzinger Marcia..... 352-8367
NRichards Christina..... 561-1100
NSmith David J..... 352-8373
NZackrison David R..... 569-2384
100 GASTROENTEROLOGY medical clinic 233-8233
105 SOUTH VALLEY CLINIC medical clinic
200 HEALTHSOUTH REHABILITATION CENTER spty otpnt clns 255-4999
215 GRANT LILLIAN phys 566-3013
220 SOUTH VALLEY DERMATOLOGY CENTER medical clinic 569-1456
300 MEADS GARNER B JR phys 566-8304
330 CLARK FRANCIS J podtrst 255-8633
3680NWeenig Dave..... 569-1000
+JUDD LN BEGINS
3706NAnderson B F..... 280-9525
NBath Marty..... 282-3008
NCech F A..... 280-9103
NClark Grace..... 280-7298
NHenline Barbara..... 280-5020
NHillis A..... 282-9013
NNeslen H E..... 280-8582
NOldham Grant..... 280-3825
NOliphant H..... 282-9172
NPerry Betty..... 280-5462
THERATX spty otpnt clns 280-4214
NThomas Judy..... 280-6114
NUran Lucille..... 282-5606
NWilliams Mary..... 282-8705
3742 ABRAXAS KENNELS & GROOMERY animal specty svcs 280-3090
NDalebout Dennis A..... 280-3090
+ELMHEARST DR BEGINS
+S 3780 W ENDS
3800 Not Verified
+S 3900 W ENDS
+S 4167 W ENDS
+RAILROAD CROSSES
4139 Diamond Holly A .....
+S 4387 W ENDS
BUSINESSES 127 HOUSEHOLDS 109

E 9045 S (SANDY)-FROM 9001 PEACH BLOSSOM DR EAST
· ZIP CODE 84094 CAR-RT C005

918NNewfang Teri..... 566-1036
933 Evans Jeffrey T & Debbia
+TERRI LYNN DR BEGINS
HOUSEHOLDS 2

E 9050 S (SANDY)-FROM 9001 S 510 E NORTHEAST
· ZIP CODE 84070 CAR-RT C006

511 Barakzia Makay R 565-8217
528NSnideman Richard H..... 561-2678
+S 530 E ENDS
542 Anzer W 567-0058
555 Kirschbaum Linda L 352-7294
569 Kendrick Alysha .....
STRATAGEM CORPORATION 565-7977
+S 570 E BEGINS
· ZIP CODE 84093 CAR-RT C004
3590 Gunther Robert L 942-1377
Gunther Robin R..... 942-1377
3596NJonas Wendy A 943-4992
3596 Foster Neil H
3602 Not Verified

WINTHROPE CIR 2000

WINDING WAY (S J)
Ingram Myrtle C 254-7784
Lund Harry T [D]+
2485 Fluckiger Terry D [D]+ ♠ 254-2770
Fluckiger Pam L 254-2770
2486 Clark Gary K [D]+ ♠ 254-7446
Clark Jeffrey S 254-7446
CLARK GARY K D M D & ASSN
ofcs clns of dntst 254-7446
2507 Lowrance John P [D]+ ♠ 254-5802
Lowrance Joey M 254-5802
2508(Q)Gust Jim 254-2643
2528 Thurgood Tauna H [D]+ ♠ .....
..... 254-9368
Thurgood James R 254-9368
2529(Q)Painter Jim 253-2115
PAINTER ENTERPRISES pntng
paper hangin 253-2115
2551(Q)Esquivel Ana I 446-6931
2552 Maxfield Tiffany [3] ♠
Maxfield Nikki
2572 Brown Steven B & Jane [4] ♠
..... 253-3986
2573 Hunsaker Phillip D & Jodie [D]+ ♠
..... 254-2232
2593(Q)Ellsworth Steven J 254-8774
2604 Zortman Marsh R [6] ♠.. 253-3168
2617(Q)Newren Les J 253-2191
2626 Hemphill William S & Mary [D]+ ♠
..... 254-9307
2637 Higgins Barbara F [D]+ ♠
..... 254-4069
2646 Withers Ivan H & Marjorie [D]+ ♠
..... 254-4507
2659 Anderson Kelvin L [7] ♠
Anderson Jodene K
2681 Berrie Michael R [2] ♠
2682 Brown Michael J [D]+ ♠
+DOVE BEND CIR BEGINS
+S 2340 W CONTINUES
+COUNTRY BEND DR INTERSECTS
9943 Child Louisa B [D]+ ♠
9863 Dannelly Paul M [2] ♠ 446-6878
Dannelly Leann L 446-6878
9877 Not Verified
BUSINESSES 2 HOUSEHOLDS 26

WINDING CREEK CV (RIVERTON)-
FROM 11995 JANICE DR WEST
· ZIP CODE 84065 CAR-RT R005
3506(Q)Brady Bob 446-0539
CAMBRIDGE BUILDERS sngl-fam
hsng cnstr 446-9188
3513 Not Verified
3524 Dobbs Christy A [5] ♠ 446-9406
3529 Pangos Trever [4] ♠ 446-1545
PANGOS CONCRETE concrete
work 446-1545
3531 Birkeland Mark A [4] ♠ .. 446-9353
3532 Woolums Jeff [4] ♠ 253-0399
Woolums Julie A 253-0399
+MIDAS RIDGE LN ENDS
3550 J W B I indus supl 253-0397
Woolums Jeffrey S [3]
BUSINESSES 3 HOUSEHOLDS 7

WINDING CREEK LN (RIVERTON)-
· ZIP CODE 84065 CAR-RT R005
3391 Glinnea William S [2]
(Q)Williams R 446-8367
3406(Q)Loveless Trent 253-9097
3413 Wack Lonnie W [7] ♠
Wack Bill
3424(Q)Hatt Gordon 254-1139
3439 Anderson Adam S [4] ♠ .. 253-1939
3442 Carne Gary S & Karen [3] ♠
..... 446-1078
3458(Q)Morgan Frank 254-6598
3483 Minich Charles M [4] ♠ .. 446-6131
Minich Amber 446-6131
3489 Cline Brecke J [3] ♠
Cline Tony D
HOUSEHOLDS 10

WINDMILL DR (WEST JORDAN)-
· ZIP CODE 84088 CAR-RT C019
5422 Castro Jose G & Caroline [5] ♠
5423(Q)Brown Courtney D ♠.... 282-3944
Brown Rebecca B 282-3944
5436 Nicholes Bryan C & Wendy [7] ♠
5439 Godfrey Brett D & Elizabeth [6] ♠
..... 280-6949
5448(Q)Pollock Jeff 282-2062
5453 Carter Anne C [6] ♠ 280-3688
5464 Baker Benjamin [7] ♠ D .. 280-7141
5467 Gates Franceen A [5] ♠
5476 Anthian Loic L [3] ♠ 280-3823
Anthian Stephanie C 280-3823
GREAT MODELS WEBSTORE
hobby toy shop 280-0634
5481 Savage Dennis M [6] ♠ .. 280-4238
Savage Tracy L 280-4238
5494 Ferrar Eric G [7] ♠ 280-7366
Ferrer Bernadette P 280-7356
5495 Garcia Magda S [6] ♠ 280-2940
5508 Lanza Silvana O [4] 282-2505
Lanza Alessandra 282-2505
8391 Morris Alan J & Carolann [D]+ ♠
..... 280-6829
8401 Not Verified
8408 Gray Mark L [4] ♠ 280-2519
8411(Q)Mortensen Don 280-7419
+WHEATRIDGE LN INTERSECTS
8421(Q)Marshall D 280-5623
8422 Moses Wayne C & Betty [2] ♠
8431 Not Verified
8434 McMillen Donald L [D]+ ♠
..... 280-4671
8435 Lewis Joseph B [2] ♠
Lewis Loree
8461 Nuttall Brian E & Traci [2] ♠
..... 282-8810
8469 Heffernan Edward M & Maria [2] ♠
..... 280-0791
JET PRINT commcl printng
..... 280-6547
8469 Eklund Henry V & Shauna [D]+ ♠
..... 282-4063
KAUFMAN & BROAD HOME
CORP sngl-fam hsng cnstr
..... 280-2575

WINDMILL DR (W J)
8477 Rankin Richard D [2] ♠
Rankin Jennifer Y
+HARVESTMILL DR BEGINS
BUSINESSES 3 HOUSEHOLDS 26

WINDRIFT BAY (WEST JORDAN)-FROM
8522 S 4590 W WEST
· ZIP CODE 84088 CAR-RT C020
4602 Hurst Ron L & Annmarie [6] ♠
..... 280-6322
4603 Walker Sandra S [5] ♠... 280-2449
4614 Not Verified
4616 Horrocks Bret J & Doris [D]+ ♠
..... 280-4026
4617 Chidester Jack B [D]+ ♠
4631 GOSS ind trckg 280-5802
Markham Reed B [2] ♠. 282-1241
Markham Lorena 282-1241
4632 BEAVER BUILDERS sngl-fam hsng
cnstr 280-5650
Wotring Shawn A [5] ♠. 280-5650
Wotring Brian M..... 280-5650
BUSINESSES 2 HOUSEHOLDS 7

WINDSONG (SANDY)-
· ZIP CODE 84092 CAR-RT R001
1 DELTA CONTROL SYSTEMS cur-
crrycng wrng dvc..... 553-0763
(R)Richards Jon L ♠ 571-6499
Richards Stephanie A.... 571-6499
2 Butt Ann L [3] ♠ 571-2103
Butt Jessica 571-2103
3 Schlegelmilch Jon D [D]+ ♠ .. 571-9549
4 Miller Linda C [D]+ ♠ 571-3237
5(W)Bremond Gregoire Patrice.. 571-7693
KAIROS CORP cstm cmptr prgmg
svc 541-8603
6 Not Verified
7(W)Webel David M 572-5559
8(W)Smolenski Mark P 571-8932
9 McGee Geoffrey M [3] ♠
11 Not Verified
12(Q)Squire Robert 571-5812
13 Not Verified
14 Mahoney Lea A & Stephen [D]+ ♠
..... 571-3392
MAHONEY & ASSOC investment
advice 571-3392
15 Fuhriman Corrin [4]
(R)Hamilton Brad 571-9362
(R)Hamilton W K 571-2531
16 Lasater Jay S [2]
(R)Wells Daniel R 571-4304
17 Staples Gloria G [D]+ ♠ 576-6400
Staples Melissa A 576-6400
18(R)Kennedy Richard W 571-7270
19 BUCKWALTER ROSS ASSOCIATES
mgmt cnsltng svcs 571-9571
20 McCarthy John B & Terri [3] ♠
..... 572-5015
21 ALL SEASON WINDOW CLEANING
fmbr bldng mtrls..... 576-1177
(R)Sattlerfield Scott 576-1177
BUSINESSES 5 HOUSEHOLDS 22

WINDSOR PL (WEST JORDAN)-FROM
3025 W 9050 S
· ZIP CODE 84088 CAR-RT R010
9014 Moore Jeff [D]+ ♠ 256-3481
9015 Larsen Kody L [4] ♠
Larsen Clinton K
9025 Snedaker Richard H [D]+ ♠
..... 561-2345
9026(Q)Bonner Clark D 255-3798
9038 Syddall Tracy R & Patsy [D]+ ♠
..... 569-2145
+WIMBLETON PL BEGINS
HOUSEHOLDS 5

WINDSOR MANOR CT (SOUTH
JORDAN)-
· ZIP CODE 84095 CAR-RT R002
2492 Not Verified
2497 Campbell David R [D]+ ♠
..... 254-5530
Campbell Jon L ♠ 254-5530
2512 Crane Rebecca R [D]+ ♠
..... 254-5155
2517 Bateman Mark W [D]+ ♠
2526 CYBERWIRE tele comm.
Hooton Duane L [D]+ ♠
2531(Q)Hull Michael R & Stephanie ♠
..... 446-1940
2546 Petersen Sharon L [D]+ ♠
..... 254-5319
2547(Q)Griffiths Kevin W 254-3727
2553(Q)May Deborah S ♠
2554(Q)McKeon Thomas H..... 254-7447
9723 Lemmons Wayne T & Peggy [3] ♠
..... 254-3465
9733 Nelson Jared T & Karen [D]+ ♠
..... 254-3465
9747 Anderson Andrew J [D]+ ♠
..... 254-2607
Anderson Janet F 254-2607
9761(Q)Young Steven R 254-6674
9773 Ferguson Dianna M [D]+ ♠
..... 254-8424
Ferguson Heather J..... 254-8424
WASATCH BENEFITS ins agts/svcs
..... 254-8428
9787 Allen Ruth C [D]+ ♠ 254-3752
BUSINESSES 2 HOUSEHOLDS 16

WINDSOR OAK CV (SANDY)-FROM
2099 VILLAGE OAK LN
NORTHEAST
· ZIP CODE 84092 CAR-RT C012
2041 Wutzke Darren L & Susan [2] ♠
2042 ATTITUDE THERAPY schs edctl
svcs 572-1350
2055 Milne Donald Y & Renee [D]+ ♠
..... 576-1628
2067(Q)Saddler Jeff 571-1354
Urizar Blanca L [2] ♠.... 495-1751

WINDSOR OAK CV (S)
2073 Deputy Michael E [D]+ ♠ 571-8631
BUSINESSES 1 HOUSEHOLDS 5

WINDWOOD CIR (WEST JORDAN)-
FROM 6233 STERNWOOD DR
WEST
· ZIP CODE 84084 CAR-RT C003
2587 Not Verified
2597 Proestakis Alexander N [D]+ ♠
2613-2614 Not Verified (2 Hses)
2621(Q)Ferguson Larry D..... 966-5051
2622 Anderson Brett A [D]+ ♠ 964-2284
HOUSEHOLDS 6

WINDY PEAK CIR (SANDY)-FROM
11201 MARIPOSA WAY EAST
+ALONDRA WAY BEGINS
+WINDY PEAK RIDGE DR INTERSECTS
· ZIP CODE 84094 CAR-RT C013
1134 Thornton Loretta A [D]+ ♠
..... 571-8514
Thornton Tao A..... 571-8514
1144 Swensen Deborah L [D]+ ♠
..... 572-6155
Swensen John 572-6155
1145(W)Watkins Jason 553-9281
1152(Q)Herman Michael
1153 Wier Amela S [4] ♠ 523-9642
1160(Q)Armstrong Kevin 553-1356
1161 Mollett Ellen P & John [D]+ ♠
1166 Taylor Linda J [5] ♠
HOUSEHOLDS 8

WINDY PEAK WAY (SANDY)-
· ZIP CODE 84094 CAR-RT C013
1043 Maurer Stephanie B [7] ♠
..... 553-0738
1053 Draper Randy K & Linda [2] ♠
..... 619-1505
HUNT DRYWALL PATCHG plstrng
dwall instl 576-1712
1063 Phillips James J & Kathie [D]+ ♠
..... 572-8210
1073 Butterfield Don K [D]+ ♠. 572-0157
1082 Davis Richard L & Aimee [D] ♠
1083 Not Verified
1091(Q)Reger Marilyn 576-1268
1092 Duffin Paul F & Rebecca [4] ♠
..... 553-0581
1099 Gard Christine K [D]+ ♠. 576-0230
1107 Heim Kevin J [D]+ ♠..... 571-1352
1116 Petty Thomas [D]+ ♠..... 572-4049
Petty Will..... 572-4049
BUSINESSES 1 HOUSEHOLDS 11

WINDY PEAK RIDGE DR (SANDY)-
FROM 1149 E 11000 S SOUTH
· ZIP CODE 84094 CAR-RT C013
11012 Richmond Katie L [D]+ ♠
..... 572-5725
Richmond Justin 572-5725
11013 Sylvester Michael B & Wendi [7] ♠
..... 576-8411
11022 Fitzgerald Barry E [4] ♠
..... 523-8935
11027 Markosian Samuel D & Andrea [2]
..... 568-0131
+BELL CASTLE CIR BEGINS
11034(Q)Newson Dick 572-5919
11046(Q)Cronenwett Teri 523-5019
11053 Wright Austin [4] ♠ 576-9983
Wright Ashley 576-9983
11058 Lund Ryan M [2] ♠..... 576-2596
11067 Hoerner Kurt [3] ♠..... 495-3576
Hoerner Alicia 495-3576
+BELSAW CIR BEGINS
11072 Crawford M A [D]+ ♠.... 571-4075
11086(Q)Maddera Don 576-9225
11091 Niemi Brook A [D]+ ♠
11096 Prince Susan J [D]+ ♠.. 571-8862
11106 Anderton Sharlyn [5] ♠. 576-8320
11114(Q)Brooks Randall 571-0751
11120(Q)Ahonen Keith 501-0686
+SILVER MESA CIR BEGINS
11125 Bigler Michelle M [D]+ ♠
..... 571-4628
11128 Warnar Vicky L [D]+ ♠. 572-5364
11134 Long Ron [5] ♠
Long Polly S
11135 Miller Joyce K [D]+ ♠... 576-1502
11148 Gordon Dennis B & Maureen [7] ♠
..... 572-7838
11149 Winters Bonnie M [5] ♠
Winters Rebecca L 572-7838
11162(Q)Petersen Karl 571-8406
11163(Q)Matheson Boyd C..... 576-8511
11176 Ackley Karen D [D]+ ♠. 571-7734
Ackley Donald G 571-7734
+SILVERSMITH DR BEGINS
11190 Clark James R [D]+ ♠... 572-0046
11191 Not Verified
11204(Q)Haley Arthur P Jr..... 553-0869
11205(Q)Grimnes D C 571-8436
11216 Caldwell Kevin B & Judy [3] ♠
+CEDAR VIEW DR BEGINS
11228(Q)Yeargin Al Jr..... 553-8296
11240 Wilder Larry B & Tonya [D]+ ♠
..... 572-3271
11241(Q)Colson James B 495-2212
11252(Q)Mattern James..... 572-2193
11253 Cornie Joanne S [D]+ ♠
..... 576-9026
Cornie Brian S..... 576-9026
11264 Herzog Donald G [2] ♠
11265(Q)Solace Richard..... 571-6511
11275(Q)Fangmann Dennis..... 571-5903
11277 Peery Steven L & Karla [D]+ ♠
..... 572-4740
11293(Q)Tenney Thayne 553-8502
11291(Q)Stringham Stuart R..... 495-1250
+WINDY PEAK CIR ENDS
11320 Lauritzen Keith R [D]+ ♠
11321 Holden James L & Lynda [D]+ ♠
..... 571-6978
MONEYSEEKERS investors
..... 571-6978
11332 Anderson Paul W & Darlene [7] ♠
..... 571-5233
11333 Harris Shane [7] ♠..... 816-0929

WINDY PEAK RIDGE DR (S)
Harris Joshua R..... 816-0929
11346(Q)Hartwall A C 572-3579
11347 Karren Corey L & Jennifer [2]
..... 501-7695
11361 Not Verified
+COLIMA DR INTERSECTS
BUSINESSES 1 HOUSEHOLDS 48

WINFIELD SCOTT WAY (DRAPER)-
FROM 1037 STRAW HAT LN
SOUTHEAST
· ZIP CODE 84020 CAR-RT R009
14107 Rush Douglas E & Arlene [6] ♠
..... 571-6115
A Allen Jennifer [2] 495-3316
14108 Smith Dallon G [7] ♠.... 523-2600
Smith Gary H..... 523-2600
14109-14111 Not Verified (2 Hses)
14116 Lafollette Robert T [4] ♠
..... 576-0752
Lafollette Alycia L..... 576-0752
14118 Schult Kevin S & Jennifer [7] ♠
14119-14121 Not Verified (2 Hses)
14126(Q)Gardner Tiffany L..... 523-5989
Rowlett Stacy A [7] ♠..... 523-2538
14128 Campbell Thomas E & Lisa [D]+ ♠
HOUSEHOLDS 12

WINGFIELD CIR (DRAPER)-FROM 1119
HACKAMORE DR SOUTHEAST
· ZIP CODE 84020 CAR-RT R015
13731 Anderson Paul R [2] ♠.. 523-5885
Anderson David..... 523-5885
13747 Wecker Nanette T [2] ♠
..... 571-5595
Wecker Troy..... 571-5595
13756 Nugent Bernard E [2] ♠
..... 501-0658
Nugent Sheila V..... 501-0658
· ZIP CODE 84020 CAR-RT R001
13757(Q)Scheuber Kenneth 495-9627
· ZIP CODE 84020 CAR-RT R015
13767 Jennings Jackie L [2] ♠
..... 571-2705
13768 Devenport Kent C [2] ♠ 553-2413
HOUSEHOLDS 6

WINGFOOT CT (DRAPER)-FROM 1823
INDIAN WELLS LN SOUTHEAST
· ZIP CODE 84020 CAR-RT R005
12221(Q)Lankford Paul E & Lori ♠
12227(Q)Robinson Rick A
12233(Q)Dastrup S..... 553-8386
12234 Peterson Merrie L [2]..... 501-0202
HOUSEHOLDS 4

WINNERS CIR (WEST JORDAN)-
· ZIP CODE 84084 CAR-RT C014
1595(Q)Barton Paul..... 562-1588
1605 Rivera Richard R & Robin [3] ♠
1612 Not Verified
1615 Clements David D [4] ♠..... 255-8568
Clements Jill L..... 255-8568
1624(Q)Duckworth Mark T..... 568-0131
DUCKWORTH DEVELOPMENT
sngl-fam hsng cnstr
..... 568-0131
1625 Green Bryan D [3] ♠..... 566-1989
Green Tami L..... 566-1989
1634 Sevy David [3] ♠
1635(Q)Rafael M..... 567-9395
+ERICKSON PARK DR CONTINUES
7332(Q)Rennemeyer Joe..... 566-5976
7345(Q)Howard Michelle T
BUSINESSES 1 HOUSEHOLDS 10

WINTER CANYON WAY (SANDY)-FROM
11495 CHERRY CREEK DR EAST
· ZIP CODE 84094 CAR-RT C007
873 Francis Steven R [D]+ ♠.. 571-9480
882(Q)Seger David..... 501-9560
VERITA'S COMPUTER SERVICES
optr intgtd sys dgn
..... 572-6726
885 DOUGHTY BARBARA EA TAX
ACCNTNG acctng audtng bkp
..... 571-5457
SYTEX..... 571-7414
892(Q)Heun Joseph C Jr..... 572-2401
+DRY CREEK RD INTERSECTS
BUSINESSES 3 HOUSEHOLDS 3

WINTER GLEN LN (DRAPER)-
· ZIP CODE 84020 CAR-RT R005
1533(Q)Walbeck Jeff S 571-5733
HOUSEHOLDS 1

WINTER HILL CV (WEST JORDAN)-
· ZIP CODE 84084 CAR-RT C017
7083(Q)Everitt Scott S 282-6613
7094(Q)Zargoza Joe..... 282-1488
7093(Q)Vincent Jeff 280-7953
7094 Hanson Robert B [3] ♠.. 280-7731
7106(Q)Patillo Jeremy 282-8485
7107(Q)Bryan D ♠
Plowman Sonja K
7114(Q)Milton Kurt D ♠
Milton Katie N
HOUSEHOLDS 7

WINTER HILL LN (WEST JORDAN)-
FROM 7053 SWAN HILL DR
WEST
· ZIP CODE 84084 CAR-RT C017
4822(Q)Todd Shawn..... 282-5447
4936 Hill Westley W [2] ♠
Hill Sharla J
4948(Q)Rideout Elmer W ♠
+WINTER HILL CV BEGINS
4962 Not Verified

WINTER HILL LN (W J)
+BREEZE HILL RD INTERSECTS
HOUSEHOLDS 4

WINTER WREN DR (SANDY)-FROM
2499 NEWCASTLE DR SOUTH
· ZIP CODE 84093 CAR-RT C001
9057(Q)Fried Jacob L & Martha ♠
9068 White Terri L [D]+ ♠
9071 Moulton Ronald E & Linda [D]+ ♠
..... 944-1815
9072(Q)Evans Robbie..... 943-7451
9083 CHADWICK KIM ROOFING rfng
sdng sht mtl 943-9441
9084 Chaus Michael G [D]+ ♠ 943-5821
Chaus Karen W..... 943-5821
9136(Q)Haden Michael A..... 943-3310
HADEN MICHAEL & CO beauty
shops 943-3310
(Q)Stinson Ray..... 942-4834
9141(Q)Morgan J C..... 944-0795
9144 Smith Terrence K [3] ♠.. 942-9201
Smith Shannon K..... 942-9201
9152 Kuhn Robert J & Kathryn [D]+ ♠
..... 942-4028
9153 Not Verified
9158 Steele Ronald E & Carolyn [D] ♠
..... 947-0467
9159 Not Verified
9164 Ross Maureen C [D]+ ♠. 942-6793
9165 Owen James [D]+ ♠..... 944-4148
9174 Heinze Richard W [D]+ ♠
9183 Cowan Christy E [7] ♠... 943-8960
9184 Balandrin Manuel F & Donna [D]+ ♠
9194 Robinson James G [D]+ ♠
..... 942-0366
Robinson Kris A..... 942-0366
9204 Thomsen Jeffrey B & Carol [D]+ ♠
..... 943-2250
+GOLDEN EYE DR BEGINS
9211(Q)Miller Zak B ♠..... 453-1483
9212(Q)Stewart Gayle B..... 942-6245
9221 Cazier Michael E & Tammie [D]+ ♠
..... 943-4881
9222 Tanner Louona H [D]+ ♠ 942-3277
Tanner Allen H..... 942-3277
9232 Barton Janice H [D]+ ♠.. 943-2450
9248(Q)Crowley David
Crowley Lara
9249 Green Sonya N [2] ♠..... 453-0578
Green Paul..... 453-0578
9259 Chads Chris [7] ♠..... 944-4764
9264 Crandall Steven R & Cheryl [D]+ ♠
..... 944-8479
+FALCON WAY INTERSECTS
BUSINESSES 2 HOUSEHOLDS 29

WINTERWOOD CIR (SANDY)-FROM
9761 WINTERWOOD DR EAST
· ZIP CODE 84092 CAR-RT C005
1422(Q)Mc Bride Steve..... 572-3204
1427 Pope Reese [5] ♠..... 571-8605
1445 BASKETS BY SHAUNA gift shop
..... 571-6510
Jorgensen Shauna B [D]+ ♠
Jorgensen Ella i
1448 Finley Colleen B [D]+ ♠.. 572-1035
1452 Not Verified
1457 Hampton Scott [3] ♠
1462(Q)Olsen D..... 553-0484
1469 Smelser James M & Mary [D]+ ♠
..... 572-4051
1474 Johnson Christopher R [D]+ ♠
..... 571-7024
1477 Nielson Sandra R [D]+ ♠ 571-4387
Nielson Kelly W..... 571-4387
1478 Vasica John T [D]+ ♠..... 572-1549
Vasica Travis..... 572-1549
1483(Q)Musselman Christopher. 619-8640
Musselman Rosanne G. 619-8640
BUSINESSES 1 HOUSEHOLDS 12

WINTERWOOD DR (SANDY)-FROM 1399
RIDGEMARK DR SOUTH
· ZIP CODE 84092 CAR-RT C005
9745 Hofeling Norvell N [D]+ ♠
..... 571-0490
Hofeling Andrew N..... 571-0490
9746 Nise Benjamine E [4] ♠
Nise Victoria L
9758 Macgregor Matthew D [D]+ ♠
..... 571-3085
Macgregor Alena A..... 571-3085
+WINTERWOOD CIR BEGINS
9770 Milne Gordon C & Clair [D]+ ♠
..... 571-5155
9782 Hardy Aaron D [D]+ ♠
9795(Q)Kuebitz Diane C..... 576-9542
LOVE AT HOME DAYCARE child
day care svcs 576-9542
9799 Rieff Shauna K & Ronald [D]+ ♠
+E 9800 S BEGINS
+PETUNIA WAY INTERSECTS
BUSINESSES 1 HOUSEHOLDS 7

WINTHROPE CIR (WEST JORDAN)-
· ZIP CODE 84088 CAR-RT R001
3655(Q)Condie Mark G..... 280-1320
3657 Hess Lori L [3] ♠..... 280-6029
3659 Calton Patrick E & Virginia [2] ♠
..... 280-1402
3665 Rasband Charles W & Earlene [D]+ ♠
..... 280-8428
3666 Larsen Richard [D]+ ♠.... 280-5013
Larsen Eric D..... 280-5013
3681(Q)Pearson Bruce E..... 280-2799
3682 Arnold Chad C [7] ♠..... 280-8499
HOUSEHOLDS 7

WINTHROPE DR (WEST JORDAN)-
+JUDD LN INTERSECTS
· ZIP CODE 84088 CAR-RT R001
3792 Not Verified
+ELMHEARST DR ENDS
9012 Gammon Kent D [D]+ ♠. 280-2188
9013 Not Verified
9024(Q)Harris Matthew N
Harris Jennifer S

WINTHROPE DR 2000

WINTHROPE DR (W J)
9036 Matheny Teresa J [7] ▲ 280-2911
9048 Holman Scott F [9]+ ▲ 280-1697
Holman Vicki L 280-1697
9057 Morris M [9]+ ▲ 280-1253
Morris David W 280-1253
9060 LOVE IN BLOOM florists 280-8022
ⓃZimmerman C 280-8022
9069 MY LADY misc hmfrnshngs str 280-0490
Sermon Anthony W [9]+ ▲ 280-0490
9072 Rubright Mary [9]+ ▲ 280-0917
9081 Harris Larry W & Karen [9]+ ▲ 280-8879
9090 Nicholson Bobby C & Karen [9]+ ▲ 280-1639
BUSINESSES 2 HOUSEHOLDS 12

WITFIELD CT (WEST JORDAN)-
· ZIP CODE 84088 CAR-RT R002

8329 Yager Darren L & Cindy [2] ▲
8334 Williams Deanne M [5] ▲
8341 Lloyd Sheri K [9]+ ▲
8342 Marrelli Vicky M [5] ▲
Marrelli Joe
8351 ROCKY MOUNTAIN DENIM BUYERS mens'boys clothing 561-7131
Tatton Brett M [5] ▲ 561-7131
Tatton Mitchell 561-7131
8354 Casper David R [8] ▲
Casper Mary J
BUSINESSES 1 HOUSEHOLDS 6

WOLF POINT CIR (SANDY)-
· ZIP CODE 84070 CAR-RT C013

11251-11253 Not Verified (3 Hses)
11257 Webster Cynthia E [9]+ ▲ 571-6519
11260 Pace Charlotte K [9]+ ▲ 571-2587
11263 Absher Brenda S [7] ▲ 572-3373
11274 Gruendell Stephanie L [9]+ ▲ 572-8476
11275 Mason Bart L & Karen [2] ▲
HOUSEHOLDS 8

WOLLEMI PINE WAY (WEST JORDAN)-
· ZIP CODE 84088 CAR-RT R013

8808 Allred Deloy W [3] ▲
Allred Marcia F
8812-8816 Not Verified (2 Hses)
8820 Hulse Louis M & Kimberly [3] ▲
ⓃSchroeder Kimberly
Schroeder Dwight
8824 Not Verified
8828ⓃDimick Doris L ▲
8836 Case Gertrude I [4] ▲
Case Jacqueline I
8840 Not Verified
8844ⓃChampion Cindy
Champion Janet S
Searle Shawn L [2] ▲
8846 Jaeger David V & Delilah [2] ▲
HOUSEHOLDS 12

WOOD ST (MIDVALE)-FROM 738 E WASATCH ST SOUTH
· ZIP CODE 84047 CAR-RT C009

325ⓃSewar Joseph J 255-6922
334 SMITH'S PILOT CAR SERVICE transprtn svcs 561-5065
+COLUMBIA DR INTERSECTS
371ⓃVan Dam J T 255-7284
419 BROWN RUEL PIANO TUNING repair svcs 255-0964
444 SMITH DERALD T CONSTRUCTION operative bldrs 255-5352
447ⓃLamb Jeff 562-5866
LAMB REALTY GROUP real est agts'mgrs 566-5732
467ⓃBrown Gregory 566-4513
+E MARQUETTE DR INTERSECTS
511ⓃTakara Kimberly 256-3378
557 Not Verified
626ⓃKofford Lloyd N 255-0345
+E PRINCETON DR INTERSECTS
8036 Cupp Cathleen D [4] ▲ 269-9955
Cupp Jeffrey R 269-9955
8041 Not Verified
8048 Perkes George A & Linda [9]+ ▲ 561-5765
8062 Not Verified
8086 Sund Marian [9]+ ▲ 255-0717
8091 Not Verified
8095 Brown Jill [2] 352-7574
8098 Smith Bobby L [9]+ ▲ 561-5065
Smith Lori 561-5065
8123ⓃLind Kathleen 561-0307
8131 Vandam Joan T [9]+ ▲ 255-7284
Vandam Dave J 255-7284
8136 Olson Marilyn D & Gerald [9]+ ▲ 255-5587
8139 MID-VALLEY INSURANCE AGENCY ins agts'svcs 255-1234
Yates Donna B [9]+ ▲ 561-2876
Yates Adoyle D 561-2876
8146 Jensen Gene R [9]+ ▲ 255-6431
Jensen Anne R 255-6431
8149 Blake Robert G & Velma [9]+ ▲ 255-6900
8158 Bentley Jean K [9]+ ▲ 255-5748
Bentley Arthur D 255-5748
8161 Thomas Ray P & Arla [9]+ ▲ 255-4836
8166 Taylor Stacy [9]+ ▲ 255-2447
Taylor Melody 255-2447
8169 Brown Ruel R [9]+ ▲ 255-0964
Brown Jill 255-0964
8176 Mann Brian D & Rhonda [8] ▲ 566-1154
8181 Blaimer Martha M & Ludwig [9]+ ▲ 255-6219
8188 Smith Derald T & Merlene [9]+ ▲ 255-5352
8191 Lamb Jefferey S [7] ▲ 562-5866
Lamb Leah A 562-5866
8202 Kynaston Eugene A [9]+ ▲ 255-8414

WOOD ST (M)
Kynaston Lynda E 255-8414
8203 Whited Orval D & Judy [9]+ ▲ 255-6424
8213ⓃBrown Gregory H & Carola ▲
8224 Reed Douglas J [9]+ ▲ 255-5840
Reed Barbara L 255-5840
8244 Jenkins Marceline T [3] ▲ 255-1037
Jenkins Eugene 255-1037
8252 Anderson Ryan C [2] ▲ 568-9308
8253 Ivie Joel R & Shelli [9]+ ▲ 566-2993
8259ⓃMendicino Francesco R 567-0288
Mendicino Kelaine C 567-0288
Takara Evelyn A [4] 256-3378
Takara Christopher T 256-3378
8263 Parkin Robert H [4] 568-1633
Parkin Diane 568-1633
8264 Roberts James W & Joan [9]+ ▲ 561-0091
8274 Markel Kaye [9]+ ▲ 255-8286
Markel Muriel K 255-8286
8275ⓃKing K 566-9736
Loulias Michael P [9]+ ▲ 566-9736
8285 Oliverson Ray H & Helen [9]+ ▲ 255-2336
8286 Brown Todd R & Peggy [9]+ ▲ 255-4484
8294 Hart Donald S & Shirley [9]+ ▲ 255-6156
8297ⓃHogenson Brent H 255-7070
Schaugaard Jacob B [3] 568-1317
Schaugaard Sarah J 568-1317
8308ⓃHaake Leonard 255-5067
8311 Kelley Kreig B [9]+ ▲ 561-2638
Kelley David K 561-2638
8324ⓃTopalian Charles 255-4837
8325 Hobbs Barbara W & Andy [9]+ ▲ 255-7248
8338 Serdar Carolyn D [9]+ ▲ 255-9097
Serdar Trudi 255-9097
8341 Jacobson Reid C [9]+ ▲ 255-0280
Jacobson Paul G 255-0280
8352 Kofford Lloyd N & Margaret [9]+ ▲ 255-0345
8355ⓃNystrom Albert D 255-2353
BUSINESSES 5 HOUSEHOLDS 56

WOOD GLEN RD (SANDY)-FROM 10361 COUNTRYWOOD DR EAST
· ZIP CODE 84092 CAR-RT C002

1542ⓃJeffery Mark 495-1032
1543ⓃDavies Jennifer
1544 Not Verified
1554 Mast Roger J [9]+ ▲ 572-2933
1555 Matsu Brent T [9]+ ▲ 572-6319
Matsu Boyson E 572-6319
1564 Murphy Richard P & Marjorie [8] ▲
1565ⓃKent C A 572-2527
1576 McGavin Kathleen L & Carl [9]+ ▲ 572-1115
1577ⓃFillingim Jeremy 619-1642
1588 Shick Robert S [8] ▲ 571-1991
1589 Lofgreen Linda M [7] ▲ 572-8211
Lofgreen Louis R 572-8211
1600 Johnson Corinne P [9]+ ▲ 572-6590
1601 Not Verified
1612 Anderson Corbin C & Erica [3] ▲
1613 McCarthy Kevin [3] 495-2044
1624 Murphy Margaret M [3] ▲ 571-7898
1625 Kunz Karen Z [9]+ ▲ 571-2781
1636 McKown Leslie L [9]+ ▲
1637ⓃAsay Dale A 553-9592
1650ⓃHudson Brian 571-8020
1651 Gibb Douglas J & Joenn [9]+ ▲ 576-0871
1677 Mowery Shaun M [4] ▲
Mowery Sharee M
+FLANDERS RD INTERSECTS
1678ⓃWasserloos Charles 523-1092
1688 Taylor Sandra [9]+ ▲ 572-3683
1689ⓃPeterson Kris 572-4800
PETERSON PROPERTIES real est agts'mgrs 572-4800
1698 Adams Steve B [2] 523-0467
1701ⓃGarretson David H 572-0992
1706 Not Verified
1713ⓃCampbell W A 572-0814
ⓃRehm E 572-8051
Thome Jeanine P [3]
Thorne Jeanine P [2]
1725 Jones Matthew S & Marjean [9]+ ▲
1737 Tueller Dennis B [9]+ ▲
Tueller Marti A
+WOODGLEN CIR BEGINS
1749 Richards Marcia L [9]+ ▲ 571-2274
Richards Robert A 571-2274
1761 Bricker Christopher D [2] ▲ 523-3828
Bricker Jana L 523-3828
1775ⓃThomas Owen L 572-0825
+EDGECLIFF DR INTERSECTS
BUSINESSES 1 HOUSEHOLDS 37

WOOD HOLLOW DR (RIVERTON)-FROM 14141 S REDWOOD RD SOUTHEAST
· ZIP CODE 84065 CAR-RT R012

15594 AWESOME AUTO FLAGS nondurable gds 254-4533
ⓃVawdrey Paul A 254-4533
15615ⓃBronson L T 446-9164
15630ⓃHill Brad 254-4028
15631 Gayler Kenneth W & Elizabeth [9]+ ▲ 254-5861
15645ⓃPowell Jim R 254-5424
15660 JEF MOWER repair svcs 253-3588
Mower Shelley P [9]+ ▲ 253-3588
15663 Ricks Renee G [9]+ ▲ 254-5111
15681 Park Grace D [8] ▲ 254-3447
15686ⓃZeeh Stuart 254-9917
+TRAVERSE CIR BEGINS
15701ⓃGerard Raymond 253-4517
M G PRODUCTS sprtg ahltc gds 253-4517

WOOD HOLLOW DR (R)
15710 Brangle Thomas W & Janette [2] ▲ 446-6786
15731 Land Michelle [3] ▲ 446-9321
15742 AFFORDABLE CUSTOM BARNS CORRALS nonresid constr 254-3123
Iverson John C [6] ▲ 253-4830
Iverson Don E 253-4830
MAIN STREET MORTGAGE real est agts'mgrs 446-7891
15751 Visser Matthew D [9]+ ▲ 254-8363
+RIVER VIEW DR INTERSECTS
15771 Mumford Levi [9]+ ▲
15782 Cozzens Blaine A & Sherrie [9]+ ▲ 254-6515
COZZENS B A TRUCKING lcl trckg 254-6515
15791 Jensen Elisha A [9]+ ▲ 254-5565
Jensen April 254-5565
BUSINESSES 6 HOUSEHOLDS 17

WOOD PARK LN (SOUTH JORDAN)-FROM 4843 SKYE DR SOUTH
· ZIP CODE 84095 CAR-RT R011

9582 Suckow John F [5] ▲ 280-7717
9587 McArthur Jim M [3] ▲ 280-8137
9592 Nilson Thyra J [5] ▲
Nilson Lucinda T
9597 Not Verified
+CINDY LN INTERSECTS
HOUSEHOLDS 4

WOOD PINE CIR (MIDVALE)-FROM 7625 S 520 E EAST
· ZIP CODE 84047 CAR-RT C018

538ⓃZhank Hao 561-7326
539 Not Verified
545ⓃWainwright Steve 561-5870
546ⓃFranco Edilberto 567-0837
551 Bendixen Lewis H [3] 561-9989
552ⓃPettey Jesse 566-1336
HOUSEHOLDS 6

WOOD RANCH CT (SOUTH JORDAN)-FROM 4955 WOOD RANCH DR
· ZIP CODE 84095 CAR-RT R011

9442 Johnson Brian S [5] ▲ 282-0264
Johnson Lisa B 282-0264
9443 Blackham Kaylynn C [2] ▲ 282-0749
Blackham Jack R 282-0749
9448 Not Verified
9449ⓃPilant Daniel 282-0474
9458ⓃBalfe Kevin 282-1916
9461ⓃDay Michael 280-9088
9472 Cox Jeffrey J [2] ▲ 282-1358
Cox Wendy S 282-1358
9473ⓃWillis Brenda A ▲
Willis Shaun G
HOUSEHOLDS 8

WOOD RANCH DR (SOUTH JORDAN)-
· ZIP CODE 84095 CAR-RT R011

4862ⓃChristensen Victoria ▲
4874 Gentle Elizabeth M [2] ▲
Gentle Cheryl D
4884 Parry Tamara J [4] ▲ 282-5052
4896 Dipo Helen U [4] ▲ 280-9551
4898 Dipo Cindy J [2]
4904 Cooper Cory R [5] ▲ 253-2925
4909ⓃHutchinson Chris L 282-2038
4914 Lindstrom Marlo A [5] ▲ 282-6067
Lindstrom Mark 282-6067
4921-4928 Not Verified (2 Hses)
4931ⓃClonts Lisa 280-6529
4938 Wood Bill [3] ▲
Wood Kathleen M
4943ⓃHolford David 282-0467
4952ⓃTuckett Emily 282-3140
+WOOD RANCH CT ENDS
4962 Hamblin Virginia A [2] ▲
4972ⓃDalton Stan 282-3620
4982 Aulai Joseph A Jr & Rebecca [6] ▲ 280-7051
4998 Smith Andrew G [2] ▲ 282-0591
5012 Baker Ronald L [3] ▲ 280-6774
Baker Trena F 280-6774
5017 Nuttall Gene L [3] ▲ 280-9115
Nuttall David W 280-9115
5022ⓃCederholm Paul M & Anna ▲ 280-3685
5029ⓃNielsen Jeffery D ▲
5032 Billis Angelo M [3] ▲ 280-2891
Billis Annette 280-2891
ⓃDrakos Katherine 282-5487
5033 Not Verified
5042ⓃYen Leslie 282-0652
5052 Jones Lynn H [2] ▲ 282-3240
Jones Linda G 282-3240
5053 Jensen Kenneth A [2] ▲ 282-6689
Jensen Joni M 282-6689
5062ⓃTroxel Terry 280-1975
5065ⓃMeeks Kevin 282-5877
5072 Martinez Evangeline P [3] ▲
5077 Prasad Roy J & Carol [2] ▲
5082 Yates Bryan E & Paulette [3] ▲ 282-0492
5089 Swensen Jason N & Josephine [2] ▲
5092 Amneteg Olof K [4] ▲ 280-9161
Amneteg Hokan P 280-9161
5101 Bennett Christopher K & Georgette [3] ▲
5102ⓃLab Les R 282-0870
5112 Brentano Sarah M [2]
Brentano Tanner
Tanner Tyson S [2] ▲ 282-2418
Tanner Brentan 282-2418
5113ⓃClavell Susan A ▲
5122 Robinson Scott H [2] ▲
5129 Christiansen Scott E [2]
+SKYE DR INTERSECTS
9652 Larson Kevin A [2] ▲
9662 Not Verified
9663 Cullen Kevin D & Lori [3] ▲ 282-1389

WOOD RANCH DR (S J)
SEASONS PASS pleating stitching 282-2988
9674 Martin Kenneth T [2]
Martin Yvonne R
9677 Mulderig Paul A [3]
+CINNAMON WOOD LN ENDS
9697ⓃGrant Jared G & Michelle
9698 Cook Timothy A [2] ▲
Cook Sherrie
+WOOD RANCH LN BEGINS
9772 Sato Wendy [2]
BUSINESSES 1 HOUSEHOLDS 50

WOOD RANCH LN (SOUTH JORDAN)-FROM 9723 WOOD RANCH DR SOUTHEAST
· ZIP CODE 84095 CAR-RT R011

9561 Not Verified
9569 Cowan George L & Colleen [2] ▲
9574ⓃOakeson Devin K ▲
9579 King Jason W & Tiffany [2] ▲ 282-9575
9591 Kirk Katrina B [7] ▲ 282-1989
Kirk Lee R 282-1989
+CINDY LN INTERSECTS
HOUSEHOLDS 5

WOOD ROSE CIR (MIDVALE)-FROM 499 E 7670 S EAST
+S 520 E INTERSECTS
· ZIP CODE 84047 CAR-RT C018

541 Henry Kimberly A [4] ▲ 568-1997
542ⓃBhattacharya Nilabhra 567-1832
ⓃRudra Bidisha 567-1832
547 Not Verified
548ⓃGardinier Clayton F 569-9437
553ⓃGergerakis Angie
554 Gaspar Andrea A [5]
Goff Shama K [2] ▲ 569-1705
Goff Kristan L 569-1705
HOUSEHOLDS 8

WOOD STONE CIR (SOUTH JORDAN)-FROM 1338 SHELBROOKE DR SOUTH
· ZIP CODE 84095 CAR-RT R013

10891ⓃRirie D 254-0786
10894ⓃHyland Mark 253-4625
10909 Not Verified
10912ⓃMaw Blaine D 253-1313
10927 Pugh Jenifer [6] ▲ 254-4157
Pugh Tim 254-4157
10928 Diederich John S [9]+ ▲ 253-1204
Diederich Chad W 253-1204
10937 Scholes Sara E [9]+ ▲ 253-1799
Scholes Sam 253-1799
10938 Oliverson Randy J & Judy [7] ▲
HOUSEHOLDS 8

WOODBINE CIR (SANDY)-FROM 9569 RAINTREE DR
· ZIP CODE 84092 CAR-RT C013

9570ⓃHarris K 942-2433
9578 Baade Ernest C & Carole [9]+ ▲ 942-4308
9586ⓃJames Louis 943-3108
Nusbaum Dan O [2] 947-9220
Nusbaum Noah D 947-9220
HOUSEHOLDS 4

WOODCHUCK CIR (SANDY)-FROM 9433 QUAIL HOLLOW DR
· ZIP CODE 84093 CAR-RT C001

2314 Kavanagh David E [9]+ ▲ 944-8802
2317ⓃFranco Nayibe 944-9329
2318 Gilmore Michael J & Renata [9]+ ▲ 943-2485
2328 Strong William J [9]+ ▲ 943-8609
Strong Brandt 943-8609
2329 Moser Jamie [9]+ ▲
HOUSEHOLDS 5

WOODCHUCK WAY (SANDY)-FROM 9383 SOLENA WAY EAST
· ZIP CODE 84093 CAR-RT C005

2235 Burnett Dawn M [9]+ ▲ 943-6526
2235 e Baird Hal D & Shari [5] ▲
2240 Not Verified
2248 Houston Paula J [9]+ ▲ 942-4210
Houston Brian 942-4210
+BLOSSOMWOOD CIR ENDS
+ALVEY LN ENDS
2266 Buchanan Robert W [6] ▲ 947-9435
Buchanan Jill R 947-9435
2267ⓃEngland Kent B 943-7009
+SHAD LN ENDS
2278ⓃOberly Robert P 944-4005
2285 Dulle David Z [9]+ ▲
Dulle Jim
2295 Cody Holli J [2] ▲ 733-0426
Cody Carl 733-0426
2296 Keddington Alan J [9]+ ▲ 942-1757
Keddington Barbara J 942-1757
PLANT-TATION INTRASCAPE busn svcs 942-1757
2306 Vise Angie K [9]+ ▲ 943-6735
Vise Beckie A 943-6735
2315 Corbridge Reese J [9]+ ▲ 942-4459
2316 NORTON M L ENTERPRISES mgmt svcs 942-8038
Norton Melvin L & Delores [9]+ ▲ 942-8038
2345ⓃBarber Dennis 943-4165
2350ⓃBall B L 942-6129
2355ⓃGooding J E 942-0960
2360 Oliver Charles B & Sandee [9]+ ▲
2365 Jansson Erick E [2] ▲ 943-1567
Jansson Melinda 943-1567

WOODCHUCK WAY (S)
2372ⓃSweatman Ron 947-0993
2377 Smart Gary A & Kimberly [9]+ ▲ 943-0978
2382 Garrett Karyn L [9]+ ▲ 943-2074
2385 Hatch Jeff [4] ▲ 947-0883
Hatch Susan M 947-0883
Paul Leslie C [2]
Paul Brian E
2397 Johansen Peter E [2] ▲ 947-0762
2398 Calderon Cresencia C [5] ▲ 944-4361
2409ⓃConnelly Chris 944-8039
2418 Snow Kimberly B [9]+ ▲ 943-3959
Snow Kristina B 943-3959
2419ⓃBourque Joseph C ▲
2424ⓃOliver Bret 942-8103
2431 Koontz Michelle S & Robert [9]+ ▲ 943-9469
2436ⓃJolley Kennion D 733-0960
2443 Not Verified
2448ⓃPeterson Steven G ▲ 453-1893
2455 Not Verified
2460ⓃRasmussen Brent 943-6272
2465ⓃBoswell David 947-0743
2474 EDUCATIONAL RENAISSANCE busn consltng 943-0841
ⓃIves Robert A 942-6492
2477 Adams Hyrum R [9]+ ▲ 943-3541
2484 Dailey Michael [9]+ ▲ 942-5660
2489ⓃSiggard K D 942-2412
2496ⓃKnudson Daniel 943-6755
2499 Searle John [9]+ ▲
Searle Beverly A
2508 Not Verified
2509ⓃGallie Craig 733-7385
Wright Garth S [2] ▲ 947-8867
2518ⓃFletcher David 947-0475
2521ⓃYoung Brian 944-0362
+PEACOCK DR INTERSECTS
2560 Askelson Douglas L [2] ▲
2565 Geurts Bruce A [9]+ ▲ 942-1975
Geurts Bonnie S 942-1975
GEURTS BRUCE PRUNING SERVICE ornmntl tree svcs 942-1975
2574 Garcia T [3] ▲ 943-7851
2577 Selzer Clare B [3] ▲ 944-4779
2584 Barnett Jack [3] ▲
2589 Symes David W & Diane [9]+ ▲ 942-7842
2596 Not Verified
2601ⓃBrowne N 944-1162
2608 Not Verified
2615ⓃStewart J 947-8431
2618ⓃChen Kuan C 733-5916
2627 INTERGRAPH COMPUTER SYSTEMS cstm cmptr prgmg sv 943-9608
ⓃMason Ronald D II ▲ 733-9693
Mason Ellen B 733-9693
2628ⓃCarlton Charles L 943-5879
2639 Taylor Edward K [4] ▲ 733-6117
ⓃWallace Mark 944-5243
2640ⓃCampbell David S
2654 Dallimore Linda L [5] ▲ 944-9068
2655ⓃJordan James A 942-1371
2668 Smith Michael I [9]+ ▲ 942-4326
Smith Krystle 942-4326
SMITTY'S MULTI SERVICE eng svcs 942-4326
2671 Akhpatalov Sergey A [5] ▲ 947-0696
+QUAIL HOLLOW DR INTERSECTS
BUSINESSES 6 HOUSEHOLDS 67

WOODFIELD RD (SOUTH JORDAN)-FROM 1499 SURREY MEADOW DR SOUTH
· ZIP CODE 84095 CAR-RT R013

11002 Hatch Raymond E [3] ▲ 446-5670
Hatch Johnathan R 446-5670
INDUSTRIAL LOGIC SYSTEMS eng svcs 254-8604
11007ⓃSherman Anthony 446-0253
11012ⓃBarker Dennis 446-0310
11017ⓃFeraco Leonard Sr 253-4643
11018 Miller Brenda C [3] ▲ 446-0843
Miller Gordon D 446-0843
11021 Gephart Brian R & Paula [7] ▲ 446-6797
11024 Rose James M & Joyce [9]+ ▲ 253-1674
11038 McCarty Ronald W [5] ▲
McCarty Britt M
11039ⓃFerenc Peter 446-7410
11056ⓃLisonbee Scott 253-2492
11059 Nelson Russell F [2] ▲ 446-8887
Nelson Leiane 446-8887
11072 Moore Michelle D [8] ▲ 253-0560
11077 Weeks Danile A [4] ▲ 253-7969
Weeks Cynthia L 253-7969
11088 Anderson Anthony B [7] ▲
Anderson Janet L
11091ⓃHedman Kirk 254-6471
11106ⓃRowley Scott C 254-3336
11107ⓃAllred Clyde 253-3562
11126ⓃReeve Robert K 253-7459
11129 Glazier Dustin [7] ▲ 253-4751
Glazier Nick 253-4751
11156 Mead Nora L [4] ▲ 253-0439
11161 Not Verified
11174 Egbert Kelly R [6] ▲ 253-4968
Egbert Melissa A 253-4968
11177 Ruegner Wolfgang D & Sharon [2] ▲ 446-9289
11188 Nielsen Paul W [2] ▲ 254-4769
Nielsen Beth P 254-4769
11191ⓃCain Bruce A 254-3425
11204 Peterson Jyll P [3] ▲ 253-0870
+W 11150 S INTERSECTS
11207ⓃHurley Shawn 254-7424
11222ⓃStockton Warren 253-0395
11223ⓃDowns Marty T 253-0941
BUSINESSES 1 HOUSEHOLDS 29

WOODGATE CIR (MIDVALE)-FROM 550 W WASATCH ST SOUTH
· ZIP CODE 84047 CAR-RT C001

289ⓃBailey Eboni 352-0977

E 9000 S (SANDY) (cont'd)

Address		Zip+4	Carr Rt	Phone
50	Russell M	-2201	C003	568-0881
50	Ryerson D T	-2201	C003	561-4682
50	Tonnesen A G	-2201	C003	562-0828
50	White Talmage L	-2201	C003	566-1267
139	Chounlamany Bounnak	-2202	C003	561-3592
139	Rodriguez Adolfo	-2202	C003	562-9545
168	Ostergaard D	-2327	C003	568-5698
172	Taylor R	-2327	C003	562-0126
177	Curtis Kenneth F	-2363	C003	566-2850
178	Taylor R E	-2327	C003	562-2730
182	Porter Layne	-2327	C003	255-4786
186	Graham Lester E	-2327	C003	255-0599
192	Christensen Lela M	-2327	C003	255-3061
192	McAdams Bardean K	-2327	C003	255-3445
226	Harrington B A	-2323	C003	561-5452
241	Lund Reed J	-2324	C003	255-4886
252	Topham Shannon	-2321	C003	562-9643
261	Mecham Kevin	-2322	C003	561-8639
263	Hays Jamie	-2322	C003	562-0335
268	Cowan Mike	-2321	C003	566-1760
284	Larrabee Sandra L	-2325	C003	568-6546
311	Johnson Jonathan L	-2320	C003	561-9318
330	Webster Moya	-2317	C003	566-5593
349	Bettis Tony	-2320	C003	255-0304
349	Olsen Jr Afton	-2320	C003	255-6307
353	Brooks Eric	-2320	C003	568-1851
353	Schaper Jerry	-2320	C003	565-8636
355	Olsen Afton	-2320	C003	255-6307
369	Latimer Tim	-2320	C003	561-1236
369	Milano E H	-2320	C003	561-3073
372	Vancil K	-2317	C003	568-0786
383	Baxter Shirlene	-2320	C003	255-0599
386	Ritzman Paul V	-2317	C003	255-5138
416	Christlieb Roxie	-2435	C003	561-7366
428	Horton N	-2435	C003	255-2668
441	Anderson Reed W	-2436	C003	255-4577
462	Granquist W A	-2433	C003	255-3225
471	McAllister Richard B	-2436	C003	255-5473
483	Anderson Paul	-2436	C003	255-4653
486	Brown Dolmer	-2431	C003	255-4008
496	Horner J	-2431	C003	255-4643
508	Bray Greg	-2431	C003	255-5731
519	Anderson E L	-2434	C003	566-8186
530	Stewart N J	-2429	C003	566-5617
531	Reich Clifford	-2434	C003	255-5624
545	Keefe Steven N	-2434	C003	565-1749
562	Roper F R	-2429	C003	255-4587
576	Ingram Russel	-2429	C003	565-0638
586	Goff David	-2429	C003	255-6026
593	Johnson B J	-2432	C003	565-7949
601	Washburn Jr James L	-2432	C003	255-7228
609	Parks A L	-2432	C003	255-4577
617	Ballamis Ernest	-2432	C003	255-4487
625	Johnson Bill B	-2432	C003	565-0096
627	Pierce Norman	-2432	C003	255-4517
629	Pickering Linda L	-2432	C003	565-9254
637	Gallegos Trina	-2432	C003	568-3842
655	Bridner Charlene	-2432	C003	562-9303
667	Cox Earl	-2432	C003	566-8945

RESIDENTS 82

S 9000 W (MAGNA) 84044

2743	Bowles Jeanie	-1128	C001	250-2140
2752	Ovklinski Thomas	-1129	C001	250-7503
2757	Benson J	-1128	C001	250-4250
2760	Quibell B L	-1129	C001	250-0488
2767	Petersen Van C	-1128	C001	250-5749
2770	Woolstenhulme Daren	-1129	C001	250-1730
2775	Miyake Jim K	-1128	C001	250-3108
2780	Hopper Russell	-1129	C001	250-7619
2822	Grygla Joyce	-1131	C001	250-0612
2822	Reddoor Jerry L	-1131	C001	250-9429
2830	Brown Charles H	-1131	C001	250-9127
2840	Herba Stanislaw	-1131	C001	250-3860
2854	Nickerson Peggie	-1131	C001	250-7038
2884	White Glenn L	-1131	C001	250-6851
2890	Adams J D	-1131	C001	250-7350
2894	Hasselhorst Amy	-1131	C001	250-7316
2910	Newland J G	-1133	C001	250-2435
2913	Garringer Maria	-1132	C001	250-3648
2933	Watters Terry	-1132	C001	250-8148
2941	Williams Sherry	-1132	C001	250-7269
2952	Mitchell N H Buck	-1133	C001	250-5657
2962	Stocker John A	-1133	C001	250-5805
3006	Williams Wana B	-1135	C001	250-8250
3011	Talbot Brian Leo	-1134	C001	250-0129
3016	Notarianni Lou	-1135	C001	250-4328
3017	Hood Clifford N	-1134	C001	250-9069
3038	Deyoung Scott S	-1135	C001	250-8407
3043	Hensley George	-1134	C001	250-5711
3050	Olsen Glen A	-1136	C001	250-8144
3056	McCune Roy E	-1135	C001	250-7851
3066	Christofferson B C	-1135	C001	250-5191
3069	Mills Jason	-1134	C001	250-5218
3071	Gallegos Heidi	-1134	C001	250-5952
3086	Jackson John D	-1135	C001	250-7343
3087	Shepherd D	-1134	C001	250-5939
3090	Triplett S Lee	-1135	C001	250-5533
3120	Macilli J	-1612	C001	250-3279
3121	Neromiliotis Carol	-1611	C001	250-2950
3141	Ward Le Roy	-1611	C001	250-3208

RESIDENTS 39

W 9000 S (SANDY) 84070

43	Bales Angela	-2008	C009	566-0159
67	Wall Roy H	-2008	C009	255-0228
91	Orton Nathan	-2007	C009	561-5295
140	Eastmond M Dirk	-2033	C009	566-4000
140	Johnson Judy	-2033	C009	565-8940
140	Kano Mark G	-2033	C009	565-8812
140	Pusey Robert Devin	-2033	C009	566-9286
140	Sanders David	-2033	C009	566-0888
412	Peterson M E	-2549	C015	255-4454

RESIDENTS 9

W 9000 S (WEST JORDAN) 84088

840	McDougal Dennis L			255-9130
995	Gillins Jeff	-9029	R004	561-7848
995	Smith Dean P	-9029	R004	255-3053
1070	Lopez Augustine	-8032	R004	255-9006
1085	Hind Spencer	-8031	R004	562-5185
1085	Lloyd L Bruce	-8031	R004	562-8922
1091	Burton Lavar C	-8031	R004	255-1629
1100	Wilson Walter C	-8034	R004	255-4153
1109	Taylor Allen A	-8033	R004	566-1816
1125	Clark La Mar	-8033	R004	255-6261
1125	Clark Lamar	-8033	R004	255-6261
1180	Jensen Mark	-8036	R004	562-5474
1187	Harrison Merlin D	-8035	R004	255-5431
1201	Spiers Clark	-8011	R004	561-5879
1227	Johnson Tracy R	-8011	R004	561-0908

W 9000 S (WEST JORDAN) (cont'd)

Address		Zip+4	Carr Rt	Phone
1231	Roach Charles W	-9011	R004	255-2390
1276	Brine Kathy	-9017	R004	566-1629
1405	Cloward Russell R	-9217	R004	561-1515
1486	Baca F L	-9218	R004	561-1694
1510	Lopez Louis	-9220	R004	255-1525
1519	Burkett Rex	-9219	R004	562-9100
1519	Davis Robert	-9219	R004	562-9100
1519	Mehra A Torab	-9219	R004	562-9100
1519	Poulson Jerry	-9219	R004	562-9100
1519	Rivera Ai	-9219	R004	562-9100
1553	Dewey Steve C	-9219	R004	561-7300
1553	Holmes Jason	-9219	R004	561-1113
1553	Lalor David M	-9219	R004	561-7300
1554	Vigil Proclopio	-9220	R004	255-0997
1580	Lance E T	-9220	R004	255-9513
1646	Harris Vaughn	-9222	R004	561-2319
1650	Jones Paul W	-9222	R004	255-9017
1652	Layba Erma	-9222	R004	255-7347
1654	Tafoya Jose P	-9222	R004	255-7695
1656	Howland Stephen	-9222	R004	571-9422
1775	Glass Joseph B	-6502	R005	562-5005
1793	Jarman Dean E	-6502	R005	566-8540
1793	Kirkpatrick Michael K	-6502	R005	566-8540
1847	Bevan R Scott	-6504	R005	255-1163
1847	Collins Tyler	-6504	R005	273-0100
1847	Eason Richard	-6504	R005	255-1144
2089	Benton Glen	-9346	R005	560-4585
2089	Benton Stacy	-9346	R005	255-8765
2666	Klinetop Bill	-8543	R006	562-2442
2666	Robinson Paul	-8543	R006	562-2442
2666	Shepherd Dean	-8543	R006	562-2442
2770	Tew Boyd	-8624	R005	566-1010
2780	Crosby Earl	-8624	R005	561-5459
2810	Hanger Sidney R	-8626	R006	566-1183
2860	Wigger Paul A	-8626	R006	569-3860
2900	Brewster P	-8715	R006	569-1502
2900	Crystal J R	-8715	R006	569-1502
2922	Loosle J K	-8715	R005	569-2832
3232	Pino James E	-8908	R005	568-3974
3324	Brackenbury George	-8909	R005	255-0373
3344	Pulley Melvin J	-8909	R005	255-3951
3366	Austin Deeann	-8609	R006	569-0965
3366	Fullmer Merlen D	-8609	R005	569-1469
3366	Pulley Harvey	-8608	R006	255-7274
3410	Barlow Hyrum W	-8810	R006	255-6904
3434	Bannion Mervin E	-8810	R006	561-5795
3434	Edvik Lunt D	-8810	R006	569-8746
3590	Aized Tazeem M D	-8857	R001	569-8344
3590	Allred Bryce Dee	-8857	R001	569-2456
3590	Clark Francis J	-8857	R001	255-8833
3590	Colosimo Lauri Rpt	-8857	R001	255-4999
3590	Forsha Douglass W	-8857	R001	569-1456
3590	Gardner Gregory Rpt	-8857	R001	255-4999
3590	Goswami Sheel	-8857	R001	569-2384
3590	Grant Lillian	-8857	R001	566-3013
3590	Hall Teresa Rpt	-8857	R001	255-4999
3590	Jarrett Arlen K	-8857	R001	569-2626
3590	Johnson Kevin	-8857	R001	569-2384
3590	Kelly Patrick Rpt	-8857	R001	255-4999
3590	Meads Jr Garner B	-8857	R001	566-8304
3590	Miller Katrina	-8857	R001	569-1374
3590	Rizzardi Barbara	-8857	R001	569-2394
3590	Smith Veon G Dsw	-8857	R001	569-1374
3590	Thomas Mark C	-8857	R001	569-8929
3590	Wagner Francis J	-8857	R001	255-8533
3590	Zackrison David R	-8857	R001	569-2384
3683	Oakason C	-8811	R001	569-1003
3706	Anderson Mattie	-8813	R001	569-3854
3706	Bethea Bonita	-8813	R001	569-3080
3706	Child S B	-8813	R001	569-0415
3706	Dale E L	-8813	R001	569-8353
3706	Greenhalgh J H	-8813	R001	569-1576
3706	Haglund John E	-8813	R001	569-2154
3706	Hattrick Audrey	-8813	R001	569-1065
3706	Jensen A	-8813	R001	569-3033
3706	Liston Grant C	-8813	R001	569-2987
3706	Moessner Philip E	-8813	R001	569-8828
3706	Montgomery Kent H	-8813	R001	569-2273
3706	Neslen H Edward	-8813	R001	569-8582
3706	Oldham Grant	-8813	R001	569-3825
3706	Randle Lear	-8813	R001	569-8701
3706	Santistevan Anita	-8813	R001	569-8794
3706	Smith Julius	-8813	R001	569-1998
3706	Stevens Jessie	-8813	R001	569-0939
3706	Vaughn J H	-8813	R001	569-1509
3802	Datebout Dennis A	-8924	R001	255-3090

RESIDENTS 101

E 900 N (CENTERVILLE) 84014

139	McGuire Bert H	-1637	R002	295-2398
161	Martin Andra	-1637	R002	292-5975
183	Ancell Kenneth	-1637	R002	295-5206
192	Hepworth Louis Don	-1634	R002	292-0266

RESIDENTS 4

E 900 N (LEHI) 84043

550	SEGO LILY ELEMENTARY SCHOOL	-1235	C003	768-7030
1085	REG CHRISTENSEN CARPETS	-1410	C003	768-8520
1251	ADAMSON INSURANCE	-9711	R001	768-4510

BUSINESSES 3

E 900 N (MAPLETON) 84664

980	R & D HART INC	-3717	R004	489-0255

BUSINESSES 1

E 900 N (PROVO) 84604

876	SABLE HEIGHTS	-3505	C031	377-1666

BUSINESSES 1

E 900 N (SPANISH FORK) 84660

62	KIM A HALLADAY DPM	-1232	C001	798-7035
62	MICHAEL R ATWOOD DDS	-1232	C001	798-3526
268	MAUGHAN'S LANDSCAPE	-1236	C001	798-8948

BUSINESSES 3

E 900 S (CENTERVILLE) 84014

419	Stone Lorin T	-2524	R001	295-3186
440	Folland Douglas	-2537	R001	298-5841
480	Wright Norman R	-2537	R001	295-2263
485	Belnap Joseph O	-2524	R001	295-6615
550	Killpack Kenner W	-2536	R001	295-1746
580	Arbuckle William M	-2536	R001	295-0747

E 900 S (CENTERVILLE) (cont'd)

Address		Zip+4	Carr Rt	Phone
832	Waddoups Cleve T	-2593	R001	295-5698

RESIDENTS 7

E 900 S (HUNTSVILLE) 84317

7345	CHRIS'S	-9778	H032	745-3542
7345	JACKSON FORK INN	-9778	H032	745-0051

BUSINESSES 2

E 900 S (OREM) 84058

375	TANNER & SONS PLUMBING	-7139	C013	224-5554
905	SHAKLEE DISTRIBUTOR	-6613	C001	225-2891

BUSINESSES 2

E 900 S (PLEASANT GROVE) 84062

790	KELLOG WACHTER	-4201	C003	785-7558
1095	KIM TOMLINSON TILE	-4208	C003	785-5346

BUSINESSES 2

E 900 S (PROVO) 84606

111	JIMZ EAST BAY AUTO SVC	-6141	C009	375-3942
115	A TOUCH OF AIR GLASS & TRIM	-6141	C009	377-8515
167	GSR	-6141	C009	373-8404
167	R & R MANUFACTURING	-6141	C009	377-4550
171	LOG-POLE ENTERPRISES INC	-6141	C009	373-5340
195	KDC WOODWORKS	-6141	C009	377-8918
301	LARSEN AUTO INC	-6108	C009	375-5330
304	BIG FOUR DISTRIBUTING CO	-6122	C009	373-2085
341	DAVES RADIATOR REPAIR	-6108	C009	375-7624
355	CLOWARD CONSTRUCTION	-6108	C009	377-6288
388	POWDER RIVER LIVESTOCK EQUIP	-6109	C009	371-1252
1315	CHURCH OF JESUS CHRIST-LDS	-6372	C024	370-6545

BUSINESSES 12

E 900 S (SALT LAKE CITY) 84105

768	Nabity David A	-1243	C001	521-0307
778	Torgrimson K	-1237	C001	596-7744
780	Datebout Bruce	-1237	C001	359-8047
786	Datebout A	-1237	C001	355-5744
989	Dela Steven R	-1452	C002	596-0147
989	Drescher Stuart	-1452	C002	596-0147
989	Holleran Theresa	-1452	C002	596-0147
989	Robertson Chris	-1452	C002	596-0147
989	Steele Lynda	-1452	C002	596-0147
989	Zemlick Sherry Lynn	-1452	C002	596-0147
1016	Birrell Chris	-1453	C002	534-0802
1016	Kowalczyk Jacek	-1453	C002	538-0556
1016	Palmer Stephen A	-1453	C002	533-8555
1016	Seeley Steven	-1453	C002	530-4860
1016	Zhang Ping	-1453	C002	363-2839
1304	Draper Matt	-1654	C006	582-3808
1304	Grant Paul G	-1654	C006	582-5002
1304	Mikami R M	-1654	C006	582-2119
1304	Ross John	-1654	C006	581-1127
1304	Scott L	-1654	C006	581-9050
1304	Skousen Sheli	-1654	C006	583-8926
1304	Smith Lans	-1654	C006	583-2739
1370	Peterson Ferdinand E	-1618	C006	583-1504
1370	Pinnock Roger	-1618	C006	583-8950
1382	Green G R	-1618	C006	583-1542
1398	Wennergren J W	-1618	C006	583-0407

ZIP CODE 84108

1741	Sharp A F	-1333	C017	582-2755
1757	Wolff Louis F	-1333	C017	583-3339
1763	Hatt Brian	-1333	C017	582-0660
1777	Thurman M	-1333	C017	582-4876
1781	White Earle A	-1333	C017	583-0245
1791	Miller Steven J	-1333	C017	581-1324
1797	Hagen Scott	-1333	C017	582-5314
1958	Green Adam P	-1367	C017	583-5832
1958	Menlove Drew	-1367	C017	582-5604
1960	Canady C J	-1367	C017	583-9027
2151	Hagedorn D	-1461	C029	582-1742
2155	Bradshaw Don F	-1461	C029	582-8553

RESIDENTS 36

E 900 S (SPRINGVILLE) 84663

1015	COMMUNITY SWIMMING POOL	-2360	C004	489-2731
1205	SPRINGVILLE SENIOR HIGH SCHOOL	-2314	C004	489-2870

BUSINESSES 2

N 900 E (BOUNTIFUL) 84010

515	Midgley R C	-2825	C007	295-0865
1185	Alexander D Ray	-2643	C006	295-6977

RESIDENTS 2

N 900 E (KAMAS) 84036

2810	Weller Richard	-9508	R001	783-2588
2940	Weller Jared	-9508	R001	783-2334
2972	WELLER REPAIR	-9508	R001	783-4770

RESIDENTS 2 BUSINESSES 1

N 900 E (OGDEN) 84414

2825	HOWELL'S EXPERT WINDOW CLNG	-2419	C053	627-4161
3228	HENDERSON'S HOUSE-ACCOUNTING	-1704	C057	782-2223

BUSINESSES 2

N 900 E (PROVO) 84606

430	TYSDAL LAUNDRY CTR	-3423	C017	373-9328
438	FOOTHILL SHOE REPAIR	-3423	C017	374-2424
441	PEGGY'S BRIDAL	-3422	C017	375-0922
442	FIRST SECURITY BANK	-3423	C017	342-2170
445	DURFEY EXTRA CARE DRY CLEANERS	-3422	C017	374-6242
480	VON CURTIS ACADEMY OF HAIR	-3424	C023	374-5111

N 900 E (PROVO) (cont'd)

Address		Zip+4	Carr Rt	Phone
486	A FLAIR FOR HAIR	-3424	C023	373-5752
496	LITTLE CAESARS PIZZA	-3424	C023	374-2315
512	MC DONALDS	-2044	C023	373-7320
525	STANS DRIVE-IN	-2063	C023	375-6082
751	MARKHAM & MARKHAM ARCHITECTS	-2059	C023	373-4665

ZIP CODE 84604

910	PARK PLAZA APARTMENTS	-3504	C031	371-6530
1050	CHURCH OF JESUS CHRIST-LDS	-3537	C031	370-6612
1060	WASATCH ELEMENTARY SCHOOL	-3537	C031	374-4910
1209	KENT'S MARKET	-2740	C031	375-9452
1218	SUBWAY SANDWICHES & SALADS	-2719	C031	377-3736
1220	OAK HILLS GAS N STUFF	-2719	C031	375-5771
1600	CHURCH OF JESUS CHRIST-LDS	-1984	C031	370-6871

BUSINESSES 18

N 900 E (SPANISH FORK) 84660

160	BROTHERHOOD-RAILROAD SIGNALMAN	-1950	C006	798-8368

BUSINESSES 1

N 900 E (SPRINGVILLE) 84663

121	ART CITY ELEMENTARY SCHOOL	-1620	C006	489-2820
235	JEFFERS TILE CO	-1623	C006	489-6610
371	TAPESTRY PRESS	-1525	C006	489-9432

BUSINESSES 3

N 900 W (LEHI) 84043

1985	MDK CONSTRUCTION INC	-2859	R002	768-3445

BUSINESSES 1

N 900 W (OGDEN) 84414

3644	LOMOND VIEW ELEMENTARY SCHOOL	-1304	C052	786-2025

BUSINESSES 1

N 900 W (OREM) 84057

590	CHURCH OF JESUS CHRIST-LDS	-3600	C005	222-0521
751	VIEWTEC	-3645	C005	225-9447
766	LUI LANDSCAPING INC	-3674	C005	225-6838
825	TRANSPORTATION DEPT	-3058	C010	227-8000
955	METROPOLITAN WATER DISTRICT	-3060	C010	221-0637
955	OREM CITY PUBLIC WORKS	-3060	C010	224-7140
1089	SUNRIDER PRODUCTS DISTR	-3062	C010	225-5733
1158	NINTH WEST HAIR DESIGN STUDIO	-3011	C010	221-1192

BUSINESSES 8

N 900 W (PLEASANT GROVE) 84062

1670	C & L ERECTION	-9620	R002	785-3654

BUSINESSES 1

N 900 W (SALT LAKE CITY) 84116

517	Wolfe Troy	-2755	C007	532-4674
648	Ballow Reva	-4003	C005	521-9048
648	Hill R	-4003	C005	359-7564
648	Otero J	-4003	C005	364-5240
648	Yukhayev Albert	-4003	C005	530-0518
654	Arustamova Larisa	-4004	C005	328-8582
654	Bond Joseph	-4004	C005	596-3285
654	Chidester Peggy	-4004	C005	596-3284
654	Zolotsev Yevgeniy	-4004	C005	328-9258
662	Callisto Ellen M	-4005	C005	328-1628
662	Canaday Tony	-4005	C005	364-0656
662	Peterson Carrie Emily	-4005	C005	328-2504
662	Yegiyan Arutyun	-4005	C005	532-8500
666	Balashov Nikita	-4006	C005	596-8625
670	Hanna Cathy	-4007	C005	364-9014
670	Kagramanova Isabel	-4007	C005	537-7410
714	Granda Blanca	-4061	C005	532-5639
714	Hernandez Martina	-4061	C005	521-8615
714	Kim Jung J	-4061	C005	531-9589
714	Larsen Scott	-4061	C005	531-9409
714	Lopez Samuel	-4061	C005	539-7751
714	Morris Sharyn	-4061	C005	328-0812
714	Whiting Paul T	-4061	C005	531-8827
716	Aniceto Romeo	-4062	C005	532-3545
716	Choi Youngik	-4062	C005	596-0854
716	Hill John	-4062	C005	532-6009
716	Melendez Jose D	-4062	C005	322-1812
716	Montejano Raul	-4062	C005	328-2042
716	Samuel Kashis	-4062	C005	537-1549
718	Azhar Ruby	-4063	C005	369-9132
718	Coates Sharrie	-4063	C005	534-1918
718	Knox Nelson W M	-4063	C005	539-0625
718	Rios Terry	-4063	C005	532-3040
744	Goldman Paul R	-4064	C005	531-7216
744	Griffin Gary L	-4064	C005	596-0828
744	Montoya Mike	-4064	C005	532-1565
744	Oh Frank Sewan	-4064	C005	521-6523
744	Sarkisov Oleg	-4064	C005	322-4219
746	Gillesp Robert P	-4065	C005	596-0833
746	Kim Dohoon	-4065	C005	532-0456
746	Miller Mitchell	-4065	C005	534-1536
746	Neill Roger	-4065	C005	531-2896
748	Argyle E K	-4066	C005	539-1628
748	Bhatti Pervaiz I	-4066	C005	363-3206
748	Laubershimer Robert S	-4066	C005	521-2915
748	Smith Donavan	-4066	C005	575-6863
750	Bridrijo Matthew	-4067	C005	328-0013
750	Dalton Gary	-4067	C005	531-2859
750	Matlock Christina	-4067	C005	539-6450
750	Rasul Abdul Ahad	-4067	C005	539-8125
750	Spor Cynthia	-4067	C005	538-0242
752	Chun Yunseok	-4068	C005	328-8565
752	Kelley David L	-4068	C005	359-0938
752	Leszczynski Stan	-4068	C005	534-0705
752	Moss Richard	-4068	C005	328-1512

WINTHROPE CIR 1995

Windy Peak Ridge Dr (SANDY) (cont'd)

Address		Zip+4	CarrRt	Phone
11332	Johansen Keith	-5425	C013	572-6413
11333	Harper Jesse P	-5426	C013	571-4605
11345	Hartwell A C	-5425	C013	572-3579
11347	Price Wayne L	-5426	C013	572-3006
11361	Ely Andrew	-5428	C013	578-8616

RESIDENTS 41

Windy Peak Cir (SANDY) 84094

1134	Thornton Gaylen	-5467	C015	571-7797
1134	Thornton Gaylen	-5467	C015	571-8514
1144	Swensen John	-5467	C015	572-6155
1152	Madsen Barbara K	-5467	C015	572-4671
1153	Bounous Steve	-6926	C015	572-6437
1160	Ford Barbara	-5467	C015	572-9232
1160	Gardner Barbara	-5467	C015	572-9232
1160	Kallish Brett	-5467	C015	576-8482
1160	Pierce Terry	-5467	C015	571-9151
1186	Christianson Scott	-5467	C015	572-0104

RESIDENTS 10

Windy Peak Way (SANDY) 84094

1063	Phillips James J	-5420	C015	572-8210
1073	Butterfield Kemp	-5420	C015	572-0157
1082	Boyer Danny G	-5450	C015	572-1934
1091	Crain Lee	-5420	C015	572-4848
1092	Conklin Stephen	-5450	C015	571-6107
1092	Conley Stephen	-5450	C015	571-6107
1107	Heim Kevin	-5422	C015	571-1352
1115	Petty James W	-5446	C015	572-4049

RESIDENTS 8

Winesap Cir (SALT LAKE CITY) 84121

7336	Clark David L	-4509	C016	942-3028
7337	Nuttall John R	-4509	C016	943-1042
7344	Norton Thomas	-4509	C016	942-7381

RESIDENTS 3

Winesap Ct (SALT LAKE CITY) 84121

7255	Johnson Ronald M	-4439	C016	943-1215
7259	Strawn Jon A	-4439	C016	943-4558
7274	Richards Sterling	-4439	C016	944-4242
7279	Causi Ian	-4439	C016	943-6628
7279	Causi Jerry	-4438	C016	943-9442

RESIDENTS 5

Winesap Rd (SALT LAKE CITY) 84121

3316	Mills Lehi L	-4444	C016	942-9989
3340	Peterson Michael J	-4444	C016	943-3482
3360	Rich R M	-4444	C016	943-5695
3361	Grow John	-4443	C016	943-5746
3376	Gibson Ronald W	-4444	C016	943-6844
3391	Haak Peter A	-4447	C016	942-3461
3392	Hill Dan	-4444	C016	942-5268
3407	Nelson Robert C	-4448	C016	943-7158
3408	Simmons Kenneth G	-4445	C016	943-3975
3420	McCann Bob	-4445	C016	943-3877
3423	Nielson Harlan K	-4448	C016	942-2126
3434	Curtis Steven E	-4445	C016	943-7953
3439	Westenskow Dwayne	-4448	C016	942-4654
3440	Whitehead Jay	-4445	C016	943-1524
3460	Weed Stuart	-4445	C016	943-3266
3498	Francom Alan	-4446	C016	942-1908
3524	Green William H	-4525	C016	942-3872
3531	Nortmann Charles A	-4524	C016	942-2206
3536	Millecam Randy D	-4525	C016	942-5225
3548	Bawden Jeff	-4525	C016	943-8906
3573	Dahaan Eldon J	-4538	C016	943-1034
3580	George Bill	-4536	C016	943-1013
3585	Speik T Benjamin	-4538	C016	943-1036
3594	Wandling C Ed	-4536	C016	943-7649
3607	Smith Mark	-4538	C016	942-4982
3608	Skantel Lonnie	-4527	C016	944-9515
3613	Savage E Scott	-4526	C016	943-1037
3671	Megcall Larry H	-4539	C016	942-3761
3672	Messineo Richard	-4537	C016	943-0567

RESIDENTS 29

Winfield Rd (SALT LAKE CITY) 84123

4261	Williams M H	-2344	C014	264-1840

RESIDENTS 1

Winifred St (SALT LAKE CITY) 84116

35	Goodsell Richard	-3049	C010	521-4034

RESIDENTS 1

Winslow Ave (SALT LAKE CITY) 84115

140	Hogge David	-4703	C017	263-9315
148	Causey Sr Dawn	-4703	C017	263-9122
153	Simmons Russell	-4711	C017	265-3157
158	Halladay K B	-4703	C017	265-3728
168	Adams Eugene	-4703	C017	265-1185
174	Sedgwick Fred J	-4703	C017	266-6192
183	Kinsey Willie	-4711	C017	264-8438
183	Miles Johnnie Mae	-4711	C017	266-1927
184	Carter A D	-4703	C017	263-6698
208	Hardman Greg D	-4712	C017	269-9584
223	Pack M A	-4712	C017	268-9364
230	Seale L	-4712	C017	261-9582
250	Deherrera Jerry B	-4760	C017	265-3697
250	Franklin Wayne	-4760	C017	261-1427
250	Miller Michial E	-4760	C017	262-5806
250	Peterson Robert	-4760	C017	262-5901
252	Carlston R M	-4761	C017	263-1958
252	Ortega N	-4761	C017	261-2915
252	Pedersen Paul	-4761	C017	264-1150
254	Daimler Eunice	-4762	C017	269-0105
254	Law Calvin	-4762	C017	262-6126
254	Ortega Carmen	-4762	C017	263-3146
256	Barnes Brian	-4763	C017	263-1916
256	Howell Marvin	-4763	C017	265-1625
256	Petty Liz	-4763	C017	268-4624
256	Romero Duane	-4763	C017	261-4665

RESIDENTS 26

Winston Dr (SALT LAKE CITY) 84120

2912	Hadden Rodney	-1379	C011	968-1251
2921	Clapp Joe	-1380	C011	967-5857
2928	Wiseman R Brad	-1379	C011	966-4167
2929	Franco Isaac	-1380	C011	963-9795
2938	Morrey J	-1379	C011	967-0197
2939	Egbert Tarra	-1380	C011	964-9061
2946	Weir Jonathan	-1379	C011	967-1514
2949	Clark Steven D	-1380	C011	964-1342
2960	Christensen Brad	-1379	C011	963-8461
2972	Breinholt Mike	-1379	C011	968-4362
2973	Carlsen Charles	-1380	C011	964-5763
2982	Lexes Larry	-1379	C011	963-8485

Winston Dr (SALT LAKE CITY) (cont'd)

Address		Zip+4	CarrRt	Phone
2983	Cox J M	-1380	C011	969-7720
2995	Turner Sean	-1380	C011	969-8232
3026	Wolford Robert D	-1381	C011	957-2703
3037	Bright Barry G	-1382	C011	966-6147
3038	Burr Wendy	-1381	C011	966-2801
3047	Thomas Craig	-1382	C011	969-6105
3058	Talbot Jim	-1383	C011	965-1049
3059	Young A C	-1382	C011	969-4048
3072	Reck Ted R	-1383	C011	963-8541
3073	Salmond Breck	-1382	C011	969-6315
3087	Koglin Kelly	-1382	C011	565-9377
3088	Baldwin Michael	-1383	C011	969-3185

RESIDENTS 24

Winter Canyon Way (SANDY) 84094

673	Francis Edward	-5503	C007	571-9480
682	Wildauer Charles F	-5509	C007	572-6806
692	Haun Jr Joseph C	-5509	C007	572-2401

RESIDENTS 3

Winter Wren Dr (SANDY) 84093

9057	Whitworth Steve	-2713	C001	942-8231
9058	White T L	-2714	C001	942-2866
9071	Moulton Ron	-2713	C001	944-1815
9072	Barber Marje	-2714	C001	942-3108
9083	Chadwick Kim	-2713	C001	943-9441
9084	Chaus Michael G	-2714	C001	943-5821
9136	Haden Michael A	-2711	C001	943-3310
9141	Morgan J C	-2709	C001	944-0795
9152	Kuhn Robert J	-2711	C001	942-4028
9153	Rogerson Tony	-2709	C001	942-0387
9158	Graham D W	-2711	C001	943-7694
9164	Ross Christopher	-2711	C001	942-1634
9163	Cowan C	-2708	C001	943-8860
9183	Hoffmann Edward J	-2708	C001	943-5079
9184	Slusser Kim	-2711	C001	944-4049
9194	Robinson James	-2711	C001	942-0366
9204	Thomsen Jeff	-2945	C001	943-2250
9211	Christopherson Glen	-2844	C001	942-7239
9212	Stewart Gayle B	-2845	C001	942-8245
9221	Cazier Michael	-2844	C001	943-4881
9222	Tanner Allen H	-2845	C001	942-3277
9232	Barton David B	-2845	C001	943-2450
9248	Markuse Thomas	-2845	C001	942-8597
9249	Blycker William L	-2843	C001	942-3005
9264	Crandall Steven	-2845	C001	944-8479

RESIDENTS 25

Winterdale Cir (SALT LAKE CITY) 84121

7679	Ellis Gary	-5472	C018	943-9673
7680	Brammer Daniel V	-5472	C018	942-5855
7683	Wood Bonnie	-5472	C018	944-8441
7687	Lie Eric C	-5472	C018	942-4550

RESIDENTS 4

Winter St (SALT LAKE CITY) 84116

244	Hines William M	-3120	C001	596-7663
249	Eatchel Ronald R	-3119	C001	596-7036
260	McColl Mildred	-3120	C001	532-6236
264	Gross Erma	-3120	C001	363-0769
269	Visarraga William	-3119	C001	595-1763
273	Lundberg Wesley V	-3119	C001	531-1458

RESIDENTS 8

Winterwood Cir (SANDY) 84092

1422	Mc Bride Steve	-2909	C005	572-3204
1427	Pope Reese	-2909	C005	571-8605
1445	Jorgensen Kenneth	-2909	C005	571-8510
1448	Finley Marc	-2909	C005	572-1035
1462	Meyer Paul E	-2909	C005	572-7935
1469	Smelser James M	-2909	C005	572-4051
1474	Johnson Greg L	-2909	C005	571-7024
1477	Nielson Marlell A	-2909	C005	571-4387
1478	Vasica John T	-2909	C005	572-1549
1483	Lewon Dan	-2909	C005	576-9434

RESIDENTS 10

Winterwood Dr (SANDY) 84092

9745	Hofeling Norvie	-2911	C005	571-0490
9745	Maxwell Bill D	-2911	C005	571-3001
9746	Bacigalupo Brian	-2912	C005	572-7772
9758	MacGregor Matthew	-2912	C005	571-3085
9770	Milne Gordon	-2912	C005	571-5155
9796	Kuebitz Bernhard W	-2912	C005	576-9542

RESIDENTS 6

Winthrope Cir (WEST JORDAN) 84088

3655	Condie Mark G	-8803	R001	569-1320
3659	Maddux Henry	-8803	R001	566-2875
3665	Rasband Charles W	-8803	R001	566-9428
3666	Larson Steven L	-8803	R001	255-5013
3681	Terry Leroy	-8803	R001	255-1847
3682	Arnold Chad	-8803	R001	569-8499

RESIDENTS 8

Winthrope Dr (WEST JORDAN) 84088

9012	Gammon Kent	-8805	R001	569-2188
9036	Matheny Teresa	-8805	R001	569-2911
9069	Sermon Bradley W	-8814	R001	255-7913
9072	Rubright Richard D	-8805	R001	566-5283
9081	Harris Larry W	-8814	R001	566-1184
9090	Nicholson Bob	-8805	R001	255-1639

RESIDENTS 6

Winton St (SALT LAKE CITY) 84119

2486	Sanchez Joe	-1508	C023	972-5473
2486	Sanchez Lori Kay	-1508	C023	972-3136

RESIDENTS 2

Winward Dr (SALT LAKE CITY) 84117

1517	Wurst Jerry	-7535	C017	278-5926
1526	Lightfoot Alvin	-7535	C017	277-5704
1531	Gough Barry G	-7535	C017	278-5514
1539	Slick Adnan	-7536	C017	272-0559
1543	Balke C	-7535	C017	277-8808
1550	McPartland T	-7536	C017	272-9251
1555	Nell Jack F	-7535	C017	277-6172
1564	Call Gregory	-7538	C017	278-7206
1564	Call MacRey	-7536	C017	272-0540
1567	Lemon K A	-7535	C017	278-7750
1574	Lemon James F	-7536	C017	278-9522
1579	Handsaker Fred E	-7535	C017	277-5562
1591	Jensen Walter D	-7535	C017	277-7159
1607	Arnesen Leon R	-7537	C017	277-3924
1615	Anderson H Kent	-7537	C017	272-2154
1628	Brehe E L	-7538	C017	277-0133
1638	Smith Richard H	-7538	C017	278-0381

Winward Dr (SALT LAKE CITY) (cont'd)

Address		Zip+4	CarrRt	Phone
1641	Ward William C	-7537	C017	277-5496
1651	Allem Michael A	-7537	C017	278-2322
1652	Winward William D	-7538	C017	278-6496
1688	Schmuck Frankie	-7551	C017	277-1809
1698	Serbousek Rod	-7551	C017	278-4006
1698	Weebar Edwin L	-7551	C017	278-4006
1699	Caldwell Ermil	-7552	C017	277-0206

RESIDENTS 24

N Wolcott St (SALT LAKE CITY) 84103

8	Franks Daniel	-4477	C006	383-5553
22	Stout Robert	-4477	C006	355-8793
25	Sandack A Wally	-4477	C006	364-0556
44	Jensen James U	-4477	C006	359-9151
51	Galanis John N	-4478	C006	533-8436
54	Williams Gregory P	-4477	C006	534-1961
66	Tucker Don	-4477	C006	521-9778
72	Fisher S R	-4477	C006	328-0810
80	Steiner Bob	-4477	C006	596-1213

