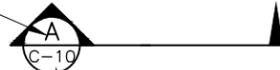


SECTION IDENTIFICATION

(1) SECTION CUT SHOWN ON DRAWING AS:
SECTION LETTER



DRAWING NUMBER WHERE THE SECTION IS SHOWN (SEE NOTE A)

(2) THIS SECTION IS IDENTIFIED AS: SECTION LETTER

SECTION

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 THE DETAIL NAME IS OPTIONAL AND LOCATED HERE, FOLLOWING DETAIL CALLOUT
DRAWING NUMBER WHERE THE DETAIL IS SHOWN



(2) THIS DETAIL IS IDENTIFIED AS: DETAIL NUMBER

DETAIL

SCALE: AS DESIGNATED (SEE NOTE A)



DRAWING NUMBER WHERE THE DETAIL IS SHOWN

TYPICAL DETAIL IDENTIFICATION

DETAIL NAME

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.

- 1 COORDINATE IDENTIFICATION
- ELEVATION INDICATOR
- SECTION CORNER
- BENCH MARK
- MONUMENT INDICATOR
- POTHOLE
- TEST HOLE
- BORING HOLE
- SECTION LINE
- PROPERTY LINE
- EASEMENT
- PARCEL
- 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
- CUT OR FILL SLOPE TO BE CONSTRUCTED
- SILT FENCE
- 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 LUMINAIRES
- LIGHT POLE
- STREET LIGHT WITH BRACKET
- MASONRY
- STEEL
- INSULATION
- GRAVEL
- CONCRETE
- EARTH
- SAND
- GRATING
- PLASTIC, RUBBER OR NEOPRENE
- WOOD (ROUGH FRAMING) OR OPENING OR DEPRESSION IN SLAB OR WALL
- CHANGE IN PIPING MATERIAL
- REVISION WORK

- ANSI AMERICAN NATIONAL STANDARDS INSTITUTE
- ASME AMERICAN SOCIETY OF MECHANICAL ENGINEERS
- ASTM AMERICAN SOCIETY FOR TESTING AND MATERIALS
- 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
- JWTP 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 PRESSURE GAUGE
- PG POINT OF INTERSECTION
- PI POINT OF BEGINNING
- 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

ABBREVIATIONS:

GENERAL NOTES:

- 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 CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED TO ORIGINAL OR BETTER CONDITION TO THE SATISFACTION OF THE OWNER AT THE EXPENSE OF THE CONTRACTOR.
- 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.
- 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.
- 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.
- PROFILE DRAWINGS ARE HORIZONTAL PROJECTIONS OF THE PIPELINE CENTERLINE, UNLESS OTHERWISE NOTED.
- 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.
- 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.
- 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.
- 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.
- HYDRAULIC DESIGN CRITERIA OF JA-3 RELOCATION SEGMENT - 50 PSI WORKING PRESSURE AND 100 PSI TEST PRESSURE.
- 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.

JA - 3 RELOCATION HORIZONTAL ALIGNMENT										
NUMBER	ELEMENT	STATION	NORTHING	EASTING	PI NORTHING	PI EASTING	DELTA	RADIUS	TANGENT	CURVE LENGTH
L3	POB	1250+15.59	408714.63	507105.98					N09°30'42"W	
L4	PI	1250+18.99	408717.99	507105.42					N17°54'48"W	
L5	PI	1251+43.24	408836.21	507067.21					N16°58'20"W	
C4	PC	1252+10.39	408900.43	507047.61	409342.27	506912.76	021°18'19"	2455.94'	N06°19'10"W	913.24'
L7	PT	1261+23.62	409802.90	506947.66					N04°19'59"E	
L9	PI	1263+22.42	410001.13	506962.68					N06°43'10"E	
L8	PI	1264+45.25	410123.12	506977.05					N47°24'08"E	
L12	PI	1266+11.59	410235.71	507099.50					N01°33'50"E	
L11	POE	1266+18.47	410242.58	507099.69					N01°33'50"E	

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATIONPROJECT NUMBER: S-0154(82)16
PIN: 14785SYMBOLS, ABBREVIATIONS AND NOTES

DATE: 07/14/16
DATE: 07/14/16

APPROVED: [Signature]
PROFESSIONAL ENGINEER

DRAWN: 2016.07.14
CHECKED BY: JL
DATE: 07-14-16

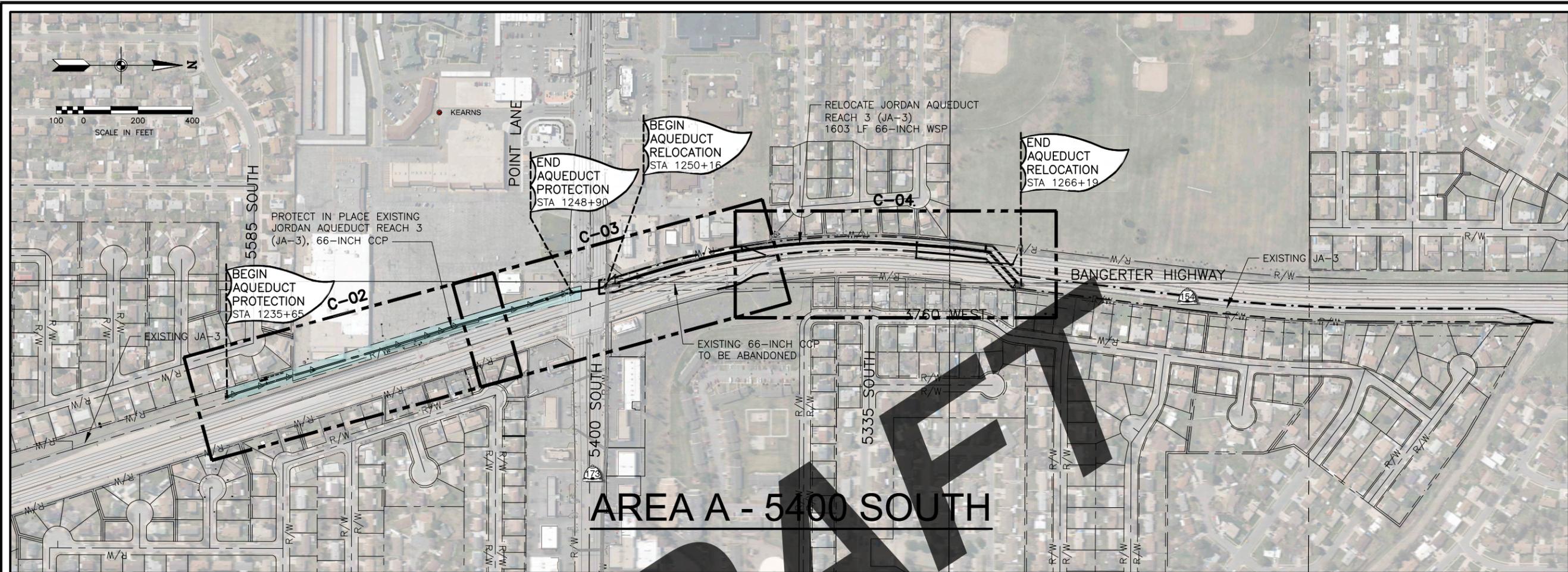
ACCEPTED: BART LEEFLANG, P.E.
MANAGER, FIELD ENGINEERING DIVISION

STATION: PROVO, UTAH

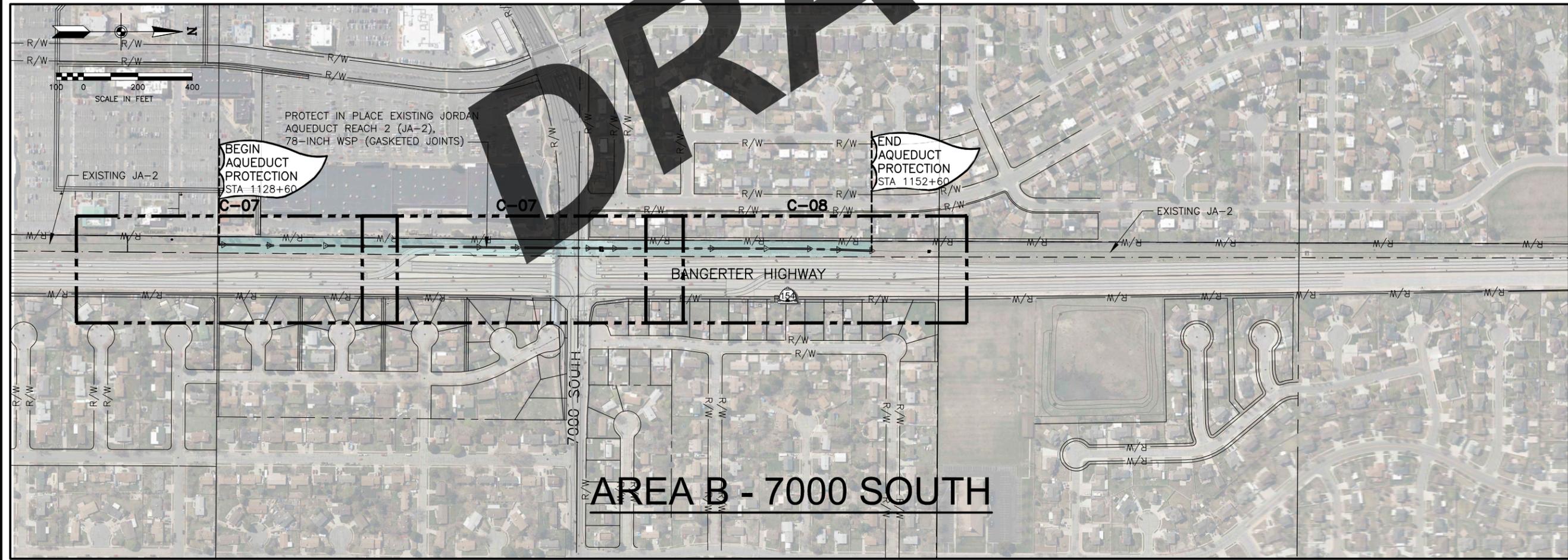
REVISIONS:

NO.	DATE	APPROVED BY	REMARKS

SHEET NO. G-01



AREA A - 5400 SOUTH

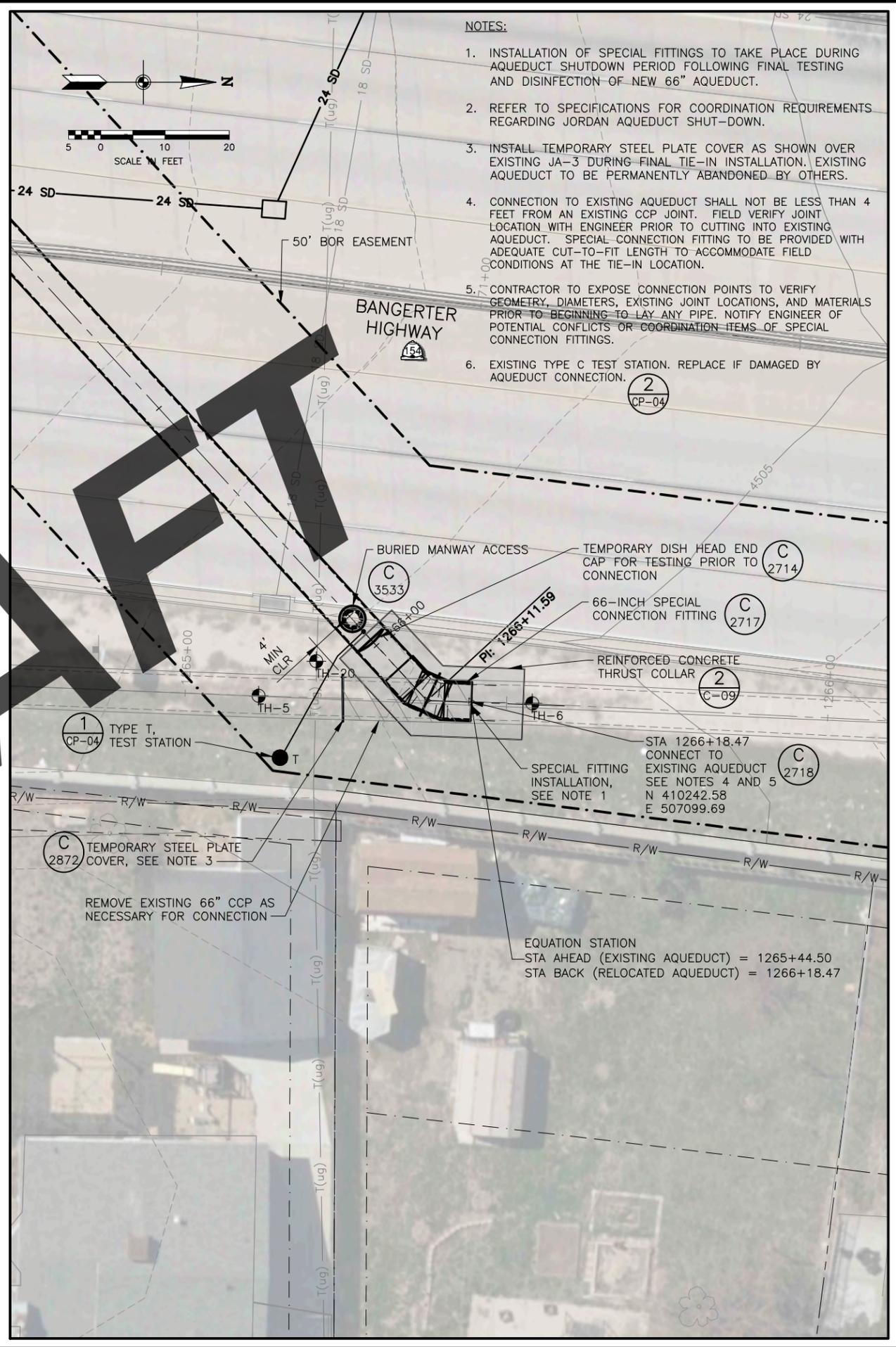
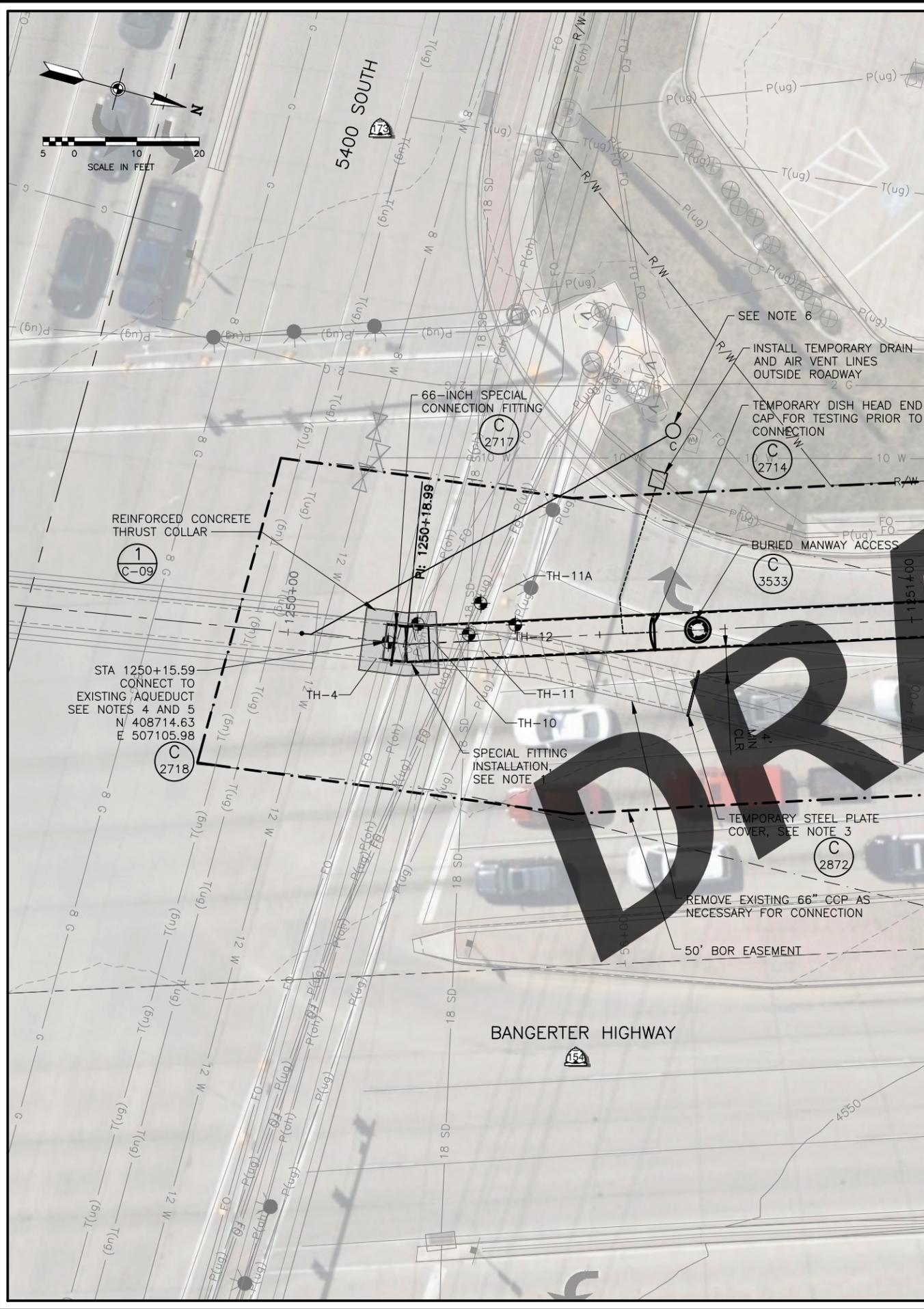


AREA B - 7000 SOUTH

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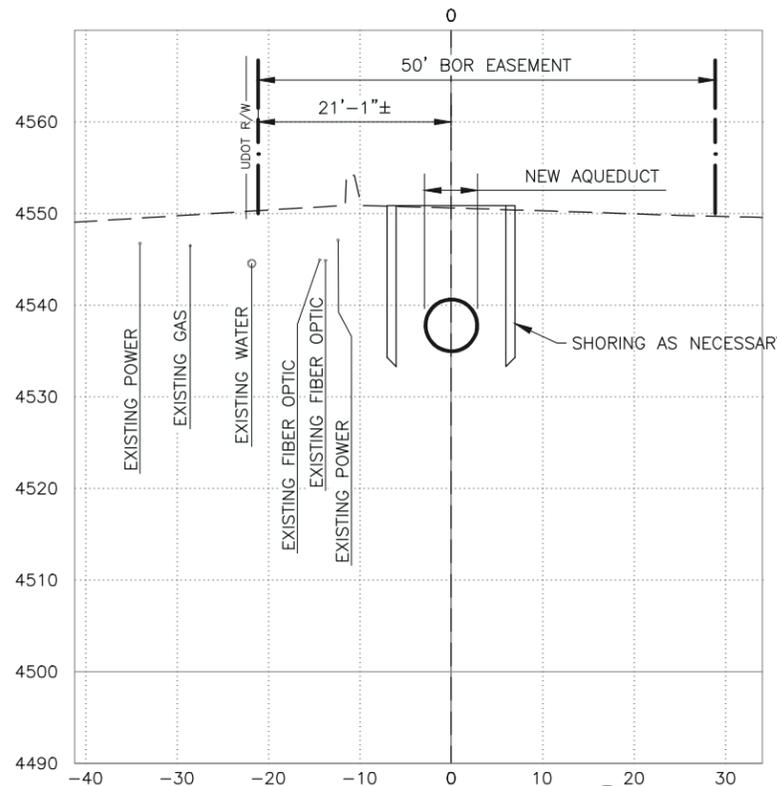
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PROJECT NUMBER		S-0154(82)16	
PROJECT PIN		14785	
OVERALL SITE PLAN			
UTAH DEPARTMENT OF TRANSPORTATION REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.			
APPROVED		DATE	
 PROFESSIONAL ENGINEER		07/14/16	
DRAWN BY		SR	
CHECKED BY		JL	
DATE		07/14/16	
STATION: PROVO, UTAH		NO. DATE APPROVED BY	
2016.07.20 18:04:00		REVISIONS	
DRAWN BY		REMARKS	
ACCEPTED		NO.	
BART LEFLANG, P.E.		DATE	
MANAGER, FIELD ENGINEERING DIVISION		APPROVED BY	
SHEET NO. C-01		REMARKS	