RESIDENTS 9

S Wolcott St (SALT LAKE CITY) 84102

7	Huntsman A B	-1815	C004	328-9976
7	Huntsman N	-1815	C004	328-9979
11	Robbins Charles D	-1815	C004	364-0556
26	Stewart Pamela K	-1816	C004	534-0270
33	Corry Alisa	-1815	C004	322-3813
33	Gaskill Angie	-1815	C004	322-3813
33	Howell Angie	-1815	C004	322-4138
33	Nye Jen	-1815	C004	322-4138
70	Cottrell Charles	-1827	C004	355-2458
70	Fry Steve	-1827	C004	328-0453
70	Haley John C	-1827	C004	359-6367
70	Madsen David E	-1827	C004	359-6131
70	Simos Gerino	-1827	C004	599-0334
70	Woods Mark	-1827	C004	322-2629
72	Brockbank Dave	-1827	C004	322-3548
74	Coleman Aaron	-1827	C004	575-6235
74	Dunn Donald Kennet	-1827	C004	363-3896
74	Kirklen Michael E	-1827	C004	521-5739
74	Ohm William C	-1827	C004	355-6452
75	Conover Kristen	-1833	C004	364-3920
75	Nerbonne Nicholas	-1833	C004	595-1551
75	Pals Marko	-1833	C004	533-9647
78	Crawford Cedric	-1827	C004	539-8458
85	Code Ian	-1828	C004	539-8230
85	Fitzsimmons Gavin D	-1828	C004	322-0417
85	Seamen James E	-1828	C004	359-8365
95	Salazar Matthew	-1828	C004	521-0971
95	Tea Travis	-1828	C004	531-6511
95	Weston Brandon	-1828	C004	322-5317

RESIDENTS 29

N Wolf Creek Dr (EDEN) 84310

3615	WOLF LODGE HOME OWNERS	-9725	H031	745-2484
3900	WOLF CREEK REAL ESTATE SVC	-9729	H031	745-6420
3900	WOLF CREEK RESORT	-9729	H031	745-3365

BUSINESSES 3

Wolf Point Cir (SANDY) 84070

11251	Gull Kevin	-5307	C013	571-1634
11252	Garcia Andrew P	-5307	C013	576-9155
11257	Webster J D	-5307	C013	571-6519
11260	Pace Steve	-5307	C013	571-2567
11274	Gruendell Craig	-5307	C013	572-2789

RESIDENTS 5

Wood Ave (SALT LAKE CITY) 84115

60	Butler D J	-1612	C008	485-3437

ZIP CODE 84105

525	Luhrs Chad	-2014	C012	467-2569
542	Green Richard R	-2057	C012	467-5094
559	Gallegos V F	-2056	C012	486-9571
560	Pace L A	-2057	C012	484-3576
569	Vincent Dortha L	-2056	C012	467-9745
1005	McEndree Jennifer	-2411	C007	583-2552
1026	Herrick S L	-2412	C007	486-4544
1032	Strain Lehman	-2412	C007	466-1358
1034	Roner Harry G	-2412	C007	484-2346
1050	Jacobsen J Douglas	-2412	C007	467-6271
1056	Jenson Travis T	-2412	C007	484-9322
1057	Mancini L H	-2411	C007	484-4307
1059	Burr Brent	-2411	C007	486-4627
1072	Shelton A	-2412	C007	466-5622
1216	Reed Matt	-2516	C018	487-9687
1226	Upchurch Kevin	-2516	C018	467-5940
1234	Petersen Darral L	-2516	C018	467-3713
1236	Miller Susan P	-2516	C018	485-4717
1246	Bricker Al	-2516	C018	467-7664
1248	Jamison Will	-2516	C018	484-2648
1256	Johnson Rob M	-2516	C018	486-6562
1256	Hayes Del K	-2516	C018	466-0423
1282	Zimbeaux F H	-2516	C018	486-7734
1288	Gunn Roy W	-2516	C018	466-4661

RESIDENTS 25

Wood Cir (SALT LAKE CITY) 84107

5753	Golder Dale	-6138	C007	263-2955
5757	Robinson Noel Thomas	-6138	C007	268-6922
5759	Allred Harold	-6138	C007	262-2794
5760	Watson B L	-6138	C007	269-9254
5760	Watson Daniel	-6136	C007	269-9254
5761	Matern Raymond	-6138	C007	266-2974
5762	Peterson James M	-6138	C007	266-2966
5764	Lessley Irene J	-6138	C007	262-7847
5767	Atkinson Deanna	-6138	C007	263-6926
5768	Hale Brad	-6136	C007	263-2421

RESIDENTS 10

Wood St (MIDVALE) 84047

308	Perkes George A	-3263	C009	561-5785
316	Reringer Charles G	-3263	C009	566-2872
325	Sewar Joseph J	-3264	C009	255-6922
326	Sund M	-3263	C009	255-0717
329	Tongish B J	-3264	C009	561-1060
334	Smith B L	-3263	C009	561-5065
349	Lind Kathleen	-3215	C009	561-0307
378	Olson Gerald L	-3266	C009	255-5967
385	Yates Doyle	-3215	C009	561-2876
390	Jensen Ralph G	-3266	C009	255-6431
395	Blake Robert George	-3215	C009	255-6900
402	Bentley A D	-3265	C009	255-3865
405	Thomas Ray P	-3266	C009	255-4836
416	Taylor Clinton R	-3265	C009	255-2447
419	Brown Ruel	-3266	C009	255-0984

Wood St (MIDVALE) (cont'd)

Address		Zip+4	CarrRt	Phone
430	Mann Brian D	-3265	C009	566-1154
433	Blaimer Ludwig S	-3266	C009	255-6219
444	Smith Gerald T	-3265	C009	255-5362
460	Kynaston Eugene	-3265	C009	255-9414
461	Whited Orval	-3266	C009	255-8424
466	Reed Douglas J	-3265	C009	255-5840
467	Deluca K L	-3266	C009	566-0699
478	Montgomery Lynn	-3265	C009	566-1013
493	Ivie Joel	-3276	C009	566-2983
511	Church Karl	-3264	C009	566-0833
515	Turpin Wayne	-3264	C009	561-0556
530	Robens James W	-3263	C009	561-0091
542	Markel Kaye	-3263	C009	255-9286
543	King K	-3275	C009	566-9736
543	Loulias Michael	-3275	C009	568-9736
557	Oliverson Ray	-3275	C009	255-2336
567	Facer Martin R	-3275	C009	255-6451
567	Hogenson Brent H	-3275	C009	255-7070
570	Hart Don S	-3263	C009	255-6156
584	Haake Leonard	-3263	C009	255-5067
585	Kelley Kreig B	-3275	C009	561-2638
598	Topalian Charles	-3263	C009	255-4837
599	Hobbs Andy F	-3275	C009	255-7248
612	Serdar Jack	-3681	C009	255-5697
615	Jacobson Paul G	-3662	C009	255-0280
626	Kofford Lloyd N	-3681	C009	255-0345
626	Kofford Lloyd N	-3681	C009	255-0345
629	Nystrom Albert D	-3662	C009	255-2353

RESIDENTS 43

Wood St (OGDEN) 84404

865	CLASSIC MOBILE LOCK & KEY	-5948	C016	782-8795
890	STETTLER REALTY	-5949	C016	621-4100

BUSINESSES 2

Wood Glen Rd (SANDY) 84092

1542	Walbeck Glen	-4316	C002	571-3687
1555	Matsu Boyson E	-4315	C002	572-6319
1565	Kent C A	-4315	C002	572-2527
1565	Kent Don	-4316	C002	576-1133
1576	McGavin Carl R	-4316	C002	572-1115
1577	Franco Rodolfo Ciro	-4315	C002	572-6487
1588	Taylor Colleen M	-4316	C002	571-1091
1589	Tonelli L	-4315	C002	572-8211
1600	Johnson C P	-4314	C002	572-6590
1613	Husman David E	-4313	C002	576-0882
1625	Kunz Todd L	-4313	C002	571-2781
1650	Mitchell Michael	-4314	C002	576-9067
1651	Gibb Douglas J	-4313	C002	576-0871
1675	Heser Brian	-4314	C002	572-5715
1688	Taylor Michael J	-4314	C002	572-3583
1698	Johnson Kirk A	-4314	C002	572-5998
1698	Stratford C	-4314	C002	572-5995
1701	Garretson David H	-4351	C002	572-0982
1701	Williams John V	-4351	C002	571-7763
1720	Armstrong Terry	-4352	C002	571-0761
1725	Jones Matt	-4351	C002	571-8045
1749	Richards Daniel D	-4351	C002	571-2274
1751	Jerome G	-4351	C002	571-7678
1775	Thomas Owen L	-4351	C002	572-0625

RESIDENTS 24

Wood Hollow Dr (RIVERTON) 84065

15630	Hill Brad	-4974	R012	254-4028
15631	Gayler Kenneth	-4975	R012	254-5861
15663	Ricks Troy G	-4977	R012	254-5111
15686	Zeeh Stuart	-4976	R012	254-9917
15701	Price Rusty	-4977	R012	254-4525
15742	Shomaker Bob	-4978	R012	254-8504
15751	Visser Dan M	-4979	R012	254-9383
15782	Cozzens Blane A	-4978	R012	254-6515

RESIDENTS 8

Wood Hollow Way (BOUNTIFUL) 84010

2127	Green Robert T	-1217	C025	292-4927
2180	Thompson Rocke	-1218	C025	298-3637
2185	Jensen Gordon R	-1217	C025	298-4320
2190	Arnold Frank D	-1218	C025	298-7732
2275	Hall A Allen	-1220	C025	295-1963
2299	Gassar G Walter	-1219	C025	292-6896
2320	Hiatt Jack W	-1222	C025	292-9580
2362	Pearson Randal	-1222	C025	295-4832
2363	Meiners Coralie	-1221	C025	298-7530
2363	Meiners Donis G	-1221	C025	298-7530
2406	Anderson Paul K	-1252	C025	295-0469
2407	Nelson Brent	-1253	C025	295-1194
2424	Swedin Jim	-1224	C025	292-6701
2453	Robinson David	-1223	C025	298-8811
2476	Hart Gary L	-1237	C025	298-7094
2497	Clayton Paul P	-1256	C025	295-1158
2510	Bahr Albert Lee	-1226	C025	292-6659
2552	Hepner Kenneth L	-1226	C025	292-9758
2577	Hussey Brett	-1225	C025	298-5627
2577	Young Karyn	-1225	C025	298-5627
2580	Wilcox Paul H	-1226	C025	292-6379
2648	Seamons Larry V	-1228	C025	292-8706
2688	Rose Joel G	-1228	C025	298-8412
2699	Hause Robert	-1227	C025	298-3204
2702	Wright Steven E	-1230	C025	298-5284
2719	Smith Silas S	-1229	C025	295-3572
2720	Wheeler Max D	-1230	C025	292-6858
2738	Erickson Barry A	-1230	C025	295-7663
2777	Lewis Warren	-1229	C025	292-8183
2795	Gnewe Ron	-1229	C025	298-5176
2832	Tholen Richard G	-1238	C025	298-4942
2839	Salt Timothy	-1239	C025	299-9918
2895	Hampton Stanley L	-1239	C025	292-0654
2941	Ballantine Pete	-1241	C025	292-8391
2982	Rushton John W	-1240	C025	295-9690

RESIDENTS 35

Wood Row St (SALT LAKE CITY) 84107

46	Burnett G	-5879	C013	268-9539
63	Jacobson MacK	-5878	C013	266-9286
64	Anderson Devin	-5879	C013	262-7480
64	Murphy Michael E	-5879	C013	266-1459
72	Nichols Harold E	-5879	C013	266-5584
73	Minnick James	-5867	C013	262-8602
89	Swenson Max	-5878	C013	266-3179
93	Kravet S	-5878	C013	265-0080
93	Powell Deon D	-5878	C013	262-4015
108	Welch Frank D	-5840	C013	264-9766
111	Kubota Gary	-5839	C013	266-0788

RESIDENTS 11

Woodash Cir (SALT LAKE CITY) 84120

5239	Koyle Chris	-5626	C020	967-2295
5240	Long D J	-5629	C020	967-0675

W 9000 SOUTH ST (WJ)—Contd
1875 Schmidt Allan ◎ 255-2177
1847 Under Constn

715
1330 New China Restr 562-1600
1333 Anderson Lumber 561-9000
1450 Stucki Max J ◎
1486 Raca Ernie ◎
1487 Vacant
1505 No Return
1510 Lopez Louis ◎ 255-1525
1550 Vacant
1554 Vigil Procopio ◎ 255-0987
1580 Malcolm Morris K ◎ 255-7087
Rear Lance Edna ◎ 255-5613
1646 Harris Vaughn 561-2319
1650 Jones Paul W excavating contr ◎ 255-2642
1652 Leyba Ermalinda Mrs ◎ 255-7347
1654 Tafoya Jose P ◎ 255-7886
1670 Vacant
1678 Kentucky Fried Chicken 566-1741
S REDWOOD RD INTERSECTS

714
1995 Church Of Jesus Christ L D S 255-6981
Church Of Jesus Christ L D S 562-1360
Church Of Jesus Christ L D S 566-0826
2089 No Return
2195 Vacant
S 2200 WEST ST INTERSECTS
2590 Vacant
2640 First Security Bank (900 South St Br) 350-5690
Ream's gro store 561-9381
2664 Vacant
2680 Hairline barber's styling salon 566-9519
2684 Vacant
2686 Fabric Center The 569-2401
2688 Seven Eleven Store gro 566-0541
S 2700 WEST ST INTERSECTS
2770 Tew Boyd N ◎ 566-1010
2780 Crosby Joyce Mrs ◎ 561-5459
2785 Mc Dougal Realtors 566-1601
Mountain View Constn 566-1601
Orton Estate Development 566-1601
2810★Hanger Sidney ◎ 569-1183
2880 Riding Ben J ◎ 561-5885
2900★Simkins Brad 569-1502
2919 West Jordan Utah South Stake Meeting House (LDS) 561-2744
Church Of Jesus Christ L D S West Jordan 255-8291
Church Of Jesus Christ Lds W Jordan 561-3221
Church Of Jesus Christ L D S W Jordan 31st Ward meeting house 566-2851
2922 Hanger Robt ◎
2985 Schmidt David H ◎ 561-1173

814
3200 Clapp Octavia ◎
3232★Giles Lee A ◎ 561-1220
3282 Erickson Ernest G ◎ 561-8609
3324 Brackenbury Geo ◎ 255-5020
3333 National Semiconductor 562-7000
3344 Pulley Melvin ◎ 255-3951
Rear Pulley Harvey ◎ 255-7274
3366★Kilpack Lowell contr 566-1086
3388 Under Constn
3410 Barlow Hyrum W genl contr ◎ 255-6904
3434 Bennion Mervin E ◎ 561-8765
3437 White Fork Cemetery
3500 Atwood Nancy M ◎ 255-3070
3580 Jordan Valley Holy Cross Hosp 561-8888
3590 Medical Arts Plaza 264-8800
105 Southwest Health Center 566-5391
105 Funke Robt H phys 566-5391
120 Family Plaza Pharmacy 566-2272
130 Jordan Valley Counseling Clinic 569-1374
200 Gardner Gregory physical therapist 255-4999
200 Toole Douglas B physical therapist 350-4310
200 Kelly Patk physical therapist 571-4571
215 Anderson Eric D phys 569-1766
215 Wilkinson Craig W phys 569-1766
215 Curtis Glade B phys 569-1766
215 Hansen Keith E phys 569-1766
215 Herzog Briant G phys 569-1766
215 Tanner Gregory C phys 569-1766
220 Hansen Robt G phys 569-1641
220 Zeluff Gary R phys
225 Mc Neilis Thos M phys 561-9304
240 Woods Gordon L phys 569-2384
240 Rizzardi Barbara E phys 569-2384
300 Winnett Albert R phys 569-1148
3k Allred Bryce D phys 569-2456
320 Meads Garner B Jr phys 566-8304
325 Mc Clellan Monty P phys 569-2382
330 Shirts Steven R phys 566-8501
340 Jordan Valley Hearing & Speech Center 566-4327
340 Platis Dean phys
340 Boyd Evelyn phys
3660 Five D Cabinet Shop 561-2711
3680★Oakeson Blaine ◎ 569-1000
3802 Abraxas Kennels 255-3090
Dalebout Dennis A ◎ 255-3090
4139 Diamond James L ◎ 255-2018

601
9000 WEST ST S (MAGNA)—FROM 9000 W 2700 SOUTH SOUTH

ZIP CODE 84044
2727★Garcia Pat ◎ 250-3818
2739 Vogles Helen Mrs ◎ 250-5544
2743 Vacant
2745 Hitt Robt L ◎ 250-1409
2752 Vacant
2757 Benson Earl J ◎
2760 Yeates Merlin D ◎ 250-7082
2767 Petersen Myrtle N Mrs 250-5749
2770 Lucas Richd
Bsmt Reed Wally
2775★Miaki J ◎
2780 Colosimo Ralph ◎ 250-5717
Bsmt Schofield Elva E
2781 Rivas Mary Mrs 250-0859
2793 Vacant
W 2800 SOUTH ST INTERSECTS
2808 Lemmon Leland ◎ 250-5492
2816 Groves Robt ◎ 250-1077
2822 Carter Ralph L ◎
2830 Vacant
2840 Our Lady Of Lourdes Catholic Church 250-6349
Verdi Genaro F Rev 250-6349
2859 Ross Lanny brick mason 250-3170
2864 Harrison Kelly B ◎ 250-2467
2878 No Return
2883 Bergstrom J T ◎ 250-4539
2884 Anderson David R ◎ 250-2884
2890 White Fern Mrs ◎ 250-6810
2893 Lamb John F ◎ 250-5505
Bsmt Mc Kinlay Tim
2894★Hope Bill
W 2900 SOUTH ST INTERSECTS
2909 Mecham Nellie D Mrs ◎ 250-5352
2910★Newland Janet ◎ 250-2435
2913 Bowen Sara D Mrs ◎ 250-6237
2917 Brems Thomas V 250-3242
2916 Moyes Charles R ◎ 250-5734
2921 Broadhead Robt R 250-4467
Bsmt★Bushnell Kelly
2922 Fendley Glen L ◎ 250-2328
2925★Homer Leland
2929 Raisor Wendella Mrs ◎ 250-6780
2930 Lyon
2933 Thomas Owyn F 250-2882
2934★Benedict Ross A
2940★Aston Pat J 250-5305
2941 Williams Wayne ◎ 250-7269
2942 Turpin Jay ◎
2947 Myers Marion G ◎ 250-1653
2952 Mitchell Nathan H ◎ 250-5857
2955 Brunson Frank D ◎ 250-8243
2959★Kingsburg Robert B ◎ 250-7047
2962 Stocker John A ◎ 250-5805
2963★Montoya Lucile 250-3107
2968★Murray Rick ◎ 250-8256
2969 Zabriskie R Alden ◎ 250-6146
2976 Loskot Mary C Mrs ◎
2977★Lopez Linda
2978★Darin K
2985★Mondragon Keith ◎
2986 Jensen Rulon E ◎ 250-6624
2994 Schwab Kathy ◎ 250-2163
W 3000 SOUTH ST INTERSECTS
3005★Kenney Wayne J ◎ 250-3123
3006 Williams Charles H ◎ 250-6250
3011★Tabbot Bryan L ◎ 250-3627
3014 Vacant
3017 Hood Clifford N ◎ 250-9069
3018 Notarianni Phillip F Jr ◎ 250-6713
3020★Powell Bill
3038 Proctor Helen M Mrs ◎ 250-6232
3043 Kilpatrick Lawrence L ◎
3050 Olsen Glen A ◎ 250-6144
3056 Corfield Raymond J ◎ 250-6775
3066 Christofferson Boyd C ◎ 250-5191
3069★Emerson Ted A
Rear★Webber D
3071★Bailey R J 250-7179
Rear★Emerson Chris 250-3495
3077★Dunster James
3086★Herrara Joe E 250-3244
3087 Adamson Thos M ◎ 250-7675
3090 Triplett Andy ◎

602
W 3100 SOUTH ST INTERSECTS
3107 Vacant
3108 Vacant
3119 Black W Craig
3120 Sadler David R ◎
3121 Brown Merle Mrs ◎ 250-7031
3126 Vacant
3139 Daniel Alvah R ◎ 250-6763
3141 Jackson Alene M Mrs ◎ 250-2226
3142 Garringer Walter A ◎ 250-6890

601
9040 WEST ST S (MAGNA)—FROM 9040 W 2600 SOUTH SOUTH

ZIP CODE 84044
2650 Larson Wm G ◎ 250-6395
2651 Kuida Hiroshi ◎ 250-6172
2675 Mountain Bell Tel (Equip Ofc)

797
9050 SOUTH ST E (SANDY)—FROM 9000 WASATCH BLVD EAST

ZIP CODE 84070
3590★Gunther Robt ◎ 942-1377
3596 Rabin Peggy Mrs ◎
3598 Sullivan Marc L ◎ 942-2199
3602★Scott Willie
3604★Pedersen Wayne
3606★Cain J Austin ◎

820
9050 SOUTH ST W (SOUTH JORDAN)—FROM 9050 S EDENBROOK WY WEST

ZIP CODE 84065
2996 Walters Milton ◎ 561-9010
3021 Ivory Russell J ◎ 566-6767
3022 Caywood Anthony J ◎ 561-0998
3075 Osoro James ◎ 566-4026
3076 Haight Gordon M ◎ 561-9019
3102 Lynch Scott ◎ 561-1288

601
9050 WEST ST S (MAGNA)—FROM 9050 W 2700 SOUTH SOUTH

ZIP CODE 84044
2720 Vacant
2728 Blue's Beauty Salon 250-2468
Panopulos Lewis G sht mtl wkr ◎ 250-2054
2744 Richards Wilbur J ◎ 250-5023
2747 Pendleton La Mar L ◎ 250-2164
2756 Johnson Gordon L ◎ 250-2998
2761★Brumweld Greg
2764 Allred O Grant ◎ 250-2315
2771 Sisneros Debra ◎
2776 Valdez Joe O ◎
2786 Duckworth Kent G ◎ 250-3331
2789 Thomas Anthony A ◎ 250-0454
2794 Vacant
W 2800 SOUTH ST INTERSECTS
2805 Vacant
2814 Simpson Lawrence E ◎ 250-5193
2824★Ross Bill
2825★Andreason Don
2832 Farnsworth Debra ◎ 250-3684
2836★Lopez Bill
2838a Vacant
2838b Vacant
2839 Rome Guy T ◎ 250-1628
2845 No Return
2846 Vacant
Rear★Guerrero Marco 250-4275
2849 Spear Scott E ◎ 250-5688
2850 Kilpatrick Scott
2856 Marquez Porfirio B ◎ 250-5030
2857 Nester Yvonne A Mrs 250-6338
2864 Lee D J ◎ 250-7795
2865 Vacant
2872 Martinez Tommy ◎ 250-2984
2880 Weichers Ann Mrs ◎ 250-6426
2881 Allen Ella B Mrs ◎ 250-4306
2887 Duke Margt Mrs ◎ 250-5706
2893 Johnson Henry M ◎ 250-2645
2894 Mirabella Tony ◎ 250-7357
W 2900 SOUTH ST INTERSECTS
2905★Thomspon Kevin 250-0679
2908 Fisher Richd ◎
2909 Van Dyke Edw ◎ 250-1079
2914 Rowsell Orville W
2915 Cole Rulon J ◎ 250-6163
2916 Hall Tahnia
2922 Litz Robt ◎ 250-1211
2923 Peterson Sandra Mrs ◎ 250-0590
2932 Lang Byron Scott ◎ 250-2576
2933★Kelsey Mike
2935 Jolly Juanita
2940 Pouha Penisimani
2943 Vacant
2948 Peterson La Verne N ◎ 250-6155
2951 Alfred Bryan L ◎ 250-7093
2956 Glispy Jay B ◎ 250-2640
2957 Sadler Michl C ◎ 250-9765
2963 Piccorelli Dan ◎
2964 Driffill Dale L ◎ 250-5161
2971 Romolo John ◎ 250-5464
2972 Kim Kyong Chol ◎ 250-5070
2979 Deherarra Lou ◎
2980 Torres Clyde
2986 Wilcox Rodney 250-5376
2994 Vacant
W 3000 SOUTH ST INTERSECTS
3004 Hamilton Erma P Mrs ◎ 250-2120
3012 Pappas Wilma ◎ 250-5033
3013 Hutto Steve ◎ 250-1278
3019 Vacant
3022 Vacant
3025 Boswell Francis
3031 Hansen Wilford J ◎ 250-6153
3036 Mc Fall S L Mrs ◎ 250-2335
3037 Jeppson Jesse ◎ 250-6042
3042 Morse David L ◎ 250-7557
3045 Vacant
3050 Snow Irvin W ◎
3051★Morse David Jr
3064 Kochonis Nick J 250-2955
3071 Papanikolas Wm G 250-1792
3083 Giles Earl ◎ 250-5436
3084 Miller Dave A
3088 Noss Hazel B Mrs 250-5509
3093 Walker Duane S ◎ 250-5371
W 3100 SOUTH ST INTERSECTS

797
9055 SOUTH ST E (HOLLADAY) FROM 9055 S DESPAIN WAY EAST

ZIP CODE 84070
3463 Richins Stan M ◎ 942-5471
TREASURE WAY INTERSECTS
3477★Mc Lean Mark 943-1630
3486 Ambrose Geo B ◎ 943-0523
3489 Holding Farrell ◎ 943-1597
3500 Burkett Jack L ◎
3501 No Return
3510 Austin John M ◎ 943-0885
3519 Newton Reed Y ◎ 942-3789
3528 Mortenson David ◎ 943-4940
3529 Borg Merrill L ◎ 942-5694
3544 Noel Frank ◎ 942-5872

836
9060 SOUTH ST E (SANDY)—FROM 9060 S 2020 EAST ST EAST

ZIP CODE 84092
2029 Corpron Wm E ◎ 942-0846
2037 Mc Cann G Craig ◎ 943-5470
2038 Pittman Russell D ◎ 943-2047
2046 Clark Kenneth T ◎ 943-7925
2047 Christensen Michl M ◎
2054 Hanson Wm F ◎
2055 Randolph Richd F ◎ 943-8075
2064 Terry E Michl ◎
2065★Carlson Paul E ◎ 943-3804
2072 Broadhead Gary L ◎ 942-2752
2073 Smith Doug ◎ 943-9226
2082★Rose Robt K
2083★Clark Dean ◎
2092 Collins Wm G ◎
2093 Sciortino Beverly A ◎ 943-9439
EAST INTERSECTS

601
9080 WEST ST S (MAG)—

ZIP CODE 84044
2640 Copperview Apartments
1 Vacant
2 Nash Debra
3 Clark Sherry
4★Burke Kelly
5 Vacant
6 Clark Kathy
7 Vacant
8 Vacant
9★Coe Leslie 250-6583
10★Jones Charles
11 Vacant
12★Mondragon Scott

601
9085 WEST ST S (MAGNA)—FROM 9085 W 2600 SOUTH ST SOUTH

ZIP CODE 84044
2611 City Mosquito Abatement Shop (MAG) 250-7765
2629e Roe Michelle
2629w Vacant
2637w Evans Debbie
2637e★Winn Lisa
2645w Waldron Joe
2645e Bradley Robt L 250-6063
2651 Apartments

661
WINTERGREEN CIR (MURRAY) FROM 625 W VINE ST CIRCLES SOUTH

ZIP CODE 84123
5096 Grimsley Leo ◎ 263-0304
5102★Snarr Alvin G ◎ 266-3475
5103 Wallentine G Craig ◎
5105 Phillips Michael ◎

855
WINTERWOOD CIR (SANDY)—FROM 9775 WINTERWOOD DR EAST

ZIP CODE 84070
1422★Cook Rex L 571-8371
1427★Ausloger T ◎ 572-1054
1445 Paul
1448 Vacant
1457 Teigen Michl W ◎ 572-4593
1462 Hall Timothy H ◎ 572-3511
1469 Hinman Rhea Mrs ◎ 571-3512
1474 Johnson Greg ◎ 571-7024
1477 Nielson Marlell ◎ 571-4387
1478 Vasica John ◎ 572-1549
1483★Watanabe Addison K ◎ 572-0147

855
WINTERWOOD DR (SANDY)—FROM 1415 RIDGEMARK DR SOUTH

ZIP CODE 84070
RIDGEMARK DR INTERSECTS
9745 Maxwell Bill D ◎ 571-3001
9746★Bacigalupo Brian L ◎ 571-6002
WINTERWOOD CIR INTERSECTS
9758 Moyes G Robt ◎ 571-4433
9770 Milne Gordon C ◎ 571-5155
9782 Hardy Douglas ◎
9796 Regan Peter ◎ 571-8400
9799 Thomas Neil W ◎

820
WINTHROPE CIR (SOUTH JORDAN) FROM 9035 S WINTHROPE DR CIRCLES EAST

ZIP CODE 843065
3655 Porter James ◎ 561-3690
3657 Hawkins Kenneth F ◎ 561-7960
3659 Tenney Dan H ◎ 561-2830
3665 Harper Ron H ◎
3666 Larsen Steven L ◎ 255-5013
3681 Terry Leroy 255-1847
3682 Tate Russ ◎ 566-8466

820
WINTHROPE DR (WEST JORDAN)—

ZIP CODE 84065
3792 Olson Ronald ◎ 566-4343
9012 Vacant
9013★Brown Bud R ◎ 569-1733
9024 Vacant
9036 Empey Bruce ◎ 561-2332
9048 Burton Mark H ◎ 255-9437
9057 Austin Douglas ◎ 566-0904
9060★Zimmerman George ◎ 569-1295
9069 Sermon Bradley ◎ 255-7913
9072 Rubright Richd D ◎ 566-5289
9081 Harris Larry W ◎ 566-1184
9090 Nicholson Bob ◎ 255-1639

828
WINTON ST (WEST VALLEY CITY) FROM 1075 W PARKWAY AV SOUTH

ZIP CODE 84119
2486 Sanchez Matilda 972-4673
2506 Salizar Ben ◎
2514 Valdez Simona ◎ 972-6478

676
WINWARD DR (HOLLADAY)—FROM 5510 FAIR OAKES DR WEST

ZIP CODE 84117
1517 No Return
1526 Lightfoot Alvin L ◎ 277-6704
1531 Gough Barry G ◎ 278-5514
1538 Slok Adrian P ◎ 272-0559
1543 Balka Cathy L ◎ 277-8808
1550 Collier Christine D ◎
1555 Allen Lester ◎ 272-1139
1564 Clark Bryant R ◎ 278-0188
1567 Lemon Kathleen Mrs beautician ◎ 278-7750
1574 Lemon James F ◎ 278-9522
1579 Handsaker Fred E ◎ 277-5562
1588 Dennis Myrtle Mrs ◎ 277-7447
1591 Jensen Walter D ◎ 277-7169
1602★Young Roger W ◎ 278-8260
1607 Arnesen Leon R ◎ 277-3924
1614 Wilkinson Gregg J ◎ 272-7618
1615 No Return
1626 Brehe Jack E L ◎ 277-0133
1631 Vacant
1638 Watson Veta H Mrs ◎ 277-6050
1641 Ward Wm C Jr ◎ 277-5496
1651 Allem Michl A ◎ 278-2322
1652 Winward Wm D ◎ 278-8496
FAIR OAKES DR INTERSECTS
1688 Schmuck Frank Jr ◎ 277-1809
1698★Serbousek Allen artist 278-4006
1699 Caldwell Ermil L Mrs ◎ 277-0206

661
WIRTHLIN DR (MURRAY)—FROM 5200 S 600 WEST ST EAST

ZIP CODE 84123
576 Greene Mac D ◎ 266-9921
578 Thomas
581 Dalton Barry E ◎ 266-5227
586★Devine Lillian ◎ 286-1211

647
WOOD CIR (MURRAY)—FROM 425 E MC MILLAN LA CIRCLES NORTH

ZIP CODE 84107
5753 Johnson Weldon R ◎
5754 Andersen Dick R ◎ 266-5866
5756 Vacant
5757 Robinson Thos L ◎
5759 Williamson Joseph C ◎ 266-2494
5760★Steadman Josette T 262-4188
5761 Matern Raymond K ◎ 266-2974
5762 Peterson James M ◎ 266-2268
5763 Feuerstein Morris ◎ 262-3834
5764 Lessley Irene J Mrs ◎ 262-7847
5766 Lancaster Ardella ◎ 266-3416
5767 Pollesche Gideon ◎
5768 Stauffer Annie E Mrs ◎ 266-6849

716
WOOD GREEN RD (WEST JORDAN) FROM 748 S 3500 WEST ST NORTH & SOUTH

ZIP CODE 84084
7247 Walker Craig A ◎ 566-6433
7261 Kinyon Jerry L ◎ 255-5323
7275 Argyle Randall ◎ 561-8169
7311★Foote Timothie ◎ 569-1505
7325★Gorganson Grant ◎
7337 Vacant
7352 Hansen J Kimball ◎ 561-1902
7353 Maestas Lorenzo ◎
7365★Tillotson Michl W ◎ 569-1535
7381★Campbell Beth 569-2533
7393★Trave Wm ◎
7438★Mc Intier Alan ◎ 569-1081
7456 Scott Dee L ◎ 566-5829
7457★Marten Robt ◎
7469 Gillman Louis W ◎ 561-3523
7491 Simons Michl L ◎ 561-3833
7492★Alsop Steven ◎ 569-1558

706
WOOD ST (MIDVALE)—FROM 736 E WASATCH SOUTH

ZIP CODE 84047
292 Anya Sandee ◎
308 Morris Donald V ◎ 255-1706
315 Tyler Ruth V Branch County Library 255-7168
318 Vacant
325 Sewar Joseph J 255-6922
329★Sund Marion
334 Smith Bobby L ◎ 561-5065
COLUMBIA DR INTERSECTS
349 Lind Eliz C Mrs ◎ 561-0307
371 Van Dam Jerry D ◎ 255-7284
378 Olson Gerald L ◎ 255-5587
385 Yates A Doyle ◎ 561-2876
390 Jensen Ralph ◎ 255-6431
395 Blake Robt ◎ 255-6900
402 Bentley Arth D ◎ 255-3865
405 Thomas Ray P ◎ 255-4836
416 Taylor Clinton R ◎ 255-2447
419 Brown Ruel R ◎ 255-0964
430 Anderson Elmer J ◎ 255-5838
433 Blaimer Ludwig S ◎ 255-6219
444 Smith Derald T plmb ◎ 255-5352
447 O'Donnell Martin T ◎ 561-1666
461 Clements Gilbert P ◎ 255-1663
462 Lynda's Stylette beauty shop 255-8414
Kynaston Eug A ◎ 255-8414
466 Reed Douglas J ◎ 255-5840
467 No Return
478 Pollick Geo R ◎ 255-8508
492 Marchant Jerry ◎ 561-0776
LA SALLE DR INTERSECTS
493★Kiel Keith ◎ 566-4034
MARQUETTE DR INTERSECTS
511★Funk Christopher ◎ 561-3072
515 No Return
530 Roberts James W ◎ 561-0091
MARQUETTE DR INTERSECTS
542★Bird Millie B ◎ 566-9118
543 Willyard Reed ◎ 566-6220
556 No Return
557 Oliverson Ray H ◎ 255-2336
567 Hogenson Harold C ◎ 255-1510
570 Hart Don S ◎ 255-6156
584 Haake Leonard H ◎ 255-5067
585 Goris Harold D ◎ 255-7240
598 Topilian Charles ◎ 255-4837
599 Hobbs Andy F ◎ 255-7248
612 Serdar Jack ◎ 255-9097
615 No Return
626 Kofford Lloyd ◎ 255-0345
629 Nystrom Albert D ◎ 255-2353

836
WOOD THRUSH CIR (SANDY) FROM 2390 E WOOD THRUSH DR NORTH

ZIP CODE 84070
9142 Vonk Richd E ◎ 942-2696
9143 Turner Evan C ◎ 942-2972
9144★Watkins Wayne ◎ 943-1788
9147 Henriod Jerry L ◎ 942-2663

836
WOOD THRUSH DR (SANDY)—FROM 9150 S QUAIL RUN DR EAST

ZIP CODE 84070
2332 O'Brien Darrell ◎
2343 Rogers Kenneth ◎ 943-4660
2344 Lyon Paul C ◎
2355★Inouye Warren 943-8282
2358★Bollinger Roy ◎ 943-3388
2363 Allen Steven R ◎ 942-5734
2366 Lyman K Bruce ◎ 943-1148
2376 Cummings J K ◎
2379 Homer Gene L ◎ 943-7021
2390 Crocker Michl L ◎ 943-1818
2398 Stuker E Grant ◎ 942-2932
2405★Larsen Kent ◎ 943-2255
2412 Fesler Gary R ◎ 942-0118
2419★Potysman Steve ◎ 943-3227
2424 Fraga Hugo ◎ 943-9050
2436 Todd Gary R ◎ 943-8757
2448 Secrist Dave H ◎ 942-5178
2455 No Return
2460★Garry Kenneth ◎ 942-4001
2461★Haddock Randy 943-3047
2472 Breinholt Craig ◎ 943-9466
2473 No Return
2483 Speirs Ken H ◎ 942-0187
2484 Merrill Thos A ◎
2496 Wellard Ken E ◎ 942-3175
2497★Stevens Robin 942-1522
2511 Archer Frank P ◎ 942-0409
9213★Bippes Wayne pntr 943-0188
9223 Cocanour John B ◎ 942-0307
9232★Pearson Colleen ◎ 943-1128

609
WOODASH CIR (WEST VALLEY CITY)—FROM 4475 WOODGROVE DR WEST

ZIP CODE 84120
5239 Morris Alice K ◎ 967-1789
5240 Abajo Ed J ◎ 967-1531
5249 Pierce Steven L ◎ 967-0782
5250 Greenwood Robt G ◎
5259 Dearcoff Don ◎
5260 Smith Devin L ◎ 967-3586
5269 Stout Mike J ◎
5270 Ashton Julie M ◎ 966-8274
5279 Decker Tony ◎
5280 Gamble Scott M ◎ 966-7056
5289 Christiansen Jim ◎
5290 Staley Clark O ◎ 967-2727

736
WOODBINE CIR (SANDY)—FROM 9575 S RAINTREE DR WEST

ZIP CODE 84092
9570 Francis Gerald F ◎ 942-4283
9578 Baade Ernest C ◎ 942-4308
9586 Wallin Robt ◎ 943-9223

639
WOODSBOROUGH CIR (KEARNS) FROM 6075 WOODSBOROUGH WAY

ZIP CODE 84118
5748★Dawson John M ◎ 966-0278
5749★Reeves Don ◎
5758★Fratto Claude ◎
5759★Trujillo Tim ◎ 969-1559
5765 Vacant
5768 Panek Joseph D ◎ 966-7942
5775 Perry Wayne S ◎ 969-1975
5776★Burr Jerry ◎

639
WOODSBOROUGH WAY (KEARNS) FROM 5725 LODESTONE AV

ZIP CODE 84118
6011 Hill R Val ◎ 967-5947
6021 Wright Kenneth L ◎ 969-6524
6033 Forsell Carl F ◎ 968-9904
6045 Burnett Roger A ◎ 967-7095
6055 Nielsen David P 969-5836
6061 Nielsen Jody D ◎ 967-5551
6062 Tate Paul D ◎ 969-4663
6071 Cook Roger D ◎ 969-2561
6081 Wanner Janice Mrs ◎ 966-3442
6088 West Danl J ◎ 969-2245
6093 Griggs Kent L ◎ 968-1202
6104 Lloyd Lee ◎
6109 Woodward Ralph A ◎ 969-6749
6117 Torres Israel G ◎ 967-2964
6129 Shaw David L ◎ 966-4340
6136★Clark Steven ◎ 964-1760
6137 Anderson
6148★Kelleher Robt M ◎ 966-2489
6153★Reid Richd ◎ 964-0065
6160 Day Lynn ◎ 968-1680
6165 Lund Randy M ◎ 967-9926
6168 Vacant
6177 No Return
6186 Vanrij Kreeg ◎ 964-1053

675
WOODBRIDGE DR (HOLLADAY) FROM 4850 S KINGS ROW DR E

ZIP CODE 84117
1695 Units
7★Carpenter Matt
8 Lander Dorothea ◎ 277-7022
9★Miner C
10 Grinaker Norman C ◎ 278-5942
11★York Scott K 272-1933
12★Duncan K
1697 Units
1★Donley Pat
2★Cook F
3 Mortensen Undine H ◎ 277-0766
4 Walker C Ray ◎ 278-6875
5 Craig Lois P ◎ 272-7160
6 Treshow Valora P ◎ 277-8173
1703 Units
19 Mart Gretchen A ◎ 277-3885
20 Richins Kenneth ◎
Model Condo
22★Alberico Dell I Jr ◎ 278-8385
23★Kehl M ◎ 278-7424
24 Swenson Annette ◎ 277-6243
1705 Units
13★Erickson Brent R ◎ 277-6034
14 Lauber Norma ◎ 277-1854
15★Cannon Jack M 272-6158
16 Mackay Mary E Mrs ◎ 277-5711
17 Allen E S ◎ 277-5235
18★Xaiz Earl ◎ 277-3200
1715 Woodbridge Condominiums 272-3615

836
WOODCHUCK CIR (SANDY)—FROM 9380 S QUAIL HOLLOW DR

ZIP CODE 84070
2314 Kelly Brent ◎ 943-7157
2317 Hudgens Bruce ◎ 943-5881
2318 Bush Wm S ◎ 942-5161
2328 Strong W John ◎ 943-8609
2329 Chavis David F ◎ 942-3922

836
WOODCHUCK DR (SANDY)—FROM 9335 QUAIL HOLLOW DR WEST

ZIP CODE 84070
QUAIL RUN INTERSECTS
PEACOCK DR INTERSECTS

836
WOODCHUCK WAY (SANDY)—FROM 2215 E SOLENA WAY EAST

ZIP CODE 84070
2235★Lu Robt ◎ 942-2945
2242 Tadje Robt ◎ 943-2625
2248 Vacant
2266 Horrocks Brent R ◎ 942-5976
2267★Maurer Stan
2278 Horn Noel M Mrs ◎ 942-2519
2285 No Return
2286 Christenson Robt P ◎ 943-0964
2295 Shelley Elwin J 942-4324
2296 Keddington Richd A ◎ 942-1757
2306★Vise Larry G ◎ 943-6735
2314★Matthews Vergil
2315 Corbridge Reese J ◎ 942-4459
QUAIL RUN INTERSECTS
2345 Barber Dennis D ◎ 943-4165
2350 Ball J Talmage ◎ 942-6129
2355 Vacant

ABSTRACTS — TITLE INSURANCE — LOANS
376 East 400 South St., Salt Lake City Tel. 355-2866

S 8950 WEST ST (MAG)—Contd
2881 Rainaldi Carmela Mrs ◎ 250-6156
2887 Bezzant Wm A ◎ 250-5565
2892 Kramer Clyde K ◎ 250-9167
W 2900 SOUTH ST INTERSECTS
2906 Begent Ernest C 250-2171
2909 Turpin Vernal I ◎ 250-6677
2912 Gee Allie D Mrs ◎ 250-2769
2919★Mc Carty Miles W 250-3045
2925 Vacant
Bsmt Vacant
2926 Andreason Glen M ◎ 250-5327
2931 Gray Bruce C ◎ 250-7679
2934 Poulos Marian J Mrs ◎ 250-6634
2940 Mirabella Emil J ◎ 250-6555
2941 Tipton Frank ◎ 250-7172
2947 Empey Linford ◎ 250-2398
2952 Fraser Geo L ◎ 250-2893
2953 Memmott Ivan R ◎ 250-6558
2954 Justesen Arth V ◎ 250-6782
2961 Poulson John H ◎
2968★Lopez Sherri V
Bsmt Lopez Ted
2969 Harris Roy ◎
Rear No Return
2977 Larsen Melva B Mrs ◎ 250-5759
2984 Frier John M ◎ 250-2694
2985 Olsen Lima Mrs ◎ 250-7754
2994 Petersen Nephi A ◎ 250-2074
2995 Johansen Vadis P ◎ 250-2353
W 3000 SOUTH ST INTERSECTS
3008 Vacant
3015 Edwards Mary Mrs 250-5604
Bsmt Vacant
3018★Pierce Matthew J ◎ 250-5943
3030 Vacant
3033 Ross Dan T 250-5848
Bsmt Simmons Mark
3034 Frisbey Joseph L ◎ 250-9229
3035 Vacant
3037 Falvo Frank ◎ 250-2395
3042 Vacant
3044 Vacant
3048 Mc Gill Scott H ◎ 250-5311
3052 Schaewe Richd J ◎ 250-5782
3056 Vacant
3057 Mc Kellar Edith L Mrs ◎ 250-6009
3059 Beckmann Robt E wldr ◎ 250-9158
3066 Montoya Peter A ◎ 250-6737
3069★Steveson Claud S
3080 Collings Chad L ◎ 250-5027
3083 Vacant
3090 Curtis De Virl P ◎ 250-2970
3096★Dea Timothy P ◎ 250-8299
3097 Costanzo Wm D ◎ 250-5303

602
W 3100 SOUTH ST INTERSECTS
3107 Patsuris Tasia Mrs ◎ 250-2098
3116 Long Jerry M ◎ 250-1046
3124 Long Bruce ◎
3125 Paddock Ruth A Mrs ◎ 250-7725
3130 Inkley Wm S ◎ 250-2520
3132 Bowen Florence
3134 No Return
3142 Gonzales Luciano ◎ 250-2173
3155 Lund Ted ◎
3161 Sanchez Abrosio ◎ 250-5772
3162 Nuesmeyer Charles H ◎ 250-6764
3169 Sanchez Danny ◎ 250-2301
3180 Lovato Pidurcio ◎ 250-2249
3181 Pearce Gene F ◎ 250-7330

601
8990 WEST ST S (MAGNA)—FROM 8990 W 2600 SOUTH SOUTH

ZIP CODE 84044
2610 Montoya Pauline Mrs ◎
2620a Vacant
2620b Vacant
2630 Scott Michl E ◎
2638a★White Wayne N 250-8483
2638b★Milsap Charles E
2646a No Return
2646b★Scott Emmett
2650a Vacant
2650b Vacant
2656 Harwood Beth L ◎
2659 No Return
2663 Nash A D ◎ 250-9717
2665 Young Henry M
2666 Barber Harold L ◎ 250-6405
2673 No Return

833
9000 SOUTH ST W (SANDY)—FROM 9000 S STATE WEST

ZIP CODE 84070
20 Sizzler Family Steak House 566-0042
43 No Return
55 Vacant
67 Robinson Clay M ◎ 255-0228
Tiny Wood Village trailer ct 255-0228
Lots
1 Johnson Clifton B
2 Sowell Mary L 566-2710
3 Patterson J J 566-0353
4 Hone Sarah W Mrs 561-0075
5 Mc Kinley Gregory A 566-4979
6 Schmeling Richd
7 Paulsen Alma 255-6608
8★Griffith Frank R 566-3757
9 Bowling Gene Mrs
10 Beck Blanch W Mrs 561-0395
11 Richin Gilbert
12 Fortie Neil
14 King Wilford 566-2703
15 Gilbert Mark
16 Lundberg Geo A 561-0810
17 Kirkpatrick J Howard 566-0702
18 Hollinger Raymond J
19★Peterson Vonda
20 Perry Gene
21 Robinson Norman 566-1477
22 Smith Oliver 255-4193
24 Douglas Wm H
25 Jennings Harry L 561-3593
26 Carter Michl J 566-1995
27 Engman Clairmont V
28 Vacant
29 Douglas Marion
30 Eyre Steven
31 Wall Roy H 566-1353
32 Nielson Wayne A 255-2306
33 Paull Flora Mrs 561-8856
34★Monson David P ◎ 561-7565
35 Wilkey Lynn R 255-8680
36 Leonard Dale H 561-3820
37 King Eliza Mrs 255-1900
38★Bodell Chad
39 Bickel Harlow 561-0072
91 Parry Kenneth R 255-2109
140 Alta Title Co 566-7716
Beauty Inc 566-3615
Farmers Ins Group 566-6111
Lancom Design Development design dev 561-8441
Sandy State Bk 566-6611
153 U S A Gasoline sta 255-9978
S 150 WEST ST INTERSECTS
165 No Return
200 Butterfield Ford 566-2441
224 Dee's Drive Inn restr 566-3352
232 City Electric lighting equip 566-1201
234 Pioneer Dodge 566-4156
253 Early David Tires 255-4231
S 255 WEST ST INTERSECTS
365 R B's Texaco 255-7823
407 Murray Feed's Genl Store pet sup & western wear 566-2486
412 Peterson Carmella J Mrs ◎ 255-4454
450 Upholstery West 561-7011
460 Smith Enterprises Inc wholesale auto parts 255-4226
465 Vacant
475★Oldroyd Randald J 535-7841
530 Discovery Discotheque
S 5TH WEST INTERSECTS
500 Pay-N-Pak 566-5136
559★Brklacich Matt
567 Utah Roses Inc florists 561-4264
S 6TH WEST INTERSECTS
600★Riley Francis P 255-7329
685 Hagerty Willard C 255-8390

717
9000 SOUTH ST W (WEST JORDAN) FROM JORDAN RIVER WEST TO CITY LIMITS

ZIP CODE 84084
840 Mc Dougal Dennis L ◎ 255-9130
900 Cooper John ◎
975 Mc Dougal Edmund L ◎ 255-3953
Mc Dougal Gaylene
995 State Athletic Commission 255-3053
Smith Dean P ◎ 255-3053
1000 Palmer Lawrence E ◎ 255-5538
1016 Thompson Hershel ◎ 255-7273
1036 Mary's Salon Of Beauty 255-9227
Nix Steph ◎ 255-9227
1070 Lopez Augustine L ◎ 255-9006
1085 Taylor Richd A ◎ 255-1578
1091 Burton La Var C ◎ 255-1629
1100 Vicchrilli Helen Mrs ◎ 255-4153
1109 Lamb Charles A ◎ 255-7846
1125 Clark La Mar F ◎ 255-6261
1187 Harrison Merlin D ◎ 255-5431
1201 Mecham La Verl ◎ 255-1543
1225 Mecham Dazel A ◎ 255-3929
1227★Johnson Tracy ◎ 561-0908
1231 Roach Charles W ◎ 255-2390
1300 WEST ST INTERSECTS

715
1450 Stucki Max J ◎
1486 Baca Ernie ◎
1487★Ulrich Jerry ◎ 566-5950
1505★Morris Bobby
1510 Lopez Louis ◎ 255-1525
1550 Calufetti Andy ◎ 561-2622
1554 Vigil Procopio ◎ 255-0987
1580★Malcolm Morris K ◎ 255-7087
1646 Jackson
1650 Jones Paul W excavating contr ◎ 255-2642
Jones Michl 255-8944
1652 Leyba Ermalinda Mrs ◎ 255-7347
1654 Tafoya Jose P ◎ 255-7886
1670 No Return
1678 Kentucky Fried Chicken 566-1741
S REDWOOD RD INTERSECTS

714
2089★Whetman P R ◎
2195 No Return
S 2200 WEST ST INTERSECTS
2590 Vacant
2600 No Return
2688 Seven Eleven Store 566-0541
S 2700 WEST ST INTERSECTS
2770 Tew Boyd N 566-1010
2780 Crosby Earl ◎ 561-5459
2785 Mc Dougal Realtors 566-1601
Mountain View Constn 561-4284
Orton Estate Development 566-1601
2880 Riding Ben J ◎ 561-5885
2919 West Jordan Utah South Stake Meeting House (LDS) 561-2744
West Jordan Seventh Ward Meeting Hse (LDS) 255-8291
West Jordan Thirteenth Ward Meeting House (LDS) 566-0301
West Jordan Seventeenth Ward Meeting Hse (LDS) 561-3221
2922 Hanger Robt ◎
2985 Schmidt David H ◎ 561-1173

814
3232 Giles Lee A ◎ 561-1220
3282 Erickson Ernest G ◎
3324 Brackenbury Geo ◎ 255-0373
3333 National Semiconductor semiconductor devices 263-7000
3344 Pulley Melvin ◎ 255-3951
3366 Pulley Harvey ◎ 255-7274
3410 Barlow Hyrum W genl contr ◎ 255-6904
3434 Bennion E Mervin ◎ 561-8765
3437 White Fork Cemetery
3500 Atwood James M ◎ 255-3070
3660 Five D Cabinet Shop cabt mkrs 561-2711
3680★Oakeson
3802 Allison Kennels 255-3090

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655

WINESAP RD (HOLL)—Contd
3440★Anthony David K ◎ 943-7090
3460 Sharp Christopher Y ◎ 943-1888
3481 Miller Wm H ◎ 942-5308
3484 Vacant
3498 Weaver Ken ◎
3512 Arnold Kathleen Mrs ◎
3524 Green Wm H ◎ 942-3872
3531★Blanchard Ed J ◎ 943-5502
3536 Rodriguez Tom ◎
3573 De Haan Eldon J ◎ 943-1034
3580 George Wm F ◎ 943-1013
3585 No Return
3594★Wandling C E ◎ 943-7649
3597 La Guess Joseph F ◎ 942-4871
3608 Ledger Muriel R Mrs ◎ 943-1031
3613 Savage Scott ◎ 943-1037
3671 Vacant
3672 Ashby Lenore S Mrs

653
WINSLOW AV (MURRAY)—FROM 3515 S STATE EAST

ZIP CODE 84115
127 Vacant
130 Vacant
133 Bohner Fred ◎ 266-6439
140 Palmer Orvil D ◎ 262-8157
143 Collis Alma L Mrs ◎ 262-3547
148 Winslow Frank H ◎ 266-3397
153 Vacant
156 Susan's Aloevera (Addl Space)
158 Vacant
163 No Return
166★Scheider Shelly
168 Susan's Aloevera skin-care 266-8463
Forbush Susan Mrs ◎ 266-8463
173★Forbush Randy ◎ 262-1591
174 Sedgwick Fred J ◎ 266-6192
183 Miles Lincoln ◎
184 Carter Arva Dawn Mrs ◎ 266-6698
S 2D EAST ST INTERSECTS
208 No Return
214 Vacant
222 Kennington Steph ◎
223 Pack Garrett C ◎ 266-9364
230 Miller Michael E ◎ 266-2639
250 Apartments
A Vacant
B★Wheeler James S
C Myers Gary
D Vacant
252 Apartments
A Nelson James R 268-9190
B ★Goff Gary R 262-7943
C Duran Andy J
D Vacant
254 Apartments
A Allen Christopher P
B★Brown Blanche
C Stollstimer Irene Mrs
D★Comeux Joseph C
256 Apartments
A Vacant
B★Kerby Rick
C★Bullington Luther L
D★Antonio Michl L 266-8686

772
WINTER CANYON WAY (SANDY)—FROM 11485 S CHERRY CREEK

ZIP CODE 84070
873 No Return
882★Mc Donald Gregory C 571-9451
885 Swingle David L ◎ 571-0234
892 Haun Jos C Jr ◎ 572-0889

661
WINTERGREEN CIR (MURRAY)—FROM 625 W VINE ST CIRCLES SOUTH

ZIP CODE 84107
5096 Grimsley Leo ◎ 263-0304
5103 Wallentine G Craig ◎
5105 Phillips Michael

855
WINTERWOOD CIR (SANDY)—FROM 9775 WINTERWOOD DR EAST

ZIP CODE 84070
1422 Fritzsching Thos W ◎ 571-5205
1427 Miller Terry L ◎ 571-2278
1445★Peterson Thyce 571-5307
1448 Mish Larry K ◎ 571-4547
1457 George Charles M ◎ 571-8780
1462 Hall Timothy H ◎ 571-8338
1469 Hinman Robt ◎ 571-3512
1474★Johnson Greg ◎ 571-7024
1477★Johnson Steph L ◎ 571-4387
1478★Vasica John ◎ 572-1549
1483 Nelsen John F ◎ 571-9668

855
WINTERWOOD DR (SANDY)—FROM 1415 RIDGEMARK DR SOUTH

ZIP CODE 84070
RIDGEMARK DR INTERSECTS
9745 Maxwell Bill D ◎ 571-3001
9746 Vacant
WINTERWOOD CIR INTERSECTS
9758 Vacant
9770 Milne C Gordon ◎ 571-5155
9782★Hardy Douglas ◎
9796 Regan Peter 571-8400
9799 Thomas Neil W ◎

820
WINTHROPE DR (WEST JORDAN)—

ZIP CODE 84084
9012★Phelps
9013★Boyle David E
9024★Janney Dale T ◎ 561-8979
9036★Empey Bruce ◎ 561-2332
9041★Burton Mark H ◎ 255-9437
9057★Austin Douglas ◎ 566-0904
9060★Raty Dallas L ◎ 566-4530
9069★Serman
9072★Rubright R D ◎ 566-5289
9081★Harris Larry W 566-1184
9090★Nicholson Bob ◎ 255-1639

676
WINWARD DR (HOLLADAY)—FROM 5510 FAIR OAKES DR WEST

ZIP CODE 84117
1517 Olmstead Alan D ◎ 277-4935
1526 Lightfoot Alvin L ◎ 277-6704
1531 Gough Barry G ◎ 278-5514
1538 Slok Adrian P ◎ 272-0559
1543 Balka Cathy L ◎ 277-8808
1550 Collier Christine D ◎
1555 Allen Lester ◎ 272-1139
1564★Bowman Claudius Jr 278-0188
1567★Lemon Kath Mrs beautician ◎ 278-7750
1574 Lemon James F ◎ 278-9522
1579 Handsaker Fred E ◎ 277-5562
1588 Dennis Myrtle Mrs ◎ 277-7447
1591 Jensen Walter D ◎ 277-7169
1602 Paul Richd N ◎ 277-5080
1607 Arnesen Leon R ◎ 277-3924
1614 Valline Robin D ◎ 278-0988
1615 No Return
1626 Brehe Jack E L ◎ 277-0133
1631★Eastham Wm Bryant ◎ 278-6969
1638 Watson Veta H Mrs ◎ 277-6050
1641 Ward Wm C Jr ◎ 277-5496
1651 Allem Michl A ◎ 278-2322
1652 Winward Wm D ◎ 278-8496
FAIR OAKES DR INTERSECTS
1688 Schmuck Frank Jr ◎ 277-1809
1698 Vacant
1699 Caldwell Ermil L Mrs ◎ 277-0206

661
WIRTHLIN DR (MURRAY)—FROM 5200 S 600 WEST ST EAST

ZIP CODE 84107
576 Greene Mac D ◎ 266-9921
578★Kenney Elden M ◎ 268-3086
581★Dalton B
586 Devine M Lillian Mrs ◎ 266-1211

647
WOOD CIR (MURRAY)—FROM 425 E MC MILLAN LA CIRCLES NORTH

ZIP CODE 84107
5753 Vacant
5754 Andersen Dick R ◎ 266-5866
5756 Butterwood Myrtle Mrs ◎ 266-0461
5757 Robinson Thos L
5759 Harper Marelda E ◎ 266-2494
5760 Blair Tarlton J ◎ 262-4358
5761 Matern Raymond K ◎ 266-2974
5762 Peterson James M ◎ 266-2268
5763 Feuerstein Morris ◎ 262-3834
5764 Lessley Irene J Mrs ◎ 262-7847
5766 Lancaster Saml G ◎ 266-3416
5767 Vasquez
5768 Stauffer Annie E Mrs ◎ 266-6849

716
WOOD GREEN RD (WEST JORDAN) FROM 748 S 3500 WEST ST NORTH & SOUTH

ZIP CODE 84084
7247★Moss Wm H ◎ 566-5200
7261★Kinyon Jerry ◎ 255-5323
7275★Argyle Randall ◎ 561-8169
7313★Peterson
7337★Baird Paul ◎ 255-2211
7352★Hansen J Kimball ◎ 561-1902
7353★Mastas Lorenzo ◎
7438★Gillette Kenneth L ◎
7456★Scott Dee L ◎ 566-5829
7457★Martin Robt ◎
7469 Gillman Louis W ◎ 561-3523
7491★Simons Michl L ◎ 561-3833
7492 Taylor R Wesley ◎ 255-3453

706
WOOD ST (MIDVALE)—FROM 736 E WASATCH SOUTH

ZIP CODE 84047
292 No Return
308 Morris Donald V ◎ 255-1706
315 Tyler Ruth V Branch County Library 255-7168
318 Cox Ervin W ◎
325 Sewar Joseph J 255-6922
329 Vacant
334 Vacant
COLUMBIA DR INTERSECTS
349 Lind Leslie A ◎ 561-0307
371 Van Dam Jerry D ◎ 255-7284
378 Olson Gerald L ◎ 255-5587
385 Yates Doyle A ◎ 561-2876
390 Jensen Ralph ◎ 255-6431
395 Blake Robt ◎ 255-6900
402 Bentley Arth D ◎ 255-3865
405 Thomas Ray P ◎ 255-4836
416 Taylor Clinton R ◎ 255-2447
419 Brown Ruel R ◎ 255-0964
430 Anderson Elmer J ◎ 255-5838
433 Blaimer Ludwig S ◎ 255-6219
444 Smith Derald T plmb ◎ 255-5352
447 O'Donnell Martin ◎ 561-1666
461 Clements Gilbert P ◎ 255-1663
462 Lynda's Stylette beauty shop 255-8414
Kynaston Eug A ◎ 255-8414
466 Reed Douglas J ◎ 255-5840
467 Deluca Sam R ◎ 255-4623
478 Pollick Geo R ◎
492 Marchant Jerry ◎ 561-0776
LA SALLE DR INTERSECTS
493 Leonard John E ◎ 255-1010
MARQUETTE DR INTERSECTS
511★Smedley Kim W 566-7421
515★Stock Richd B 566-5705
530 Roberts James W ◎ 561-0091
542 Ross Howard G ◎ 255-8809
543 Willyard Charles R ◎ 561-5510
556 Burnham Marshall H ◎ 255-0125
557 Oliverson Ray H ◎ 255-2336
567 Hogenson Harold C ◎ 255-1510

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5180 S 300 WEST "SAME DAY DELIVERY" 268-0900

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Murray, Utah

W 90TH SOUTH ST (SAN)—Contd
Smith Enterprises Inc wholesale auto parts 255-4226
465 Beckstead I Eldon 255-1018
475★Gaillard Steven L 561-1123
496 Larson Melvin I ◎ 255-0789
S 5TH WEST INTERSECTS
506 Hardcastle Thos D ◎ 255-8452
567 Utah Roses Inc florists 561-4264
S 6TH WEST INTERSECTS
600 Hardcastle Dimond I ◎ 255-1825
Rear Vacant
685 Hagerty Willard C 255-8390

666

90TH WEST ST S (MURRAY)—FROM ½ BLK NORTH OF 90 W 5750 SOUTH SOUTH

ZIP CODE 84107
5725★Dickson Geo A Jr ◎ 261-0682
5730 Ellsworth Duane L ◎ 266-5148
5735 Mitchell Warren G ◎ 262-3512
W 5750 S INTERSECTS
5755 Root Wm M ◎ 262-6395
5760 Carling Pat Mrs ◎ 266-1916

717

9000 SOUTH ST W (WEST JORDAN) FROM JORDAN RIVER WEST TO CITY LIMITS

ZIP CODE 84084
840 Mc Dougal Dennis L ◎ 255-9130
900★Hansen Michl B
975 Mc Dougal Edmund L ◎ 255-3953
Mc Dougal Gaylene
995 State Athletic Commission 255-3053
Smith Dean P ◎ 255-3053
1000 Palmer Lawrence E ◎ 255-5538
1016 Thompson Hershel ◎ 255-7273
1036 Mary's Salon Of Beauty 255-9227
Nix Steph ◎ 255-9227
1070 Lopez Augustine ◎ 255-9006
1085 Taylor Richd A ◎ 255-1578
1091 Burton La Var C ◎ 255-1629
1100 Vicchrilli Helen Mrs ◎ 255-4153
1109 Lamb Charles A ◎ 255-7846
1125 Clark La Mar F ◎ 255-6261
1187 Harrison Merlin D ◎ 255-5431
1201 Mecham La Verl ◎ 255-1543
1225 Mecham Dazel A ◎ 255-3929
1231 Roach Charles W ◎ 255-2390
1300 WEST ST INTERSECTS

715

1450 Stucki Max J ◎
1486★Ta Foya Orlando
1487★Sevy Franklin J ◎ 255-6683
1488 Baca Ernie ◎
1505 C L C Wrecking & Repair 255-5617
Connelley Charles L ◎ 255-5617
1510 Lopez Louis ◎ 255-1525
1550 Vacant
1554 Vigil Procopio ◎ 255-0987
1580 Graham G Rex ◎ 255-3018
1646 Jackson David H ◎ 561-1910
1650 Jones Paul W excavating contr ◎ 255-2642
1652 Leyba Ermalinda Mrs ◎ 255-7347
1654 Tafoya J Paul ◎ 255-7886
1658 Vacant
1670 Malcolm Bros cement contr 255-7087
Malcolm M Keith ◎ 255-7087
1678 Anderson Muray F ◎ 255-0718
1680 James Elliot R ◎
S REDWOOD RD INTERSECTS

714

2089★Johns Evan ◎ 56-1364
2195 No Return
S 2200 WEST ST INTERSECTS
2200★Nelson Henry
2600 Schaugaard Bert G ◎ 255-5202
2620★Mendenhall Alan L 561-2807
2670 Trolin Arnold A Jr 561-3184
2690 Vacant
2780★Crosby Earl ◎ 561-5459
S 2700 WEST ST INTERSECTS
2919 West Jordan Utah South Stake Meeting House (LDS) 561-2744
West Jordan 7th Ward Meeting House (LDS) 255-8291
West Jordan 13th Ward Meeting House (LDS) 566-0301
West Jordan 17th Ward Meeting House (LDS) 561-3221
2920 Under Constn
2922★Hanger R ◎
3200 Clapp Edwin C ◎ 561-0492
3232★Keysan Kathy ◎
3282 Erickson Ernest G ◎ 255-1955
3324 Brackenbury Geo ◎ 255-0373
3333 National Semiconductor
3344 Pulley Melvin ◎ 255-3951
3366 Pulley Harvey ◎ 255-7274
3410 Barlow Hyrum W ◎ 255-6904
3434★Bennion Mervin ◎ 561-8765
3437 West Jordan Cemetary
3500 Atwood James M ◎ 255-3070
3660 Fire D Cabinet Shop cabt mkrs 561-2711
3802 Allison Kennels 255-3090
Allison Charles L Jr ◎ 255-3090
4139 Diamond James L ◎ 255-2018

601

9000 WEST ST S (MAGNA)—FROM 9000 W 2700 SOUTH SOUTH

ZIP CODE 84044
2727 Frandsen Ned 250-2487
2739 Vogles Tom ◎ 250-5544
2743★Miller Greg ◎ 250-5524
2745 Romero Gilbert L ◎ 250-2626
2752 Jones Lynette Mrs ◎
2757 Benson Earl J ◎ 250-2068
2760 Yeates Merlin D 250-7082
2767 Petersen Myrtle N Mrs ◎ 250-5749
2770 Di Bello Larry J 250-9207
Bsmt Vacant
2775 Manzanares Julian F ◎ 250-7564
2780 Colosimo Ralph ◎ 250-5717
Bsmt Schofield Elva E Mrs
2781 Foote Robt E ◎ 250-2123
2793 Vacant
W 2800 SOUTH ST INTERSECTS
2808 Lemmon Leland ◎ 250-5492
2816 Coe H Lloyd ◎ 250-2972
2822 Rhoads Karen Mrs
2830 Jones Jim T 250-7887
2840 Our Lady Of Lourdes Church 250-6349
Kaiser Thos J Rev 250-6349
2859 Brown John B ◎ 250-6787
2864 Dimond Edwin R ◎ 250-5531
2878 Vacant
2883 Bergstrom John S 250-7274
2884 Anderson David R ◎ 250-2884
2890 White Geo H ◎ 250-6810
2893 Lamb J Frank ◎ 250-5505
Vacant
2894★Montoya Danl 250-5855
W 2900 SOUTH ST INTERSECTS
2909 Mecham Nellie D Mrs ◎ 250-5352
2910 Newland Janet G Mrs ◎ 250-2435
2913 Bowen Sara D Mrs ◎ 250-6237
2915 Vacant
2916 Moyes Charles R ◎ 250-5734
2921★Norton Tony 250-9149
Bsmt★Rosin Ellis
2922★Chaplin Rick ◎ 250-9198
2925 Whittaker John
2929 Raisor Wendella W Mrs ◎ 250-6780
2930★Havalin Wm H
2933 Thomas Owyn F 250-2882
2934 Thomas Bob 250-9305
2940 Skelton M Agnes Mrs ◎ 250-6729
2941 Williams Wayne D ◎ 250-9487
2942 Turpin Jay ◎
2947★Myers Marion ◎ 250-2103
2952 Mitchell Nathan H ◎ 250-5857
2955 Brunson Frank D ◎ 250-8243
2959 Palmer Ruth 250-7047
2962 Stocker John A ◎ 250-5805
2963 Asbury Afton
2968 Lambros Vasiliki Mrs ◎ 250-5449
2969 Zabriskie R Alden ◎ 250-6145
2976 Burrows Minerva Mrs ◎ 250-2002
2977 Phillips Keith 250-5643
2978 Taylor John M
2985 Monsen James A ◎ 297-6027
2986 Jensen Rulon E ◎ 250-6624
2994 Schwab M Charles 250-2163
W 3000 SOUTH ST INTERSECTS
3005 Street Madge D Mrs ◎ 250-5668
3006 Williams Charles H ◎ 250-6250
3011 Sheppick Kevin W ◎
3014 Utah Shoe Repair Service
3017 Hood Clifford N ◎ 250-8069
3018 Notarianni Filippo ◎ 250-6713
3020 Vigil Abel 250-2119
3038 Proctor Helen M Mrs ◎ 250-6232
3043 Hainsworth Wm H 250-2741
3050 Olsen Glen A ◎ 250-6144
3056 Sandall Muriel D Mrs ◎ 250-6775
3066 Christofferson Boyd C ◎ 250-5191
3069 Duckworth James W 250-7291
Rear★Blake Wm T 250-9783
3071 Howarth Dorothy N Mrs 250-7179
Rear★Richards Dean
3077 O'Carroll John J ◎ 250-2829
3086 Petersen Terry J ◎ 250-7408
3087 Munsee Laura C Mrs ◎ 250-7785
3090★Guiterrez Richd A

602

W 3100 SOUTH ST INTERSECTS
3107 Averett Roy G ◎ 250-5498
3108 White Lillian K Mrs ◎ 250-2732
3119 Peterson Bill 250-7517
3120 Sadler O La Vell ◎ 250-6274
3121 Brown Myrll Mrs ◎ 250-7031
3126 Dimond Beatrice W Mrs ◎ 250-6044
3139★Daniel Alva R ◎
3141 Jackson Alene M Mrs ◎ 250-2226
3142 Garringer Walter A ◎ 250-6890

601

9040 WEST ST S (MAGNA)—FROM 9040 W 2600 SOUTH SOUTH

ZIP CODE 84044
2650★Larson Wm G ◎ 250-6395
2651 Kuida Hiroshi ◎ 250-6172

601

9050 WEST ST S (MAGNA)—FROM 9050 W 2700 SOUTH SOUTH

ZIP CODE 84044
2720 Kerr A Sally Mrs
2728 Panopulos Lewis G ◎ 250-2054
2735 Johnson Gordon L ◎ 250-7201
2744 Korakis Irene Mrs ◎
2747 Pendleton La Mar L ◎ 250-2164
2756 No Return
2761 Pitt Johny 250-2018
2764 Allred Grant ◎ 250-2315
2771 Payne Edw H ◎ 250-6757
2776 Valdez Joe O ◎ 250-7243
2786 Simpson Steve R ◎ 250-2522
2789 Manzanares Felix ◎ 250-7178
2794 Coon Janet B Mrs ◎ 250-5762
W 2800 SOUTH ST INTERSECTS
2805 Anderson Lynn J 250-2850
2814 Simpson Lawrence E ◎ 250-5193
2824 Brown Larry C 250-2471
2825 Peterson Ronald C
2832★Chlargan Glen ◎
2838a Vacant
2838b Vacant
2839 Curtis James E ◎ 250-5348
2845 Buckner G Lee ◎ 250-2528
2846★Christlieb Sue 250-9426

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W 8750 SOUTH ST (WJ)—Contd
3090 Hopes Robt ◎ 255-1976
3106 Shomaker Marion M ◎ 255-1027
3111 Walker Richd G ◎ 255-0436
3134 Ipson Robt ◎
3135 Avery R Lamar ◎ 255-8138
3158 Fausett Lewis A ◎ 255-8848
3170 Lopez Luis J ◎ 255-8415
3185 Matthews Wayne ◎ 255-5125

46A

8870 SOUTH ST W —FROM 8870 S 2700 WEST ST WEST

ZIP CODE 84084
2758 Ingman Herbert E ◎ 255-3069
2785 Hansen Charles J Jr ◎ 255-6438
2798 Barlow Jessie M ◎ 255-2009
2805 Lancaster S Gilbert ◎ 255-8310
2825 Neider Wilder C ◎ 255-1365
2838 Bodell Sherman R ◎ 255-3704
2845 Lancaster Robt L ◎ 255-2495

46

9000 SOUTH ST W —FROM JORDAN RIVER WEST TO CITY LIMITS

ZIP CODE 84084
840 Mc Dougal Dennis L ◎ 255-9130
975 Mc Dougal Edmund L ◎ 255-3953
995 State Athletic Commission 255-3053
Smith Dean P ◎ 255-3053
1000 Palmer Lawrence E ◎ 255-5538
1070 Lopez Augustine ◎ 255-9006
1085 Taylor Richd A ◎ 255-1578
1091 Burton La Var C ◎ 255-1629
1100 Vicchrilli Helen Mrs ◎ 255-4153
1109 Jenkins Vernal E ◎ 255-9420
1125 Clark La Mar F ◎ 255-6261
1187 Harrison Merlin D ◎ 255-5431
1201 Mecham La Verl ◎ 255-1543
1225 Mecham Dazel A ◎ 255-3929
1231 Roach Charles W ◎ 255-2390
1300 WEST ST INTERSECTS
1450 Stucki Teresa Mrs ◎
1487 Sevey Franklin J ◎
1500 Tafoya Frances L Mrs ◎
1510 Lopez Louis ◎
1550 Vacant
1555 Vigil Procopio ◎ 255-0987
1580 Graham G Rex ◎ 255-3018
1646 Granguist Severin J ◎ 255-3065
1650 Jones Paul W excavating contr ◎ 255-2642
1652 Leyba Fred ◎ 255-3421
1654 Tafoya J Paul ◎ 255-7886
1658 Myers Richd
1670 Malcolm Bros cement contr 255-7087
Malcolm M Keith ◎ 255-7087
1678 Anderson Muray F ◎ 255-0718
1680 James Elliot R ◎ 255-8784
S REDWOOD RD INTERSECTS

46A

2195 Jones La Mar R ◎ 255-1055
S 2200 WEST ST INTERSECTS
2500 Vacant
2600 Schaugaard Bert G ◎ 255-5202
2620 Dalton Lawrence E ◎ 255-8200
S 2700 WEST ST INTERSECTS
3200 Clapp Edwin C ◎ 255-8830
3282 Erickson Ernest G ◎ 255-1955
3324 Brackenbury Geo ◎ 255-0373
3344 Pulley Melvin ◎ 255-3951
3366 Pulley Harvey ◎ 255-3910
Pulley's Custom Mfg Co metal parts for army tanks 255-3910
3500 Atwood James M ◎ 255-3070
3600 Lehmitz Glen W ◎ 255-2081
3802 Allison Kennels 255-3090
Allison Charles L Jr 255-3090
4139 Diamond James L ◎ 255-2018

46

ANDERSON WAY —FROM 6815 W ANDERSON WAY SOUTH TO 1350 COLUMBIA DR

ZIP CODE 84084
6815 Warthen Essie Mrs ◎ 255-4644
6816 Bates F Fenton ◎ 255-7939
6817 Pace Burke C ◎
6818 Campbell Betty Jo Mrs ◎
6820 Moncur Lee ◎
6821 Strebel Peter G ◎ 255-5705
6823 Reeves Wm G ◎ 255-0027
6824 Covington Marion U Mrs ◎
6826 Dale Edith L Mrs ◎ 255-4049
6828 Jones Clarence E ◎ 255-5444
6829 German John F ◎ 255-5251
6832 Harvey Dennis J ◎
6842 Mitchell Harry E 255-2031
6852 Vacant
6854 Malcolm Oliver L ◎ 255-9212
6857 Waddell Grace ◎ 255-0236
6860 Dennis Harold H ◎ 255-8431

46

BRIDGEPORT WAY —FROM 6960 COLUMBIA DR WEST

ZIP CODE 84084
1407 Jelsma Leon ◎ 255-4548
1415 Anderson Carlos S ◎ 255-3843
1423 Nye Gale ◎ 255-9105
1430 Vacant
1431 Schultz Conrad A ◎ 255-4819
1439 Benson L I ◎
1440 Bachman Dean W ◎ 255-6245
1449 Baker R Raymond ◎
1450 Shoemaker Cullen H ◎ 255-8403
1451 Vacant
1464 Hensley John A 255-6992
1469 Hansen Owen ◎
1474 Marshall Thill ◎ 255-1421
1477 Peterson Gifford ◎
1480 Kinsman Violet V Mrs ◎ 255-3732
1485 Owen Wm E ◎
1488 Gressmen Orvil ◎ 255-6798

46

COLUMBIA DR —FROM 6870 S 1300 WEST ST WEST

ZIP CODE 84084
1312 Thomas Wm H ◎ 255-1855
1315 Bowers Alfred ◎ 255-6942
1326 Wright Don W ◎ 255-1322
1336 Moyer Dale L 255-6046
1344 Lundgreen Joel S ◎
6875 Ulibarri Eleuterio ◎ 255-7234
6876 Garnes Stanley L ◎ 255-1537
6877 Henderson Frank L ◎ 255-3907
6878 Jansen Ronald ◎ 255-6591
6880 Vacant
6881 Scott Wm ◎
6882 Shepherd Dick W ◎ 255-3310
6890 Conway Kenneth C ◎ 255-7597
6891 Sullivan Duke A 255-1591
6898 Boone Walter E ◎ 255-6536
6901 Murphy Jack F 255-2685
6908 Bishoff Lorenzo D 255-4178
6911 King Dana E ◎ 255-5349
6916 Vacant
6920 Vacant
6921 Ramsey Wallace G ◎
Ward Harold ◎
6930 Whitaker Bob A ◎ 255-4351
6936 Smith Frank ◎ 255-2845
6943 Powell Sharon Mrs 255-4635
6946 Parry Don E ◎
6953 Cross Wm E ◎
6956 Barela Rudy L ◎ 255-8655
6963 Jacobs Curtis W ◎ 255-8391
6972 Wigget Leslie D ◎ 255-7596
6973 Vacant
6981 Sharp Geo I ◎ 255-9038
6989 Hewitt Paul L ◎
6995 Adams Victor D 255-2549

46A

DERBY CIR —FROM END OF DERBY WAY EAST

ZIP CODE 84084
3226 Hansen Jerry C ◎ 255-4130
3300 Under Constn

46A

DERBY WAY —FROM 8200 S 3410 WEST ST EAST

ZIP CODE 84084
3216 Black Gerald D ◎ 255-2696
3388 Larson O Neil ◎ 255-6345

46A

FAHNIAN CIRCLE —FROM 8400 S 2700 WEST ST CIRCLES WEST

ZIP CODE 84084
2764 Foster Lance ◎ 255-6250
2773 Jones Claude H ◎ 255-5169
2788 Lloyd Darwin B ◎ 255-7339

46

FLAMINGO WAY —FROM 1350 COLUMBIA DR SOUTH

ZIP CODE 84084
6896 Fox Donald G ◎
6903 Carter Bert E ◎
6906 Brindley Jerald G ◎ 255-7530
6908 Hartman Fred P ◎ 255-3422
6909 Hayes Douglas P ◎
6911 Horan James ◎ 255-6101
6912 Clark Geo M ◎ 255-5203
6915 Romero Rudolph C 255-7507
6918 Chidester John F Jr ◎ 255-3427
6919 Gooch Verlin
6922 Knight Wm B ◎ 255-5829
6929 Kemp Douglas
6932 Knight Raymond B 255-4076
6933 Southam De Vere ◎ 255-9342
6935 Martinez Victor 255-8981
6936 Henson Le Roy ◎ 255-0780
6944 Davis Donald L ◎ 255-1874
6945 Bristol Bruce W ◎ 255-1226
6948 Garfield Emily Mrs ◎ 255-1566
6950 Hartman Nettie P Mrs 255-7472
6955 Mc Neill Glen H ◎ 255-8976
6959 Mc Gee Malcolm L ◎ 255-8834
6965 Vacant

WILLARD CONSTRUCTION COMPANY
GENERAL CONTRACTORS
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NEW METHOD WALL CLEANER CO.
COMPLETE HOUSE and COMMERCIAL CLEANING
231 EAST 4th SOUTH-EMPIRE BUILDING
SALT LAKE CITY, UTAH
TELS. 322-5186
278-4052

C

Historic Aerial Photographs

UDOT Bengerter
3584 W 9000
West Jordan, UT 84088

Inquiry Number: 4657552.9
June 27, 2016

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

06/27/16

Site Name:

UDOT Bengerter
3584 W 9000
West Jordan, UT 84088
EDR Inquiry # 4657552.9

Client Name:

HDR
412 East Park Center Boulevard
Boise, ID 83706
Contact: Manuel Rauhut

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2011	1"=500'	Flight Year: 2011	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
1997	1"=500'	Acquisition Date: October, 04 1997	USGS/DOQQ
1993	1"=500'	Flight Date: August, 14 1993	USGS
1981	1"=500'	Flight Date: April, 08 1981	USGS
1977	1"=500'	Flight Date: June, 28 1977	USDA
1971	1"=500'	Flight Date: October, 09 1971	USDA
1965	1"=500'	Flight Date: July, 26 1965	USDA
1958	1"=500'	Flight Date: May, 27 1958	USDA
1952	1"=500'	Flight Date: August, 30 1952	USDA
1946	1"=500'	Flight Date: August, 17 1946	USDA
1937	1"=500'	Flight Date: October, 09 1937	USDA

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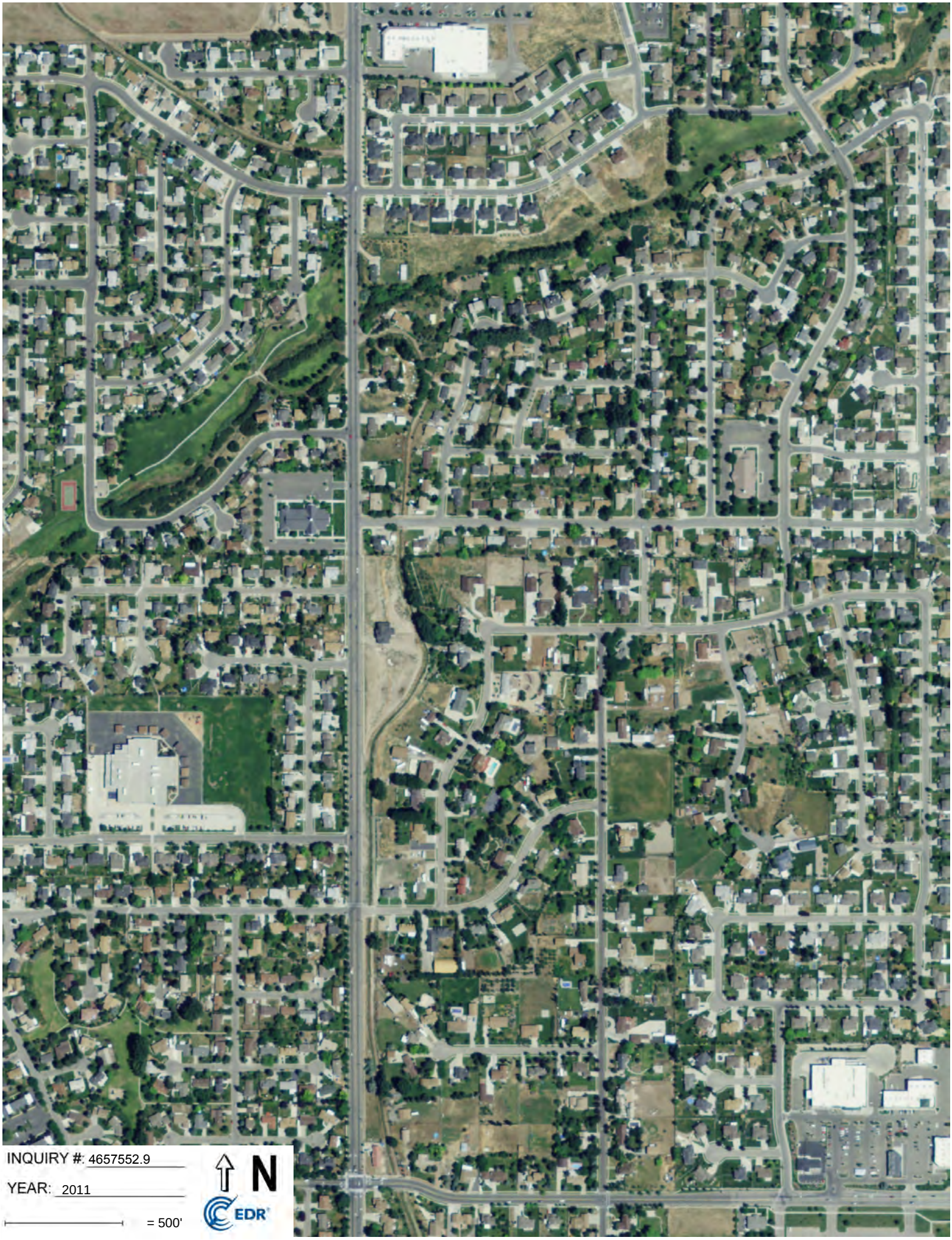
INQUIRY #: 4657552.9
YEAR: 2011
= 500'
N
EDR

INQUIRY #: 4657552.9
YEAR: 2011
= 500'
N
EDR

INQUIRY #: 4657552.9
YEAR: 2011
= 500'
N
EDR

INQUIRY #: 4657552.9
YEAR: 2011
= 500'
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EDR

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YEAR: 2009
= 500'
N
EDR

INQUIRY #: 4657552.9
YEAR: 2009
= 500'
N
EDR

INQUIRY #: 4657552.9
YEAR: 2009
= 500'
N
EDR

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YEAR: 2009
= 500'
N
EDR

INQUIRY #: 4657552.9
YEAR: 2006
= 500'
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EDR

INQUIRY #: 4657552.9
YEAR: 2006
= 500'
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EDR

INQUIRY #: 4657552.9
YEAR: 2006
= 500'
N
EDR

INQUIRY #: 4657552.9
YEAR: 2006
= 500'
N
EDR

INQUIRY #: 4657552.9
YEAR: 1997
= 500'
N
EDR

INQUIRY #: 4657552.9
YEAR: 1997
= 500'
N
EDR

INQUIRY #: 4657552.9

YEAR: 1997

= 500'

N

EDR

INQUIRY #: 4657552.9
YEAR: 1997
= 500'
N
EDR

INQUIRY #: 4657552.9
YEAR: 1993
= 500'
N
EDR

INQUIRY #: 4657552.9
YEAR: 1981
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N
EDR

INQUIRY #: 4657552.9
YEAR: 1977
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EDR

INQUIRY #: 4657552.9
YEAR: 1971
= 500'
N
EDR

INQUIRY #: 4657552.9
YEAR: 1965
= 500'
N
EDR

INQUIRY #: 4657552.9

YEAR: 1958

= 500'

N

EDR

INQUIRY #: 4657552.9

YEAR: 1952

= 500'

N

EDR

INQUIRY #: 4657552.9
YEAR: 1946
= 500'
N
EDR

INQUIRY #: 4657552.9

YEAR: 1937

= 500'

N

EDR

D

Historic Topographic Maps

UDOT Bengerter
3584 W 9000
West Jordan, UT 84088

Inquiry Number: 4657552.4
June 24, 2016

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

06/24/16

Site Name:

UDOT Bengerter
3584 W 9000
West Jordan, UT 84088
EDR Inquiry # 4657552.4

Client Name:

HDR
412 East Park Center Boulevard
Boise, ID 83706
Contact: Manuel Rauhut

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by HDR were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:

P.O.# UDOT Bangerter
Project: UDOT Bangerter

Coordinates:

Latitude:	40.587838 40° 35' 16" North
Longitude:	-111.977208 -111° 58' 38" West
UTM Zone:	Zone 12 North
UTM X Meters:	417304.87
UTM Y Meters:	4493463.65
Elevation:	4596.30' above sea level

Maps Provided:

2014
1999
1975
1969
1963
1951
1928
1925

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Topo Sheet Key

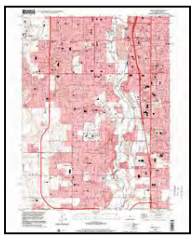
This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2014 Source Sheets

Copperton
2014
7.5-minute, 24000

Midvale
2014
7.5-minute, 24000

1999 Source Sheets



Midvale
1999
7.5-minute, 24000
Aerial Photo Revised 1997

Copperton
1999
7.5-minute, 24000
Aerial Photo Revised 1997

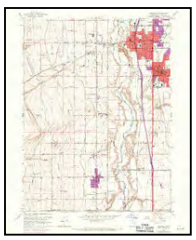
1975 Source Sheets

Lark
1975
7.5-minute, 24000
Photo Revised 1975
Aerial Photo Revised 1975

Midvale
1975
7.5-minute, 24000
Photo Revised 1975
Aerial Photo Revised 1975

1969 Source Sheets

Lark
1969
7.5-minute, 24000
Photo Revised 1969
Aerial Photo Revised 1969



Midvale
1969
7.5-minute, 24000
Photo Revised 1969
Aerial Photo Revised 1969

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1963 Source Sheets

Midvale
1963
7.5-minute, 24000
Aerial Photo Revised 1962

1951 Source Sheets

Midvale
1951
7.5-minute, 24000
Aerial Photo Revised 1950

1928 Source Sheets

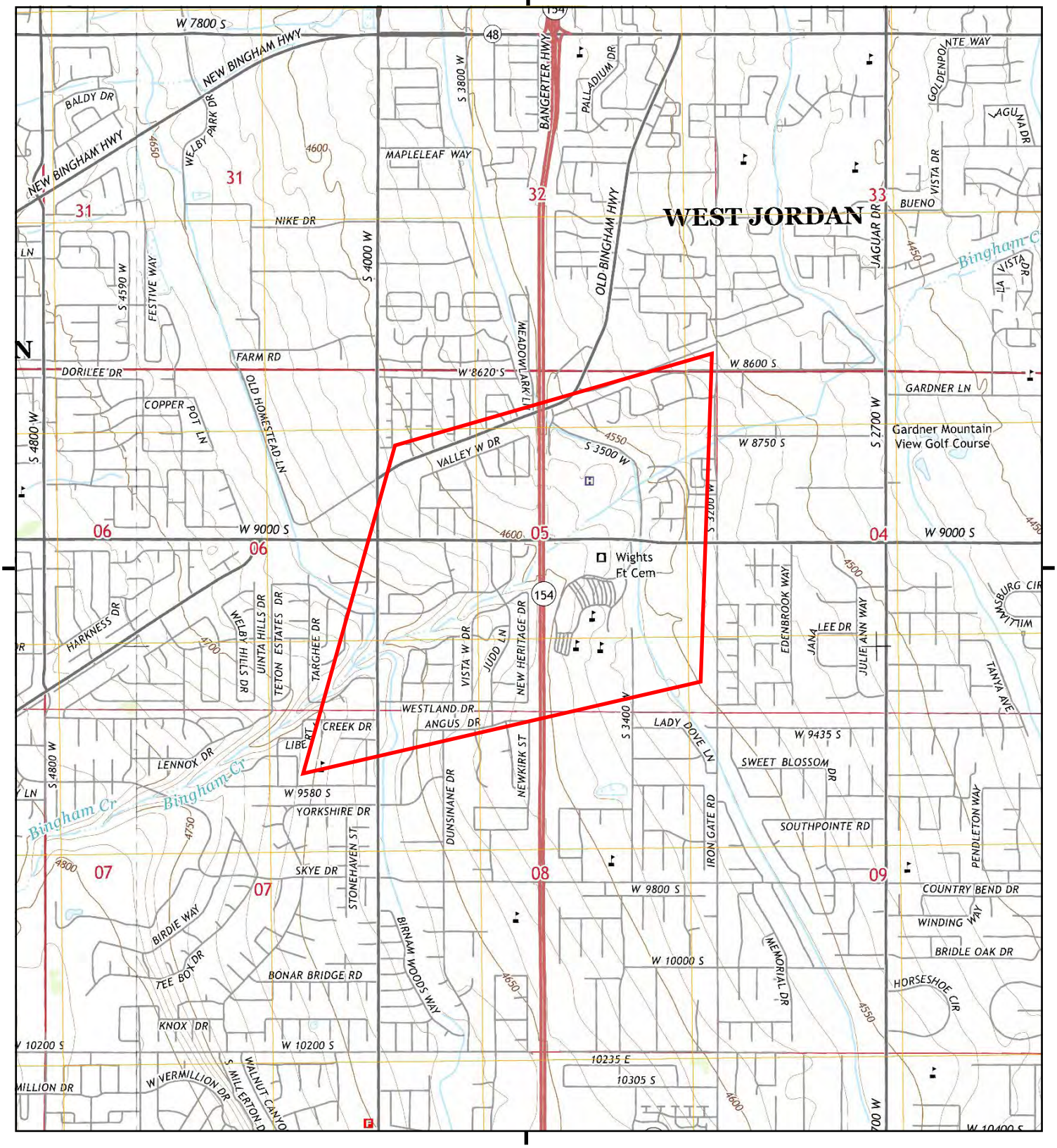
Ft. Douglas
1928
30-minute, 125000

1925 Source Sheets

Ft. Douglas
1925
30-minute, 125000

Historical Topo Map

2014



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

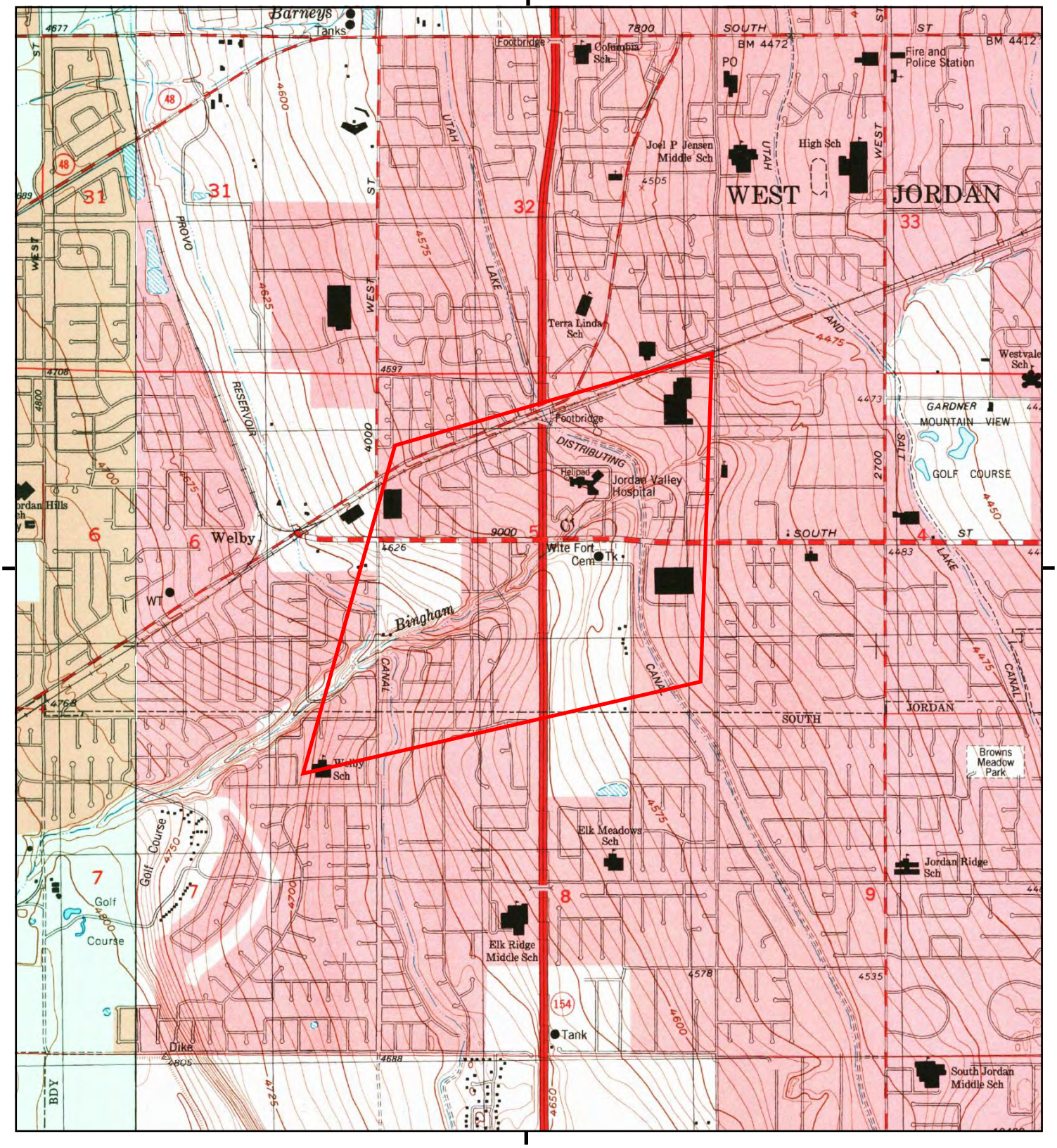
TP, Midvale, 2014, 7.5-minute
W, Copperton, 2014, 7.5-minute

SITE NAME: UDOT Bengerter
ADDRESS: 3584 W 9000
West Jordan, UT 84088
CLIENT: HDR

N

Historical Topo Map

1999



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

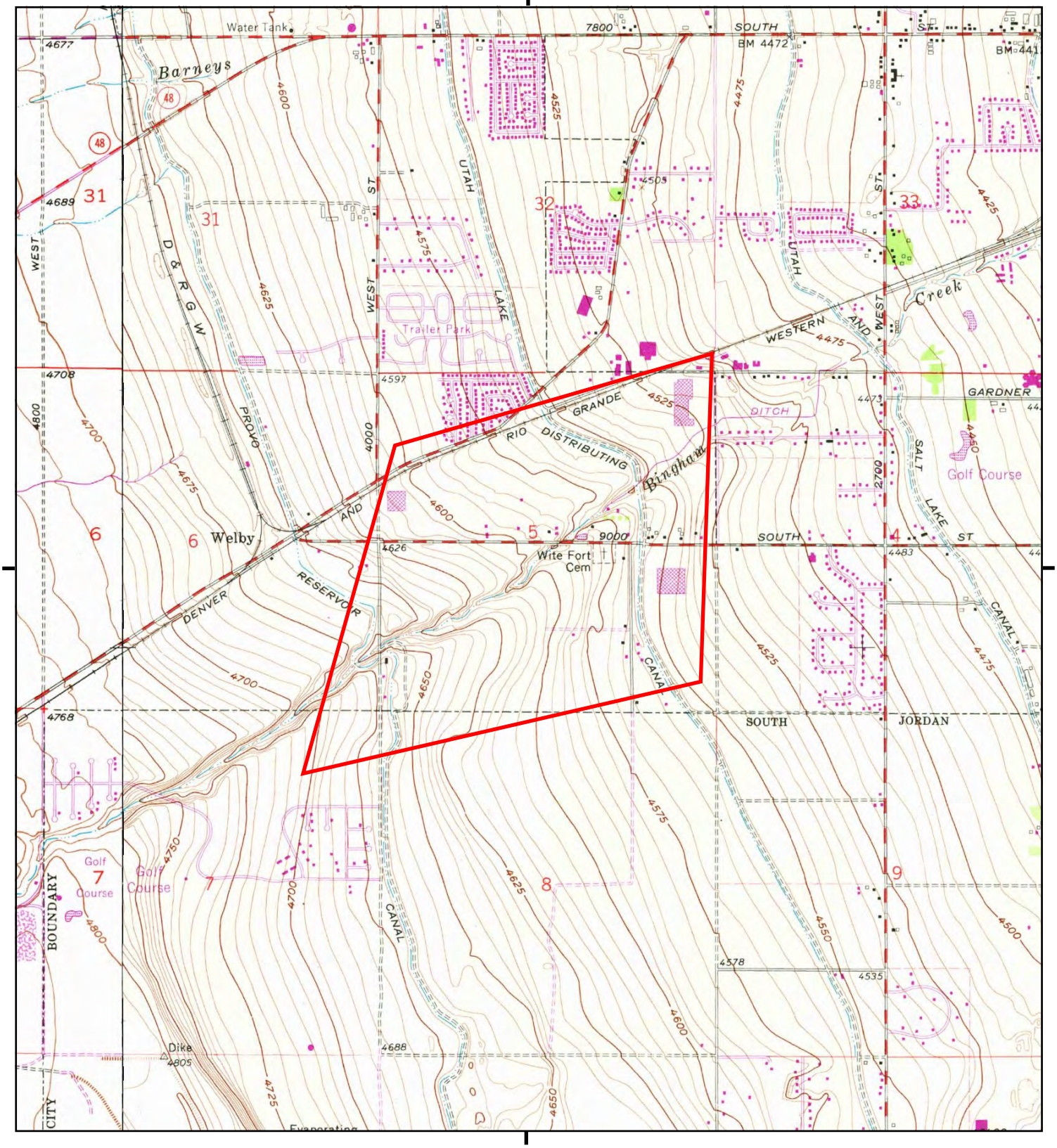
TP, Midvale, 1999, 7.5-minute
W, Copperton, 1999, 7.5-minute

SITE NAME: UDOT Bengerter
ADDRESS: 3584 W 9000
West Jordan, UT 84088
CLIENT: HDR

N

Historical Topo Map

1975



This report includes information from the following map sheet(s).

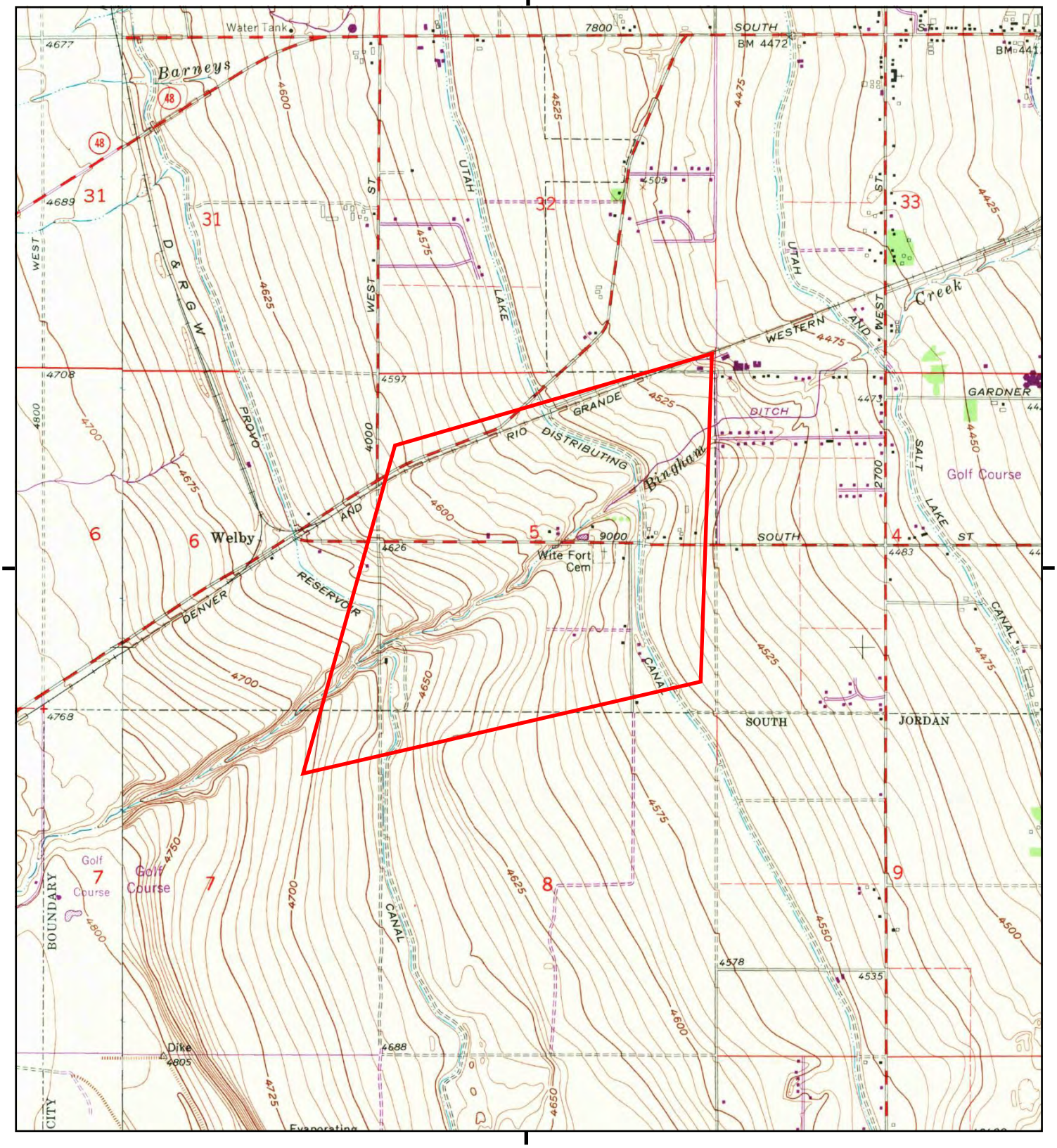
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Midvale, 1975, 7.5-minute
W, Lark, 1975, 7.5-minute

SITE NAME: UDOT Bengerter
ADDRESS: 3584 W 9000
West Jordan, UT 84088
CLIENT: HDR

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

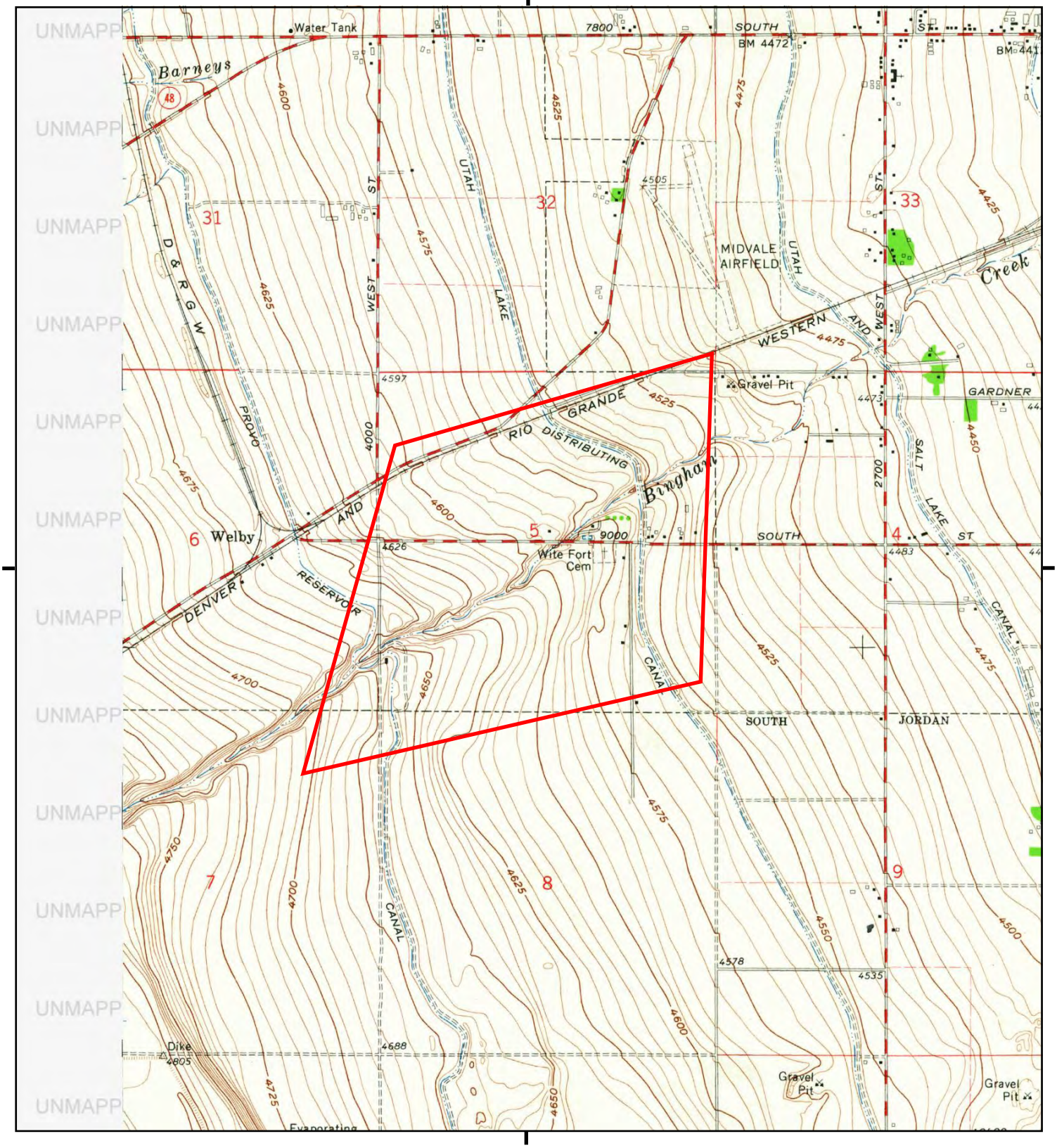
TP, Midvale, 1969, 7.5-minute
W, Lark, 1969, 7.5-minute

SITE NAME: UDOT Bengerter
ADDRESS: 3584 W 9000
West Jordan, UT 84088
CLIENT: HDR

N

Historical Topo Map

1963



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

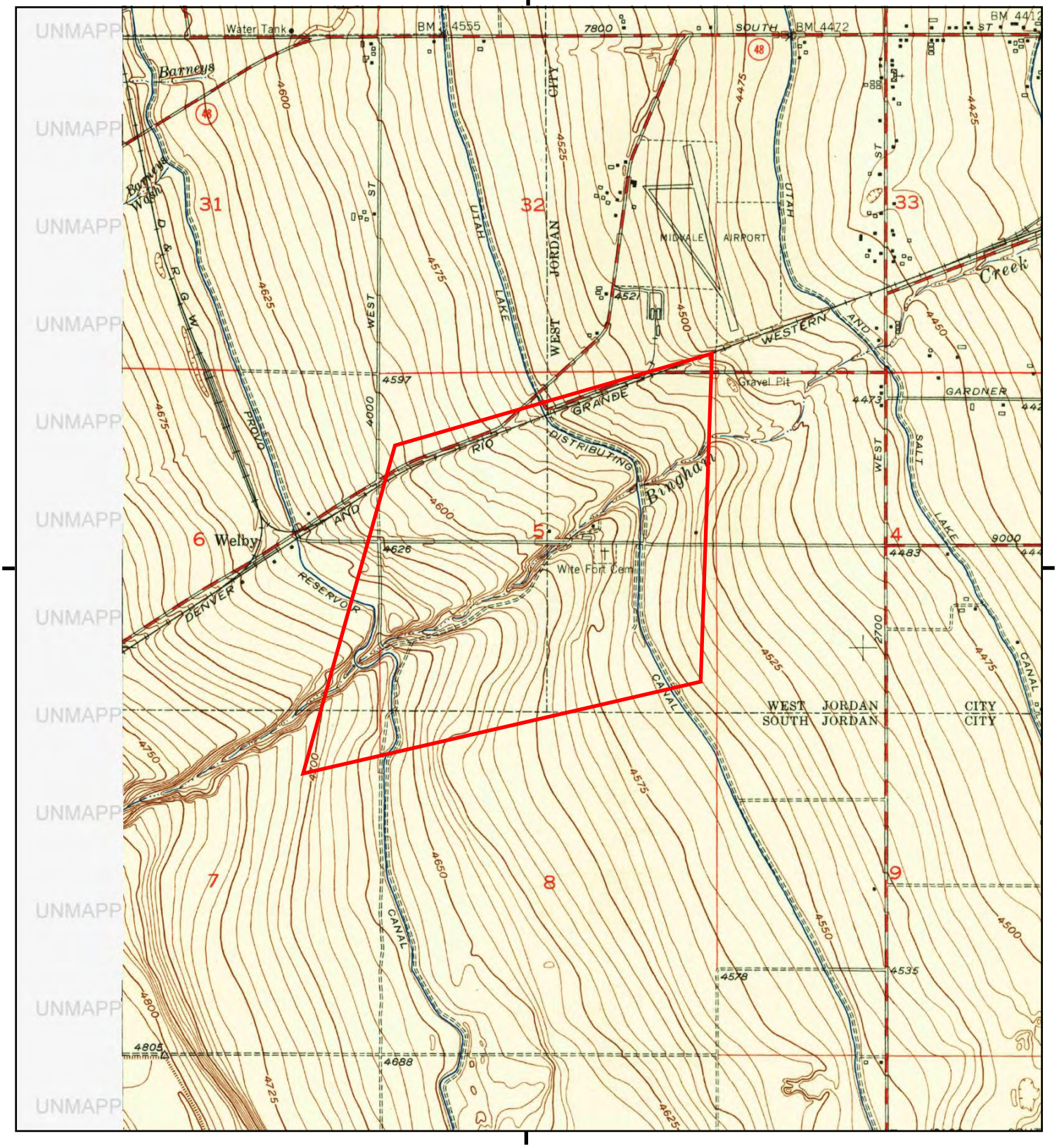
TP, Midvale, 1963, 7.5-minute

SITE NAME: UDOT Bengerter
ADDRESS: 3584 W 9000
West Jordan, UT 84088
CLIENT: HDR

N

Historical Topo Map

1951



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

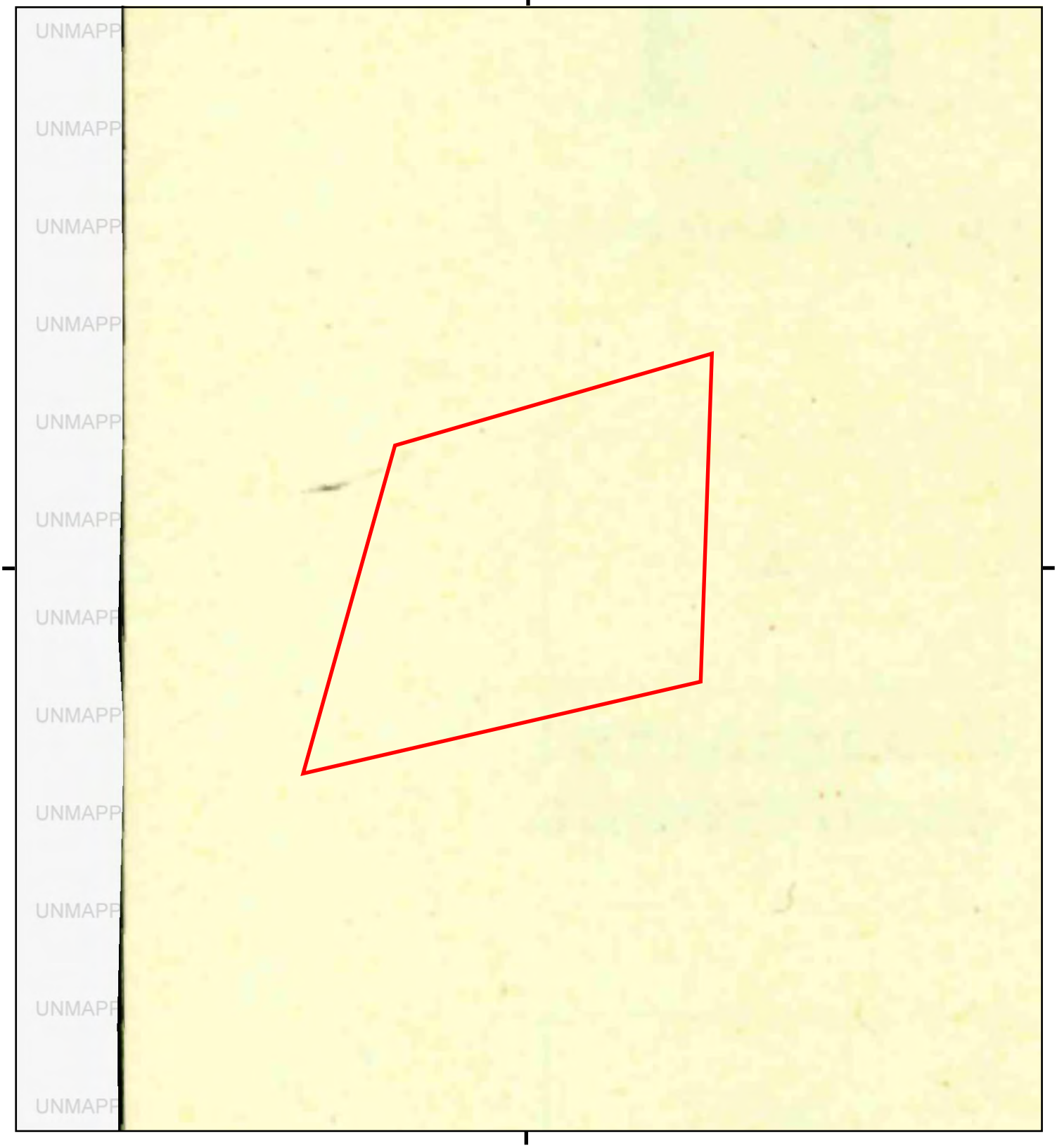
TP, Midvale, 1951, 7.5-minute

SITE NAME: UDOT Bengerter
ADDRESS: 3584 W 9000
West Jordan, UT 84088
CLIENT: HDR

N

Historical Topo Map

1928



This report includes information from the following map sheet(s).

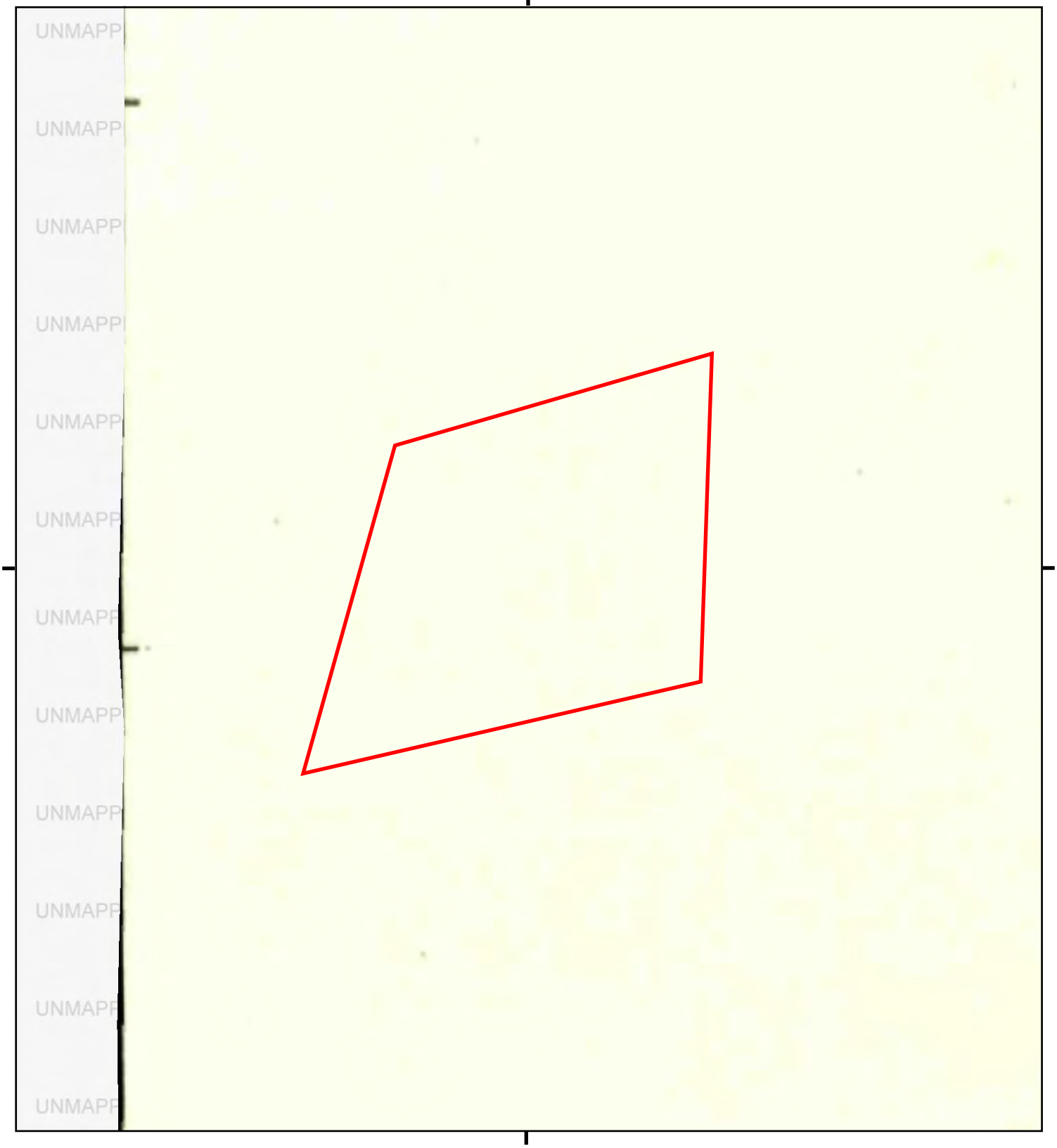
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Ft. Douglas, 1928, 30-minute

SITE NAME: UDOT Bengerter
ADDRESS: 3584 W 9000
West Jordan, UT 84088
CLIENT: HDR

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Ft. Douglas, 1925, 30-minute

SITE NAME: UDOT Bengerter
ADDRESS: 3584 W 9000
West Jordan, UT 84088
CLIENT: HDR

N

E

Site Photographs

Subject Property looking west towards Bangerter Highway from W9000S. The adjacent property to the south (left in photo) is the Salt Lake City Community College. The area next to the sidewalk is a stormwater basin. Note transmission line along the north side of W9000S.

Close-up of stormwater basin at the southeast corner of the Bangerter Highway and W9000S.

Looking north along Bangerter Highway towards W 9000 S. The area to the east (right in photo) are baseball fields and parking lots associated with the Salt Lake City Community College campus. The area to the west (left in photo) is a sound wall adjacent to the Vista West subdivision.

Looking south along Bangerter Highway near the southern boundary of the Salt Lake City Community College campus. The area to the west (righ in photo) is a sound wall adjacent to the Vista West subdivision.

Looking north along Bangerter Highway from W 9000S. The area to the east is the Jordan Valley Hospital complex.

Looking east along W9000S. The area to the north (left in photo) is the Jordan Valley Hospital. The area to the south is the baseball field associated with the Salt Lake City Community College campus. Note transmission line.

Looking south along Bangerter Highway from the northern boundary of theJordan Valley hospital (left in photo) . The area to the east (left in photo). The area east of the Bangerter Highway is a subdivision, which is north of a fallow pasture.

Looking north along Bangerter Highway from W9000S. The area in the foreground is a fallow pasture.

Looking west along W9000S. The area to the north (right in photo) is a fallow pasture. The area south of W9000S is the Vista West subdivision. Note transmission line.

Looking east along W9000S. The area to the north (left in photo) is a nursing home. The area south of W9000S is the Vista West subdivision. Note transmission line.

Looking southwest and upstream at Bingham Creek. Bingham Creek flows through a box culvert from the Vista West subdivision on the southwest side of the Bangerter Highway/W9000S intersection to the northeast side and daylights within the Jordan Valley Hospital complex, shown in this photo.

Looking northeast and downstream along Bingham Creek within the Jordan Valley Hospital complex.

Bingham Creek looking northeast and downstream from Winthrope Drive.

Looking towards the southeast at the closed Fairchild Semiconductor plant from W9000S, east of the Salt Lake City Community College.

Looking southeast at Utah Lake Distribution Canal near Bangerter Highway and the Old Bingham Highway. Note the parcel to the south (right in photo), which appears to be a small vehicle and boat storage area.

Looking towards the east from the nursing home along W9000S. Dry pasture between nursing home and Bangeter Highway. The 55 gallon drums in the pasture are empty.

F

Kennecott South Zone
Superfund Site Documents

Second Five Year Review Report

Kennecott South Zone

OU1 – Bingham Creek
OU4 – Bingham Reservoir
OU5 – Anaconda Tailings
OU10 – Copperton Soils
OU11 – Bingham Canyon

CERCLIS ID: UTD000826404

Copperton
Salt Lake County, Utah

September 2010

Prepared By:

US Environmental Protection Agency, Region 8
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Assistant Regional Administrator
Office of Ecosystems Protection and
Remediation

Date:

9/29/10

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List of Acronyms

Ac	Acute
AOC	Administrative Order on Consent
ARARs	Applicable or Relevant and Appropriate Requirements
ARCO	Atlantic Richfield Company
As	Arsenic
ASL	Above Sea Level
BRA	Baseline risk assessment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COC	Contaminants of concern
cy	Cubic yards
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
HDR	HDR Engineering Inc.
IC	Institutional Control
mg/Kg	milligrams per kilogram
mg/L	milligrams per liter
MOU	Memorandum of Understanding
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation & Maintenance
OU	Operable Unit
Pb	Lead
PRP	Potentially Responsible Party
ppm	Parts per million
RAO	Remedial Action Objective
RD/RA	Remedial Design/ Remedial Action
RI/FS	Remedial Investigation/ Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
µg/L	microgram per liter
UAO	Unilateral Administrative Order
UDEQ	Utah Department of Environmental Quality
UGW	Utah Ground Water permit
UTA	Utah Transit Authority
VCP	Voluntary Cleanup Program

Executive Summary

The Environmental Protection Agency (EPA) has conducted the second Five-Year Review of the response actions implemented at Operable Units (OU) 1, 4, 5, 10, and 11 of the Kennecott South Zone Superfund Site (the Site) near Copperton in Salt Lake County, Utah. This review was conducted from August 2009 through July 2010, five years after the first Five-Year Review completed in June 2004.

A complete review with associated protectiveness statements was performed for OUs 1 and 5 (Bingham Creek and Anaconda Tailings, respectively). Treatment of the remaining OUs was limited to a summary of the OU status.

Operable Unit 1 consists of the Bingham Creek Channel and surrounding historic floodplain. The up- and down-stream limits include the Kennecott Large Bingham Reservoir on the west to the Jordan River on the east, a distance of about 10 miles.

The OU is divided into the Bingham Creek Channel and Bingham Creek Residential Soils, which include certain residential developments in the floodplain. During the early days of mining, wastes from mining and mineral processing (mine dumps, mill tailings, and smelter slag) were dumped directly into Bingham Creek or stored adjacent to the creek where they were subject to erosion and transport to the creek. The concentrations of arsenic and lead found in the Bingham Creek channel in a residential area averaged 202 milligrams per kilogram (mg/Kg) and 5,661 mg/Kg, respectively.

Operable Unit 5 includes the Anaconda Tailings, also known as Copperton Tailings, ARCO Copperton Tailings and Utah-Apex Tailings. The tailings consisted of approximately 3.5 million tons of lead, arsenic, zinc, and silver-bearing, fine grained sediments covering 96 acres along the south side of Bingham Creek. Average arsenic and lead concentrations were found to be 394 mg/Kg and 6,244 mg/Kg, respectively. These wastes are now consolidated into a 41 acre capped repository. Operable Unit 5 also includes Bastian Ditch which originates in the vicinity of the Anaconda Tailings and roughly follows Utah Highway 111 southward.

Response actions at OU1 and OU5 prior to issuance of the 1998 ROD were deemed to have adequately addressed risks to human health and the environment such that the ROD called for no further action. Response actions involved the excavation and consolidation of mine wastes and contaminated soils from OU1 and OU5 into capped repositories, one of which is located on OU5. Areas where mine waste and soils containing lead above land-use based cleanup levels remained were covered in place (residential areas) and/or subject to land use controls. Land use controls are the responsibility of local municipal and county government.

Although the residential area response actions at OU1 were conducted in accordance with the Action Memoranda (and therefore may be functioning as intended), it is not clear from the site files whether all residential properties ultimately were cleaned to the final lead standard of 1,100 mg/Kg.

This is due to an inconsistency in the lead action level required in the Action Memoranda for the Phase I residential removal action (2,500 mg/Kg) and the Phase II and III residential removal actions (1,100 mg/Kg). The OU1 ROD identifies the appropriate action level for lead in a residential setting as 1,100 mg/Kg. Therefore, if the Phase I residential cleanup achieved a lead standard of 2,500 mg/Kg, this portion of the remedy would not be functioning as intended by the ROD.

Land use controls and regular inspections of those response actions that left waste in-place are necessary to provide future protectiveness of the remedy. Future land development and disturbance of either capped or soil covered wastes by residents and by erosion may compromise the protectiveness of the remedy selected at OU1 and OU5.

Land use controls in OU1 and OU5 have not been fully implemented. Regular inspections of the Bingham Creek Channel response actions in OU1 were not performed. However, review of relevant documents and observations made at OU1 and OU5 during the Five-Year Review indicate the following:

- Response actions where waste was left in-place are in good condition.
- Limited development has occurred in OU1 since the first Five-Year Review and this development is under EPA or UDEQ oversight.
- No development or change in land use has occurred at OU5. Operable Unit 5 remains within Kennecott's secured property boundary and land use control is still under the control of ARCO, the parcel owner.

A protectiveness determination of the remedy at OU1 cannot be made at this time until further information is obtained. Further information will be obtained by determining what arsenic and lead concentration standards the fifty properties under the Phase I residential removal action were remediated to. It is expected that this additional information will be obtained by December 31, 2010, at which time a protectiveness determination will be made. In order for the remedy to be protective in the long-term, land use controls and annual inspections and maintenance of certain response actions required by decision documents must be fully implemented.

The remedy at OU5 currently protects human health and the environment through actions that isolate contaminants. However, in order for the remedy to be protective in the long-term, land use controls must be fully implemented.

It is anticipated that ARARs and cleanup levels will be evaluated for the entire Kennecott Site as part of the development of an Explanation of Significant Differences (ESD). The ESD will pertain to all RODs except OU2. This evaluation is expected to be completed in the spring of 2011.

A number of issues were identified and will be addressed as summarized in the following tables.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Kennecott South Zone		
EPA ID *(from WasteLAN)*: UTD000826404		
Region: 8	**State:** UT	**City/County**: Copperton/Salt Lake County

SITE STATUS	
NPL status: Final ☐ Deleted X Other (specify) proposed and withdrawn	
Remediation status (choose all that apply): Under Construction X Operating X Complete	
Multiple OUs? X YES NO	**Construction completion date**: NA not on NPL
Has site been put into reuse? X☐YES NO	

REVIEW STATUS	
Reviewing agency: x EPA State ☐ Tribe ☐Other Federal Agency	
Author name: Rebecca Thomas	
Author title: Project Manager	**Author affiliation:** US Environmental Protection Agency
Review period: August 2009 through July 2010	
Date(s) of site inspection: 7/25/09, 10/6/09, 11/18/09, 12/01/09	
Type of review: X Post-SARA ☐Pre-SARA ☐NPL-Removal only ☐Non-NPL Remedial Action Site X NPL State/Tribe-lead ☐Regional Discretion	
Review number: 1 (first) X2 (second) 3 (third) ☐Other (specify)	
Triggering action: ☐ Actual RA Onsite Construction at OU #___ ☐Actual RA Start ☐ Construction Completion X Other (specify) – 5-years from the date of the first 5YR.	
Triggering action date: For OUs 1, 4, 5, 10, and 11 the trigger date is 5-years from the date of the 1st FYR (June 2004).	
Due date: June 2009	

*["OU" refers to operable unit.]

Five-Year Review Summary Form, cont'd.

Issues:

Item No.	Issues	Affects Current Protectiveness	Affects Future Protectiveness
Bingham Creek - Operable Unit No. 1			
1	Bingham Creek Channel annual inspection and reporting was not performed.	No	Yes
2	A maintenance and reporting program for Bingham Creek Channel response actions has not been developed or implemented.	No	Yes
3	Land use controls have not been implemented (including finalization and approval by EPA Region 8 and UDEQ) by West Jordan and South Jordan Cities and Salt Lake County.	No	Yes
4	A cleanup goal has not been identified at OU1 for arsenic under recreational, open space, commercial or industrial land uses or for lead under a commercial land use.	No	Yes
5	It is unclear what arsenic and lead cleanup levels were achieved at the residential properties addressed under the 1991 Action Memorandum (Phase I).	Yes	Yes
6	ARARs have not been reviewed as part of this Five-Year Review.	No	Yes
Anaconda Tailings - Operable Unit No. 5			
1	Land use controls have not been implemented by Salt Lake County. In addition, reporting on land use control performance was not required but are necessary to ensure that Institutional Controls (ICs) are functioning.	No	Yes
2	A one acre sized uncapped/uncovered waste pile is present at the toe of the Large Bingham Reservoir dam. Arsenic and lead concentrations at the surface of this feature are unknown.	No	Yes
3	ARCO is not required to provide reports of their operation, monitoring and maintenance activities for the cap at their repository. Reporting is necessary to demonstrate and document that such activities are occurring between Five-Year Reviews.	No	Yes
4	Segments of the Bastian Ditch may still contain tailings.	No	Yes
5	A cleanup goal has not been identified at OU5 for arsenic under recreational, open space, commercial or industrial land uses.	No	Yes
6	ARARs have not been reviewed as part of this Five-Year Review.	No	Yes

Five-Year Review Summary Form, cont'd.

Recommendations and Follow-up Actions:

Item No.	Issues	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
						Current/	Future
Bingham Creek - Operable Unit No. 1							
1	Bingham Creek Channel annual inspection and reporting was not performed.	EPA will begin annual inspection of response actions in the channel and will prepare a report for the site files.	EPA	EPA/UDEQ	6/30/11	No	Yes
2	A maintenance and reporting program for Bingham Creek Channel response actions has not been developed or implemented.	EPA and UDEQ will coordinate with local authorities to define roles for this portion of the remedy.	EPA/ UDEQ	EPA/UDEQ	6/30/11	No	Yes
3	Land use controls have not been implemented (including finalization and approval by EPA Region 8 and UDEQ) by West Jordan and South Jordan Cities and Salt Lake County.	EPA will provide the Cities and County with mapping showing the location of wastes remaining in-place. The Cities and County will develop, formalize and implement land use controls for OU1.	EPA/ UDEQ	EPA/UDEQ	6/30/11	No	Yes
4	A cleanup goal has not been identified at OU1 for arsenic under recreational, open space, commercial or industrial land uses or for lead under a commercial land use.	Select appropriate cleanup levels and document in an ESD to be prepared for the entire Kennecott Site (except for OU2).	EPA/UDEQ	EPA/UDEQ	Spring 2011	No	Yes
5	It is unclear what arsenic and lead cleanup levels were achieved at the residential properties addressed under the 1991 Action Memorandum (Phase I).	Determine what arsenic and lead concentration standard the fifty properties under Phase I were remediated too.	UDEQ/EPA	UDEQ/EPA	12/31/10	Yes	Yes
6	ARARs have not been reviewed as part of this Five-Year Review.	Perform ARARs review and document in ESD.	UDEQ/EPA	UDEQ/EPA	Spring 2011	No	Yes

Recommendations and Follow-up Actions (cont'd):

Item No.	Issues	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
						Current/	Future
Anaconda Tailings - Operable Unit No. 5							
1	Land use controls have not been implemented by Salt Lake County. In addition, reporting on land use control performance was not required but is necessary to ensure that ICs are functioning.	Develop, formalize and implement land use controls for OU5 and report on their implementation and functionality.	UDEQ/EPA	EPA/UDEQ	6/30/11	No	Yes
2	A one acre sized uncapped/uncovered waste pile is present at the toe of the Large Bingham Reservoir dam. Arsenic and lead concentrations at the surface of this feature are unknown.	Develop a land use change restriction.	ARCO	EPA/UDEQ	6/30/11	No	Yes
3	ARCO is not required to provide reports of their operation, monitoring and maintenance activities for the cap at their repository. Reporting is necessary to demonstrate and document that such activities are occurring between Five-Year Reviews.	UDEQ will perform annual inspections and will document the condition of the remedy.	UDEQ	EPA/UDEQ	12/31/10	No	Yes
4	Segments of the Bastian Ditch may still contain tailings.	Develop a land use change restriction.	EPA/ UDEQ	EPA/UDEQ	6/30/11	No	Yes
5	A cleanup goal has not been identified at OU5 for arsenic under recreational, open space, commercial or industrial land uses.	Select appropriate cleanup levels and document in an ESD to be prepared for the entire Kennecott Site (except for OU2).	EPA/ UDEQ	EPA/UDEQ	Spring 2011	No	Yes
6	ARARs have not been reviewed as part of this Five-Year Review.	Perform ARARs review and document in an ESD to be prepared for the entire Kennecott Site (except for OU2).	EPA/ UDEQ	EPA/UDEQ	Spring 2011	No	Yes

Protectiveness Statement(s):

The following protectiveness statements apply to OU1 and OU5.

OU1

A protectiveness determination of the remedy at OU1 cannot be made at this time until further information is obtained. Further information will be obtained by determining what arsenic and lead concentration standards the fifty properties under the Phase I residential removal action were remediated to. It is expected that this additional information will be obtained by December 31, 2010, at which time a protectiveness determination will be made. In order for the remedy to be protective in the long-term, land use controls and annual inspections and maintenance of certain response actions required by decision documents must be fully implemented.

OU5

The remedy at OU5 currently protects human health and the environment through actions that isolate contaminants. However, in order for the remedy to be protective in the long-term, land use controls must be fully implemented.

Other Comments:

In order for land use controls to be fully implemented at OU1 and OU5, accurate mapping of waste or contaminated soils left in-place must be developed.

A. INTRODUCTION

A.1. Purpose of the Review

The purpose of Five-Year Reviews is to determine whether response actions at a site are protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and makes recommendations to address them.

A.2. Authority for Conducting the Five-Year Review

The U.S. Environmental Protection Agency (EPA) is preparing this second Five-Year Review pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) §121 and the National Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The EPA interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The response actions conducted at the Site resulted in Site conditions that do not allow for unlimited use and unrestricted exposure. Therefore a Five-Year Review is required by statute.

A.3. Who Conducted the Five-Year Review

The EPA Region 8 conducted the second Five-Year Review of response actions implemented at Kennecott South Zone Site Operable Units 1, 4, 5, 10 and 11 near the town of Copperton, Utah. This review was conducted from August 2009 through July, 2010. This report documents the results of the review.

HDR Engineering, Inc. (HDR) of Denver, Colorado was retained by EPA Region 8 to provide technical support during preparation of the Five-Year Review Report.

A.4. Other Review Characteristics

The status of response actions at the OUs addressed in this Five-Year Review varies and so the treatment of each OU also varies, as follows:

- OU1 Bingham Creek - This OU is in post-construction operation and maintenance (O&M) with wastes remaining in-place. Therefore, this OU is subjected to a full review including a protectiveness statement.
- OU4 Large Bingham Reservoir - Performance measures at this OU are limited to compliance with a Utah ground water permit. Therefore, the assessment is limited to degree of permit compliance.
- OU5 Anaconda Tailing - This OU is in post-construction O&M with wastes remaining in-place. Therefore, this OU is subjected to a full review including a protectiveness statement.
- OU10 Copperton Soil - Conditions at this OU allow for unrestricted land use. Therefore, no further five-year reviews are necessary and the assessment is limited to that subject.
- OU11 Bingham Canyon - All but three of the historic mining facilities comprising this OU have been either buried or subsumed by the open pit of the active mine operation. Therefore, the assessment is limited to this subject.

B. BINGHAM CREEK – OU1

B.1. Site Chronology

Table 1 summarizes the important events and relevant dates in the Site's chronology.

Table 1 - Chronology of Site Events

Date	Activity
Aug-90	PA/SI at Bingham Creek
May-91	Action Memo, Phase 1, removal action at residential areas along Bingham Creek, Fund-lead, excavate contaminated soils down to depth of 18" and replace with clean fill.
May-91	AOC, CERCLA-VIII-91-1 1, Kennecott agrees to build a soils repository and haul the excavated soils to their repository.
Dec-91	Completion of Phase 1 removal, cleanup of 52 residences. The interim removal action level is 2500 ppm lead in soils.
Jan-93	Action Memo, Phase 2, cleanup of the Bingham Creek Channel
Feb-93	UAOs issued to Kennecott and ARCO, CERCLA- VIII-93-10, removal of top 3 feet or more of contaminated sediments, haul contaminated sediments to repositories, regrade and revegetate channel.
Dec-95	Completion of Phase 2 removal. The removal action level is 2000 ppm lead in sediments.
Jun-95	Action Memo, Phase 3, cleanup of remainder of residences along Bingham Creek using final action level of 1100 ppm lead in soils.
Jul-95	UAO issued to ARCO, CERCLA- VIII- 95-19, excavation of contaminated soils down to maximum depth of 18", removal of soils to ARCO's repository, regrade with fill, and revegetate with sod for residences.
Dec-97	Completion of Phase 3 removal. The removal action level (final) was 1100 ppm lead in soils.
Sep-98	Record of Decision, No Further Action Required
Dec-98	RD/RA Consent Decrees with Kennecott and ARCO
Jun-04	First Five-Year Review
2005	Repair to erosional feature identified during the First Five-Year review.

B.2. Background

Location and Setting

Operable Unit 1 consists of the Bingham Creek Channel and surrounding historic floodplain. The up- and down-stream limits include the Kennecott Large Bingham Reservoir on the west to the Jordan River on the east, a distance of about 10 miles (See Map of OU1 in Appendix A). The creek course travels easterly from the Large Bingham Reservoir through Salt Lake County towards the Jordan River.

The OU is divided into the Bingham Creek Channel and Bingham Creek Residential Soils, which include certain residential developments in the floodplain.

Bingham Creek Channel:

The channel transects an eastward, gently-sloping alluvial plain that extends from the foot of the Oquirrh Mountains front to the Jordan River. Elevation ranges from 5,300 feet above sea level (ASL) at the Large Bingham Reservoir to 4,300 feet ASL at the confluence of the creek with the Jordan River.

The upper part of the creek channel is located on private land used for farming, mining, and industrial purposes. Portions of the lower part of the creek channel are located on public lands used for open space and recreation, but is bounded by suburban residential, commercial, industrial, and agricultural development. Other portions of the creek channel are located on privately owned residential property. In some cases, the creek has been rerouted in man-made ditches, channels, and culverts with suburban development occurring on the historic channel.

Bingham Creek is generally an intermittent, losing stream that flows only during peak runoff periods or during major storm events. However, as the channel progresses east of 3200 West, various springs discharge groundwater into the creek. In the lower creek section, Bingham Creek flows most of the year.

The channel course, over time, has meandered and overflowed during flood events that have been caused by natural and human-caused events. Historically, the creek has abandoned old channels and formed new channels spreading contaminated alluvial and waste materials across broad areas. The principal aquifer under the creek is recharged along the foothills of the Oquirrh Mountains and discharges downgradient at the Jordan River. Ground water is being addressed as part of another operable unit (OU2).

Bingham Creek Residential Soils:

The Bingham Creek Residential Soils area consists of certain residential development areas in the floodplain of Bingham Creek. Located in the cities of South Jordan and West Jordan, numerous residences were built on the floodplain or over historic channels.

Since most of the historic flow of the creek was diverted by early farmers and ranchers, some creek-borne contaminants were also found near irrigation ditches. Neighborhoods affected include Jordan View Estates, Meadow Green, Fahnian Ranchettes, Vista West, Sugar Factory, and Brookside. Approximately 125 individual residences were addressed as part of three removal actions. Most of these residences were located within 2 blocks of the creek channel.

Site History and Extent of Contamination

During the early days of mining, wastes from mining and mineral processing (mine dumps, mill tailings, and smelter slag) were dumped directly into Bingham Creek or stored adjacent to the creek where they were subject to erosion and transport to the creek. Mining wastes contained elevated levels of lead and arsenic.

Over the years, especially during flood events, these mining and processing wastes washed downstream where they were deposited in creek channels and floodplain.
Lands traversed by Bingham Creek were originally agricultural, but with the growth of Salt Lake City suburbs, several residential neighborhoods were built along the creek, on floodplains, and over historical creek channels.

Concentrations of arsenic and lead found in the Bingham Creek channel in a residential area averaged 202 milligrams per kilogram (mg/Kg) and 5,661 mg/Kg, respectively.

Baseline Risk Assessment

Human Health:

The summary of site risks in the OU1 ROD included the following conclusions:

- A strong relationship exists between arsenic and lead concentrations in soil with arsenic levels about 4% of lead concentrations.
- Other contaminants such as cadmium were present at low levels, below any plausible residential risk-based concentration for soils.
- An evaluation of lead concentrations in soil and clean-up levels was made with the intent of being protective under a residential land use scenario. A range of values were developed using the Integrated Exposure Uptake Biokinetic Model. The following Site-specific parameters were used to help make a risk management decision for the cleanup values.
    - Bioavailability of lead in soil using a juvenile swine model.
    - Relationship between the concentration of lead in soil and house dust.
    - Exposure frequency and duration.
    - Garden vegetable uptake of metals from soil.
- Arsenic was also evaluated and a value was selected that would be protective under a residential land use scenario. This value was developed using the Site-specific measurements listed above under the discussion of lead.

Regulators and Stakeholders developed cleanup goals. In the development of these cleanup goals there were many issues considered including an extensive blood lead and urinary arsenic study conducted in the area.

The range of lead and arsenic concentrations proposed for the cleanup goal was presented to a delegation of Bingham Creek residents at a public meeting. Reasons for uncertainties were explained and residents preferred the clean-up values of 1,100 mg/Kg for lead and 100 mg/Kg for arsenic. As a result, final lead and arsenic cleanup levels were established for residential land use, including vacant land within residential neighborhoods.

Vacant lands outside residential areas were evaluated on the basis of current and future land use. As discussed in Section B.3., response actions conducted in these vacant lands (Bingham Creek channel), employed a lead cleanup level of 2,000 mg/Kg. The ROD concluded that this cleanup level was sufficiently protective for open space, recreational and industrial land uses.

Ecological Risk:

At the time of the ROD the majority of Kennecott South Zone, including OU1, had land uses that provided relatively little habitat for wildlife where meaningful contact with hazardous constituents would occur. Thus, a qualitative ecological risk evaluation was performed as part of a Phase III Endangerment Assessment. In addition, Kennecott conducted a site-wide ecological risk assessment for areas of the larger Kennecott South Zone and North Zone which have substantial wildlife habitat. Although wildlife occasionally visits the area, the land is not primarily wildlife habitat.

Bingham Creek is generally an intermittent, losing stream that flows only during peak runoff periods or during major storm events. However, as the channel progresses east of 3200 West, various springs discharge groundwater into the creek. In the lower creek section, Bingham Creek flows most of the year.

The 1998 OU1 ROD states that "the creek serves mainly as a drainage ditch and does not support aquatic life." Aquatic impacts in the Jordan River are possible following storm events or floods. The Jordan River is not covered under the OU1 decision documents and impacts there were not evaluated. Thus, EPA concluded in the OU1 ROD that there are no actual or threatened releases from OU1 (as well as OU 4, 5, 10, 11 and 17) that pose a present or potential future threat to the environment.

B.3. Response Actions

Decision Documents and Responsible Party

The Kennecott South Zone Site (including OU1) was proposed for the National Priorities List (NPL) on January 18, 1994. Utah Department of Environmental Quality (UDEQ) and EPA withdrew the proposal to list the Kennecott South Zone Site on the NPL in 2008.

In September 1995, the UDEQ, EPA and Kennecott entered into a Memorandum of Understanding (MOU). Pursuant to the terms of the MOU, Kennecott agreed to complete numerous cleanup projects for both the South Zone and nearby Kennecott North Zone Site. Upon Kennecott's completion of the cleanup projects, EPA agreed to take no further action related to final listing of the sites.

On July 2, 2008 EPA Region 8 issued, with concurrence from UDEQ, a request to EPA Headquarters to withdraw the proposed listing of the South Zone Site. Notice within the Federal Register in early September signifies the South Zone's withdrawal.

The following summarizes decision documents and the responsible parties' specific to OU1.

Bingham Creek Channel:

Contaminated tailings were removed from Bingham Creek channel and a number of road crossings and utility corridors were cleaned up in accordance with a January 1993 Action Memorandum. Kennecott and ARCO participated in portions of this work under provisions of the following Orders:

- Unilateral Administrative Order (UAO), Docket No. CERCLA-VIII-93-10, February 18, 1993
- Administrative Order on Consent (AOC), CERCLA VIII 92-01, 1992

Bingham Creek Residential Soils:

Surface soils contaminated with mining wastes were excavated and removed from residential properties in the Bingham Creek floodplain in accordance with May 1991 and June 1995 Action Memoranda. Kennecott and ARCO participated in portions of this work under provisions of the following Orders:

- AOC, Docket No. CERCLA-VIII-91-11, May 20, 1991.
- UAO, CERCLA VIII-95-19 July 21, 1995 (amended October 31, 1995).

A ROD was issued in 1998 for OU1 (as well as other OUs in the Kennecott South Zone). The ROD selected No Further Action. However, as discussed below in the Summary of Response Actions, O&M and other activities are required under the Action Memoranda after the date of the ROD.

Summary of Response Actions

All response actions at OU1 were conducted as time critical removal actions and include.

Bingham Creek Channel:

- Remove mine wastes containing lead over 2,000 mg/Kg to a minimum depth of three feet from Large Bingham Reservoir dam to the downstream side of Brookside Trailer Park.
- Cover remaining contamination and re-contour the creek bed.
- Remove mine wastes from road and utility creek crossings.
- Haul excavated wastes to Kennecott Bluewater Repository or Anaconda Tailings (OU5).

Bingham Creek Residential Removal:

- Excavate soil from 52 properties containing lead above 2,500 mg/Kg and from 75 properties containing lead above 1,100 mg/Kg to a maximum depth of 18-inches and replace with clean soil (conducted in 1991 and 1995-7, respectively).
- Haul excavated wastes to Kennecott Bluewater Repository or Anaconda Tailings (OU5).

Based on UDEQ review of site files, it remains uncertain whether the 52 properties described above were ultimately subjected to further removal action(s) to meet the final lead standard of 1,100 mg/Kg and the arsenic standard of 100 mg/Kg. This is discussed further in sections B.6, B.7 and B.8.

At the time of the ROD, the lower portion of Bingham Creek drainage, located in the Jordan River floodplain was (and still is) used for agriculture, ranching, and industry with no plans to develop this area for residential use. The City of West Jordan is obligated under the Action Memoranda to manage this area through land use planning, zoning, and building permit authorities.

Operation, Maintenance, Monitoring and Reporting

Various documents in the administrative record identify the need for, or an obligation for, local governments or private parties to inspect and maintain response actions and to prepare report on such activities as part of the long-term supervision and operation of the remedy.

The responsibilities, responsible party and controlling document(s) include:

Annual Inspection and Maintenance of the Bingham Creek Channel:

- A January 28, 1993 Action Memorandum states that "*it is anticipated that State, City and County governments will be involved to ensure long-term maintenance of the response action".*
- 1992 AOC with ARCO required inspection and repairs to response actions in the channel for five-years. The 2004 Five-Year Review Report stated that the five-year maintenance period had recently expired and that Salt Lake County had assumed the responsibility for repairs to the channel (as well as the implied need to inspect the channel for necessary repairs). The County accepted responsibility to ensure long-term control over land redevelopment through their existing ordinances and other land use controls in a November 4, 1998 letter to EPA and UDEQ.
- The 2004 Five-Year review Report states that *"in the future, the channel itself will be inspected by EPA contractors (on an annual basis)".*

Based on these statements, it appears that annual inspection of the channel since at least 2004 is the responsibility of EPA and Salt Lake County has agreed to maintain land use controls. The level of compliance with these obligations is discussed in Section B.6. Although the 2004 Five-Year review identified the County as responsible for repairs to the channel, the County has not formally been asked to accept this responsibility.

Control of Land Uses (Bingham Creek and Residential Soils):

- A November 4, 1998 letter from Salt Lake County to EPA and UDEQ identifies the County as responsible for long-term management of properties cleaned-up in unincorporated areas of the County. Management is to include use of existing county ordinances involving land use planning, zoning, and building permits.

- The 1998 OU1 ROD states that the Cities of West Jordan and South Jordan have agreed to supervise long-term management of the site using existing authorities for land use planning, zoning and building permits.
- The 2004 Five-Year Review Report reiterated the responsibilities of the Cities discussed in ROD and explained that the City of West Jordan has received a Brownfields Grant to design a long-term plan for Lower Bingham Creek and nearby areas.

Based on these statements, the Cities of West Jordan and South Jordan have been responsible for land use controls within city limits at least since the last Five-Year Review. Salt Lake County has similar responsibilities for unincorporated portions of OU1. Level of compliance with these obligations is discussed in Section B.6.

B.4. Progress Since Last Five-Year Review

The First Five-Year Review included the following protectiveness statement:

> *"The remedy at OU1 is currently protective of human health and the environment and exposure pathways that could result in unacceptable risks are being controlled."*

Only one issue was identified during the last Five-Year Review (2004). It involved an erosion gully located where drainage from Trans Jordan Landfill access road and Route 111 discharges into Bingham Creek. Trans Jordan Landfill in cooperation with South Jordan City and Kennecott agreed to make the repair.

Based on a communication with Doug Bacon of UDEQ, the repair was completed before the end of 2005 and involved installation of a new drainage culvert and riprap. Photo Nos. 28-30 in Appendix B illustrates the post-repair condition.

Based on discussions with West Jordan and South Jordan Cities, as well as Utah Transit Authority (UTA), certain development planning and infrastructure construction activities have occurred since the last Five-Year Review. These include:

- West Jordan instituted a soils ordinance within the past year requiring developers to enlist in UDEQs Voluntary Cleanup Program (VCP) if there is contamination known or detected on the property intended to be redeveloped. However, the ordinance is undergoing revision and the existing ordinance has not been reviewed by EPA or UDEQ.
- South Jordan described a "hazardous Geologic Map" that is in development by the city engineering department. This map reportedly will illustrate "sensitive land areas" within the city to support land use controls. However, EPA and UDEQ have not been involved in the development of this document or other activities related to land use controls.
- UTA is constructing a Light Rail project in West Jordan traversing portions of OU1 and incorporating the historic Union Pacific rail line not previously addressed during removal actions. UDEQ has been providing oversight of this project.

B.5. Five-Year Review Process

Administrative Components

This is the second Five-Year Review for OU1. The Five-Year Review was led by Rebecca Thomas, EPA Project Manager. The following Team Members participated in the review:

- Doug Bacon, UDEQ Remedial Project Manager
- Scott Everett, UDEQ Toxicologist
- David Allison, UDEQ Community Involvement Coordinator

EPA Contractors:

- Kenneth Napp, HDR Engineering, Inc.

This Five-Year Review consisted of the following activities: a review of relevant documents, a site inspection and meeting with representatives of EPA, UDEQ and Kennecott. The schedule for the review was extended through March 2010.

Community Notification and Involvement

A display ad to announce the Five-Year Review and to invite public input was published in the Salt Lake Tribune and Deseret News on Oct. 2, 2009 and in the West Valley Journal on Oct. 15, 2009.

Superfund community involvement staff from UDEQ conducted interviews with various Kennecott South Zone stakeholders during the period, September to December, 2009. These interviews are valuable to the five-year review process. Respondents provide their views regarding the Kennecott South Site cleanup and its continued protectiveness. Often, EPA and UDEQ discover new information from these interviews to be considered in the five-year review. A summary of the interviews is provided as Appendix C.

Document Review

In performing this Five-Year Review, the following documents were reviewed:

- First Five-Year Review Report, Kennecott South Zone OU3 Butterfield Canyon Creek, Herriman Residential and Agricultural lands, OUs 6, 7, 17 and 18, September 30, 2009.
- Letter from EPA to Masters at Mountain View Development Company regarding requirements to ensure development is consistent with the OU1 remedy. April 8, 2009.
- First Five-Year Review Report for Kennecott South Zone OU1, 4, 5, 10, 11, 17, prepared by EPA, June 2004.
- Preliminary Remediation Goals for Addressing Risks to Human Health from Exposure to Chemicals in Kennecott Soil, prepared by EPA, December 1999.

- Letter from Salt Lake County to EPA regarding long-term management of Bingham Creek properties. November 4, 1998
- EPA Record of Decision, Kennecott (South Zone) OU1, November 3, 1998.
- Action Memorandum for a Time-Critical Removal Action at the Bingham Creek Channel – Phase Two Site. January 28, 1993.

The following individuals provided supplemental technical information:

- Rebecca Thomas - EPA
- Doug Bacon - UDEQ

Data Review

No analytical or other data relevant to this Five-Year Review was collected during the review period. Analytical data collection was not required under the remedy. Annual inspections and other elements of the institutional control portion of the remedy that might have resulted in reports or data were not performed as discussed in Section B.6.

Site Inspection

The Site Inspection was performed on July 25, 2009, by the following personnel:

- Rebecca Thomas, EPA Remedial Project Manager
- Doug Bacon, UDEQ Remedial Project Manager
- Dave Allison, UDEQ Community Relations
- Brian Vinton, North American Mine Services Inc.(contractor to Kennecott Utah Copper)

The purpose of the Site Inspection was to observe current Site conditions and remedy elements. The Site Inspection consisted largely of a drive-by tour of the most readily observable portions of the Bingham Creek Channel from the Jordan River, upstream to the Anaconda Tailings (OU5).

Where observed, the stream banks appeared heavily vegetated with no obvious erosional features. The channel itself is approximately 10 miles long and so observation of the entire channel was not possible during a one-day Site inspection. As discussed in Section B.3., the remedy for OU1 includes an annual inspection of the entire channel by EPA as well as Salt Lake County.

Portions of the residential area of OU1 subjected to response actions to address contaminated yard soils were also observed from roadways during the Site visit. Other than a residential development under construction (2690 West 8410 South in West Jordan), all properties observed appeared in good condition and were well maintained. As discussed in Section B.6., the new residential development is being constructed consistent with the OU1 remedy.

Additional site visits were made by Doug Bacon, the UDEQ Project Manager during the period from September to December 2009. One of these visits (December 1, 2009) was made to address specific questions about the site condition that arose during the preparation of this report.

Portions of the Bingham Creek channel that were not seen during the July 25, 2009 Site Inspection were observed by UDEQ personnel on October 6 and December 1, 2009. The condition of the channel appeared to be good, including the response actions that left mine waste in-place. Photographs of the channel and surrounding lands taken on July 25 and December 1, 2009 are provided as Photo Nos. 1-10 in Appendix B.

In addition, two development activities have occurred since the first Five-Year Review. These include:

- UTA light rail project in West Jordan.
- Masters at Mountain View development at 2690 West 8410 South in West Jordan.

The UTA and Masters at Mountain View projects are being constructed with oversight by UDEQ and EPA, respectively.

B.6. Technical Assessment

Question A: Is the Remedy Functioning as Intended by the Decision Documents?

No, the remedy is not functioning as intended by the decision documents.

The decision documents for the Site include:

- 1991 Action Memorandum (Phase I - Bingham Creek Channel Response Action)
- 1993 Action Memorandum (Phase II - Residential Response Action)
- 1995 Action Memorandum (Phase III - Residential Response Action)
- 1998 OU1 ROD

Remedy elements identified in decision documents are summarized below. An assessment of remedy element functionality is also provided.

1. Bingham Creek channel covered wastes.

   This response action was constructed in accordance with the 1991 Action Memorandum. Its condition at the time of the July 25, 2009 Site Inspection (and during subsequent observations made by UDEQ) appeared good with stable and heavily vegetated banks. As discussed below under Item No.2, annual inspections of the channel have not been formally conducted by EPA since the last Five-Year Review. However, the channel condition observed during this Five-Year Review shows that this remedy element is functioning as intended.

2. Maintenance, Monitoring and Reporting of Bingham Creek channel covered wastes.

Based on information summarized in Section B.3., annual inspections (and reporting) must be performed, with EPA currently holding the position of responsibility. Salt Lake County accepted responsibility to ensure long-term control over land redevelopment through their existing ordinances and other land use controls in a November 4, 1998 letter to EPA and UDEQ.

Based on the information available, such inspections, maintenance and reporting have not been performed on a regular basis. Therefore, this remedy element is not functioning as intended in the 1993 Action Memorandum and as described in the First Five-Year Review.

3. Bingham Creek Residential Removal.

This response action was constructed in accordance with the 1993 and 1995 Action Memoranda. Under the response actions, contaminants of concern in soil present above action levels identified in the Action Memoranda were removed to a depth of 18-inches and replaced with clean fill. Therefore, the response action will remain functioning as intended under the Action Memoranda unless the clean backfill is breached such that contaminants above action levels (if any) are present at the surface.

Although the response actions were conducted in accordance with the Action Memoranda (and therefore may be functioning as intended), it is not clear from the site files whether all properties ultimately were cleaned to the final arsenic standard of 100 mg/Kg or the final lead standard of 1,100 mg/Kg. This is due to an inconsistency in the lead action level required in the Action Memoranda for the Phase I removal action (2,500 mg/Kg) and the Phase II and III removal action (1,100 mg/Kg).

The OU1 ROD identifies the appropriate action level for lead in a residential setting as 1,100 mg/Kg. Therefore, if the Phase I residential cleanup achieved a lead standard of 2,500 mg/Kg, this portion of the remedy would not be functioning as intended by the ROD.

This is discussed further in sections B.7 and B.8.

4. Bingham Creek Land Use Controls.

Based on information summarized in Section B.3., land use controls on incorporated and unincorporated portions of OU1 are the responsibility of the Cities and County, respectively. These controls may, for example, regulate future development or residential homeowner activities such as excavations. Although documents reviewed for this report indicate the Cities and County have accepted

the responsibility, interviews with city officials indicate that land use controls have not been formalized and therefore, are not fully implemented.

It is also possible that the Cities and County do not possess accurate mapping to show the locations of waste remaining in-place. Therefore, this remedy element is not functioning as intended by the decision documents.

Interviews with the Cities and County and various recent site inspections indicate that, with one exception, no dwellings or other buildings have been constructed in OU1 since the last Five-Year Review. The single exception is the Masters at Mountain View development located at 2690 West 8401 South in West Jordan. This development is occurring with EPA involvement to ensure the development is consistent with the remedy. In addition, UTA is constructing light rail in West Jordan City. This work is being conducted under oversight from UDEQ and is being implemented consistent with the remedy.

Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives (RAOs) Used at the Time of the Remedy Selection Still Valid?

Yes, the exposure assumptions, toxicity data, cleanup levels and remedial action objectives used at the time of the remedy selection are still valid.

Exposure Assumptions and Toxicity Data

Cleanup levels set in the OU1 ROD are similar (and generally lower) to those adopted for identical land uses at several OUs in the Kennecott South Zone that underwent a Five-Year Review in 2009 (September 30, 2009). These include OU3 Herriman Residential & Agricultural Lands. At this OU, residential arsenic and lead cleanup levels are 100 mg/Kg and 1,200 mg/Kg, respectively. The cleanup levels for these chemicals in the OU1 ROD for residential land use are 100 mg/Kg and 1,100 mg/Kg.

Given the similarity in residential cleanup levels for lead and arsenic between OU3 and OU1, certain conclusion regarding the current protectiveness of these cleanup levels published in the OU3 Five-Year Review were incorporated into the following discussion.

Human Health

Changes in Exposure Pathways:

The OU1 ROD set cleanup levels for arsenic and lead for developed and undeveloped residential lands. It also established the adequacy of lead levels previously used in response actions in open space, recreational and industrial lands at the Kennecott South Zone Site.

However, an arsenic cleanup goal was not identified in the ROD for open space, recreational or industrial land uses. Therefore, a cleanup goal should be set for an exposure scenario involving arsenic and these land uses. In addition, the potential exists for commercial land uses in OU1.

No cleanup levels were set for this land use in OU1. Therefore, cleanup levels should be set for a commercial worker exposure pathway.

Changes in Toxicity, and Other Contaminant Characteristics:

There have been no changes in toxicity factors or characteristics for contaminants of concern (COCs) that were used to develop cleanup levels.

Changes in Risk Assessment Methods:

There has been no change to standardized methodology that could affect the protectiveness of response actions.

Expected Progress Towards Meeting RAOs:

Because past removal actions were designed to achieve final remedial cleanup goals, no further action was selected as the remedy for OU1 and no RAOs were identified.

Ecological Assessment:

EPA concluded in the OU1 ROD that there are no actual or threatened releases from OU1 (as well as OU 4, 5, 10, 11 and 17) that pose a present or potential future threat to the environment. Therefore, ecological impacts were not considered further in this Five-year review.

Cleanup Levels

ARAR-Based Cleanup Levels:

Site cleanup levels are risk-based concentrations. However, all ARARs including any potential ARAR-based cleanup levels will be evaluated for the entire Kennecott Site as part of the development of an Explanation of Significant Differences (ESD) that will pertain to all RODs except OU2. This evaluation is expected to be completed in the spring of 2011.

Risk-Based Cleanup Levels:

Surface Soils/Mine Waste:

Risk-based cleanup levels were identified in the OU1 ROD as well as subsequent documents related to remedial design. These risk-based cleanup levels include:

1. Arsenic - A cleanup level of 100 mg/Kg was established for residential land use only. This standard is generally still adequate to ensure protectiveness for public health and the environment. No arsenic cleanup level was established for other land uses including recreational, open space, commercial or industrial. Therefore, a cleanup level should be set for an exposure scenario involving arsenic and these land uses.

2. Lead - A cleanup level of 1,100 mg/Kg was established for residential land use and a cleanup level of 2,000 mg/Kg was established for open space, recreational and industrial lands. This standard is generally still adequate to ensure protectiveness for public health and the environment. No lead cleanup level was established for commercial land use

which is a plausible future land use at OU1. Therefore, a cleanup level should be set for an exposure scenario involving lead and this land use.

Review of existing cleanup levels and establishment of arsenic and lead cleanup levels for land uses discussed above will be documented in the ESD to be completed in the spring of 2011.

Other ARARs

Since no further response action was required under the 1998 ROD (unless redevelopment proposals are submitted), EPA did not list any federal or state ARARs under the ROD for continued remedial work.

All ARARs will be evaluated for the entire Kennecott Site during preparation of the ESD discussed above.

Question C: Has Any Other Information Come to Light that Could Call Into Question the Protectiveness of the Remedy?

No other information has come to light during the Five-Year Review that could call into question the current protectiveness of the remedy.

Technical Assessment Summary

According to the information collected and reviewed, the physical response actions are functioning as intended by decision documents. However, some inspection, maintenance, and land use control elements of the response actions are not functioning as intended by decision documents.

B.7. Issues

Based on information collected during this Five-Year Review Report, the following issues are identified in Table 2:

Table 2 - Issues for OU1

Item No.	Issues	Affects Current Protectiveness	Affects Future Protectiveness
1	Bingham Creek Channel annual inspection and reporting was not performed.	No	Yes
2	A maintenance and reporting program for Bingham Creek Channel response actions has not been developed or implemented.	No	Yes
3	Land use controls have not been implemented (including finalization and approval by EPA Region 8 and UDEQ) by West Jordan and South Jordan Cities and Salt Lake County.	No	Yes
4	A cleanup goal has not been identified at OU1 for arsenic under recreational, open space, commercial or industrial land uses or for lead under a commercial land use.	No	Yes
5	It is unclear what arsenic and lead cleanup levels were achieved at the residential properties addressed under the 1991 Action Memorandum (Phase I).	Yes	Yes
6	ARARs have not been reviewed as part of this Five-Year Review.	No	Yes

B.8. Recommendations and Follow-Up Actions

The recommendations and follow-up actions for the issues are summarized below in Table 3:

Table 3 - Recommendations and Follow-Up Actions for OU1

Item No.	Issues	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
						Current/	Future
1	Bingham Creek Channel annual inspection and reporting was not performed.	EPA will begin annual inspection of response actions in the channel and will prepare a report for the site files.	EPA	EPA/UDEQ	6/30/11	No	Yes
2	A maintenance and reporting program for Bingham Creek Channel response actions has not been developed or implemented.	EPA and UDEQ will coordinate with local authorities to define roles for this portion of the remedy.	EPA/UDEQ	EPA/UDEQ	6/30/11	No	Yes
3	Land use controls have not been formalized (including finalization and approval by EPA Region 8 and UDEQ) by West Jordan and South Jordan Cities and Salt Lake County.	EPA will provide the Cities and County with mapping showing the location of wastes remaining in-place. The Cities and County will develop, formalize and implement land use controls for OU1.	EPA/UDEQ	EPA/UDEQ	6/30/11	No	Yes
4	A cleanup goal has not been identified at OU1 for arsenic under recreational, open space, commercial or industrial land uses or for lead under a commercial land use.	Select appropriate cleanup levels and document in an ESD to be prepared for the entire Kennecott Site (except for OU2).	EPA/UDEQ	EPA/UDEQ	Spring 2011	No	Yes
5	It is unclear what arsenic and lead cleanup levels were achieved at the residential properties addressed under the 1991 Action Memorandum (Phase I).	Determine what arsenic and lead concentration standard the fifty properties under Phase I were remediated too.	EPA/UDEQ	EPA/UDEQ	12/31/10	Yes	Yes
6	ARARs have not been reviewed as part of this Five-Year Review.	Perform ARARs review and document in an ESD to be prepared for the entire Kennecott Site (except for OU2).	EPA/UDEQ	EPA/UDEQ	Spring 2011	No	Yes

B.9. Protectiveness Statement

A protectiveness determination of the remedy at OU1 cannot be made at this time until further information is obtained. Further information will be obtained by determining what arsenic and lead concentration standards the fifty properties under the Phase I residential removal action were remediated to. It is expected that this additional information will be obtained by December 31, 2010, at which time a protectiveness determination will be made. In order for the remedy to be protective in the long-term, land use controls and annual inspections and maintenance of certain response actions required by decision documents must be fully implemented.

B.10. Next Review

The Site requires ongoing Five-Year Review in accordance with CERCLA § 121 (c). The next five-year review for the Site will be performed no later than September 2015, five-years from the date of this review.

C. ANACONDA TAILINGS - OU5

C.1. Site Chronology

Table 4 summarizes the important events and relevant dates in the Site's chronology.

Table 4 - Chronology of Site Events

Date	Activity
Jan-93	UAO issued to ARCO, for EE/CA and removal (CERCLA VIII 93-06)
1997	Completion of response action
Sep-98	ROD
Dec-98	RD/RA Consent Decree with ARCO
1998-2003	Annual O&M reports submitted to EPA
Jun-04	First Five-Year Review.

C.2. Background

Location and Setting

Anaconda Tailings, also known as Copperton Tailings, ARCO Copperton Tailings and Utah-Apex Tailings, consists of approximately 3.5 million tons of lead, arsenic, zinc, and silver-bearing, fine grained sediments consolidated into a repository comprising 41 acres adjacent to Bingham Creek (See Map of OU5 in Appendix A). Land use is industrial/mining and since response actions have been completed, is used for open space. The nearest residential neighborhood is Copperton, about 3/4 mile away. The site is fenced and is not accessible to the general public.

Operable Unit 5 also includes Bastian Ditch which originates in the vicinity of Anaconda Tailings and roughly follows Utah Highway 111 southward nearly to the location of Butterfield Creek. The ditch is no longer in use. However, remnants can be seen along the south side of Anaconda Tailings and on Kennecott lands south of Anaconda Tailings. Current land use along the ditch is industrial and agricultural and the nearest residential neighborhood is Copperton, 3/4 mile away (at northern end of the ditch).

Site History and Extent of Contamination

Anaconda Tailings Impoundment:

Anaconda Tailings Site was originally a tailings pond constructed in 1914 to trap tailings produced by Utah Apex and Bingham New Haven Mills upstream in Bingham Canyon. Tailings were sluiced to the site via flumes. The pond allowed most tailings to settle out. Water, containing acids, heavy metals, and residual tailings, was then sent back to Bingham Creek or used by farmers for irrigation. Erosion, seepage and tailwaters from the tailings created contamination along Bingham Creek as well as in Bastian Ditch, discussed below.

There was approximately 1.3 to 1.5 million cubic yards of tailings present on the site. Average arsenic and lead concentrations were found to be 394 mg/Kg and 6,244 mg/Kg, respectively. Concentrations of lead at percent levels were found frequently at depth in the tailings.

Tailings showed some acid generating potential and evidence of some migration of metals in the acidic zone was found. However, deeper tailings samples showed neutralizing potential. During an investigation of the original tailing impoundment, subsurface soil and ground water provided no evidence of impacts to ground water from the site.

Ground water quality in the area is poor due to a sulfate and metals plume associated with upgradient sources. Groundwater is being addressed under a 2000 ROD.

Bastian Ditch:

The Bastian Ditch was constructed in the 1880's when water was diverted from Bingham Creek near the Oquirrh foothills to the Bastian Sink vicinity. The ditch conveyed irrigation waters to ranch and farm land south of Bingham Creek and ultimately carried water as far south as Copper Creek. The ditch captured tailings (originating from the Anaconda Tailings) that entered the creek upstream of the diversion. Ditch remnants could be seen along the south side of Anaconda Tailings and on Kennecott lands south of Anaconda Tailings.

Subsequent sampling showed scattered elevated lead values in the southern extension of the ditch system.

Baseline Risk Assessment

See Section B.2.

C.3. Response Actions

Decision Documents and Responsible Party

See Section B.3. for a general discussion of NPL status and enforcement history.

Tailings deposited in Bastian Ditch were removed by Kennecott and ARCO on their respective lands (west of Route 111) in accordance with decision documents under provisions of the following Orders:

- UAO, CERCLA VIII 93-06, January 15, 1993.
- AOC, CERCLA VIII 98-09, 1998.

Anaconda Tailings were consolidated and capped by ARCO in accordance with Decision Documents under provisions of the following Order:

- UAO, CERCLA VIII 93-06, January 15, 1993.

ARCOs obligations under the 1993 administrative order have been satisfied. Further, EPA and ARCO entered into a consent decree resolving ARCO's liability for the Bingham Creek Channel (OU 1); the Anaconda/ARCO Tailings (OU 5); and the Bastian Ditch and Bastian Sink (OU 17). See Consent Decree between the United States of America and Atlantic Richfield Company, Civil Action No. 2:95-cv-0698 entered by the U.S. District Court on December 16, 1999 ("ARCO CD").

There are no outstanding financial assurance issues.

A ROD was issued in 1998 for OU5 (as well as other OUs in the Kennecott South Zone). The ROD selected No Further Action. However, as discussed below in the Summary of Response Actions, O&M and other activities are required under Action Memoranda after the date of the ROD.

Summary of Response Actions

All response actions at OU5 were conducted as time critical removal actions and include.

Anaconda Tailings Impoundment:

- Consolidate tailings containing lead at or above a concentration of 2,000 mg/Kg from a 96-acre parcel on OU5 as well as soils excavated from ARCO projects along Bingham Creek to a repository on the western end of OU5. The repository is situated on 41 acres of the original 96 acre site.
- Cap consolidated mine wastes with a high-density polyethylene liner, clay, and vegetated soils.

- Install run-off and run-on controls, including a retention basin designed to withstand a 100-year storm event.

Bastian Ditch:

- Excavate mine wastes and either place them in the repository described above or transport to Bluewater Repository.

Operation, Maintenance, Monitoring and Reporting

ARCO agreed to perform long-term maintenance of the capped repository. There are upgradient and downgradient ground water monitoring wells to insure the cap is effective in prevention of leaching.

However, the requirement for five-years of ground water monitoring (under the 1993 UAO) was satisfied at the time of the first Five-Year Review. In addition, Salt Lake County agreed to use its authorities in land use planning, zoning, and building permits to insure cap integrity is not compromised.

The Site inspection (Section C.5.) indicated that maintenance of the capped facility is occurring. However, the lack of reporting requirements precludes any document review associated with cap maintenance.

C.4. Progress Since Last Five-Year Review

The First Five-Year Review included the following protectiveness statement:

> *"The remedy at OU5 is currently protective of human health and the environment and exposure pathways that could result in unacceptable risks are being controlled."*

No issues were identified in the first Five-Year Review requiring resolution.

Since the first Five-Year Review, ARCO has been conducting regular inspections of response action features in OU5. However, no reporting has been performed.

C.5. Five-Year Review Process

Administrative Components and Community Notification and Involvement

See Section B.5.

Document Review

- Action Memorandum for a Time-Critical Removal Action at the ARCO Tailings Site, Salt Lake County, Utah. August 5, 1993.

Also see Section B.5.

Data Review

No analytical or other data relevant to this Five-Year Review was collected during the review period.

Site Inspection

Two Site Inspections were performed on July 25, and November 18, 2009, by the following personnel:

- Rebecca Thomas, EPA Remedial Project Manager
- Doug Bacon, UDEQ Remedial Project Manager
- Dave Allison, UDEQ Community Relations
- Brian Vinton, North American Mine Services Inc.(contractor to Kennecott Utah Copper)
- Steve Anderson, Anderson Engineering (contractor to ARCO)

The Site inspection of OU5 was limited due to inaccessibility of the capped repository (locked gate), which was observed from a distance. Therefore, Doug Bacon of UDEQ conducted a more thorough inspection of OU5 on November 18, 2009. The purpose of the inspection was to visually verify stability of the repository cap, successful growth of vegetation, and condition of run-on/run-off controls.

The inspection revealed that the repository and cap are stable. There were no visible gullies or erosional cuts in the cap surface. Photographs of the repository taken on July 25 and November 18, 2009 are provided as Photo Nos. 11-26 in Appendix B. There were a few minor gopher holes located along the southern repository boundary just east of the run-off control ditch. Depth of gopher holes could not be determined, but no visible tailings were seen. Vegetative cover on the repository cap is primarily grasses, with a few rabbit brush or sage plants.

Run-off control ditches (surrounding the repository) were vegetated and showed very little signs of use. Precipitation that percolates through the soil cover and to the gravel drainage blanket above the repository clay layer is directed towards drainage ditches. Water then is directed to a sediment basin designed to withstand the maximum flood event for this area. The sediment basin, its emergency overflow channel and drainage pipe were all in good condition.

Although the July 25th Site Inspection was limited, one feature of interest was noted. A one-acre pile of consolidated and uncapped wastes was present at the toe of Large Bingham Reservoir dam. Concentrations of arsenic and lead at the surface of this pile reportedly are not known. This feature is identified on a Map of OU5 presented in Appendix A and in Photo No. 27 in Appendix B.

C.6. Technical Assessment

Question A: Is the Remedy Functioning as Intended by the Decision Documents?

No, the remedy is not functioning as intended by the decision documents.

Site decision documents include:

- 1993 Action Memorandum
- 1998 OU1 ROD

Remedy elements identified in decision documents are summarized below. An assessment of remedy element functionality is also provided.

1. Condition of Response Action

   Based on the results of the Site Inspection, the cap and surface water control features are in good condition. Therefore, this remedy element is functioning as intended.

   The suspected uncharacterized one-acre area of consolidated material just east of the Large Bingham Reservoir Dam is of potential concern. Although the site is currently secured, knowledge of chemical concentrations at the surface would be helpful during development of land use controls discussed below.

2. Land Use Controls

   Based on information summarized in Section C.3., land use controls on OU5 are the responsibility of Salt Lake County.

   Although documents reviewed for this report indicate the County has accepted responsibility, interviews with County officials indicate that land use controls have not been formalized and are not fully implemented. It is also likely the County does not possess accurate mapping to show locations of waste remaining in-place. Therefore, this remedy element is not functioning as intended by decision documents.

Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives (RAOs) Used at the Time of the Remedy Selection Still Valid?

Human Health:

Changes in Exposure Pathways:

These have been no changes in land use or potentially exposed populations. Therefore, there have no changes in exposure pathways.

Changes in Toxicity, and Other Contaminant Characteristics:

There have been no changes in toxicity factors or characteristics for COCs that were used to develop cleanup levels.

Changes in Risk Assessment Methods:

There has been no change to standardized methodology that could affect protectiveness of the response action.

Expected Progress Towards Meeting RAOs:

Because past removal actions were designed to achieve final remedial cleanup goals, no further action was selected as the remedy for OU5 and no RAOs were identified.

Ecological Assessment:

EPA concluded in the OU1 ROD that there are no actual or threatened releases from OU5 (as well as OU 1, 4, 10, 11 and 17) that pose a present or potential future threat to the environment. Therefore, ecological impacts were not considered further in this Five-Year Review.

Cleanup Levels:

ARAR-Based Cleanup Levels:

Site cleanup levels are risk-based concentrations. However, all ARARs including any potential ARAR-based cleanup levels will be evaluated for the entire Kennecott Site as part of the development of an ESD that will pertain to all RODs except OU2. This evaluation is expected to be completed in the spring of 2011.

Risk-Based Cleanup Levels:

Surface Soils/Mine Waste:

The 1993 Action Memorandum identified 2,000 mg/Kg lead as the concentration above which mine wastes at OU5 were consolidated and capped. The 1998 ROD recognized this concentration as protective for open space, recreational and industrial land uses.

Given that there have been no changes to exposure pathways, toxicity or risk assessment methods that would affect calculation of a lead cleanup goal, this standard is generally still adequate to ensure protectiveness for public health and the environment under recreational, open space and industrial land uses.

No arsenic cleanup level was established for OU5. Therefore, a cleanup level should be set for arsenic under recreational, open space and industrial land uses. Review of existing cleanup levels and establishment of an arsenic cleanup level for recreational use will be documented in the ESD discussed above.

Other ARARs:

Since no further response action was required under the 1998 ROD (unless redevelopment proposals are submitted), EPA Region 8 did not list any federal or state ARARs under the ROD for continued remedial work.

All ARARs will be evaluated for the entire Kennecott Site during preparation of the ESD discussed above.

Question C: Has Any Other Information Come to Light that Could Call Into Question the Protectiveness of the Remedy?

It is suspected that portions of Bastian Ditch containing tailings deposits were not subjected to response actions. These may include, but are not limited to:

- Where Route 111 crosses the ditch
- Where the ditch crosses the Trans-Jordan Landfill
- Segments south of 11800 South

These and other segments of the ditch are candidates for ICs that would include land use controls to minimize the possibility of unacceptable human exposure to COCs.

No other information has come to light during the Five-Year Review that could call into question current protectiveness of the remedy.

Technical Assessment Summary

According to information collected and reviewed, physical response actions are functioning as intended by decision documents. However, land use control portions of response actions are not functioning as intended by decision documents. In addition, ARCO is not required to provide reports of their operation, monitoring and maintenance activities for the cap at their repository. Reporting (including reports on cap stability) is necessary to demonstrate and document that such activities are occurring between Five-Year Reviews.

C.7. Issues

Based on the information collected during this Five-Year Review Report, the following issues are identified in Table 5:

Table 5 - Issues for OU5

Item No.	Issues	Affects Current Protectiveness	Affects Future Protectiveness
1	Land use controls have not been implemented by Salt Lake County. In addition, reporting on land use control performance was not required but is necessary to ensure that ICs are functioning.	No	Yes
2	A one acre sized uncapped/uncovered waste pile is present at the toe of the Large Bingham Reservoir dam. Arsenic and lead concentrations at the surface of this feature are unknown.	No	Yes
3	ARCO is not required to provide reports of their operation, monitoring and maintenance activities for the cap at their repository. Reporting is necessary to demonstrate and document that such activities are occurring between Five-Year Reviews.	No	Yes
4	Segments of the Bastian Ditch may still contain tailings.	No	Yes
5	A cleanup goal has not been identified at OU5 for arsenic under recreational, open space, commercial or industrial land uses.	No	Yes
6	ARARs have not been reviewed as part of this Five-Year Review.	No	Yes

C.8. Recommendations and Follow-Up Actions

The recommendations and follow-up actions for the issues are summarized below in Table 6:

Table 6 - Recommendations and Follow-Up Actions for OU5

Item No.	Issues	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
						Current/	Future
1	Land use controls have not been implemented by Salt Lake County. In addition, reporting on land use control performance was not required but is necessary to ensure that ICs are functioning.	Develop, formalize and implement land use controls for OU5 and report on their implementation and functionality.	EPA/UDEQ	EPA/UDEQ	6/30/11	No	Yes
2	A one acre sized uncapped/uncovered waste pile is present at the toe of the Large Bingham Reservoir dam. Arsenic and lead concentrations at the surface of this feature are unknown.	Develop a land use restriction.	ARCO	EPA/UDEQ	6/30/11	No	Yes
3	ARCO is not required to provide reports of their operation, monitoring and maintenance activities for the cap at their repository. Reporting is necessary to demonstrate and document that such activities are occurring between Five-Year Reviews.	UDEQ will perform annual inspections and will document the condition of the remedy.	UDEQ/ARCO	EPA/UDEQ	12/31/10	No	Yes
4	Segments of the Bastian Ditch may still contain tailings.	Develop a land use restriction.	EPA/UDEQ	EPA/UDEQ	6/30/11	No	Yes
5	A cleanup goal has not been identified at OU5 for arsenic under recreational, open space, commercial or industrial land uses.	Select appropriate cleanup levels and document in an ESD to be prepared for the entire Kennecott Site (except for OU2).	EPA/UDEQ	EPA/UDEQ	Spring 2011	No	Yes
6	ARARs have not been reviewed as part of this Five-Year Review.	Perform ARARs review and document in an ESD to be prepared for the entire Kennecott Site (except for OU2).	EPA/UDEQ	EPA/UDEQ	Spring 2011	No	Yes

C.9. Protectiveness Statement(s)

The remedy at OU5 currently protects human health and the environment through actions that isolate contaminants. However, in order for the remedy to be protective in the long-term, land use controls must be fully implemented.