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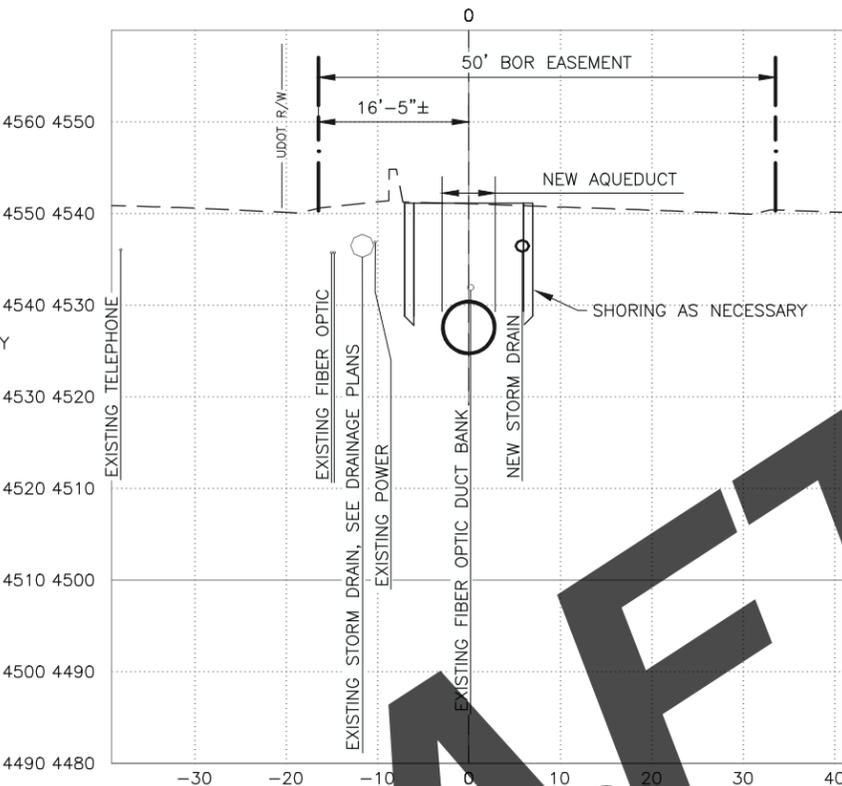


- NOTES:
1. INSTALLATION OF SPECIAL FITTINGS TO TAKE PLACE DURING AQUEDUCT SHUTDOWN PERIOD FOLLOWING FINAL TESTING AND DISINFECTION OF NEW 66" AQUEDUCT.
 2. REFER TO SPECIFICATIONS FOR COORDINATION REQUIREMENTS REGARDING JORDAN AQUEDUCT SHUT-DOWN.
 3. INSTALL TEMPORARY STEEL PLATE COVER AS SHOWN OVER 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

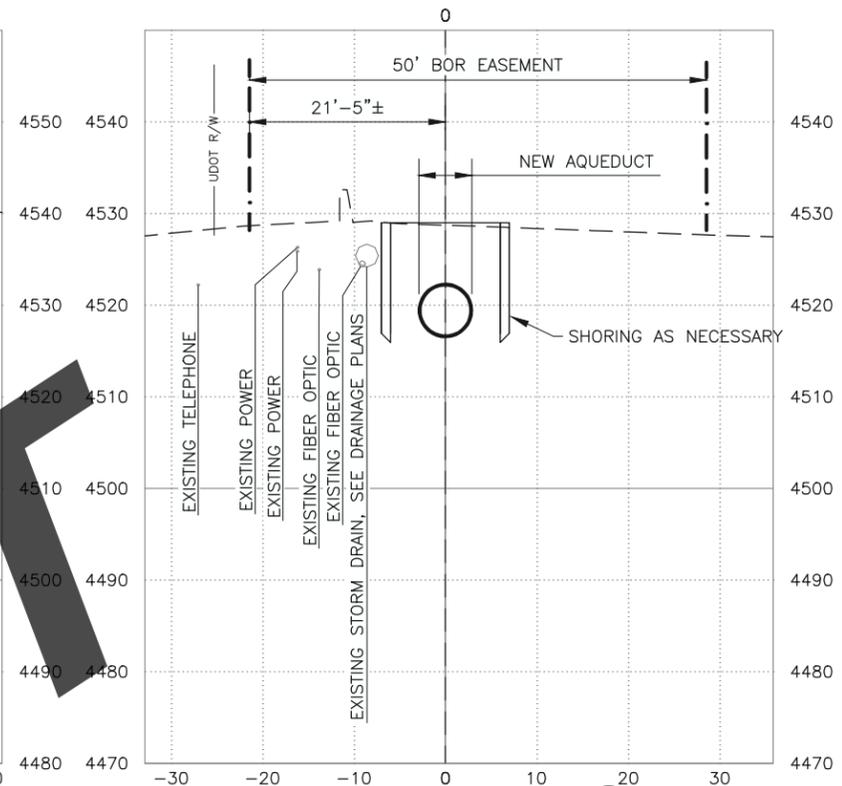
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PROJECT: SR-154 BANGERTER HWY	PROJECT NUMBER: S-0154(82)16	PIN: 14785	PROFESSIONAL ENGINEER: _____	DATE: 07/14/16
JORDAN AQUEDUCT PROTECTION AND RELOCATION		ENLARGED PLANS AT CONNECTION POINTS		
DRAWN: 2016.07.20 18:04		STATION: PROVO, UTAH		
ACCEPTED: BART LEIFLANG, P.E. MANAGER, FIELD ENGINEERING DIVISION		REMARKS:		
NO. DATE APPROVED BY		REVISIONS:		
SHEET NO. C-05		STATION: PROVO, UTAH		