C.10. Next Review

The Site requires ongoing Five-Year Review in accordance with CERCLA § 121 (c). The next five-year review for the Site will be performed by September 2015, five-years from the date of this review.

D. OTHER OPERABLE UNITS

The following sections of this report provide a brief discussion of the status of OUs 4, 10, and 11.

D.1. Large Bingham Reservoir - OU4

The current Large Bingham Reservoir replaced leaking and unlined reservoirs retired in 1991(See Map of OU4 in Appendix A). The exiting facility is triple lined and impounds storm water and mineral extraction process water and other waters managed by Kennecott Utah Copper in the South Zone. The performance of this facility is monitored through a Utah Ground water Permit (UGW 350006). Permit compliance involves meeting hydraulic head limitations in the reservoirs as well as ground water quality as measured in downgradient monitoring wells. Permit compliance is the only performance measure for OU4.

Based on a December 2, 2009, email from Dan Hall of UDEQ Division of Water Quality, Kennecott is in compliance with UGW 350006 for the Large and Small reservoirs of Bingham Canyon. The permit is up for renewal at the end of 2010.

D.2. Copperton Soils - OU10

Historical photographs revealed that the eastern end of the town of Copperton was constructed on a tailings deposit (See Map of OU10 in Appendix A). However, the 1998 ROD explained that the concentrations of hazardous substances were low and well beneath action levels for residential property.

Therefore, conditions at this OU allow for unrestricted use and no further five-year reviews of this OU are required.

D.3. Bingham Canyon - OU11

The Bingham Canyon OU consists of multiple historic mining sites located within the active Kennecott mine operation (See Map of OU11 in Appendix A). Some of these historic mine sites were at one time considered candidates for active cleanup. However, since the first Five-Year Review in 2004, all but three of the inventoried historic mining sites have been buried or subsumed by the open pit of the active mine operation. A report entitled "Oquirrh Mountain Mining and the Environment" by Dr. Eva Hoffman of USEPA (2005), provides the following site descriptions

The Yellow Cake Plant (facility ID #83) was located on property owned by Energy Fuels in the 1980s (until the property was acquired by Kennecott Utah Copper). The process was a uranium recovery plant that treated effluent from Kennecott's Precipitation Plant with an ion-exchange circuit. The plant was closed in 1989. In the early 90's Kennecott instructed the operator to remove everything from the property. The cleanup was performed by Energy Fuels Nuclear Inc., supervised by UDEQ's Division of Radiation Control and observed by Kennecott.

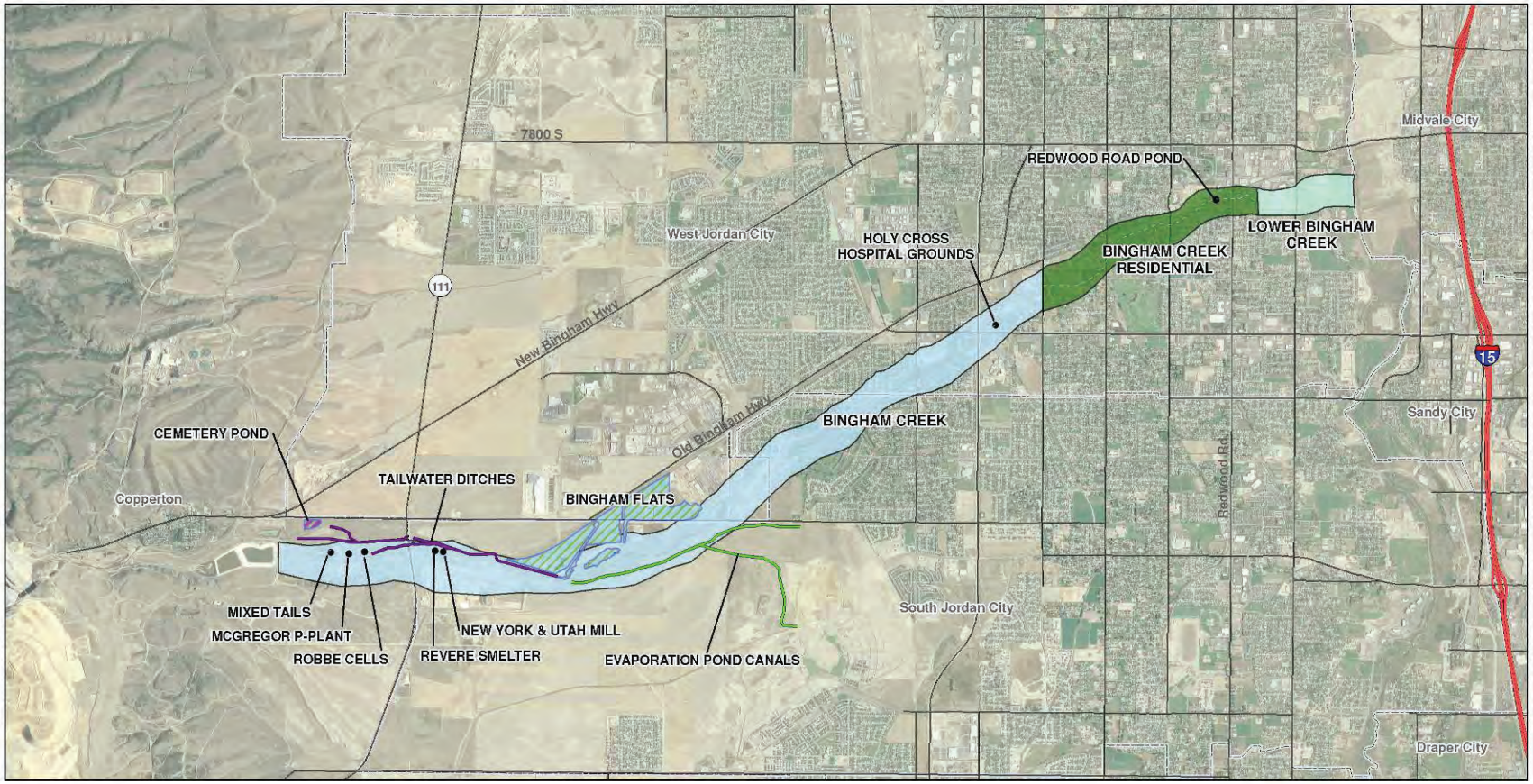
As noted in the 2005 report, the site is suitable for unrestricted land use and currently is the location for a materials storehouse operated by Kennecott.

The Lead Mine Mill (facility ID #1) was built in 1883 and operated until it burned in 1896. The milling process included the grinding and crushing of lead, silver and gold ores. A pyretic smelter was then erected at the site and operated until 1901. Kennecott reported to EPA that during operations the mill processed 70,000 tons of lead, silver and gold ore leaving approximately 46,667 tons of tailings containing at least 1400 tons of lead (Kennecott 104e, 1991). Due to the site being buried under the Precipitation Plant site, the site was closed out in the Bingham Creek ROD. The Lead Mine Mill will fall under the scope of the characterization and land use controls development actions being pursued by Kennecott at the Precipitation Plant site (OU24). Kennecott Utah Copper intends to negotiate land use controls (through an environmental covenant) with the Agencies under the pending North Zone & South Zone Consent Decree.

The C.W.Watson's Jig (facility ID #40.14) was located in the vicinity of the current Kennecott Utah Copper Precipitation Plant. The jig was used to collect placer gold in Bingham Creek Canyon in the early 1890s. The water and probable feed used by the jig was flumed from a tunnel (Watson) located 2,000 feet up gradient in Bingham Creek Canyon. In 1903 the site was used by Utah Copper Company for tailings storage. The Bingham Creek ROD gave the site a No Further Action status from CERCLA response action because of the site's inaccessibility or non-existence. The site does exist but is only accessible to mine workers.

The forthcoming ESD will evaluate the status of all historic features.

Appendix A - Maps



OU1

- BINGHAM CREEK
- BINGHAM CREEK RESIDENTIAL
- LOWER BINGHAM CREEK
- BINGHAM FLATS
- CEMETERY POND
- EVAPORATION POND CANALS
- TAILWATER DITCHES
- HISTORIC SITE/ WASTE STORAGE LOCATION

Note: All areas and sites are in approximate location.

N

0 4,000 8,000 Feet

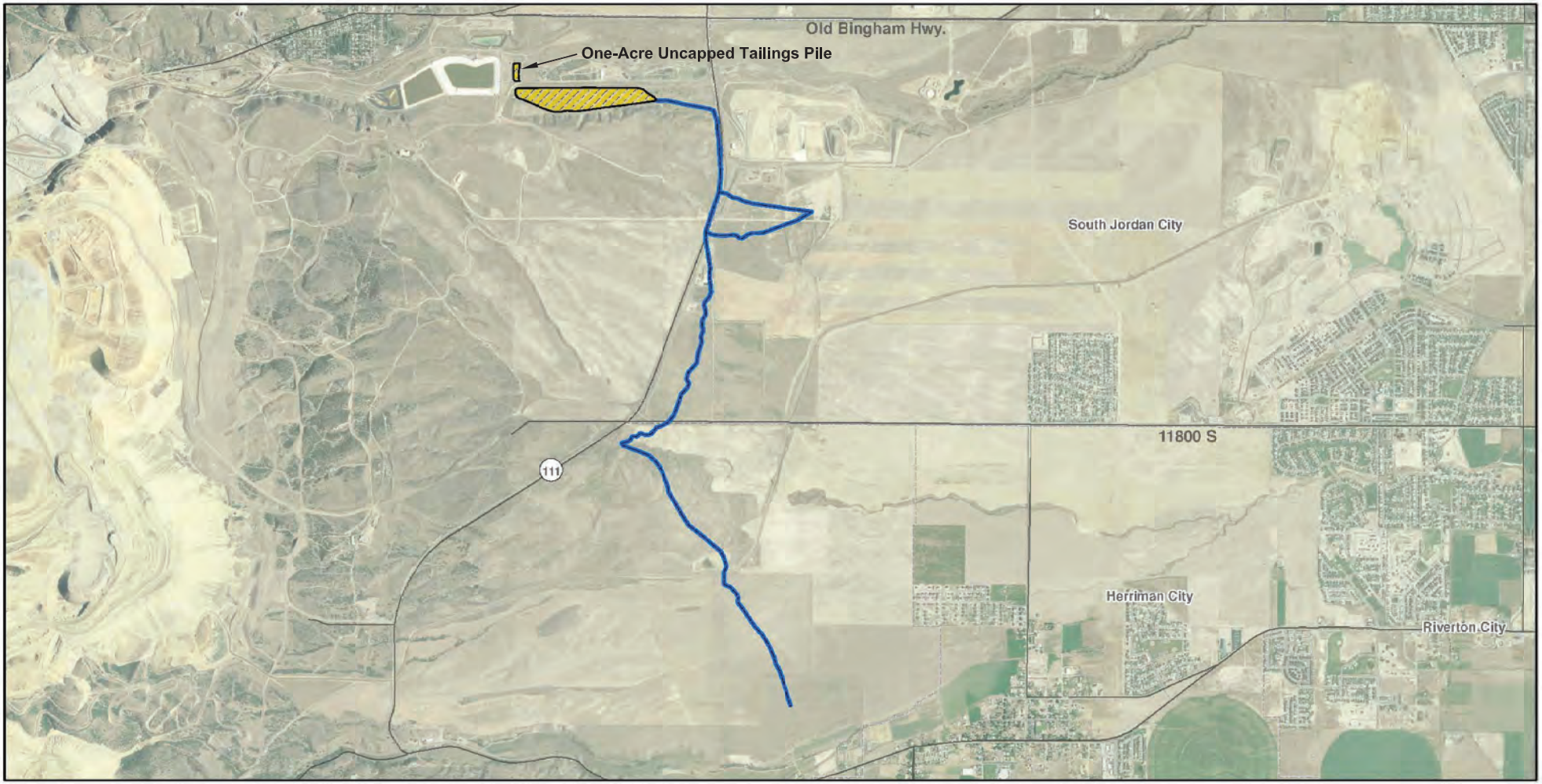
RioTinto

KENNECOTT SOUTH ZONE
OPERABLE UNIT 1
BINGHAM CREEK

ENVIRONMENTAL
RESTORATION GROUP

Drawing Number: OU1_72309

Date: 7/09
Drawn By: JI
Project Mgr: BV
Rev:



OU5

ANACONDA (ARCO) TAILINGS (APPROXIMATE LOCATION)

BASTIAN DITCH (APPROXIMATE LOCATION)

N

0 3,000 6,000 Feet

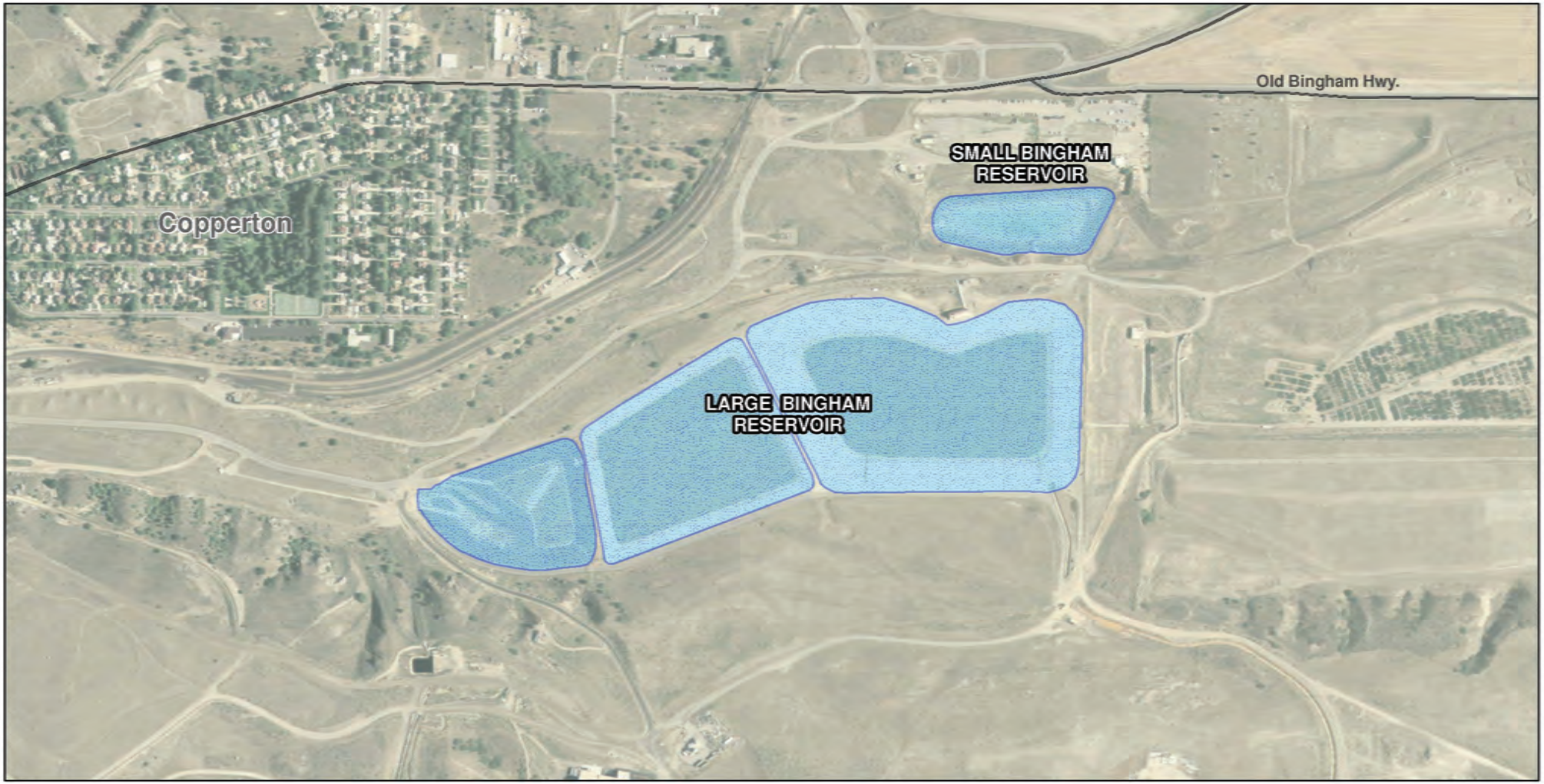
Rio Tinto

KENNECOTT SOUTH ZONE
OPERABLE UNIT 5
ARCO TAILINGS - BASTIAN DITCH

ENVIRONMENTAL RESTORATION GROUP

Drawing Number: OU5_72309

Date: 7/09
Drawn By: JI
Project Mgr: BV
Rev:



OU4 - LARGE BINGHAM RESERVOIR

N

0 500 1,000 Feet

RioTinto

KENNECOTT SOUTH ZONE
OPERABLE UNIT 4
LARGE BINGHAM RESERVOIR

ENVIRONMENTAL RESTORATION GROUP

Drawing Number: OU4_72309

Date: 7/09
Drawn By: JI
Project Mgr: BV
Rev:

OU10 - COPPERTON SOILS
(APPROXIMATE LOCATION)

N

0 500 1,000
Feet

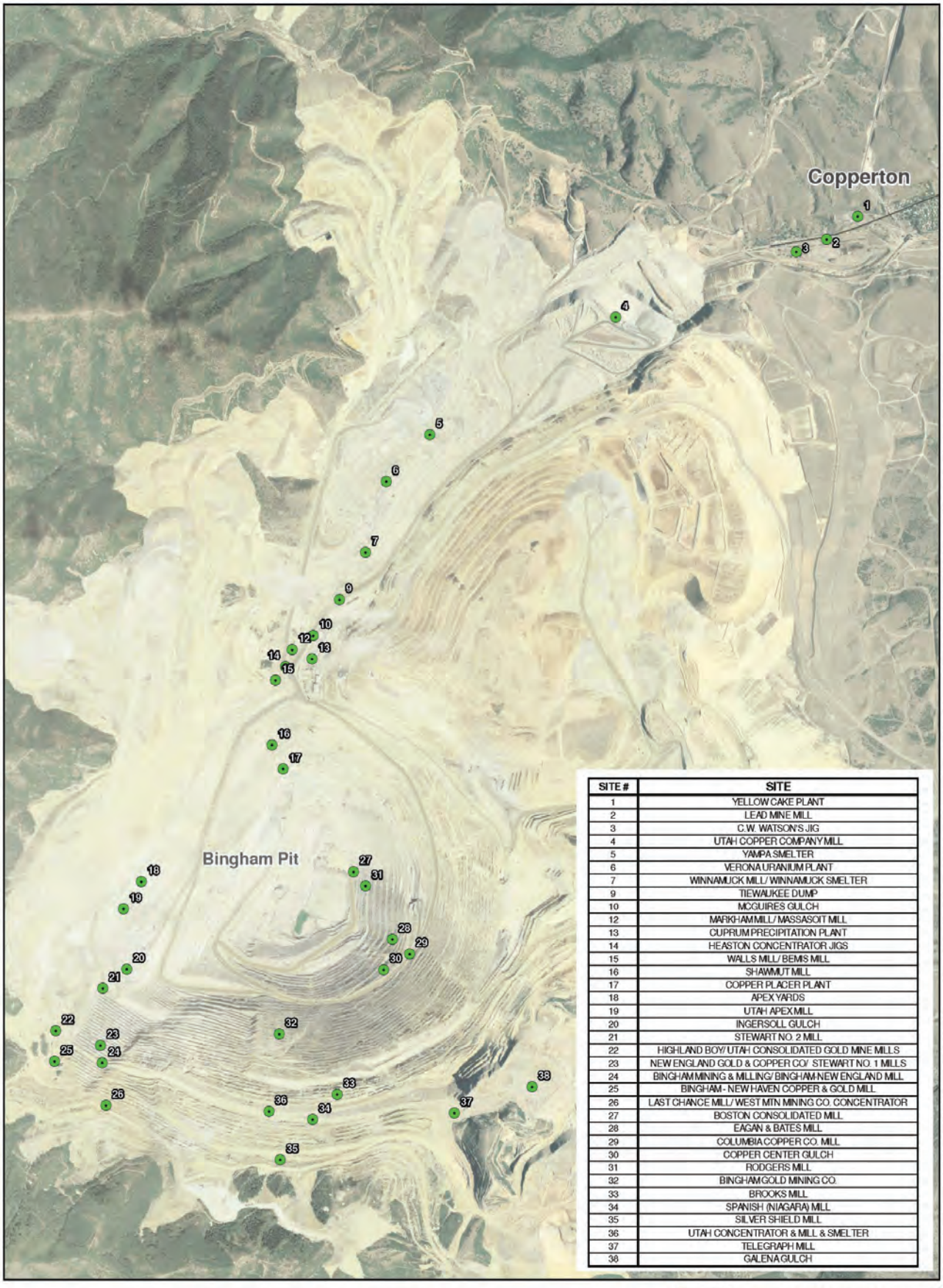
RioTinto

KENNECOTT SOUTH ZONE
OPERABLE UNIT 10
COPPERTON SOILS

ENVIRONMENTAL
RESTORATION GROUP

Drawing Number: OU10_72309

Date: 7/09
Drawn By: JI
Project Mgr: BV
Rev:



SITE #	SITE
1	YELLOW CAKE PLANT
2	LEAD MINE MILL
3	C.W. WATSON'S JIG
4	UTAH COPPER COMPANY MILL
5	YAMPA SMELTER
6	VERONA URANIUM PLANT
7	WINNAMUCK MILL/ WINNAMUCK SMELTER
9	TIEWAUKEE DUMP
10	MCGUIRES GULCH
12	MARKHAM MILL/ MASSASOIT MILL
13	CUPRUM PRECIPITATION PLANT
14	HEASTON CONCENTRATOR JIGS
15	WALLS MILL/ BEMIS MILL
16	SHAWMUT MILL
17	COPPER PLACER PLANT
18	APEX YARDS
19	UTAH APEX MILL
20	INGERSOLL GULCH
21	STEWART NO. 2 MILL
22	HIGHLAND BOY/ UTAH CONSOLIDATED GOLD MINE MILLS
23	NEW ENGLAND GOLD & COPPER CO/ STEWART NO. 1 MILLS
24	BINGHAM MINING & MILLING/ BINGHAM-NEW ENGLAND MILL
25	BINGHAM - NEW HAVEN COPPER & GOLD MILL
26	LAST CHANCE MILL/ WEST MTN MINING CO. CONCENTRATOR
27	BOSTON CONSOLIDATED MILL
28	EAGAN & BATES MILL
29	COLUMBIA COPPER CO. MILL
30	COPPER CENTER GULCH
31	RODGERS MILL
32	BINGHAM GOLD MINING CO.
33	BROOKS MILL
34	SPANISH (NIAGARA) MILL
35	SILVER SHIELD MILL
36	UTAH CONCENTRATOR & MILL & SMELTER
37	TELEGRAPH MILL
38	GALENA GULCH

OU11 - BINGHAM CANYON HISTORIC FACILITIES
(APPROXIMATE LOCATIONS)

N

0 1,000 2,000
Feet

Rio Tinto

KENNECOTT SOUTH ZONE
OPERABLE UNIT 11
BINGHAM CANYON
HISTORIC FACILITIES

ENVIRONMENTAL RESTORATION GROUP

Drawing Number: OU11_72309

Date: 7/09
Drawn By: JI
Project Mgr: BV
Rev:

Appendix B - Site Photographs

Photo No.1 – Lush vegetation on banks of Bingham Creek (OU1) approximately 1 mile upstream of confluence with Jordan River. View to East.

Photo No.2 – Bingham Creek channel 1300 West, view to the west.

Photo No.3 – Bingham Creek channel 1300 West, view to the east.

Photo No.4 – Bingham Creek channel 2200 West, view to the east.

Photo No.5 – Bingham Creek channel 2700 West, view to east.

Photo No.6 – Bingham Creek channel near 2700 West, view to the west.

Photo No.7 – Bingham Creek channel 2700 West, view to the east.

Photo No.8 – View of north bank of Bingham Creek (OU1) at 4000 West. View to West.

Photo No.9 – Bingham Creek channel just 4400 West, view to the east.

Photo No.10 – Bingham Creek channel near 4400 West, view to the west.

Photo No. 11 –Bingham Creek Channel located north of OU5 and east of OU4 (Kennecott's Large Bingham Reservoir). This section of the Creek depicts conditions in the channel from OU5 to about 4000 West.

Photo No.12 – ARCO Tailings Repository (OU5). View to South.

Photo No.13 – ARCO Tailings Repository (OU5). View to Southeast.

Photo No.14 –Panoramic view of the eastern end of OU5. In the foreground is the run-on/run-off sedimentation basin and in the distance are the Oquirrh Mountains. The photo was taken from the emergency spill way of the basin looking west toward the OU5 tailings repository.

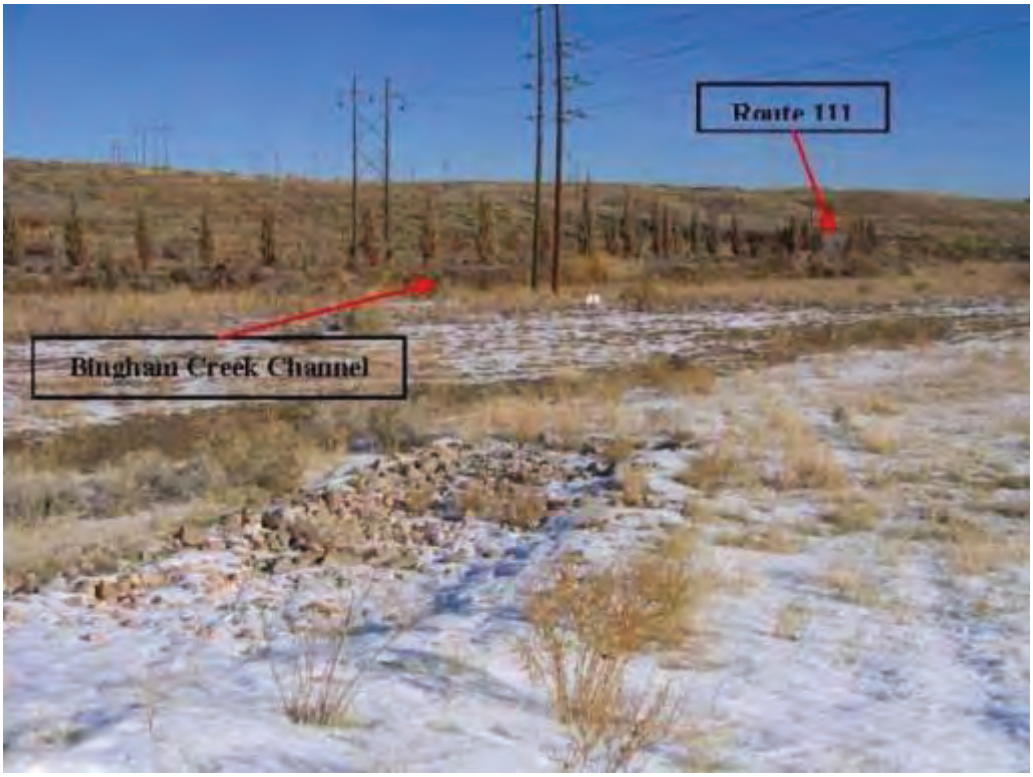


Photo No.15 - Spillway release channel (rip-rap) leading from the sedimentation towards the modern day channel of Bingham Creek. Route 111 is in the distance through the access road to Progressive Nursery.

Photo No.16 – Top of the emergency spillway of the sedimentation basin of OU5, and along the northern embankment (in the near distance) is the vertical drainage pipe.

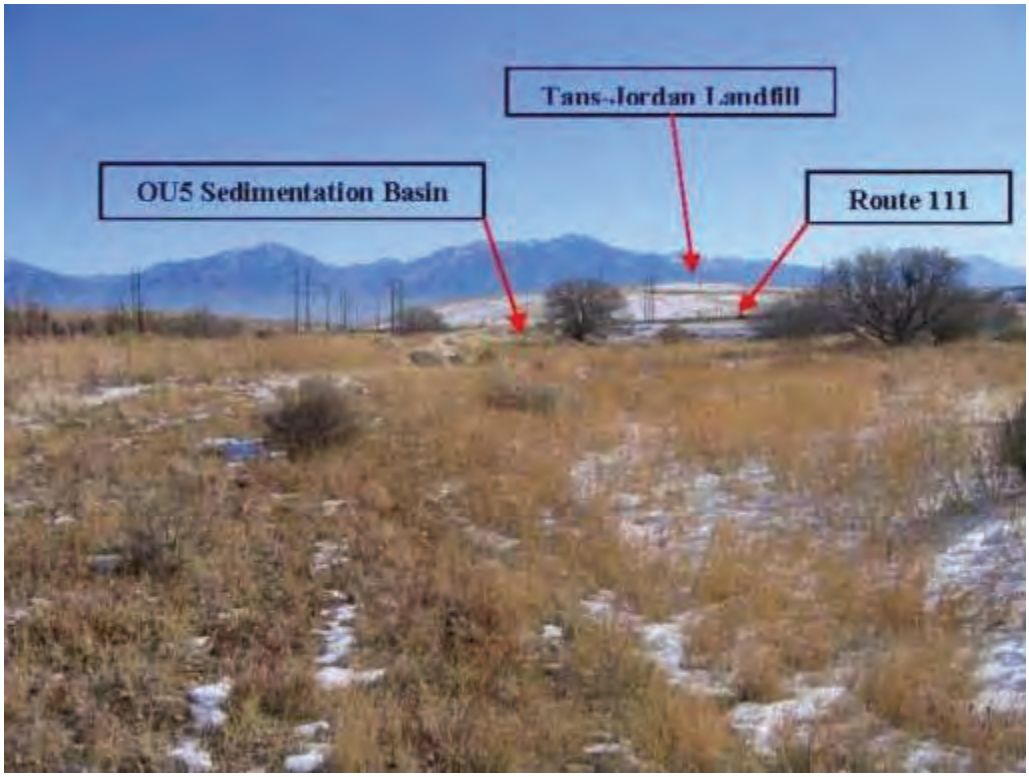


Photo No.17 – Northern run-off ditch used to direct precipitation from the repository to the sedimentation basin. .

Photo No.18 – Top and east slope of repository. The top of the repository is sloped to the south/southeast. The slope was stable, with very little erosional activity along it.

Photo No.19 – Monitoring wells, completed at different depths. These wells are located approximately at the northeast corner of the tailings repository at OU5.

Photo No.20 –Run-off control ditch that runs parallel to the southern boundary of the repository.

Photo No.21 – Southern run-off ditch as it straightens and heads north to connect to the north run-off ditch. This ditch is underlain by HDPE liner with rip-rap over the top.

Photo No.22 –Top surface of the tailings repository at OU5 (near the center of the approximate 41 acre repository).

Photo No. 23 – Top surface of the tailings repository (looking west). The photo was taken to document the planting rows still visible from the revegetation efforts in 1997. 12 years have expired since the revegetation effort and these rows help to document the stability of the cap on the repository.

Photo No. 24 – Northern embankment of the tailings repository at OU5 (view is to the west toward Bingham Canyon). Visible are some of the planting rows along the surface of the embankment.

Photo No. 25 –Northern embankment of the tailings repository at OU5 (view is to east). Though this slope appears not to be well vegetated, in the spring low lying grasses spring up with new growth.

Photo No. 26 - Northern embankment of the tailings repository at OU5 viewed from the northwest corner.

Photo No. 27 – Located on land whose ownership is not known currently (due east of Kennecott's Large Bingham Reservoir Zone 2 Dam) are piles of mixed soils with unknown characteristics. The land is about 1 acre in size and is within Kennecott secured property. The location of this feature is illustrated on a map provided in Appendix A.

Photo No. 28 - Area of the repaired erosional cut along Rt. 111 as it is today.

Photo No. 29 - Area of the buried drainage pipe leading off to Bingham Creek Channel (after Repair).

Photo No. 30 – View up Bingham Canyon illustrating the extent of encroachment of mine waste deposits. All historic facilities in this are (OU11) have been buried by mine waste deposits. View to West.

Appendix C - Summary of Community Interviews

Utah Department of Transportation
REGION 2
2010 South 2760 West
Salt Lake City, Utah 84104
801-975-4900

Reed Soper, Mountain View Corridor
Environmental Project Manager
Ed Rock, HDR Deputy Program Manager

November 19, 2009

BINGHAM CREEK FIVE-YEAR REVIEW QUESTIONS

1) What is your current knowledge of the Bingham Creek cleanup actions? The Utah Department of Transportation said its discovery and Phase I process located areas of concern while coordinating with local agencies during planning of the Mountain View Corridor freeway system. The Mountain View Corridor freeway system is located in western Salt Lake and northwestern Utah County traveling across an upper section of the Bingham Creek cleanup area. The Mountain View corridor will service 13 municipalities and will begin construction in late spring/early summer of 2010 on a 15-mile segment between 5400 South and Redwood Road (at approximately 16000 South).

To ensure construction activities do not interfere with communities, UDOT follows guidelines in accordance with the National Environmental Policy Act (NEPA). UDOT said UDEQ and EPA have reviewed the Environmental Impact Statements (EIS) during planning stages. Air quality was the primary environmental topic of concern.

2) Are there any concerns UDOT has regarding long term protectiveness of the remedy for properties where soils with elevated contaminants of concern (COCs) were left in place either at depth or at the surface? UDOT officials did not have any health or environmental concerns as construction plans will occur in a phased approach and will not involve subsurface digging into capped areas for some time (Phase I). UDOT will construct one lane frontage roads on top of capped areas where the freeway will eventually be built. Construction activities within areas of the Bingham Creek would not take place until Phase II when the freeway is constructed and pylons are buried for support. Any excavation requires permits and triggers mechanisms (in-house) to address any subsurface soil contamination in the future.

At this time, UDOT did not foresee any construction scenario which would require removal and disposal of large amounts of contaminated soil. UDOT said they would coordinate all activities with UDEQ and EPA as necessary. There is a 20–year completion schedule depending on how quickly funds are available. Also, all required safety and management plans (developed in house) are observed to protect workers onsite and surrounding communities.

3) Do you have any additional comments, suggestions or questions regarding the clean up? No additional comments were provided and contact information was exchanged for future dialogue and questions regarding the Bingham Creek cleanup areas.

Interviews conducted by Dave Allison and Doug Bacon, UDEQ.

South Jordan City
1600 W. Towne Center Dr. (10610 S.)
South Jordan, Utah 84095
(801) 254-3742 phone
Gary Whatcott, Assistant Manager/Municipal Services
Don Bruey, Public Works Director
Ana Paz, Associate Engineer
Jeremy Nielson, Deputy City Engineer
October 27, 2009

BINGHAM CREEK FIVE-YEAR REVIEW QUESTIONS

1) What is your current knowledge of the Bingham Creek (OU1) cleanup actions? South Jordan is aware of cleanup occurring in the upper portions of the Bingham Creek west of the City in undeveloped portions of South Jordan. Despite growing development interest in South Jordan there is no development plans in or near the Bingham Creek cleanup areas other than: 1) a proposed trail system near 4500 West and 9600 South, a location south of the Bingham Creek corridor, and 2) Mountain View Corridor, a UDOT road project. South Jordan wants to coordinate and link its trail system with one planned for the Daybreak area by Kennecott Land in the future.

2) Are there any concerns South Jordan City has regarding long term protectiveness of the remedy for properties where soils with elevated contaminants of concern (COCs) were left in place either at depth or at the surface? South Jordan did not have any health or environmental concerns as cleanup areas were located in undeveloped areas of the City. Also the city is not planning any immediate development near the Bingham Creek cleanup locations and no community concerns were ever raised over the last five years.

South Jordan does not have a formal Institutional Control process or reporting mechanism in place since the cleanup occurred in undeveloped areas. South Jordan said any development precautions would fall within the South Jordan building permit process. A hazardous Geologic Map is in development by the city Engineering Department to track any sensitive land areas in South Jordan for the future.

There are projects the City watches closely (but is not necessarily involved with) which may impact the Bingham Creek remedy areas. As noted above under #1, a major highway, the Mountain View Corridor, is planned for the west side of the Salt Lake Valley and within city limits of South Jordan which crosses the Bingham Creek Channel. Also the UTA Light Rail extension is in development which could impact areas of cleanup.

3) Do you have any knowledge of any actions or events that may have caused for a reduction of the protectiveness of the remedy? South Jordan has heard in stakeholder meetings the County and Kennecott Land have plans for an extensive park and trails system along the Bingham Creek Channel corridor in the near future. South Jordan expects the cleanup areas would be accounted for during development and consideration

made to trail and park locations in coordination with known soil characteristics in the Channel.

4) Do you have any additional comments, suggestions or questions regarding the clean up? South Jordan would appreciate more open dialogue with Kennecott Land and Salt Lake County concerning information on the status of parks and trails. South Jordan City would also like more information on areas that were cleaned up.

Interviews conducted by Dave Allison and Doug Bacon, UDEQ.

West Jordan City
8000 S. Redwood Rd.
West Jordan, Utah 84088
Phone: (801) 569-5070

Nate Nelson, City Engineer
Dave Murphy, Capital Improvement Projects
Bill Bailey, Building Official
September 10, 2009

BINGHAM CREEK FIVE-YEAR REVIEW QUESTIONS

1) What is your current knowledge of the Bingham Creek (OU1) cleanup actions? With the cleanup completed in 1999, West Jordan's primary role over the last five years was focus on maintaining the integrity of the cleanup areas. West Jordan City was involved with Phase I and II of the cleanup and the majority of residential properties. West Jordan is currently growing and experiencing development interest and has transportation light rail construction ongoing within areas of the Bingham Creek operable unit. Though noted was development interest, the City was not aware of any large development projects since the last five years within the site. The Engineering Department has experienced members on staff who worked on the cleanup with institutional knowledge of the cleanup activities.

2) Do you have any *personal* concerns regarding the clean up? Are you aware of any *community* concerns? No one expressed any health or environmental concerns from the cleanup. The City only receives a rare community inquiry with property or home transactions. The City is confident cleanup areas are well documented and development procedures are place (though not formally accepted by the Agencies) to maintain the remedy.

3) Are there any concerns West Jordan City has regarding long term protectiveness of the remedy for properties where soils with elevated contaminants of concern (COCs) were left in place either at depth or at the surface? Anyone developing or utility work occurring within sensitive areas is coordinated via permits through the City of West Jordan's engineering department. West Jordan City expressed a need to work with EPA and UDEQ to approve their Institutional Control ordinances and program. West Jordan is confident the building review process and requirements for testing (if necessary) are universally applied for all proposed developments. West Jordan has developed a GIS overlay map with a residential grid to keep track of the properties that were originally cleaned up.

4) Did West Jordan adopt an Institutional Controls Plan the City had drafted and if so, please explain how the plan continues to be implemented? West Jordan has documented the cleanup areas and instituted a soils ordinance a year ago to deal with cleanup areas. West Jordan's soil ordinance requires developers to enlist in the Utah Department of Environmental Quality's (UDEQ) Voluntary Cleanup Program (VCP). However, a revised ordinance has yet to be approved by the City's Planning and Zoning

Commission as well as UDEQ and EPA. West Jordan felt this could be done quickly as draft language is developed just not formally approved.

5) Do you have any knowledge of any actions or events that may have caused for a reduction of the protectiveness of the remedy? The only area of concern for the city is the Utah Transportation Authority (UTA) Light Rail project for West Jordan. Consistent coordination is required within the cleanup zone and the City is reliant upon timely reporting from UTA. West Jordan assumes UDEQ oversight is involved with the UTA to prevent a release or note any soil disposal actions.

6) Does West Jordan City have records on their maintenance activities for the area?

West Jordan said they have all of the closure remediation reports associated with the cleanup available to the public as well as residential property clean letters on file.

7) Do you have any additional comments, suggestions or questions regarding the clean up? No additional comments other than scheduling future meetings with EPA and UDEQ to finalize language for their soil ordinance plan.

8) Does West Jordan City know of anyone else that the Agencies should interview? West Jordan suggested coordinating with Salt Lake County and also could provide some residential contacts for interviews**.**

Interviews conducted by Dave Allison and Doug Bacon, UDEQ.

Steve Anderson, Anderson Engineering (ARCO's Contractor)
Chuck Stillwell, ARCO
Utah Department of Environmental Quality
168 North 1950 West
Salt Lake City, Utah 84116

August 6, 2009

BINGHAM CREEK FIVE-YEAR REVIEW QUESTIONS

1) What is your current knowledge of the Bingham Creek (OU1) and Anaconda Tailings (OU5) cleanup actions? Anderson Engineering was contracted by the Atlantic Richfield Company (ARCO) to address portions of the cleanup of Operable Units (OU) 1 and all of OU5. ARCO's work in Bingham Creek Phase III included approximately 76 properties in the Jordan View Estates, Meadow Green, Fahnian Ranchettes, Vista West, Sugar Factory, and Brookside areas. ARCO was also involved with portions of the Bingham Creek Channel cleanup work (Bingham Creek Phase II and lower Bingham Creek). OU5 involved the Anaconda (ARCO) Tailings repository located adjacent to Bingham Creek. ARCO still has the responsibility to perform long-term maintenance of the capped repository.

Removal Actions were conducted in 1995 by ARCO to address the problems associated with mining wastes beginning with the streambed channels of Bingham Creek and over flow areas. ARCO cleaned up the streambed to 2500 ppm lead soils and came back in following years to do some repair and energy reduction work to avoid erosion.

Chuck Stillwell, ARCO Project Manager, and Steve Anderson of Anderson Engineering, were on hand for all of the removal work at OU1 and OU5. As residential properties became the focus, ARCO removed all soils above 1100 ppm lead and 100 ppm arsenic, down to 18-inches in depth with clean top soil on approximately 76 properties.

2) Do you have or know of any community concerns? Anderson said the project went smoothly, with no difficulties and nothing has changed the remedy. The only recent follow up activities include maintenance of the capped repository located in OU5 and monitoring inspections. Mr. Anderson and Mr. Stillwell were not aware of evidence documenting negative impacts to the protectiveness of the remedial action at this time. Recently the community has not presented or discussed with either ARCO or Anderson Engineering any health or environmental concerns. A year after the cleanup was completed Anderson received an occasional call regarding property transactions and provided (upon request) data from the previous sampling program. No Further Action/Clean Letters were provided to every property owner whose property was cleaned up to the prescribed remedy.

3) In your opinion, do you have any knowledge of actions or events that may have caused for a reduction of the protectiveness of the remedy? Other than some minor repair work in some areas a few years ago no reason has risen to suspect the remedy is

not functioning at OU1. As for OU-5, ARCO knows of no events causing maintenance issues at the capped repository and associated migration controls. Mr. Anderson mentioned he was aware of recent construction work near the 9000 South portion of the Bingham Creek streambed by the Utah Department of Transportation (UDOT) and was curious if the Agencies or local communities were involved in overseeing their work. The UDOT project was the only activity Mr. Anderson knew of that might excavate into buried impacted soils in OU1.

4) Was ARCO or its contractor(s) involved with the discussions concerning long term protectiveness of the remedy, for properties where soils with elevated contaminants of concern (COCs) were left in place either at depth or at the surface? Mr. Anderson said discussions were coordinated with the regulators and Salt Lake County Flood Control, no specific policies were established. Mr. Anderson also noted he has only been called twice concerning properties that were not sampled in OU1 and wondered if the local communities would require developers to address potentially impacted soils. Mr. Anderson stated 11 volumes of post removal, closure, and O&M inspection reports were provided to West Jordan and Salt Lake County to detail cleanup specifications that would be useful for developing Institutional Controls. As the responsibility for maintaining the remedy in OU1 was apparently passed to the County and local communities, Mr. Anderson really could not comment on what level of involvement occurs by local jurisdictions when redevelopment takes place in the post-remedy cleanup areas of OU1.

5) Do you have any additional comments, suggestions, or questions regarding the cleanup work? Mr. Anderson and Mr. Stillwell thought speaking with Salt Lake County would help with ensuring that the remedy in OU1 is protected and that the County still has existing documentation on the remedies for both OU1 & OU5. No other comments were provided.

Interviews conducted by Dave Allison and Doug Bacon, UDEQ.

Piper Rhodes, Sr. Environmental Specialist – Kennecott Land
Ben Franciscotti, Manager Community Construction - Kennecott Land
Ehud Ardon, North American Mine Services (Kennecott Land Contractor)
Jeff Haws, Landscape Planner/Architect - Kennecott Land
Kennecott Land Company
4700 Daybreak Parkway
South Jordan, Utah 84095
Tel: 801-204-2000

Questions -

1) Is Kennecott Land aware that the sections of Bingham Creek within the Daybreak property were cleaned up to the established commercial land use standard established by EPA for the removal action (2000 mg/kg lead)? With a long history of Kennecott reclamation in the area, Kennecott Land by necessity, is aware and coordinates all development/construction within the company to handle areas of previous cleanups that are under redevelopment.

2) What are Kennecott Land's current development plans for the Bingham Creek corridor? Kennecott Land officials have future plans for a park, ball fields, and trail system within areas near the Bingham Creek channel. The plans are three years out or more as financing becomes available. Kennecott Land does not intend to undertake any other redevelopment of the Bingham Creek corridor that would be beyond a commercial/park type land use. Kennecott Land is working with the city of South Jordan and Salt Lake County on future plans to coordinate linking respective trail systems.

3) Does Kennecott Land have data documenting metals concentrations potentially above what may be appropriate for the intended land use? Kennecott Land has all pertinent data from Kennecott Utah Copper and makes the data available online for their project managers.

4) Is Kennecott Land coordinating with the local jurisdiction on the redevelopment plan for the Bingham Creek corridor? Presentations were made to South Jordan and West Jordan cities as well as at stakeholder meetings to communicate development activities by Kennecott Land.

5) Is Kennecott Land intending to complete acquisition of the UP freight line west of 5600 West and paralleling the north boundary of Daybreak within the area of the Daybreak Commerce Park? If so, will Kennecott Land be pursuing a removal of the rail and the rail bedding material after acquisition? At this time, no determinations have been made by Kennecott Land regarding the removal of the railway. However, any soil removal would be performed under an approved work plan with oversight by the Agencies (EPA & UDEQ). Coordination with other local jurisdictions and interested stakeholders would also take place prior to implementing said work plan.

8) If Kennecott Land is intending to develop the Bingham Creek corridor as a park or recreational area, what long term institutional controls (if any) does Kennecott

Land foresee being needed to ensure that this land use remains in place? Kennecott Land expressed a corporate philosophy of eliminating any restrictions on property and wants to avoid Institutional Controls. That said, any redevelopment would need to ensure that soils comply with the Agencies' accepted residential land use standards for lead and arsenic, for the Daybreak Community. Any remediation efforts would address soils above the residential land use standards. Kennecott Land said cooperation with local authorities, county, city and regulatory agencies can expedite information exchange necessary to ensure continuous dialogue so all are informed about remedial activities.

9) Do you have any additional comments, suggestions or questions regarding the clean up? Kennecott Land said they would check with South Jordan City to make sure they were aware of future park and trail plans and any remediation work performed by Kennecott Land would be coordinated with Kennecott Utah Copper's Environmental Division, as well with UDEQ and EPA.

Interviews conducted by Dave Allison and Doug Bacon, UDEQ.

Salt Lake County Government Center
2001 South State Street
SLC, Utah 84190-3050
Phone: 801 468-3000

David White, SLCO Planning and Development
Max Johnson, SLCO Planning and Development
Dan Drumiler, SLCO City Engineer
Craig Anderson, SLCO District Attorney
Scott Baird, SLCO Flood Control
John Hoggan, Salt Lake Valley Health Dept.
Amy McClelland, GIS Specialist

December 10, 2009

BINGHAM CREEK FIVE-YEAR REVIEW QUESTIONS

1) What is your current knowledge of the Bingham Creek (OU1) cleanup actions? Salt Lake County (SLCO) officials from the Planning and Engineering Departments said they were aware of the Bingham Creek cleanup activity, primarily through the Flood Control Dept. and coordination efforts during the years of remediation. SLCO said any issues regarding the Bingham Creek cleanup areas are usually referred to UDEQ or EPA with the expectation that these agencies are the appropriate authorities with detailed information on the cleanup areas.

2) Do you have any *personal* concerns regarding the clean up? Are you aware of any *community* concerns? No one representing the various divisions of SLCO expressed any health or environmental concerns regarding the cleanup and no issues have occurred over the last five years from the community. However, internal coordination as it pertains to documentation on the past removal/remedial actions, at SLCO and the regulating entities is becoming more important. SLCO officials feel development pressures along the West Bench of the Salt Lake Valley could impact remediated areas if not managed in detail.

SLCO officials said through staff turnover and time, only a general knowledge of cleanup actions exists with the long term employees of the individual departments. SLCO currently relies on UDEQ and EPA oversight when their customers have questions or seek development approval. SLCO wishes to incorporate the cleanup history (where appropriate) to make planning, engineering and land management decisions for this area under their existing authorities.

No one at SLCO wants any mistakes due to a lack of documentation. Establishing both an institutional controls program and the necessary document repository would require some internal research, sharing, and coordination of departmental information. How the cleanup areas are documented (as an information source at SLCO) and who addresses within the planning, development, and engineering departments during redevelopment proposals, needs clarification at SLCO.

3) Are there any concerns SLCO has regarding long term protectiveness of the remedy for properties where soils with elevated contaminants of concern (COCs) were left in place either at depth or at the surface? No situations have come up to date as far as SLCO knows. SLCO understands that (where applicable based on jurisdiction) local cities generally use their building permit or ordinances to control development actions within OU1 Bingham Creek. SLCO expressed a need to work with EPA and UDEQ to develop and approve institutional control ordinances similar to what the cities have in place or are developing. SLCO wants to develop a GIS overlay map with a residential grid to keep track of the cleanup areas (both residential properties and undeveloped segments on Bingham Creek).

4) Did SLCO adopt an Institutional Controls Plan and if so, please explain how the plan continues is implemented? Nothing is implemented to date although the SLCO emphasized an intention to do so, to address recent development issues in the West Bench areas of the Salt Lake Valley. SLCO says they currently require seismic evaluations on properties and could easily require land management tools to address development along Bingham Creek.

The SLCO District Attorney worked on the Bingham Creek cleanup from the beginning, has detailed knowledge of the existing protective requirements, and was involved with discussions for institutional controls with Kennecott, EPA and UDEQ years ago. SLCO did not see any reason discussions couldn't begin as early as next year to develop land use control language or a possible ordinance(s). SLCO said developing a management philosophy for remediated areas is necessary to keep track of areas in a rapidly developing Salt Lake West Bench. SLCO said by mapping areas, using title search and survey records, or incorporating a checklist process, there are many ways SLCO can assist with transparency about previous remediation work and can assist with ensuring the protectiveness of the selected remedy for OU1 Bingham Creek.

5) Do you have any knowledge of any actions or events that may have caused for a reduction of the protectiveness of the remedy? The current area of concern for SLCO is a 150 acre residential development that is located north of the OU1 Bingham Creek site (but is crossed by a historic rail line used as an ore haulage route). SLCO expects the developer to follow all general safety measures and will look for any areas of concern within OU1.

6) Does SLCO have records on their maintenance activities for the area?

The SLCO District Attorney said he has all of the documentation associated with the Bingham Creek cleanup and would share with interested departments to assist them with an understanding about past work.

7) Do you have any additional comments, suggestions or questions regarding the clean up? No additional comments were provided. The representatives did discuss scheduling future meetings with EPA and UDEQ to develop possible land use controls to be managed by SLCO.

Interviews conducted by Dave Allison and Doug Bacon, UDEQ

FINAL REPORT

FOR

KENNECOTT WORK ACTIVITIES

RELATED TO THE

ADMINISTRATIVE ORDER ON CONSENT FOR REMOVAL ACTION

SITE NO. T4
BINGHAM CREEK CHANNEL, PHASE II

HOLY CROSS JORDAN VALLEY HOSPITAL

SCANNED
DERR 1996-002882

Submitted By

KENNECOTT UTAH COPPER
March, 1996

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Kennecott Utah Copper Corporation
PLANT PROJECTS GROUP
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P. O. Box 112
Bingham Canyon, Utah 84006-0112
(801) 569-6810
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Hand Delivered 8-16-96

August 16, 1996

Kennecott

Ms. Kathleen Johnson
Division of Environmental Response and Remediation
Utah Department of Environmental Quality
168 North 1950 West
Salt Lake City, Utah 84116

DEQ / DERR
RECEIVED
AUG 16 1996
HAND DELIVERED

Subject: Transmittal of Final Reports

Dear Ms. Johnson:

Enclosed under cover of this letter of transmittal are one copy each of the following final reports for Kennecott removal projects completed recently:

- South Jordan Evaporation Ponds, 4 volumes
- Bingham Flats, Evaporation Pond Canals and Pond AO, 2 volumes
- Holy Cross Jordan Valley Hospital

These reports are transmitted for your files. Please do not hesitate to call if there are questions or comments, or if further information is desired.

Sincerely,

Ivan Weber
Engineering Coordinator
Environmental Engineering Projects Group

encl: reports listed

cc:
W.R. Williams
J. Callender
file

Kennecott Utah Copper Corporation
PLANT PROJECTS GROUP
8400 West 10200 South
P. O. Box 112
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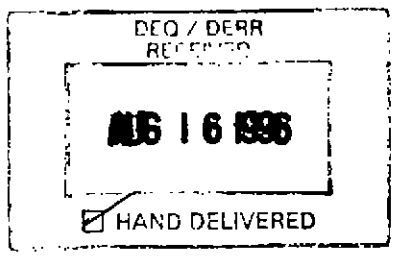
August 16, 1996

Kennecott

Mr. Steve Way (8HWM-ER)
On-Scene Coordinator
USEPA Region VIII
999 18th Street, Suite 500
Denver, Colorado 80202-2405



RE: Notice of Completion and Final Report
Bingham Creek Channel Site T4
Holy Cross Hospital

Dear Mr. Way:

Transmitted under cover of this letter are four copies of the Final Report for the segment of Bingham Creek Channel (Phase II) work that encompasses the site of the Holy Cross Hospital property, at the northeast corner of the intersection of 90th South Street and the Bangerter Highway in Salt Lake County, Utah. Kennecott's removal work at the Holy Cross Hospital site was conducted in 1992, prior to the finalization of the Unilateral Administrative Order for Removal Action ("Order"), concurrent with the Delta M8 Phase I removal. In compliance with understandings established at the time of development of work plans for Phase II of Bingham Creek Channel, however, this Final Report is submitted in compliance with requirements of the Order, CERCLA-VIII-93-10, and the Statement of Work (section III, paragraph M.2).

In compliance with Article XVIII paragraph 72 of the Order, a signed Notice of Completion is enclosed. The original signature document is in the copy designated as "original" on the cover.

Separate final reports and notices of completion have been submitted previously for your review for other segments of Bingham Creek Channel Phase II. These include 4800-3200 West, Mixed Tailings, Robbe Cells/Tailwater Ditches, Cemetery Pond and Rock Dam to Property Line. A final report for the Bingham Flats, Evaporation Pond Canals and Pond AO is being transmitted under separate cover.

Kennecott requests that certification of completion for this final report be sent by EPA when review has been completed.

Please call if you wish to discuss this report, or any of the other segments of the work related to the Order for Phase II Bingham Creek Channel.

Sincerely,

William R. Williams
Director, Health, Safety and Environmental Quality

WRW/
encl: 4 copies (1 volume each), Final Report Holy Cross Hospital

cc: Kathleen E. Johnson, UDEQ

FINAL REPORT

FOR

KENNECOTT WORK ACTIVITIES

RELATED TO THE

ADMINISTRATIVE ORDER ON CONSENT FOR REMOVAL ACTION

SITE NO. T4
BINGHAM CREEK CHANNEL, PHASE II

HOLY CROSS JORDAN VALLEY HOSPITAL

Submitted By

KENNECOTT UTAH COPPER
March, 1996

Printed on 100% Post-Consumer
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FINAL REPORT
BINGHAM CREEK CHANNEL
SITE NO. T4
HOLY CROSS JORDAN VALLEY HOSPITAL

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  A. Air Monitoring

NOTICE OF COMPLETION

HOLY CROSS JORDAN VALLEY HOSPITAL
PHASE II BINGHAM CREEK CHANNEL SITE T4

Pursuant to Paragraph III.M.2 of the Statement of Work attached to the Unilateral Administrative Order for Removal Action (CERCLA VIII-93-10) Bingham Creek Channel, Phase II, SSID #T4, Kennecott Corporation submits the accompanying Final Report for the segment of the Site at the Holy Cross Jordan Valley Hospital, and certifies that all activities required under the Order have been performed and completed.

As required by the Order, I certify that the information contained in or accompanying this Notice of Completion is true, accurate and complete. As to those identified portions of this Notice of Completion for which I cannot personally verify their truth and accuracy, I certify as the official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Kennecott Utah Copper Corporation

By William R. Williams
William R. Williams

Its Director, Health, Safety and Environmental Quality

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PROGRESS PHOTOGRAPHS

1.0 INTRODUCTION

1.1 Final Report Compliance with Order

This Final Report is submitted in compliance with, and in satisfaction of the requirements of the Unilateral Administrative Order (UAO) and Section III M Part 2 "Final Report" of the Statement of Work, attached to the (UAO).

1.2 Site Description

The description of the Bingham Channel Phase II Site T4, as stated in the UAO, includes the "Bingham Creek Channel and its associated floodplain and alluvial fans from the Brookside Trailer Park east of Redwood Road to the base of the Large Reservoir located on Kennecott property", and the area located at the northeast corner of 3200 West and 9000 South.

Bingham Creek originates in Bingham Canyon and was the primary drainage from the mining district in this area. Bingham Creek Channel historically flowed east approximately 14 miles to the discharge point at the Jordan River in Midvale, Utah. The Large Bingham Reservoir on KUC property (Section 17, Township 3 South, Range 2 West, Salt Lake Base and Meridian) now captures the head-water flow from the canyon. Bingham Creek Channel essentially begins at the east toe of the reservoir and is predominantly a dry creek channel, except for water transported during run-off, storm events and irrigation episodes.

Soils sampling conducted by the EPA in the Spring of 1991 indicated elevated levels of lead and arsenic in the soil in and adjacent to Bingham Creek on Holy Cross Jordan Valley Hospital (Hospital) property (Dwg No. 453-T-164). Lead and arsenic are hazardous substances as defined by 101(14) of CERCLA. It is believed that the elevated levels of lead and arsenic are a result of historic lead mining, beneficiation, and extraction activities and downstream transport of the resulting tailings.

Bingham Creek Channel runs across a section of the Hospital property at approximately 9000 South and 3500 West. Removal of the tailings from Bingham Creek Channel on the Hospital property was undertaken by Kennecott to eliminate the potential health risk to the public during the expansion of the Hospital and construction of the West Valley (Bangerter) Highway immediately west of the Hospital. The site boundary and haul roads for this project are shown on drawing 453-T-169.

1.3 Summary of Removal Action

Kennecott and its contractors performed the excavation and transportation of the tailings from the Hospital property during the 1992 Construction Season. The tailings were placed by Kennecott in Bluewater I Repository located on Kennecott property.

The removal activities began on July 1, 1992, at the west end of the property adjacent to 9000 South. Excavation proceeded in Bingham Creek from west to east to completion at the Hospital's east property boundary. Excavation of tailings was completed on July 29, 1992. Recontouring and seeding of the area was completed in November of 1992.

A Work Plan, including Air Sampling and Analysis Plan, Health and Safety Plan, and Soil Sampling and Analysis Plan was followed throughout the project. Post-removal soil sampling was conducted according to the Soil Sampling and Analysis Plan. The sampling plan was revised after discussions with an EPA Representative, the changes are reflected in the post-removal soil sampling report enclosed. Post-removal soil samples were collected as removal activities proceeded. Analytical sample results were used to determine the soil lead and arsenic concentration following the tailings removal. Reclamation activities for the channel proceeded after area was determined to be "clean".

2.0 SCOPE OF REMOVAL

2.1 Objectives of the Removal Action

The objective of this removal action was to remove the tailings and associated contaminated soils from Bingham Creek on Holy Cross Jordan Valley Hospital property. The removal action eliminated the risk for human exposure to potentially hazardous substances.

2.2 Removal Criteria

Pre-removal soil characterization sampling was conducted by the EPA in 1991 to delineate the extent of mine waste contamination. The response action, as outlined in the UAO for Bingham Creek Channel, required removal of tailings and associated soils with lead concentrations in excess of 2000 ppm or to a depth of three feet from existing grade. Kennecott conducted the removal action in accordance with this requirement.

Post-removal soil sampling was conducted in the areas of excavation once the area was designated as "clean". Additional soil removal was required in some areas where the clean-up objectives were not achieved initially. The removal of additional soils beyond a depth of three feet was left to the discretion of Kennecott representatives. Vegetation that did not interfere with removal procedures or vehicle traffic was not removed.

2.3 Personal Protection

Personal protection and related air monitoring activities were implemented according to the Air Monitoring and Analysis Plan and the Health and Safety Plan include as appendices to the Work Plan.

Air monitoring at the excavation and repository sites was conducted throughout the project. Air monitoring was conducted by Kennecott to assess levels of airborne arsenic, lead and total airborne dust, to achieve objectives stated in Appendix A of the Work Plan, as well as compliance with applicable occupational health regulatory requirements. The project air monitoring results are tabulated in the Final Air Monitoring Report.

Level D personal protective equipment (basic OSHA construction safety equipment) was appropriate for all workers engaged in excavation, transportation, and repository activities. Personal protective equipment was upgraded to modified Level D (half face respirator with HEPA cartridges) based on results from air sampling or task specific duties. All personnel received 40-hour Hazardous Substance Training prior to working in exclusion zones. Medical Surveillance as outlined in the Health and Safety Plan was conducted on this project. The Final Health and Safety Report shows the results of implementation of the Health and Safety Plan.

2.4 Kennecott Excavation Procedures

Preparation for tailings removal began Monday, June 29, 1992, by building access roads and clearing debris in Bingham Creek on the Hospital property. Excavation and haulage of tailings from the Hospital area began on July 1, 1992, and were completed on July 29, 1992.

Excavation of tailings from Bingham Creek Channel began at the west (upstream) end of the Channel on the Hospital property to prevent re-contamination of cleaned areas during the removal. The tailings were excavated using a tracked excavator positioned in the bottom of the channel. The excavation was visually guided with the interface between natural ground and tailings distinguishable by color. The excavation proceeded from west to east except for approximately the last 100 feet

which was excavated from east to west to provide access for the haul trucks. The excavator was able to load the haul trucks directly, so stockpiling was not necessary. Following removal of the mine waste, the channel was recontoured and revegetated.

2.5 Recontouring and Revegetation

Recontouring of the channel began after all post removal soil sampling was completed. Clayey material and rip-rap was imported to construct a settling basin at the west end of the excavation area adjacent to 9000 South. The settling basin was constructed to prevent recontamination of the removal area by transportation of tailings from upstream. Once the settling basin was completed, recontouring of the channel began.

In order to re-establish the flow line of the Channel, material from the surrounding area and imported material were used in the recontouring. Local borrow material was used to recontour the west end of the removal area. A limited amount of local borrow was available for recontouring, therefore imported fill was required to re-establish the flow line. Fill material was imported, placed and compacted at the east end of the property where the Hospital established a new entrance by crossing Bingham Creek Channel. A box culvert in Bingham Creek was placed by the Hospital contractor for the new entrance road. Upon completion of the recontouring, the channel was seeded to establish vegetation in the area. The revegetation was completed the first week of November.

The reclaimed area was scarified to a depth of six to eight inches on the contour to prepare the ground for seeding. Fertilizer was applied to a rate of 40 pounds of available nitrogen per acre using a 2:1:1 ratio of a nitrogen, phosphorous, potassium blend. The seed and fertilizer were applied by hydroseeding. The seed and fertilizer were mixed in with wood fiber mulch and tackifier, and then applied at a rate of 1500 lbs. per acre.

The following seed mixture was used.

Species	Variety	Lbs. PLS/acre
Western Wheatgrass	Rosanna	5.0
Thickspike Wheatgrass	Critanna	4.0
Slender Wheatgrass	Revenue	4.0
Streambank Wheatgrass	Sodar	4.0
California Poppy	---	1.5
Desert Marigold	---	1.5
Total		**20.0**

3.0 TRANSPORTATION PROCEDURES

Tailings material was hauled from the excavation site to the repository using appropriate haulage trucks. The type of haul trucks varied due to space limitations. Haul trucks had secured gates and were tarped from the loading zone to the repository to control potential release of contaminants.

3.1 Types of Equipment

Small end-dump trucks and end-dumps with pups were used to transport excavated materials from the removal area to the repository. The end-dumps were able to maneuver throughout the channel and channel haul roads. The trucks backed to the loading equipment, were loaded, and hauled the excavated material out through the bottom of the channel. End-dumps with pups were used where turnabout area was available.

3.2 Haul Routes

Excavated materials were hauled from the Hospital property to Bluewater I Repository using the new hospital access road, then proceeding on public roads to Kennecott property. The haulage equipment exited the removal area on to 9000 South, proceeded to the Old Bingham Highway, and then onto Highway 111 to the Kennecott Gate 47 (Dwg 453-T-169). The haulage equipment then proceeded to the repository using haul roads shown on drawing 451-T-807. The same roads were used as a return route. Ramps were constructed within the removal area as required to maximize the efficiency of the operation and were removed when the operation was completed. Public road weight limits were adhered to and drivers were trained in aspects of transporting over public roads.

3.3 Decontamination Procedures

Decontamination procedures were implemented at the removal and repository sites throughout the project. Prior to entry onto public streets, inspection of the haul trucks was performed in a decontamination zone. All visible soils on the exterior of the truck were removed. Haul trucks were covered prior to entry onto the public streets to prevent release of airborne emissions. All equipment was dry decontaminated prior to leaving the Hospital site, and wet decontaminated before leaving the project. Once removal activities were completed on the Hospital site, unpaved haul roads and "decon" areas were decontaminated by removing the top two to four inches of soil. The material was transported to the repository.

3.4 Engineering Controls

Water spray on haul roads and tarped haul trucks were the only engineering controls required to control airborne emission. Frequent air monitoring was conducted to document airborne emissions from the work zone and to determine the need for additional measures.

4.0 PLACEMENT OF CONTAMINATED SOILS

Bluewater I Repository is located in the Bluewater I drainage basin between two ridge tops within a natural draw. It occupies an area contained within Kennecott's present leach collection system. A system of dirt haul roads provides access to the repository.

4.1 Description

Bluewater I Repository is located on Kennecott property within the North half of the South-east quarter of Section 18, Township 3 South, Range 2 West, Salt Lake Base and Meridian. Approximately 12,463 cubic yards of tailings and associated soils were removed from Bingham Creek on the Hospital property and placed in Bluewater I Repository. Volume of tailings removed was determined using truck scales and a conversion of 1.6 tons per cubic yard calculated from soil dry density test results.

The repository consists of a clay bottom lining with a seepage collection system. A composite, low permeability clay barrier and soil cap was constructed once placement of tailings was completed in the repository. Closure of Bluewater I Repository was conducted in compliance with the requirements of the State Groundwater Discharge Permit Number UGW350002. A final report documenting repository cap construction is in preparation, in accordance with permit requirements copies of which will be sent to EPA when the report is submitted to the State.

4.2 Air Monitoring

Air monitoring at the repository was conducted by Kennecott to assess level of airborne arsenic, lead (as indicator metals), and total airborne dust. Quantitative air monitoring was conducted to document repository personnel exposure using appropriate monitoring equipment.

Samples of air at the perimeter of work zones were collected during excavation and repository work activities. The Final Air Monitoring Report shows results of these samples.

PROGRESS PHOTOGRAPHS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2466

FEB 18 1993

RECEIVED
FEB 22 1993
G.F.J.

Ref: 8HWM-ER

Frank Joklic, CEO
Robert A. Lonergan
General Counsel
Vice President
Kennecott Corporation
10 East South Temple
Salt Lake City, UT 84147

Re: Transmittal of Unilateral Administrative Order for Bingham Creek Channel, Phase II Site, Salt Lake County, Utah

Dear Messrs. Joklic and Lonergan:

Enclosed please find an original, fully executed Unilateral Administrative Order concerning the Removal action planned this spring for the Bingham Creek Channel, Phase II site, located in Salt Lake County, Utah. This Order, issued to both ARCO and Kennecott, is effective on the twenty-first day after the date of issuance. An opportunity for negotiation of an Administrative Order on Consent has been provided for in the Order and notice of intent to negotiate must be received in our offices no later than seven days after the date of issuance of this Unilateral Order.

Should you have technical questions concerning this Removal action, please contact Steve Way at (303) 294-7080. Legal questions can be addressed to Karen Kellen at (303) 391-6201.

I look forward to your prompt response in this matter.

Sincerely,

Robert L. Duprey, Director
Hazardous Waste Management Division

Enclosures

cc: Karen Kellen, ORC
Maureen O'Reilly, HWM-ER
Steve Way, HWM-ER

Printed on Recycled Paper

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION VIII

IN THE MATTER OF: BINGHAM CREEK CHANNEL PHASE II, SSID # T4 ATLANTIC RICHFIELD COMPANY (ARCO), KENNECOTT CORPORATION and KENNECOTT UTAH COPPER CORPORATION Respondents. Proceeding Under Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9606(a).	UNILATERAL ADMINISTRATIVE ORDER FOR REMOVAL ACTION DOCKET NO.: CERCLA-VIII-93-10

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Exhibit 1: Statement of Work

Exhibit 2: Maps of Area

I. JURISDICTION

1. This Unilateral Administrative Order ("Order") is issued pursuant to the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. § 9606(a). This authority was delegated to the Administrator of the United States Environmental Protection Agency ("EPA") on January 23, 1987, by Executive Order No. 12,580, 52 Fed. Reg. 2,923 (1987), and has been further delegated to the Regional Administrators by EPA Delegation No. 14-14-B, and to the Director of the Hazardous Waste Management Division of EPA Region VIII.

II. PARTIES BOUND

2. This Order shall apply to and be binding upon Kennecott Corporation, Kennecott Utah Copper Corporation (together referred to as "Kennecott") and Atlantic Richfield Company ("ARCO") (collectively referred to as "Respondents") and upon all directors, officers, principals, employees, agents, successors, and assigns of Respondents. No change in corporate status of Respondents shall in any way alter, diminish, or otherwise affect Respondents' obligations and responsibilities under this Order.

3. Respondents shall be responsible for carrying out all actions required of Respondents by the terms and conditions of this Order.

III. DEFINITIONS

4. For purposes of this Order, the following terms shall have the meanings set forth below:

"**Contractor**" means any person, including the contractors, subcontractors, or agents, retained or hired by Respondents to undertake any Work under this Order.

"**Day**" means calendar day, unless otherwise specified.

"**Deliverable**" means any written product describing the Work performed or to be performed, including but not limited to, the Sampling and Analysis Plan, Alternative Analysis, Health and Safety Plan or Phase II Work Plan, that Respondents are required to submit under the terms of this Order.

"**NCP**" means the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300.

"**Order**" means this Order, the exhibits attached to this Order, and all documents which are incorporated into this Order according to the procedures set forth herein.

"**Site**" means the Bingham Creek Channel Phase II Site including the areal extent of contamination and all suitable areas necessary for implementation of the removal action, including any temporary staging or storage areas for contaminated soils. The Site includes the area described in Paragraph 6, below, and depicted on the maps attached as Exhibit 2.

"**Statement of Work**" or "**SOW**" means the Statement of Work which is attached hereto as Exhibit 1 and incorporated herein by reference.

"**Work**" means all tasks required by this Order, including all activities related to the performance of such activities.

5. All other terms, not otherwise defined herein, shall have their ordinary meaning unless defined in CERCLA or the NCP, in which case the CERCLA or NCP definition shall control.

IV. FINDINGS OF FACT

SITE DESCRIPTION AND HISTORY

6. The Bingham Creek Channel Phase II Site includes the Bingham Creek Channel and its associated floodplain and alluvial fans from the Brookside Trailer Park east of Redwood Road to the base of the Large Bingham Reservoir located on Kennecott property. Also included in the Site is the area located at the corner of 3200 West and 9000 South ("Northeast corner"). The Site is located in Salt Lake and Tooele counties, Utah (see maps attached as Exhibit 2). The rock and\or concrete lined channel through the Jordan View subdivision is not included in the Work under this Removal action.

7. From approximately 1904 until 1932, companies, including Utah Apex Company and Utah Copper Company, mined and milled lead and/or copper ores in Bingham Canyon. The residual "tailings" material from the milling operation, which contained lead and arsenic, was disposed of in waste piles near the mills or directly into Bingham Creek. Normal runoff events and flooding transported the tailings down Bingham Creek and deposited them along the banks of the channel.

8. In 1905 Utah Copper Company built a tailings impoundment north of Bingham Creek on property later acquired by Kennecott (hereinafter "Kennecott Tailings"). In 1914, Utah Apex Company built a tailings impoundment south of Bingham Creek on property later acquired by ARCO (hereinafter "ARCO Tailings"). Tailings from some of the mills in Bingham Canyon were disposed of into these impoundments while Utah Apex Company and Utah Copper Company were the respective owners of these properties. Sampling activities conducted by EPA in September 1992, at the Kennecott Tailings, revealed lead levels ranging between 270 and 8400 mg/Kg. Sampling activities conducted at the ARCO Tailings at the same time showed an average lead concentration of 6,244 mg/Kg with a range of 1,800 to 15,000 mg/Kg.

9. Runoff events and flooding caused tailings to erode from the Kennecott and ARCO Tailings into Bingham Creek Channel. At present the channel flows intermittently due to localized storms and snow melt. However, this flow in the channel has and will continue to transport fine-grained particles such as those particles present in the tailings. In addition, a County engineering study estimates that flow in a 100 year flood event would be approximately 400 cubic feet per second. This volume of flow in the channel would transport significant volumes tailings-related material deposited in the channel.

10. Sampling and analyses performed by EPA and Kennecott independently have identified lead, arsenic and other hazardous substances at the Site. In July/August 1992, EPA collected 85 samples from the Bingham Creek Channel between 4800 West and 3200 West and found lead and arsenic averaging 5,661 mg/Kg and 202 mg/Kg, respectively. The concentrations of lead ranged from 200 to 23,000 mg/Kg and the concentrations of arsenic ranged from 9 to 890 mg/Kg. Similar levels of lead and arsenic are found progressively up the channel as demonstrated by samples collected by Kennecott in 1990. Samples collected by EPA from 8600 South down channel through the Brookside Trailer Park also show elevated lead.

ENDANGERMENT

11. Arsenic is a human carcinogen. Arsenic can be acutely and chronically poisonous and can be fatal if ingested or inhaled in sufficient quantities by humans, livestock, and wildlife. Arsenic compounds are absorbed into the body primarily through inhalation or ingestion.

12. Lead is a cumulative poison which can cause neurologic, kidney, and blood cell damage in humans. Some lead compounds are also animal carcinogens adversely affecting the lungs and kidneys. Children under the age of seven years are especially sensitive to the effects of lead.

13. Several exposure routes are associated with lead and arsenic contamination conditions at the Bingham Creek Channel Site. Direct contact, ingestion, inhalation, and inhalation resulting in ingestion of the lead and/or arsenic contaminated soils and dust pose the primary exposure pathways.

RELEASE OR THREAT OF RELEASE

14. During site assessment (1990 - 1992) activities, EPA identified lead and arsenic in the soil of residential properties in the vicinity of Bingham Creek Channel as a potential threat to human health and welfare. EPA performed a removal action to mitigate the potential threat posed by the contaminated soil in 50 residential properties. The presence of the large volume of tailings at the Site containing high concentrations of lead and arsenic poses a continuing threat of release down-channel and recontamination of previously remediated residential property. The health based action level for lead at the above mentioned residential removal was 2,500 mg/Kg. This level was designed to address only the most critical levels of contamination.

15. Population growth adjacent to and near the Bingham Creek Channel continues to accelerate. The 1980 census report indicated that approximately 1,360 people lived within a 4 mile radius of the Site. The 1990 census report indicated that the population is approximately 2,450 for the corresponding area. New residential development along the channel continues and more is planned.

RESPONDENTS

16. ARCO is the owner and/or operator of the ARCO Tailings, a facility along Bingham Creek Channel, from which hazardous substances were disposed of and/or released into Bingham Creek. ARCO, through its predecessor in interest, owned or operated, at the time of disposal, facilities along Bingham Creek Channel from which hazardous substances were disposed of and/or released into Bingham Creek. ARCO, a corporation incorporated under the laws of the State of Delaware, is qualified to perform the actions set forth in this Order.

17. Kennecott is the owner and/or operator of facilities along Bingham Creek Channel from which hazardous substances were disposed of and/or released into Bingham Creek. Kennecott and/or its predecessor in interest owned or operated, at the time of disposal, facilities along Bingham Creek Channel from which hazardous substances were disposed of and/or released into Bingham Creek. Kennecott, two corporations incorporated under the laws of the State of Delaware, is qualified to perform the actions set forth in this Order.

RESPONSE ACTIONS

18. An enforcement action was taken at Bingham Creek Channel (Phase I) during 1991, pursuant to Administrative Order on Consent, Docket No. CERCLA VIII-91-11. To date, no CERCLA enforcement actions have taken place in the area defined as Bingham Creek Channel, Phase II.

19. On January 28, 1993, EPA Region VIII signed an Action Memorandum documenting the need for this removal action (Phase II), outlining the proposed action and explaining the basis for the decision to take such action.

V. CONCLUSIONS OF LAW

20. The ARCO Tailings, the Kennecott Tailings and the Site are each a "facility" as defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

21. Respondents are "persons" as defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

22. Lead and arsenic found on the Site are "hazardous substances" as defined in Section 101(14)(B) of CERCLA, U.S.C. § 9601(14)(B).

23. The past, present, and potential future migration of hazardous substances into the environment described in Section IV of this Order constitute a "release" or threat of "release" as defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

24. As current and past owners and operators of the Site, and/or as generators of hazardous substances at the Site, Respondents are responsible parties under section 107(a)(1), (2) and (3) of CERCLA, 42 U.S.C. § 9607(a)(1), (2) and (3).

VI. DETERMINATIONS

25. Based on the preceding Findings of Fact and Conclusions of Law and on the Administrative Record for the Site, EPA has determined that:

26. There has been a release and there exists a threat of further release into the environment of hazardous substances from the Site which may present an imminent and substantial endangerment to the public health, welfare, or the environment.

27. To protect the public health, welfare, or the environment, and to prevent and mitigate the imminent and substantial endangerment thereto, it is necessary that a Removal action be taken to abate the release and threat of release of hazardous substances at and from the Site. The activities required by this Order are not inconsistent with the NCP.

VII. NOTICE TO THE STATE

28. EPA has notified the State of Utah of this action pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

VIII. WORK TO BE PERFORMED

29. Based upon the foregoing Findings of Fact, Conclusions of Law, and Determinations, and pursuant to the authority of Section 106(a) of CERCLA, Respondents are ORDERED to plan, implement, perform, and complete all actions required by this Order in accordance with the standards, criteria, specifications, requirements, and schedule set forth in this Order and the attached Statement of Work ("SOW"). The SOW is hereby incorporated by reference into this Order as Exhibit 1.

30. The final EPA-approved work plan ("Work Plan") shall be incorporated into and made an enforceable part of this Order. Respondents shall undertake all tasks described in the Work Plan and complete all tasks according to the approved schedule.

31. All work under this Order is subject to oversight by and the prior approval of EPA. Respondents shall obtain EPA approval for all documents and reports required by the Work Plan and all proposed modifications to documents or reports previously approved by EPA. Commencing or undertaking any removal action at this Site without prior EPA approval is a violation of this Order.

32. The plans, documents, and reports required by the Work Plan shall be subject to review and approval or modification by EPA. Unless otherwise specified in the Work Plan schedule, Respondents shall, within fourteen (14) days of receipt of any EPA disapproval, submit a revised document addressing all deficiencies and incorporating any modifications specified by EPA. At the time a revised document is submitted, Respondents shall submit a cover letter describing their response to each EPA comment and modification and a certification that no other changes were made. Failure to incorporate or address any EPA comment or modification in accordance with these procedures is a violation of this Order. EPA may unilaterally modify any plan, document, or report if Respondents do not make the required modifications.

33. All Work shall be conducted and completed in accordance with CERCLA, the NCP, EPA guidance, and any amendments thereto which become effective prior to the date of completion of Work under this Order. Respondents shall be responsible for identifying and using other guidelines, policies, procedures, and information that may be appropriate for performing the Work.

34. Activities undertaken by Respondents shall be in compliance with all other Federal, State, and local laws and regulations, including permit requirements, unless an exemption is provided by Section 121(e) of CERCLA, 42 U.S.C. § 9621(e). Respondents shall identify all permits, licenses, and approvals which may be required for performance of the Work in sufficient time to obtain such permit, license or approval, where not exempt under CERCLA, and to perform Work as scheduled.

35. Respondents shall perform all Work in a high-quality manner. Deliverables shall be edited for content, organization, grammar, and spelling before submittal to EPA. Failure to perform or prepare Work of high quality shall be considered a violation of this Order.

36. Respondents shall employ sound scientific, engineering, and construction practices in performing Work pursuant to this Order. All tasks performed shall be under the direction and supervision of qualified personnel or contractors with experience in the types of tasks required for implementation of the Work. Respondents shall provide a copy of this Order and any relevant modifications to this Order to any contractor retained or hired to perform any Work and shall condition the performance of Work on compliance with the relevant requirements of this Order.

37. On or before the effective date of this Order, Respondents shall notify EPA, in writing, of the name, title, and qualifications of the personnel and contractors to be used in carrying out the Work. Respondents shall demonstrate to EPA that proposed personnel and contractors possess the qualifications, experience, technical capability, and management capability necessary to perform the Work in a safe and timely manner, consistent with the requirements of this Order. If EPA disapproves of any personnel or contractor, Respondents shall within fourteen (14) days submit the name of another person or contractor and the information outlined above. Any change in personnel or contractor performing Work under this Order shall be submitted, with the information outlined above, to EPA for approval at least seven (7) days before Respondents make such change.

38. All waste disposal conducted by Respondents pursuant to this Order shall comply with all requirements of CERCLA, 42 U.S.C. § 9601-9675, and all regulations and guidance promulgated thereunder.

39. Respondents shall cooperate and coordinate with each other in the performance of activities required by this Order.

IX. REPORTING REQUIREMENTS

40. Beginning thirty (30) days after EPA approves Respondents' Work Plan or seven (7) days before construction activities begin, whichever occurs first and during the course of Work under this Order, Respondents shall submit the following reports to EPA and the State:

a. Weekly Progress. Respondents shall submit weekly progress reports containing the following information and any information required by the Work Plan:

(1) A description of the actions taken toward achieving compliance with this Order, including plans and actions completed, during the reporting period;

(2) A description and estimate of the percentage of the Work completed;

(3) A description of any activities that deviated from or were carried out in addition to those provided for in the Work Plan, which occurred during the reporting period;

(4) Summaries of significant findings pertaining to the removal action during the reporting period;

(5) Summaries of all changes made in the removal action during the previous week;

(6) A description of unresolved problems or potential problems encountered during the reporting period that may cause a performance delay and a description of efforts made to mitigate those problems and/or delays;

(7) Change orders, nonconformance reports, claims made, and actions taken to rectify problems;

(8) Changes in personnel during the reporting period;

(9) Projected work for the next reporting period and a schedule of activities for the next month; and,

(10) Copies of inspection logs and results of all sampling, tests, and other data (including validated analytical data with supporting documentation on Contract Laboratory Program Form I's or in a similar format) received or produced by Respondents during the course of work during the previous week.

These reports shall be provided to EPA and the State by Thursday morning of each week from the effective date of the Order until EPA terminates the Order or otherwise authorizes Respondents to discontinue such reporting.

41. Respondents shall submit all deliverables under this Order by hand delivery or overnight or certified mail, return receipt requested, to the following persons or to such other persons as EPA hereafter may designate in writing:

a. Documents submitted to EPA shall be sent in quadruplicate to:

Steve Way (8HWM-ER)
On-Scene Coordinator
U.S. Environmental Protection Agency
Region VIII
999 18th Street, Suite 500
Denver, Colorado 80202-2405

b. Copies of documents submitted to EPA shall also be submitted simultaneously to:

Brent H. Everett
UDERR
1950 West North Temple
Salt Lake City, UT 84114-4840

42. In the event of any significant change in conditions, emergency circumstances, or immediate endangerment to public health, welfare, or the environment at the Site, Respondents shall immediately notify the EPA On-Scene Coordinator, or if unavailable, his or her supervisor or other appropriate EPA personnel. Respondents shall provide EPA with written notice of the event within seven (7) days of its occurrence. The written notice shall include a detailed description of the event, including time and location, any known causes of the event, the consequences of the event to public health, welfare, and the environment, and actions taken, or to be taken, to stop or mitigate the event.

X. PROJECT MANAGER, ON-SCENE COORDINATOR

43. Within seven (7) days of the effective date of this Order, Respondents shall designate a technical Project Manager and an Alternate Project Manager and shall notify EPA in writing of their names, titles, affiliations, addresses, and telephone numbers. The Project Manager shall be responsible for overseeing implementation of this Order. To the maximum extent possible, communications concerning technical aspects of this Order shall be coordinated through the Project Manager for Respondents and the On-Scene Coordinator designated by EPA. Respondents' Alternate Project manager shall receive communications if the Project Manager is unavailable. EPA retains the right to disapprove of any Project Manager or Alternate Project Manager designated by Respondents.

44. Respondents may replace their Project Manager or Alternate Project Manager by notifying EPA's On-Scene Coordinator in writing of the replacement's name, title, affiliation, address, and telephone number at least five (5) days before the replacement.

45. The EPA On-Scene Coordinator has the authority vested in the On-Scene Coordinator by the NCP. The absence of the EPA On-Scene Coordinator from the Site shall not be a cause for stoppage or delay of Work.

XI. SITE ACCESS AND SAMPLING

46. Respondents shall in no way hinder or impede access by EPA, the State, or their authorized representatives to the Site or any other areas where the Work is conducted. Respondents shall not prohibit such persons from being present on the Site or such other areas at any and all times or from observing any and all Work conducted pursuant to this Order. All persons who engage in activity under this Order shall be available to and shall cooperate with EPA in its oversight of Work under this Order.

47. To the extent that access to property other than property owned by Respondents is required for the proper and complete performance of Work under this Order, Respondents shall use their best efforts to obtain a written right of access for access to such property within ten (10) days of the effective date of this Order. Respondents shall provide EPA and the State with a copy of such right of access within fourteen (14) days of the effective date of this Order. Such agreements shall ensure access for EPA, the State, and their authorized representatives. If Respondents are unable within the deadline specified to obtain such access for themselves, EPA, the State, and their authorized representatives, they shall notify EPA immediately by telephone,

and in writing within three (3) days thereafter, of their failure and efforts made to obtain access.

48. Nothing herein shall limit or otherwise affect EPA's or the State's right of entry pursuant to any applicable statute, regulation, or legal authority.

49. Respondents shall provide EPA and the State written notice at least seven (7) days prior to collecting samples pursuant to this Order. Upon request, Respondents shall provide EPA, the State, and their authorized representatives with split or duplicate samples. Respondents shall allow EPA and the State to take any other samples and conduct any tests and inspections EPA or the State deems necessary.

50. All sampling activity is subject to EPA direction and approval.

51. All sampling and analyses performed pursuant to this Order shall conform to EPA guidance regarding sampling, quality assurance/quality control ("QA/QC"), data validation, and chain of custody procedures. Respondents shall ensure that EPA and State personnel and their authorized representatives are allowed access to any laboratory utilized by Respondents in implementing this Order. Respondents shall ensure that the laboratory participates in a QA/QC program equivalent to that which is followed by EPA. Upon request, Respondents shall have such laboratory analyze samples submitted by EPA for quality-assurance monitoring.

52. If Respondents obtain any samples from property owned by a third party, Respondents shall provide the third party with a receipt describing the samples obtained, and an opportunity to request and obtain split samples. Respondents shall also promptly provide such third party with a copy of the results of any analyses made.

XII. DOCUMENTATION, AVAILABILITY OF INFORMATION, AND RECORD RETENTION

53. For the period during which this Order is in effect, Respondents shall permit EPA, the State, and their authorized representatives to inspect and copy all non-privileged records, files, maps, and other documents, writings, or depictions pertaining to implementation of this Order.

54. Respondents shall maintain a running log of privileged documents on a document-by-document basis containing the date, author(s), addressee(s), the privilege claimed (e.g., attorney work product, attorney-client), and the factual basis for the assertion of the privilege. The privilege log shall be kept on file and available for inspection. EPA may at any time challenge

claims of privilege through negotiations or otherwise as provided by law or the Federal Rules of Civil Procedure.

55. Respondents may assert a business confidentiality claim pursuant to 40 C.F.R. § 2.203(b) with respect to part or all of any information they submit to EPA pursuant to the terms of this Order, provided such claim is allowed by Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7). All claims will be reviewed and allowed or disallowed pursuant to 40 C.F.R. Park 2, Subpart B. EPA shall only disclose information covered by a business confidentiality claim to the extent permitted by and by means of the procedures set forth at 40 C.F.R. Part 2, Subpart B. If no such claim accompanies the information when it is received by EPA, EPA may make it available to the public without further notice to Respondents.

56. Respondents shall preserve during the pendency of this Order and for a minimum of six (6) years after termination of this Order, all records and documents in their possession or in the possessions of their divisions, employees, agents, contractors, or attorneys which relate in any way to this Order or Work performed hereunder, notwithstanding any document retention policy to the contrary. At the end of this six year period, Respondents shall make such records available to EPA for inspection or shall provide the original or copies of such documents to EPA. If EPA requests that some or all documents be preserved beyond this six year period, Respondents shall either comply with EPA's request or provide to EPA the original or legible copies of the retained documents.

XIII. MODIFICATIONS TO ORDER

57. No oral advice, guidance, suggestions, assurances, or comments by EPA or its authorized representatives shall modify the terms or conditions of this Order or relieve Respondents of their obligations under this Order.

58. If Respondents seek to deviate from the approved Work Plan, Respondents' Project Manager shall submit a written request to EPA outlining the proposed Work Plan modification and the basis therefor. If EPA approves the Work Plan modification in writing, such modification shall be deemed incorporated into this Order. Deviation from the Work Plan without EPA's prior approval is a violation of this Order.

XIV. EFFECTIVE DATE AND CONFERENCE OPPORTUNITY

59. This Order shall be effective twenty-one (21) days from the Date of Issuance. Each Respondent shall, within seven (7) days from the Date of Issuance, notify EPA, in writing, of its intent to comply with this Order or to request the opportunity to negotiate an Administrative Order on Consent (AOC). If either

Respondent submits a Notice of Intent to negotiate an AOC, this Order shall, with respect to that Respondent, be superceded by any fully executed AOC, which results from these negotiations. Twenty-one (21) days, calculated from the Date of Issuance of this Order, shall be allowed for the negotiation of an AOC. The schedule for performance of Work shall be calculated from the effective date of this Order or from the effective date of the superceding AOC once it is fully executed.

60. Respondents may request a conference with EPA, to occur no later than seven (7) days after the Date of Issuance, to discuss this Order, including its applicability, the appropriateness of activities required to be undertaken, and other issues and contentions relevant to issuance of this Order. Any request for a conference shall be made to Karen S. Kellen, Assistant Regional Counsel, EPA Region VIII, 999 18th Street, Suite 500, Denver, Colorado 80202-2405, (303) 391-6201. At any such conference, Respondents may appear in person or through an attorney or other designated representative. Such conference is not, and shall not be deemed to be, an adversarial hearing or part of a proceeding to challenge this Order, and no official stenographic record of such proceeding shall be kept.

61. If Respondent(s) does not submit a letter of Intent to Negotiate, each Respondent shall, no later than seven (7) days after the Date of Issuance, inform EPA in writing as to whether it intends to comply with the Order. If Respondent(s) submits a letter of Intent to Negotiate but does not reach agreement with EPA within twenty-one (21) days of the Date of Issuance of this Order, then, within twenty-four (24) hours of the Effective Date of this Order, each Respondent shall inform EPA in writing as to whether it intends to comply with this Order. A failure to respond or to indicate an intention to comply with this Order by such date shall be deemed to mean that Respondent(s) does not intend to comply with this Order.