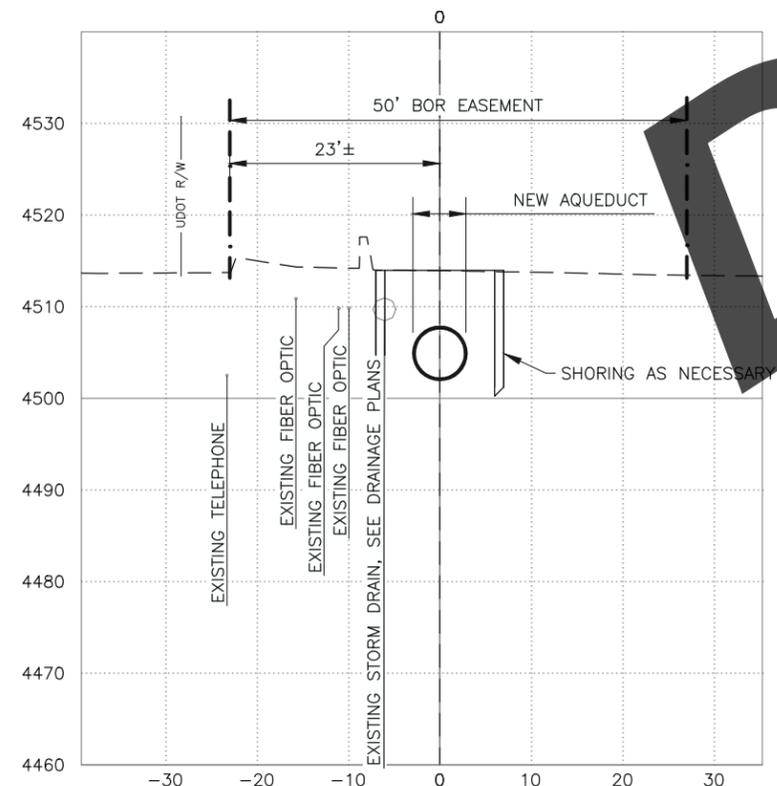
CROSS SECTION A
SCALE: 1" = 20'-0"
C-03



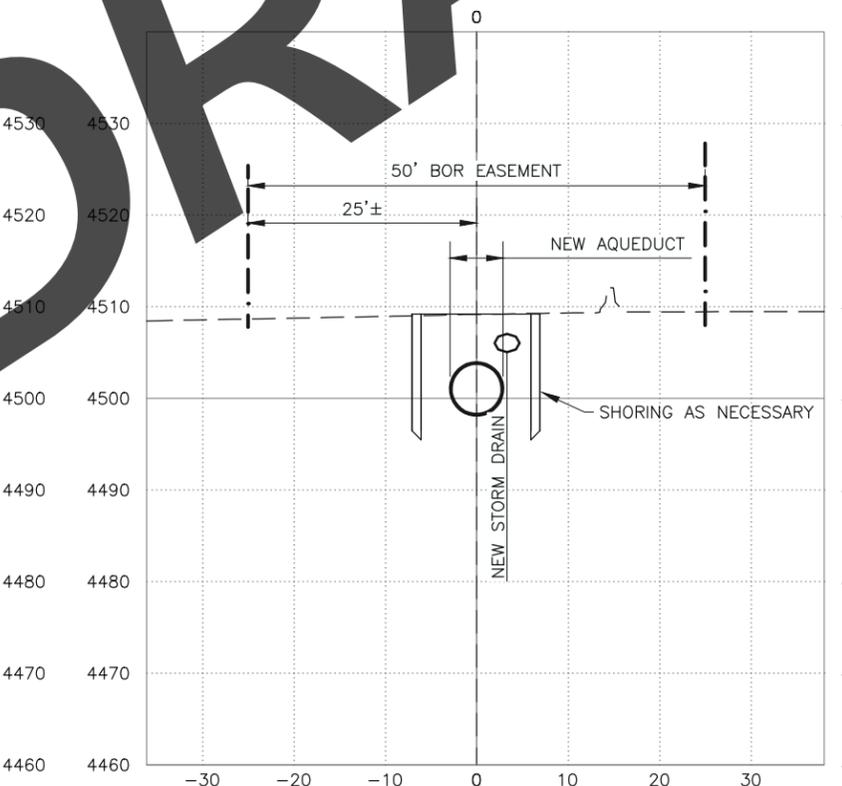
CROSS SECTION B
SCALE: 1" = 20'-0"
C-03



CROSS SECTION C
SCALE: 1" = 20'-0"
C-04



CROSS SECTION D
SCALE: 1" = 20'-0"
C-04

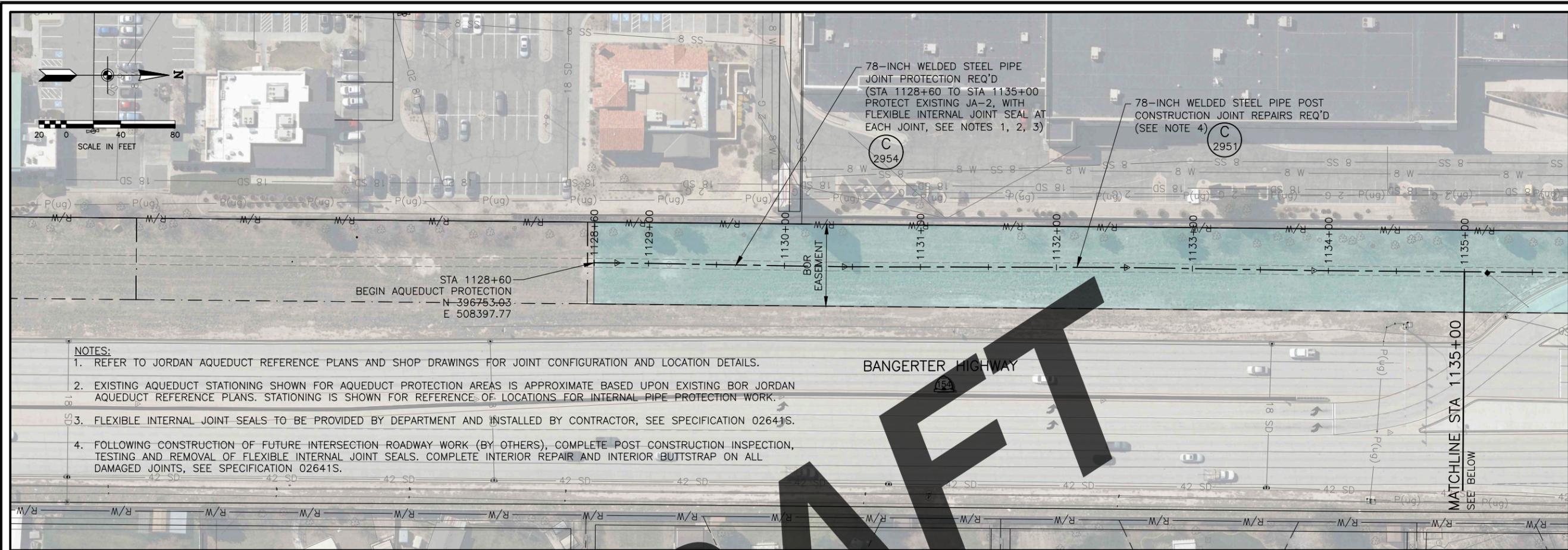


CROSS SECTION E
SCALE: 1" = 20'-0"
C-04

DRAFT

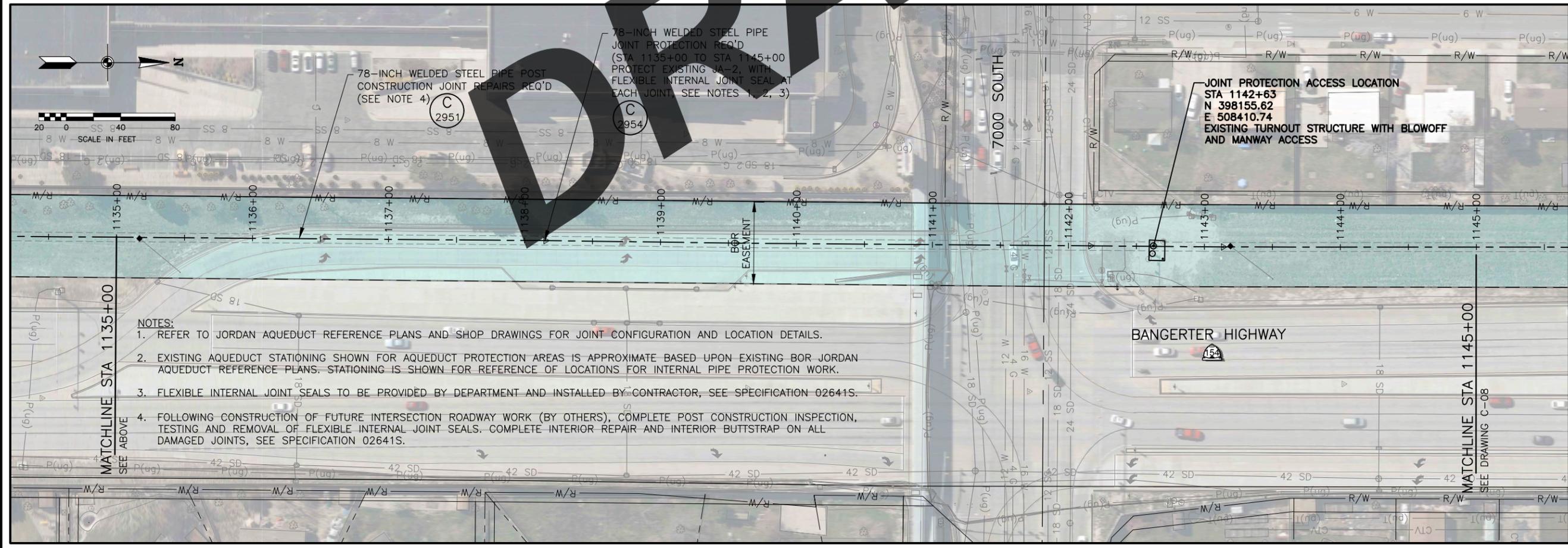
UTAH DEPARTMENT OF TRANSPORTATION REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.		APPROVED: _____ DATE: 07/14/16	PROFESSIONAL ENGINEER
PROJECT SR-154 BANGERTER HWY	PROJECT NUMBER S-0154(82)16	PIN 14785	STATION: PROVO, UTAH
JORDAN AQUEDUCT PROTECTION AND RELOCATION		5400 SOUTH CROSS SECTIONS	
DRAWN BY: _____		CHECKED BY: _____	
DRAWN: 08-06-10		CHECKED: _____	
ACCEPTED: 08-06-10		ACCEPTED: _____	
2016.07.20		2016.07.20	
BART LEEFLANG, P.E. MANAGER, FIELD ENGINEERING DIVISION		JL MANAGER, FIELD ENGINEERING DIVISION	
REVISIONS		REMARKS	
NO.		DATE	
APPROVED BY		APPROVED BY	

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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.



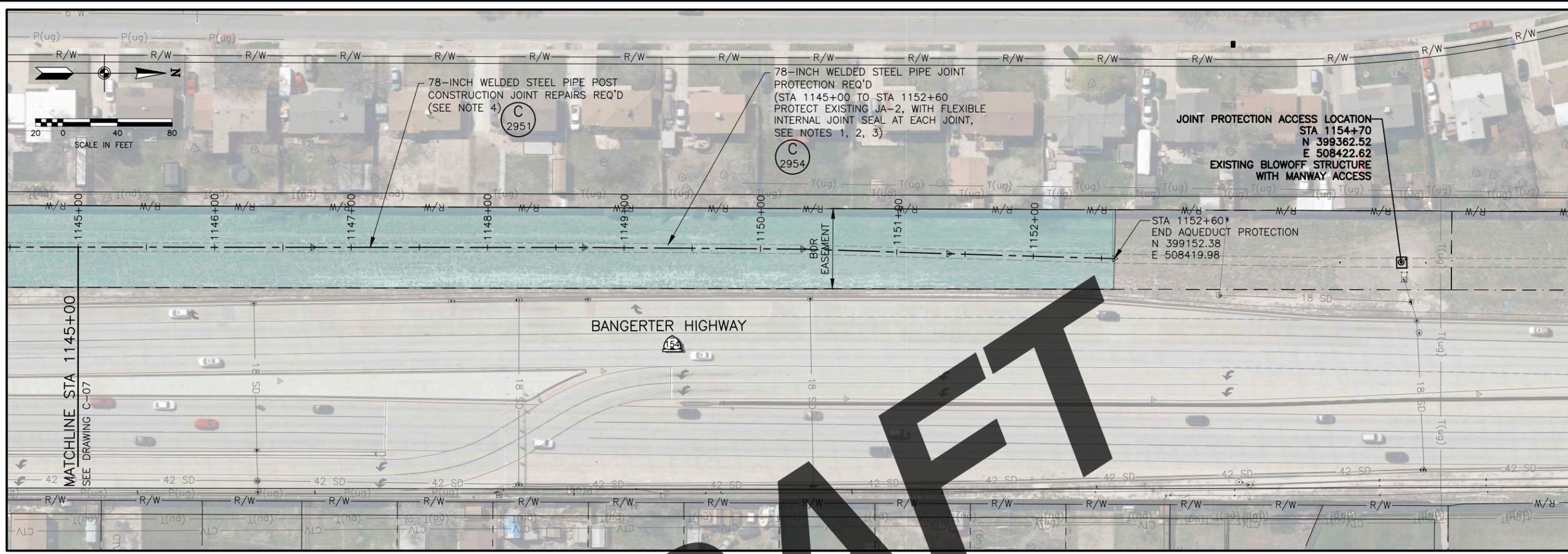
NOTES:

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.
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PROJECT		SR-154 BANGERter HWY	
PROJECT NUMBER		S-0154(82)16	
PROJECT TITLE		JORDAN AQUEDUCT PROTECTION AND RELOCATION	
DATE		07/14/16	
DRAWN		2016.07.20 18:05:06'00"	
ACCEPTED		BART LEFLANG, P.E. MANAGER, FIELD ENGINEERING DIVISION	
STATION		PROVO, UTAH	
NO.		DATE	
APPROVED BY		REMARKS	
PROFESSIONAL ENGINEER		DATE	
APPROVED		DATE	
PROJECT NUMBER		PIN	
14785		14785	
PROJECT TITLE		7000 SOUTH PLANS	
SHEET NO.		C-07	

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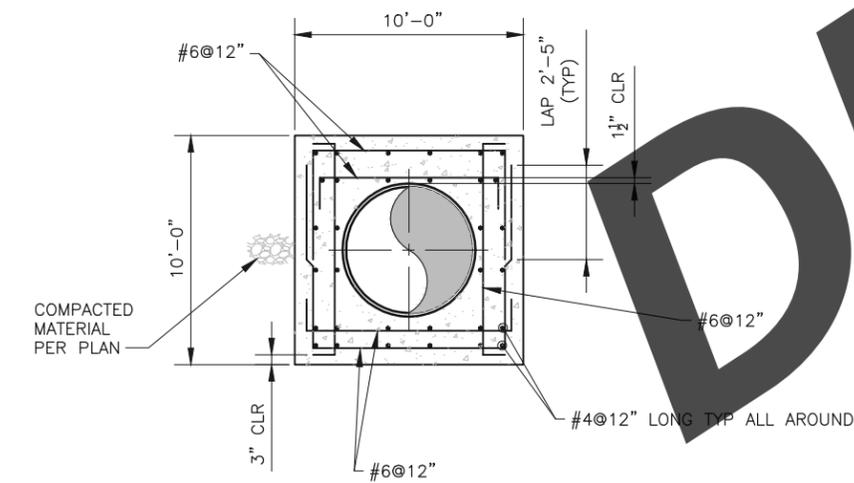
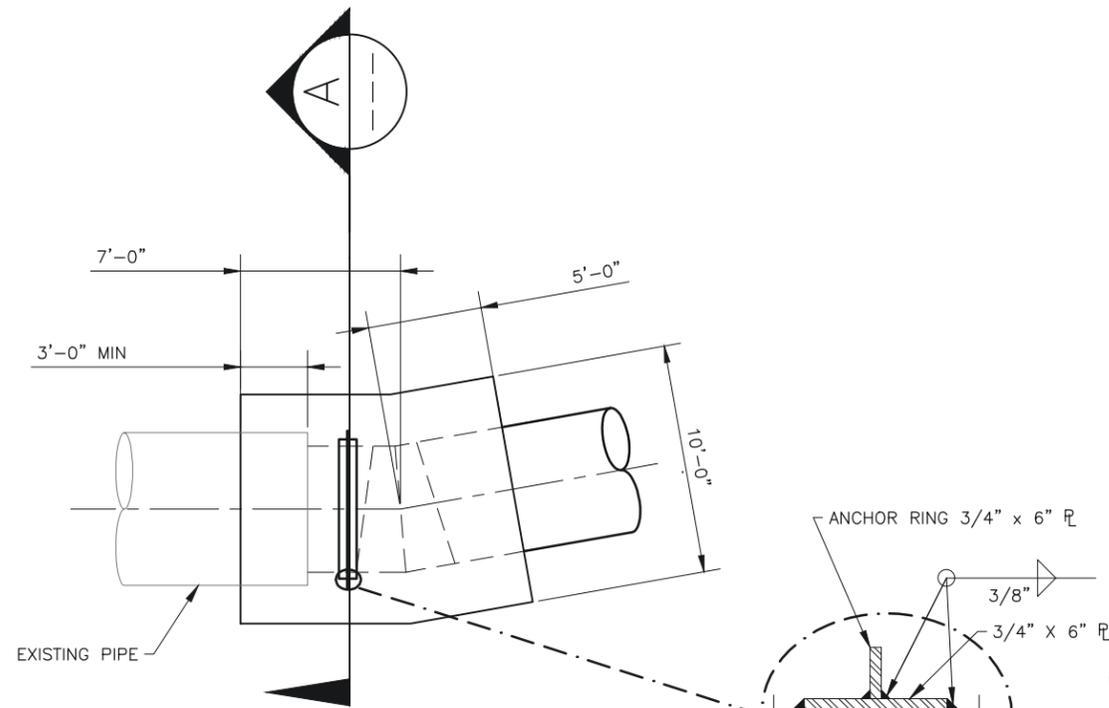
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DRAFT

- 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.

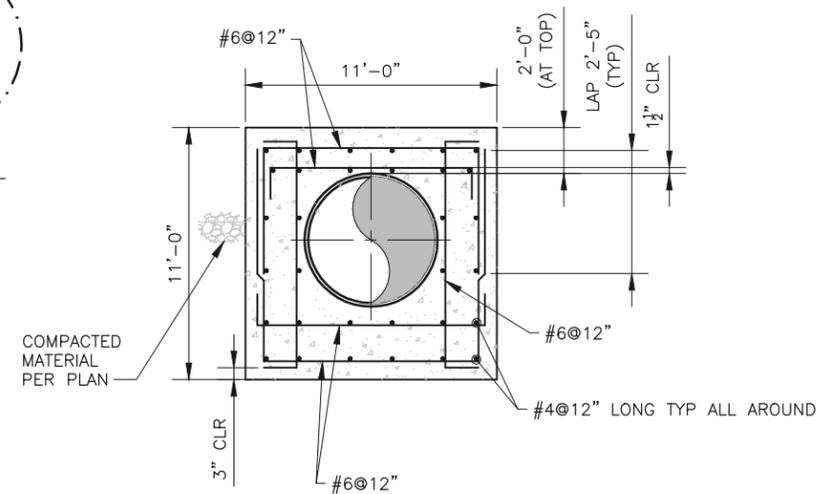
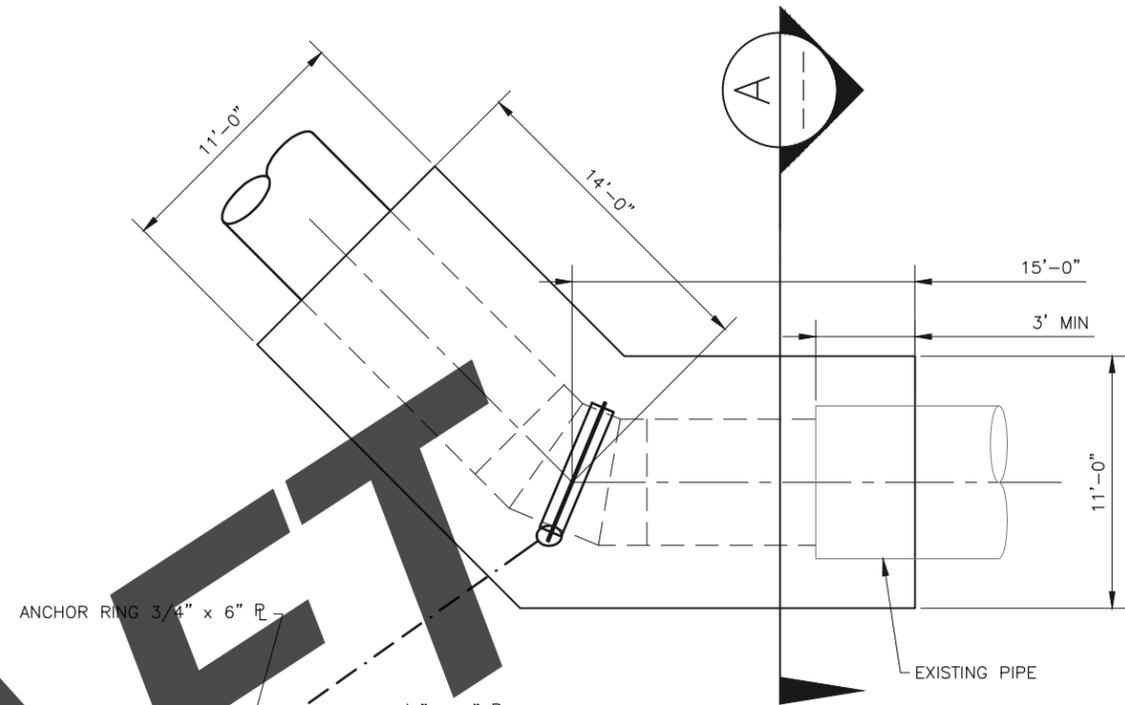
UTAH DEPARTMENT OF TRANSPORTATION REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.		APPROVED	DATE	07/14/16	DATE	07/14/16
PROJECT	SR-154 BANGERTER HWY	DRAWN BY	SR	CHECKED BY	JL	DATE
PROJECT NUMBER	S-0154(82)16	PIN	14785	PROFESSIONAL ENGINEER	JL	DATE
JORDAN AQUEDUCT PROTECTION AND RELOCATION		7000 SOUTH PLANS		STATION: PROVO, UTAH		
		DBAWN	2016.07.20 18:05	ACCEPTED		
				BART LEFLANG, P.E.		
				MANAGER, FIELD ENGINEERING DIVISION		
				NO.	DATE	APPROVED BY
				REVISIONS		
				REMARKS		



SECTION A
SCALE: NTS

REINFORCED CONCRETE
COLLAR STA 1250+19
SCALE: NTS

1
C-05



SECTION A
SCALE: NTS

REINFORCED CONCRETE
COLLAR STA 1266+13
SCALE: NTS

2
C-05

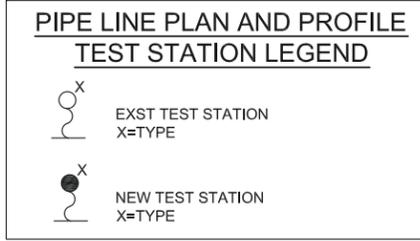
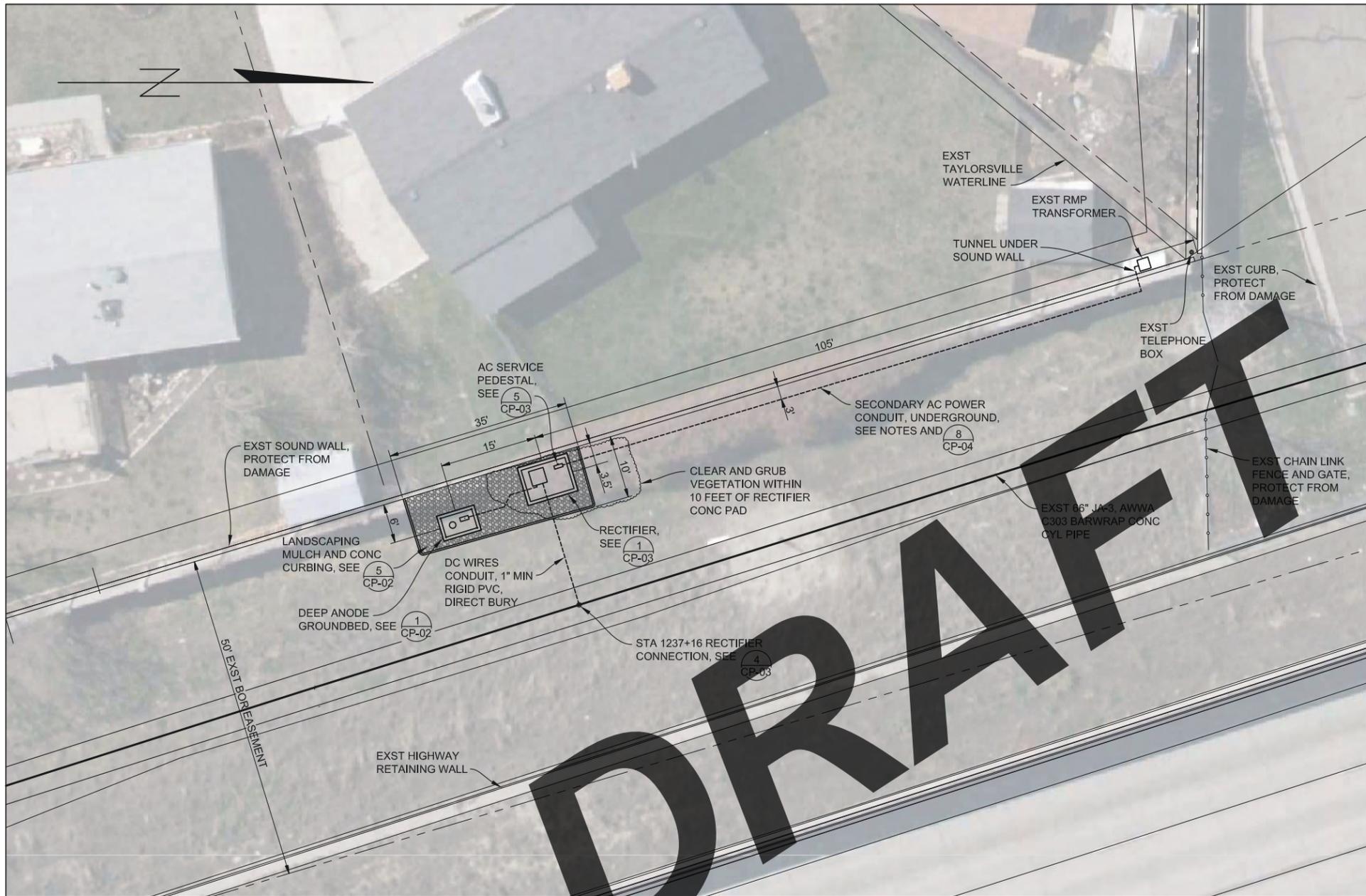
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NO.	DATE	APPROVED BY	REMARKS