XV. RESERVATIONS, DISCLAIMERS

62. In the event that EPA determines that the activities performed pursuant to this Order or any emergency circumstances may pose a threat to public health or welfare or the environment, EPA may direct Respondents to stop further implementation of Work pursuant to this Order or may take or order further actions to abate the threat. This provision is not to be construed to limit any powers EPA may have under CERCLA, the NCP, or any law or regulation.

63. Nothing herein shall preclude EPA from taking action to enforce this Order, nor from taking any action pursuant to Sections 104, 106, 107, or 122 of CERCLA, 42 U.S.C. §§ 9604, 9606, 9607, or 9622, nor any and all actions pursuant to CERCLA or any other available legal authority, including without

limitation, seeking injunctive relief, monetary penalties, or punitive damages. Nothing herein shall preclude EPA from undertaking any additional enforcement actions and/or other actions it may deem necessary for any purpose, including the prevention or abatement of an imminent and substantial danger to the public health or welfare or the environment arising from Site conditions.

64. Neither EPA nor the United States, by issuance of this Order, assumes any liability for any acts or omissions of Respondents, nor employees, agents, contractors, or consultants of Respondents, in carrying out Work pursuant to this Order. Neither EPA nor the United States shall be held a party to any contract entered into by Respondents, nor by their employees, agents, contractors, or consultants in carrying out Work pursuant to this Order.

65. Nothing in this Order shall affect any right, claim, interest, defense, or cause of action of any party against any entity not subject to this Order for any liability it may have arising from or relating in any way to the Site. Nothing in this Order shall be deemed to constitute a decision on preauthorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2).

66. Nothing in this Order shall constitute or be construed as a satisfaction or release from liability for Respondents, nor their agents, contractors, lessees, successors, or assigns with respect to any conditions or claims arising as a result of past, current, or future operations at the Site, ownership of the Site, or use or disposal of hazardous substances at the Site.

67. EPA reserves its rights to seek, pursuant to Section 107 of CERCLA, 42 U.S.C. § 9607, recovery from Respondents of the United States' costs incurred in oversight, administration, and enforcement of this Order, and any other past and future costs incurred by the United States in connection with response activities at the Site not otherwise reimbursed by Respondents.

68. Nothing in this Order shall be construed to release Respondents from any liability for failure to perform the Work in accordance with this Order.

XVI. ASSURANCE OF ABILITY TO COMPLETE WORK

69. Respondents shall establish and maintain a financial instrument, trust account, or other financial mechanism such as one of those set forth at 40 C.F.R. Part 264.143, acceptable to EPA, funded sufficiently to perform the work and any other obligations required under this Order, including a margin for cost overruns. Within fifteen (15) days of the effective date of this Order, Respondents shall either fund the financial

instrument or trust account or demonstrate to the satisfaction of EPA that their financial resources are sufficient to perform the work required under this Order projected for the period beginning with the effective date of the Order through the end of the current calendar year quarter. On or before the 15th calendar day of each calendar year quarter thereafter, Respondents shall either fund the financial instrument or trust account or demonstrate to the satisfaction of EPA that their financial resources are sufficient to perform the work and other activities required under this Order projected for the succeeding calendar year quarter. Within five (5) days of the funding of any account or other mechanism or the demonstration of ability to perform Work, Respondents shall report such to the On-Scene Coordinator.

70. If at any time the net worth of the financial instrument or trust account is insufficient or the other demonstration of financial ability is inadequate to assure performance of the Work and other obligations under the Order for the upcoming quarter, Respondents shall provide written notice to EPA within seven (7) days after the net worth of the financial instrument, trust account or other demonstration of financial ability becomes insufficient or inadequate. The written notice shall describe why the financial instrument, trust account or other demonstration of financial ability is insufficient and shall explain what actions have been or will be taken to fund the financial instrument or trust account adequately or to demonstrate to the satisfaction of EPA that it has the financial resources to continue the Work through the time period required. EPA reserves the right to terminate this Order if funding becomes or will become inadequate.

XVII. ENFORCEMENT

71. Should Respondents violate this Order or any portion thereof, EPA may carry out the required actions unilaterally, pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604, and/or may seek judicial enforcement of this Order pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606. Respondents may also be subject to an action for cost recovery, civil penalties of up to $25,000 per day per violation of this Order, and/or punitive damages (including treble damages), as provided in Sections 106(b), 107(a) and 107(c)(3) of CERCLA, 42 U.S.C. §§ 9606(b), 9607(a) and 9607(c)(3), respectively, for failure to comply with the terms of this Order.

XVIII. TERMINATION AND SATISFACTION

72. Respondents shall submit a written Notice of Completion to EPA upon completion of all Work described in this Order indicating that, in Respondents' opinion, the tasks required by the Order have been completed. The Notice of Completion shall

contain the following statement which shall be signed by a responsible official representing each Respondent:

> I certify that the information contained in or accompanying this Notice of Completion is true, accurate, and complete. As to (the) (those) identified portion(s) of this Notice of Completion for which I cannot personally verify (its) (their) truth and accuracy, I certify as the official having supervisory responsibility for the person(s) who, acting under my direct instructions, made the verification that this information is true, accurate, and complete.

73. The term "responsible official" means: (a) A president, secretary, treasurer or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or, (b) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditure exceeding $35 million, if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

74. EPA shall make the final determination as to the sufficiency and/or acceptability of all Work conducted under this Order, including but not limited to each required submittal and activity completed. EPA may inspect the Site for adequacy of Respondents' performance of the Work. EPA will notify Respondents, in writing, of any deficiencies and the actions required to correct these deficiencies at the Site. Respondents shall take the necessary corrective measures to address any deficiencies, identified by EPA. This Order shall terminate upon Respondents' receipt of written notice from EPA that Respondents have complied with all terms of this Order.

IT IS SO ORDERED

Robert L. Duprey, Director
Hazardous Waste Management Division
Region VIII
U.S. Environmental Protection Agency

2-18-93
Date of Issuance

Effective Date: March 11, 1993

EXHIBIT I

BINGHAM CREEK CHANNEL SITE
PHASE 2
SSID # T4

STATEMENT OF WORK

February 10, 1993

BINGHAM CREEK CHANNEL - PHASE 2

SSID # T4
STATEMENT OF WORK

I. SITE HISTORY AND BACKGROUND

Bingham Creek originates in the Bingham Canyon and was the primary drainage from the mining district in this area. Although historically, water from the mining district flowed in the channel, the Large Bingham Reservoir now contains nearly all the flow from the canyon. The reservoir is located in Western Salt Lake County, Utah approximately one-half mile East of Copperton, Utah in Section 17, Township 3 South, Range 2 West, Salt Lake Base and Meridian. The channel starts at the toe of the reservoir.

The channel passes through several miles of Kennecott property before reaching a county gravel plant and a brick factory, and then entering residential areas at 4800 West. The channel is accessible year-round and is used as a recreational area and trail by residents in the area. It serves as a storm water drainage during runoff events and receives irrigation wastewater.

Sampling in 1992 by the EPA indicated high levels of lead and arsenic in the soil in Bingham Creek Channel. Samples were collected through residential reaches and from upper reaches on ARCO and Kennecott property. The tailings in the upper reaches also indicated elevated levels of lead and arsenic consistent with those found down channel.

Lead and arsenic were identified at the Site as the contaminants of concern. These are hazardous substances, as defined by § 101(14) of CERCLA, that were released into the environment through mining and beneficiation processes in the Bingham Canyon. Mining waste (tailings), were discharged directly to Bingham Channel and deposited along the banks of the channel upstream from the residential areas. The mining waste was transported primarily by normal runoff events and flooding. The last major flood through the Bingham Creek Channel occurred in 1983. Precipitation events continue to erode tailings into the channel.

Contaminated soil is also wind-blown and disturbed during development activities. Dust-size particles (especially those with diameters of 100 microns or less), are a significant source of exposure, and are transported by wind and human

activities from source areas into yards and homes. Also, irrigating systems contribute to migration of contaminated soil in the channel; the channel receives water released from the irrigation canals.

Analytical results for 85 samples show that the lead levels in the channel soil between 3200 West and 4800 West range from 290 mg/Kg to 23,000 mg/Kg, and arsenic levels range from 19 mg/Kg to 890 mg/Kg. The mean concentrations are 5661 mg/Kg lead and 202 mg/Kg arsenic. Previous sampling indicates that lead levels range even higher in some areas of the channel.

A significant potential for continued human exposure to hazardous substances exists at the Site. Several miles of the channel have soil with an average concentration of lead in excess of 2500 mg/Kg. Approximately 70% of the material from 85 samples tested at the Site passed through a 250 micron mesh, which is the particle size considered most available for human exposure. In addition, concentrated deposits of tailings with high lead levels are frequently observed at depths from six inches to several feet below the surface of the channel.

II. PURPOSE - OVERVIEW

This Statement of Work (SOW) defines the objectives and scope of work that is involved in fulfilling the requirements of the Unilateral Administrative Order (Docket # CERCLA VIII-93-10). The purpose of the work described herein is to address the uncontrolled tailings with elevated lead and arsenic present at the Site and prevent the release or potential release of hazardous substances. This action is designed to protect residents in the area who may be exposed to lead and arsenic levels that may pose a health threat. The scope is limited and is focussed on the channel as a source area that poses a potential for human exposure to high levels of hazardous substance in the channel and poses the potential for recontamination of residential properties remediated in a Removal action implemented in 1991. It should be noted that the threat posed by arsenic will be addressed by this Removal Action. The primary contaminant of concern at the Site is lead.

The scope of work required in this action includes but is not limited to the channel invert, side slopes, and associated flood plain areas. The priority is placed on the channel through the residential reach, which extends from Redwood Road (including Brookside Trailer Park), to 4800 West. The channel reach up gradient from 4800 West is also included in the scope of this Removal Action. Also included in the scope is the area located at the northeast corner of 3200 West and 9000

South. However, generally the action does not include residential properties unless the property is adjacent to or inherently part of the channel, flood plain, or alluvial fans and concentrations of lead in the soil exceed the action level.

The action requires the removal of soil containing lead at concentrations greater than 2,000 mg/Kg or to depths generally not to exceed 3 feet in the channel and placing an adequate cover over contaminated areas to prevent exposure and continued migration of contaminated soil. The channel will be regraded with clean fill from either the banks of the channel or from an off-site borrow source.

Specific elements of the response action are described in more detail below.

A. Channel Area:

The response action calls for removing soil containing lead concentrations greater than 2,000 mg/Kg from the channel, and placing an adequate cover over contaminated areas to prevent exposure. The channel will be regraded with clean fill from either the banks of the channel or from an off-site source.

1. Soil removal depths will depend on conditions in the channel and contaminant depth; generally, the removal depth will not exceed three feet, except in limited areas where pockets of deep deposits may be effectively removed. The lateral extent of soil removal will generally be limited to the channel banks and undeveloped flood plain with lead concentrations in excess of 2,000 mg/Kg.

2. Channel grade and contours will be restored, and soil fill will have sufficient clay content to prevent erosion, due to normal runoff flow and 100 year flood events in the channel. Restoration of the channel must be based on appropriate designs for open channel flow.

3. Vegetation will be re-established where necessary to restore the landscape and stabilize the channel.

4. Culverts, spillways, rip-rap, stilling basins or other systems will be installed as necessary.

5. Contaminated soil will be consolidated and transported to a repository for storage.

The estimated volume of soil that may be removed from the channel between 3200 and 4800 West is 92,000 cubic yards. However, this is not a limit to the amount to be removed. The soil volume requiring removal in the channel below 3200 West is uncertain. It is expected, however, to be significantly less than the upper reaches.

If conditions prohibit adequate removal of contaminated soil, a second approach to stabilizing the channel and preventing exposure is constructing a concrete channel. EPA will determine when and if this approach is appropriate. Conditions that may warrant concrete channelization include side slope stability and proximity to structures such as roads or buildings adjacent to the channel. This option will also require some soil removal in the channel and up the embankments as described above. However, concrete channelization will not be used unless necessary to adequately stabilize the channel to prevent contaminant migration.

A retention or settling basin on the up gradient end of the remediated area may be necessary to prevent recontamination, if the Removal is not completed through the upper reach of the channel.

B. **Lots 9000 South/3200 West:**

The Removal Action calls for removing a minimum of 18 to 24 inches of contaminated soil (lead greater than 2000 mg/Kg). Additional sampling is necessary, however, to identify exact boundaries.

1. Soil excavated from this area must be transported to the approved repository for storage.

2. The area must be restored to original grade and re-vegetated. All haul roads and soil staging areas must be rehabilitated.

Specific requirements that must be addressed in the Work Plan are described below.

III. REMOVAL WORK PLAN

The Respondent shall prepare a draft Work Plan for submittal to EPA 30 days after the effective date of the Order. The Work Plan must describe how the approved Removal action for

the Site as described above will be implemented by the Respondents. The Work Plan must include at a minimum the following elements:

A. SELECTED RESPONSE ACTION AND SITE DESCRIPTION

Describe the EPA approved Removal action with a short overview of the tasks required to implement the Removal. Also provide a description of the Site relating specific areas to the elements of the response action. This section must address the physical characteristics of the channel and the engineering design required for restoration of the channel. The Work Plan must include a digitized copy (for computer) and graphic presentation of current surveyed channel cross sections. The Respondents must coordinate with EPA before obtaining the channel cross sections to determine the location and interval requirements for those measurements.

B. MATERIALS HANDLING AND STORAGE

Methods of materials handling for contaminated soils, clean soils, and stabilized soils (if required) must be described. This section shall include methods and equipment for excavation, transportation on-site, temporary stockpiling, and final placement of stabilized material (if required). Maps depicting access routes, stockpile areas, work areas, etc., shall be provided.

C. DISPOSAL FACILITY

If an off-site disposal facility is used to meet the requirements of the response action, the plan shall list the name and location of the facility. If an on-site repository is selected, the design specifications and construction QA/QC plans must be submitted in the Work Plan. The EPA shall have final approval of the use of the proposed disposal facility.

D. TRANSPORTATION

Transportation of contaminated material to the repository and the routes for hauling off-site borrow material is to be addressed. This section shall discuss the types of vehicles, routing and load limits. Primary and alternate routing from the Site to the disposal facility shall be listed. Maps of the route shall be attached. Any required permits shall be obtained from the appropriate agency. Appropriate traffic control measures must be provided for during hauling activities.

E. ENGINEERING CONTROLS

Controls to prevent release of contaminants off-site shall be addressed in this section. Also to be addressed are the final grading, contouring, erosion controls, and re-vegetation of the Site. Methods for dust suppression from the trucks (tarping, wet loads) and from the roadways, shall be addressed. This requirement also includes necessary retention or stilling basins to mitigate recontamination of the channel from upper reaches that may not be addressed during the construction season.

1. DUST SUPPRESSION

Methods of dust control to be used during excavation, transportation, and placement of soil must be addressed.

2. EROSION CONTROL

Methods of erosion control, both during and after completion of the Removal, must be addressed. Long term monitoring of erosion control methods must also be addressed.

3. FINAL CONTOURING

The channel must be re-established to ensure the appropriate flow capacity using standard methods of open channel design. The Site shall be recontoured to meet with existing native ground contours, and to minimize erosion due to air and water action. During construction grade control must be maintained with engineering surveying. Generally, only those measures necessary to ensure the stability of the channel will be required and no additional work such as replacement of existing culverts related to routine flood control measures will be required.

4. RE-VEGETATION

Methods of re-vegetation for the final configuration on the site shall be addressed. The mixture of seed to be used for vegetation shall be approved by the EPA.

F. SAMPLING and ANALYSIS/TESTING PROCEDURES

Sampling and analysis will be necessary to fulfill the requirements of the response. Soil sampling will be necessary to delineate perimeter areas for excavation, defining the depth and lateral extent of contamination and similar objectives. The respondents must determine the potential for leaching of hazardous substances from the

soil to be placed in the repository. A sampling plan for confirmation of concentrations of hazardous substances in the removal area after excavation of soil must be implemented. To the extent it is necessary to collect multimedia samples, the procedures and plans for sampling all environmental media must be addressed in the Work Plan.

Also, data related to the repository design specification and materials testing must be provided as necessary, and the appropriate testing procedures must be addressed in the Work Plan.

Details for the sampling and analyses procedures must be provided in the sampling and analysis plan (SAP) as described in Section IV.

G. WORK AREAS

Work areas shall be outlined. Maps of the proposed work areas shall be provided.

H. SITE SECURITY

Security shall be maintained at the Site and the work plan must describe in general the plans for maintaining security.

I. PERSONNEL AND EQUIPMENT REQUIREMENTS

The work plan must identify labor mix and the number and types of equipment required to implement the action. Key management/supervisory personnel who will be available on-site must be identified.

J. PERSONNEL AND EQUIPMENT DECONTAMINATION

Decontamination procedures for personnel on-site shall be addressed in this section. Decontamination procedures for all equipment used on-site shall be listed. Disposal of decontamination materials shall be addressed. Criteria for release of equipment off-site shall be addressed.

K. OPERATION AND MAINTENANCE

Requirements for ensuring the long term effectiveness of the Removal such as monitoring ground water, maintenance of the capping, erosion control and site security will be addressed in the Removal Work Plan. If necessary, sampling to determine if contaminated soil has migrated

into clean areas must be implemented during construction and after demobilization.

L. ARARs

The Respondent must specify in the Work Plan how the applicable or relevant and appropriate requirements will be complied with during and after the implementation of the Removal action.

M. REPORTING AND DOCUMENTATION

1. WEEKLY REPORTS

In addition to the weekly reporting specified in the Order, weekly reports submitted to the EPA must also detail Site activities, volumes of materials excavated, volumes of materials stockpiled, volumes of materials stabilized (if required), volumes of materials transported off-site, and any injuries/accidents on-site. Additional reporting will be made immediately available in the event of an emergency or deviation from the Removal Work Plan. Confirmation soil sampling results must be summarized and reported also.

2. FINAL REPORT

A final report detailing all major tasks and critical data regarding volumes, area and depths associated with materials excavated, stabilized, transported and placed in storage shall be submitted to EPA 60 days after completion of all work on the Site. The report shall detail all confirmation samples taken on-site and the analytical data from the sampling. Long term erosion protection/monitoring shall also be addressed in the final report. An engineering survey of the channel must also be provided in graphic and digitized formats for conditions before and after the implementation of the response action. In addition, photographic documentation of the final channel construction must be provided in the report.

IV. Sample Analysis Plan (SAP)

The Respondents will develop a site specific Sampling and Analysis Plan (SAP). The individual sections, as outlined below, must be addressed in the SAP. The SAP must be submitted to EPA for comment and approval as part of the Work Plan. The SAP shall be applicable to all phases of work performed under the Order. The SAP must include the following

elements and it must be consistent with the Quality Assurance/Quality Control Guidance for Removal Activities - Sampling QA/QC Plan and Data Validation Procedures, April 1990 (EPA/540/G-90/004).

A. SITE HISTORY AND BACKGROUND

A brief site history and background introduction will be given. The availability and quality of existing data for the Site will be addressed in this section. Previously obtained analytical results from sampling activities shall be described and used to develop the SAP. EPA will determine the usefulness of existing data and the need to expand upon that data. To the extent that existing data is relied upon to direct activities during the response action, a summary of the existing data shall be submitted with the Work Plan.

B. RATIONALE FOR SAMPLING DESIGN

The rational for the overall sampling design, and for specific matrices and locations, must be given. Representative sampling procedures for soil must be applied for determination of heavy metals concentrations. Specifically, statistically random approaches for selecting specific locations for grab samples must be employed.

C. SAMPLES - LOCATIONS AND NUMBERS

The location and number of samples to be taken for each subcategory below shall be listed.

1. TAILINGS AND SOILS
   a. SURFACE
   b. SUBSURFACE

2. WATER
   a. SURFACE
   b. SUBSURFACE

3. AIR

D. EQUIPMENT DECONTAMINATION CHECK SAMPLES

E. ANALYTICAL METHODS

EPA approved analytical procedures shall be utilized for each matrix. The table shall list the EPA reference number for the procedure and the detection limits for each matrix. Conditions may warrant using X-ray florescence (XRF) for screening soil samples

during the removal operations. Appropriate confirmation analyses using standard EPA methods would also be required.

The Respondent's laboratory shall be identified to the EPA for approval prior to Site operations. The EPA at its option, may perform an audit on the laboratory selected.

1. SOIL

2. WATER

3. AIR

F. QA/QC PROTOCOLS

Quality Assurance/Quality Control procedures must be consistent with accepted EPA standards as described in the above referenced guidance. Generally, quality assurance objective 2 (QA2) must be achieved for the sampling and analyses at the Site. However, QA1 (including XRF analytical methods) data may be used with appropriate quality control and confirmation analyses.

G. SAMPLING PROCEDURES

The plan shall address the procedures for obtaining representative samples for each matrix as listed below:

1. TAILINGS (SURFACE AND SUBSURFACE)

2. SOILS (SURFACE AND SUBSURFACE)

3. SURFACE WATER

4. GROUND WATER

5. AIR

6. EQUIPMENT DECONTAMINATION SAMPLES

H. SAMPLE CUSTODY

Procedures for sample custody, logbooks, recordkeeping, in the field and in the laboratory must be described in the SAP.

I. SPLIT SAMPLES

Split samples will be available for EPA during all sampling activities. In any case where the analytical results differ, the EPA shall have the final determination as to which results shall be used in determining clean-up objectives.

J. DATA REDUCTION, VALIDATION, AND REPORTING

Reduction of the analytical data, validation procedures for the data, and final reporting format for the data shall be addressed.

K. DATA QUALITY OBJECTIVES

The Data Quality Objectives for all sampling activities must be described in the SAP. Generally QA1 and QA2 objectives are appropriate. Procedures for achieving the necessary Q level including the laboratory and field duplicate samples, matrix spikes, performance Evaluation samples, limits of detection must be described.

L. DECONTAMINATION

Decontamination areas and methods, for equipment and personnel, shall be addressed.

M. REPORTING AND DOCUMENTATION OF ANALYTICAL DATA

A final report detailing all sampling activity on-site, analytical data, procedures used for sampling, analytical procedures used, QA/QC controls, and data validation results shall be presented to the EPA within 30 days of completion of the removal phase of work. Summary reports of analytical results must be submitted to EPA 21 days after the sample collection dates for each sampling event, or 7 days after receiving analytical results whichever is less. When analytical results are obtained during the implementation of the Removal action that effect soil removal decisions such data must be made available to EPA immediately.

V. PROJECT SCHEDULE

A schedule of operations for the Removal must be developed addressing the specific tasks to be accomplished, the anticipated start date, the duration of the tasks, and the projected completion date. This must include the sequence in

which the specific reaches of the channel are scheduled for earth moving and re-habilitation activities.

VI. HEALTH & SAFETY

A Site Health and Safety (H&S) plan for all anticipated activities at the Site must be developed and submitted to EPA prior to initiation of work on Site, pursuant to the Order. The H&S plan shall cover anticipated activities and personnel for both Phases of work under this Order. The plan shall address required training, medical monitoring, and personnel health and safety. In addition, a site specific safety plan shall be developed for Site activities.

A. REQUIRED TRAINING

All personnel on-site shall complete the training required by the Occupational Health and Safety Agency (OSHA) (1910.120) for workers on hazardous waste sites. Documentation of such training shall be provided to the EPA prior to any on-site activities.

B. MEDICAL MONITORING

A medical monitoring program for workers on-site shall be established as required by OSHA.

C. SITE SAFETY PLAN

A site specific safety plan shall be developed prior to mobilization on Site for any activity. The plan shall describe the tasks to be performed, the hazards (both physical and chemical) on site, the hazards for each task, personnel on site and their responsibilities, hazard monitoring, designated levels of protection for each task (protective clothing, respiratory protection (level A, B, C, or D.)), decontamination procedures and areas, and emergency information (phone numbers for EMS, ambulance, hospital, etc., hospital route with map).

VIII. ACCESS AND PERMITS

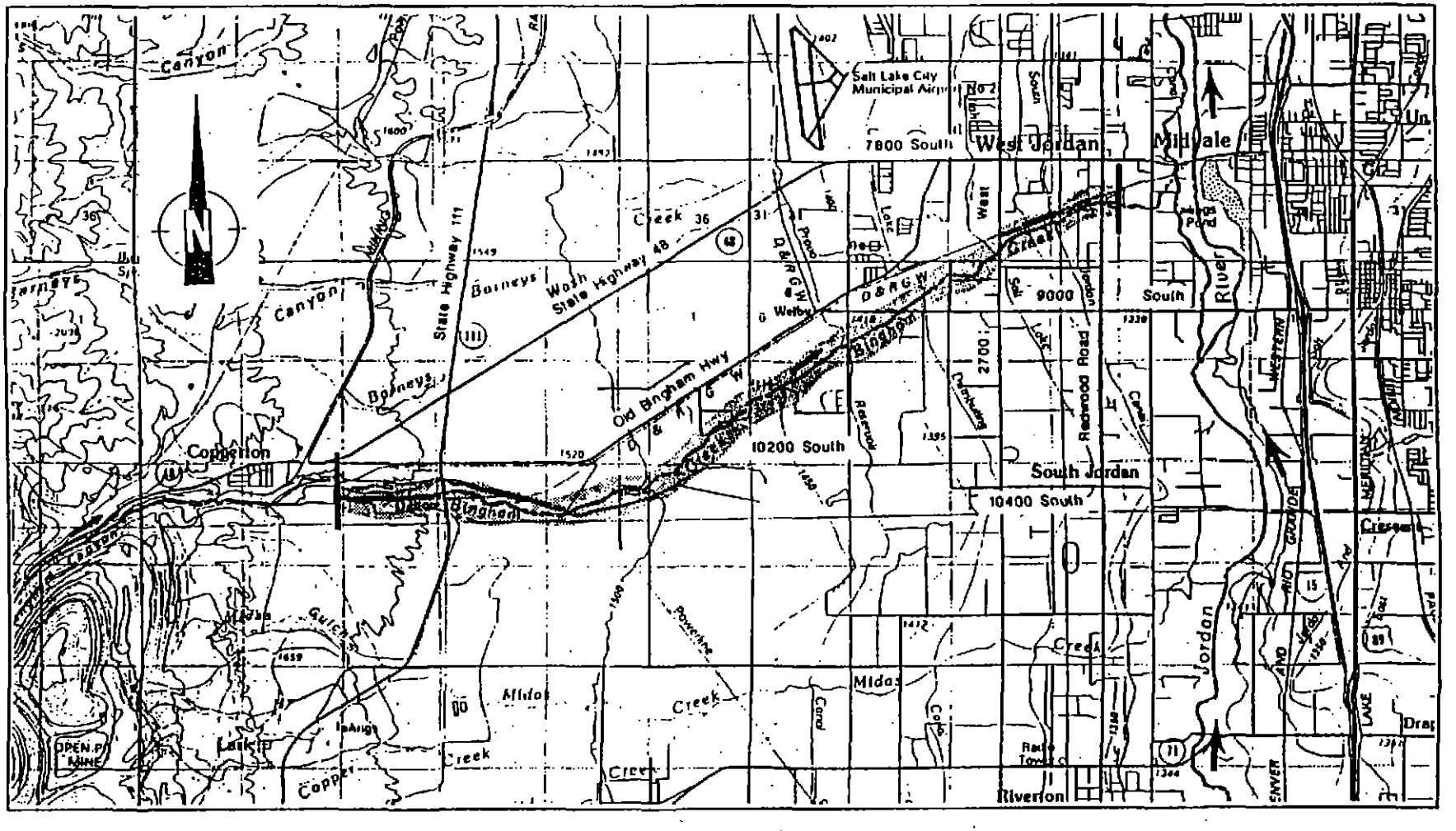
Access to the Site shall be secured from the landowners of the specific site and from owners of adjacent lands where required for access to the Site. The Respondent shall obtain, in advance of operations, all required state and local transportation, construction, and operating permits as appropriate for a Removal action pursuant to CERCLA.

STATEMENT OF WORK SCHEDULE OF TASKS
BINGHAM CREEK CHANNEL SITE - PHASE 2

TASKS/DELIVERABLES	START DATE	DUE DATE/ESTIMATED COMPLETION DATE
Draft Work Plan and SAP		30 days after UAO effective date
Final Work Plan and SAP	upon receipt of EPA comments	14 days after EPA comments received
Health\Safety Plan		45 days after UAO effective date
Sampling Activities	7 Days after SAP approved by EPA	ongoing
Removal Action	May 15, 1993	October 30, 1993
Draft Final Report		60 days after response completed
Final Report	after EPA comments received on draft	30 days after EPA comments received
O & M	Completion of Removal action	ongoing

EXHIBIT 2

Maps of the Area



0 .5 1 2 3 4 MILES

LOCATION MAP

UTAH

West Jordan

LEGEND

Site location

TECHNICAL ASSISTANCE TEAM FOR EMERGENCY RESPONSE, REMOVAL AND PREVENTION
EPA CONTRACT 68-W0-0037

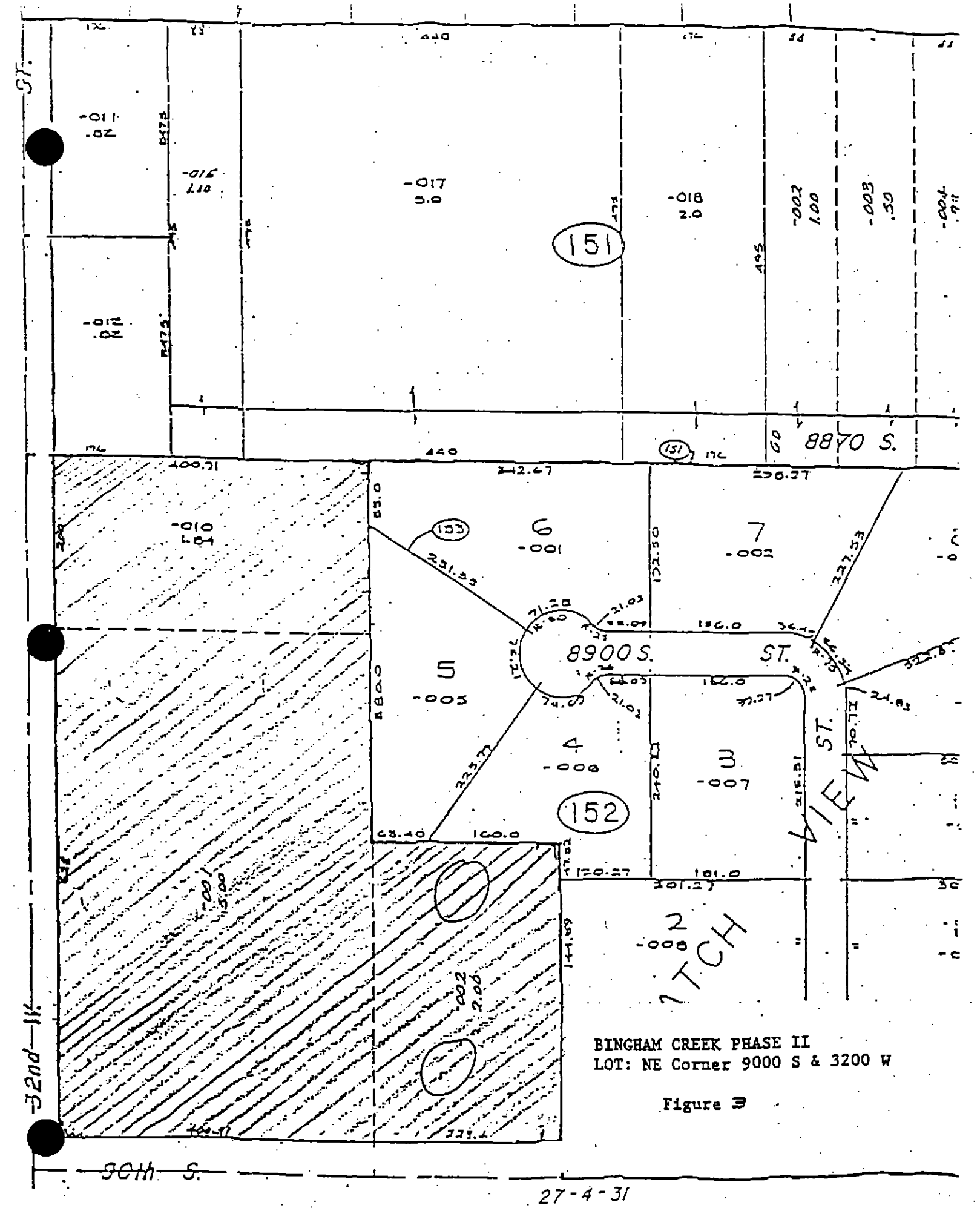
TITLE: *BINGHAM CREEK CHANNEL PHASE II*
West Jordan, Utah
SITE LOCATION MAP

T.D.D. T08-9210-026

ecology & environment, inc.
DENVER, COLORADO

FIG. 1

Date: 12/92 Drawn by: RSM



BINGHAM CREEK PHASE II
LOT: NE Corner 9000 S & 3200 W

Figure 3

HOLY CROSS HOSPITAL SITE

BINGHAM CREEK CHANNEL

REMOVAL ACTION

WORK PLAN

Kennecott
Plant Projects Group

July 27, 1992

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APPENDICES:

Appendix A, Air Sampling and Analysis Plan (including QA/QC) - (Attachment)
Appendix B, Health and Safety Plan - (Attachment)

Appendix C, Soil Sampling and Analysis Plan - (Attachment)

1.0 INTRODUCTION

Tailings containing elevated levels of metals have been identified in Bingham Creek Channel between Bingham Creek Reservoir and the Jordan River. It is believed that the elevated levels of lead and arsenic are the result of historic lead mining, beneficiation and extraction activities and downstream transport of the resulting tailings. These deposits may present a health hazard to residents along the channel. To mitigate this potential health risk, a removal action by a capable party would be in the public interest. Kennecott Utah Copper (KUC) has provided technical support to the State and Environmental Protection Agency (EPA) that will assist in leading to an expeditious solution. The following Work Plan details the removal.

1.1 Site Summary

Bingham Creek Channel is a dry creek channel for most of its length which contains tailings with elevated levels of lead and arsenic. East of the KUC property line, the channel meanders through residential areas, vacant/agricultural land, golf courses, parks, and commercial/industrial property to its discharge point at the Jordan River. Between the KUC property line and the Jordan River, the channel has been sub-divided into work areas to facilitate overall management of the Bingham Creek Channel Removal Action. This Work Plan pertains only to Holy Cross Hospital property. Bounded on the southwest by 9000 South and on the east by Holy Cross Property Boundary. The north and south sides of the channel are bordered by vacant land owned by Holy Cross Hospital. Throughout the area, the channel is approximately five to ten feet deep, varies in width and both slopes are moderately vegetated.

1.1.1 *Tailings Deposits*

Tailings in the creek channel between the KUC property line and the Jordan River are generally found in pockets on inside bends of the channel. The tailings excavated during sampling events were generally continuous throughout the channel. Tailings which appeared to be isolated, unconnected deposits on the insides of channel bends were nearly always connected by thin deposits of tailings which had been covered with other soil subsequent to tailings deposition. Generally, concentrated deposits of tailings are found in deep, narrow portions of the channel while thinner deposits of tailings are found where the channel broadens out and becomes relatively flat.

The tailings are usually yellow, fine-grained material. In several areas the tailings have been mixed with native soil and stream gravels giving them an uncharacteristic texture and color (tan and brown). In those areas where

the tailings have not been disturbed by previous activities, the visual demarkation between tailings and the native soil is clearly identifiable. The visual distinction is less clear but still useful in disturbed areas.

Approximately 6200 cubic yards (CY) of tailings and associated overexcavation have been identified for removal governed by this Work Plan.

2.0 SCOPE OF REMOVAL ACTION

Target soil lead and arsenic concentrations following removal procedures are 1000 ppm and 100 ppm, respectively. If over four feet of tailings and associated soils are removed, sampling will be conducted for verification purposes only. If less than four feet of material is removed and soil clean-up levels are not attained, as indicated by quantitative sample results, additional material will be removed.

2.1 Objective of Removal Action

The objective of this removal action is to remove visible tailings and any associated contaminated soils from Bingham Creek Channel on Holy Cross Hospital property. The tailings removal will mitigate potential health risks to the public through proper work procedures and increase the overall environmental quality of the channel. The following sections detail the scope of the removal action.

2.2 Removal Criteria

Based on results from previous KUC field investigations and similar removal actions conducted elsewhere, removal of visible tailings and a minimum amount of overexcavation will result in soil lead and arsenic concentrations below acceptable levels. Post-removal verification sampling will be conducted in the removal area disturbed by excavation equipment. Target soil lead and arsenic concentrations following removal procedures are 1000 ppm and 100 ppm, respectively. If over four feet of tailings and associated soils are removed, sampling will be conducted for verification purposes only. If less than four feet of material is removed and soil clean-up levels are not attained, as indicated by quantitative sample results, additional material will be removed.

Vegetation in the channel which does not interfere with removal procedures or vehicle traffic will not be removed.

2.3 Removal Procedures

The tailings will be removed using appropriate excavation and transport equipment depending on the width and depth of the channel and the characteristics of tailings deposition.

The work zone will extend from 9000 South to the Holy Cross Hospital property line to the east and will include the haul roads and temporary staging area. The work zone will be delineated by lighted barricades and signs, as necessary. The work zone may be adjusted in the field to best accommodate removal activities and protect human health and welfare.

2.3.1 *Types of Equipment*

Based on results from similar removal actions, a tracked excavator and a dozer will be appropriate for removing tailings from the majority of the channel. Smaller sized rubber tire excavators may also be used to remove tailings in isolated and difficult access areas. The tracked excavator will be used to remove tailings and load trucks in the channel and a dozer will be used to prepare the channel for truck traffic and build access ramps. The tracked excavator and dozer will be used to recontour channel slopes. Other equipment such as loaders (all sizes) and motor graders will be used to build and maintain haul roads, load stockpiled material, or excavate tailings from the channel, as necessary.

2.3.2 *Recontouring*

Excavation of tailings from the slopes and bottom of the channel will leave slopes unstable in some locations. When the natural slope is disturbed to remove tailings, it will be recontoured at a slope no steeper than 1.5H:1V. Natural slopes that are steeper than 1.5H:1V and are not disturbed during the removal action will be left as found. Fill material for recontouring the channel can be removed from both slopes and adjacent fields in places, but imported material may used if necessary.

2.3.3 *Engineering Controls - Work Zone*

Engineering controls, such as water application, during excavation and loading will ensure that both occupational exposures and airborne emissions from the work zone are below accepted, safe levels for total suspended particulates (TSP), lead, and arsenic (as indicators of all metals). The action levels for lead and arsenic are 30 ug/m3 and five ug/m3, respectively. The permissible exposure limit (PEL) for TSP is 15000 ug/m3 (PEL for respirable fraction is 5000 ug/m3). Air monitoring will be conducted during removal activities according to the Sampling and Analysis Plan included in Appendix A to document occupational exposures and airborne emissions from the work zone. Additional engineering controls will be implemented as necessary.

A small, temporary desilting basin including a small dam with an overflow culvert will be constructed south of 9000 South to prevent recontamination of Holy Cross Hospital property.

2.4 Personal Protection

Level D personal protective equipment (basic OSHA construction safety equipment) will be appropriate for all workers engaged in excavation, transportation, and repository activities. A site-specific Health and Safety Plan (Appendix B) is included with this Work Plan based on available information from all investigative activities completed to date.

3.0 Transport Procedures

Excavated tailings will be transported from the channel to the Blue Water I Repository on KUC property using appropriate haul units, designated haul routes, and adequate engineering controls.

3.1 Types of Equipment

Small end-dumps will be used to transport excavated material from the channel directly to the Blue Water I Repository. The small end-dumps are capable of maneuvering throughout the channel and channel haul roads. These units will back to the loading equipment, load, and haul excavated material out through the unexcavated channel bottom. The end dumps will exit the channel using earthen ramps that will be constructed as required to maximize the efficiency of the operation and removed when the operation is completed. All haul units will be tarped to control dust emissions during transport.

As conditions dictate, the size and types of equipment may be modified to match channel conditions.

3.2 Staging Area

A temporary staging area will constructed to support vehicle decontamination, control access to the work zone, and provide an area for vehicle maintenance and storage. The staging area will be used to minimize transport traffic into and out of the work zones, reducing the risk of spreading contaminated material.

Transports will be visually inspected and, if necessary, physically decontaminated before leaving the staging area. Other machinery will be decontaminated upon completion of removal activities. Decontamination equipment such as pressure/steam washers, brushes, and shovels will be maintained in the temporary staging area.

3.3 Haul Routes

Excavated tailings will be transported to the repository using 9000 South to the Old Bingham Highway, and the Kennecott Haul Road to the repository. The haul road for this area will be on the south side of the channel, approximately 10-20 feet from the center of the channel. Where lack of available space prevents use of the south side, the channel bottom or north side of the channel will serve as the haul road. All haul roads in the work zone will have berms on both sides to contain any spillage that may occur. Once removal activities are complete, unpaved haul roads will be decontaminated by removing the top two to four inches of soil, if necessary. This soil will be transported to the repository on KUC property.

3.4 Engineering Controls - Haul Routes

Based on the results from previous removal actions, water spray on unpaved haul roads and tarps on trucks hauling over public roads will be the only engineering controls required to control airborne emissions. Frequent air monitoring will be conducted to document airborne emissions from the work zone and to determine the need for additional control measures.

The temporary staging area will be decontaminated after operations by removing the top two to four inches of soil, if necessary. This soil will be hauled to the repository along with the other excavated material.

3.5 Emergency Spill Contingency Plan

To prepare for an accidental spill of excavated material on public roads or unpaved haul roads, the following precautionary measures will be taken:

- All transports will be equipped with radios to notify the field supervisor in the event of an accidental spill;
- All transports will be equipped with secured gates which will reduce the possibility of an accidental spill;
- Equipment from the work zone will be available at all times while transporting contaminated material; and
- In the event of an accidental spill on public roads, appropriate emergency response agencies may be contacted to provide traffic control or other necessary assistance.

4.0 REPOSITORY LOCATION

The Bluewater I Repository is located in the northern portion of the Bluewater I drainage basin between two ridge tops. It occupies an area of approximately 25 acres, all contained within Kennecott's present leach collection system. A dirt haul road provides access to the repository from Highway 111.

4.1 Description

The repository will receive approximately 6200 CY of contaminated soils identified for the Holy Cross Hospital Site removal action. The repository consists of a clay bottom lining with a seepage collection system and previously placed contaminated soils. A composite low permeability clay barrier and soil cap will be constructed once placement activities are complete for an individual cell.

The contaminated soils will be deposited, graded, and compacted in 8" lifts over existing material and drain system, and compacted in place to a minimum of 90% relative compaction.

4.2 Air Monitoring

Air monitoring at the repository will be conducted by Kennecott to assess levels of airborne arsenic, lead, and TSP. Samples of ambient air at the perimeter of the repository will occasionally be collected during placement activities. Quantitative air monitoring will be conducted to document repository personnel exposure levels using appropriate monitoring equipment.

4.3 Decontamination Procedures

Decontamination procedures at the repository will be similar to those described in section 3.2. Transports will be visually inspected and, if necessary, physically decontaminated before leaving the repository. Other machinery will be decontaminated upon completion of removal activities.

4.4 Engineering Controls

See Sections 2.3.3 and 3.4.

4.5 Emergency Spill Contingency Plan

See Section 3.5.

4.6 Personal Protection

See Section 2.4.

5.0 REPOSITORY OPERATIONS AND MAINTENANCE

After the contaminated soils have been placed and the repository has been capped, the repository will be monitored as described below on a quarterly basis.

Vegetation will be observed at each inspection and repaired or maintained as necessary.

The seepage collection system and surface water diversion system will be inspected at each quarterly inspection. The systems will be cleaned and maintained to provide continuity of their integrity. The repository cap will be inspected for structural defects on the same frequency. If liquid is detected in the seepage collection sump it will be sampled and analyzed for total lead and total arsenic. Sampling and analytical procedures will follow EPA guidelines. If contaminated seepage from the seepage collection system is confirmed, inspection will be increased to a once per week frequency. If flow subsides, the inspection frequency will correspondingly be reduced to quarterly. If flow continues to indicate a problem, a plan for corrective measures will be developed.

6.0 SCHEDULE OF MAJOR MILESTONES FOR WORK PLAN

Excavation/Haulage July, 1992

APPENDIX A:
AIR SAMPLING & ANALYSIS PLAN

APPENDIX A

AIR SAMPLING AND ANALYSIS PLAN

A.1.0 INTRODUCTION

Air monitoring samples will be collected at the work zone and the Bluewater I Repository to monitor airborne emissions during tailings excavation and placement. The sampling will be conducted using Gilian 113 HFS 113A hi-flow and Gilian 520 AC hi-volume pumps to draw air through sampling media. Quantitative air sampling will be used to monitor employee exposures, work zone boundaries, and the repository.

The purpose of air monitoring is threefold:

- Document employee exposure, if any;
- Document work-zone and repository particulate emissions; and
- Evaluate the effectiveness of engineering controls;

A.1.1 BACKGROUND AIR SAMPLING PROCEDURES

Background air samples will be collected prior to any removal, hauling or placement activities. Hi-flow (2.0 L/min) and/or hi-volume (20.0 L/min) samples will be collected at the removal work zone and repository. The background samples will be used to set a datum for airborne particulate concentrations.

A.1.2 PERSONAL AIR SAMPLING PROCEDURES

Personal monitoring will be performed with hi-flow personal sampling pumps drawing air through sampling media following National Institute for Occupational Safety and Health (NIOSH) methodologies. Sampling procedures may be altered at the discretion of field sampling personnel as site-specific conditions warrant. NIOSH sampling results are quantitative and will be used to document work zone and repository air quality and worker exposures.

A.1.3 WORK ZONE SAMPLING PROCEDURES

Air samples will be collected at the removal and placement work zones to determine possible particulate emission and document work zone air quality. The samples will be collected with both hi-flow and hi-volume (if necessary) sampling pumps drawing air through sampling media following National Institute for Occupational Safety and Health (NIOSH) methodologies. Sampling procedures may be altered at the discretion of field sampling personnel as site-specific conditions warrant.

A.2.0 AIR SAMPLING PROCEDURE

The following standard operating procedure (SOP) will be followed for all quantitative sampling conducted.

A.2.1 AIR SAMPLING SEQUENCE

The following sequence of events will be followed for all collected air samples.

1. Fill out logbook header at the beginning of the day;
2. Calibrate sampling pumps;
3. Unplug cassettes and turn on pumps;
4. Document initial information about the individual samples and conditions in a field logbook, including calibrations, start times, locations and a map or diagram; and
5. Ensure required blank (1 per 10 samples) is opened and placed near a sampling pump.

At days end:

6. Turn off pumps, record stop time in field log, and plug cassettes;
7. Recalibrate pumps and record information in both the field logbook and the calibration documentation forms;
8. Place the pumps on charge overnight;
9. Prepare chain of custody forms for all samples; and
10. Either securely store or, package and ship samples, including chain of custodies.

Sequence events are described in detail in the following sections.

A.2.2 LOGBOOK HEADER

An up-to-date sampling field notebook will be maintained by project personnel during all sampling activities. The general information recorded for each day's sampling includes:

- Date;
- Name of overall sampling event;
- Sampling personnel;
- Climatic conditions; and
- Equipment calibrations.

A.2.3 PUMP CALIBRATION

Air pumps will be calibrated using a graduated buret and a soap solution or commercially available primary standard calibration device. With the first method, the pump is hooked up to an inverted buret, air is drawn through the open mouth of the buret, and a soap bubble is formed with the soap solution across the buret mouth. As the bubble moves across two pre-determined graduations on the buret, a stopwatch is used to record elapsed time. From the graduated volume and elapsed time, the volume per time, or flow, can be calculated. Enter this calibration data on a calibration form as documentation. Pumps are calibrated both before and after sampling each day.

A rotameter, a secondary calibration device, can be calibrated against the buret and then used to calibrate each pump. The rotometer has the advantage of simplicity and speed over the soap bubble-buret technique.

A.2.4 LOGBOOK SAMPLE ENTRIES

Quality assurance and quality control (QA/QC) procedures for air sampling require completion of a Field Sampling Log. For each sample collected (including blanks), the logbook must contain:

- Sample number;
- Sampling location;
- Sample Date;
- Start and stop calibrated air flows;
- Average air flow;
- Start and stop time;
- Sampled volume;
- Sampling method (i.e. NIOSH);
- Field observations; and
- A map or diagram.

Significant deviations from sampling protocol shall be formally noted in the field log, along with visiting personnel and unusual circumstances which might affect the sampling.

A.2.5 QC BLANKS

One QC blank should be submitted with each 10 samples. The blanks are unsampled cassettes that are returned to the lab with the other samples as a test for contamination during sampling and transport.

A.2.6 CASSETTE LABEL

To prevent sample misidentification, each sample cassette is affixed with a label. The following information will be recorded on the sample container:

- Date sample collected;
- Sampling pump identification number;
- Sample cassette number; and
- Chain-of-custody number.

A.2.7 CHAIN OF CUSTODY

To establish the documentation necessary to trace sample possession from the time of collection, a chain-of-custody record will be filled out for each sample and accompany every set of samples. The record will include the following:

- The project number;
- Air sample analysis request;
- Sample number;
- Flow rate;
- Length of sampling time;
- Signature of the collector;
- Sample date;
- Signature of person(s) involved in the chain of possession; and
- Time(s) and date(s) of change(s) of possession.

A.2.8 SAMPLE PACKAGING AND SHIPPING

Samples will be packaged in clean areas that are remote from potential contaminant sources. Packing material will be used to stabilize the cassettes during shipment. Samples will be delivered or shipped for analysis once a sufficient amount of cassettes have been collected.

A.2.9 ANALYTICAL METHODS

The air samples collected using NIOSH methods will be analyzed for lead and arsenic (as indicator metals), and total airborne dust (see Appendix B, section 3.2). Samples collected early in the removal action may be analyzed for a suite of metals, determined at a later date. Samples will be analyzed using NIOSH standard methods. Samples for total airborne dust will be collected using cassettes containing pre-weighed filters, and will be analyzed gravimetrically.

A.3.0 QUALITY ASSURANCE AND QUALITY CONTROL

The purpose of data quality assessment is to assure that data generated during the QA program is accurate and consistent with program objectives. The quality of the data will be assessed based on accuracy and completeness. Accuracy is a determination of how close the measurement is to the true value and will be assessed by the cleanliness of blanks. Completeness is a measure of the amount of valid data obtained, compared to the amount that was expected under normal conditions. Ninety (90%) percent completeness is the goal of this plan.

The project data objectives for accuracy and completeness are consistent with guidelines established by NIOSH and OSHA.

A.3.1 SAMPLING CALIBRATIONS

Personal sampling pump flow will be calibrated following NIOSH protocol. The pumps will be calibrated at the beginning and end of sampling each day. The cassette used for pre-calibration will also be used for post-calibration. The two calibrations must be within 20% of each other or the day's sampling for that pump will be invalidated.

A.3.2 QC SAMPLES

Internal quality-control checks will be conducted to evaluate the quality of data based on field conditions and constraints. The field QA/QC program will be conducted in addition to laboratory QA/QC. The following quality-control check will be performed:

- Field Blank - Opened but unsampled cassette placed near an active sampler and returned to the lab with the other samples as a test for contamination during sampling and transport.

- Trip Blank - Unopened cassette that is subject to the same handling as sampled cassettes. The trip blank is returned to the lab as a test for contamination during handling and/or prior to receiving the cassette from the lab.

The above internal QC samples will be evaluated to determine if the field and transport procedures are adequate to provide valid analytical data. The evaluation process for QC samples is outlined below.

One field blank or trip blank will be collected and analyzed for each 10 samples.

A.3.3 DATA REDUCTION, VALIDATION AND REPORTING

All data will be reported in appropriate units. All raw data will be reviewed and validated against calibration records to ensure that data are reliable and that the data are in compliance with QA/QC objectives. Upon completion, a copy of the signed laboratory report will be retained for future reference. Raw data from field measurements and sample collection activities that are used in project reports will be appropriately identified.

QC records, showing accumulated precision and accuracy data, will be maintained in the laboratory and reported along with analytical results. Poor quality results require that the problem be determined and corrected.

A.3.4 QA REPORTS TO MANAGEMENT

Final field and laboratory reports will be submitted to the QA/QC Officer for review; issues requiring clarification will then be addressed. Following review by the QA/QC Officer, final field and laboratory reports will be submitted to the Project Manager.

A.3.5 CORRECTIVE MEASURES

If QC system or performance audits detect conditions or data that do not meet QC requirements, corrective action will be initiated. The nature of the action will depend on the circumstances of each situation and may include:

- Evaluating and amending sampling and analytical procedures; and
- Accepting data, acknowledging level of uncertainty.

APPENDIX B:
HEALTH & SAFETY PLAN

APPENDIX B

HEALTH AND SAFETY PLAN

B.1.0 INTRODUCTION

This site-specific Health and Safety Plan (HASP) applies to activities related to the Holy Cross Hospital site tailings removal, haulage, and placement activities, conducted by employees, contractors, and subcontractors of Kennecott. This plan will be available at all times at the work area for review by employees, contractors, subcontractors, regulatory agencies, or representatives thereof. All visitors and regulatory personnel are expected to be familiar with and comply with all aspects of this plan.

The HASP is designed to identify, evaluate, and control health and safety hazards associated with this project. The plan is based upon existing information regarding the site, similar work conducted elsewhere on Kennecott property, and past experience at other sites. Addressed are specific safety and health hazards and procedures necessary to protect the employees conducting the soils removal.

It is anticipated that site conditions may vary during the project. As actual site conditions change, sections of the HASP may change, and will be subject to approval by the Health and Safety Officer (HSO). Such changes will be communicated to all employees.

B.2.0 COMPREHENSIVE WORK PLAN

A comprehensive work plan for the operations to be conducted precedes this HASP. The work plan describes work tasks, objectives, personnel requirements, and methods for conducting excavation, haulage, and placement of tailings in the repository.

B.3.0 JOB HAZARD ANALYSIS

The potential hazards associated with site activities include both chemical and physical hazards. Equipment operators and laborers directly involved in project activities have the greatest potential for exposure to these hazards. Haulage truck operators have lower potential exposure to these hazards.

B.3.1 PHYSICAL HAZARDS

This section describes normal physical construction site hazards.

B.3.1.1 Heat Stress

Heat stress is a potential hazard associated with elevated body temperatures caused by high ambient air temperatures, heavy physical labor, and/or any combination thereof. This hazard will be evaluated on a day-to-day basis.

B.3.1.2 Cold Exposure

Cold injury (frostbite and hypothermia) and impaired work ability are potential hazards at low ambient air temperatures or when the wind chill factor is low. This hazard will be evaluated on a day-to-day basis.

B.3.1.3 Inclement Weather

Rain, snow, extreme low or high temperatures, or high winds may occur during scheduled work activities. All employees will be trained in the hazards of exposure to cold and/or wet conditions. Protective clothing for cold and/or wet, slippery conditions will be used when needed. Severe weather conditions may result in cessation of work activities at the discretion of the Project Manager, Construction Superintendent or HSO.

B.3.1.4 Utility Lines

Overhead utility lines are present near the work area but should not pose hazard. Appropriate precautions will be taken when working around overhead utilities.

B.3.1.5 Noise

Exposure to elevated noise is expected for heavy-equipment operators. This hazard will be controlled by wearing hearing protection. Either ear plugs or muffs will be encouraged for heavy-equipment operators, laborers, and any other personnel working near the equipment.

B.3.1.6 Construction

As on all construction sites, there is potential for personal injury. American National Standards Institute (ANSI) approved equipment will be required. Hard hats, steel toe boots, and safety glasses will be required to guard against head, foot, and eye injuries. Applicable MSHA and OSHA guidelines will be followed.

B.3.1.7 Dust Suppression

Dust may be generated during excavation, transportation and placement of material. Water spray, tarping of transport vehicles, or other controls will be used, as necessary, to control dust levels. Air monitoring will be conducted to ensure occupational exposures to emissions from the work zone of are below accepted safe levels.

The OSHA Permissible Exposure Limit (PEL) for Total Suspended Particulates (TSP) is 15,000 micrograms per cubic meter in air for any 8-hour time-weighted average (29 CFR 1910.1000).

B.3.1.8 Other Physical Hazards

Other physical hazards such as insect bites, stings, etc. may occur during construction and placement operations. Precautions will be taken to prevent these hazards.

B.3.2 CHEMICAL HAZARDS

Based on available information regarding the site, contaminants of concern identified in the tailings are arsenic and lead. Arsenic and lead have been selected as hazard indicators due to their low Action Levels (AL) and PELs. If additional chemical hazards become evident, appropriate measures will be taken to protect the health and safety of personnel on the site and prevent off-site migration. All employees will be notified of any new hazards as they become known.

B.3.2.1 Arsenic

Arsenic is a solid material with no odor. Potential exposure routes are through inhalation or ingestion. Skin contact can also result in adverse effects. Some arsenic compounds may cause irritation of the eyes, mucous membranes, respiratory system and skin. Dermatitis can also result from poor personal hygiene when working around these materials. Excessive inhalation of arsenic may result in respiratory problems such as coughing and chest pain. Other symptoms include giddiness, headache, and extreme weakness preceding gastrointestinal irregularities. Prolonged exposure can result in weight loss, nausea, diarrhea, pigmentation of skin, and loss of hair. Arsenic is considered a carcinogen: a cancer-causing substance.

The OSHA AL for arsenic is 5.0 micrograms per cubic meter in air for an 8-hour time-weighted average (29 CFR 1910.1018). The OSHA PEL for arsenic is 10 micrograms per cubic meter in air for an 8-hour time-weighted average.

B.3.2.2 Lead

Lead is a solid material with no odor. Potential exposure routes are through inhalation or ingestion. The early effects of overexposure to lead are nonspecific and are difficult to distinguish from the symptoms of minor seasonal illnesses, except by laboratory testing. The symptoms are decreased physical fitness, fatigue, sleep disturbance, headache, aching bones and muscles, abdominal pains, and decreased appetite. More advanced effects include anemia, pallor, a "lead Line" on the gums, and decreased hand grip strength. Lead colic produces intense abdominal pain with nausea and vomiting.

Headache, convulsions, coma, delirium, and kidney damage can occur. Lead is not considered a carcinogen but it is classified as a reproductive toxin and a teratogen (fetal malformation).

The OSHA AL for lead is 30 micrograms per cubic meter in air for an 8-hour time-weighted average (29 CFR 1910.1025). The OSHA PEL for inorganic lead is 50 micrograms per cubic meter in air for an 8-hour time weighted average.

B.3.3 HAZARD MITIGATION

The hazards identified in the above sections, and any additional hazards which arise or are identified during the work will be mitigated by personal protective equipment (PPE), engineering controls, and other safety procedures. Physical hazards will be mitigated by the implementation and enforcement of standard operating procedures described in Section 9.0. Chemical hazards will be identified through the air monitoring program described in Section 7.0 and mitigated by the use of engineering controls.

B.4.0 PERSONAL PROTECTIVE EQUIPMENT

Occupational exposures to arsenic, lead, and TSP are expected to be well below action levels specified in CFR 1910.1018, 1025, and 1000, respectively. Therefore, the level of personal protection to be utilized for all initial site activities is Level D. Level D personal protective equipment (PPE) shall consist of a hard hat (ANSI Z89), safety glasses, (ANSI Z87), steel-toed boots (ANSI Z41 with substantial leather 6-inch uppers), and coveralls. Hearing protection and cotton gloves will be worn as necessary. Work zone visitors will be required to wear applicable safety equipment. The level of protection may be adjusted according to results of employee exposure monitoring, specific job functions, or as site conditions change.

B.5.0 TRAINING REQUIREMENTS

All project employees will receive as a minimum 8 hours of Hazardous Substance Awareness Training. All employees and supervisors working in the excavation and placement of tailings will be required to have 40-hours of hazardous substance training. Employees will be trained to a level required by their job function and responsibility before being permitted to engage in field activities. Pre-employment safety information will include:

- Names of personnel and alternates responsible for Site safety and health;
- Chemical and Physical Hazards present on the site;

- Work practices by which risks from hazards can be minimized;
- Detailed review of this HASP;
- Safe use of engineering controls and equipment on the site;
- Use of Personal Protective Equipment; and
- Medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards.

Site safety meetings will be held at least weekly to notify personnel of specific hazards, air monitoring results, changes in the HASP, or other topics determined by the HSO. Specific meetings will be held at the initiation of new or different field activities and at the time of any crew changes.

B.6.0 DECONTAMINATION PROCEDURES

Equipment decontamination will be conducted on site as appropriate. Equipment decontamination will consist of physically removing visible contamination from contact points of the equipment at completion of work tasks and before leaving the work area.

Personal decontamination will consist of removing and leaving outer PPE at the work zone and good personal hygiene. Employees will be required to wash with soap and water at each break and lunch period and at the end of the work shift.

A temporary staging area will be set up at the perimeter of the work zone. Outer PPE (rubber boots, gloves and washable coveralls) will be removed and will remain in the staging area. The staging area will have facilities for washing exposed skin. Workers and visitors will be required to pass through and use the staging area when exiting the work zone.

Decontamination procedures will be monitored by the HSO to determine their effectiveness. If such procedures are found to be ineffective, they will be altered to correct any deficiencies.

B.7.0 AIR MONITORING

Air monitoring will be conducted to evaluate the potential for employee exposure and to determine the overall contribution of work activities to ambient air quality. Prior to any activities on site, background air samples will be collected around the perimeter of the work zone and repository. During placement activities, qualitative and quantitative air sampling will be conducted to determine employee exposures. All air samples will be collected and analyzed according to the appropriate National Institute of Occupational Safety and Health (NIOSH) method for determining concentrations of

arsenic, lead, and total suspended particulates (TSP). (See Appendix A to the Work Plan).

B.7.1 Occupational Air Monitoring

Quantitative personal samples will be collected using Gilian constant-flow pumps calibrated using a rotameter or "bubble tube" to draw between 1.0 and 2.0 liters of air per minute. The samples will be handled under chain-of-custody procedures and delivered to a qualified laboratory for analysis. (See Appendix A to the Work Plan)

Employees with the highest potential for exposure will be selected for personal monitoring. At the start of field activities and periodically thereafter, occupational air samples will again be collected and analyzed for arsenic, lead and TSP. Additional air monitoring will be conducted whenever there is a change in work conditions which can be expected to result in new or additional exposure levels or whenever an employee complains of symptoms which may be attributable to exposure to lead or arsenic.

Qualitative work zone air monitoring will be conducted using real-time instruments which measure the light-scattering effect of particulates.

B.8.0 MEDICAL SURVEILLANCE PROGRAM

A medical surveillance program provides a means of selection of employees who are physically able to safely perform the work assigned and monitor their health on a regular basis. The medical surveillance program to be implemented for this project will comply with 29 CFR 1910.120(f).

The program consists of a pre-employment medical evaluation to determine fitness for the job assignment, an annual evaluation based on length of assignment, and an end-of-employment evaluation. In addition, a special evaluation is warranted when an employee indicates that they may have developed symptoms resulting from a possible exposure to hazardous substances.

Medical surveillance will be conducted for all Site personnel who may be exposed to arsenic and lead in excess of PELs, without regard to the use of respirators, for 30 days or more per year. All personnel participating in the medical surveillance program will have an examination which equals or exceeds the following:

- Medical and Occupational History;
- Physical Examination;
- Pulmonary Function Test;
- Six Frequency Audiogram;
- Urinalysis, with microscopic morphology and dipstick;

- Complete Blood Count;
- CHEM 20 Chemistry Screen;
- SAM 10 Drug Screen;
- Chest X-Ray; and
- Blood lead and 24-hour urine arsenic levels

All contractor personnel with the potential for chemical exposure are required to have medical monitoring which equals or exceeds this program. Visitors and regulatory personnel who will enter the work area may be required to demonstrate participation in a medical program which is equivalent to or exceeds this program. The Health and Safety Officer will determine which personnel must meet training and medical-monitoring requirements.

Prior to the start of project activities, all employees with potential for exposure will have a baseline evaluation conducted for lead levels in blood and urine arsenic levels. These evaluations are to be repeated at the completion of work activities or end of employment, as deemed necessary by the Health and Safety Officer.

Copies of the physician's written opinion for the capability of the individual to work in areas with a potential for arsenic and lead exposure and the ability to wear a respirator will be maintained by the Health and Safety Officer for all workers on Site.

B.9.0 STANDARD OPERATING PROCEDURES/SAFE WORK PRACTICES

Standard operating procedures and safe work practices for this project consist of Kennecott General Safety for Contractors in addition to the following:

- No alcohol, firearms, or illegal drugs will be allowed on Site. Anyone reporting to work under the influence of alcohol and/or illegal drugs will be discharged immediately.

- Any employee under a physician's care and/or taking prescribed medication must notify the Site Health and Safety Officer.

- Eating and drinking are allowed only in designated areas and never in the removal work zone or at the dump site.

- All personnel shall listen for warning signals on construction equipment and shall yield to construction equipment.

- All equipment operators shall pay careful attention to workers on the ground who may be in their path and provide warning to these people before moving. All employees working regularly on the ground will wear

orange vests with reflective tape. Operators shall also pay deliberate attention to all types of utility lines and sources.

- All personnel are required to be familiar with and abide by the security rules, and emergency procedures.

- All personnel must report any injuries, vehicle accidents, and/or illnesses to their supervisor. This includes minor slight injuries.

- All prospective employees must pass a pre-employment physical and subsequent exams as required by this plan. Failure to submit to, or pass, any exam will be grounds for dismissal.

- All personnel must participate in the air-quality exposure monitoring program by wearing personal monitors or sampling devices designated by the Site Health and Safety Officer. Any personnel refusing to participate in the program, or who tamper with the sampling devices, will be subject to disciplinary action or expulsion from the Site.

- All personnel must abide by all safety rules and procedures as described in the work rules and/or throughout the project.

APPENDIX C:
SOIL SAMPLING & ANALYSIS PLAN

APPENDIX C
SOIL SAMPLING AND ANALYSIS PLAN

C.1.0 INTRODUCTION

Following removal activities in Bingham Creek Channel on Holy Cross Hospital property, soil will be sampled and analyzed to document lead and arsenic concentrations. Composite soil samples will be collected and quantitatively analyzed. The sampling program for quantitative analysis is designed to fulfill the data requirements of the removal action which includes:

- The samples collected are representative of the materials sampled;
- Sample integrity is maintained and documented;
- Proper measurements and information are recorded;
- Sample volumes are sufficient for the required analytical procedures;
- Analytical results adequately characterize soil; and
- The sampling protocol is efficient and relatively uncomplicated.

C.2.0 POST-REMOVAL SAMPLING PROCEDURE

The following sections outline the standard operating procedure (SOP) to be followed in conducting sampling for quantitative analysis. The site-specific Health and Safety Plan will be complied with at all times during sampling.

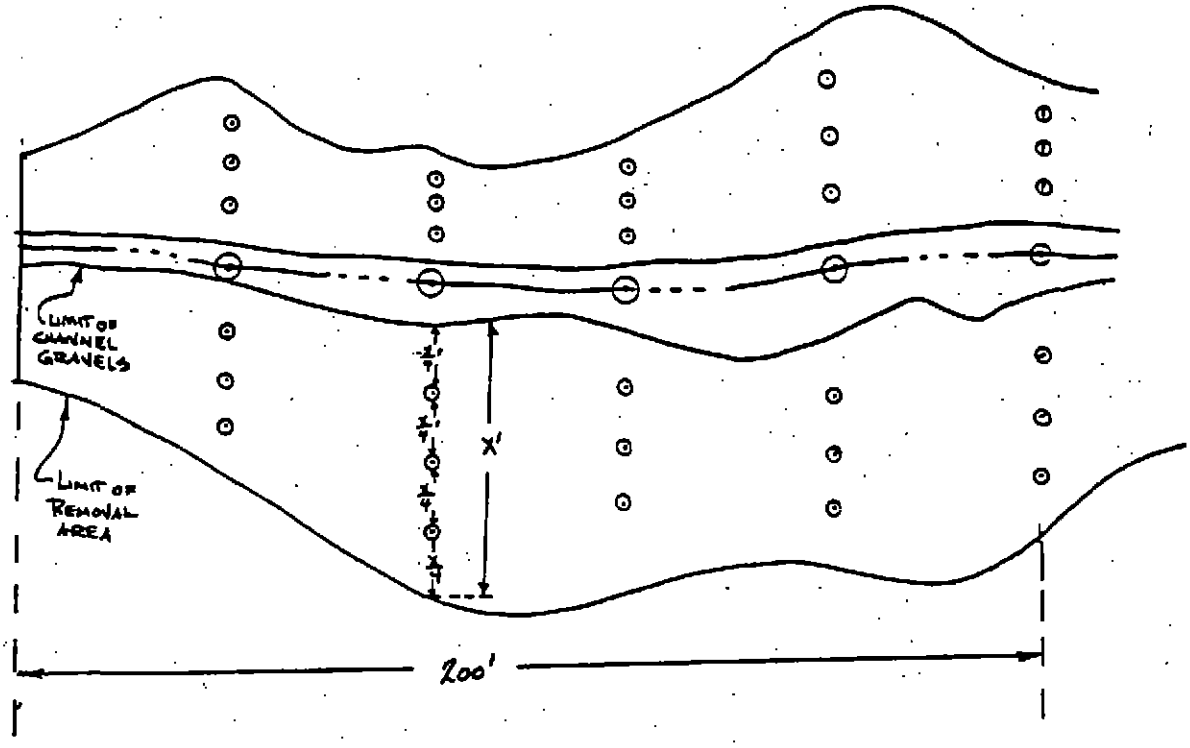
Two types of composite samples will be from the post-removal area. One composite sample will be collected along the center line of the channel consisting of five subsamples. The other composite type, for both channel banks, will consist of 15 subsamples. This sampling plan was developed to provide adequate coverage for the tailings removal areas disturbed be excavation equipment. The subsample locations are described below.

C.2.1 Sub-Sample Locations

The sample cells will be 200 feet long and the width will be equal to the widest distance of the removal area. Five parallel lines will be spaced over the 200 foot cell at 40 foot intervals. A channel axis line will be established at the centerline.

The channel axis composite sample will be generated from five, preselected subsample locations in the channel bottom. The subsample locations will be at the intersection of the channel axis line and the 40 foot

interval line. These five subsamples will be composited to generate the channel bottom composite sample (see diagram).



The channel bank composite subsamples will be collected along the 40 foot interval line at preselected points. If the channel bank width is X feet, three subsample locations will be collected at 1/4 X (see diagram). For each channel bank sample, 15 subsamples will be composited.

For each 200 foot cell, three samples will be collected: two channel bank samples and one channel axis sample. The total number of sample cells will depend on the total length of channel to be sampled. The last sample cell will be adjusted, if necessary, to provide coverage for all removal areas.

The sample locations will be located in the field using tape and compass methods and each sample will be referenced to existing points on Holy Cross Hospital property.

C.2.2 Sample Collection

The soil samples will be collected using disposable plastic or hand tools. The quantity of material sampled at each sub-site will be approximately 1/4 to 1/2 lbs. Soil samples will be collected from the top 4 inches at the sampling location.

C.2.2.1 Generation of Composite

Sample containers will be 12" x 17" polyethylene bags. Each bag will be taped closed after sample collection and compositing. Composite sample mixing will occur by thoroughly shaking the sample in a vertical and horizontal motion.

C.2.2.2 Sampling Sequence

The following sequence of events will be followed for all collected soil samples.

1. Fill out logbook header at the beginning of the day;

2. Document initial information about the individual samples and conditions in a field logbook, including a map or diagram;

3. Label container with sample number, date, time, any comments, and samplers' initials;

4. Collect the sample. As a precautionary measure always collect twice the required sample volume;

5. Place soil samples in separate sample containers.

6. Record sample description in the field logbook; and

7. Ensure required duplicates (10%, i.e.-every tenth sample), are included.

At days end:

8. Prepare chain-of-custody forms for all samples;

9. Package and ship samples, including chain of custodies.

Each sequence event is described in detail in the following sections.

C.2.2.3 Logbook Header

An up-to-date sampling field notebook will be maintained by on-site personnel during all sampling activities. The general information recorded for each days' sampling event includes:

- Date;
- Name of overall sampling event
- Sampling personnel; and
- Climatic conditions;

C.2.2.4 Logbook Sample Entries

QA/QC procedures for soil sampling require completion of a Field Sampling Log. For each sample collected, the logbook must contain:

- sample number;
- location;
- time;
- sampling method;
- field observations; and
- a map or diagram.

Significant deviations from sampling protocol should be formally noted in the field log, along with visiting personnel and unusual circumstances which might affect the sampling.

C.2.2.5 Container Label

To prevent misidentification of samples, each sample container will be affixed with a label. Labels will be written with indelible ink and will be sufficiently durable to remain on the container. The following information will be recorded on the sample container:

- Sample identification number;
- Name of sampling personnel;
- Date and time of collection; and
- Location.

C.2.2.6 Decontamination

All non-disposable sampling equipment will be cleaned when moving to a different sampling point to prevent cross-contamination. All samples will be collected with disposable plastic spoons. In the event if hand tools are needed, the equipment decontamination procedures are as follows:

1. Remove gross contaminants;

2. Wash with Algonox or other lab soap;

3. Rinse with tap water;

4. Triple-rinse with deionized water;

5. Repeat all or part of the procedure, if necessary.

Field personnel conducting the equipment decontamination and sampling will be required to wear protective gloves and the personnel protective wear required under the HASP. The decontamination procedures used will be recorded in the field logbook.

C.2.3 Chain-of-Custody

Chain-of-custody forms should be available in the field. If for any reason, the sampling foreman must leave, he should sign off of the chain-of-custody form and his assistant or replacement should sign on and assume responsibility for sample custody.

To establish the documentation necessary to trace sample possession from the time of collection, a chain-of-custody record will be filled out and accompany every set of samples. The record will include the following:

- List of sample numbers;
- Signature of collector;
- Date and time of collection;
- Sample types;
- Number of containers;
- Parameters requested for analysis for each sample;
- Signature of person(s) involved in the chain of possession; and
- Inclusive dates of possession.

C.2.4 Sample Packaging and Shipping

Sample preparation and packaging will be conducted in clean areas that are remote from potential contaminant sources. The soil samples will be secured in shipping containers. Packing material will be provided to stabilize the shipping containers if necessary.

Samples will be delivered to the laboratory daily. In cases where samples will leave the immediate control of project personnel, a seal will be affixed to the sample container to ensure that the samples have not been disturbed during storage or transportation. The integrity of the seal will be observed and documented upon arrival at the laboratory.

C.2.5 QA Objectives

The purpose of data quality assessment is to assure that data generated under the QA program is accurate and consistent with program objectives. The quality of the

data will be assessed based on precision, accuracy, and completeness. Precision is the degree to which a measurement is reproducible and will be assessed by a review of duplicate analyses. Accuracy is a determination of how close the measurement is to the true value and will be assessed via spike recovery in sample matrices. Completeness is a measure of the amount of valid data obtained, compared to the amount that was expected under normal conditions. Ninety-five (95%) percent completeness is the goal of this removal action. The project data objectives for precision, accuracy, and completeness are consistent with guidelines established by the EPA Contract Lab Program.

C.2.6 QA/QC Samples

Ten percent of all samples will be split and analyzed at a second lab. The analysis comparisons will be made to ensure accurate and reproducible results are ascertained from each laboratory.

One decontamination rinsate sample will be collected for ten percent of all soil samples collected.

C.2.7 Analytical Method

The soil samples will be analyzed for lead and arsenic according to EPA Methods. The soil samples and splits will be analyzed at two Certified Environmental Laboratories in Salt Lake City, Utah.

All analytical procedures will be consistent with federal guidance Solid Waste (SW) - 846 (test methods for evaluating solid waste).

C.2.8 Data Reduction, Validation, and Reporting

All data will be reported in appropriate units. All raw data will be reviewed and validated against calibration records to ensure that data are reliable, and that data are in compliance with QA/QC objectives. Upon completion, a copy of the signed laboratory report will be submitted to the appropriate agency for review.

Raw data from field measurements and sample collection activities that are used in project reports will be appropriately identified.

QC records showing accumulated precision and accuracy data will be maintained in the laboratory and reported along with analytical results. Poor quality results require that the problem be determined and corrected.

C.2.9 Corrective Action

If QC results detect conditions or data that do not meet QC requirements, corrective action will be initiated. The nature of the action will depend on the circumstances unique to each situation and may include:

- Reanalyzing the samples, if holding time criteria permit;
- Resampling and analyzing;
- Evaluating and amending sampling and analytical procedures; and
- Accepting data, acknowledging level of uncertainty.

TRENCHING AND SAMPLING IN BINGHAM CREEK AT THE HOLY CROSS JORDAN VALLEY HOSPITAL SITE

FEBRUARY, 1992

Prepared By:

Kennecott Plant Projects Group

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Attachment A Location Map
Attachment B Field Notes
Attachment C Chain of Custody Forms
Attachment D Photographs
Attachment E Drawings

TRENCHING AND SAMPLING IN BINGHAM CREEK AT THE HOLY CROSS JORDAN VALLEY HOSPITAL SITE

1.0 INTRODUCTION

Construction activities are currently underway at Holy Cross Jordan Valley Hospital in West Jordan, Utah, to expand the facility. The hospital property includes a 1050' section of Bingham Creek in the area of 9000 South and 3600 West. A previous EPA investigation of Bingham Creek at the hospital site has indicated elevated levels of lead and arsenic in surface soils. In anticipation of a removal action, a trenching, sampling, and analysis program was conducted by Kennecott in order to estimate the volume of material needed to be removed to accommodate the hospital expansion plans.

On February 19 and 20, 1992, 20 soil samples were collected from fourteen trenches excavated in Bingham Creek on the hospital property. The samples were analyzed for lead and arsenic concentrations at Ford Chemical Laboratory in Salt lake City, Utah.

The samples were assigned the identification numbers HC-1 through HC-20.

A rubber-tired backhoe contracted from W. W. Clyde, was used to excavate the trenches.

Personnel present during trenching and sampling activities were as follows:

Keith Smith, Envirocon representing Kennecott
Larry Elkin, North American Exploration representing Kennecott
Bud Henderson, Kennecott
Ron Segura, Bureau of Reclamation representing the EPA

2.0 LOCATION AND DESCRIPTION

Holy Cross Jordan Valley Hospital property is bounded on the south by 9000 South Street and is located at approximately 3600 West, (See Attachment A, Location Map). Bingham Creek trends SW to NE through the southeast corner of the property for approximately 1050' in length. Hospital expansion plans includes landscaping adjacent to and in Bingham Creek.

The downstream, northeast part of Bingham Creek is incised 5' to 10' and is 75' to 110' across its floodplain. The upstream, southwest end of the creek is narrower, approximately 50' across and is incised 10'.

3.0 TRENCHING

A total of 14 trenches were excavated using a rubber-tired backhoe. Trench locations were arranged in a linear fashion trending perpendicular to the channel axis. The depths of excavation were guided by visual examination. Steeper topography and vegetation prevented backhoe access to the southwest, upstream portion of the creek.

4.0 SAMPLING COLLECTION

A total of 20 samples were collected from fourteen trenches. The samples were assigned the identification numbers HC-1 through HC-20. Samples were collected from visible tailings and material suspected of being natural and in place. Please refer to Table 1 for a complete list of sampling and analytical data.

5.0 SAMPLING PROCEDURES

Sample material was collected from trenches using the following procedure:

- Loose material from the desired sample interval was scraped from the trench wall until undisturbed material was exposed;
- A decontaminated plastic trowel was used to scrape sample material from the wall and place it directly in a 9" x 15" polyethylene bag;
- The bag was secured shut with a plastic-coated wire twist-tie;
- The bag was labeled with the following information:

    - Sample identification number
    - Collection date
    - Samplers initials

Due to greater depths, sample material for HC-6, HC-7 and HC-18 was excavated from the trench by instructing the backhoe operator to scoop material from the desired interval and place it on the ground in a separate pile. The sample was collected from the pile using the aforementioned procedure.

Trench sites were located on a 1" = 75' scale map in the field. A tape measure was used to measure from locatable landmarks to the trench. A log was compiled of each trench in the field logbook.

6.0 DECONTAMINATION PROCEDURES

The plastic trowels used to collect the samples were decontaminated before use, using the following procedure:

- Brush gross contaminants off with nylon bristled scrub brush;
- Wash with alconox and tap water;
- Triple rinse with tap water;
- Triple rinse with deionized water;
- Dry with paper towel;
- Place in polyethylene bag and seal.

7.0 QA/QC

A duplicate sample was collected from sample HC-10 and will be delivered to American West Analytical Laboratory on February 24, 1992.

8.0 ANALYSIS AND RESULTS

Samples were delivered to Ford Chemical Laboratory in Salt Lake City for analysis of lead and arsenic. EPA Method 3050 was used for sample preparation. The results of analysis are listed in Table 1.

9.0 DOCUMENTATION

Documentation procedures included the following:

- Field logbook notes
- Photographs
- Labeling of sample containers
- Chain of custody forms

Field notes, photographs and chain of custody forms are included in Attachments B, C, and D respectively.

TABLE 1. SAMPLING AND ANALYTICAL DATA FROM BINGHAM CREEK AT HOLY CROSS JORDAN VALLEY HOSPITAL SITE.

TRENCH NUMBER	SAMPLE I.D. NUMBER	SAMPLE DEPTH	ANALYTICAL RESULTS (ppm)	
			Pb	As
1	HC-1	1.0' - 2.1'	67.380	6.263
1	HC-2	2.0' - 4.0'	120.380	10.152
2	HC-3	5.0' - 6.0'	553.390	22.511
2	HC-4	6.4' → 7.5'	9906.050	260.685
3	HC-5	2.0' - 3.0'	172.280	22.971
4	HC-6	6.0'	7721.800	113.338
4	HC-7	10.5' → 11.0'	1261.070	108.190
5	HC-8	2.5' → 3.0'	108.190	8.937
6	HC-9	2.3' - 3.3'	139.260	19.961
7	HC-10	3.8' - 4.2'	200.16	21.517
7	HC-11	2.5' - 4.0'	4435.120	130.872
7	HC-12	1.6' - 2.0'	7662.210	331.847
9	HC-13	2.3' 2.7'	218.260	20.304
10	HC-14	3.0' - 4.0'	192.850	21.263
11	HC-15	2.6' - 4.0'	74.960	13.586
12	HC-16	2.7' - 3.5'	8343.100	310.081
12	HC-17	4.0' - 5.0'	232.050	15.470
12	HC-18	2.5' - 3.5'	12858.280	231.548
13	HC-19	3.0' - 4.0'	149.330	19.409
14	HC-20	2.5' - 3.5'	183.270	20.501

Feb. 19, 1992 L. Elkin.

Ron Segura Bureau of Rec. / EPA

Sample collection Procedures:

- Sample material will be scraped free of loose material, so in place material is exposed.
- Sample material will scraped from wall of trench using decontaminated plastic trowel.
- Sample material will be placed directly in 9"x15" polyethylene bag.
- Bag will be secured shut with a plastic coated twist tie.
- Sample bag will be labeled with the following information:
  - sample I.D. number
  - date of sample collection
  - samplers first initial and last name.

Feb 17, 1992 LARRY ELKIN
Larry Elkin

Trenching and Sampling of Holy Cross Hospital Site

Purpose: To trench and collect samples in order to define extent of contamenated material in Bingham Creek channel/floodplain. This will be used to estimate volume of material to be removed from area.

Samples will be analyzed for lead and arsenic at Ford Chemical Laboratory in S.L.C. EPA method 3050 preparation will be used prior to analysis.

Rubber tired backhoe will be used to excavate trenches. Backhoe contracted from W.W. Clyde

On site Personnel:
Keith Smith: Envircon
Larry Elkin North American Explor.
Bud Henderson: Kennecott

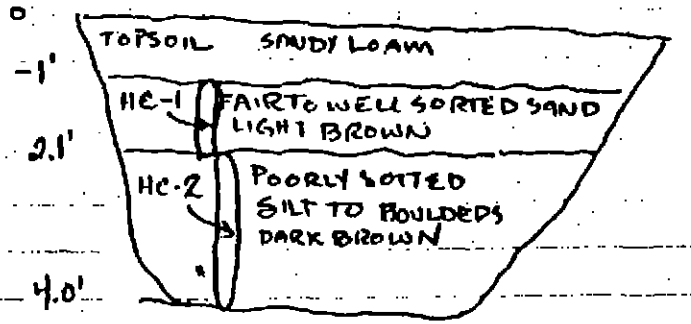
FEB. 19, 1992 LARRY ELKIN (1)

TRENCH #1 END OF PROPERTY 38' west from property line

HC-1

HC-2

X-SECTION Looking west

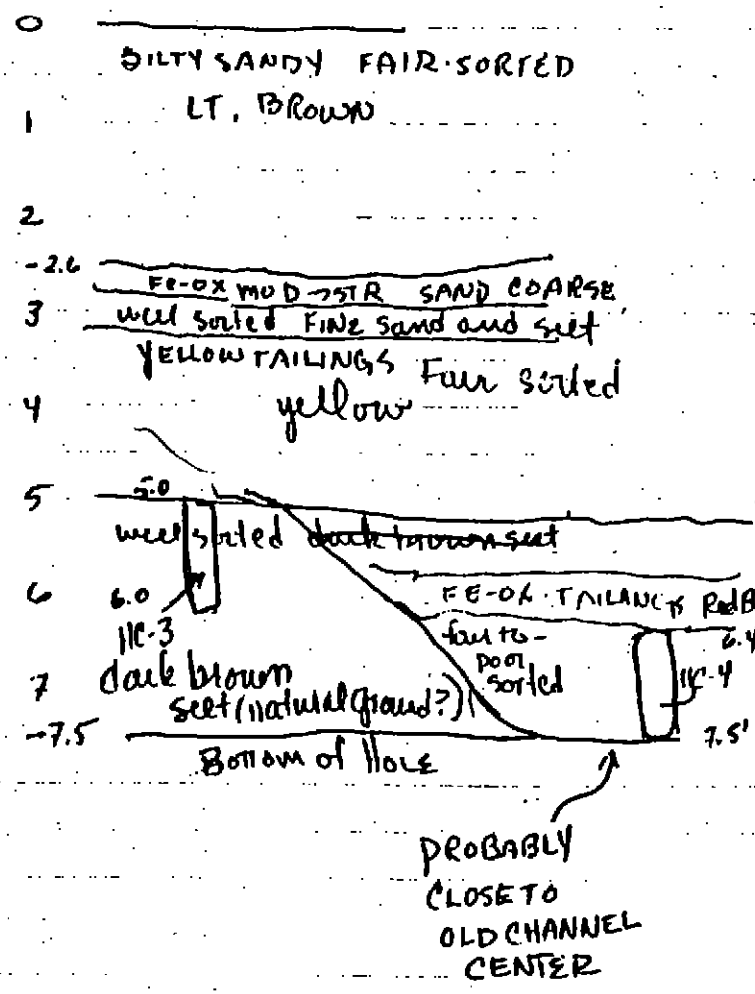


(2) FEB. 19, 1992 L. Elkin

59' west from road/property line

TRENCH #2 HC-3, HC-4

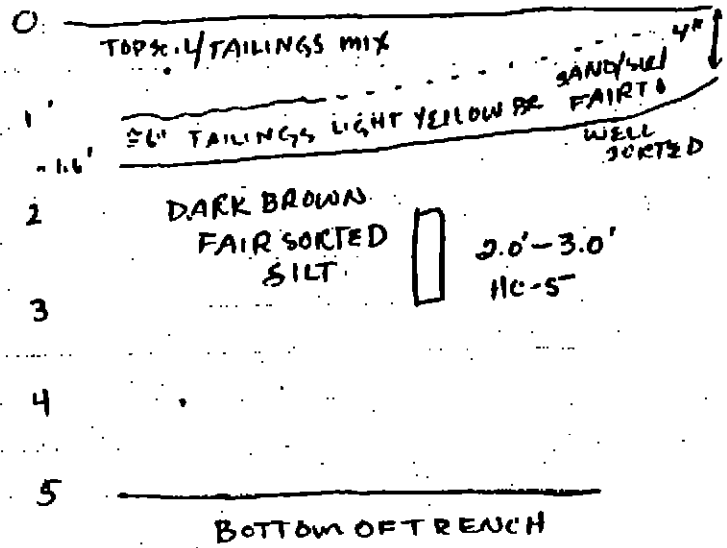
X-SECTION LOOKING WEST



FEB. 19, 1992 L. ELKIN

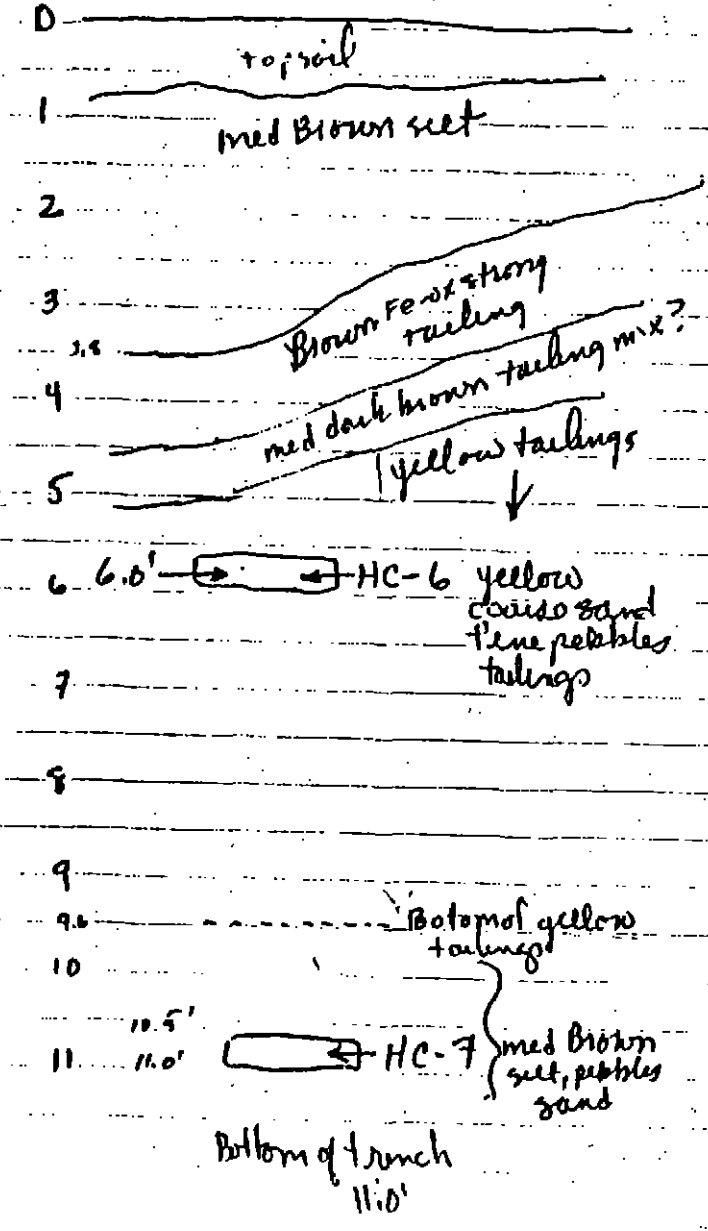
TRENCH #3 HC-5

X-SECTION LOOKING WEST



(4) FEB. 19, 1992 L. Elkin

TRENCH #4 14' west of property line
HC-6
HC-7 ... x-section looking west



(5) FEB. 19, 1992 L. Elkin

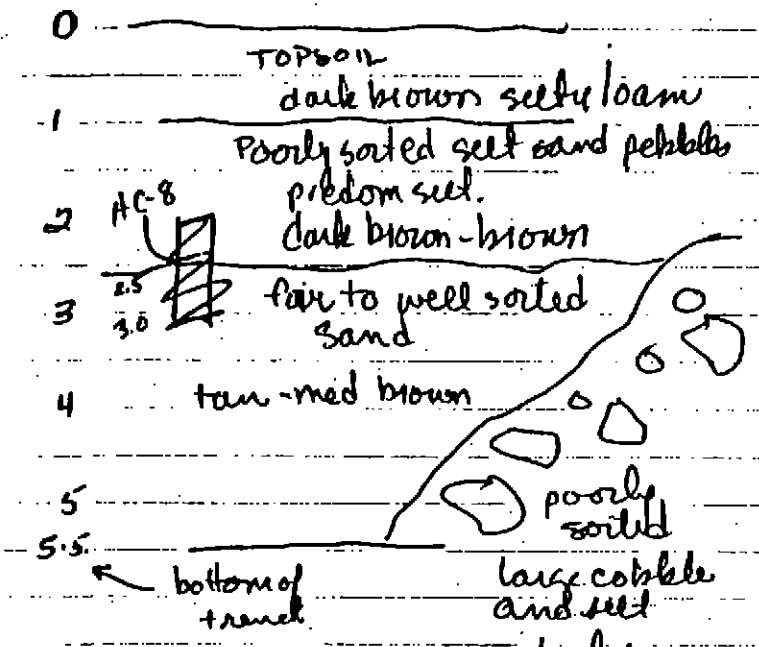
HC-6 & HC-7 sampled by having backhoe operator scrape material from desired interval and place on ground in separate pile. Depths measured with tape measure dropped into trench

(6) FEB. 19, 1992 L. Elkin

TRENCH #5

HC-8 2.0' → 3.0' X-SECTION LOOKING EAST

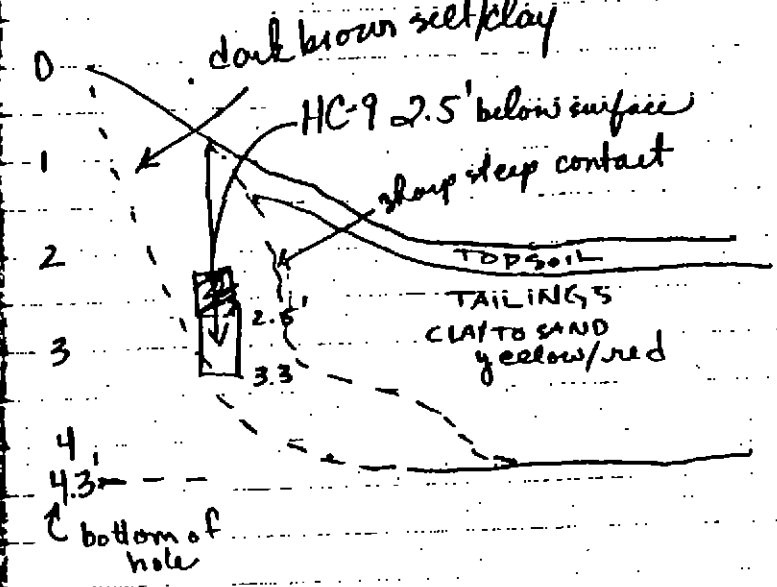
≅175' from east property line



(7) FEB. 19, 1992 L. Elkin

TRENCH #6 HC-9 - in present day drainage

X-SECTION Looking east



(8) FEB. 19, 1992 L. Elkin

TRENCH #7 Center of drainage bottom ~46' from drainage bottom Trench #6
bottom between trench 5 and 6.