DRAWN: 2016.07.20 18:05
C-060
ACCEPTED: BART LEFLANG, P.E.
MANAGER, FIELD ENGINEERING DIVISION
STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.
APPROVED: 07/14/16
DATE: 07/14/16
DRAWN BY: SR
CHECKED BY: JL
PROFESSIONAL ENGINEER

SR-154 BANGERTER HWY
JORDAN AQUEDUCT PROTECTION AND RELOCATION
PROJECT NUMBER: S-0154(82)16
PIN: 14785
REINFORCED CONCRETE THRUST COLLARS - PLAN & SECTION



TEST STATION NOTES:

- CONTRACTOR TO INSTALL NEW TEST STATION WHERE INDICATED ON THE PIPELINE PLAN AND PROFILE SHEETS.
- EXISTING TEST STATION SHALL BE RELOCATED OR REPLACED WHERE INDICATED OR WHEN DAMAGED BY PIPE CONSTRUCTION WORK.
- ALL TEST STATIONS SHALL BE STEEL CONDUIT POST MOUNT STYLE.
- MARK TEST STATIONS WITH JWCD DISTRICT APPROVED LABEL WITH DISTRICT NAME, PIPELINE, AND PIPE STATIONING.
- PROVIDE WIRE LOOP AT BASE OF TEST STATION AND AT PIPE CONNECTIONS TO MINIMIZE SETTLEMENT STRESSES ON WIRE.
- PROVIDE SUFFICIENT WIRE TO ALLOW FOR PROPER TERMINATION IN TEST STATIONS.
- ALL WIRES TO BE INSTALLED SPICE FREE.
- ALL WIRE CONNECTIONS TO PIPE SHALL BE THERMITE WELDED CONNECTIONS, EACH WIRE CONNECTION TO BE SEPARATED A MINIMUM OF 6-INCHES.
- QUANTITY OF TERMINALS AND WIRING CONNECTIONS VARIES, SEE APPLICABLE DETAIL FOR TEST STATION TYPE.
- 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.
- DO NOT DIRECTLY CONNECT ROADWAY OFFSET CONDUIT TO TEST STATION CONDUIT.

GROUND BED INSTALLATION	
GROUND BED STYLE	DEEP ANODE
GROUND BED 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
GROUND BED 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

JA-56S SITE PLAN NOTES:

ELECTRICAL SERVICE:

- CONTRACTOR TO COORDINATE ELECTRICAL SERVICE PER WORK ORDER #621105, RMP CONTACT IS HENRY TSOSIE.
- CONTRACTOR SHALL INSTALL NEW AC POWER SERVICE IN ACCORDANCE WITH ROCKY MOUNTAIN POWER REQUIREMENTS, NEW UTILITY SERVICE INSTALLATION COST TO BE PAID BY DEPARTMENT.
- UTILITY AC SERVICE TO INCLUDE CONDUIT WITHIN 1 FOOT FROM TRANSFORMER BOX, UNDERGROUND CONDUIT, AND UNDERGROUND AC SERVICE PEDESTAL.
- 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.

GROUND BED CONSTRUCTION

- DRILLING MUD, WATER AND CUTTINGS SHALL BE FULLY CONTAINED ON THE PROJECT SITE AND SHALL NOT BE PERMITTED TO FLOW OVER THE GROUND SURFACE.
- ANY SPILLAGE OR LEAKAGE OF DRILLING MUD AND CUTTINGS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AND THE SITE RESTORED.
- DIGGING OF MUD PIT WILL NOT BE PERMITTED.
- DRILL CUTTINGS TO BE REMOVED FROM SITE AND DISPOSED AT OFFSITE LANDFILL OR OTHER APPROVED LOCATION.

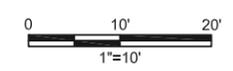
RECTIFIER INSTALLATION

- CONCRETE WORK SHALL BE AA (AE) PER UDOT STANDARDS.
- FORMS SHALL BE SET LEVEL AND SQUARE.
- CONCRETE FINISH SHALL BE TROWELED SURFACE AND RADIUS EDGES.
- ALL FORM WORK SHALL BE REMOVED FROM THE CONCRETE AFTER CURING IS COMPLETED.
- 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:

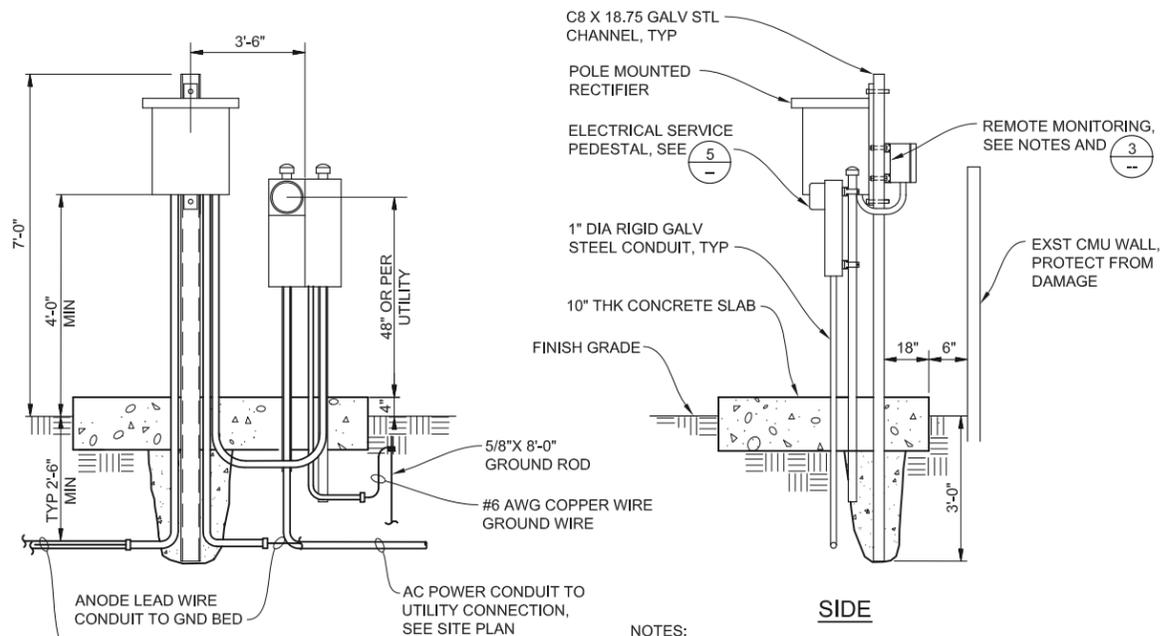
- EXISTING VEGETATION TO BE CLEARED AND GRUBBED TO A DEPTH OF 12-INCHES WHERE INDICATED ON THE PLAN OR WHERE TRENCHING IS REQUIRED.
- ALL DISTURBED AREAS TO BE RE-SEEDED FOLLOWING CONSTRUCTION PER UDOT STANDARD SPECIFICATIONS.

**JA3 CATHODIC PROTECTION STATION
JA-56S SITE PLAN**



REVISIONS
 DRAWN: 2016.07.20 18:07:01
 ACCEPTED: BART LEEFLANG, P.E. MANAGER, FIELD ENGINEERING DIVISION
 STATION: PROVO, UTAH
 NO. DATE APPROVED BY REMARKS
 2016.07.20 18:07:01
 DRAWN BY: JLM
 CHECKED BY: JLM
 DATE: 07/14/16
 UTAH DEPARTMENT OF TRANSPORTATION
 REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.
 Jeffrey L. Mattson
 PROFESSIONAL ENGINEER
 APPROVED: Jeffrey L. Mattson
 Date: 2016.07.20 15:26:37 -0800
 SR-154 BANGERTER HWY AT
 5400 SOUTH AQUEDUCT RELOCATION
 PROJECT NUMBER: S-0154(82)16
 PIN: 14785
 CATHODIC PROTECTION SITE PLAN
 SHEET NO. CP-01

H:\BCA\CA-034\Design\AS CP Relocation Site Plan.dwg Plotted 7/14/2016 By: Stacy Hilling