0 — 3' TOPSOIL

0.8 — MOD/STR. FE-OX TAILING

1 — MED BROWN/grey. well sorted sand/silt clay

1.6' — HC-12 1.6'-2.0'

1.8' 2 — yellow tailings

2.5 — HC-11

2.8 3 — 4.0'

4 — HC-10 3.8' 4.2'

5 — dark brown silty

5.7

TRENCH #8 No SAMPLES

0 — med brown gray 6" silt/sand no visible tailings

1 — dark brown/black dense silt looks natural

2

3

3.5 — bottom

Feb. 19, 1992 L. Elkin (9)

TRENCH #9 North side of drainage HC-13

0

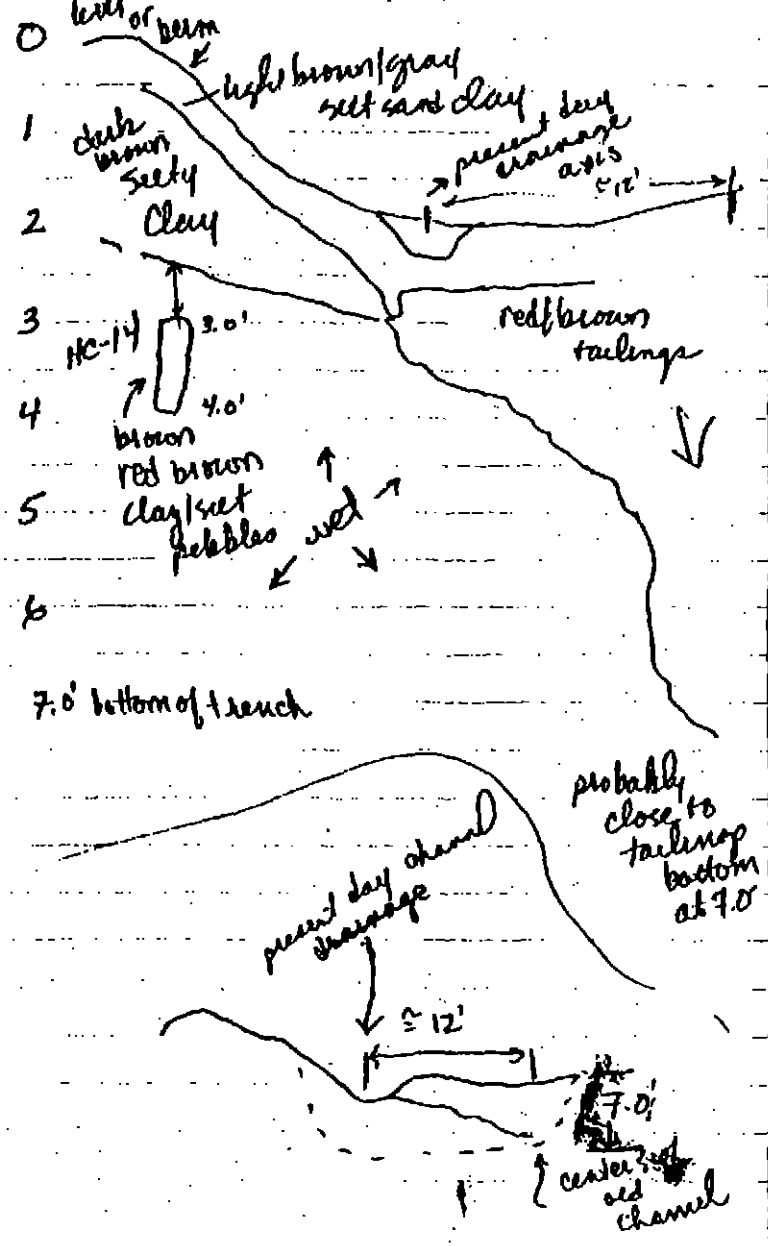
1 — moist dark brown/black silt pebbly

2 — 2.3 — 2.5' — HC-13 dry silt/clay med to light brown

3 — 2.7

(10) FEB. 19, 1992 ... L. Elkin

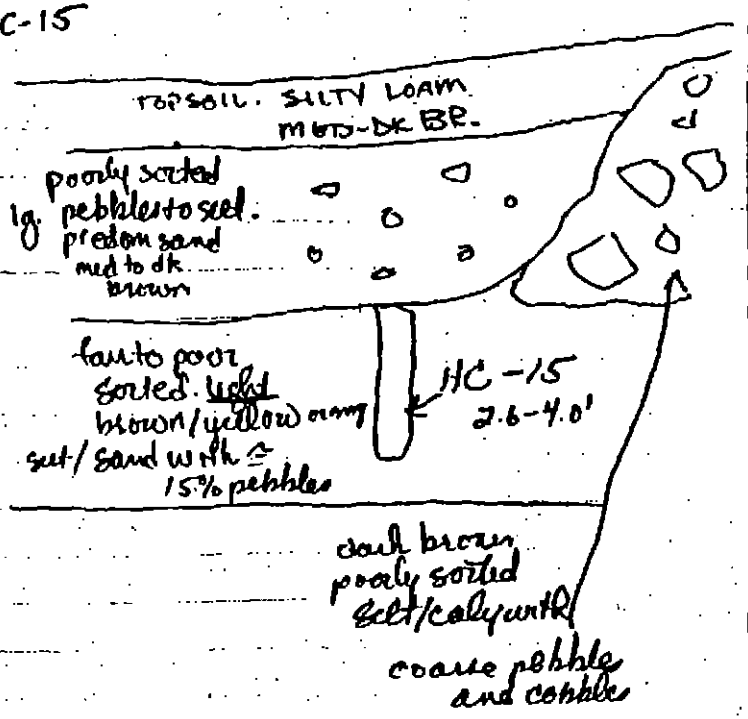
TRENCH # 10 center of present day channel x-section looking east



(11) FEB. 17, 1992 L. Elkin

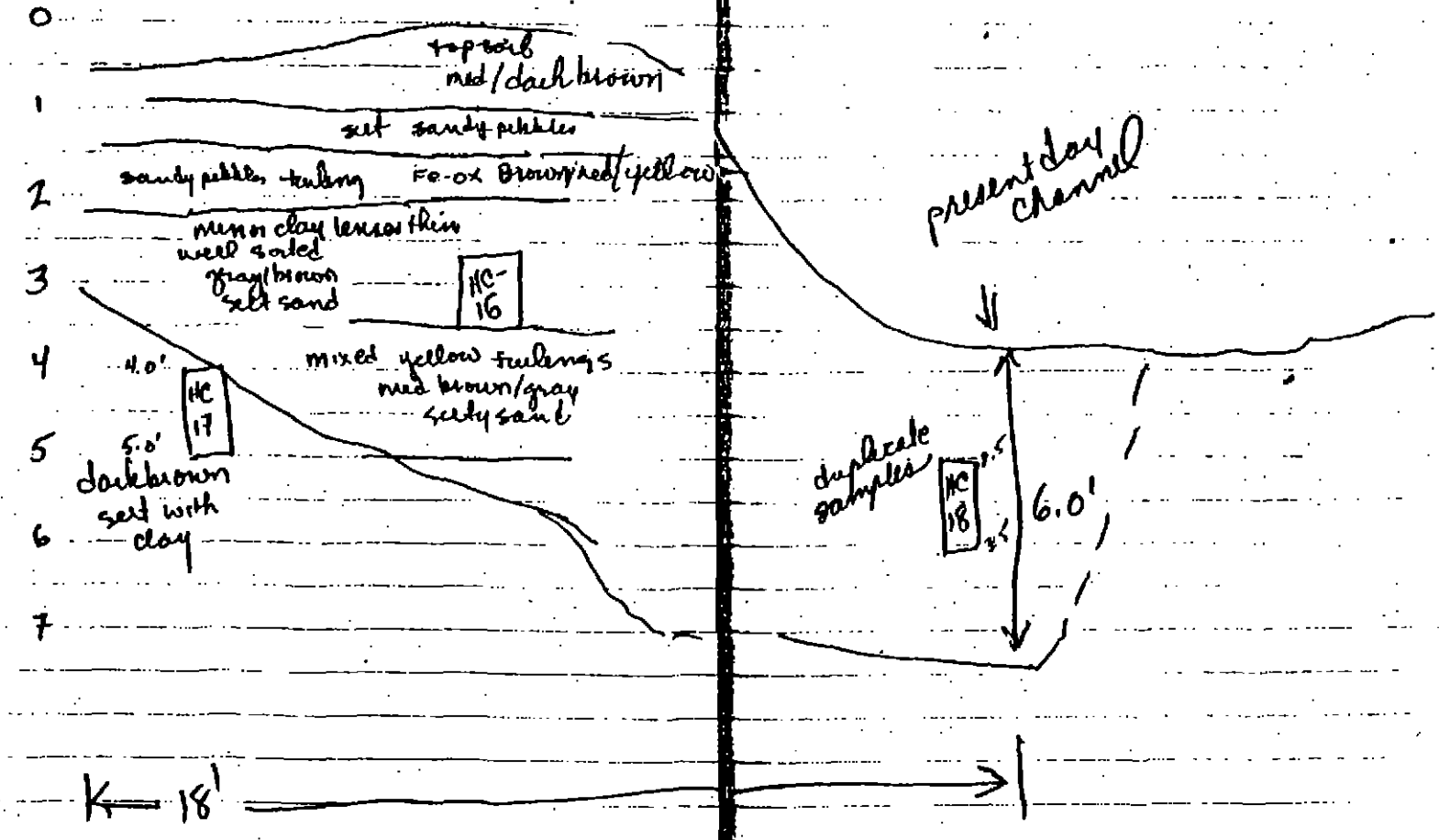
trench 11. South side of drainage 5' from center of present day drainage

HC-15



(12) Feb, 19, 1992 L. Elkin

trench 12
HC-16
HC-17
HC-18

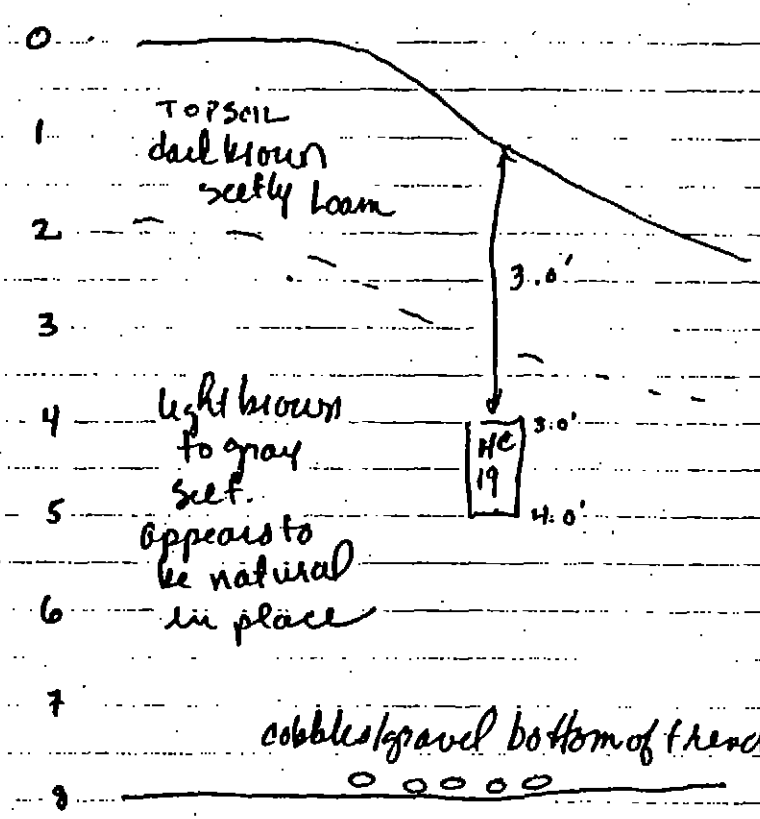


Feb. 19, 1992
L. Elkin

(14) FEB. 20, 1991 L. Elkin

TRENCH #13 NW side of creek

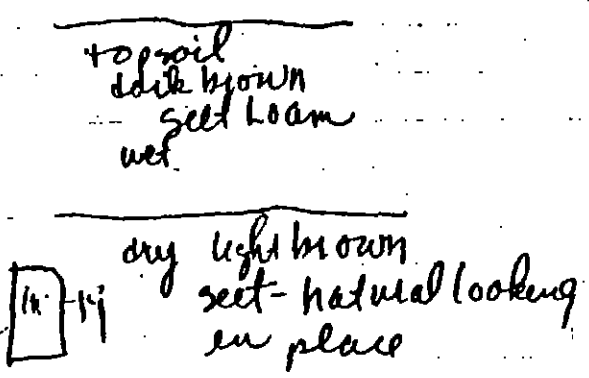
X-SECTION looking west east



Feb. 20, 1992 L. Elkin (15)

TRENCH #14 NW SIDE OF CREEK

± 40' from trench #13



16 Feb. 20, 1992 L. Elkin

- A total of 20 samples were collected from 14 trenches. Samples were assigned the identification numbers HC-1 through HC-20.

- Samples HC-1 thru HC-18 were delivered to Ford Laboratory on February 19, 1992. Samples HC-19 & HC-20 will be delivered Feb 20, 1992
- Photographs were taken at each site.

- Sample sites were located on a field map, (scale 1" = 75'). Each trench location was measured to a landmark in the field or adjacent trench

- Sample intervals were measured with tape measure from existing ground surface

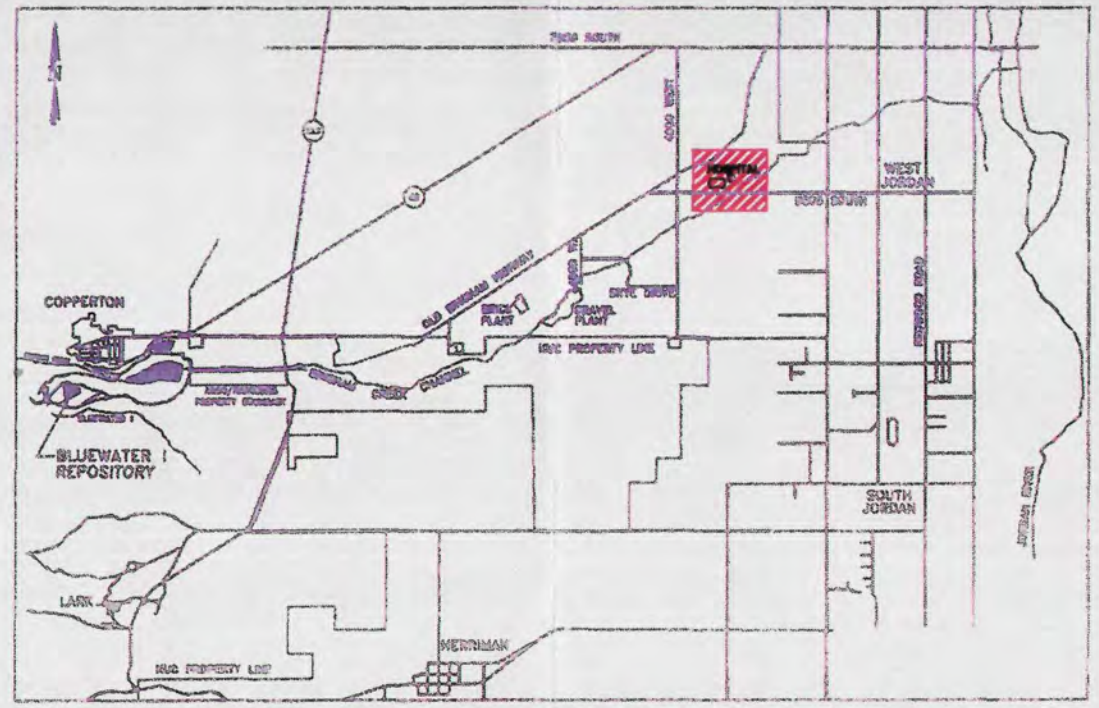
- one QA/QC sample/duplicate was collected for HC-10.

A split of sample HC-4 was made for Ron Segura. Two

Feb. 20, 1992
L. Elkin

samples were collected from HC-18 material as another split for Ron Segura. Ron Segura picked up splits at PPG from L. Elkin at ≈ 12:45 PM Feb. 20, 1992.

LOCATION MAP



KEY PLAN

SAMPLE ID NUMBER	SAMPLE DEPTH	TRENCH NUMBER	ANALYTICAL RESULTS (ppm)	
			Pb	As
HC-1	1.0'-2.1'	T-1	67.380	6.263
HC-2	2.1'-4.0'	T-1	120.380	10.152
HC-3	5.0'-6.0'	T-2	553.390	22.571
HC-4	6.4'-7.5'	T-2	9906.050	260.685
HC-5	2.0'-3.0'	T-3	172.280	22.971
HC-6	6.0'	T-4	7721.800	113.338
HC-7	10.5'-11.0'	T-4	1261.070	108.190
HC-8	2.5'-3.0'	T-5	108.190	8.937
HC-9	2.3'-3.3'	T-6	139.260	19.961
HC-10	3.8'-4.2'	T-7	200.16	21.517
HC-11	2.5'-4.0'	T-7	4435.120	130.872
HC-12	1.6'-2.0'	T-7	7662.210	331.847
HC-13	2.3'-2.7'	T-9	218.260	20.304
HC-14	3.0'-4.0'	T-10	192.850	21.263
HC-15	2.6'-4.0'	T-11	74.960	13.586
HC-16	2.7'-3.5'	T-12	8343.100	310.081
HC-17	4.0'-5.0'	T-12	232.05	15.470
HC-18	2.5'-3.5'	T-12	12858.2801	231.548
HC-19	3.0'-4.0'	T-13	149.330	19.409
HC-20	2.5'-3.5'	T-14	183.270	20.501

SAMPLE ID NUMBER	SAMPLE TYPE	ANALYTICAL RESULTS				
		Pb	As	Sulfate (mg/l)	TDS (mg/l)	pH
HC-21	SOIL	220.710 ppm	14.394 ppm			
HC-22	WATER	0.030 mg/l	0.004 mg/l	390	1228	7.97

LEGEND

- EXISTING ROADS AND PARKING AREAS
- EXISTING BUILDINGS AND STRUCTURES
- EXISTING TOPOGRAPHY
- JORDAN VALLEY HOSPITAL PROPERTY LINE
- T-0 TRENCH LOCATION
- HC-0 SAMPLE LOCATION

PLANT PROJECTS GROUP		
SCALE: 1"=75'	DATE	
	LE	2/92
	DVG	2/92

KENNECOTT
UTAH COPPER

OLY CROSS JORDAN VALLEY HOSPITAL
BINGHAM CREEK CHANNEL
SAMPLE LOCATION MAP
SAMPLES HC-1 THRU HC-22

Job No. ----- Dwg. No. 453-T-171 REV 0

453-T-171 06/24/93 10:40 jm

FIELD NOTES

CHAIN OF CUSTODY FORMS
ANALYTICAL DATA

KENNEC[redacted] UTAH COPPER CORPORATION - CHAIN OF CUST[redacted]Y RECORD

PROJECT NAME: KENNECOTT PLANT PROJECTS GROUP	PROJECT NO:	SAMPLERS: (SIGNATURE) Larry Elkin

SAMPLE I.D. NO.	DATE COLLECTED	SAMPLE TYPE: COMP	GRAB	AIR	WATER	OTHER SPECIFY	NO. OF CONTAINERS	ANALYSIS REQUIRED: Pb	As						REMARKS
HC-1	2-19-92	✓					1	✓	✓						ANALYZE USING EPA PREP METHOD 3050
HC-2		✓					1	✓	✓						
HC-3		✓					1	✓	✓						
HC-4		✓					1	✓	✓						
HC-5		✓					1	✓	✓						
HC-6		✓					1	✓	✓						SPLIT FOR RON SEGURA HC-4
HC-7		✓					1	✓	✓						
HC-8		✓					1	✓	✓						
HC-9		✓					1	✓	✓						
HC-10		✓					1	✓	✓						
HC-11		✓					1	✓	✓						
HC-12		✓					1	✓	✓						
HC-13		✓					1	✓	✓						
HC-14		✓					1	✓	✓						
HC-15		✓					1	✓	✓						

RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) Larry Elkin	DATE: 2-19-92	TIME: 4:15 AM	RECEIVED FOR LABORATORY BY: (Signature) [illegible]	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)

REMARKS

SPLIT SAMPLES

☐ ACCEPTED ☐ DECLINED

Ron Segura
SIGNATURE

KENNECOTT UTAH COPPER CORPORATION - CHAIN OF CUSTODY RECORD

PROJECT NAME: KENNECOTT PLANT PROJECTS GROUP

PROJECT NO:

SAMPLERS: (SIGNATURE) Larry Elkin

SAMPLE I.D. NO.	DATE COLLECTED	SAMPLE TYPE: COMP	GRAB	AIR	WATER	OTHER SPECIFY	NO. OF CONTAINERS	ANALYSIS REQUIRED: Pb	As						REMARKS
HC-16	2/8/92	✓					1	✓	✓						ANALYZE USING PREP EPA METHOD 3050
HC-17	↓	✓					1	✓	✓						
HC-18	↓	✓					1	✓	✓						← SPLIT FOR RON SEGURA HC-18

RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) Larry Elkin	DATE: 2-7-92	TIME: 4:15 pm	RECEIVED FOR LABORATORY BY: (Signature) Mandy Lewis	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)

REMARKS:

SPLIT SAMPLES

☐ ACCEPTED ☐ DECLINED

Ron Segura
SIGNATURE

KENNECOTT UTAH COPPER CORPORATION - CHAIN OF CUSTODY RECORD

PROJECT NAME: KENNECOTT PLANT PROJECTS GROUP

PROJECT NO:

SAMPLERS: (SIGNATURE) Larry Elkin

SAMPLE I.D. NO.	DATE COLLECTED	SAMPLE TYPE: COMP	GRAB	AIR	WATER	OTHER SPECIFY	NO. OF CONTAINERS	ANALYSIS REQUIRED: Pb	As						REMARKS
HC-19	2-20-92	✓					1	✓	✓						EPA PREP METHOD 3050
HC-20	2-20-92	✓					1	✓	✓						

RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) Larry Elkin	DATE: 2-20-92	TIME: 4:31 PM	RECEIVED FOR LABORATORY BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)

REMARKS:

SPLIT SAMPLES

☐ ACCEPTED ☐ DECLINED

SIGNATURE

FORD ANALYTICAL LABORATORIES

CHEMICAL AND BACTERIOLOGICAL ANALYSIS

CERTIFICATE OF ANALYSIS

DATE: 02/20/92

KENNECOTT PLANT PROJ
GROUP,%B. VAN DYKEN
P.O. BOX 112
BINGHAM CYN,UT 84006

92-022272

SAMPLE: SOIL SAMPLES COLLECTED BY L. ELKIN RECEIVED 2-19-92 FOR ANALYSIS STARTING AT 4:30 P.M.

	HC-1	HC-2	HC-3	HC-4
Arsenic As Tot ppm EPA7060	6.263	10.152	22.511	260.685
Lead Pb Tot ppm EPA7421	67.380	120.380	553.390	9,906.050

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40 West Louise Avenue • Salt Lake City, Utah 84115 • PHONE (801) 466-8761 • FAX (801) 466-8763

CERTIFICATE OF ANALYSIS

91-022272

	HC-5	HC-6	HC-7	HC-8
Arsenic As Tot ppm EPA7060	22.971	113.338	56.048	8.937
Lead Pb Tot ppm EPA7421	172.280	7,721.800	1,261.070	108.190

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CERTIFICATE OF ANALYSIS

91-022272

	HC-9	HC-10
Arsenic As Tot ppm EPA7060	19.961	21.517
Lead Pb Tot ppm EPA7421	139.260	200.160

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CERTIFICATE OF ANALYSIS

DATE: 02/20/92

KENNECOTT PLANT PROJ
GROUP,%B. VAN DYKEN
P.O. BOX 112
BINGHAM CYN,UT 84006

92-022273

SAMPLE: SOIL SAMPLES COLLECTED BY L. ELKIN RECEIVED 2-19-92 FOR ANALYSIS STARTING AT 4:30 P.M.

	HC-11	HC-12	HC-13	HC-14
Arsenic As Tot ppm EPA7060	130.872	331.847	20.304	21.263
Lead Pb Tot ppm EPA7421	4,435.120	7,662.210	218.260	192.850

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CERTIFICATE OF ANALYSIS

PAGE: 2

91-022273

	HC-15	HC-16	HC-17	HC-18
Arsenic As Tot ppm EPA7060	13.586	310.081	15.470	231.548
Lead Pb Tot ppm EPA7421	74.960	8,343.100	232.050	12,858.280

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FORD ANALYTICAL LABORATORIES

CHEMICAL AND BACTERIOLOGICAL ANALYSIS

CERTIFICATE OF ANALYSIS

DATE: 02/21/92

KENNECOTT PLANT PROJ
GROUP,%B. VAN DYKEN
P.O. BOX 112
BINGHAM CYN,UT 84006

92-022331

SAMPLE: COMPOSITE SOIL SAMPLES COLLECTED 2-20-92 BY L. ELKIN
RECEIVED 2-20-92 FOR ANALYSIS STARTING AT 5 P.M.

	HC-19	HC-20
Arsenic As Tot ppm EPA7060	19.409	20.501
Lead Pb Tot ppm EPA7421	149.330	183.270

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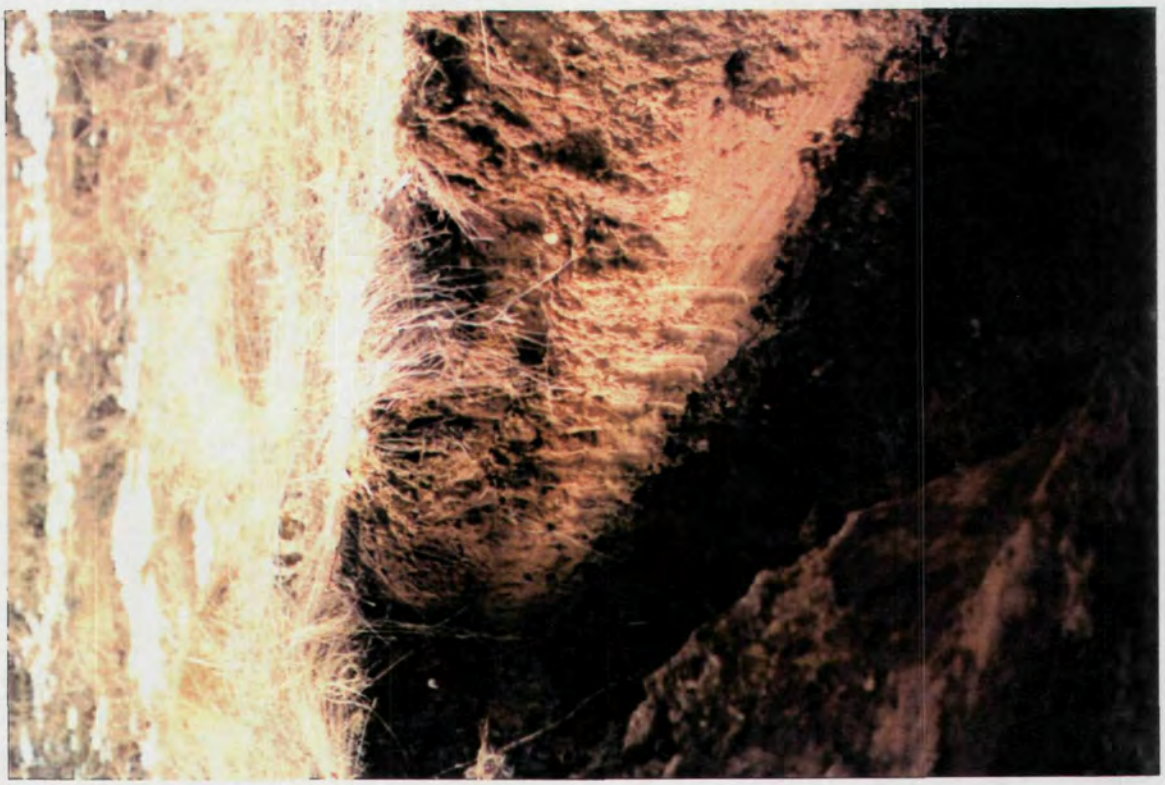
MAP

PHOTOGRAPHS

LOOKING WEST. TRENCH #1
2-19-92 Photo By L. Elkin



LOOKING AT WEST WALL OF TRENCH #1.
SAMPLE SITES HC-1 & HC-2. 2-19-92
Photo By L. Elkin

C-LINE #52564
4"x6" PRINTS

LOOKING WEST. TRENCH #2. SAMPLE SITES
HC-3 AND HC-4. 2-19-92 Photo By L. Elkin

LOOKING DOWN INTO TRENCH #2. SAMPLE SITES
HC-3 AND HC-4. BOTTOM OF TRENCH 7.5' BELOW
SURFACE. 2-19-92 Photo By L. Elkin

LOOKING WEST AT TRENCH #3. SAMPLE SITE HC-5.
2-19-92. Photo By L. Elkin

LOOKING SOUTH AT TRENCH #3. SAMPLE SITE
HC-5. 2-19-92 Photo By L. Elkin

C-LINE #52564
4"x6" PRINTS

LOOKING NORTHEAST AT TRENCH #4. SAMPLE SITES HC-6 & HC-7. 2-19-92 Photo By L. Elkin

LOOKING DOWN INTO WEST WALL OF TRENCH #4. SAMPLE SITES HC-6 & HC-7. BOTTOM OF TRENCH 11.0' BELOW SURFACE. 2-19-92. Photo By L. Elkin

LOOKING NORTHEAST AT TRENCH #5.
SAMPLE SITE HC-8. 2-19-92. Photo By L. Elkin

LOOKING SOUTH INTO TRENCH #5. SAMPLE SITE
HC-8. 2-19-92. Photo By L. Elkin

C-LINE #52564
4"x6" PRINTS

LOOKING NORTHEAST AT TRENCH #6. SAMPLE SITE HC-9. 2-19-92 Photo By L. Elkin

LOOKING AT NORTHEAST WALL OF TRENCH #6. SAMPLE SITE HC-9. 2-19-92. Photo by L. Elkin

LOOKING NORTHEAST AT TRENCH #7. SAMPLE SITES HC-10, HC-11, HC-12. 2-19-92 Photo By L. Elkin

LOOKING AT SOUTHEAST WALL OF TRENCH #7. SAMPLE SITES HC-10, HC-11, HC-12. PALEO -CHANNEL FILLED WITH TAILINGS VISIBLE ON RIGHT HALF OF PHOTO. 2-29-92 Photo By L. Elkin

C-LINE #52564
4"x6" PRINTS

LOOKING NORTHEAST AT TRENCH #9. SAMPLE SITE HC-13. 2-19-92 Photo By L. Elkin

LOOKING WEST AT TRENCH #10. SAMPLE
SITE HC-14. 2-19-92 Photo By L. Elkin

C-LINE #52564
4"x6" PRINTS

LOOKING AT NORTHEAST WALL OF TRENCH #10. SAMPLE
SITE HC-14. BOTTOM OF TRENCH 4.6' BELOW SURFACE.
PALEO-CHANNEL VISIBLE AT RIGHT HALF OF PHOTO.
2-19-92. Photo By L. Elkin

LOOKING NORTHEAST AT TRENCH #11. SAMPLE
SITE HC-15. 2-19-92 Photo By L. Elkin

LOOKING SOUTHEAST INTO TRENCH #11. SAMPLE
SITE HC-15. 2-19-92 Photo By L. Elkin

LOOKING NORTHEAST AT TRENCH #12. SAMPLE SITES HC-16, HC-17, HC-18. 2-19-92. Photo By L. Elkin

LOOKING SOUTHEAST INTO TRENCH #12. BOTTOM OF TRENCH 5' BELOW SURFACE. 2-19-92
Photo By L. Elkin

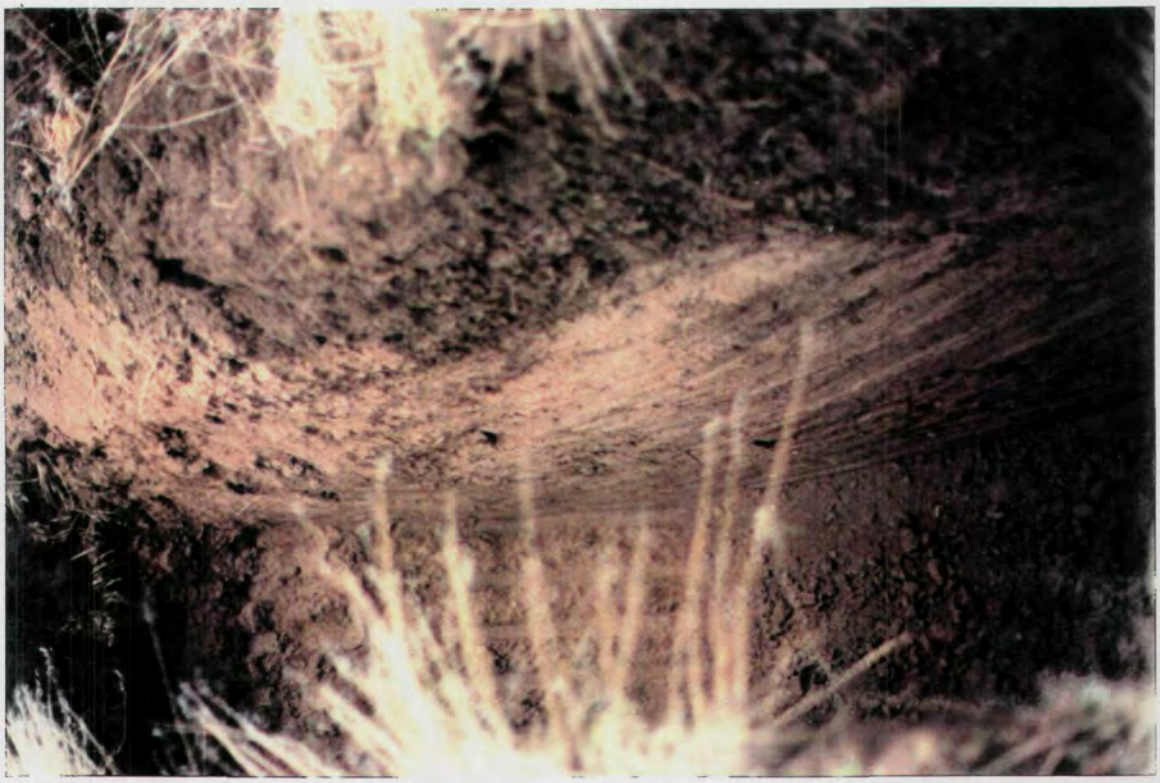
C-LINE #52564
4"x6" PRINTS

LOOKING NORTH AT TRENCH #12. 2-19-92
Photo By L. Elkin

LOOKING SOUTHEAST INTO TRENCH #12. FAR END OF TRENCH IN CENTER OF PRESENT DAY BINGHAM CREEK CHANNEL. BOTTOM OF TRENCH 6' BELOW CREEK BOTTOM.
2-19-92 Photo By L. Elkin

LOOKING NORTHEAST AT SITE OF TRENCH
#13, SAMPLE HC-19, FEBRUARY 20, 1992
PHOTO BY L. ELKIN

C-LINE #52564



LOOKING NORTHWEST INTO TRENCH #13,
SAMPLE HC-19. FEBRUARY 20, 1992
PHOTO BY. L. ELKIN

LOOKING NORTHEAST INTO TRENCH #14,
SAMPLE HC-20. FEBRUARY 20, 1992
PHOTO BY. L. ELKIN

DRAWINGS

N

GRAPHIC SCALE

(IN FEET)
1 inch = 2000 ft.

7800 SOUTH

4000 WEST

3200 WEST

2700 WEST

1300 WEST

8600 SOUTH

ALTERNATE HAUL ROAD

HOSPITAL

9000 SOUTH

WEST JORDAN

MAIN HAUL ROUTE

48

OLD BINGHAM HIGHWAY

4800 WEST

SKYE DRIVE

BRICK PLANT

GRAVEL PLANT

JORDAN RIVER

ALTERNATE HAUL ROAD

SMALL BINGHAM CREEK RESERVOIR

COPPERTON

KUC PROPERTY LINE

BINGHAM CREEK

ARCO/ANACONDA PROPERTY BOUNDARY

BINGHAM CREEK CHANNEL

LARGE BINGHAM CREEK RESERVOIR

REDWOOD ROAD

SOUTH JORDAN

BLUEWATER I REPOSITORY

111

LARK

LEGEND

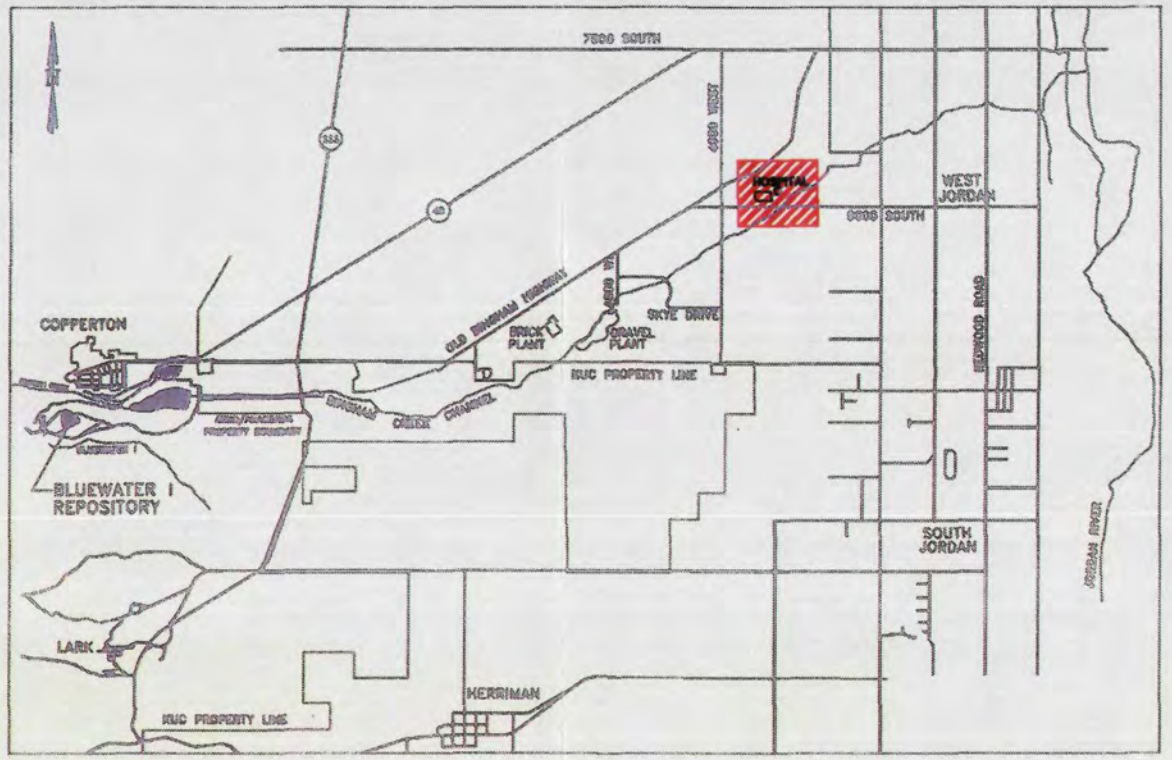
- PROPOSED MAIN HAUL ROAD
- PROPOSED ALTERNATE HAUL ROAD
- SITE BOUNDARY
- BLUEWATER I REPOSITORY

PLANT PROJECTS GROUP		
SCALE: 1"=2000'		DATE
BY	DVG\RMG	2/92
BY	DVG	2/92
BY		
BY		
PROJECT ENGR.		
DRWG.		

KENNECOTT
UTAH COPPER

BINGHAM CREEK CHANNEL
HOLY CROSS JORDAN VALLEY HOSPITAL
TAILINGS REMOVAL
SITE BOUNDARY AND HAUL ROADS

Job No. 603 | Dwg. No. 453-T-169 | REV 1



KEY PLAN

LEGEND

- ROADS AND PARKING AREAS
- EXISTING BUILDINGS AND STRUCTURES
- NEW BUILDINGS AND STRUCTURES
- EXISTING TOPOGRAPHY
- NEW TOPOGRAPHY
- JORDAN VALLEY HOSPITAL PROPERTY LINE
- BINGHAM CREEK CHANNEL

PLANT PROJECTS GROUP		KENNECOTT UTAH COPPER
SCALE: 1"=75'	DATE	HOLY CROSS JORDAN VALLEY HOSPITAL PROPOSED ADDITIONS
DVG	1/92	
DVG	1/92	
Job No. ----	Dwg. No. 453-T-168	REV. 0

453-T-168 0 3 1422 jm

HOLY CROSS HOSPITAL SITE

BINGHAM CREEK CHANNEL

REPORTS

REMOVAL QUANTITIES

ENGINEERING AND SURVEY INFORMATION

KENNECOTT
PLANT PROJECTS GROUP

JULY, 1992

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A. **REMOVAL QUANTITIES**

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B. **ENGINEERING AND SURVEY INFORMATION**

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FIELD DENSITY TEST RESULTS

MOISTURE DENSITY RELATIONSHIP TEST DATA

DRAWING
FIELD SURVEY PLAN & SECTION

A: REMOVAL QUANTITIES

HOLY CROSS JORDAN VALLEY HOSPITAL
BINGHAM CREEK CHANNEL TAILINGS REMOVAL
TRUCK SCALE DATA

DAY HAULED	NO. LOADS	QUANTITY		AVE. YARDS	AVE. CYCLE
		TONS	YARDS	PER LOAD	TIME
01-Jul-92	8	57	35.6	4.45	52.67
02-Jul-92	51	712	444.7	8.72	55.83
TOTAL WEEK 1	59	769	480.3	6.59 *	54.25 *
06-Jul-92	61	830	518.4	8.50	50.05
07-Jul-92	67	871	544.0	8.12	55.52
08-Jul-92	80	1025	640.2	8.00	54.71
09-Jul-92	83	1012	632.1	7.62	52.93
10-Jul-92	97	1287	803.9	8.29	50.57
TOTAL WEEK2	388	5025	3138.7	8.10 *	52.76 *
13-Jul-92	75	1008	629.6	8.39	47.83
14-Jul-92	88	1377	860.1	9.77	55.16
15-Jul-92	88	1411	881.3	10.02	55.03
16-Jul-92	83	1450	905.7	10.91	53.82
17-Jul-92	64	995	621.5	9.71	61.60
TOTAL WEEK 3	398	6241	3898.2	9.76 *	54.69 *
20-Jul-92	82	1098	685.8	8.36	57.24
21-Jul-92	78	1005	627.7	8.05	55.94
22-Jul-92	77	1018	635.9	8.26	60.38
23-Jul-92	75	1068	667.1	8.89	58.96
TOTAL WEEK 4	312	4189	2616.5	8.39 *	58.13 *
27-Jul-92	92	1253	782.6	8.51	46.53
28-Jul-92	89	1088	679.6	7.64	49.49
29-Jul-92	100	1404	877.0	8.77	50.48
TOTAL WEEK 5	281	3745	2339.2	8.30 *	48.83 *
TOTALS	1438	19969	12473	160.98	1024.74
AVERAGE/DAY	76	1051	656.5	8.47	53.93

Note: data compiled from truck scale program and 3202 lb/yd conversion factor based on soil test results.
* Average values for each week.

HOLY CROSS JORDAN VALLEY HOSPITAL
BINGHAM CREEK CHANNEL TAILINGS REMOVAL
MOISTURE AND COMPACTION TEST RESULTS

TEST DATE	DRY DENSITY (LB/CU. FT)	% MOISTURE	WET DENSITY (LB/CU. FT)
7/8/92	116.8	10.7	129.3
7/8/92	104.1	10.0	114.5
7/8/92	121.5	7.5	130.6
7/9/92	123.1	9.5	134.8
7/9/92	124.6	7.1	133.4
7/14/92	120.9	11.2	134.4
7/14/92	124.5	10.8	137.9
7/16/92	126.7	8.8	137.8
7/16/92	116.5	9.4	127.5
7/16/92	124.5	8.0	134.5
7/21/92	113.0	12.8	127.5
7/21/92	112.0	15.6	129.5
7/21/92	116.5	9.6	127.7
7/27/92	124.5	10.8	137.9
7/27/92	121.5	8.2	131.5
7/28/92	102.0	17.6	120.0
7/28/92	112.0	15.2	129.0
7/29/92	127.3	9.2	139.0
7/29/92	121.2	12.2	136.0
AVERAGE	118.6	10.7	131.2

Note: all testing conducted by SH&B in Bluewater I Repository.
Water was added to the material in the Repository to acheive 95% compaction.
Data from the truck scales is representative of the material hauled prior to the addition of water, so the dry density of the material will be used to calculate the conversion factor from pounds to yard hauled.

Conversion factor = 3202 lb/cu. yd.

B: ENGINEERING & SURVEY INFORMATION

SERGENT, HAUSKINS & BECKWITH CONSULTING GEOTECHNICAL ENGINEERS
SOIL & FOUNDATION ENGINEERING • ENGINEERING GEOLOGY • HYDROGEOLOGY
MATERIALS ENGINEERING • MATERIALS TESTING • ENVIRONMENTAL SERVICES

September 24, 1992

Kennecott Plant Projects Group
P.O. Box 112
Bingham Canyon, Utah 84006-0112

SHB AGRA Job No. T92-2602

Attention: Ms. Richelle Golightly

Re: Summary Report
Moisture/Density Tests
Holy Cross Jordan Valley Hospital
West Jordan, Utah
for Kennecott Plant Projects Group

Dear Ms. Golightly:

Submitted is a summary of in-situ moisture/density tests performed during the period of August 12, through August 24, 1992 at the referenced project. Testing was performed on bank-run backfill material placed and compacted by Glen's Excavation within the Bingham Creek Channel. Testing was performed at the request of Ms. Richelle Golightly and Mr. Roger Hall of Kennecott Plant Projects Group. Also submitted is a plot of the moisture/density relationship (proctor) utilized as the maximum in determining percent compaction.

Should you have any questions with regards to this submittal or if we may be of further assistance, please contact the undersigned.

Respectfully submitted,
SHB AGRA, Inc.

By Marc H. Olesen
Marc H. Olesen
Project Supervisor

Copies: Addressee (3)

REPLY TO: 4030 S. 500 WEST, SUITE 90, SALT LAKE CITY, UTAH 84123

PHOENIX	TUCSON	ALBUQUERQUE	SANTA FE	SALT LAKE CITY	EL PASO	RENO/SPARKS
(602) 272-6848	(602) 792-2779	(505) 884-0950	(505) 471-7836	(801) 266-0720	(915) 564-1017	(702) 331-2375
FAX 272-7239	FAX 888-0014	FAX 884-1694	FAX 438-7156	FAX 266-0727	FAX 562-7739	FAX 331-4153

SUMMARY OF FIELD DENSITY TEST RESULTS

Project Holy Cross Jordan Valley Hospital Job No. T92-2602

Location Bingham Canyon, Utah Contractor Glen's Excavating

Client Kennecott Corporation/Plant Projects Group

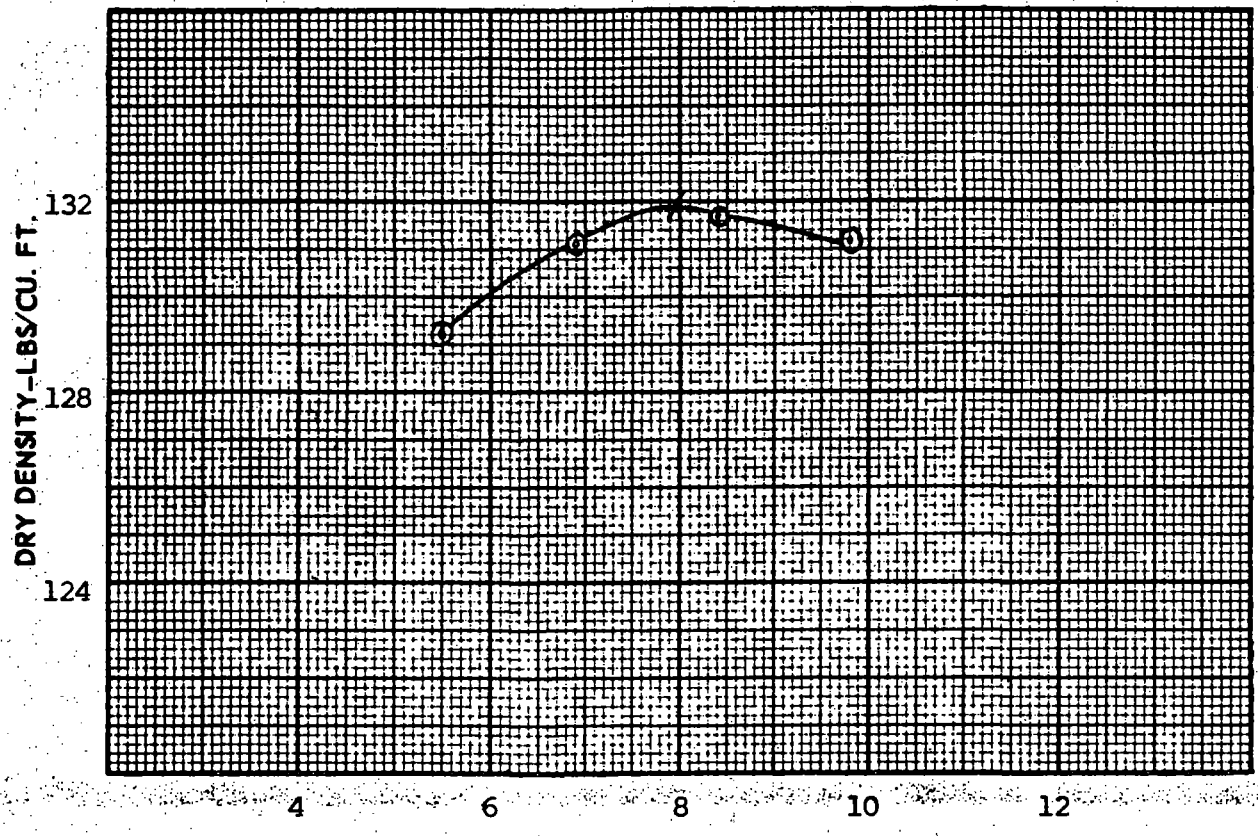
Date of Test	Test No.	Depth of Test	* Location	Moisture Content % Dry Wt.	Dry Density Lbs/Cu.Ft.	% Max. Dry Density	Curve No.
08-12-92	1	L-1	N. 822370 E. 1869170	6.3	129.2	98	02-23
08-13-92	2	L-3	N. 822380 E. 1869160	8.5	126.5	96	02-23
08-13-92	3	L-3	N. 822410 E. 1869180	4.9	128.1	97	02-23
08-13-92	4	L-5	N. 822360 E. 1869170	5.5	128.2	97	02-23
08-14-92	5	L-7	N. 822350 E. 1869200	6.6	129.5	98	02-23
08-14-92	6	L-7	N. 822320 E. 1869130	7.0	132.8	100	02-23
08-14-92	7	L-9	N. 822360 E. 1869150	6.1	130.1	99	02-23
08-14-92	8	L-9	N. 822380 E. 1869170	7.2	128.1	97	02-23
08-17-92	9	L-11	125' E. of Road Intersection	6.3	130.5	99	02-23
08-17-92	10	L-11	30' E./NE. of Road Intersection	5.6	126.7	96	02-23
08-17-92	11	L-11	125' E./SE. of Road Intersection	5.1	124.4	94	02-23
08-17-92	11-R1	L-11	125' E./SE. of Road Intersection	5.4	127.7	97	02-23
08-17-92	12	L-11	130' E. of Road Intersection	5.7	127.8	97	02-23
08-18-92	13	L-13	N. 822340 E. 1869210	6.6	133.0	100	02-23
08-18-92	14	L-13	N. 822360 E. 1869110	5.5	132.0	100	02-23
08-19-92	15	L-2	N. 822320 E. 1869095	5.8	130.0	99	02-23
08-19-92	16	L-4	N. 822320 E. 1869100	5.4	128.0	97	02-23
08-19-92	17	L-6	N. 822320 E. 1869090	5.5	127.6	97	02-23
08-19-92	18	L-6	N. 822330 E. 1869110	4.9	125.6	95	02-23
08-20-92	19	L-8	N. 822335 E. 1869090	7.3	126.4	96	02-23
08-20-92	20	L-8	N. 822305 E. 1869105	7.1	130.5	99	02-23
08-21-92	21	L-10	N. 822340 E. 1869070	6.0	128.2	97	02-23
08-21-92	22	L-10	N. 822370 E. 1869170	5.1	130.2	99	02-23
08-21-92	23	L-12	N. 822375 E. 1869100	6.3	129.8	98	02-23
08-21-92	24	L-12	N. 822390 E. 1869160	4.5	128.5.	97	02-23
08-24-92	25	S.G.	N. 822350 E. 1869125	5.1	127.8	97	02-23
08-24-92	26	S.G.	N. 822360 E. 1869150	5.4	125.0	95	02-23

L- = Lift
S.F. = Rough finish subgrade

*Locations are estimated and should be considered approximate.

SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Holy Cross Jordan Valley Hospital **JOB NO.** T92-2602



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
02-23	Bank-Run, silty sandy	7.9	131.9	ASTM D-1557	D	02-23
	gravel					

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

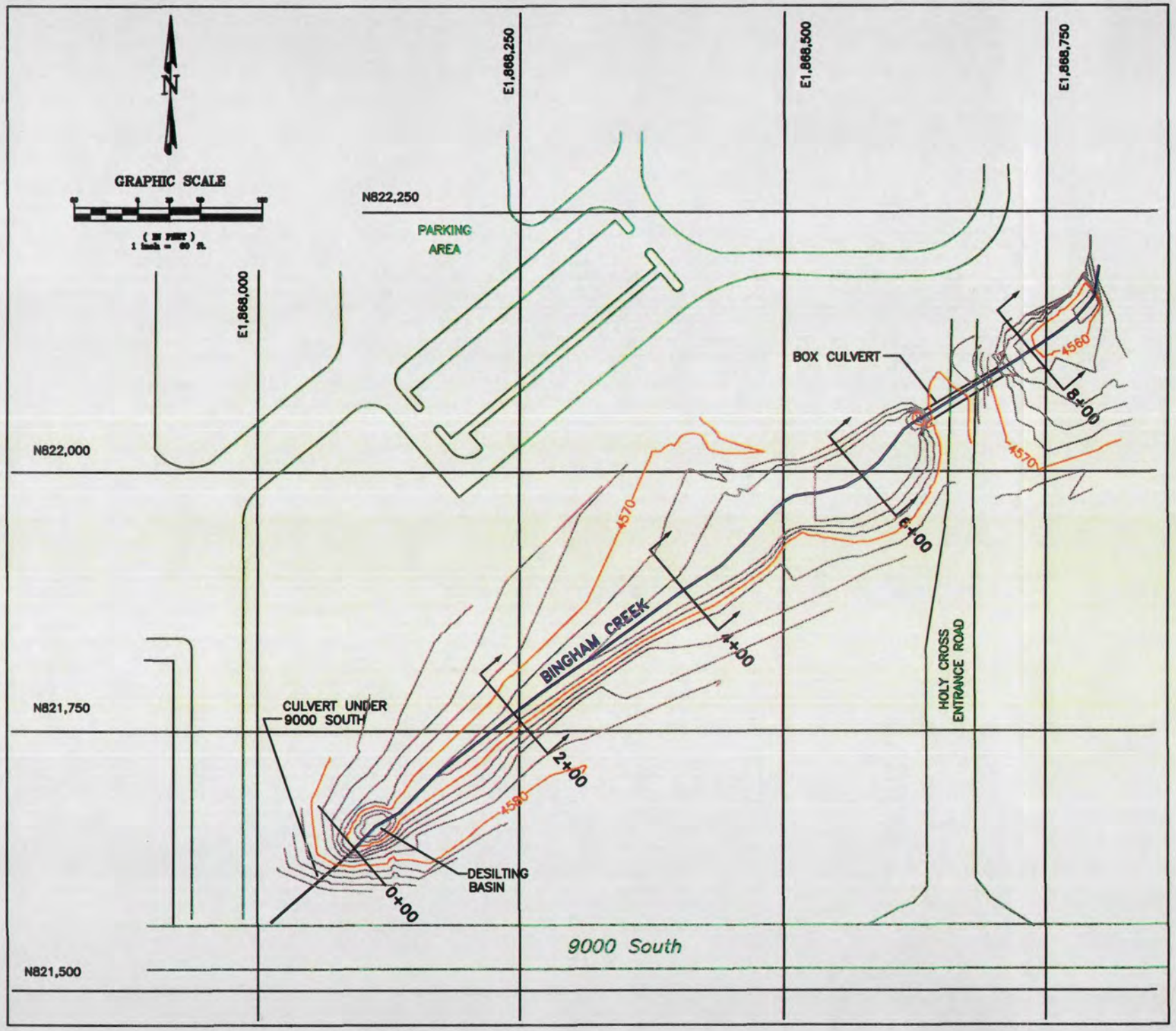
AASHTO T99 and ASTM D698 (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHTO T180 and ASTM D1557 (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO · RENO

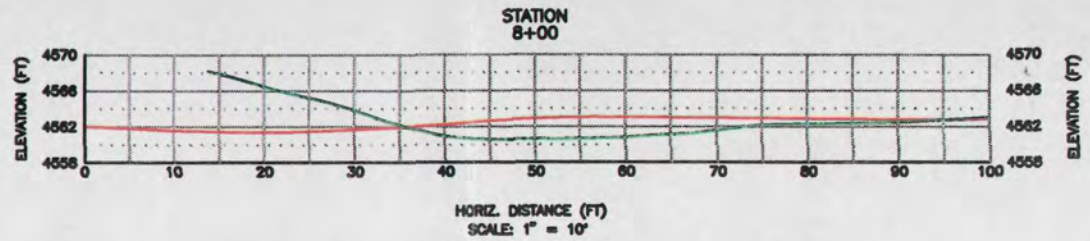


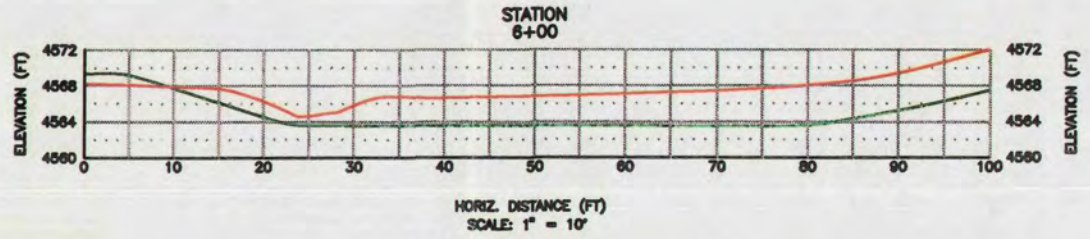
NOTE:

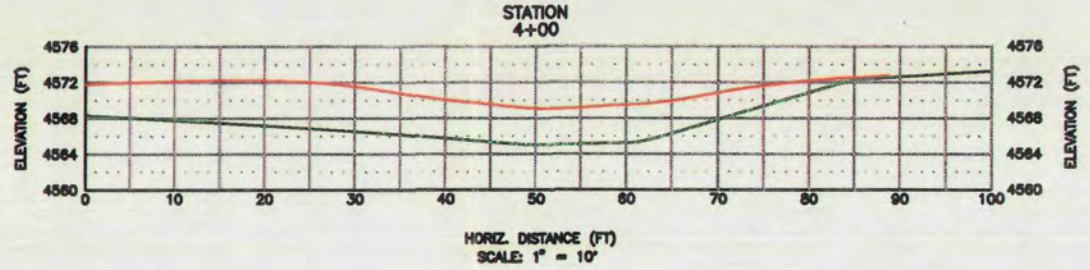
1. GRID COORDINATES AND ELEVATIONS SHOWN BASED ON STATE PLANE COORDINATE SYSTEM.
2. TOPOGRAPHY SHOWN BASED ON SURVEY INFORMATION AFTER RECLAMATION.
   PRE-REMOVAL SURVEY CONDUCTED 6/92, AND POST REMOVAL SURVEY CONDUCTED 2/94.

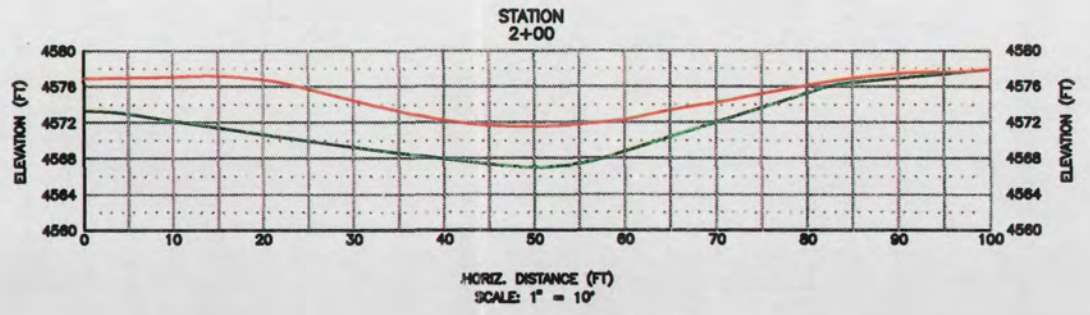
REFERENCE DRAWING:

453-T-231 BINGHAM CREEK CHANNEL
TAILINGS REMOVAL
4800 WEST TO 3200 WEST - AREA E
FIELD SURVEY PLAN AND SECTIONS









LEGEND
PRE-REMOVAL CROSS SECTION
POST-REMOVAL CROSS SECTION
BINGHAM CREEK CHANNEL

PLANT PROJECTS GROUP		KENNECOTT UTAH COPPER
SCALE: AS NOTED	DATE	BINGHAM CREEK CHANNEL TAILINGS REMOVAL 1992 HOLY CROSS HOSPITAL - AREA E FIELD SURVEY PLAN & SECTION
DESIGNED BY RMG	1/25/94	
DRAWN BY RMG	1/25/94	
CHECKED BY		
PROJECT ENGINEER		
PROJECT MANAGER		
Job No. ---	Dwg. No. 453-T-233	REV 0 1/1/94

453-T-233 02/ 14:08 KROCLIGH

BINGHAM CREEK

POST-REMOVAL SAMPLING

ON

HOLY CROSS JORDAN VALLEY

HOSPITAL PROPERTY

July, 1992

Prepared By:

Kennecott Plant Projects Group

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3.0 Sample Compilation 2

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Appendix A Field Notes

Appendix B Chain of Custody Forms
Lab Analytical Sheets

Appendix C Photographs

Appendix D Sample Location Map

BINGHAM CREEK POST REMOVAL SAMPLING
ON
HOLY CROSS JORDAN VALLEY HOSPITAL PROPERTY

1.0 INTRODUCTION

Kennecott has recently completed a tailings removal operation in Bingham Creek on Holy Cross Jordan Valley Hospital property located immediately north of 9000 South between approximately 3500 West and 3800 West. Tailings in the creek channel had been sampled previously and were known to contain elevated levels of lead and arsenic. The tailings were excavated and transported to the Bluewater I Repository located on Kennecott property. As written in the SAP, post-removal samples were collected in order to document lead and arsenic concentrations of the underlying soils.

The soils were collected by Larry Elkin and Steve Schnoor (North American Exploration) between July 10 and July 30, 1992. Glen's Excavating Company was contracted to excavate, transport, and recontour the removal area.

Tom McCarl and Ron Segura (Bureau of Reclamation representing the EPA) were on site during much of the removal and sampling activities.

Samples were analyzed for lead and arsenic concentrations at American West Analytical Laboratory. One split sample was analyzed at Ford Analytical Laboratory as part of the QA/QC procedures.

2.0 LOCATION AND DESCRIPTION

Holy Cross Jordan Valley Hospital is located immediately north of 9000 South between approximately 3500 West and 3800 West. Bingham Creek trends SW-NE for approximately 1100' through Hospital property, (See Appendix D, Sample Location Map).

The creek is incised approximately 5' to 10'. Grassy vegetation exists on the north side of the creek and small to large trees on the south.

Tailings in Bingham Creek were observed to varying depths below the pre-removal surface ranging from 2' at the southwest end to approximately 10' at the northeast end. The tailings appears to have been deposited by water in a v-shaped channel with natural alluvial gravels underlying the tailings and sand, silt, and clay deposits of probably lacustrine origin on the sides. The tailings

are generally silt, sand and fine gravel and have a distinct yellow color. Underlying the tailings is a transition zone of tailings mixed with natural alluvium. Red iron oxidation is moderate to strong in and below the transition zone. The tailings were observed to taper towards the shoulders of the channel and to dip steeply near the center of the channel.

3.0 SAMPLE COMPILATION

A total of 10 samples were collected. The samples were assigned the following identification numbers:

HCX-1
HCX-2
HCX-9 Thru HCX-16

4.0 SAMPLING PROCEDURES

4.1 Samples HCX-1, HCX-2, HCX-9, HCX-10

Samples HCX-1, HCX-2, HCX-9, and HCX-10 were 5-point composite samples collected from the southwestern two-thirds of the removal area. Each composite sample consisted of 5 subsites located by random number generation. Each composite sample was collected from within the boundaries of a composite cell. The length of each cell (along channel axis) was 150' and the width was equal to the widest distance of the removal area (perpendicular to channel axis) for that particular length of channel. Subsite locations, randomly generated that were outside the removal area, were skipped and the following random numbers used until 5 subsites were located within the removal area. Some subsite locations were skipped or moved if random number generation did not provide adequate coverage. This was done by the EPA's (Ron Segura's) suggestion.

Each subsite consisted of material collected from 4-points located symmetrically around the actual subsite (1 foot) and also including the subsite. The subsites were located in the field using a measuring tape and a hand held compass.

Loose material was scraped away from the surface of the subsite area until undisturbed soils were exposed. A decontaminated plastic trowel was used to collect the sample material from the 0" to 4" below surface

interval. An equal amount of sample material was collected from each subsite. The sample material was placed in a 12" x 18" polyethylene bag and secured shut with tape. The sample bag was labeled with indelible ink and included the following information:

- Sample identification number
- Collection date
- Samplers initials

Sample material was homogenized by stirring and chopping in a stainless steel bowl. Sample splits were made of all samples collected after homogenization and given to either Tom McCarl or Ron Segura.

Chain of custody was maintained for all samples collected. Chain of custody forms are included in Appendix B.

4.2 Samples HCX-11 Thru HCX-16

Samples HCX-11 thru HCX-16 were collected from the northeastern third of the removal aea. This area covers 270' along channel axis and was divided into 2 zones. The south-western zone was 150' long (parallel to channel axis) and the northeastern zone was 120' long. Three composite samples were collected from each zone.

One composite sample from each zone was collected along the centerline of the channel and consisted of 5 subsamples evenly spaced from one end of the zone to the other end.

A 15-point composite sample was collected from each of the two channel bank areas per zone. Subsite locations were determined by the following procedure:

A line, perpendicular to channel axis, was established at each of the channel bottom subsite locations using a compass. The area along these lines outside the channel gravels to the limit of the removal area, was divided into 4 equal parts (this distance varied at each location). Each of the 3 interior diversion points were the subsite locations.

At each subsite loose material was scraped away until undisturbed ground was exposed. The sample material was collected using a decontaminated plastic trowel from the 0" to 4" below surface interval.

An equal amount of sample material was collected from each subsite. The sample material was placed in a 8" x 12" polyethylene bag and labeled including the following information:

- Sample I.D. Number
- Collection date
- Sampler's initials

The samples were homogenized by stirring and chopping in a stainless steel bowl. After homogenization, samples were split. Splits of all samples were given to Tom McCarl (Bureau of Reclamation).

Chain of custody was maintained for all samples collected. Chain of custody forms are included in Appendix B.

5.0 DECONTAMINATION PROCEDURES

Plastic trowels and stainless steel bowls used in the collection process were decontaminated prior to use by the following procedure:

- Brush gross contaminants off with nylon bristled scrub brush;
- Wash in alconox soap and tap water;
- Triple rinse in tap water;
- Triple rinse in deionized water;
- Dry with paper towel;
- Place in polyethylene bags and seal

6.0 ANALYTICAL RESULTS

All samples were analyzed for lead and arsenic concentrations. Samples were analyzed at American West Analytical Laboratory in Salt Lake City. One QA/QC sample (split sample) was collected and analyzed at Ford Analytical Laboratory also located in Salt Lake City. Laboratory analytical sheets are included in Appendix B. The results of analysis are listed in Table 1.

7.0 DOCUMENTATION

Documentation procedures included the following:

- Field notes (Appendix A)
- Chain of Custody Forms (Appendix B)
- Photographs (Appendix C)
- Labeling of sample containers

TABLE 1:
ANALYTICAL RESULTS

TABLE 1. ANALYTICAL RESULTS OF POST REMOVAL SAMPLES BINGHAM CREEK ON HOLY CROSS JORDAN VALLEY HOSPITAL PROPERTY

SAMPLE I.D. NUMBER	ANALYTICAL RESULTS (PPM)		QA/QC PPM	
	LEAD	ARSENIC	LEAD	ARSENIC
HCX-1	580	< 50	709	13
HCX-2	1,600	< 50		
HCX-9	500	< 50		
HCX-10	440	< 50		
HCX-11	2,000	110		
HCX-12	300	20		
HCX-13	250	15		
HCX-14	1,600	140		
HCX-15	300	17		
HCX-16	210	15		

APPENDIX A:
FIELD NOTES

CONTENTS

PAGE NO.	REFERENCE	DATE

July 2, 1992 Inc. Elkin Larry Elkin (1)

Post Removal Sampling at Holy Cross Jordan Valley Hospital

Holy Cross Jordan Valley Hospital is located at 9000 South and west. Bingham Creek is located on the southern portion of Hospital property and trends SW-NE through the property for approximately 1100'.

Mine Tailings have been deposited in the Bingham Creek channel on Hospital property. The tailings will be removed and post removal samples will be collected in order to characterize and document the soil to be disposed of after removal.

Removal operations began on June 1, 1992 at the SW end of Bingham Creek. Kennecott is carrying out the removal operation. Glenbs Construction has been contracted the perf by Kennecott to perform

the removal operation. Tailings will be hauled from the hospital and placed on a repository on Kennecott property approx ½ mile South of Copperton, Utah (Bluewater I Repository).

On site personnel:

- Project Manager Richele Golightly (Kennecott)
- Samplers: Larry Elkin (North American Explor.)
  Edward Grafton (Contracted by Kennecott)
- Glenn Comstock (Contracted by Kennecott)
- Tom McCash (Bureau of Reclamation) representing EPA and overseeing removal operation.

July 2, 1992
Began removal at 7:00 AM Partly cloudy
Cool Ground is damp from yesterdays rain.

11:30 AM Took 2 photos at excavation looking SW. Culvert at SW end of Hospital Bingham Creek on hospital property. 900' South beyond embankment. Roll A - #1, #2. Tailings and natural ground visible in photos. Tailings yellow brown clay sand dipping towards culvert. Iron stained gravel below tailings.

Left site at 11:30 AM

JULY 10, 1992 Friday
LARRY ELKIN Larry Elkin

Post Removal Sampling
Bingham Creek at Holy Cross
Jordan Valley Hospital

- Purpose: To characterize (Pb and As concentrations) and document (by sampling and analysis) soils after removal of tailings from Bingham Creek.

- Samplers: Larry Elkin, ~~xxxxx~~ North American Exploration, representing Kennecott.

- On site personnel:

At the present time the first 150' of Bingham Creek has been removed of tailings. The first post removal sample will be collected. This sample will be assigned the identification number HCX-1. The sample will be collected by procedures described in the SAP, as written below.

Sampling Procedure

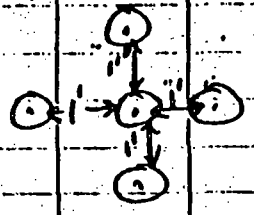
One, 5-point composite sample will be collected from the removal area of the first 150' of Bingham Creek, (Starting point at NE end of culvert under 9000 South) on Hospital property.

Five sample sites will be located by generating random

numbers representing locations

A random numbers chart, acquired from Ron Segura, Bureau of Reclamation, will be used.

Any point later generated by numbers chart falling outside the removal area will be skipped and the following point from the chart used until 5 locations within the removal area have been located. At each of the 5 sample subsites sample material will be collected and composited to form one sample. At each sample subsite material will be collected from 5 points located in the following configuration:



⊙ 1 aliquot

5 aliquots = one subsite

5 subsites = one sample

Sample material will be collected from the 0" to 4" below surface interval.

Before sample material is collected loose material from surface will be scraped away until undisturbed sample material representative of that point is exposed.

Sample material will be collected from using a decontaminated plastic trowel. An equal amount of sample material will be collected from each sample point. The sample material will be placed in a styrofoam cup (measuring cup) and then poured into one 12"x18" bag. When all the sample material

for a composite is collected the sample will be transferred to a decontaminated plastic stainless steel bowl and composited by mixing/chopping etc. until homogenization is achieved. The sample material will then be spooned (using trowel) in 3 separate bags. Each bag will be labeled the same (as follows)

HCX-1
7-10-91
L.E
SPLIT

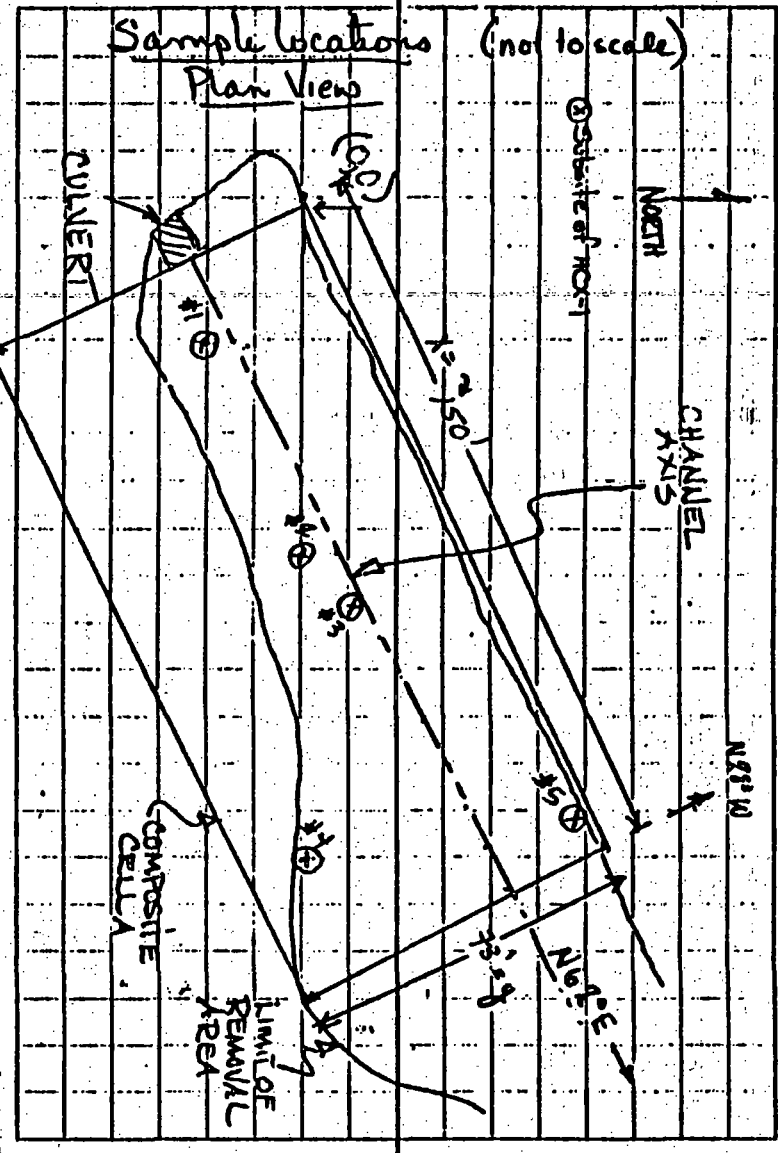
One of the splits will be given to Tom McCall (Bureau of Reclamation). One of the splits will be delivered to American West Laboratory in SLC and analyzed for Pb and As. concentrations. The remaining

split will be delivered to Fast Analytical Laboratory in SLC as a QA/QC sample (analyzed for lead and arsenic).

Sample subsite locations were determined by the following generation of random numbers representing footage along x, y axis. The origin (0,0) was arbitrarily chosen to be the NW corner of the composite cell. The composite cell will be 150' long (y) and 73' wide (x). Seventy three feet is the widest distance of the removal area for the 150' length of stream channel.

0.45x = 32.85'	0.15y = 20.50'
0.55x = 40.15'	0.46y = 67.50'
0.35x = 25.55'	0.55y = 82.5'
0.85x = 62.05'	0.85y = 127.5'
0.05x = 3.65'	0.95y = 142.5'

Subsite locations were located in the field using sunto compass and measuring tape. Tom McCarl assisted in location of points



(12)

~~Evans Branch~~ Hood Swale
July 10, 1992 L. Elkin

Sample descriptions

HCX-1

Subsite #1. Poorly sorted, sandy gravels. Large cobbles to silt. Predominately sand and pebbles. orange brown color and medium brown color. In bottom center of channel

Subsite #2 mixture of dark to medium brown and yellow brown silty sand. Poor sorted. Yellow brown may be lacustrine sediments Site located on south bank of excavation

Subsite #3 located in bottom center of channel Sandy gravel medium brown, cobbles to silt, predom. sand and small pebbles.

July 10, 1992
L. Elkin

(13)

Subsite #4 South side of channel Collected from well sorted sand. Light brown, orange and gray mottled color.

Subsite #5 located near top of removal boundary on north side of creek. Medium brown fair sorted, sandy, clayey, silt

(14) July 10, 1992 L. Elkin

Sample HCK-1 was collected from ≈ 8:30AM -> 9:45AM.

Samples splits were delivered to Ford Analytical Laboratory and American Wet Laboratory on July 10, 1992 AM.

A sample split was given to Tom McCarl at 9:40AM

Photographs were taken of sample HCK-1 area.

Chain of Custody Forms were completed for all samples.

(15)

(14) July 10, 1992 L. Elkin

Sample HCX-1 was collected from ≈ 8:30AM → 9:45AM.

Samples splits were delivered to Ford Analytical Laboratory and American West Laboratory on July 10, 1992 AM.

A sample split was given to Tom McCarl at 9:40AM

Photographs were taken of sample HCX-1 area.

Chain of Custody Forms were completed for all samples.

July 14, 1992 LARRY ELKIN (15)

Continuation of Post Removal Sampling at Holy Cross Jordan Valley Hospital

11:00AM
on site Personnel

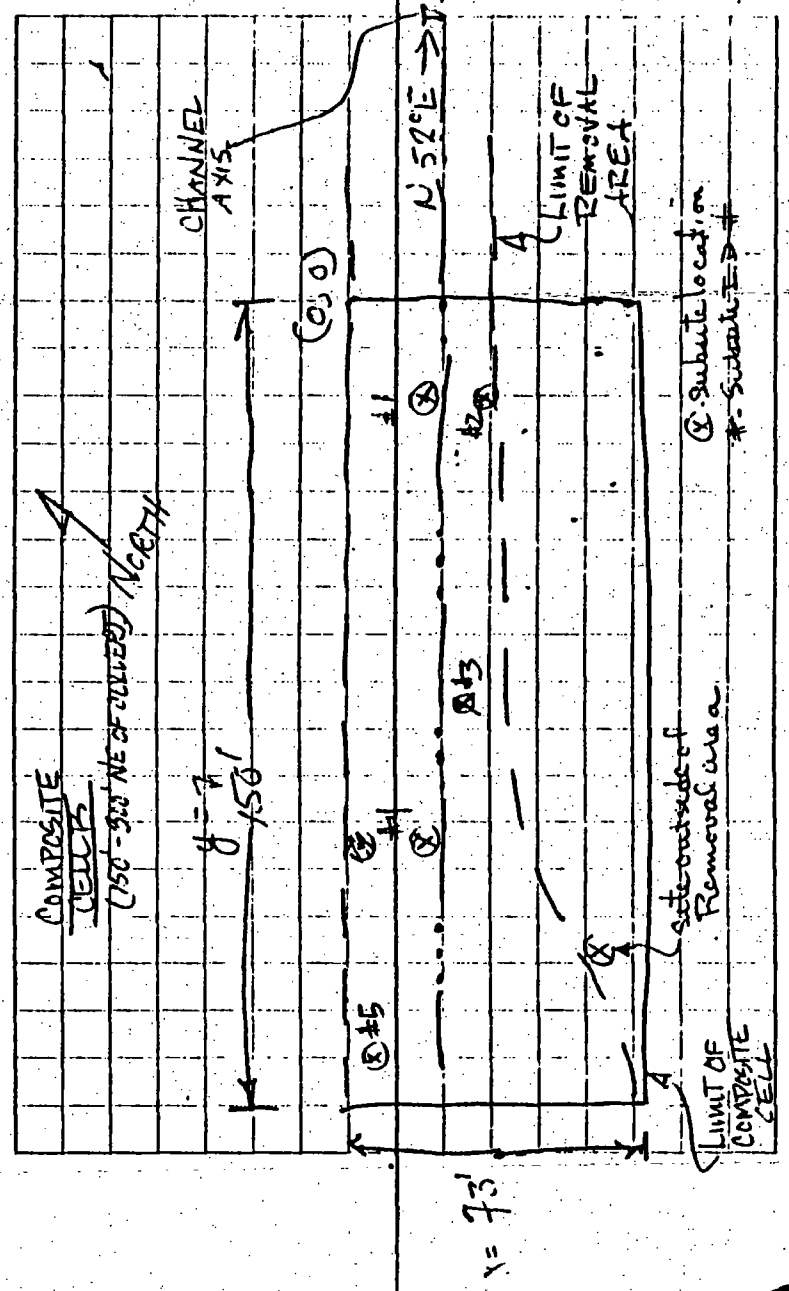
Tom McCarl Bureau of Reclamation
Keith Smith Chevron/Kennecott
Larry Elkin North Am. Exploration/Kennecott

- Composite Cell B. (Adjacent to A) in downstream direction
- Composite Cell B is 73' wide (across drainage) and 150' long.
- This morning an irrigation ditch immediately South of Hospital property on the south side of 9000 South breached its banks and flowed west into Bingham Creek, water

then flowed downstream on Bingham Creek (under 9000 So.) and onto the removal area on Hospital property. The water pooled on the downstream end of the removal area, on at the time of sampling the bottom of the removal area was wet and a small pond approx. 2' deep and 40' long existed at the downstream end. Water from the irrigation ditch was no longer flowing at sampling time.

Sample subsets were randomly generated (as previously described pg 10 of the logbook). The (c, c) coordinate point was the north corner of the composite cell (clockwise from previous cell (1)).

0.45x = 32.85	0.15y = 22.50	outside removal area. skipped to extra sample points
0.55x = 40.15	0.45y = 67.50	
~~0.35x = 25.55~~	0.55y = 82.50	
0.85x = 62.05	0.85y = 127.5	
0.05x = 3.65	0.95y = 142.5	
0.15x = 11.15	0.15y = 22.50	



Sample descriptions HCX-2

Subsite #1 Center of channel bottom med. brown Sandy gravel, small cobbles to silt. Larger clasts qtzite and sandstone. Minor silt and clay.

Subsite #2 HCX-2, on south bank near top of removal area. - Med. brown to light brown fair sorted clayey silt. Organics

Subsite #3 HCX-2 collected from channel bottom. Med brown, and orange brown sandy gravel. Cobble to sand predom. qtzite pebbles. Minor silt and clay.

Subsite #4 HCX-2 collected from channel bottom (on north side) gravelly sand. Dog Orange Brown

Subsite #4 HCX-2 (continued) and med. brown. Predom. sand and small pebbles.

Subsite #5 HCX-2 north side, near top edge of removal area. Med to dark brown fair to well sorted clayey silt. Organics

---

Sample material was homogenized as previously described and a split was given to Tom McCarl (Bureau of Reclamation)

All sampling procedures were identical to those described earlier (See pages 5-10 of this log book)

The samples were delivered to American West Laboratory in Salt Lake City at approx 1200 PM

(20)

7-14-97 L. Elkin

Sample HCX-2 will be analyzed for Lead and Arsenic concentrations.

(21)

(28)

July 17, 1992 LARRY ELKIN

Larry Elkin

Continuation of post-Removal Sampling of Bingham Creek at Holy Cross Jordan Valley Hospital

On site Personnel
Rochelle Goldsby (Kennecott)
Keith Smith (Envirocon)
Ron Segura (Bureau of Reel./EPA)

Sampling procedures will be the same as previously described with minor variation on the randomly generated sample subsites.

By Ron Segura suggestion some sampling points generated by random numbers were rejected or modified in order to collect a "representative" sample. For example, if two points randomly generated fell in similar parts of composite cell,

7-17-92
L. Elkin

(29)

the second point was rejected or modified to ensure the subsites were from the entire cell.

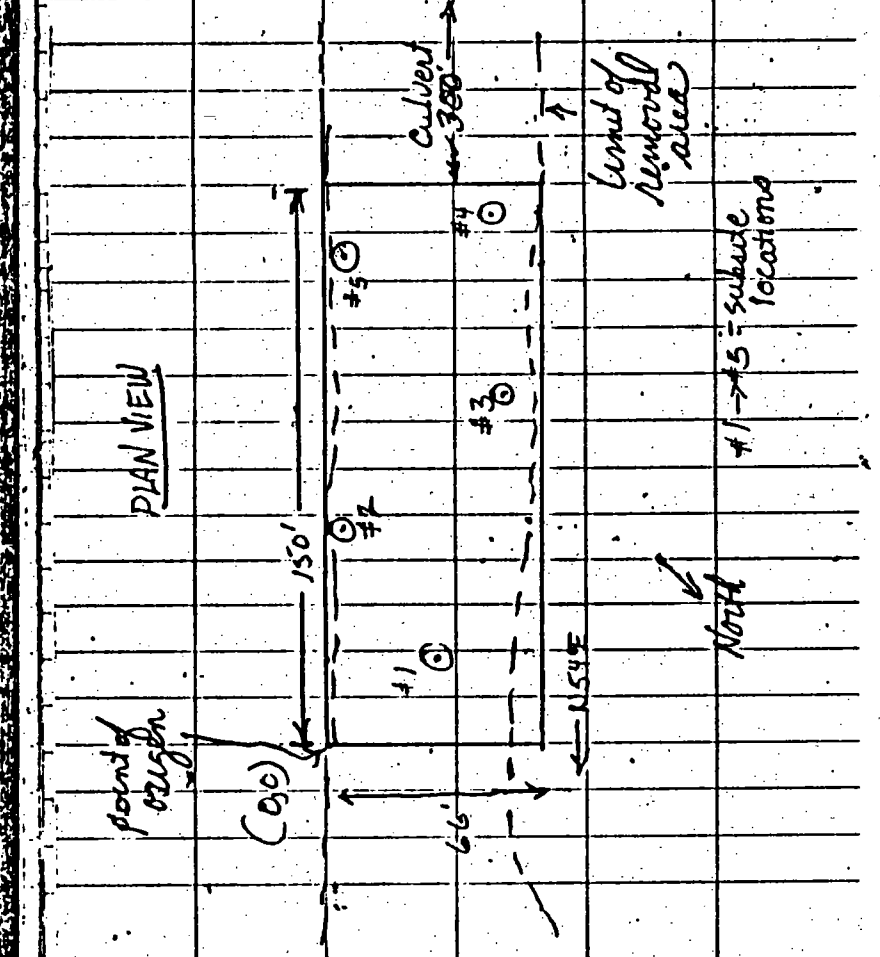
All other sampling procedures were as described previously in this field book.

~~So~~ Random numbers. Composite Cell C

Sample 116X-9 (5 point composite)

	X=66 Y=150'
0.45X = 29.7'	0.15y = 22.5'
0.85X = 56.1'	0.85y = 127.5'
0.20X = 13.2'	0.95y = 142.5'
0.70X = 46.2'	0.65y = ~~22.5~~ 97.5'
0.20X = 13.2'	0.40y = 60'

Sample HCX-7. Composite Cell C 66' wide x 150' long. 3rd Composite cell from culvert at SW end of property line



Sample Descriptions

HCX-7

Subsite #1. Gravelly sand small cobbles and pebbles comprise ± 35% matrix is predom sand & minor silt. med to light brown. Center bottom of channel

Subsite #2 near upper bank on south side. Clay silt. Dark to med brown. Organics

Subsite #3. Near channel bottom on north bank. Mostly dark brown to med. brown clayey silt. Minor sand.

Subsite #4 Halfway up bank on north side. Med to light brown clayey silt. Fair sorted.

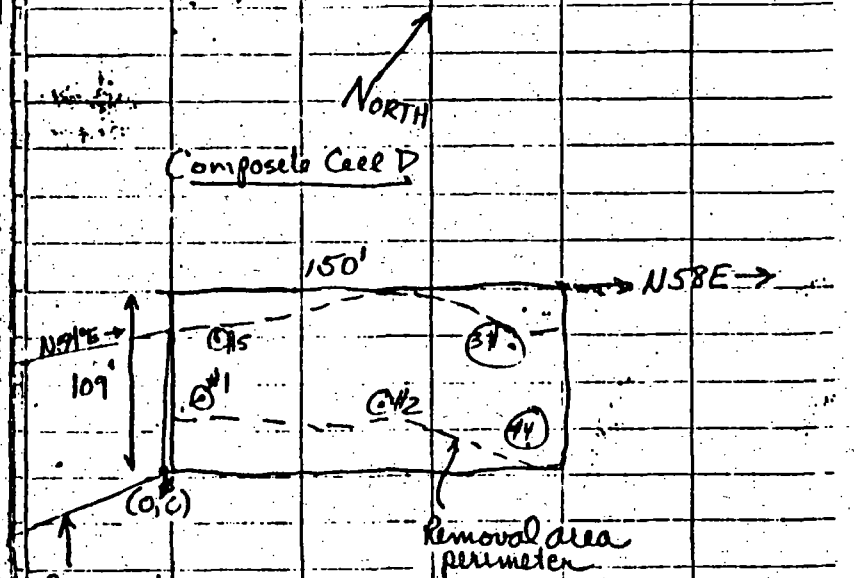
Subsite #5 near upper south bank. Fair to well sorted med brown clayey silt.