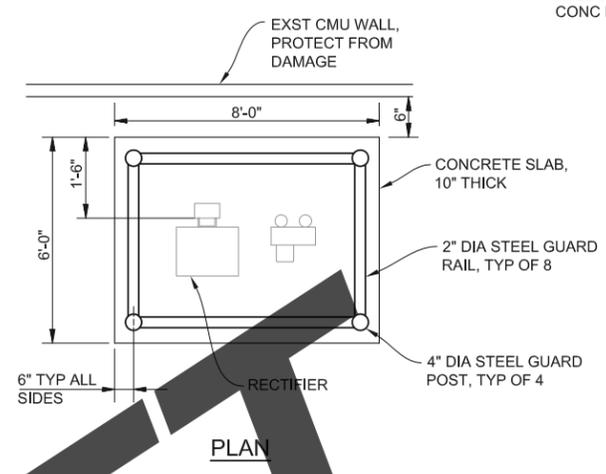


FRONT

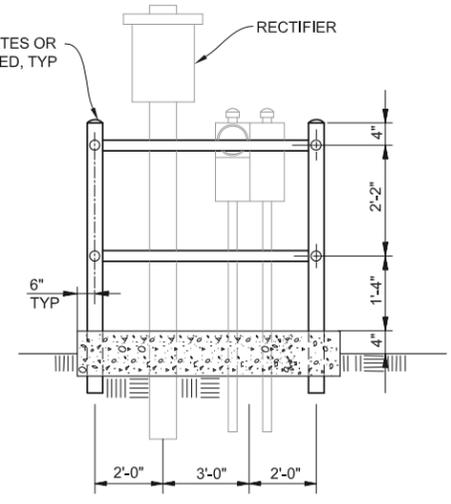
SIDE

TYPE 1-POLE MOUNTED RECTIFIER
NOT TO SCALE

1
CP-01



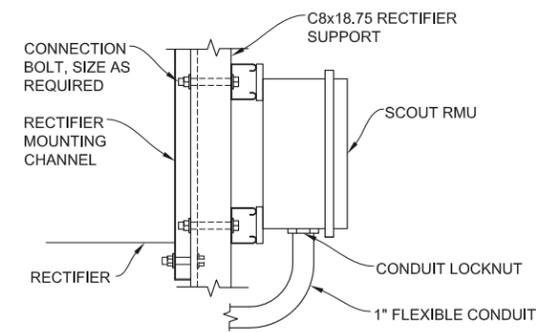
PLAN



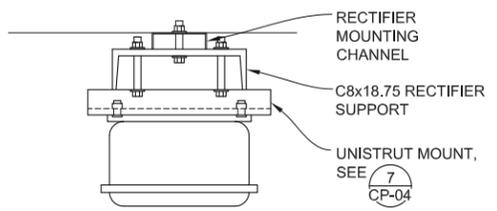
ELEVATION

TYPE 1 - RECTIFIER RAIL
NOT TO SCALE

2
-



SCOUT ELEVATION

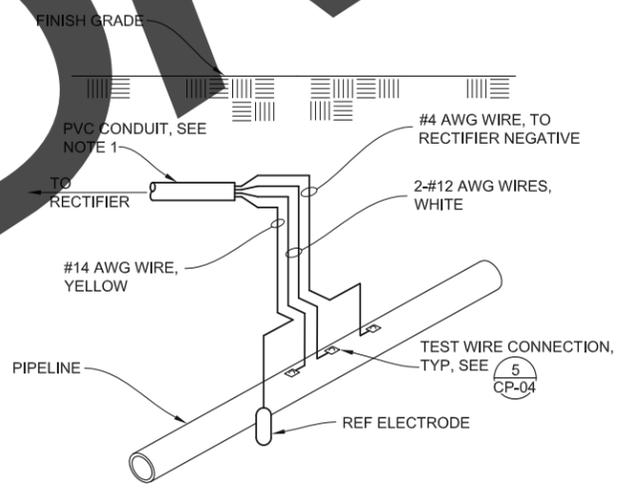


SCOUT PLAN

- NOTES:
- SCOUT MOUNTING PLATE NOT USED, REMOVE AND MOUNT TO UNISTRUT.
 - BACK OF RECTIFIER MOUNT SHOWN, MOUNTING ON NON-DOOR SIDE OF RECTIFIER ALLOWED AS OPTION.

REMOTE MONITORING UNIT MOUNT
NOT TO SCALE

3
-

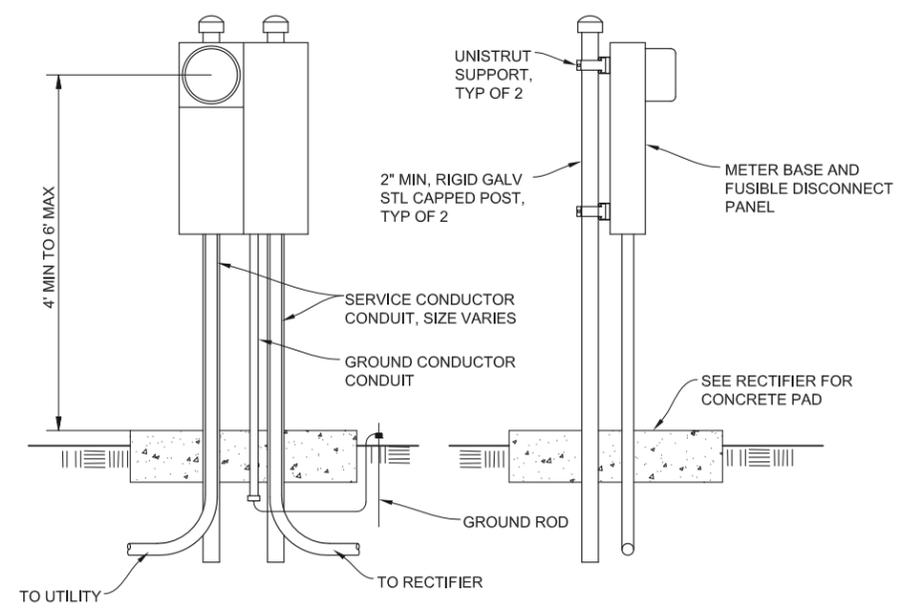


- NOTES:
- ALL WIRES SHALL BE PLACED IN CONDUIT FROM CENTERLINE OF PIPE TO CATHODIC PROTECTION STATIONS.
 - LOCATE REFERENCE ELECTRODE 6" FROM EDGE OF PIPE.

RECTIFIER CONNECTION
NOT TO SCALE

4
CP-01

- NOTES:
- ALL RAIL TO POST CONNECTIONS SHALL BE WELDED, EXCEPT FRONT RAILS SHALL HAVE BOLTED CONNECTIONS FOR REMOVAL.
 - ORIENTATION OF RECTIFIER AND AC PEDESTAL TO BE DETERMINED IN THE FIELD.
 - ALL EQUIPMENT DOORS SHALL BE FULLY OPENABLE AND WITHOUT OBSTRUCTION
 - HOT DIP GALVANIZE RAILING AFTER FABRICATION.



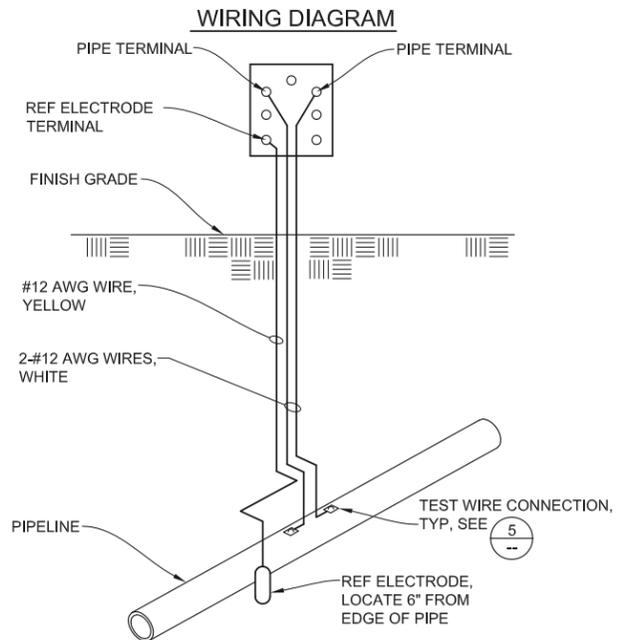
- NOTES:
- METER BASE TO HAVE MANUAL LINK BYPASS SOCKETS AND CONFORM TO ELECTRICAL UTILITY REQUIREMENTS
 - SEE CATHODIC PROTECTION SCHEDULE, FOR SERVICE TYPE.

UNDERGROUND AC SERVICE PEDESTAL
NOT TO SCALE

5
CP-01

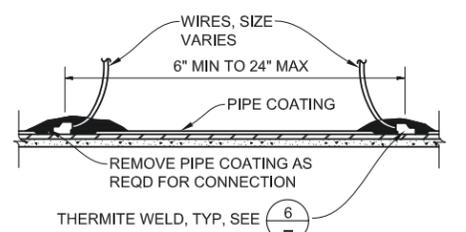
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STATION:		PROVO, UTAH							
UTAH DEPARTMENT OF TRANSPORTATION REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.									
DRAWN BY		JLM		CHECKED BY		JLM		DATE	
07/14/16									
Jeffrey L. Mattson PROFESSIONAL ENGINEER									
APPROVED: [Signature]									
PROJECT		SR-154 BANGERTER HWY AT		PROJECT NUMBER		S-0154(82)16		PIN	
5400 SOUTH AQUEDUCT RELOCATION		14785							
RECTIFIER PLANS AND DETAILS									
SHEET NO. CP-03									

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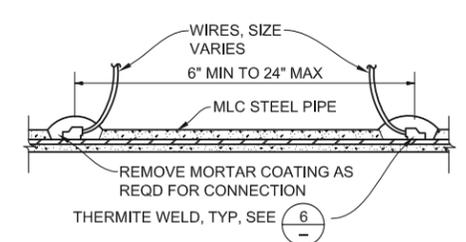


NOTES:
 1. SEE TEST STATION STYLE DETAIL AS REQUIRED BY TEST STATION SCHEDULE.
 2. WHERE TEST STATION OFFSET IS REQUIRED, SEE 4

TYPE T TEST STATION 1
 NOT TO SCALE



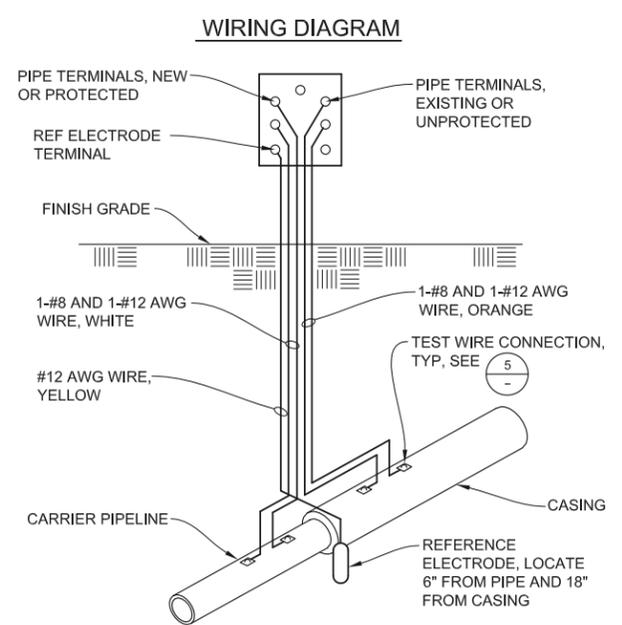
DIELECTRIC COATED STEEL



CCP OR MLC STEEL

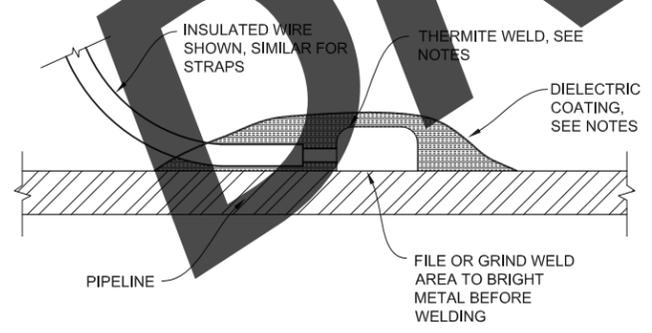
NOTES:
 1. PRETENSIONED WIRES ON BARWRAP (CCP) CONCRETE CYLINDER PIPE SHALL NOT BE CUT OR DAMAGED FOR WIRE CONNECTIONS TO PIPE CYLINDER.
 2. CEMENT MORTAR COAT ALL CONNECTIONS AND EXPOSED COPPER ON BARWRAP (CCP) PIPE.