(32)

7-17-92

L Elkin

Sample HCX-10 (5-point composite)



Subsite	#1	0.45x = 49.05	0.15y = 22.5
"	#2	0.35x = 38.15	0.55y = 82.5
"	#3	0.70x = 76.3	0.85y = 127.5
"	#4	0.10x = 10.9	0.95y = 142.5
"	#5	0.75x = 76.3	0.15y = 22.5

7-17-92 L. Elkin (33)

Sample descriptions

HCX-10

Subsite #1, gravelly sand. Collected from bottom. Small cobbles and pebbles comprise ≤ 35%. In silty sand matrix, med brown to orange brown

Subsite #5 north bank 5' from top of removal area. med brown fair to well sorted clayey silt. Organics

Subsite #2 south side bottom, silty clay mottle orange brown to dark brown mod Fe-ox.

Subsite #4 south side upper bank well sorted sand, light brown.

Subsite #3. north bank, middle. med orange brown fair to well sorted silty clay

(34) 7-17-92 L. Elkin

Samples HCK-9 and HCK-10 were each homogenized by stirring in a stainless steel bowl. A split was made from each sample and delivered to Ron Segura's trailer (~8600 S. 3460 West), and

the other splits were delivered to American West Analytical Laboratory in S.L.C. at ~ 12:45 PM.

The samples will be analyzed for Pb and As concentrations

(35)

(36) 7-21-92 LARRY ELKIN

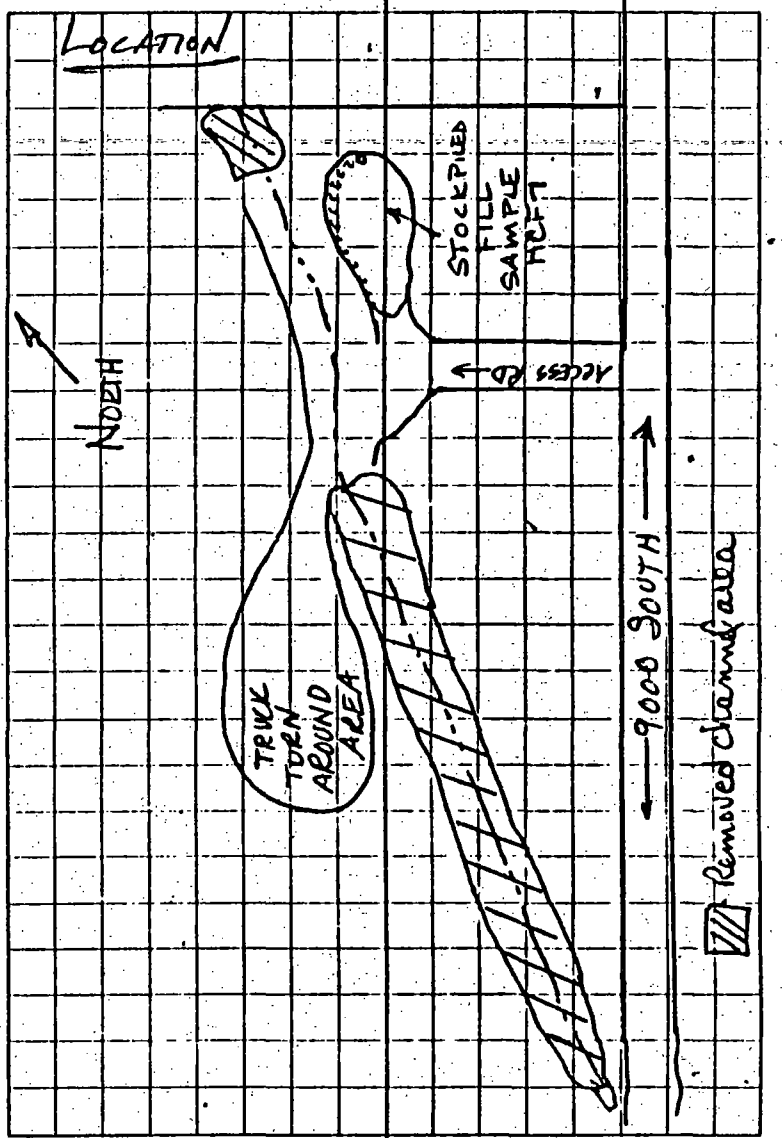
Continuation of Post-Removal Sampling of Bingham Creek at Holy Cross Jordan Valley Hospital

Removal operations are continuing. A stockpile of fill material is being placed near the NE end of Bingham Creek on Hosp Property (on south side of Creek)

A Sample of the stockpiled material will be collected and analyzed for Pb and arsenic concentrations.

Stockpiled fill material sample will be assigned the I.D.# HCF-1.

7-21-92 L. Elkin (37)



Sample Procedure

Stockpile is approx. 120' long and 40' wide. Sample was collected by sampling top 2", .5' up from bottom of pile, along NW side of pile. All 30 subsites were composited to form one sample. Sample was homogenized by shaking sample bag. Sample was then split. Bags were taped shut and labeled with the following information:

- I.D. #
- Collection date
- Samplers initials

(split sample also include "split")

Sample Description

Stockpiled appears fairly homogenous that being a

gravelly sand. Cobbles and pebbles comprise ≈ 35%. Matrix is predom. sand with minor silt. Light brown color. Largest clasts quartzite and sandstones.

- photos were taken of site

(40) 7-30-92 LARRY ELKIN
STEVE SCHNOOR

Continuation of Post-Removal Sampling at Bingham Creek on Holy Cross Jordan Valley Hospital.

On site personnal: Larry Elkin, (WAE) Steve Schnoor, (WAE) Tom McCall (Bureau of Rec.)

Samples HCX-11 → HCX-16

By suggestion of the EPA a different sampling plan will be used to sample the remaining removal area.

The sampling procedure for samples HCX-11 thru HCX-16 will be as follows:

The remainder of the sample area will be divided into 2 zones. Three samples will be collected from each zone. From each zone 2-types

7-30-92
L.E/S.S.

composite
of 15 samples will be collected.

One composite will be collected along the centerline of the channel consisting of five subsamples evenly spaced between opposite ends of the zone.

The other composite type (for both channel bank areas) will consist of 15 subsamples systematically placed on the banks. Subsample locations for bank samples will be determined by the following procedure:

Sandy 202
Brunton N39°E

(41)

At each of the channel axis subreaches the area outside the channel gravels to the limit of the removal area will be measured and divided into 4 equal parts. The

three interior points will be the subsample location. As the distance of the removal age varies at a sample area the points will be vary in order to symmetrically cover the sample area.

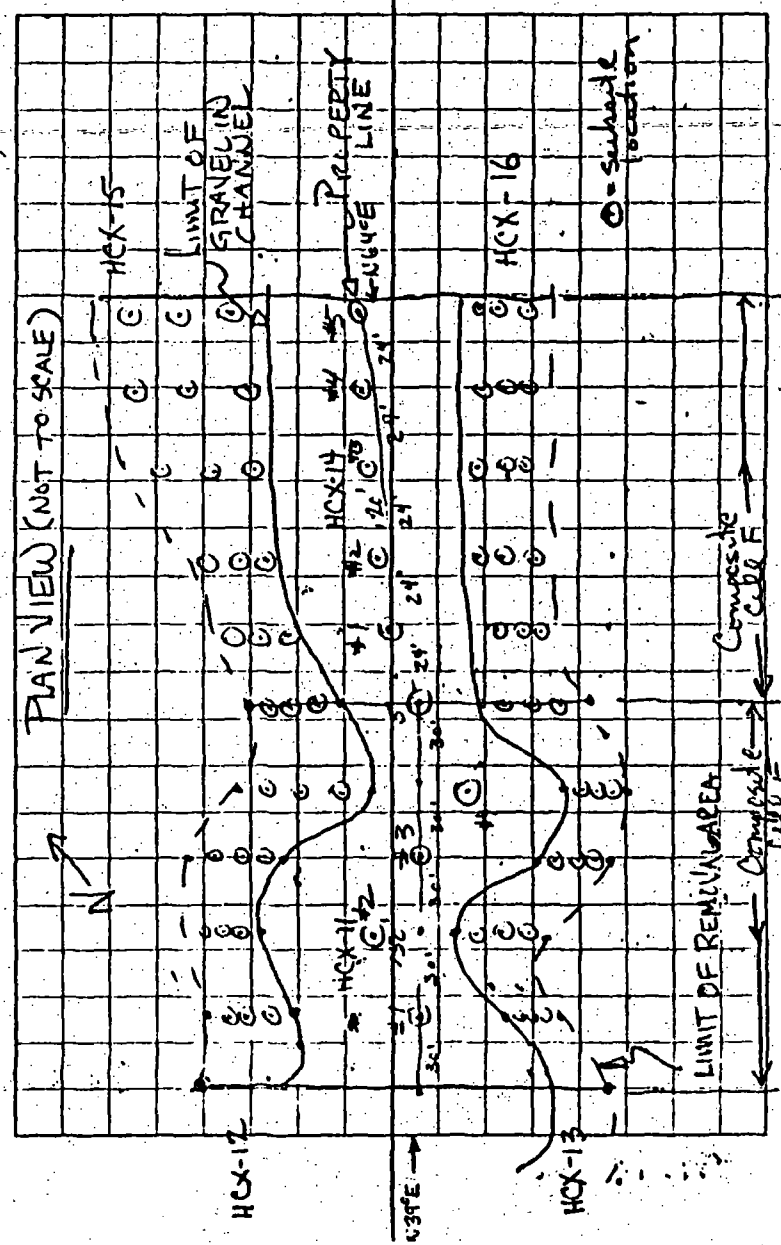
Each channel bank sample will consist of 15 subsamples.

The western-most zone will contain 3 samples. (this zone is 150' long)

Samples HCX-11 (Channel bottom)
HCX-12 (NW Bank)
HCX-13 (SE Bank)

The eastern-most sample zone (adjacent to property boundary) is 120' long and contains samples HCX-14 (Channel bottom)
HCX-15 (NW Channel bank)
HCX-16 (SE Channel bank)

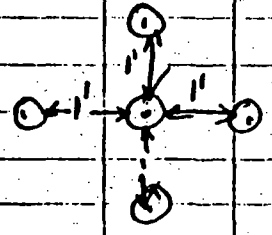
See diagram Pg 43 →



(44) 7-30-92 L. Elkin
S. Schnoor

A discreet sample will be collected from the channel bank samples.

At each of the 5 subsites of the channel bottom samples sample material will be collected ~~from~~ as diagramed below:



Approx. 4oz of sample material will be collected from all subsites (a plastic cup was used to measure sample amount)

A decontaminated plastic trowel was used to collect the sample material.

7-30-92 L. Elkin
S. Schnoor (45)

Sample Descriptions

5 rows of 3 sites each

HCX-13 15 subsites

Soil composition appears homogeneous - grayish sandy/silty clay

Lt. yellowish - red brown color. Note: all bottom samples were darker orange and sandier than samples toward top of row.

HCX-12

Row 1 bottom sandy/silty clay med orange - Brown - Loi - very sorted darker lacustrine sed at top.

Row 2

bottom sandy - orange color at base of Lo. Strap. Bank dark brown silty clay.

(46) 7-30-92 L. Elkin S. Schnoor

Samples were homogenized by chopping and stirring the sample in a mixing bowl with a plastic trowel.

After homogenization was completed - Sample was split. A split was given to Tom. McCall (Bureau of Rec.)

Sample bags were labeled with the sample ID #, Samplers initials, and collection date.

Samples were sealed shut using fiberglass tape.

Chain of Custody forms were completed for all samples.

Photographs were taken of the site.

7-30-92 L. Elkin S. Schnoor (47)

Sample Descriptions (Cont)

HCX-12 Row 3
Bottom sandy clay orange in color
Top brown silty clay
Well sorted

Row 4 Same as 3

Row 5 Bottom sandy clay - orange as you go up back color becomes darker more Brown + less sand
Row 5 sandier than 1-4

HCX-11 20 subsites 4 sides per
Lt - moderate orange gravelly sand

Sample Descriptions (continued)

HCX-16 Southeast side of creek on bank. Subsite closest to channel silty sand, light brown, orange brown Subsite farther to SE up on bank dark brown silty clay

HCX-15. Northwest side of creek on bank. Most sites dark to med brown silty clay. Two subsite (easternmost and western most) closest to creek bottom silty sand.

HCX-14 Channel bottom Sandy gravels, light brown and light orange brown. Appear to be natural alluvium Several subsites were en well sorted sand (bars)

Samples HCX-11 thru HCX-16 were delivered to American West Analytical Lab in S.L.C. on 7-30-92 PM. by Steve Schnoor. Samples will be analyzed for Pb and As concentrations.

APPENDIX B:
CHAIN OF CUSTODY FORMS
LAB ANALYTICAL SHEETS

PAGE 03

FORD ANALYTICAL LAB

07/13/1992 15:52 8014668763

KENNECOTT UTAH COPPER CORPORATION - CHAIN OF CUSTODY RECORD

PROJECT NAME: KENNECOTT PLANT PROJECTS GROUP

PROJECT NO:

SAMPLERS: (SIGNATURE) Larry Elkin

SAMPLE I.D. NO.	DATE COLLECTED	SAMPLE TYPE: COMP	GRAB	AIR	WATER	OTHER (SPECIFY)	NO. OF CONT. AMERS	ANALYSIS REQUIRED: Pb	As					REMARKS
HCX-1	7-10-92	✓					1	✓	✓					TOTAL METALS (Not Rush Analyses)

RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED FOR LABORATORY BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
Larry Elkin	7-10-92	AM 10:22	S Peterson				

REMARKS: FAX RESULTS TO: ASIM MUKHERJEE

SPLIT SAMPLES: ☐ ACCEPTED ☐ DECLIN

SIGNATURE

KENNECOTT UTAH COPPER CORPORATION - CHAIN OF CUSTODY RECORD

LAB # 782

PROJECT NAME: KENNECOTT PLANT PROJECTS GROUP	PROJECT NO:	SAMPLERS: (SIGNATURE) Larry Elkin

SAMPLE I.D. NO.	DATE COLLECTED	SAMPLE TYPE: COMP	GRAB	AIR	WATER	OTHER SPECIFY	NO. OF CONTAINERS	ANALYSIS REQUIRED: Pb	As						REMARKS
HCX-1	7-10-92	✓					1	✓	✓						
															TOTAL METALS

RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) Larry Elkin	DATE: 7-10-92	TIME: AM 10:17	RECEIVED FOR LABORATORY BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)

REMARKS: FAX RESULTS TO: KENNECOTT PLANT PROJECTS GROUP
ASIM MUHKERJEE

SPLIT SAMPLES

☐ ACCEPTED ☐ DECLINED

SIGNATURE

KEN● TT UTAH COPPER CORPORATION - CHAIN OF C● JDY RECORD Lab# 16820 ●

PROJECT NAME: KENNECOTT PLANT PROJECTS GROUP	PROJECT NO:	SAMPLERS: (SIGNATURE) Larry Eckin

SAMPLE I.D. NO.	DATE COLLECTED	SAMPLE TYPE: COMP	GRAB	AIR	WATER	OTHER SPECIFY	NO. OF CONTAINERS	ANALYSIS REQUIRED: Pb	As						REMARKS
HCX-2	7-14-92	✓						✓	✓						REQUEST 24 HOUR RUSH ANALYSIS

RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) Larry Eckin	DATE: 7-14-92	TIME: 12:25 PM	RECEIVED FOR LABORATORY BY: (Signature) [illegible]	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)

REMARKS: FAX RESULTS TO ASIM MUKHERJEE

SPLIT SAMPLES

☒ ACCEPTED ☐ DECLINED

[illegible]
SIGNATURE

KENNECOTT UTAH COPPER CORPORATION - CHAIN OF CUSTODY RECORD

L402 4-10880

PROJECT NAME: KENNECOTT PLANT PROJECTS GROUP	PROJECT NO:	SAMPLERS: (SIGNATURE) Larry Elkin

SAMPLE I.D. NO.	DATE COLLECTED	SAMPLE TYPE: COMP	GRAB	AIR	WATER	OTHER SPECIFY	NO. OF CONTAINERS	ANALYSIS REQUIRED: Pb	As						REMARKS
HCX-9	7-17-92	✓					1	✓	✓						
HCX-10	7-17-92	✓					1	✓	✓						REQUEST ANALYSIS BY MONDAY JULY 20, 1992

RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) Larry Elkin	DATE: 7/17/92	TIME: 1255	RECEIVED FOR LABORATORY BY: (Signature)	RELINQUISHED BY: (Signature)	DATE: 7/	TIME:	RECEIVED BY: (Signature)

REMARKS: FAX RESULTS TO: ASIM MUHKERJEE

SPLIT SAMPLES

☐ ACCEPTED ☐ DECLINED

SIGNATURE

KENNECOTT UTAH COPPER CORPORATION - CHAIN OF CUSTODY RECORD

LAB # 11008

PROJECT NAME: KENNECOTT PLANT PROJECTS GROUP

PROJECT NO:

SAMPLERS: (SIGNATURE) Larry Elkin, Steve Shroeder

SAMPLE I.D. NO.	DATE COLLECTED	SAMPLE TYPE: COMP	GRAB	AIR	WATER	OTHER SPECIFY	NO. OF CONTAINERS	ANALYSIS REQUIRED: Pb	As						REMARKS
HCX-11	7-30-92	✓					1	✓	✓						
HCX-12	7-30-92	✓					1	✓	✓						REQUEST 24 HR ANALYSIS
HCX-13	7-30-92	✓					1	✓	✓						
HCX-14	7-30-92	✓					1	✓	✓						
HCX-15	7-30-92	✓					1	✓	✓						
HCX-16	7-30-92	✓					1	✓	✓						

RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) Steve Shroeder	DATE: 7/30/92	TIME: 1440	RECEIVED FOR LABORATORY BY: (Signature) Edna Hunt	RELINQUISHED BY: (Signature)	DATE:	TIME:	RECEIVED BY: (Signature)

REMARKS: FAX RESULTS TO: ASIM MUHKERJEE

SPLIT SAMPLES

☒ ACCEPTED ☐ DECLINED

Bill Wall
SIGNATURE

FORD ANALYTICAL LABORATORIES

CHEMICAL AND BACTERIOLOGICAL ANALYSIS

DATE: 07/10/92
CERTIFICATE OF ANALYSIS

KENNECOTT PLANT PROJ
GROUP,%B. VAN DYKEN
P.O. BOX 112
BINGHAM CYN,UT 84006

92-025633

SAMPLE: SOIL SAMPLE HCX-1 COLLECTED 7-10-92 BY LARRY ELKIN
RECEIVED 7-10-92 FOR ANALYSIS STARTING AT 10:40 A.M.

	RESULTS	DETECTION LIMIT
Arsenic As ppm EPA 6010	12.980	.053
Lead Pb ppm EPA 6010	708.978	.042

* ND Indicates Not Detected *

FORD ANALYTICAL LABORATORIES

All reports are submitted as the confidential property of clients. Authorization for publication of our reports, conclusions, or extracts from or regarding them is reserved pending our written approval as a mutual protection to clients, the public and ourselves.

40 West Louise Avenue • Salt Lake City, Utah 84115 • PHONE (801) 466-8761 • FAX (801) 466-8763

INORGANIC ANALYSIS REPORT

Client: Kennecott-Bart Van Dyken
Date Received: July 10, 1992
Time Received: 10:17 a.m.
Lab Sample ID Number: 10782-01
Field Sample ID: Plant Projects Group/HCX-1

Contact: Asim Mukherjee
Received By: Elona Hayward

Analytical Results	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
TOTAL METALS			
Arsenic	6010	50.0	<50.0
Lead	6010	3.0	580.

Released by: _____
Laboratory Supervisor

Report Date 7/13/92

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

INORGANIC ANALYSIS REPORT

Client: Kennecott-Bart Van Dyken
Date Received: July 14, 1992
Time Received: 12:25 p.m.
Lab Sample ID Number: 10820-01
Field Sample ID: Plant Projects Group/HCX-2

Contact: Asim Mukherjee
Received By: Jennifer Habel

Analytical Results

	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
TOTAL METALS			
Arsenic	6010	50.0	<50.0
Lead	6010	3.0	1,600.

Released by: _____
Laboratory Supervisor

Report Date 7/15/92

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ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

INORGANIC ANALYSIS REPORT

Client: Kennecott-Bart Van Dyken
Date Received: July 17, 1992
Time Received: 12:55 p.m.
Lab Sample ID Number: 10880-01
Field Sample ID: Plant Projects Group/HCX-9

Contact: Asim Mukherjee
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	6010	50.0	<50.0
Lead	6010	3.0	500.

Released by: _____
Laboratory Supervisor

Report Date 7/20/92

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LABORATORIES

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Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

INORGANIC ANALYSIS REPORT

Client: Kennecott-Bart Van Dyken
Date Received: July 17, 1992
Time Received: 12:55 p.m.
Lab Sample ID Number: 10880-02
Field Sample ID: Plant Projects Group/HCX-10

Contact: Asim Mukherjee
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	6010	50.0	<50.0
Lead	6010	3.0	440.

Released by: _____
Laboratory Supervisor

Report Date 7/20/92

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INORGANIC ANALYSIS REPORT

Client: Kennecott-Bart Van Dyken
Date Received: July 30, 1992
Time Received: 1:44 p.m.
Lab Sample ID Number: 10931-01
Field Sample ID: Plant Projects Group/HCX-11

Contact: Asim Mukherjee
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	6010	50.	**110.**
Lead	6010	3.0	**2,000.**

Released by: _____
Laboratory Supervisor

Report Date 7/31/92

INORGANIC ANALYSIS REPORT

Client: Kennecott-Bart Van Dyken
Date Received: July 30, 1992
Time Received: 1:44 p.m.
Lab Sample ID Number: 10931-02
Field Sample ID: Plant Projects Group/HCX-12

Contact: Asim Mukherjee
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	6010	50.	<50.
Arsenic	7060	0.5	20.
Lead	6010	3.0	300.

Released by: _____
Laboratory Supervisor

Report Date 7/31/92

INORGANIC ANALYSIS REPORT

Client: Kennecott-Barn Van Dyken
Date Received: July 30, 1992
Time Received: 1:44 p.m.
Lab Sample ID Number: 10931-03
Field Sample ID: Plant Projects Group/HCX-13

Contact: Asim Mukherjee
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	6010	50.	<50.
Arsenic	7060	0.5	15.
Lead	6010	3.0	250.

Released by: _____
Laboratory Supervisor

Report Date 7/31/92

INORGANIC ANALYSIS REPORT

Client: Kennecott-Bart Van Dyken
Date Received: July 30, 1992
Time Received: 1:44 p.m.
Lab Sample ID Number: 10931-04
Field Sample ID: Plant Projects Group/HCX-14

Contact: Asim Mukherjee
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	6010	50.	**140.**
Lead	6010	3.0	**1,600.**

Released by: _____
Laboratory Supervisor

Report Date 7/31/92

INORGANIC ANALYSIS REPORT

Client: Kennecott-Bart Van Dyken
Date Received: July 30, 1992
Time Received: 1:44 p.m.
Lab Sample ID Number: 10931-05
Field Sample ID: Plant Projects Group/HCX-15

Contact: Asim Mukherjee
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	6010	50.	<50.
Arsenic	7060	0.5	17.
Lead	6010	3.0	300.

Released by: _____
Laboratory Supervisor

Report Date 7/31/92

INORGANIC ANALYSIS REPORT

Client: Kennecott-Barr Van Dyken
Date Received: July 30, 1992
Time Received: 1:44 p.m.
Lab Sample ID Number: 10931-06
Field Sample ID: Plant Projects Group/HCX-16

Contact: Asim Mukherjee
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	6010	50.	<50.
Arsenic	7060	0.5	15.
Lead	6010	3.0	210.

Released by: _____
Laboratory Supervisor

Report Date 7/31/92

APPENDIX C: PHOTOGRAPHS

7-14-92 LOOKING SW AT AREA OF SAMPLE HCX-2 (FOREGROUND) AND HCX-1 (BACKGROUND). PHOTO BY L. ELKIN

7-14-92 CLOSE UP OF SUBSITE #1, SAMPLE HCX-2. TYPICAL OF CHANNEL BOTTOM AFTER REMOVAL. PHOTO BY L. ELKIN

7-14-92. LOOKING NE AT POST TAILINGS REMOVAL AREA APPROX. 300' TO 550' NE OF CULVERT. (SAMPLE SITES HCX-9 AND HCX-10). PHOTO BY L. ELKIN

LOOKING SW AT BINGHAM CREEK REMOVAL AREA. PHOTO TAKEN FROM NE END OF COMPOSITE CELL D (SAMPLE HCX-10). CULVERT AT FAR END OF CHANNEL UNDERLIES 9000 S. 7-20-92. PHOTO BY L. ELKIN.

LOOKING NE AT AREA OF SAMPLES HCX-9
(FOREGROUND) AND HCX-10 (BACKGROUND).
7-20-92. PHOTO BY L. ELKIN.

LOOKING NE AT AREA OF SAMPLES HCX-10.
7-20-92. PHOTO BY L. ELKIN.

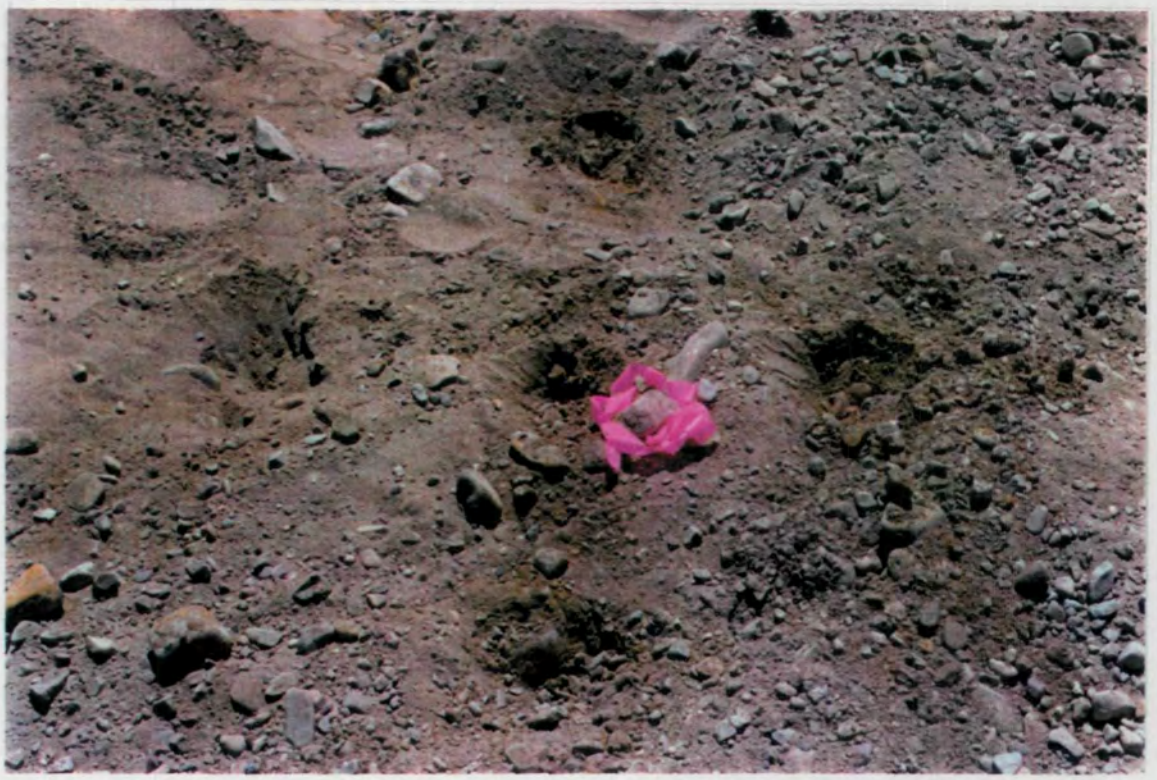
LOOKING NE AT STOCKPILED FILL MATERIAL
(SAMPLE HCF-1). 7-21-92 PHOTO BY L. ELKIN.

CLOSE-UP OF FILL MATERIAL. 7-21-92.
PHOTO BY L. ELKIN.

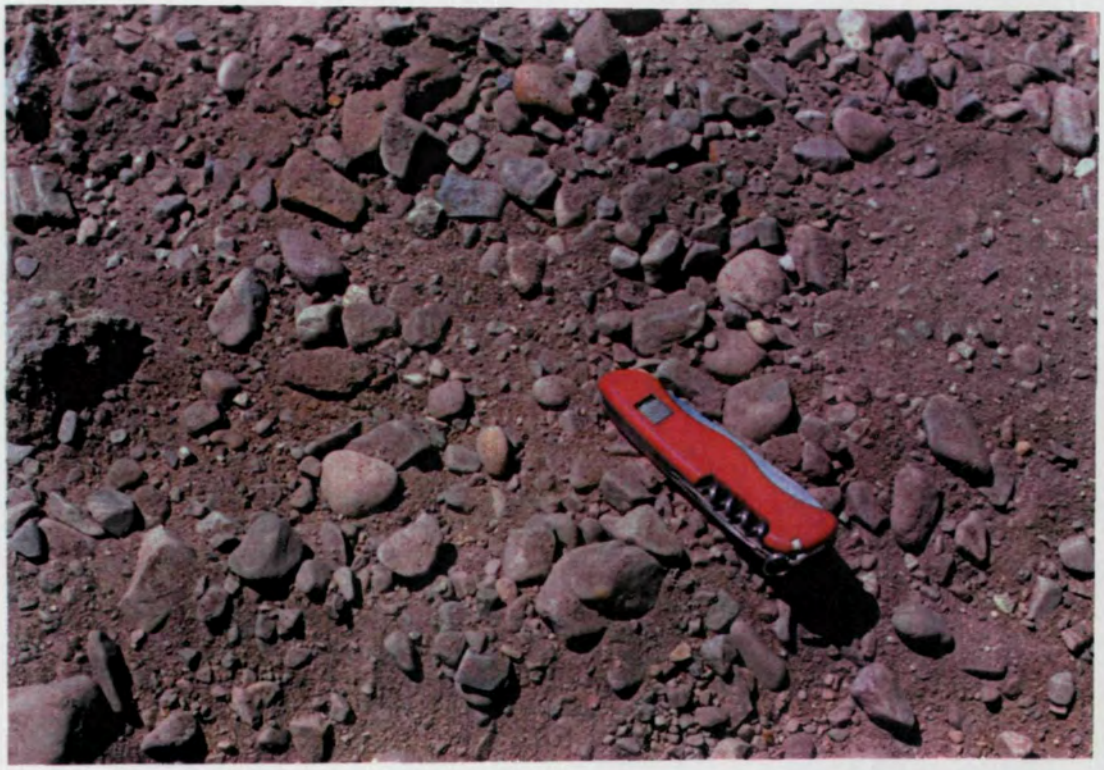
LOOKING NE AT AREA OF SAMPLES HCX-11 THRU HCX-16 DIVISION BETWEEN CHANNELS GRAVELS AND SAND, SILT, AND CLAY IN BANKS CLEARLY DEFINED. 7-30-92 PHOTO BY L. ELKIN

LOOKING NE AT AREA OF SAMPLES HCX-14 THRU HCX-16. 7-30-92. PHOTO BY L. ELKIN

LOOKING SW AT AREA OF SAMPLES HCX-11 THRU HCX-16. PHOTO TAKEN FROM EAST BOUNDARY OF HOSPITAL PROPERTY LINE. 7-30-92. PHOTO BY L. ELKIN

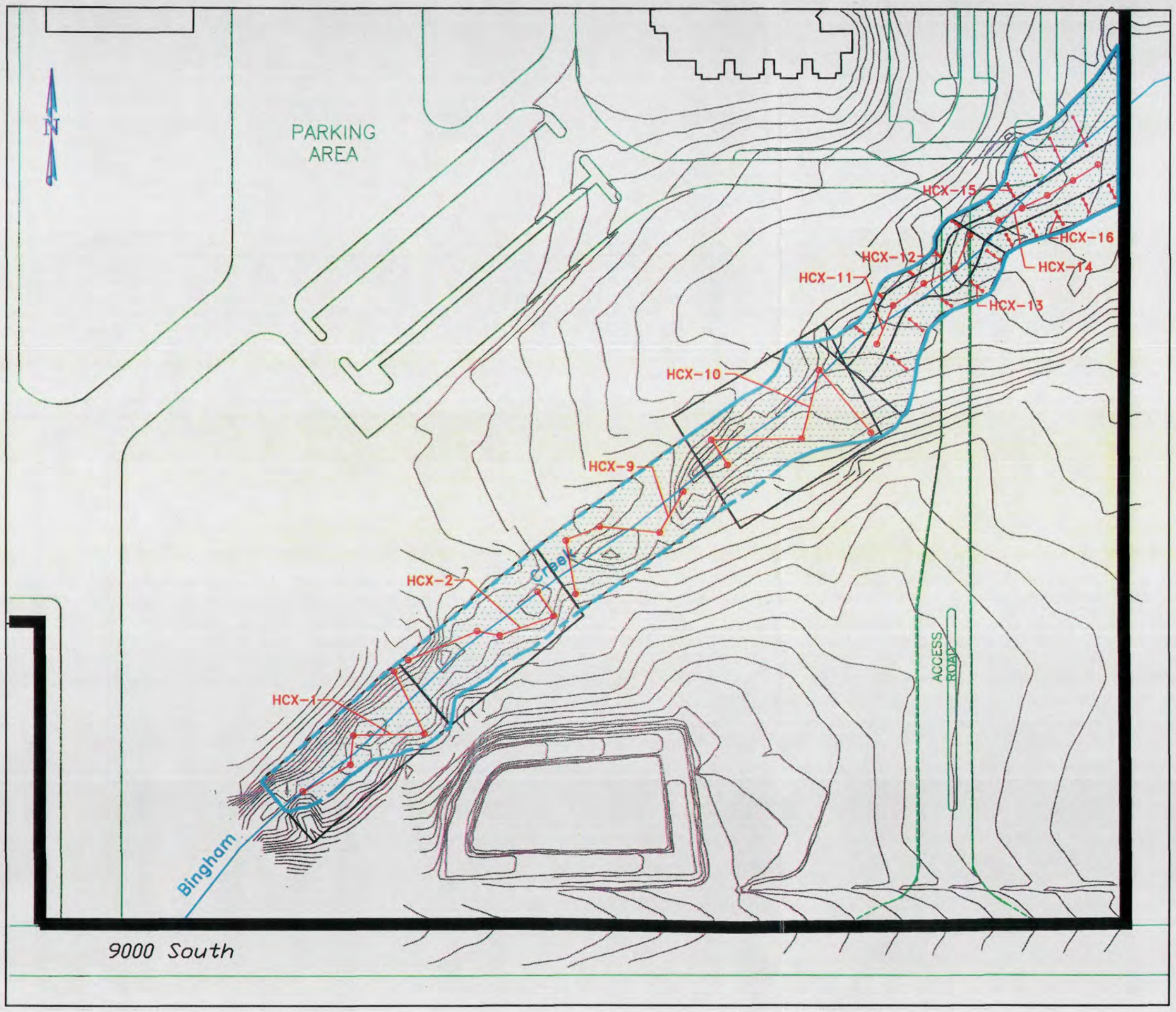


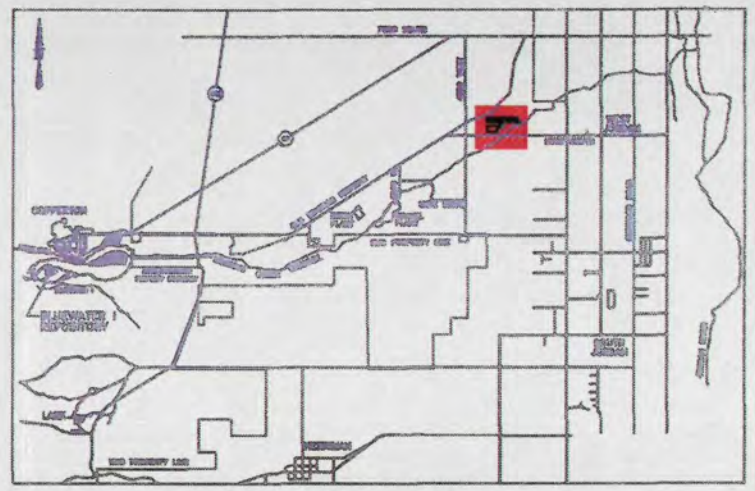
CLOSE UP OF CHANNEL BOTTOM SUBSITE AFTER SAMPLING. 7-30-92. PHOTO BY L. ELKIN



CLOSE UP OF TYPICAL CHANNEL BOTTOM
GRAVELS (SAMPLES HCX-11 AND HCX-14).
7-30-92. PHOTO BY L. ELKIN

APPENDIX D:
SAMPLE LOCATION





KEY PLAN

SAMPLE I.D. NUMBER	ANALYTICAL RESULTS (PPM)		QA/QC (PPM)	
	LEAD	ARSENIC	LEAD	ARSENIC
HCX-1	580	<50	709	13
HCX-2	1600	<50		
HCX-9	500	<50		
HCX-10	440	<50		
HCX-11	2000	110		
HCX-12	300	20		
HCX-13	250	15		
HCX-14	1600	140		
HCX-15	300	17		
HCX-16	210	15		

LEGEND

- EXISTING ROADS AND PARKING AREAS
- EXISTING BUILDINGS AND STRUCTURES
- EXISTING TOPOGRAPHY
- JORDAN VALLEY HOSPITAL PROPERTY LINE
- 5-POINT COMPOSITE SAMPLE
- SAMPLE SUBSITE
- 15-POINT COMPOSITE SAMPLE
- SAMPLING CELL AREA
- PERIMETER OF EXCAVATION AREA

PLANT PROJECTS GROUP	
SCALE: 1"=40'	DATE
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KENNECOTT
UTAH COPPER

BINGHAM CREEK CHANNEL
HOLY CROSS JORDAN VALLEY HOSP.
POST REMOVAL SAMPLING
LOCATIONS AND RESULTS

Job No. ---- Dwg. No. 453-T-181 REV. 0

453-T-181 A3 10:43 KROOUGH

BINGHAM CREEK CHANNEL, PHASE II
SITE T4

FINAL

HEALTH AND SAFETY REPORT

HOLY CROSS HOSPITAL

Kennecott Utah Copper
January, 1995

BINGHAM CHANNEL TAILINGS REMOVAL
HOLY CROSS HOSPITAL

FINAL

HEALTH AND SAFETY REPORT

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EXECUTIVE SUMMARY

The Bingham Channel, located down gradient from the Large Bingham Channel Reservoir, was historically used as a diversion channel for mine tailings disposal and meteoric runoff. The segment of Bingham Channel reclamation completed in 1992 involved the excavation and removal of tailings and related waste from the channel adjacent to Holy Cross Jordan Valley Hospital (Holy Cross) in West Jordan. Material removed from this site was placed in Blue Water One Repository on Kennecott property. Reclamation began July 1, 1992, and continued until completion July 29, 1992.

All work was conducted by employees, contractors, and subcontractors of Kennecott. Pre-construction and weekly safety meetings conducted by Kennecott and the removal contractor (Glen's), stressed the importance of proper engineering controls for the suppression of dust; health and safety issues pertaining to lead, arsenic, and other waste metals; construction hazards; and other topics that were essential to a safe and timely completion of project objectives.

A medical surveillance program was provided during the removal action. This medical surveillance provided a means to select employees who were physically able to safely perform the work assigned, and to monitor their health on a regular basis. Blood lead and urine arsenic levels were obtained from each employee before and after the work. An entrance medical examination was given to each employee before he/she began work. The examination complied with 29 CFR 1910.120(f). At the end of the job, all employees were given exit physicals, which consisted of blood lead and urine arsenic tests.

At the completion of the job, entrance and exit medical results were evaluated by the Kennecott Plant Projects Health and Safety Department. Urine arsenic levels in exposed individuals are typically found to be between 0-50 micrograms per gram (μg/g) of creatnine, but may range up to 100 μg/g in individuals who consume certain types of seafood. Total arsenic levels greater than 50 μg/l may be speciated to differentiate organic arsenic (seafood) from inorganic arsenic (industrial). No arsenic samples were speciated on this project. The highest level of total arsenic found in any employee at the end of the job was 39.3 μg/g. This is still within the normal range of arsenic-exposed individuals. Blood lead levels in exposed individuals are typically found to be between 0 and 30 μg/100g of blood. The highest level of blood lead level found on this project was 5 μg/100g of blood which is very low for exposed individuals. These test results indicate that lead and arsenic levels found in all employees on this removal action project were within the normal range.

In addition to the medical surveillance program, Kennecott adhered to the air monitoring plan during all aspects of the excavation and removal activities. The specific results of the air monitoring program can be found in the Final Air Monitoring

Report. Results collected during the Bingham Channel Work Action at Holy Cross show that airborne contaminant emissions produced were below regulated levels for total suspended particulates (TSP), arsenic, and lead.

Weekly safety meetings were conducted by Kennecott with the Removal contractor. The contractor also held a weekly safety meeting with their own employees. Daily pre-shift equipment safety inspections were conducted and documented. The use of water to dampen haul roads and other practices were used in preventing potential project employee exposures. The air monitoring contractor discussed the air monitoring results with the health and safety department for evaluation throughout the project and used to adjust removal activities and control measures, when necessary.

Detailed air monitoring results are enclosed in the Final Air Monitoring Report.

1.0 INTRODUCTION

The Bingham Channel at Holy Cross Health and Safety Plan applied to activities related to tailings and associated waste removal from Gingham Channel, haulage, and placement in Blue Water One Repository. The Health and Safety Plan was based on all available information pertaining to the site and on experience gained from similar programs conducted by Kennecott. The plan was designed to identify, evaluate, and control possible health and safety hazards associated with the project, such as pre-shift equipment safety inspections, task training, weekly toolbox safety meetings, etc.

The Excavation and removal work for the Bingham Channel Work Action at Holy Cross was initiated on July 1, 1992, and completed on July 29, 1992.

Kennecott initiated an air monitoring plan prior to and during all aspects of the removal activities. Engineering controls and work practices were evaluated and adjusted as necessary according to the results of the air monitoring. All air sampling methods, quality assurance and quality control procedures, laboratory methods and analysis, and air sampling results can be found in the final air monitoring report.. This report includes a site-specific Health and Safety Plan (HASP) assessment for this project.

Pre-construction and weekly safety meetings conducted by Kennecott with the removal contractor stressed the importance of proper implementation of engineering controls, health and safety issues pertaining to air quality, personal hygiene, and other topics that were essential to a safe and timely completion of project objectives. These health and safety requirements were enforced on a daily basis by the removal contractors health and safety officer. The removal contractor was required to make available a health and safety officer who reported directly to the Kennecott health and safety officer. The Kennecott health and safety officer also conducted periodic inspections on a regular basis.

2.0 SITE HEALTH AND SAFETY

This Final Health and Safety Report describes activities conducted during the Bingham Channel Work Action at Holy Cross. The Health and Safety Plan was designed to identify, evaluate, and control health and safety hazards associated with this project. The plan was based on existing information regarding the site, similar work conducted elsewhere, and past experience at other sites. Site-specific safety and health hazards and procedures necessary to protect the employees conducting the project were addressed.

The Health and Safety Plan (HASP) was covered during the "new-hire" employee orientation, and was made available at the work area and site trailers for review by employees, contractors, subcontractors and regulatory agencies. All visitors were familiarized with and complied with relevant aspects of the HASP.

2.1 Hazard Mitigation

The potential hazards associated with site activities included both physical and chemical hazards. Equipment operators and laborers directly involved in project activities had the greatest potential for exposure to physical and chemical hazards, while haul truck operators and supervisors had lower exposure potential, because of closed cabs of vehicles.

Excavation, loading and transport of concrete and soils with elevated metals could have generated airborne exposure to workers if engineering controls and monitoring had not been performed. As removal work occurred in the work area, dust-suppression was particularly important to the prevention of high concentrations of suspended particulates.

2.1.1 Physical Hazards

The physical hazards associated with site activities included heat stress, inclement weather, standard construction activity, and total dust emissions.

The above hazards were evaluated and controlled on a day-to-day basis. The physical hazards were discussed daily prior to work activities and during weekly safety meetings. Daily pre-shift equipment inspections were required and enforced. Hard hats, steel-toed boots, and safety glasses were required to guard against head, foot, and eye injuries. The physical hazards posed only minor problems and were successfully controlled during all phases of the project.

2.1.2 Chemical Hazards

Arsenic and lead were the only chemical hazards identified by the air monitoring conducted during work activities. Potential chemical hazards identified prior to the start of the removal action included lead and arsenic. The potential exposure routes to these hazards were through direct contact and/or inhalation or ingestion. The chemical hazards were mitigated by engineering controls, personal protective equipment (PPE), and personal hygiene procedures. Air sampling results indicated that employee exposure to total suspended particulates (TSP), arsenic and lead was below the PEL during all phases of the project.

2.2 Training Requirements

All employees and supervisors working in the excavation and placement of material were required to have 40 hours of Hazardous Substance Training per OSHA 29 CFR 1910.120. MSHA Newly Employed Experienced Miner Training was also required per 30 CFR 48.26. Training records were maintained on the job site by the Health and Safety Officer to ensure compliance. Prior to and during project activities, safety information discussed with employees included:

- Names of personnel and alternates responsible for site safety and health;
- Detailed review of the HASP;
- Detailed review of Kennecott Utah Copper (KUC) emergency protocol;
- Safe use of equipment on site;
- Chemical and physical hazards present on the site;
- Work practices by which risks from hazards can be minimized;
- Proper use of engineering controls;
- Use of personal protective equipment; and
- Site specific training, including recognition of symptoms and signs which might indicate overexposure to chemical hazards.

Site safety meetings were held at least weekly to notify personnel of specific hazards, air monitoring results, changes in the HASP, or other topics determined by the site Health and Safety Officer. Specific meetings were held at the initiation of new or different field activities and at the time of any crew or subcontractor crew changes.

2.3 Personal Protective Equipment

Occupational exposures to arsenic and lead for the entire project were below regulated levels specified by OSHA in 29 CFR 1910.1018 and 1910.1025, respectively. Occupational exposures to total suspended particulates for the project were below regulated levels specified in 29 CFR 1910.1000. Therefore, the level of personal protection utilized for all site activities were Level D (hard hats, steel-toed boots, and safety glasses).

2.4 Medical Surveillance Program

A medical surveillance program was provided for a means of selection of employees who were physically able to safely perform the work assigned and monitor their health on a regular basis. This medical surveillance program was developed to comply with 29 CFR 1910.120(f).

The program consisted of a pre-employment medical evaluation, an annual evaluation based on length of assignment, and a post-employment medical evaluation (exit medical) and had a provision for special evaluations in the event that an employee showed signs of overexposure to lead or arsenic. No special evaluations were required on this project.

A medical surveillance was conducted for all site personnel who worked in the exclusion zone for more that 30 days. All personnel who participated in the medical surveillance program received the following pre-employment examination.

- Medical and Occupational History;
- Physical Examination;
- Pulmonary Function Test;
- Six Frequency Audiogram;
- Urinalysis, with microscopic morphology and dipstick;
- Complete Blood Count;
- CHEM 20 Chemistry Screen;
- SAM 9 Drug Screen;
- Chest X-Ray read by "B" reader; and
- Blood lead and urine arsenic levels (urine arsenic were speciated if higher than 50 μg/g of creatnine)

Exit medical examinations consisted of the following:

- Blood lead and urine arsenic levels (urine arsenic were speciated if higher than 50 μg/g of creatnine)

Copies of all pre-employment and exit medicals can be found in the medical files maintained by the health and safety officer.

3.0 EVALUATION

A Site-Specific Health and Safety Plan (HASP) and an Air Monitoring Plan were implemented to minimize worker exposure to physical and chemical hazards. The plans were enforced to protect personnel working on the Bingham Channel Work Action at Holy Cross to minimize the generation of particulate emissions.

3.1 Site Health and Safety Results

The contractor that worked on the Bingham Channel Work Action at Holy Cross concluded with a total of 20,553 man hours with no recordable injuries, as compared to 12.4 for the national average. Key elements in the safe completion of the project included:

- Pre-construction and weekly safety meetings conducted by Kennecott with the relocation contractor stressing the importance of all aspects of site-specific safety.
- Daily pre-shift equipment safety inspections.
- Employee awareness of health and safety issues pertaining to particulate generation and its potential to contain metals such as arsenic and lead. This included implementation of engineering controls, employee personal hygiene, and the proper use of personal protective equipment.

Exit medicals show that both blood lead and urine arsenic levels found in employees on this project were well within the normal range.

3.2 Air Sampling Results

Quantitative and qualitative air monitoring data gathered on the project provided ample information concerning the airborne contaminant generation from the removal activities. Air sampling results may be examined in detail in the Final Air Monitoring Report. From the air monitoring results, the following evaluation can be made:

- The results documented that no employees were exposed to airborne concentrations of arsenic, lead, or TSP at or approaching regulated levels (PEL).

- The personal protective equipment used by the Bingham Channel at Holy Cross employees (level D) was sufficient to protect them against airborne contaminants.

- The engineering controls used were effective in suppressing work zone airborne contaminant emissions.

BINGHAM CREEK CHANNEL, PHASE II
SITET4

BINGHAM CHANNEL
HOLY CROSS JORDAN VALLEY HOSPITAL

FINAL
AIR MONITORING REPORT

Prepared for:

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EXECUTIVE SUMMARY

The Bingham Channel, located down gradient from the Large Bingham Channel Reservoir, was historically used as a diversion channel for mine tailings disposal and meteoric runoff. The segment of Bingham Channel reclamation completed in 1992 involved the excavation and removal of tailings and related waste from the channel adjacent to Holy Cross Jordan Valley Hospital (Holy Cross) in West Jordan. Material removed from this site was placed in Blue Water One Repository on Kennecott property. Reclamation began July 1, 1992, and continued until completion July 29, 1992.

All work was conducted by employees, contractors, and subcontractors of Kennecott Utah Copper. Pre-construction and weekly safety meetings conducted by Kennecott with the removal contractor (Glen's Excavating) stressed the importance of proper engineering controls implementation for the suppression of dust, and health and safety issues pertaining to lead, arsenic, and other waste metals.

Kennecott initiated an air monitoring plan during all aspects of the excavation and removal activities. The Air Monitoring Plan, included in the Work Plan that was approved by letter from the EPA, was based on all available information pertaining to the site and experience gained from similar programs conducted by Kennecott. This plan was implemented during the removal action to assess the potential generation of total suspended particulates (TSP) containing indicator metals (lead and arsenic), to evaluate the engineering controls and work practices used to suppress airborne contaminants, and to document any possible employee exposure to these contaminants.

The air sampling program was carried out by Envirocon, Inc. Background air samples were collected prior to excavation and removal activities to establish TSP and indicator metals baseline ambient air concentrations. Once work began, the daily air monitoring involved personal and work zone air sampling. The air samples were collected using both battery powered personal air sampling pumps and high volume (work zone) sampling pumps. Placement of these pumps around the work area and on removal workers insured that all aspects of the removal action were monitored. All air samples were analyzed for TSP, lead, and arsenic.

Air monitoring results obtained during the Bingham Channel Work Action at Holy Cross show that airborne contaminant emissions produced were below regulated levels for total suspended particulates, arsenic, and lead. Water to dampen haul roads and the excavation, a truck decontamination station, careful loading of excavated material, enclosed cabs on machinery and haul trucks, good employee personal hygiene, and employee awareness were all essential and adequate in preventing potential project employee exposures and off site migration of contaminants. Air monitoring results were evaluated throughout the project and used to adjust removal activities when necessary.

1.0 INTRODUCTION

The Bingham Channel at Holy Cross Air Monitoring Plan applied to activities related to the tailings and associated waste removal from Bingham Channel, haulage, and placement in Blue Water One Repository. The air monitoring plan was based on all available information pertaining to the site and on experience gained from similar programs conducted by Kennecott. The plan was designed to identify, evaluate, and control possible health and safety hazards associated with the generation of total suspended particulates having the potential to contain indicator metals (lead and arsenic).

Excavation and removal work for the Bingham Channel Work Action at Holy Cross was initiated on July 1, 1992, and completed on July 29, 1992. Kennecott initiated the air monitoring plan prior to and during all aspects of the removal activities. Engineering controls and work practices were evaluated and adjusted as necessary according to the results of the air monitoring. All air sampling methods, quality assurance and quality control procedures, laboratory methods and analysis, and air sampling results are discussed in detail in the respective sections of the report.

2.0 SITE AIR SAMPLING

The Bingham Channel at Holy Cross Air Monitoring Plan was initiated on June 24, 1992 with the collection of background samples. These samples were analyzed for total suspended particualtes (TSP), arsenic, and lead. The results were used to determine the initial personal protective equipment (PPE) to be used. Personnel and work zone air monitoring was initiated with the start up of removal activities on July 1, 1992. All phases of the tailings removal were monitored until work was finished on July 29, 1992. Air monitoring was conducted on every haul day for the duration of the project unless inclement conditions existed which would affect sampling results. The objectives of the air monitoring were as follows:

1) To establish the level of PPE needed for employees involved in daily activities at the work site.

2) To document any employee exposure to airborne contaminants generated by the tailings removal activities, and

3) To evaluate the effectiveness of engineering controls being used to suppress work zone airborne emissions.

The daily sample sweep consisted of three to six personnel and work zone air samples along with one quality control (QC) blank which was placed near a running sampler. Work zones and personnel that were monitored included the tailings removal personnel and work zone, decontamination (decon) personnel and work zone, truck drivers, haul roads, and repository. The haul roads and repository were monitored under the Relocated Utah Copper (Mixed) Tailings Work Action Air Monitoring Program. Refer to Holy Cross Jordan Valley Hospital Air Monitoring Locations (Figure 1) and map of repository and haul road (drawing no. 451-T-2432) in Appendix A for specific air sampling site locations.

The air sampling was conducted according to the Occupational Safety and Health Administration (OSHA) Standards (29CFR, Part 1910). These include Subpart Z, Sections 1910.1000 (particulates and PM10), 1910.1018 (inorganic arsenic), and 1910.1025 (lead). All samples were handled under chain-of-custody procedures and delivered to a qualified laboratory where they were analyzed according to the appropriate National Institute of Occupational Safety and Health (NIOSH) and OSHA methods (see Section 4.1). The results are quantitative and were used to document work zone air quality and worker exposure. Spontaneous, real-time data was also collected. Quantitative (personnel) sampling, and qualitative (real-time) sampling methods are described in sections 2.1 and 2.2 respectively.

2.1 Quantitative Air Sampling

Personnel air samples were collected using battery powered Gilian personal pumps (carried by the worker) that drew 2.0 liters per minute of air through a filter. These samples provided a good estimation of the air quality of an individual's immediate work area. Two to three samples were collected daily, with closer attention given to personnel working in areas of potentially high exposure to lead, arsenic, and particulates (such as the excavator and dozer operators). Decon work zone samples were also collected using personal pumps. Daily personal air samples were analyzed for TSP, arsenic, and lead.

Excavation work zone samples were collected using Gilian Aircon-2 high volume ("hi-vol") pumps that drew 20.0 liters per minute of air through a filter. The excavation work zones sampled were the tailings removal areas. Two to three hi-vols were placed around the perimeter of the work area and were used to estimate work-zone emissions. Placement of the pumps was adjusted according to work activities and wind direction.

Locations along the haul road and at the repository were sampled with personal pumps, and the results are included in the Relocated Utah Copper (Mixed) Tailings Removal Action Final Air Monitoring Report. Haul road and repository air samples were analyzed for TSP, arsenic, and lead.

2.2 Qualitative Air Sampling

Real-time air monitoring instruments provide instantaneous results which can be used to modify the engineering controls, work practices and/or PPE. This data was collected for the removal action using a "miniature real-time aerosol monitor" (Miniram). The Miniram is a nephelometer which measures the light-scattering effect of particulates and gives an estimated, digital representation of the respirable dust concentration (PM10) of an area. This instrument was placed in the field with a personal pump (as a reference), and in locations determined to have the greatest potential for air emissions. The use of this instrument allowed project supervisors to immediately adjust work activities.

3.0 QUALITY ASSURANCE AND QUALITY CONTROL

The purpose of the Quality Assurance/Quality Control (QA/QC) Program was to assure that data generated during the air monitoring program was accurate and consistent with QA/QC objectives. The quality of the data was assessed based on accuracy and completeness. Accuracy is a determination of how close the measurement is to the true value and was assessed by the cleanliness of field blanks. Using this criterion, 100 percent accuracy was obtained. Completeness is a measure of the amount of valid data obtained, compared to the amount that was expected under normal conditions. Ninety-eight percent (98.0%) completeness was attained during the Bingham Channel at Holy Cross Air Monitoring Program (see Appendix C). The project data objectives for accuracy and completeness are consistent with guidelines established by NIOSH and OSHA.

QA/QC procedures for air sampling required the calibration of instruments, the completion of a sampling log, following chain-of-custody procedures, and the use of quality control blanks. Additionally, internal QA/QC audits and laboratory audits were conducted. The following sections describe each of these QA/QC procedures.

3.1 Instrument Calibration

Personal sampling pumps were calibrated following NIOSH protocol. The pumps were calibrated at the beginning and end of each sampling day with a BIOS International DryCal calibrator and the data recorded in the pump calibration logbook. The filter cassette used for pre-calibration was also used for post-calibration. If the start/stop flow rates differed by more than 20%, the sample for that day was voided. For this project, the maximum start/stop flow

rate percent difference for non-voided samples was less than 2.5%. It should be noted that the BIOS International DryCal calibrator is an approved EPA primary standard.

3.2 Field Sampling Logbook

Field logbooks were kept to record information on every aspect of the samples taken. The following entries were made in the field logbook for each sampling day:

- Date;
- Sampling personnel;
- Weather conditions;
- Air pump number;
- Pump start and stop times, elapsed time;
- Sampling location for area monitors (including location of field blank);
- Personnel and location if personal pump;
- Sampling method (i.e., personal or real-time);
- Field observations; and
- Signature of sampler.

Maps were added as necessary. Significant deviations from sampling protocol were formally noted in the field log, as well as unusual circumstances which may have affected the sampling. Additional information was included in the chain-of-custody logbook each day.

3.3 Sampling Chain-of-Custody

The purpose of "chain-of-custody" was to insure that the sample or data retained its integrity and was not contaminated, lost, or damaged. Chain-of-custody tracked who was responsible for a particular sample or data at each point as it moved from the field through the laboratory or data processing. Documentation of chain-of-custody for air sampling included the sampling logbook, the chain-of-custody record (request for analysis form), and the personal sample data sheet.

3.4 Quality Control Samples

One quality control (QC) field blank was submitted with each sample shipment. A QC blank is an opened but unsampled filter cassette. The cartridges were placed near an active sampler each day and returned to the lab with the other samples as a test for contamination during sampling and transport. The presence of contamination in field blanks would indicate that field and/or laboratory procedures were not adequate to prevent contamination of samples.

Of the total samples taken for the project, 19.6 percent were field blanks. As mentioned earlier, field blanks are used to test sampling accuracy. Analytical results obtained for the field blanks showed no contamination, indicating that the field, shipping, and laboratory procedures were adequate for this project. For this project, 100 percent accuracy was obtained.

3.5 Quality Control Audits

Quality control system audits were conducted once a month by the QA/QC coordinator as an internal check on all components of the monitoring procedures including field and laboratory methods. The purpose of the QA/QC audit was to:

1. Identify and correct reporting errors.
2. Ensure that quality data is being reported.
3. Determine if a sufficient amount of air sampling is being performed in accordance with Federal regulations.

All audits performed revealed overall system integrity and conformance with the sampling plan. Copies of the QA/QC audits are included in Appendix C.

3.6 Data Reduction, Validation, and Reporting

All data is reported in appropriate units, and raw data has been reviewed and validated against calibration and chain-of-custody records to ensure that all the reported data is reliable and is in compliance with QA/QC objectives. Upon completion, a copy of the signed QA/QC report, showing accumulated precision and accuracy data, was maintained for future reference (Appendix C).

3.7 Quality Assurance Reports to Management

Weekly meetings were held for the duration of the project between the Project Manager and the Project Engineer to discuss conformance of the project effort with the QA/QC Plan. Any major issues requiring attention were immediately addressed and corrected.

4.0 LABORATORY METHODS AND ANALYSIS

Biotrace Laboratories of Salt Lake City, Utah was responsible for the analysis of all samples collected. The following sections describe the laboratory methods and findings.

4.1 Laboratory Methods

Biotrace Laboratories conducted the analyses of all air filter cassettes collected during the removal action. Turnaround time for the sample results was approximately ten days to two weeks unless otherwise specified. The analysis consisted of a gravimetric method for determination of total suspended particulates with a detection limit of 100 micrograms per cubic meter ($\mu g/m^3$) for personal samples. Arsenic analysis was conducted using a Zeeman Furnace Atomic Absorption Spectrophotometer with a detection limit of 1.0 $\mu g/m^3$. Lead analysis was conducted by flame atomic absorption spectrophotometry with a detection limit of 2.0 $\mu g/m^3$.

4.2 Laboratory Findings

For the entire project, 102 samples were collected and analyzed using the aforementioned criteria. Air sampling results summarized in Appendix B, Table 1 (Holy Cross) were below the permissible exposure limit (PEL) for total suspended particulates (TSP), the respirable fraction of the total particulates (PM10), arsenic (As), and lead (Pb).

The haul roads and repository were monitored under the Relocated Utah Copper (Mixed) Tailings Work Action Air Monitoring Program. All samples collected during placement of Holy Cross tailings at Bluewater One Repository were within standards for TSP, PM10, arsenic, and lead.

The results of all air monitoring were shown to all the removal action contractor employees within five days of receiving them as per OSHA regulations. These results are summarized in Appendix B.

5.0 EVALUATION

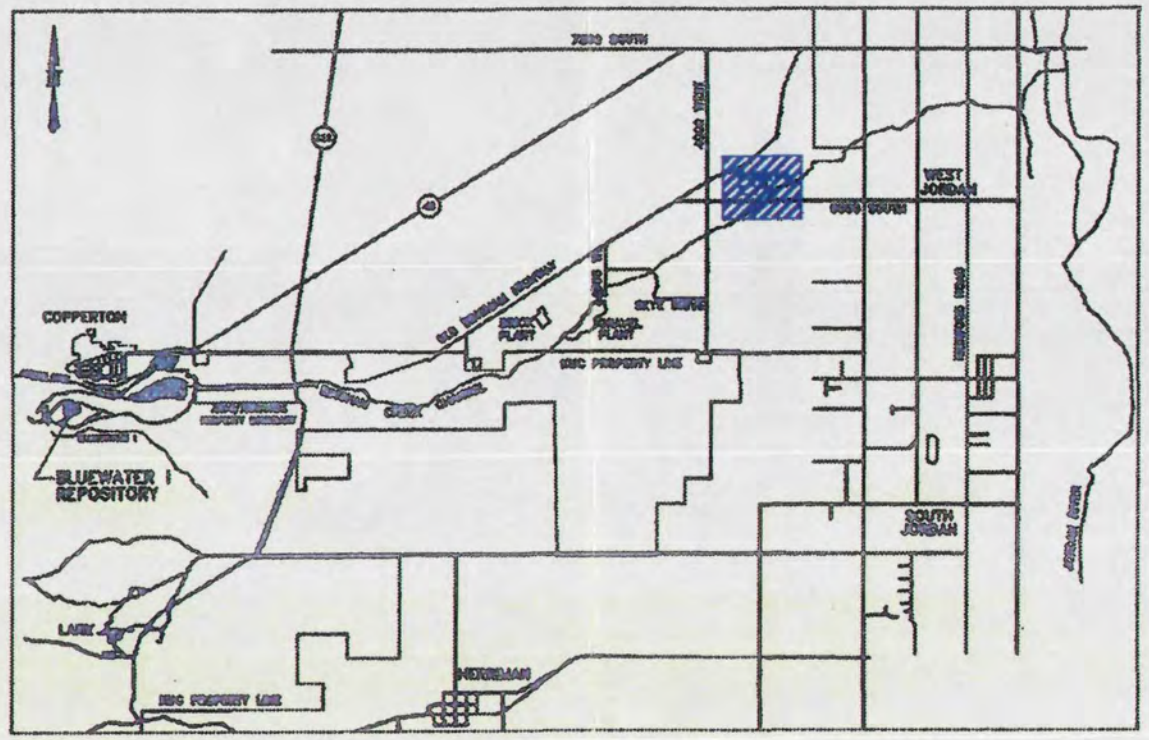
Recommendations were made prior to the project to protect personnel working on the Bingham Channel Work Action at Holy Cross from hazards. As a result of these recommendations a site-specific air monitoring program was implemented to minimize worker exposure to airborne physical and chemical hazards. Results from air monitoring were used to adjust site activities to reduce particulate generation.

5.1 Air Sampling

Quantitative and qualitative air monitoring data gathered on the project provided ample information concerning the airborne contaminant generation from the removal action activities. From the air monitoring results, the following evaluation can be made:

- The results documented that no employees were exposed to airborne concentrations of TSP, arsenic, lead, or PM10 at or approaching regulated levels (PEL).
- The results documented that there was little off site migration of particulate matter and no off site migration of arsenic or lead for the duration of the job.
- The personal protective equipment used by the removal employees (level D) was sufficient to protect them against airborne contaminants.
- The engineering controls used were effective in suppressing work zone airborne contaminant emissions.

APPENDIX A:
AIR SAMPLING LOCATIONS (MAP)



KEY PLAN

LEGEND

- ROADS AND PARKING AREAS
- BUILDINGS AND STRUCTURES
- AIRMONITORING LOCATIONS
- EXISTING TOPOGRAPHY
- JORDAN VALLEY HOSPITAL PROPERTY LINE
- BINGHAM CREEK CHANNEL

PLANT PROJECTS GROUP		KENNECOTT UTAH COPPER
SCALE: 1" = 75'	DATE	HOLY CROSS JORDAN VALLEY HOSPITAL AIRMONITORING LOCATIONS
NVD	7/92	
NVD	7/92	
Job No. 117	Dwg. No. FIGURE 1	REV. 3 5/1992

APPENDIX B:
AIR SAMPLING DATA SUMM

TABLE I

SAMPLING EVENT:

BINGHAM CHANNEL AT HOLY CROSS HOSPITAL

Sample Number	Date Collected	Location/ Personnel	Time (min)	Analytical Results (TWA ug/m3)			
				TSP	As	Pb	PM10
AL				5000	5	30	
PEL				15000	10	50	5000
24347	6/24/92	HC1	445	23.92	ND*	ND	
24348	6/24/92	HC2	435	20.75	ND	ND	
24349	6/24/92	BLANK	435	ND	ND	ND	
27994	6/25/92	HC1	383	ND	ND	ND	
27995	6/25/92	HC2	373	ND	ND	ND	
27996	6/25/92	BLANK	373	ND	ND	ND	
27999	6/26/92	HC1	415	ND	ND	ND	
28000	6/26/92	HC2	415	ND	ND	ND	
28001	6/26/92**	BLANK	415	ND	ND	ND	
28031	7/1/92	HC1	95	ND	ND	ND	
28032	7/1/92	HC3	110	ND	ND	ND	
28033	7/1/92	BLANK	110	ND	ND	ND	
28034	7/1/92	WORTHINGTON	94	ND	ND	ND	
28035	7/1/92	BURTON	97	ND	ND	ND	
28048	7/2/92	HC1	440	124.94	ND	ND	
28049	7/2/92	BLANK	440	ND	ND	ND	
28050	7/2/92	HC2	440	270.78	ND	ND	
25950	7/2/92	WORTHINGTON	440	1281.23	ND	5.04	
25951	7/2/92	BURTON	440	208.27	ND	1.65	
25674	7/3/92	HC1	480	50.00	ND	ND	
25675	7/3/92	HC2	480	29.10	ND	ND	
25676	7/3/92	BURTON	480	1260.40	ND	6.00	
25677	7/3/92	BURR	480	1166.60	ND	2.40	
25678	7/3/92	BLANK	480	ND	ND	ND	
25692	7/8/92	HC1	480	60.40	ND	ND	
25693	7/8/92	HC2	469	33.32	ND	ND	
25694	7/8/92	S. FLANDERS	500	145.83	ND	ND	
25695	7/8/92	KROON	485	124.99	ND	ND	
25696	7/8/92	BLANK	480	ND	ND	ND	
25714	7/9/92	HC2	480	13.50	ND	ND	
25715	7/9/92	HC1	480	21.80	ND	ND	
25716	7/9/92	BURTON	480	166.60	ND	ND	
25717	7/9/92	DECON	480	156.20	ND	ND	
25718	7/9/92	BLANK	480	ND	ND	ND	
25737	7/10/92	HC2	488	34.36	ND	ND	

*Non-detectable

**End of background sampling

Note: HC1, HC2, and HC3 are locations of hi-vol samplers at Holy Cross Hospital.

TABLE I

SAMPLING EVENT:

BINGHAM CHANNEL AT HOLY CROSS HOSPITAL

Sample Number	Date Collected	Location/ Personnel	Time (min)	Analytical Results (TWA ug/m3)			
				TSP	As	Pb	PM10
AL				**5000**	**5**	**30**	
PEL				**15000**	**10**	**50**	**5000**
25738	7/10/92	WORTHINGTON	480	500.00	ND*	ND	
25739	7/10/92	DECON	487	ND	ND	ND	ND
25740	7/10/92	BLANK	487	ND	ND	ND	
25758	7/13/92	HC1	485	ND	ND	ND	
25759	7/13/92	HC2	480	26.00	ND	ND	
25760	7/13/92	DECON	485	ND	ND	ND	ND
25761	7/13/92	BURTON	485	ND	ND	ND	
25762	7/13/92	BLANK	485	ND	ND	ND	
25781	7/14/92	HC1	505	ND	ND	ND	
25782	7/14/92	HC2	492	83.33	ND	ND	
25783	7/14/92	TURNER	497	ND	ND	ND	
25784	7/14/92	DECON	494	ND	ND	ND	ND
25785	7/14/92	BLANK	480	ND	ND	ND	
25795	7/16/92	HC1	480	56.20	ND	ND	
25807	7/16/92	HC2	480	28.10	ND	ND	
25808	7/16/92	BURTON	480	187.50	ND	2.00	
25809	7/16/92	DECON	480	ND	ND	ND	ND
25810	7/16/92	BLANK	480	ND	ND	ND	
25811	7/17/92	HC1	420	41.65	ND	ND	
25812	7/17/92	HC2	420	29.14	ND	ND	
25813	7/17/92	BURTON	420	208.25	ND	ND	
25814	7/17/92	DECON	420	ND	ND	ND	
25815	7/17/92	BLANK	420	ND	ND	ND	
25847	7/20/92	HC1	485	56.18	ND	ND	
25848	7/20/92	HC2	485	41.63	ND	ND	
25849	7/20/92	DECON	480	229.10	ND	ND	
25850	7/20/92	S . FLANDERS	480	ND	ND	ND	
25851	7/20/92	BLANK	480	ND	ND	ND	
25852	7/21/92	HC1	480	89.50	ND	ND	
25853	7/21/92	HC2	480	55.20	ND	ND	
25854	7/21/92	BURTON	480	ND	ND	ND	
25855	7/21/92	CASTAGNO	462	177.00	ND	ND	
25856	7/21/92	DECON	480	ND	ND	ND	
25857	7/21/92	BLANK	480	ND	ND	ND	
25898	7/22/92	HC1	480	73.90	ND	ND	

*Non-detectable

Note: HC1and HC3 are locations of hi-vol samplers at Holy Cross Hospital.

TABLE I

SAMPLING EVENT:

BINGHAM CHANNEL AT HOLY CROSS HOSPITAL

Sample Number	Date Collected	Location/ Personnel	Time (min)	Analytical Results (TWA ug/m3)			
				TSP	As	Pb	PM10
AL				5000	5	30	
PEL				15000	10	50	5000
25899	7/22/92	HC2	480	19.70	ND*	ND	
25900	7/22/92	BURTON	474	ND	ND	ND	
25901	7/22/92	DECON	461	ND	ND	ND	
25902	7/22/92	S. FLANDERS	483	ND	ND	ND	
25903	7/22/92	BLANK	480	ND	ND	ND	
25919	7/23/92	HC1	420	37.45	ND	ND	
25920	7/23/92	HC2	420	ND	ND	ND	
25921	7/23/92	CASTOGNA	420	614.51	ND	ND	
25922	7/23/92	DECON	420	ND	ND	ND	
25923	7/23/92	HARVEY	420	104.13	ND	ND	
25924	7/23/92	BLANK	420	ND	ND	ND	
25946	7/27/92	HC1	481	10.32	ND	ND	
25947	7/27/92	HC2	480	13.50	ND	ND	
25948	7/27/92	BURTON	474	562.48	ND	3.56	
25949	7/27/92	DECON	461	ND	ND	ND	
24770	7/27/92	BLASER	483	ND	ND	ND	
24771	7/27/92	BLANK	480	ND	ND	ND	
24795	7/28/92	HC2	483	ND	ND	ND	
24796	7/28/92	HC3	475	30.18	ND	ND	
24797	7/28/92	HC1	480	73.90	ND	ND	
24798	7/28/92	BURTON	480	ND	ND	2.10	
24799	7/28/92	DECON	480	156.20	ND	ND	
24800	7/28/92	PILLING	480	ND	ND	ND	
24801	7/28/92	BLANK	480	ND	ND	ND	
24835	7/29/92	HC3	484	17.65	ND	ND	
24836	7/29/92	HC2	484	36.40	ND	ND	
24837	7/29/92	BURTON	480	ND	ND	ND	
24838	7/29/92	TORRES	480	ND	ND	ND	
24839	7/29/92	DUDLEY	480	ND	ND	ND	
24840	7/29/92	BLANK	480	ND	ND	ND	

*Non-detectable

Note: HC1, HC2, and HC3 are locations of hi-vol samplers at Holy Cross Hospital.

APPENDIX C:
QA/QC REPO

QUALITY ASSURANCE/QUALITY CONTROL AUDIT

PROJECT: **Bingham Channel at Holy Cross Removal Action**
MONTH: **June, 1992**

The Quality Assurance/Quality Control audit is performed once a month as an internal check on all personnel/work zone air monitoring for each project. The purpose of the QA/QC audit is to:

1) Identify and correct reporting errors;
2) Ensure that quality data is being reported; and
3) Determine if a sufficient amount of air sampling is being performed in accordance to Federal Regulations.

The following QA/QC parameters were examined for June, 1992:

A. Number of samples collected:	9
B. Number of samples voided/lost:	0
C. Number of blanks for month:	3
D. Percent of blanks: D(%) = [C/A]100	33.3
E. Percent completion: E(%) = [100 - (B/A)100]	100.0
F. Number of sampling days lost to rain/holidays:	1

Note: Enter A,B, & C; then hit Layout/Tables/Calculate.

Total QA/QC parameters for project to date:

G. Total number of samples collected for project:	9
H. Total number of samples voided/lost for project:	0
I. Total number of blanks for project:	3
J. Percent of blanks: J(%) = [I/G]100	33.3
K. Percent completion: K(%) = [100 - (H/G)100]	100.0
L. Number of sampling days lost to date:	1

Note: Enter G,H, & I; then hit Layout/Tables/Calculate.

COMMENTS:

Three days background sampling during month of June (6/24, 6/25, 6/26/93).
Rain on June 30 - no sampling.

Signed: Michael Rosler Date: 8/19/92
Project Technician

Signed: [signature] Date: 8/19/92
QA/QC Coordinator

QUALITY ASSURANCE/QUALITY CONTROL AUDIT

PROJECT: **Bingham Channel at Holy Cross Removal Action**
MONTH: **July, 1992**

The Quality Assurance/Quality Control audit is performed once a month as an internal check on all personnel/work zone air monitoring for each project. The purpose of the QA/QC audit is to:

1) Identify and correct reporting errors;
2) Ensure that quality data is being reported; and
3) Determine if a sufficient amount of air sampling is being performed in accordance to Federal Regulations.

The following QA/QC parameters were examined for July, 1992:

A. Number of samples collected:	93
B. Number of samples voided/lost:	2
C. Number of blanks for month:	17
D. Percent of blanks: D(%) = [C/A]100	18.3
E. Percent completion: E(%) = [100 - (B/A)100]	97.9
F. Number of sampling days lost to rain/holidays:	4

Note: Enter A,B, & C; then hit Layout/Tables/Calculate.

Total QA/QC parameters for project to date:

G. Total number of samples collected for project:	102
H. Total number of samples voided/lost for project:	2
I. Total number of blanks for project:	20
J. Percent of blanks: J(%) = [I/G]100	19.6
K. Percent completion: K(%) = [100 - (H/G)100]	98.0
L. Number of sampling days lost to date:	5

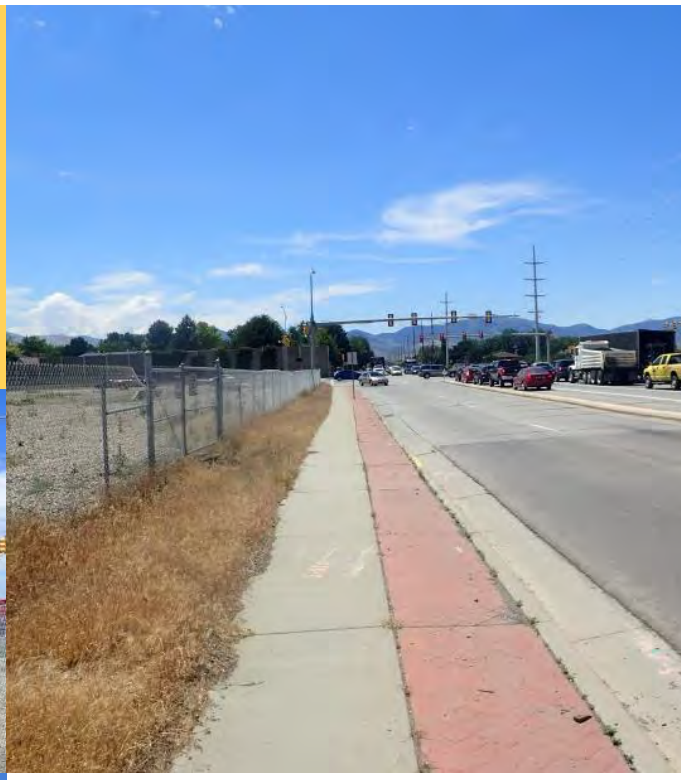
Note: Enter G,H, & I; then hit Layout/Tables/Calculate.

COMMENTS:

Two days sampling lost to rain, two days lost to holidays for month of July. Removal of tailings at Holy Cross completed on 7/29/93. Crew begin work at Tailwater Ditches on 7/30/93.

Signed: _____ Date: 8/20/92
Project Technician

Signed: _____ Date: 8/20/92.
QA/QC Coordinator



Final Phase II Environmental Site Assessment Report

Bangerter Highway W 9000 S Interchange

Prepared for Utah Department of Transportation

West Jordan, Utah

August 2016

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August 22, 2016

Mr. Marwan Farah, P.E.
Project Director
Utah Department of Transportation
4501 2700 W
Salt Lake City, UT 84119

Re: Bangerter Highway and W 9000 S
Phase II Environmental Site Assessment Results
HDR Project No. 10029760

Dear Marwan:

We are pleased to provide you with the above-referenced *Phase II Environmental Site Assessment* (ESA) Report, presenting soil monitoring activities and analytical results at the project site.

HDR appreciates the opportunity to serve the Utah Department of Transportation on this important project. If you have any questions or comments, please feel free to contact me at (208) 387-7033.

Cordially,

HDR, Inc.

Michael Murray, Ph.D.
Project Manager

cc: HDR File 10029760

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Appendix A – Compilation of Soil and Groundwater Action Levels
Appendix B – Laboratory Results

List of Acronyms

Term	Definition
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations
COC	constituents of concern
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
ESC	ESC Lab Sciences
HDR	HDR, Inc.
NRCS	Natural Resources Conservation Service
OU1	operable unit 1
TCLP	Toxic characteristic leaching procedure
UDEQ	Utah Department of Environmental Quality
UDOT	Utah Department of Transportation

1 Introduction

The Utah Department of Transportation (UDOT) proposes a project that includes replacing an existing 720-foot-long, 84-inch-diameter corrugated pipe, that extends from the west side of Bangerter Highway, just south of Winthrope Circle in the Vista West Subdivision, to the Jordan Valley Hospital property east of Bangerter Highway and north of W 9000 S (**Figure 1** and **Figure 2**).

In July 2016 at UDOT's request, HDR, Inc. (HDR) conducted a Phase I Environmental Site Assessment (ESA) of properties at the Bangerter Highway and W 9000S Street intersection (Subject Property). The Subject Property includes several landowners (HDR 2016a).

HDR conducted this ESA in conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Practice E 1527-13; the ESA satisfies the requirements of Title 40 of the Code of Federal Regulations (CFR) Part 312 (40 CFR 312).

As reported in the Phase 1 ESA, the Subject Property includes a portion of Bingham Creek, which was part of response actions implemented at the Kennecott South Zone Superfund Site near Copperton, Utah. Response actions in the 1990s, within and adjacent to the Subject Property, included three phases of soil removal activities from the Bingham Creek channel and its banks along residential areas to address lead and arsenic contaminated soils. Contaminated sediments were also removed from Bingham Creek in 1992 during construction of the Jordan Valley Hospital.

HDR included the following recommendation in the Phase I ESA:

- **Recommendation 1**: Conduct a Phase II site investigation to determine concentrations of lead and arsenic in the soil along Bingham Creek, which was part of response actions implemented at the Kennecott South Zone Superfund Site near Copperton, Utah.

A Phase II site investigation was necessary to assess the concentrations of constituents of concern (COCs)—arsenic and lead—in the soil along Bingham Creek and adjacent areas that could be disturbed during the Bangerter Highway W 9000 S Interchange Project. The City of West Jordan also requested that UDOT collect samples for toxic characteristic leaching procedure (TCLP) analysis. This report presents data objectives and needs, the field activities, and the results of this Phase II ESA.

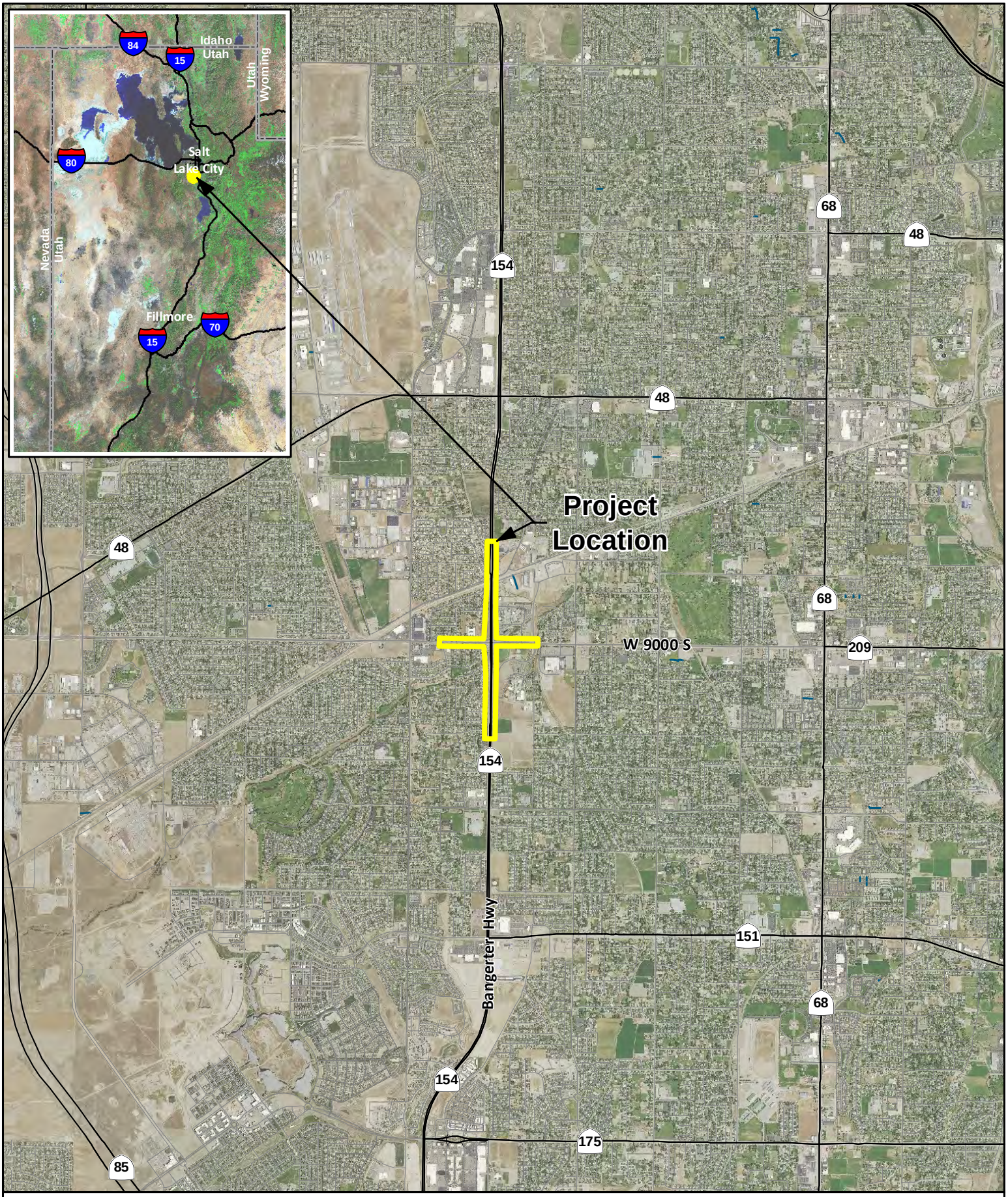

Figure 1. Vicinity Map
UDOT, 9000 South and Bangerter Highway

Imagery: 2014 NAIP, 1 Meter Resolution
Source: USDA/NRCS Digital Gateway
Other Data Sources: Utah Automated Geographic Reference Center (AGRC); USGS

0 4,000 8,000
Feet

Map Date: 7/6/2016
Document: Q:\UDOT\Bangerter\Work_in_Progress\map_docs\Vicinity.mxd

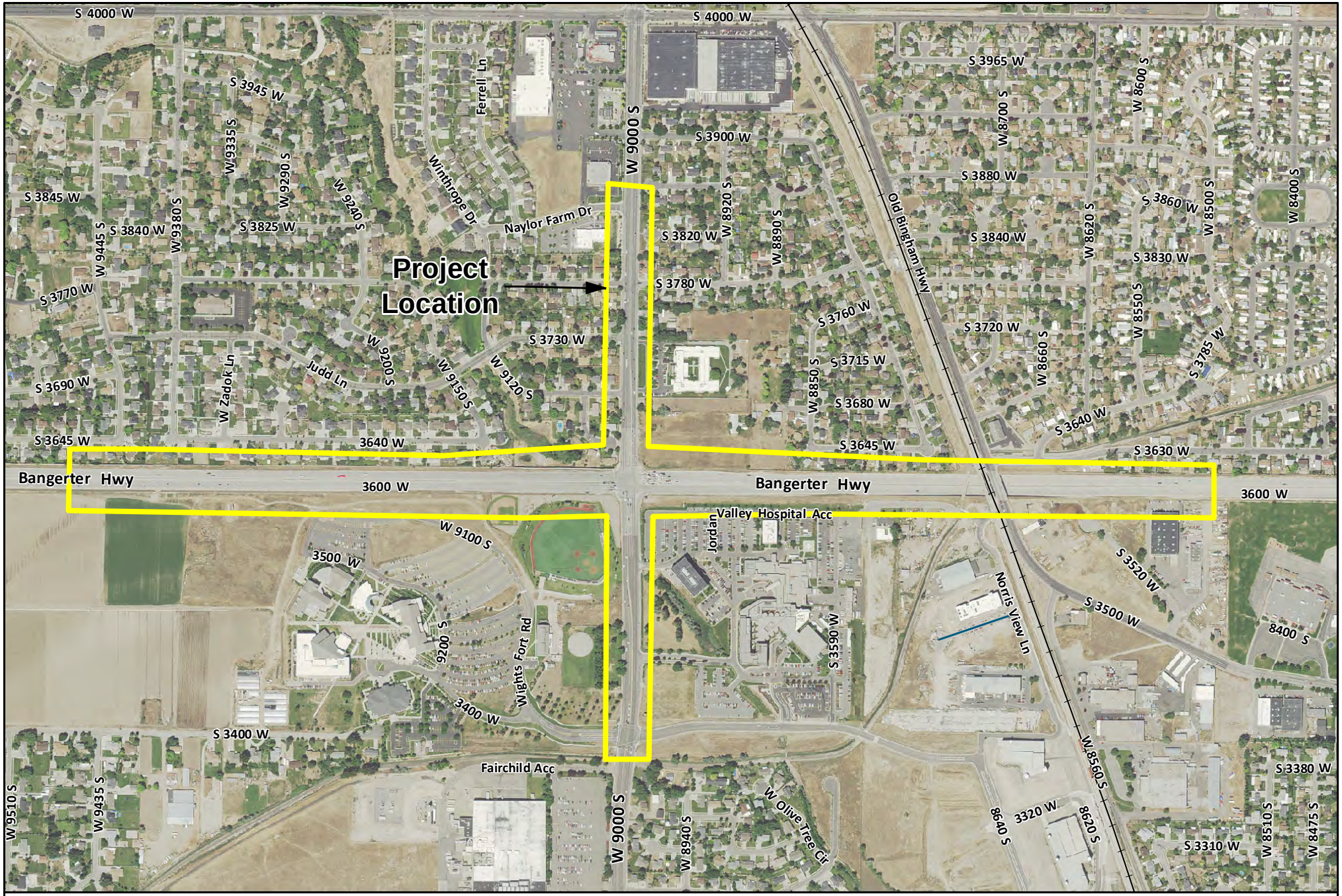

Figure 2. 9000 South and Bangerter Highway
UDOT

Imagery: 2014 NAIP, 1 Meter Resolution
Source: USDA/NRCS Digital Gateway
Other Data Sources: Utah Automated Geographic Reference Center (AGRC); USGS

Map Date: 7/6/2016
Document: Q:\UDOT\Bangerter\Work_in_Progress\map_docs\Site_land.mxd

0 700 1,400
Feet

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2 Site Description

2.1 Location and Legal Description

The Subject Property is comprised of UDOT-owned, right-of-way property along the Bangerter Highway and W 9000 S intersection and multiple adjoining parcels (private property and City owned property) in West Jordan, Utah, 84088. The various portions of the Subject Property are located in Section 5 of Township 03 South, Range 01 West in Salt Lake County (**Figure 2**).

2.2 Site and Vicinity Characteristics

The Subject Property is comprised of single-family residential lots and one residual lot, owned by the City of West Jordan, which consists of Bingham Creek and its banks. The Subject Property also includes UDOT right-of-way along the east and west side of Bangerter Highway and the north and south side of W 9000 S Street. Primary access to the Subject Property is by Bangerter Highway or W 9000 S Street. Access to the residential lots (Vista West subdivision) in the southwest corner of the intersection of Bangerter and W 9000 S is by heading south from W 9000 S on Winthrope Drive. The Subject Property is located within a mixed residential and commercial area, which includes the Jordan Valley Hospital northeast of the intersection, the Salt Lake Community College campus in the southeast corner of the intersection, and a currently fallow pasture on the northwest corner of the intersection.

2.3 Description of Structures, Roads, and Other Site Improvements

The Subject Property is developed except the fallow pasture located on the northwest corner of the intersection of Bangerter Highway and W 9000 S Street. Development includes residential subdivisions, athletic fields, and parking lots associated with the Salt Lake Community College Jordan Campus, and medical facilities and parking lots associated with the Jordan Valley Medical Center.

2.4 Area Geology, Hydrogeology, and Soil Characteristics

West Jordan, Utah, is located between the Jordan River and the Oquirrh Mountains within the Jordan River Basin. The Subject Property is located within the historic floodplain of Bingham Creek, which consists of Post-Lake Bonneville (Holocene) alluvial deposits ranging from silty, fine- to coarse-grained sand, and pebbles and cobbles. The area to the north and south of the historic floodplain along Bingham Creek consists of Bonneville Lake Cycle (late Pleistocene) fine-grained lacustrine deposits. The area to the west consists of late Pleistocene gravel of lacustrian and/or alluvial origin.

Depth to groundwater varies near the Subject Property; however, in general, it is at least 80 feet below land surface. The groundwater gradient is toward Jordan River to the east (Stolp 2007).

Table 2-1 characterizes the dominant soils in the area, based on a Natural Resource Conservation Service (NRCS) soil survey for Salt Lake County (2016).

Table 2-1. Dominant Soils Mapped by NRCS for Subject Property

Soil Component Name (surface texture)	Red Rock Silt Loam
Characteristics	The Red Rock Silt Loam occurs along the historic floodplain of Bingham Creek, with a typical profile of silt loam from 0-4 inches, silty clay loam from 4-28 inches, clay loam from 28-40 inches, silt loam from 40 to 45 inches, and silty clay loam from 45 to 60 inches. The parent material is alluvium.
Soil drainage class	Well drained. Moderately low to moderately high transmissivity (0.06 to 0.20 inches per hour). The available water storage is high.
Depth to bedrock	More than 80 inches
Soil Component Name (surface texture)	Bingham Gravelly Loam
Characteristics	The Bingham Gravelly Loam occurs to the south of the historic floodplain of Bingham Creek, with a typical profile of gravelly loam from 0-6 inches, gravelly sandy clay loam from 6-12 inches, gravelly fine sand loam from 12-18 inches, very gravelly sand loam from 18 to 27 inches, and extremely gravelly sand from 27 to 60 inches. The parent material is fine-loamy slope alluvium derived from quartzite and/or limestone over sandy and gravelly lacustrine deposits derived from quartzite and/or limestone.
Soil drainage class	Well drained. Moderately high to high transmissivity (0.60 to 2.00 inches per hour). The available water storage is very low.
Depth to bedrock	More than 80 inches
Soil Component Name (surface texture)	Butterfield Soils
Characteristics	The Butterfield soils occur to the north of the historic floodplain of Bingham Creek, with a typical profile of gravelly silt loam from 0-5 inches, very gravelly silt loam from 5-10 inches, extremely gravelly loam from 10-22 inches, very gravelly loam from 22 to 50 inches, and unweathered bedrock from 50 to 60 inches. The parent material is colluvium and/or residuum.
Soil drainage class	Well drained. Very low to moderately high transmissivity (0.00 to 0.20 inches per hour). The available water storage is very low.
Depth to bedrock	50 inches

3 Previous Soil Investigations

The Subject Property includes a portion of Bingham Creek, which was part of response actions implemented at the Kennecott South Zone Superfund Site near Copperton, Utah. The Subject Property is part of Operable Unit 1 (OU1), which consists of Bingham Creek downstream of the Kennecott South Zone Superfund Site. Response actions in the 1990s, within and adjacent to the Subject Property, included three phases of soil removal activities from the Bingham Creek channel and its banks along residential areas to address lead and arsenic contaminated soils. Contaminated sediments were also removed from Bingham Creek in 1992 during construction of the Jordan Valley Hospital. Bingham Creek flows through a 84-inch diameter, 720-foot-long, corrugated metal pipe from the Vista West Subdivision towards the Jordan Valley Hospital (northeasterly direction).

The executive summary of the *Second Five Year Review Report* for the Kennecott South Zone (EPA 2010) states the following:

> *"Although the residential area response actions at OU1 were conducted in accordance with the Action Memoranda (and therefore may be functioning as intended), it is not clear from the site files whether all residential properties ultimately were cleaned to the final lead standard of 1,100 mg/Kg. This is due to an inconsistency in the lead action level required in the Action Memoranda for the Phase I residential removal action (2,500 mg/Kg) and the Phase II and III residential removal actions (1,100 mg/Kg). The OU1 ROD identifies the appropriate action level for lead in a residential setting as 1,100 mg/Kg. Therefore, if the Phase I residential cleanup achieved a lead standard of 2,500 mg/Kg, this portion of the remedy would not be functioning as intended by the ROD."*

The December 29, 2015, Utah Department of Environmental Quality's (UDEQ) technical memorandum, "Compilation of soil and groundwater action levels," for Kennecott north and s zones is attached in Appendix A. See the Phase 1 ESA (HDR 2016a) for more details on the Kennecott site.

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4 Soil Investigation Activities

This section presents data objectives and needs, and describes HDR's field activities conducted August 3 and 4, 2016, for this Phase II ESA.

4.1 Data Objectives and Needs

As addressed in the *Second Five Year Review Report,* the status of response actions at OU1 are in post-construction operation and maintenance with wastes remaining in place. Future development could affect potentially contaminated soils along Bingham Creek. UDEQ and the U.S. Environmental Protection Agency (EPA), Region 8, have compiled soil action levels for Bingham Creek, necessitating soil sampling to assess COC concentrations for arsenic and lead in the soil along Bingham Creek.

The soil action levels for OU1 are compiled in UDEQ's December 29, 2015 technical memorandum (Appendix A). The listed residential action levels for lead are 1,100 milligrams per kilogram (mg/kg) and 100 mg/kg for arsenic.

4.2 On-Site Soil Investigation

HDR conducted on-site activities in accordance with the document, *Phase II Environmental Site Assessment Work Plan* (HDR 2016b).

4.2.1 Discrete Soil Samples

The proposed project includes replacing an existing 720-foot-long, 84-inch-diameter corrugated pipe, that extends from the west side of Bangerter Highway, just south of Winthrope Circle in the Vista West Subdivision, to the hospital property east of Bangerter Highway and north of W 9000 S. The existing culvert would be replaced with a box culvert or similar hydraulic structure (to be determined). During construction of the new culvert, soil would likely be excavated within Bingham Creek. For planning purposes, a total depth of excavation at the bottom of Bingham Creek is assumed to be approximately 3.5 feet.

With a goal to determine lead and arsenic concentrations in areas of disturbance within Bingham Creek and the areas adjacent to Bingham Creek, HDR advanced soil borings using a hand auger and collected soil samples at the following locations (see **Figure 3** and **Table 4-1**):

- 10 borings within Bingham Creek (5 upstream of Bangerter Highway and 5 downstream),
- 4 borings adjacent to Bingham Creek (2 upstream of Bangerter Highway and 2 downstream), and
- 2 borings near the Bangerter Highway W 9000 S intersection (1 northwest quadrant and 1 southeast quadrant)

At each boring location, HDR collected one sample at 0 to 12 inches and one sample at 24 to 36 inches.

Figure 3. Boring Locations
UDOT

Imagery: 2012 HRO, 1/8 Meter Resolution
Source: Utah Automated Geographic Reference Center (AGRC)
Other Data Sources: Utah Automated Geographic Reference Center (AGRC); USGS

Map Date: 8/17/2016
Document: Q:\UDOT\Bangerter\Work_in_Progress\map_docs\Site_land.mxd

N

0 150 300
Feet

Table 4-1. Number of Soil Samples that were collected from each Boring

Boring Location	Number of Borings	Number of Soil Samples	Sample per Boring
Bed and Bank of Bingham Creek	10	20	Sample 1: 0-12 inches from surface Sample 2: 24-36 inches from surface
Areas adjacent to Bingham Creek	4	8	Sample 1: 0-12 inches from surface Sample 2: 24-36 inches from surface
Northwest quadrant	1	2	Sample 1: 0-12 inches from surface Sample 2: 24-36 inches from surface
Southeast quadrant	1	2	Sample 1: 0-12 inches from surface Sample 2: 24-36 inches from surface
Total	16	32	Note: 30 discrete samples were collected for laboratory analysis, as 2 samples could not be collected due to auger refusal or collapsing boring)

HDR's sampling team determined the exact sampling locations in the field following a review of accessibility, utility locations, and consideration of personnel safety.

For each boring, the sampling team collected a discrete soil sample at the specified depth, placed the soil sample into a clean (decontaminated) mixing bowl, mixed lightly, and then placed a subset of the sample into a laboratory sample jar for laboratory analysis. In addition, they placed a subset of each sample into a clean bucket to serve as part of a composite sample as described in Section 4.2.2. This approach of collecting discrete soil samples at a specified depth allows for assessing concentrations of lead and arsenic with depth and specific locations. The sampling team collected 30 soil samples out of a goal of 32 samples. They could not collect 2 samples; in one case, the boring collapsed due to water flowing over the boring, and in the other case, the boring could not be advanced past a depth of 1 foot (auger refusal).

Upon collection, the sampling team labeled each sample container and placed it in a clean ice chest, where the samples chilled until delivery to the laboratory. The sampling team followed standard chain-of-custody procedures from the time they collected samples until the samples arrived at the laboratory. After sampling, the sampling team backfilled each opening with soil cuttings.

4.2.2 Composite Soil Samples for TCLP analysis

The sampling team collected four composite samples for TCLP analysis, by taking a small sample volume from each of the discrete samples at the appropriate depth and combining them in a mixing bowl.

Two composite samples are from the southwest quadrant (Vista West subdivision); one of these composite samples consisted of soil collected from each discrete sample at a depth from 0 to 1 feet; and the second composite sample consisted of soils collected from each discrete sample from 2 to 3 feet.

- SW-TCLP-0-1= composite of all samples (Bingham Creek and floodplain) taken from 0-1 feet in the south west quadrant.
- SW-TCLP-2-3= composite of all samples (Bingham Creek and floodplain) taken from second depth increment (variable depths) in the south west quadrant

Similarly, two composite samples are from the northeast quadrant (Jordan Valley Hospital), and collected from the same depth increments as the southwest quadrant samples.

- NE-TCLP-0-1= composite of all samples (Bingham Creek and floodplain) taken from 0-1 feet in the north east quadrant.
- NE-TCLP-2-3= composite of all samples (Bingham Creek and floodplain) taken from second depth increment (variable depths) in the north east quadrant.

4.2.3 Equipment Decontamination

The sampling team decontaminated sampling equipment (hand auger, mixing bowl, mixing spoon) prior to collecting the next sample, using the following procedure:

- Wash and scrub equipment with phosphate-free, laboratory-grade detergent (e.g., Alconox™ or equivalent)
- Rinse with distilled water
- Air dry

The sampling team also used disposable nitrile gloves for each sample collected.

4.2.4 Quality Assurance and Quality Control

To assess the effectiveness of equipment decontamination, the sampling team collected a "decon" blank sample. They poured distilled water over the decontaminated hand auger and mixing bowl, collected the water and placed an aliquot of the water into a laboratory supplied sample jar, and had the water sample analyzed for lead and arsenic.

4.2.5 Laboratory Analyses

HDR shipped overnight a chilled and secured cooler with soil samples and the decon blank sample to ESC Lab Sciences (ESC) in Mt. Juliet, Tennessee. ESC laboratory analyses and methods are summarized in **Table 4-2**.

Table 4-2. Proposed Laboratory Analyses

Analytical Parameter	Method
Lead	EPA Method 6010b
Arsenic	EPA Method 6010b
TCLP RCRA Metals[1]	EPA Method 6010/7470

[1]RCRA Metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and sliver.

4.3 Health and Safety

The sampling team conducted all activities under the supervision of senior HDR project personnel and in strict accordance with a health and safety plan, which was completed prior to beginning field activities.

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5 Results and Conclusions

5.1 Arsenic and Lead

Table 5-1 summarizes the analytical results (laboratory reports are presented in Appendix B). The listed UDEQ residential action levels for lead are 1,100 mg/kg and 100 mg/kg for arsenic. Discrete soil samples ranged from 48.9 to 351 mg/Kg for lead and 7.43 to 49.4 mg/Kg for arsenic. Values are below the residential action levels identified in the UDEQ technical memorandum (Appendix A).

5.2 TCLP

All four TCLP samples (NE-TCLP-0-1, NE-TCLP-2-3, SW-TCLP-0-1, and SW-TCLP-2-3) were non-detect for mercury, arsenic, barium, cadmium, chromium, lead, selenium, and silver. Laboratory reports are presented in Appendix B.

5.3 Equipment Rinsate

The equipment rinsate (ER-1) was non-detect for lead and arsenic.

5.4 Conclusions

Soil sample results are below the action levels established by UDEQ (Appendix A) for soil lead and arsenic under a residential scenario. This suggest that no remedial action would be required by UDEQ for these soils. Furthermore, soils are below the TCLP threshold values, indicating that the excavation of soils would not result in the generation of hazardous waste.

Table 5-1. Analytical Results for Lead and Arsenic

Sample ID	Total Solids %	Arsenic (mg/kg, dry)	Lead (mg/kg, dry)	Sample Depth (feet)	Comments
NE-BC-1-0-1	87.0	17.4	196	0-1	Upper south bank.
NE-BC-1-2-3	88.6	22.2	183	2-3	Upper south bank.
NE-BC-2-0-1	76.5	26.3	351	0-1	Middle south bank.
NE-BC-2-1.5-2.5	77.5	49.4	264	1.5-2.5	Middle south bank. Cobbles at 2.5 feet.
NE-BC-3-0-1	71.9	23.8	255	0-1	Bottom of stream channel with 1.5 feet of water flowing.
NE-BC-3	NA	NA	NA	NA	Stream flow caused hole to collapse, so no deeper sample could be collected.
NE-BC-4-0-1	77.8	24.9	257	0-1	Middle north bank.
NE-BC-4-2-3	76.0	23.9	312	2-3	Middle north bank.
NE-BC-5-0-1	92.3	13.2	53.5	0-1	Upper north bank.
NE-BC-5-1.5-2	93.6	14.7	78.0	1.5-2	Upper north bank. Cobbles at 2.0 feet
NE-FP-W-0-1	91.1	10.8	111	0-1	Floodplain west.
NE-FP-W-2-2.5	92.3	16.9	174	2-2.5	Floodplain west.
NE-FP-E-0-1	94.6	9.36	87.4	0-1	Floodplain east.
NE-FP-E-2-3	97.2	7.43	48.9	2-3	Floodplain east.
SW-BC-1-0-1	95.4	15.2	102	0-1	Upper bank west.
SW-BC-1-1.75-2.25	93.3	15.5	100	1.75-2.25	Upper bank west. Cobble at 2.25 feet.
SW-BC-2-0-1	87.2	15.4	86.8	0-1	Middle bank west.
SW-BC-2-1.5-2	88.7	14.4	87.2	1.5-2	Middle bank west. Cobble/roots at 2.0 feet.
SW-BC-3-0-1	79.8	12.1	78.5	0-1	Bottom of stream channel. Saturated soil.
SW-BC-3-1.75-2.25	76.7	16.7	97.9	1.75-2.25	Bottom of stream channel. Saturated soil. Cobble at 2.25 feet.
SW-BC-4-0-1	81.3	16.5	104	0-1	Middle bank east.
SW-BC-4-1.25-1.75	91.4	23.1	160	1.25-1.75	Middle bank east. Cobble/roots at 1.75 feet.
SW-BC-5-0-1	89.6	15.6	117	0-0.8	Upper bank east. Cobble at 0.8 feet
SW-BC-5	NA	NA	NA	NA	Cobble at 0.8 feet, so no deeper sample could be collected.
SW-FP-N-0-1	99.4	14.6	108	0-1	Floodplain north.
SW-FP-N-2-3	96.4	11.8	96.6	2-3	Floodplain north.
SW-FP-S-0-1	98.6	15.6	101	0-1	Floodplain south.
SW-FP-S-2-3	97.7	18.1	109	2-3	Floodplain south.
SE-0-1	95.7	10.2	54.8	0-1	Sample along W 9000 S. Appeared to be fill material.
SE-1.25-1.5	97.8	12.3	79.7	1.25-1.5	Sample along W 9000 S. Appeared to be fill material. Cobble at 1.5 feet.
NW-0-1	88.8	11.1	108	0-1	Sample from NW quadrant of intersection.
NW-2-3	90.7	14.8	126	2-3	Sample from NW quadrant of intersection.

NE= north east quadrant of intersection; SW=south west; SE=south east; NW=north west; BC= Bingham Creek; FP= flood plain

6 References

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HDR 2016b. Phase II Environmental Site Assessment Work Plan. Bangerter Highway W 9000 S Interchange. July 2016.

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A

Compilation of Soil and Groundwater Action Levels

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State of Utah
GARY R. HERBERT
Governor
SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality
Alan Matheson
Executive Director
DIVISION OF ENVIRONMENTAL
RESPONSE AND REMEDIATION
Brent H. Everett
Director

TECHNICAL MEMORANDUM

SUBJECT: Compilation of soil and groundwater action levels

FROM: Douglas Bacon, UT DEQ–DERR DCB

Kerri Fiedler, U.S. EPA Region 8 KF

TO: Kennecott North and South Zones Administrative File

DATE: December 29, 2015

Since 1998, four records of decision (RODs) have been issued for the Kennecott North and South Zone operable units (OUs). Under each of these RODs various land use action levels for metals in soils were selected. Similarly, various action levels for groundwater contaminants were established under the RODs or by the State of Utah's Groundwater Protection Program (GWPP). This technical memorandum compiles all the action levels into a single document and clarifies inconsistencies determined during recent five-year reviews.

The UT DEQ-DERR and the EPA Region 8 (Agencies) have compiled the soil action levels for OUs 1, 3-15, 17-20, 22, and 24 (Attachment 1). Listed action levels are obtained from existing risk assessment and risk management documents which are part of the administrative record. There are footnotes at the end of the soil action levels table which explain the applicability of the action levels and define the action which can be performed to address an exceedance. Numbered notes on the table provide reference where each of the listed action levels are obtained.

The Agencies have compiled the groundwater action levels for OUs 2, 12, 16, and 23 (Attachment 2). Listed action levels are obtained from existing human health and ecological risk assessment and risk management documents which are part of the administrative record. The listed action levels also take into account the Agencies' selected remedy to rely on the permitting restrictions of the State of Utah's GWPP, overseen by the UT DEQ - Division of Water Quality (UT DEQ-DWQ) for OUs 12 and 16. Remedial actions being implemented at OUs 12 and 16 are being overseen by UT DEQ-DWQ under the permit program to ensure that OU2 is not further impacted.

It is the intent of the Agencies that this technical memorandum will be used as reference under various site-wide and OU-specific management plans, to ensure the mining impacted soils and groundwater are effectively managed until such time that unrestricted use/unlimited exposure action levels are attained. The action levels listed in the two attachments are amendable by the Agencies premised on further risk assessment and risk management decisions, or recommendations by UT DEQ-DWQ.

Attachment 1

Table of Soil Action Levels
for Kennecott North and South Zones

Site Wide Summary of Soil Action Levels for Kennecott North and South Zones								
Land Use, Media or Receptor	**As**	**Cd**	**Cr**	**Cu**	**Mo**	**Pb**	**Se**	**Zn**
OU1 Bingham Creek (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Commercial[2]	-	-	-	-	-	2000	-	-
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%
Residential[2]	100	-	-	-	-	1100	-	-
Discrete Bingham Creek Channel Parcels (Daybreak Community) - Residential[8]	100	-	-	-	-	700	-	-
Discrete Bingham Creek Channel Parcels (Daybreak Community) - Commercial[8]	450	-	-	-	-	2000	-	-
Discrete Daybreak Commerce Park Parcels[8]	450	-	-	-	-	2000	-	-
OU2 South End Groundwater (SOUTH ZONE)								
Groundwater	See Groundwater Action Levels Table							
OU3 Butterfield Waste Rock (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%
Residential, Day Care and Playgrounds[3]	100	-	-	-	-	1200	-	-
OU3 Butterfield Canyon Creek (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%
Residential, Day Care and Playgrounds[3]	100	-	-	-	-	1200	-	-
OU3 Herriman Residential and Agricultural (SOUTH ZONE)								
Industrial[5]	850	2794	8381	10.3%	13972	4000	13972	83%
Agricultural[5]	300	2148	6444	79689	10740	10,000	10740	64%
Recreational[5]	300	758	114	25.2%	34067	10,000	34067	100%
Residential, Day Care and Playgrounds[3]	100	-	-	-	-	1200	-	-
OU4 Large Bingham Reservoir (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%
OU5 Anaconda Tailings (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%
OU5 Bastian Ditch (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%
OU5 Bastian Ditch Daybreak Area (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%
Commercial[4]	450	-	-	-	-	2000	-	-
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%
Residential[4]	100	-	-	-	-	700	-	-
OU6 Lark Waste Rock and Tailings (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%

Site Wide Summary of Soil Action Levels for Kennecott North and South Zones								
Land Use, Media or Receptor	**As**	**Cd**	**Cr**	**Cu**	**Mo**	**Pb**	**Se**	**Zn**
OU7 South Jordan Evaporation Ponds (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Commercial[4]	450	-	-	-	-	2000	-	-
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%
Residential[4]	100	-	-	-	-	700	-	-
OU8 Waste Water Treatment Plan and Sludge Ponds (NORTH ZONE)								
Industrial[6]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[6]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[6]	283	758	114	25.2%	34067	2207	34067	100%
OU9 Magna Soils (NORTH ZONE)								
Industrial[6]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[6]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[6]	283	758	114	25.2%	34067	2207	34067	100%
OU10 Copperton Soils (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%
OU11 Historic Facilities (SOUTH ZONE)								
Industrial[7]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[7]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[7]	283	758	114	25.2%	34067	2207	34067	100%
OU12 Eastside Collection System (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%
Groundwater	See Groundwater Action Levels Table							
OU13 Smelter and Acid Plant (NORTH ZONE)								
Industrial[6]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[6]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[6]	283	758	114	25.2%	34067	2207	34067	100%
OU14 Refinery (NORTH ZONE)								
Industrial[6]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[6]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[6]	283	758	114	25.2%	34067	2207	34067	100%
OU15 Magna Mills and Tailings Ponds (NORTH ZONE)								
Industrial[6]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[6]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[6]	283	758	114	25.2%	34067	2207	34067	100%
OU16 Bingham Creek Underflow (SOUTH ZONE)								
Groundwater	See Groundwater Action Levels Table							
OU17 Bastian Sink (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Commercial[4]	450	-	-	-	-	2000	-	-
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%
Residential[4]	100	-	-	-	-	700	-	-
OU18 Acid Mine Drainage (Tooele County Areas) (SOUTH ZONE)								
Industrial[1]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[1]	100	2148	6444	79689	10740	8500	10740	64%

Site Wide Summary of Soil Action Levels for Kennecott North and South Zones								
Land Use, Media or Receptor	**As**	**Cd**	**Cr**	**Cu**	**Mo**	**Pb**	**Se**	**Zn**
Recreational[1]	283	758	114	25.2%	34067	2207	34067	100%
OU19 Smelter Fallout (NORTH ZONE)								
Industrial[6]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[6]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[6]	283	758	114	25.2%	34067	2207	34067	100%
OU20 Pine Canyon (SOUTH ZONE)								
Industrial[6]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[6]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[6]	283	758	114	25.2%	34067	2207	34067	100%
OU22 Great Salt Lake and Wetlands (NORTH ZONE)								
Industrial[6]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[6]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[6]	283	758	114	25.2%	34067	2207	34067	100%
OU23 North Zone Groundwater (NORTH ZONE)								
Groundwater	See Groundwater Action Levels Table							
OU24 Precipitation Plant (SOUTH ZONE)								
Industrial[6]	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural[6]	100	2148	6444	79689	10740	8500	10740	64%
Recreational[6]	283	758	114	25.2%	34067	2207	34067	100%

Notes for Site Wide Summary of Soil Action Levels for Kennecott North and South Zones

† The table provides a listing of the action levels for various metals of concern which can be found in soils located in the operable units of the Kennecott South and North Zones. The table provides concentration levels (or percentage values) to compare against soil characterization results. If a particular land use action level is exceeded, then, prior to redevelopment a person will have to undertake action to assess and/or mitigate the potential for exposure risk.

The term "action" may include but is not limited to: further site characterization, further site specific risk assessment, remedial/response action to mitigate exposure risk, implementation of institutional controls (ICs), and/or ongoing site management after development activities.

†† *The soil action levels listed in this table can only be used when comparing metals concentrations in soils/sediments collected from the operable units of the Kennecott South and North Zone.* As part of assessing the potential exposure risk caused by the listed metals of concern, certain variables specific to the Kennecott operable units were considered. These variables include, but are not limited to, the following: speciation and bioavailability of the metals of concern, the industrial processes that produced the specific mine waste with the metals of concern, and the types of specific land use activities that are likely to take place in each operable unit.

The listed action levels presented herein do not apply to other sites within the State of Utah located beyond the boundaries of the Kennecott operable units (except as otherwise explained below as it pertains to the site wide unrestricted land use action levels).

††† Default site wide (Kennecott South or North Zone) unrestricted land use action levels for arsenic (50 mg/kg), cadmium (70 mg/kg), lead (500 mg/kg), and selenium (390 mg/kg) have been derived for those portions of the site where a site specific, risk based, residential action level has not been established and for locations not modeled during the site specific risk assessments. Using default numbers for exposure parameters, conservative values for bioavailability and intake ratios under standard risk assessment and management methodology, the Agencies calculated the default unrestricted land use action levels. The unrestricted land use action levels are protective of public health for all land uses without restrictions, including relocation beyond the Kennecott boundaries. It is important to note, that while the arsenic, cadmium, lead, and selenium unrestricted land use action levels may be protective for a residential land use, they may not protective of other exposure scenarios (e.g., ecological risk).

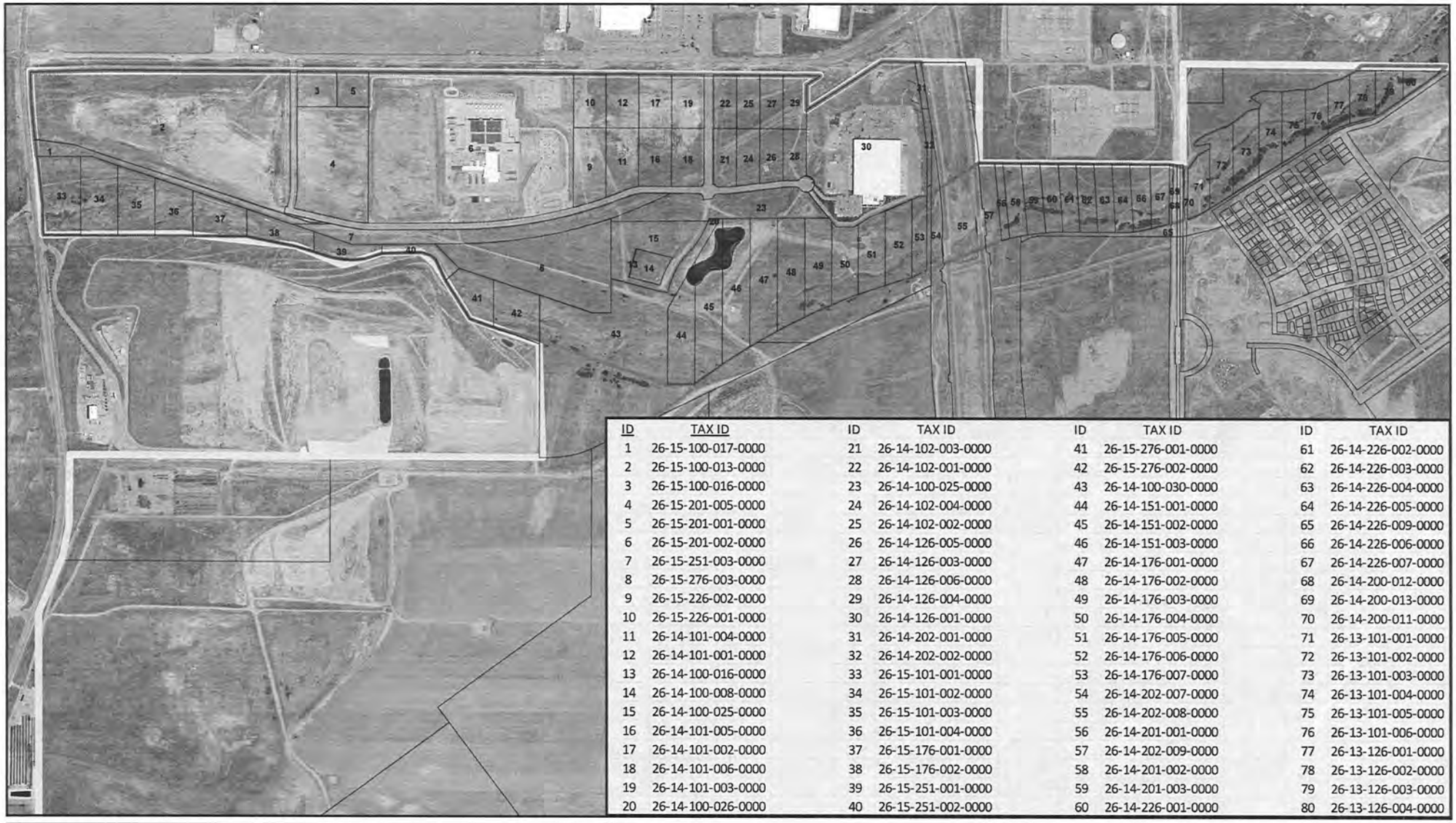
Both the arsenic and lead unrestricted land use action levels are based on risk assessment and risk management methods. Due to possibility of contaminated media associated with mining and smelting operations and the uncertainty associated with the limited environmental information (i.e., bioavailability) these unrestricted land use action levels should be used when limited characterization data is available and potential off-site (meaning beyond the Kennecott boundaries) relocation is being considered. The arsenic and lead unrestricted land use action levels are derived from the September 2002 Record of Decision.

The cadmium and selenium unrestricted land use action levels have been calculated by using a residential exposure scenario based on the "Risk Assessment Guidance for Superfund (RAGS) part B" (http://www.epa.gov/swerrims/riskassessment/ragsb/index.htm). Also considered were the screening values that are found in the Regional Screening Levels Tables dated May 2014. The unrestricted land use action levels for cadmium and selenium are the residential RSLs.

[1] The listed industrial, agricultural, and recreational land use action levels are located in the document entitled, *Final Preliminary Remediation Goals Report for Addressing Risks to Human Health From Exposure to Chemicals in Kennecott Soils*, December 30, 1999. These action levels are applicable site wide, absent operable unit specific risk based concentrations listed in the November

Notes for Site Wide Summary of Soil Action Levels for Kennecott North and South Zones
1998, September 2001, and September 2002 Records of Decision.
[2] For Operable Unit #1, the residential and commercial action levels for lead (respectively 1100 mg/kg and 2000 mg/kg lead) are obtained from two documents: (1) U.S. EPA Region 8 June 1995 Action Memo for the Bingham Creek Phase III residential removal action, and (2) U.S. EPA Region 8 February 1993 Unilateral Administrative Orders to Kennecott and ARCO (CERCLA-VIII-93-10) for the Bingham Creek Channel removal action. The residential action level for arsenic (100 mg/kg) is obtained from the November 1998 Record of Decision for Operable Unit 1.
[3] For Operable Unit #3, the action levels for residential, day care and playground land use application are obtained from the September 28, 2001 Record of Decision. The arsenic and lead action levels for these land use applications are based on speciation and exposure pathways which were considered as part of the risk assessment performed for the City of Herriman.
[4] Commercial and Residential action levels for undeveloped areas within the Daybreak Master Planned Community were proposed by Kennecott Utah Copper in the May 26, 2006 Exponent document entitled *Evaluation of Cleanup Levels for Arsenic and Lead in Soil for Undeveloped Portions of the Daybreak Area* and accepted by the CERCLA Agencies in a letter dated September 22, 2006.
[5] The listed industrial, agricultural, and recreational land use action levels are located in the document entitled, *Final Preliminary Remediation Goals Report for Addressing Risks to Human Health From Exposure to Chemicals in Kennecott Soils*, December 30, 1999, and as modified in the *Record of Decision* dated September 28, 2001 for Operable Unit #3.
[6] The listed industrial, agricultural, and recreational land use action levels are located in the document entitled, *Final Preliminary Remediation Goals Report for Addressing Risks to Human Health From Exposure to Chemicals in Kennecott Soils*, December 30, 1999, and as modified in the *Record of Decision Kennecott North Zone Site/Kennecott South Zone Site*, September 26, 2002.
[7] The listed industrial, agricultural and recreational land use action levels are obtained from the document entitled, *Final Preliminary Remediation Goals Report for Addressing Risks to Human Health From Exposure to Chemicals in Kennecott Soils*, December 30, 1999. At the time of land use change, the location of a historic site needs to consider the operable unit specific applicable land use standards (listed in the November 1998, September 2001 and September 2002 Records of Decision) to ascertain if an operable unit specific risk based land use standard is applicable.
[8] There are discrete parcels located within the Bingham Creek Channel and in the Daybreak Commerce Park that were considered in 2006 to be part of the overall Daybreak Community. The May 26, 2006 Exponent document entitled *Evaluation of Cleanup Levels for Arsenic and Lead in Soil for Undeveloped Portions of the Daybreak Area* addressed the establishment of residential and commercial land use action levels for the Daybreak Community as defined in the Exponent document and represented herein on Figure 1-A. Though limited, site specific data from the portions of Bingham Creek Channel and the Daybreak Commerce Park areas (located within the Daybreak Community) were included in the risk assessment. The CERCLA Agencies in a letter dated September 22, 2006 accepted the proposed land use action levels for the Daybreak Community. Figure 1-B herein portrays those portions of OU1 which are subject to the residential and commercial land use action levels for arsenic and lead, for the Daybreak Community.

DAYBREAK DEVELOPMENT
FIGURE 1-A



ID	TAX ID	ID	TAX ID	ID	TAX ID	ID	TAX ID
1	26-15-100-017-0000	21	26-14-102-003-0000	41	26-15-276-001-0000	61	26-14-226-002-0000
2	26-15-100-013-0000	22	26-14-102-001-0000	42	26-15-276-002-0000	62	26-14-226-003-0000
3	26-15-100-016-0000	23	26-14-100-025-0000	43	26-14-100-030-0000	63	26-14-226-004-0000
4	26-15-201-005-0000	24	26-14-102-004-0000	44	26-14-151-001-0000	64	26-14-226-005-0000
5	26-15-201-001-0000	25	26-14-102-002-0000	45	26-14-151-002-0000	65	26-14-226-009-0000
6	26-15-201-002-0000	26	26-14-126-005-0000	46	26-14-151-003-0000	66	26-14-226-006-0000
7	26-15-251-003-0000	27	26-14-126-003-0000	47	26-14-176-001-0000	67	26-14-226-007-0000
8	26-15-276-003-0000	28	26-14-126-006-0000	48	26-14-176-002-0000	68	26-14-200-012-0000
9	26-15-226-002-0000	29	26-14-126-004-0000	49	26-14-176-003-0000	69	26-14-200-013-0000
10	26-15-226-001-0000	30	26-14-126-001-0000	50	26-14-176-004-0000	70	26-14-200-011-0000
11	26-14-101-004-0000	31	26-14-202-001-0000	51	26-14-176-005-0000	71	26-13-101-001-0000
12	26-14-101-001-0000	32	26-14-202-002-0000	52	26-14-176-006-0000	72	26-13-101-002-0000
13	26-14-100-016-0000	33	26-15-101-001-0000	53	26-14-176-007-0000	73	26-13-101-003-0000
14	26-14-100-008-0000	34	26-15-101-002-0000	54	26-14-202-007-0000	74	26-13-101-004-0000
15	26-14-100-025-0000	35	26-15-101-003-0000	55	26-14-202-008-0000	75	26-13-101-005-0000
16	26-14-101-005-0000	36	26-15-101-004-0000	56	26-14-201-001-0000	76	26-13-101-006-0000
17	26-14-101-002-0000	37	26-15-176-001-0000	57	26-14-202-009-0000	77	26-13-126-001-0000
18	26-14-101-006-0000	38	26-15-176-002-0000	58	26-14-201-002-0000	78	26-13-126-002-0000
19	26-14-101-003-0000	39	26-15-251-001-0000	59	26-14-201-003-0000	79	26-13-126-003-0000
20	26-14-100-026-0000	40	26-15-251-002-0000	60	26-14-226-001-0000	80	26-13-126-004-0000

Rio Tinto
Kennecott Copper

N W E S

0 0.125 0.25 0.5 MI

0 250 500 1,000 1,500 2,000 2,500 FT

DaybreakDevelopment

Commerce Park

Bingham Creek Drainage

DAYBREAK DEVELOPMENT
FIGURE 1-B

Attachment 2

Table of Groundwater Action Levels for Kennecott North and South Zones

Site Wide Summary of Groundwater Action Levels for Kennecott North and South Zones													
	std units	mg/L	mg/L	Reported mg/L (Dissolved)									
	pH	Sulfate[8]	TDS[8]	D-As	D-B[9]	D-Ba-	D-Cd	D-Cr	D-Cu	D-Pb	T-Hg	D-Ni	D-Se
Groundwater Use	Std. Units	mg/L	mg/L	Reported mg/L (Dissolved) (except where noted)									
OU2[1] South End Groundwater, Zone A Acid Plume (SOUTH ZONE)													
Drinking	6.5 - 8.5	1500 (A) // 500 (P)[A]	NA[A]	0.01[B]		2.0	0.005	0.1	1.3[C]	0.015[D]	0.002	0.1	0.05
OU2[1] South End Groundwater, Zone A Sulfate Plume (SOUTH ZONE)													
Drinking	6.5 - 8.5	1500 (A) // 500 (P)[A]	NA[A]	0.01[B]		2.0	0.005	0.1	1.3[C]	0.015[D]	0.002	0.1	0.05
OU2[1] South End Groundwater, Zone B Plume[2] (SOUTH ZONE)													
Drinking	6.5 - 8.5	500	1000	0.01[B]		2.0	0.005	0.1	1.3[C]	0.015[D]	0.002	0.1	0.05
OU12[3] Eastside Collection System (SOUTH ZONE)													
Non-Drinking[4]	Refer to Footnote 4												
OU16[3] Bingham Creek Underflow (SOUTH ZONE)													
Non-Drinking[5]	Refer to Footnote 5												
OU23[3] North Zone Groundwater (NORTH ZONE)													
Non-Drinking[6]	Refer to Footnote 6												
Drinking[7]	6.5 - 8.5	500	1000	0.01[B]		2.0	0.005	0.1	1.3[C]	0.015[D]	0.002	0.1	0.05

Notes for Site Wide Summary of Groundwater Action Levels for Kennecott North and South Zones

† *This table summarizing CERCLA selected action levels and State of Utah protection limitations for groundwater is intended for use only at the Kennecott South and North Zones where mining influenced groundwater is managed.*

[1] The action levels listed are derived from UAC R309-200-5 (State of Utah Primary Drinking Water Standards) and the June 2007 ESD for OU2. Review of the April 2014 remedial progress report determined that for the 2012 and 2013 data sets there were some samples of groundwater extracted from the Zone A acid plume which contained un-speciated chromium results in exceedance of the State Primary Drinking Water Standard. Thus chromium is added until it can be demonstrated that this standard is complied with throughout the entirety of the Zone A plume.

[2] The December 2000 Record of Decision denotes that EPA Region 8 was deferring the selection of a remedy for the Zone B Plume pursuant to the State of Utah's Natural Resource Damage project addressing the mining influence to the aquifer in Zone B. The project being implemented in Zone B pursuant to the 2004 NRD Three Party Agreement (as amended in 2009) is producing treated water (in compliance with municipal water quality standards) from extracted groundwater from the impacted aquifer in Zone B. The contaminant specific limitations listed are derived from R309-200-5 for reference purposes (and are applicable for the treated water).

[3] The action levels listed (or referenced) are pursuant to the selected remedies for these three operable units and the 1995 Memorandum of Understanding. Kennecott manages mining influenced groundwater (in part) under the requirements of the State of Utah Groundwater Protection Program.

[4] Pursuant to the Utah Groundwater Protection Program, to ensure the protection of the underlying aquifer, discharge limits for the following contaminants are listed in Table 1 of Permit #UGW350010: pH, Sulfate, TDS, Cd-D, Cu-D, and Zn-D. The compliance limits are established from background concentrations at each compliance well (pursuant to R317-6-4). The permit can be found at: http://www.waterquality.utah.gov/GroundWater/gwpermits/index.htm

[5] Pursuant to the Utah Groundwater Protection Program, to ensure the protection of the underlying aquifer, discharge limits for the following contaminants are listed in Table 2 of Permit #UGW350010: pH, Sulfate, TDS, Cd-D, Cu-D, and Zn-D. The compliance limits are established from background concentrations at each compliance well (pursuant to R317-6-4). The permit can be found at: http://www.waterquality.utah.gov/GroundWater/gwpermits/index.htm

[6] Pursuant to the Utah Groundwater Protection Program, to ensure the protection of the underlying aquifer, discharge limits for the following contaminants are listed in Table 3 of Permit #UGW350008 (Smelter): pH, Chloride, Sulfate, TDS, As-D, Ba-D, Cd-D, Cr-D, Cu-D, PB-D, Se-D, Zn-D; Table 1 of Permit #UGW350011 (Tailings Impoundment): pH, Sulfate, TDS, As-D, Ba-D, Cd-D, Cr-D, Cu-D, Pb-D, Se-D, Zn-D, Table 1 of Permit #UGW350015 (North Concentrator): pH, Sulfate, TDS, As-D, B-D, Cd-D, Cr-D, Cu-D, Pb-D, Se-D, Zn-D. The compliance limits are established from historical trends at each compliance well (pursuant to R317-6-4). The permits can be found at: http://www.waterquality.utah.gov/GroundWater/gwpermits/index.htm

[7] Absent the mining influence and naturally occurring elevated TDS at OU23, the aquifer represents a potential source of drinking water for nearby communities. Though a drilling restriction (to prevent the development of the aquifer as a source of drinking water) is pending, the State of Utah Primary Drinking Water Standards (R309-200-5) are relevant if the impacted aquifer is somehow developed as a source of drinking water in the future.

[8] Pursuant to R309-200-5 (1)(c)(2) & (1)(c)(3) the State of Utah Primary Drinking Water Standards for Sulfate (500 mg/L) and TDS (1000 mg/L) can be allowed by the Division of Drinking Water Board to be higher. As it pertains to sulfate, (1)(c)(2), if the primary standard is to be set to 1000 mg/L a supplier will demonstrate: (a) no better quality water is available, and (b) the water is not for human consumption from commercial establishments. As it pertains to TDS, (1)(c)(3), if TDS is greater than 1000 mg/L (i.e. 2000 mg/L), a supplier shall demonstrate that no better water is available.

Notes for Site Wide Summary of Groundwater Action Levels for Kennecott North and South Zones
[9] Pursuant to the Groundwater Protection Permit #UGW350015 DWQ has established a permit limitation for Dissolved Boron due to the storage and use of coal at the RTKC Power Plant. Refer to note 6 and the reference to Permit #UGW350015 therein.
[A] The OU2 selected remedy (Dec. 2000 Record of Decision) requires active ("A") cleanup of the Zone A plume (extract and treat) until it can be demonstrated that sulfate concentrations comply with the site specific action level of 1,500 mg/L and drinking water standards for metals are attained. Thereafter, a passive ("P") cleanup requirement (monitored natural attenuation) is to be used to document that sulfate concentrations comply with the State of Utah Primary Drinking Water Standard for sulfate of 500 mg/L. No TDS action level was established under the selected remedy.
[B] Pursuant to R309-200-5(5) the primary drinking water standard for arsenic is 0.010 mg/L as of January 23, 2006.
[C] Pursuant to UAC R309-200-5(2)(b) "the copper action level is exceeded if the concentration of copper in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with R309-210-6(3) is greater than 1.3 mg/L (i.e. if the 90th percentile copper level is greater than 1.3 mg/L).
[D] Pursuant to UAC R309-200-5(2)(a) "the lead action level is exceeded if the concentration of lead in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with R309-210-6(3) is greater than 0.015 mg/L (i.e. if the 90th percentile lead level is greater than 0.015 mg/L).

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B

Laboratory Reports

ANALYTICAL REPORT

August 12, 2016

HDR - Boise, ID

Sample Delivery Group:	L851587
Samples Received:	08/05/2016
Project Number:	
Description:	Bangerter

Report To:

Manuel Rauhut
412 E. Park Center Blvd, Ste 100
Boise, ID 83706

Entire Report Reviewed By:

Shane Gambill
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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NE-BC-1-0-1 L851587-01 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 06:30 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 03:47	CCE
Total Solids by Method 2540 G-2011	WG896805	1	08/09/16 08:54	08/09/16 09:15	MEL

NE-BC-1-2-3 L851587-02 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 06:45 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 03:49	CCE
Total Solids by Method 2540 G-2011	WG896805	1	08/09/16 08:54	08/09/16 09:15	MEL

NE-BC-2-0-1 L851587-03 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 07:30 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 03:57	CCE
Total Solids by Method 2540 G-2011	WG896805	1	08/09/16 08:54	08/09/16 09:15	MEL

NE-BC-2-1.5-2.5 L851587-04 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 08:00 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:00	CCE
Total Solids by Method 2540 G-2011	WG896805	1	08/09/16 08:54	08/09/16 09:15	MEL

NE-BC-3-0-1 L851587-05 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 08:20 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:02	CCE
Total Solids by Method 2540 G-2011	WG896805	1	08/09/16 08:54	08/09/16 09:15	MEL

NE-BC-4-0-1 L851587-06 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 08:40 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:05	CCE
Total Solids by Method 2540 G-2011	WG896805	1	08/09/16 08:54	08/09/16 09:15	MEL

NE-BC-4-2-3 L851587-07 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 09:00 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:08	CCE
Total Solids by Method 2540 G-2011	WG896805	1	08/09/16 08:54	08/09/16 09:15	MEL

NE-BC-5-0-1 L851587-08 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 09:20 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:10	CCE
Total Solids by Method 2540 G-2011	WG896805	1	08/09/16 08:54	08/09/16 09:15	MEL

NE-BC-5-1.5-2 L851587-09 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 09:40 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:13	CCE
Total Solids by Method 2540 G-2011	WG896805	1	08/09/16 08:54	08/09/16 09:15	MEL

NE-FP-W-0-1 L851587-10 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 10:00 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:15	CCE
Total Solids by Method 2540 G-2011	WG896805	1	08/09/16 08:54	08/09/16 09:15	MEL

NE-FP-W-2-2.5 L851587-11 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 10:20 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:18	CCE
Total Solids by Method 2540 G-2011	WG896808	1	08/09/16 08:43	08/09/16 08:53	MEL

NE-FP-E-0-1 L851587-12 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 10:40 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:21	CCE
Total Solids by Method 2540 G-2011	WG896808	1	08/09/16 08:43	08/09/16 08:53	MEL

NE-FP-E-2-3 L851587-13 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 10:55 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:29	CCE
Total Solids by Method 2540 G-2011	WG896808	1	08/09/16 08:43	08/09/16 08:53	MEL

NE-TCLP-0-1 L851587-14 Waste

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 11:10 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG897334	1	08/10/16 11:15	08/10/16 16:03	TRB
Metals (ICP) by Method 6010B	WG897260	1	08/09/16 23:29	08/10/16 03:09	CCE
Preparation by Method 1311	WG896731	1	08/08/16 18:12	08/08/16 18:13	LJN

NE-TCLP-2-3 L851587-15 Waste

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 11:15 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG897334	1	08/10/16 11:15	08/10/16 16:06	TRB
Metals (ICP) by Method 6010B	WG897260	1	08/09/16 23:29	08/10/16 03:12	CCE
Preparation by Method 1311	WG896731	1	08/08/16 18:12	08/08/16 18:13	LJN

SW-BC-1-0-1 L851587-16 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 11:45 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:31	CCE
Total Solids by Method 2540 G-2011	WG896808	1	08/09/16 08:43	08/09/16 08:53	MEL

SW-BC-1-1.75-2.25 L851587-17 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 12:00 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:34	CCE
Total Solids by Method 2540 G-2011	WG896808	1	08/09/16 08:43	08/09/16 08:53	MEL

SW-BC-2-0-1 L851587-18 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 12:20 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:37	CCE
Total Solids by Method 2540 G-2011	WG896808	1	08/09/16 08:43	08/09/16 08:53	MEL

SW-BC-2-1.5-2 L851587-19 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 12:40 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:39	CCE
Total Solids by Method 2540 G-2011	WG896808	1	08/09/16 08:43	08/09/16 08:53	MEL

SW-BC-3-0-1 L851587-20 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 13:00 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:42	CCE
Total Solids by Method 2540 G-2011	WG896808	1	08/09/16 08:43	08/09/16 08:53	MEL

SW-BC-3-1.75-2.25 L851587-21 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 13:20 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897300	1	08/10/16 20:56	08/11/16 04:45	CCE
Total Solids by Method 2540 G-2011	WG896808	1	08/09/16 08:43	08/09/16 08:53	MEL

SW-BC-4-0-1 L851587-22 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 13:50 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897303	1	08/11/16 10:47	08/12/16 02:06	LTB
Total Solids by Method 2540 G-2011	WG896808	1	08/09/16 08:43	08/09/16 08:53	MEL

SW-BC-4-1.25-1.75 L851587-23 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 14:00 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897303	1	08/11/16 10:47	08/12/16 02:18	LTB
Total Solids by Method 2540 G-2011	WG896809	1	08/09/16 08:31	08/09/16 08:42	MEL

SW-BC-5-0-1 L851587-24 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 14:20 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897303	1	08/11/16 10:47	08/12/16 02:21	LTB
Total Solids by Method 2540 G-2011	WG896809	1	08/09/16 08:31	08/09/16 08:42	MEL

SW-FP-N-0-1 L851587-25 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 14:30 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897303	1	08/11/16 10:47	08/12/16 02:29	LTB
Total Solids by Method 2540 G-2011	WG896809	1	08/09/16 08:31	08/09/16 08:42	MEL

SW-FP-N-2-3 L851587-26 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 14:50 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897303	1	08/11/16 10:47	08/12/16 02:32	LTB
Total Solids by Method 2540 G-2011	WG896809	1	08/09/16 08:31	08/09/16 08:42	MEL

SW-FP-S-0-1 L851587-27 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 15:10 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897303	1	08/11/16 10:47	08/12/16 02:34	LTB
Total Solids by Method 2540 G-2011	WG896809	1	08/09/16 08:31	08/09/16 08:42	MEL

SW-FP-S-2-3 L851587-28 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 15:25 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897303	1	08/11/16 10:47	08/12/16 02:37	LTB
Total Solids by Method 2540 G-2011	WG896809	1	08/09/16 08:31	08/09/16 08:42	MEL

SW-TCLP-0-1 L851587-29 Waste

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 15:45 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG897334	1	08/10/16 11:15	08/10/16 16:09	TRB
Metals (ICP) by Method 6010B	WG897260	1	08/09/16 23:29	08/10/16 03:15	CCE
Preparation by Method 1311	WG896731	1	08/08/16 18:12	08/08/16 18:13	LJN

SW-TCLP-2-3 L851587-30 Waste

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 15:50 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG897334	1	08/10/16 11:15	08/10/16 16:12	TRB
Metals (ICP) by Method 6010B	WG897260	1	08/09/16 23:29	08/10/16 03:17	CCE
Preparation by Method 1311	WG896731	1	08/08/16 18:12	08/08/16 18:13	LJN

SE-0-1 L851587-31 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 07:40 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897303	1	08/11/16 10:47	08/12/16 02:40	LTB
Total Solids by Method 2540 G-2011	WG896809	1	08/09/16 08:31	08/09/16 08:42	MEL

SE-1.25-1.5 L851587-32 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 08:00 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897303	1	08/11/16 10:47	08/12/16 02:43	LTB
Total Solids by Method 2540 G-2011	WG896809	1	08/09/16 08:31	08/09/16 08:42	MEL

NW-0-1 L851587-33 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 06:20 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897303	1	08/11/16 10:47	08/12/16 02:45	LTB
Total Solids by Method 2540 G-2011	WG896809	1	08/09/16 08:31	08/09/16 08:42	MEL

NW-2-3 L851587-34 Solid

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 06:40 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG897303	1	08/11/16 10:47	08/12/16 02:48	LTB
Total Solids by Method 2540 G-2011	WG896809	1	08/09/16 08:31	08/09/16 08:42	MEL

ER-1 L851587-35 GW

Collected by: Manuel Ranhut | Collected date/time: 08/03/16 09:00 | Received date/time: 08/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG896849	1	08/09/16 11:50	08/09/16 17:36	ST

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Shane Gambill
Technical Service Representative

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	87.0		1	08/09/2016 09:15	WG896805

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	17.4		0.747	2.30	1	08/11/2016 03:47	WG897300
Lead	196		0.218	0.574	1	08/11/2016 03:47	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	88.6		1	08/09/2016 09:15	WG896805

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	22.2		0.733	2.26	1	08/11/2016 03:49	WG897300
Lead	183		0.214	0.564	1	08/11/2016 03:49	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	76.5		1	08/09/2016 09:15	WG896805

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	26.3		0.850	2.61	1	08/11/2016 03:57	WG897300
Lead	351		0.248	0.654	1	08/11/2016 03:57	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	77.5		1	08/09/2016 09:15	WG896805

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	49.4		0.839	2.58	1	08/11/2016 04:00	WG897300
Lead	264		0.245	0.645	1	08/11/2016 04:00	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	71.9		1	08/09/2016 09:15	WG896805

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	23.8		0.904	2.78	1	08/11/2016 04:02	WG897300
Lead	255		0.264	0.695	1	08/11/2016 04:02	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	77.8		1	08/09/2016 09:15	WG896805

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	24.9		0.835	2.57	1	08/11/2016 04:05	WG897300
Lead	257		0.244	0.642	1	08/11/2016 04:05	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	76.0		1	08/09/2016 09:15	WG896805

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	23.9		0.855	2.63	1	08/11/2016 04:08	WG897300
Lead	312		0.250	0.657	1	08/11/2016 04:08	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	92.3		1	08/09/2016 09:15	WG896805

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	13.2		0.704	2.17	1	08/11/2016 04:10	WG897300
Lead	53.5		0.206	0.542	1	08/11/2016 04:10	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	93.6		1	08/09/2016 09:15	WG896805

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	14.7		0.695	2.14	1	08/11/2016 04:13	WG897300
Lead	78.0		0.203	0.534	1	08/11/2016 04:13	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	91.1		1	08/09/2016 09:15	WG896805

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	10.8		0.714	2.20	1	08/11/2016 04:15	WG897300
Lead	111		0.209	0.549	1	08/11/2016 04:15	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	92.3		1	08/09/2016 08:53	WG896808

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	16.9		0.704	2.17	1	08/11/2016 04:18	WG897300
Lead	174		0.206	0.542	1	08/11/2016 04:18	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	94.6		1	08/09/2016 08:53	WG896808

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	9.36		0.687	2.11	1	08/11/2016 04:21	WG897300
Lead	87.4		0.201	0.528	1	08/11/2016 04:21	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	97.2		1	08/09/2016 08:53	WG896808

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	7.43		0.669	2.06	1	08/11/2016 04:29	WG897300
Lead	48.9		0.195	0.514	1	08/11/2016 04:29	WG897300

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		8/8/2016 6:12:30 PM	WG896731

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	08/10/2016 16:03	WG897334

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.450	5	1	08/10/2016 03:09	WG897260
Barium	ND		1.35	100	1	08/10/2016 03:09	WG897260
Cadmium	ND		0.450	1	1	08/10/2016 03:09	WG897260
Chromium	ND		0.450	5	1	08/10/2016 03:09	WG897260
Lead	ND		0.450	5	1	08/10/2016 03:09	WG897260
Selenium	ND		0.450	1	1	08/10/2016 03:09	WG897260
Silver	ND		0.450	5	1	08/10/2016 03:09	WG897260

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		8/8/2016 6:12:30 PM	WG896731

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	08/10/2016 16:06	WG897334

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.450	5	1	08/10/2016 03:12	WG897260
Barium	ND		1.35	100	1	08/10/2016 03:12	WG897260
Cadmium	ND		0.450	1	1	08/10/2016 03:12	WG897260
Chromium	ND		0.450	5	1	08/10/2016 03:12	WG897260
Lead	ND		0.450	5	1	08/10/2016 03:12	WG897260
Selenium	ND		0.450	1	1	08/10/2016 03:12	WG897260
Silver	ND		0.450	5	1	08/10/2016 03:12	WG897260

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	95.4		1	08/09/2016 08:53	WG896808

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	15.2		0.681	2.10	1	08/11/2016 04:31	WG897300
Lead	102		0.199	0.524	1	08/11/2016 04:31	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	93.3		1	08/09/2016 08:53	WG896808

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	15.5		0.697	2.14	1	08/11/2016 04:34	WG897300
Lead	100		0.204	0.536	1	08/11/2016 04:34	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	87.2		1	08/09/2016 08:53	WG896808

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	15.4		0.745	2.29	1	08/11/2016 04:37	WG897300
Lead	86.8		0.218	0.573	1	08/11/2016 04:37	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	88.7		1	08/09/2016 08:53	WG896808

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	14.4		0.733	2.25	1	08/11/2016 04:39	WG897300
Lead	87.2		0.214	0.564	1	08/11/2016 04:39	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	79.8		1	08/09/2016 08:53	WG896808

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	12.1		0.815	2.51	1	08/11/2016 04:42	WG897300
Lead	78.5		0.238	0.627	1	08/11/2016 04:42	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	76.7		1	08/09/2016 08:53	WG896808

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	16.7		0.848	2.61	1	08/11/2016 04:45	WG897300
Lead	97.9		0.248	0.652	1	08/11/2016 04:45	WG897300

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	81.3		1	08/09/2016 08:53	WG896808

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	16.5		0.799	2.46	1	08/12/2016 02:06	WG897303
Lead	104		0.234	0.615	1	08/12/2016 02:06	WG897303

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	91.4		1	08/09/2016 08:42	WG896809

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	23.1		0.711	2.19	1	08/12/2016 02:18	WG897303
Lead	160		0.208	0.547	1	08/12/2016 02:18	WG897303

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	89.6		1	08/09/2016 08:42	WG896809

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	15.6		0.725	2.23	1	08/12/2016 02:21	WG897303
Lead	117		0.212	0.558	1	08/12/2016 02:21	WG897303

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	99.4		1	08/09/2016 08:42	WG896809

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	14.6		0.654	2.01	1	08/12/2016 02:29	WG897303
Lead	108		0.191	0.503	1	08/12/2016 02:29	WG897303

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	96.4		1	08/09/2016 08:42	WG896809

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	11.8		0.674	2.07	1	08/12/2016 02:32	WG897303
Lead	96.6		0.197	0.519	1	08/12/2016 02:32	WG897303

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	98.6		1	08/09/2016 08:42	WG896809

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	15.6		0.659	2.03	1	08/12/2016 02:34	WG897303
Lead	101		0.193	0.507	1	08/12/2016 02:34	WG897303

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	97.7		1	08/09/2016 08:42	WG896809

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	18.1		0.665	2.05	1	08/12/2016 02:37	WG897303
Lead	109		0.194	0.512	1	08/12/2016 02:37	WG897303

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		8/8/2016 6:12:30 PM	WG896731

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	08/10/2016 16:09	WG897334

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.450	5	1	08/10/2016 03:15	WG897260
Barium	ND		1.35	100	1	08/10/2016 03:15	WG897260
Cadmium	ND		0.450	1	1	08/10/2016 03:15	WG897260
Chromium	ND		0.450	5	1	08/10/2016 03:15	WG897260
Lead	ND		0.450	5	1	08/10/2016 03:15	WG897260
Selenium	ND		0.450	1	1	08/10/2016 03:15	WG897260
Silver	ND		0.450	5	1	08/10/2016 03:15	WG897260

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		8/8/2016 6:12:30 PM	WG896731

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	08/10/2016 16:12	WG897334

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.450	5	1	08/10/2016 03:17	WG897260
Barium	ND		1.35	100	1	08/10/2016 03:17	WG897260
Cadmium	ND		0.450	1	1	08/10/2016 03:17	WG897260
Chromium	ND		0.450	5	1	08/10/2016 03:17	WG897260
Lead	ND		0.450	5	1	08/10/2016 03:17	WG897260
Selenium	ND		0.450	1	1	08/10/2016 03:17	WG897260
Silver	ND		0.450	5	1	08/10/2016 03:17	WG897260

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	95.7		1	08/09/2016 08:42	WG896809

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	10.2		0.679	2.09	1	08/12/2016 02:40	WG897303
Lead	54.8		0.198	0.522	1	08/12/2016 02:40	WG897303

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	97.8		1	08/09/2016 08:42	WG896809

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	12.3		0.665	2.05	1	08/12/2016 02:43	WG897303
Lead	79.7		0.194	0.511	1	08/12/2016 02:43	WG897303

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	88.8		1	08/09/2016 08:42	WG896809

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	11.1		0.732	2.25	1	08/12/2016 02:45	WG897303
Lead	108		0.214	0.563	1	08/12/2016 02:45	WG897303

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	90.7		1	08/09/2016 08:42	WG896809

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Arsenic	14.8		0.716	2.20	1	08/12/2016 02:48	WG897303
Lead	126		0.209	0.551	1	08/12/2016 02:48	WG897303

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Arsenic	U		0.00650	0.0100	1	08/09/2016 17:36	WG896849
Lead	U		0.00190	0.00500	1	08/09/2016 17:36	WG896849

Method Blank (MB)

(MB) R3155566-1 08/09/16 09:15

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.000400			

L851587-02 Original Sample (OS) • Duplicate (DUP)

(OS) L851587-02 08/09/16 09:15 • (DUP) R3155566-3 08/09/16 09:15

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	88.6	88.7	1	0.0635		5

Laboratory Control Sample (LCS)

(LCS) R3155566-2 08/09/16 09:15

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3155565-1 08/09/16 08:53

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00130			

L851587-18 Original Sample (OS) • Duplicate (DUP)

(OS) L851587-18 08/09/16 08:53 • (DUP) R3155565-3 08/09/16 08:53

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	87.2	87.1	1	0.189		5

Laboratory Control Sample (LCS)

(LCS) R3155565-2 08/09/16 08:53

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3155564-1 08/09/16 08:42

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00130			

L851587-33 Original Sample (OS) • Duplicate (DUP)

(OS) L851587-33 08/09/16 08:42 • (DUP) R3155564-3 08/09/16 08:42

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	88.8	88.5	1	0.316		5

Laboratory Control Sample (LCS)

(LCS) R3155564-2 08/09/16 08:42

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3155832-1 08/10/16 15:22

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Mercury	U		0.00333	0.0100

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3155832-2 08/10/16 15:25 • (LCSD) R3155832-3 08/10/16 15:28

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Mercury	0.0300	0.0298	0.0297	99	99	80-120			0	20

L851616-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L851616-01 08/10/16 15:31 • (MS) R3155832-4 08/10/16 15:33 • (MSD) R3155832-5 08/10/16 15:36

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Mercury	0.0300	ND	0.0285	0.0307	95	102	1	75-125			7	20

L851449-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L851449-02 08/10/16 15:39 • (MS) R3155832-6 08/10/16 15:48 • (MSD) R3155832-7 08/10/16 15:51

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Mercury	0.0300	ND	ND	ND	0	0	1	75-125	J6	J6	0	20

Method Blank (MB)

(MB) R3155483-1 08/09/16 14:19

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Arsenic	U		0.0065	0.0100
Lead	U		0.0019	0.00500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3155483-2 08/09/16 14:21 • (LCSD) R3155483-3 08/09/16 14:24

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Arsenic	1.00	1.04	1.04	104	104	80-120			1	20
Lead	1.00	1.00	1.01	100	101	80-120			1	20

L851516-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L851516-01 08/09/16 14:26 • (MS) R3155483-5 08/09/16 14:32 • (MSD) R3155483-6 08/09/16 14:34

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Arsenic	1.00	ND	1.04	1.05	104	105	1	75-125			1	20
Lead	1.00	ND	0.992	1.00	99	100	1	75-125			1	20

Method Blank (MB)

(MB) R3155576-1 08/10/16 02:28

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.15	0.450
Barium	U		0.45	1.35
Cadmium	U		0.15	0.450
Chromium	U		0.15	0.450
Lead	U		0.15	0.450
Selenium	U		0.15	0.450
Silver	U		0.15	0.450

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3155576-2 08/10/16 02:31 • (LCSD) R3155576-3 08/10/16 02:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	9.11	9.07	91	91	80-120			0	20
Barium	10.0	9.31	9.29	93	93	80-120			0	20
Cadmium	10.0	9.21	9.17	92	92	80-120			0	20
Chromium	10.0	8.94	8.93	89	89	80-120			0	20
Lead	10.0	9.29	9.28	93	93	80-120			0	20
Selenium	10.0	9.38	9.29	94	93	80-120			1	20
Silver	10.0	9.00	8.99	90	90	80-120			0	20

L851449-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L851449-02 08/10/16 02:36 • (MS) R3155576-5 08/10/16 02:42 • (MSD) R3155576-6 08/10/16 02:44

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	9.26	9.49	93	95	1	75-125			3	20
Barium	10.0	ND	9.50	9.70	90	92	1	75-125			2	20
Cadmium	10.0	ND	9.29	9.46	93	95	1	75-125			2	20
Chromium	10.0	ND	8.81	8.93	88	89	1	75-125			1	20
Lead	10.0	ND	9.44	9.57	93	94	1	75-125			1	20
Selenium	10.0	ND	9.64	9.82	96	98	1	75-125			2	20
Silver	10.0	ND	9.13	9.31	91	93	1	75-125			2	20

L851884-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L851884-01 08/10/16 02:47 • (MS) R3155576-7 08/10/16 02:49 • (MSD) R3155576-8 08/10/16 02:52

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	9.18	9.07	92	91	1	75-125			1	20
Barium	10.0	ND	9.45	9.32	94	93	1	75-125			1	20
Cadmium	10.0	ND	9.32	9.17	93	92	1	75-125			2	20
Chromium	10.0	ND	9.01	8.86	90	89	1	75-125			2	20
Lead	10.0	ND	9.35	9.21	93	92	1	75-125			2	20
Selenium	10.0	ND	9.46	9.36	95	94	1	75-125			1	20
Silver	10.0	ND	9.46	9.26	92	90	1	75-125			2	20

Method Blank (MB)

(MB) R3155936-1 08/11/16 03:26

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.65	2.00
Lead	U		0.19	0.500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3155936-2 08/11/16 03:29 • (LCSD) R3155936-3 08/11/16 03:31

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	94.6	93.9	95	94	80-120			1	20
Lead	100	94.5	94.1	94	94	80-120			0	20

L851480-22 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L851480-22 08/11/16 03:34 • (MS) R3155936-6 08/11/16 03:42 • (MSD) R3155936-7 08/11/16 03:44

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	3.21	91.7	92.3	88	89	1	75-125			1	20
Lead	100	11.7	106	107	95	95	1	75-125			0	20

Method Blank (MB)

(MB) R3156243-1 08/12/16 01:58

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.65	2.00
Lead	0.251	J	0.19	0.500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3156243-2 08/12/16 02:01 • (LCSD) R3156243-3 08/12/16 02:03

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	97.9	108	98	108	80-120			10	20
Lead	100	99.8	110	100	110	80-120			10	20

L851587-22 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L851587-22 08/12/16 02:06 • (MS) R3156243-6 08/12/16 02:13 • (MSD) R3156243-7 08/12/16 02:16

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	123	16.5	152	137	110	98	1	75-125			10	20
Lead	123	104	248	234	117	106	1	75-125			6	20

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Rec.	Recovery.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660
Alaska	UST-080
Arizona	AZ0612
Arkansas	88-0469
California	01157CA
Colorado	TN00003
Conneticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia [1]	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
Iowa	364
Kansas	E-10277
Kentucky [1]	90010
Kentucky [2]	16
Louisiana	AI30792
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086
Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico	TN00003
New York	11742
North Carolina	Env375
North Carolina [1]	DW21704
North Carolina [2]	41
North Dakota	R-140
Ohio–VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	221
South Carolina	84004
South Dakota	n/a
Tennessee [1 4]	2006
Texas	T 104704245-07-TX
Texas [5]	LAB0152
Utah	6157585858
Vermont	VT2006
Virginia	109
Washington	C1915
West Virginia	233
Wisconsin	9980939910
Wyoming	A2LA

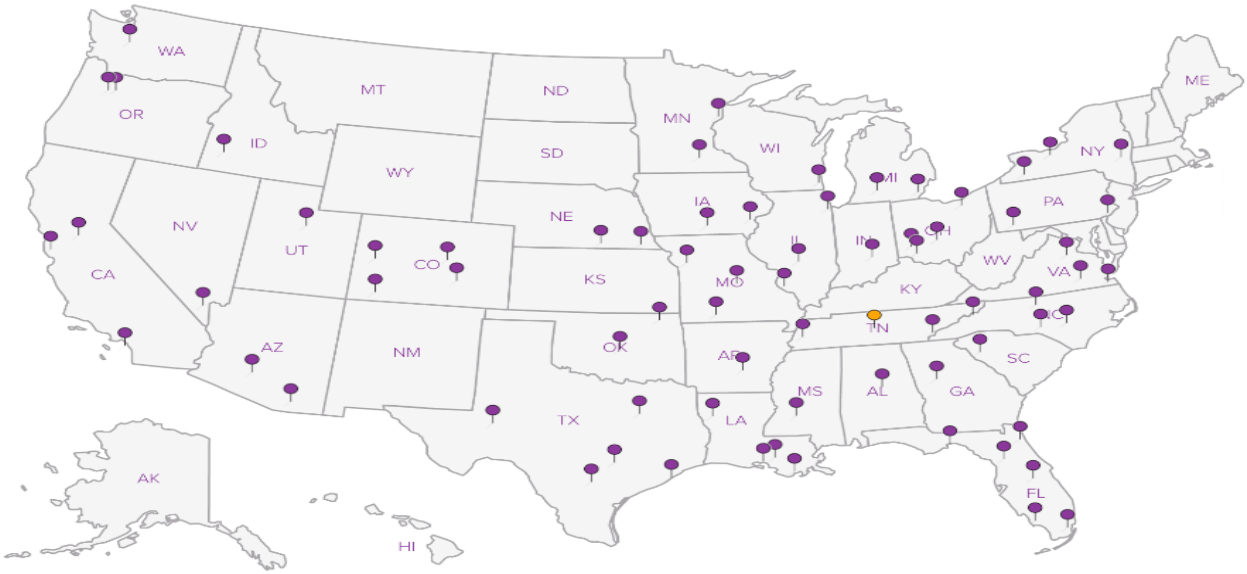
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



HDR - Boise, ID

412 E. Park Center Blvd, Ste 100
Boise, ID 83706

Billing Information:

Accounts Payable- Zelma Miller
412 E. Park Center Blvd, Ste 100
Boise, ID 83706

Report to: **Manuel Rauhut**

Email To: **Manuel.Rauhut@hdrinc.com**

Project Description: Bungerter

City/State Collected:

Phone: **208-850-4668**
Fax:

Client Project #

Lab Project # **HDRBID-UTSOIL**

Collected by (print): Manuel Rauhut

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 185187

J059

Acctnum: **HDRBID**
Template: **T114381**
Prelogin: **P562337**
TSR: **728 - Shane Gambill**
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TCLP Metals 4ozClr-NoPres	TS, ASICP,PBICP 4ozClr-NoPres	Rem./Contaminant	Sample # (lab only)
NE-BC-1-0-1		SS		8/3/16	0630	1		X		-01
NE-BC-1-2-3		SS		8/3/16	0645	1		X		-02
NE-BC-2-0-1		SS		8/3/16	0730	1		X		-03
NE-BC-2-1.5-2.5		SS		8/3/16	0800	1		X		-04
NE-BC-3-0-1		SS		8/3/16	0820	1		X		-05
NE-BC-4-0-1		SS		8/3/16	0840	1		X		-06
NE-BC-4-2-3		SS		8/3/16	0900	1		X		-07
NE-BC-5-0-1		SS		8/3/16	0920	1		X		-08
NE-BC-5-1.5-2		SS		8/3/16	0940	1		X		-09
NE-FP-W-0-1		SS		8/3/16	1000	1		X		-10

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

6617 3619 7130

Hold #

Condition: (lab use only) SW 7

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF: X

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	8/4/16	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 2.9 °C Bottles Received: 35

Date: 8-5-16 Time: 0800

HDR - Boise, ID

412 E. Park Center Blvd, Ste 100
Boise, ID 83706

Billing Information:

Accounts Payable- Zelma Miller
412 E. Park Center Blvd, Ste 100
Boise, ID 83706

Report to: **Manuel Rauhut**

Email To: **Manuel.Rauhut@hdrinc.com**

Project Description: Bangerter

City/State Collected: West Jordan Utah

Phone: **208-850-4668**
Fax:

Client Project #

Lab Project # **HDRBID-UTSOIL**

Collected by (print): Manuel Rauhut

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TCLP Metals 4ozClr-NoPres	TS, ASICP,PBICP 4ozClr-NoPres	Rem./Contaminant	Sample # (lab only)
NE-FP-W-2-2.5	G	SS		8/3/16	1020	1		X		-11
NE-FP-E-0-1	G	SS		8/3/16	1040	1		X		-12
NE-FP-E-2-3	G	SS		8/3/16	1055	1		X		-13
NE-TCLP-0-1	C	SS		8/3/16	1110	1	X	~~X~~		-14
NE-TCLP-2-3	C	SS		8/3/16	1115	1	X	~~X~~		-15
SW-BC-1-0-1	G	SS		8/3/16	1145	1		X		-16
SW-BC-1-1.75-2.25	G	SS		8/3/16	1200	1		X		-17
SW-BC-2-0-1	G	SS		8/3/16	1220	1		X		-18
SW-BC-2-1.5-2	G	SS		8/3/16	1240	1		X		-19
SW-BC-3-0-1	G	SS		8/3/16	1300	1		X		-20

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	8/4/16	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 2.9 °C Bottles Received: 35

Date: 8-5-16 Time: 0900

Hold #

Condition: (lab use only) JW7

COC Seal Intact: ___Y ___N ✓NA

pH Checked: NCF: X

Chain of Custody Page ___ of ___

ESC LAB SCIENCES

YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 151587

Table #

Acctnum: **HDRBID**
Template: **T114381**
Prelogin: **P562337**
TSR: **728 - Shane Gambill**
PB:
Shipped Via:

HDR - Boise, ID

412 E. Park Center Blvd, Ste 100
Boise, ID 83706

Billing Information:
Accounts Payable- Zelma Miller
412 E. Park Center Blvd, Ste 100
Boise, ID 83706

Report to: **Manuel Rauhut**

Email To: **Manuel.Rauhut@hdrinc.com**

Project Description: Bangerter

City/State Collected: West Jordan Utah

Phone: **208-850-4668**
Fax:

Client Project #

Lab Project # **HDRBID-UTSOIL**

Collected by (print): Manuel Rauhut

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L851587

Table #

Acctnum: **HDRBID**
Template: **T114381**
Prelogin: **P562337**
TSR: **728 - Shane Gambill**
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TCLP Metals 4ozClr-NoPres	TS, ASICP,PBICP 4ozClr-NoPres	Rem./Contaminant	Sample # (lab only)
SW-BC-3-1.75-2.25		SS		8/3/16	1320	1		X		-21
SW-BC-4-0-1		SS		8/3/16	1350	1		X		-22
SW-BC-4-1.25-1.75		SS		8/3/16	1400	1		X		-23
SW-BC-5-0-1		SS		8/3/16	1420	1		X		-24
SW-FP-N-0-1		SS		8/3/16	1430	1		X		-25
SW-FP-N-2-3		SS		8/3/16	1450	1		X		-26
SW-FP-S-0-1		SS		8/3/16	1510	1		X		-27
SW-FP-S-2-3		SS		8/3/16	1525	1		X		-28
SW-TCLP-0-1		SS		8/3/16	1545	1	X	X		-29
SW-TCLP-2-3		SS		8/3/16	1550	1	X	X		-30

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	8/4/16	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 2.9 °C Bottles Received: 35

Date: 8-5-16 Time: 0900

Condition: (lab use only)

COC Seal Intact: ___Y ___N ✓ NA

pH Checked: NCF: X

HDR - Boise, ID

412 E. Park Center Blvd, Ste 100
Boise, ID 83706

Billing Information:
Accounts Payable- Zelma Miller
412 E. Park Center Blvd, Ste 100
Boise, ID 83706

Report to: **Manuel Rauhut**

Email To: **Manuel.Rauhut@hdrinc.com**

Project Description: Bangerter

City/State Collected: West Jordan Utah

Phone: **208-850-4668**
Fax:

Client Project #

Lab Project # **HDRBID-UTSOIL**

Collected by (print): Manuel Rauhut

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TCLP Metals 4ozClr-NoPres	TS, ASICP,PBICP 4ozClr-NoPres	Rem./Contaminant	Sample # (lab only)
SE-0-1		SS			0740	1		X		-31
SE-1.25-1.5		SS			0800	1		X		-32
NW-0-1		SS			0620	1		X		-33
NW-2-3		SS			0640	1		X		-34
		SS				1	X			
		TCLP				1	X			
		SS				1	X			
ER-1		H_2O			0900					-35

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: ER-1 Rinsate; Lead & Arsenic

pH _____ Temp _____
Flow _____ Other _____

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L851587

Table #

Acctnum: **HDRBID**
Template: **T114381**
Prelogin: **P562337**
TSR: **728 - Shane Gambill**
PB:

Shipped Via:

Hold #

Condition: (lab use only) Jw7

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF: X

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	8/4/16	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 2.9 °C Bottles Received: 35

Date: 8-5-16 Time: 0900

ESC
L·A·B S·C·I·E·N·C·E·S
YOUR LAB OF CHOICE

Cooler Receipt Checklist

Client: HDRBID SDG# L851587

Cooler Received/Opened On: 8-5-2016 By: Richard Hughes

Temperature Upon Receipt: 3.9 °c

(Signature)

Cooler Receipt Check List	Yes	No	N/A
Were custody seals on outside of cooler and intact?	✓		
Were custody papers properly filled out (ink, signed, etc.)?	✓		
Did all bottles arrive in good condition?	✓		
Were correct bottles used for the analyses requested?	✓		
Was sufficient amount of sample sent in each bottle?	✓		
Were correct preservatives used?			✓
Were all applicable sample containers checked for preservation? (Any samples not in accepted pH range noted on COC .)			✓
If applicable, was an observable VOA headspace present?			✓
Non Conformance Generated? (If yes see attached NCF)	Ø	✓	

TO Ø

ESC Lab Sciences
Non-Conformance Form

Login #: L851587	Client: HDRBID	Date: 8/5/16	Evaluated by: Troy Dunlap

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time		Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type	X	Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Courie
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: Container received unpreserved for ER-1. Total or Dissolved?

Client informed by:		Call		Email		Voice Mail		Date:	Time:
TSR Initials: CSG	Client Contact:								

Login Instructions:

Please pour up and preserve for Total metals – PBICP, ASICP

This E-mail and any attached files are confidential, and may be copyright protected. If you are not the addressee, any dissemination of this communication is strictly prohibited. If you have received this message in error, please contact the sender immediately and delete/destroy all information received.

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS

PART 9:

WARRANTY PROVISIONS

Final Issued September 15, 2016

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9C -2 Distress Trigger Values for Flexible Pavements 6

9—WARRANTY PROVISIONS

9A. GENERAL

Warrant the Work for the duration of the Warranty Period in accordance with the requirements of this Part 9 and Part 2 (General Provisions). Remove, replace, or correct Work at no cost to the Department when an element of Work does not meet Contract requirements.

Warranty Period. Except as specified otherwise within the Contract provisions, warrant the Work for two years after the date of Final Acceptance.

9B. STANDARDS

Not used

9C. REQUIREMENTS

9C-1 Geotechnical—Maximum Permissible Settlements

Warrant the maximum permissible settlements during the designated Warranty Periods as follows.

A. **Pavements**: As measured by a string line and/or from the as-designed roadway grade.

1. Transverse direction: 0.2 inch differential per 12-foot lane width
2. Longitudinal direction:
    a. Structure approaches: 0.5 inch differential per 25 feet
    b. All other locations: 0.3 inch differential per 50 feet
3. Total post-construction settlement: 1 inch

B. **Foundations Supporting Bridges**:

1. Total settlement: 1.0 inch, and maintain minimum structure height clearances
2. Differential settlement:
    a. Transverse across substructure unit(s): 0.2 inch per 12-foot width
    b. Longitudinal between adjacent foundation supports: 0.75 inch per 100 feet

C. Structure Approach Slabs

1. Longitudinal direction (parallel to roadway alignment): 1 inch differential per 25 feet
2. Transverse direction: 0.2 inch per 12-foor lane width

D. **Deep Foundations Supporting Walls**:

1. Total settlement: 1 inch
2. Differential settlement: 0.5 inch per 30 feet

E. **Mechanically Stabilized Earth (MSE) Walls**: The following maximum movements (all measured at the wall face) will be applied for the wall Warranty Period. The parenthetical entries are examples of the maximum allowable movements, typically

for the minimum length of measurement;

1. Differential Settlement (measured at wall face):
   a. Single-stage walls: 0.3% (1.8 inches per 50 lineal feet of wall)
   b. Two-stage walls, first stage (wire facing): 1.5% (3.6 inches per 20 feet of wall)
   c. Two-stage walls, second stage (panels): 0.15% (0.9 inch per 50 feet of wall)
2. Horizontal Alignment: 0.25% (0.9 inch per 30 lineal feet of wall)
3. Vertical Alignment: 0.25% (0.3 inch per 10-foot vertical segment of wall)
4. Overall Plumbness: 0.2% (0.45 inch for 20 foot height of wall)

9C-2 Pavement—Rigid and Flexible

A. Warrant that, during the Warranty Period, both the allowable level and extent of severity for the various distress types identified do not exceed those trigger values identified in Table 9C-1 (Distress Trigger Values for Rigid Pavements) and Table 9C-2 (Distress Trigger Values for Flexible Pavements) for the two pavement types. If any of these values is exceeded, take the recommended corrective action to bring these parameters within the limits.

TABLE 9C-1
DISTRESS TRIGGER VALUES FOR RIGID PAVEMENTS

Distress Type	***Allowable Severity***		***Corrective Action ****
	Level	***Extent***	
Cracking:			
Corner Break	Low Severity: Crack not spalled for more than 10% of the length of crack; no measurable faulting; and corner piece not broken into two or more pieces	Low Extent: 2 corner breaks per lane-mile	Repair full depth.
Durability "D" Cracking	Crescent-shaped hairline cracking, with no loose or missing pieces	Not allowed	Replace total slab.
Longitudinal Cracking	Low Severity: Crack widths <1/8", no spalling, and no measurable faulting; or well-sealed and with a width that cannot be determined	Low Extent: 4 slabs per lane-mile	If cracking exceeds low severity, replace full depth of slab. If two or more cracks per panel, replace full slab.
Transverse Cracking	Low Severity: Crack widths <1/8", no spalling, and no measurable faulting; or well-sealed and with a width that cannot be determined.	Low Extent: 4 slabs per lane-mile	Replace according to UDOT Standard Drawings, Section 450. If two or more cracks per panel, replace full slab.
Joint Deficiencies:			
Joint Seal Damage—Transverse	Low Severity: Transverse joint sealant damage, as described by the Strategic Highway Research Program (SHRP): extrusion, hardening, adhesive failure, cohesive failure, or complete loss of sealant	Low Extent: 10% of joint length per lane-mile	Reseal joint.

TABLE 9C-1
DISTRESS TRIGGER VALUES FOR RIGID PAVEMENTS

Distress Type	*Allowable Severity*		*Corrective Action **
	Level	*Extent*	
Joint Seal Damage—Longitudinal	Low Severity: Longitudinal joint sealant damage, as described by SHRP: joint sealant damage, extrusion, hardening, adhesive failure, cohesive failure, or complete loss of sealant.	Low Extent: 10% of joint length per lane-mile	Reseal joint.
Spalling—Longitudinal Joint	Low Severity: Spalls <3" wide (measured to center of joint) with loss of material; or spalls with no loss of material and no patching.	Low Extent: <5% of joint length per lane-mile	If severity is low, fill void with hot-pour sealant. If low severity is exceeded, repair to full depth.
Spalling—Transverse Joint	Low Severity: Spalls <3" wide (measured to center of joint), with loss of material; or spalls with no loss of material and no patching.	Low Extent: <5% of joint length per lane-mile or 25% of a joint.	If severity is low, fill void with hot-pour sealant. If low severity is exceeded, repair to full depth.
Surface Defects:			
Surface Crazing	(Not applicable)	Low Extent: <1% of surface area per lane-mile	Apply UDOT Standard Penetrating Seal.
Scaling	Deterioration of upper concrete surface	Low Extent: <1% of surface area per lane-mile	Apply UDOT Standard Penetrating Seal.
Map Cracking	Cracks that extend only into the upper surface of slab, compromising structural capacity	Not allowed	Replace total slab.
Polished Aggregate Damage	Surface mortar and texturing worn away	Low Extent: Skid resistance value <45 at end of 2 years	Abrade or grind surface to exceed established skid resistance values.
Popouts	Small pieces of pavement >1 inch in diameter broken loose from surface	More than 3 per square yard ($yd^{2)}$	Remove and replace with flexible repair material.
Miscellaneous Distress:			
Blowups	Not applicable; however, severity levels can be defined by ride quality and safety.	Low Severity: Within established ride quality and skid-resistance criteria, and a visual inspection	Within 24 hours, Department will perform temporary repair; within six months, Design-Builder must repair to full depth.
Faulting of Transverse Joints and Cracks	None allowed		If faulting of transverse joints occurs, replace the full depth of the slab.
Lane-to-Shoulder or Lane-to-Lane Dropoff; Lane-to-Shoulder or Lane-to-Lane Ramp Separation	Allowable: Maximum = ¼ inch; Mean width < ¼ inch.	2% of joint length per lane-mile	Retrofit No. 5 tie bars @ 3-foot centers; grind and overlay.

TABLE 9C-1
DISTRESS TRIGGER VALUES FOR RIGID PAVEMENTS

Distress Type	***Allowable Severity***		***Corrective Action ****
	Level	***Extent***	
Differential Settlement at approach slab/pavement interface	Allowable: Maximum = ½ inch	At any location	Slab-jack or remove and replace pavement panel
Patch/Patch Deterioration	None allowed		Replace to full depth.
Water Bleeding and Pumping	Seeping or ejection of water from beneath the pavement through cracks	Not allowed	Underseal slab and seal joint.
** All corrective action(s) apply to full width of paving pass for full length of distress, except as noted otherwise.*			

TABLE 9C-2
DISTRESS TRIGGER VALUES FOR FLEXIBLE PAVEMENTS

Distress Type	*Allowable Severity*		*Corrective Action **
	Level	*Extent*	
Cracking:			
Fatigue Cracking	Low Severity: An area of cracks with no cracks or only a few connecting cracks; cracks not spalled or sealed; pumping not evident	Low Extent: <5% of the wheelpath, defined as a 3-foot-wide pass centered 3 feet off the lane line each side per lane-mile	Repair to full depth and replace with similar section; in this case, "full depth" is the depth of the pavement section (including base courses).
Block Cracking	Low Severity: Cracks with mean width ≤¼"; or sealed cracks with sealant material in good condition and with a width that cannot be determined	Low Extent: <5% of surface area per lane-mile	Seal cracks and overlay.
Edge Cracking	Low Severity: Cracks with no breakup or loss of material	Low Extent: <10% of pavement edge per lane-mile	Seal crack.
Longitudinal Cracking	Low Severity: Cracks with mean width ≤¼"; sealed cracks with sealant material in good condition and with a width that cannot be determined	Low Extent: <10% of pavement edge per lane-mile	Reseal crack and overlay.
Transverse Cracking	Low Severity: An unsealed crack with mean width ≤¼"; or sealed cracks with sealant material in good condition and with a width that cannot be determined.	Low Extent: <100 cracks per lane-mile; no 3 cracks (no cracks??) within 50-foot stretch	Seal or reseal crack or joint and overlay.
Patching and Potholes:			
Patch/Patch Deterioration	None allowed		Repair to full depth.
Potholes	None allowed		Repair to full depth.
Surface Deformation:			
Rutting	<1/8 inch deep	Low Extent: <5% of traveled surface per lane-mile	Rotomill and overlay; determine cause (e.g., OGSC or full depth) and replace to that depth.
Shoving	<1/8 inch deep	Low Extent: <5% of traveled surface per lane-mile	Repair to full depth or Rotomill and overlay; determine cause (e.g., OGSC or full depth) and replace to that depth.
Surface Defects:			
Bleeding	Low Severity: An area of pavement surface discolored (relative to the remainder of the pavement) by excess asphalt	Low Extent: 2% of surface area per lane-mile	Surface-treat with plant mix friction course.

TABLE 9C-2
DISTRESS TRIGGER VALUES FOR FLEXIBLE PAVEMENTS

Distress Type	*Allowable Severity*		*Corrective Action **
	Level	*Extent*	
Polished Aggregate	Reduction in surface friction.	Low Extent: 2% of surface area per lane-mile	Surface-treat with plant mix friction course.
Raveling	Low Severity: Aggregate or binder beginning to wear away, but no significant progression yet; some loss of fine aggregate.	Low Extent: <2% of surface area per lane-mile.	Surface-treat with plant mix surface treatment.
Miscellaneous Distress:			
Lane-to-Shoulder Dropoff	Allowable: Maximum ¼"; and Mean width, <¼".	Low Extent: 5% of joint length per lane-mile	Restore shoulder elevation.
Water Bleeding and Pumping	Seeping or ejection of water from beneath the pavement through cracks	Not allowed	Seal or reseal.
Differential Settlement at approach slab/pavement interface	Allowable: Maximum = ½ inch	At any location	Slab-jack or remove and replace pavement
**** All corrective action(s) apply to full width of paving pass for full length of distress, except where noted otherwise.***			

9C-3 Lamps and Luminaires

Warrant all luminaires for 10 years.

9C-4 Pedestrian Bridge

Warrant the pedestrian bridge against defects in material and workmanship.

9C-5 Drainage

A. Warrant the quality and function of drainage features constructed under this contract for the duration of the Warranty Period.

B. Warrant the quality and function of irrigation facilities constructed under this Contract for the duration of the Warranty Period.

9D. SUBMITTALS

Provide submittals to the Department in accordance with Table 9D-1.

TABLE 9D-1
DESIGN-BUILDER SUBMITTALS FOR WARRANTIES

Submittal	*For Approval*	*Schedule*
Warranty Bond and Letter of Credit for Pavement Markings	No	Prior to Placing

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

REFERENCE DOCUMENTS (RD)

Final Issued September 15, 2016

TABLE OF CONTENTS

1. Aerial Images

2. Preliminary Engineering Concept (PEC) Base Build - Revised

3. PEC Build Alternative – 4015 West Reconstruction - Revised

4. Electronic Files - Revised

a) 5400 South
    1. 4015 West - Build Alternative
b) 7000 South
c) 9000 South
d) 11400 South

5. Environmental Documentation - Revised

a) Final State Environmental Study (SES) Bangerter Hwy & 5400 South
b) Final SES Bangerter Hwy & 7000 South
c) Final SES Bangerter Hwy & 9000 South
d) Final SES Bangerter Hwy & 11400 South
e) USBOR Aqueduct Environmental Assessment (EA) Draft
f) Section 404 Permit 9000 South

6. Municipal & County Standards

a) Salt Lake County Standards
b) South Jordan City Standards
c) South Valley Sewer District Standards
d) Taylorsville City Standards
e) Taylorsville Bennion Improvement District Standards
f) West Jordan City Standards

7. USBOR Aqueduct Relocation Plans

8. Drainage Basin Maps and Supporting Information

a) Drainage Basin Maps
b) South Jordan City Bangerter Hwy. and 9000 South Supporting Drainage and Utilities Information
c) South Jordan City Bangerter Hwy. and 11400 South Supporting Drainage Information

9. As-Builts

a) Bangerter Hwy (SR-154) at 6200, 7000 & 7800 South DB
b) Bangerter Hwy (SR-154) at 4700 & 5400 South (SR-173) Flex Lanes CFI
c) 5400 South (SR-173) from Bangerter Hwy (SR-154) to 4800 West
d) 7000 South & WVH Pedestrian Bridge
e) Original Bangerter
    1. SR-154 WVH 4100 South to 5400 South

f) USBOR Aqueduct As-Builts

10. West Jordan Betterment

11. Draft Aesthetics Plan

a) Bangerter Highway Aesthetics Treatment
b) Aesthetics Land Form

12. Right-of-Way Plans - Revised

13. Utility General Estimated Costs

a) Estimated Costs for AT&T
b) Estimated Costs for First Digital and Questar
c) Estimated Costs for Syringa

14. Miscellaneous Agreements

a) MOA UDOT and SJ Marketplace
b) SLCC RIRO Letter
c) UTA-UDOT Partnering Agreement June 2015

15. Utility Structure Sheets

a) Water Vaults
b) Storm Drain
c) Sewer

16. Traffic Models

a) 5400 South
b) 7000 South
c) 9000 South
d) 11400 South

REFERENCE DOCUMENTATION NOT INCLUDED IN MAIN PDF DOCUMENT; INCLUDED AS SEPARATE DOCUMENTS/ELECTRONIC FILES.