TEST WIRE CONNECTION 5
 NOT TO SCALE



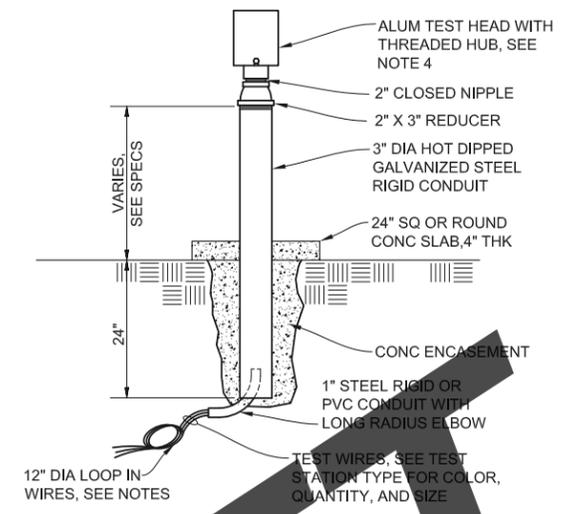
NOTES:
 1. SEE TEST STATION STYLE DETAIL AS REQUIRED BY TEST STATION SCHEDULE.
 2. WHERE TEST STATION OFFSET IS REQUIRED, SEE 4

TYPE C TEST STATION 2
 NOT TO SCALE



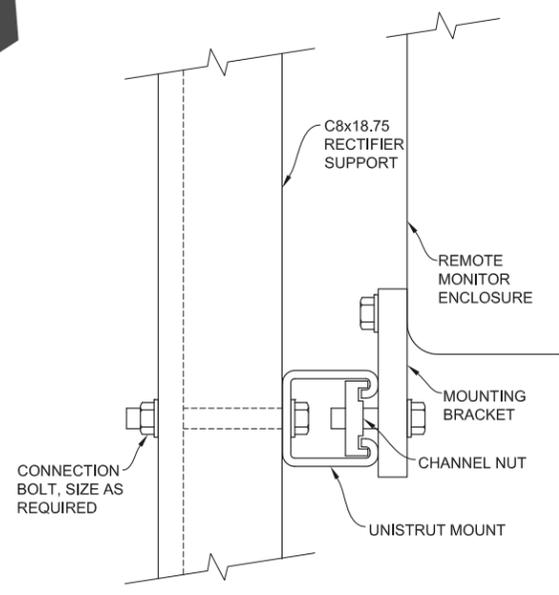
NOTES:
 1. MAKE WIRE CONNECTION TO PIPE AT FIELD JOINT WHERE HOLDBACK OCCURS ON PIPELINE COATING, WHERE POSSIBLE.
 2. COPPER SLEEVE REQUIRED FOR #2 AWG JOINT BONDS OR FOR #12 AWG OR SMALLER TEST WIRES.
 3. WELDER AND CARTRIDGE SIZE VARIES ACCORDING TO PIPE SIZE AND PIPE MATERIAL, CONSULT WELDER MANUFACTURER 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



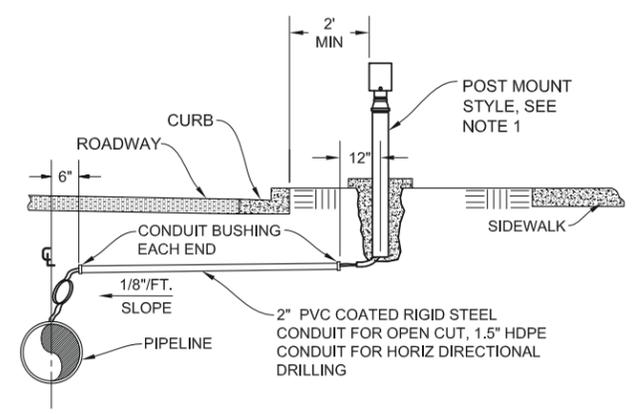
NOTES:
 1. TERMINAL QUANTITY AND WIRE CONNECTIONS VARY, SEE TEST STATION TYPE DETAIL.
 2. LOOP WIRE AT BASE OF POST TO MINIMIZE WIRE STRESS.
 3. COAT THREADS WITH INORGANIC ZINC PRIMER OR COLD GALVANIZING REPAIR COATING.
 4. TESTOX SERIES 700 TEST STATION FOR TYPE T, C, AND I TEST STATIONS OR TESTOX 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



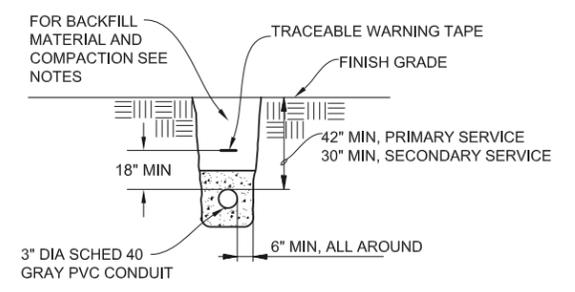
NOTES:
 1. UNISTRUT AND HARDWARE TO BE HOT DIPPED GALVANIZED, UNLESS OTHERWISE SPECIFIED.

UNISTRUT MOUNT 7
 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

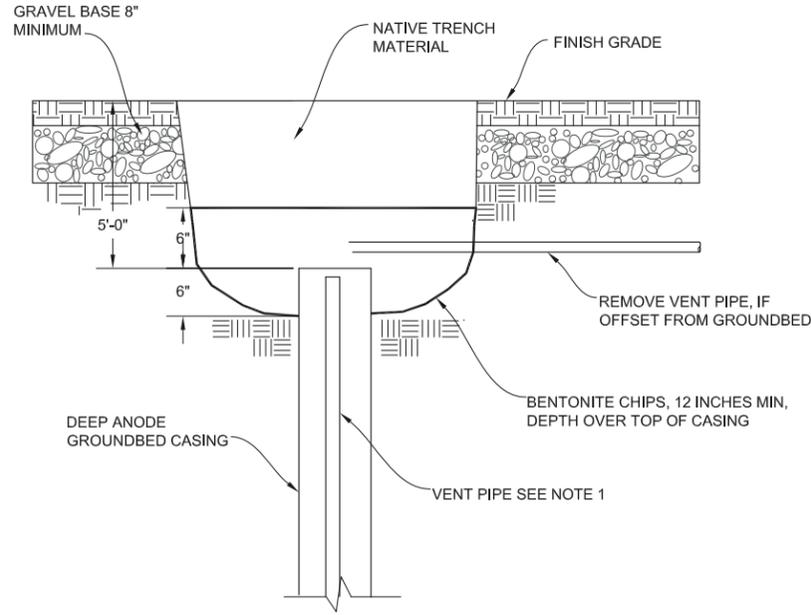


NOTES:
 1. BACKFILL AROUND CONDUIT SHALL BE SELECT MATERIAL IN CONFORMANCE WITH ELECTRICAL UTILITY CONSTRUCTION STANDARDS OR NOTE 2.
 2. SELECT MATERIAL FOR BACKFILL SHALL CONSIST OF SAND OR WELL GRADED GRANULAR MATERIAL OF THE FOLLOWING GRADATION:
 NO. 200 SIEVE 5%, MAX.
 NO. 4 SIEVE 50%, MAX.
 3/4\" 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
 NOT TO SCALE

REVISIONS		NO.		DATE		APPROVED BY		REMARKS	
DRAWN		2016.07.20		18:07		ACCEPTED		BART LEEFLANG, P.E. MANAGER, FIELD ENGINEERING DIVISION	
STATION: PROVO, UTAH		DATE		07/14/16		DRAWN BY		JLM	
UTAH DEPARTMENT OF TRANSPORTATION		REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.		CHECKED BY		OC		JLM	
SR-154 BANGERTER HWY AT		5400 SOUTH AQUEDUCT RELOCATION		DATE		DATE		DATE	
PROJECT NUMBER		S-0154(82)16		DATE		DATE		DATE	
TEST STATIONS AND MISC DETAILS		PIN		DATE		DATE		DATE	
PROJECT		14785		DATE		DATE		DATE	
SHEET NO.		CP-04		DATE		DATE		DATE	

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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.

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

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NO.	DATE	APPROVED BY	REMARKS

DRAWN: JLM
2016.07.20 18:07:40
ACCEPTED: BART LEEFLANG, P.E.
MANAGER, FIELD ENGINEERING DIVISION
STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.

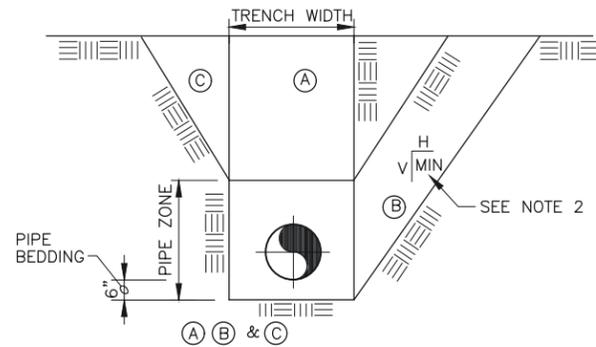
APPROVED: Jeffery L. Mattson
July 14, 2016 15:28:53 -0600

DRAWN BY: JLM
CHECKED BY: JLM
DATE: 07/14/16

PROFESSIONAL ENGINEER

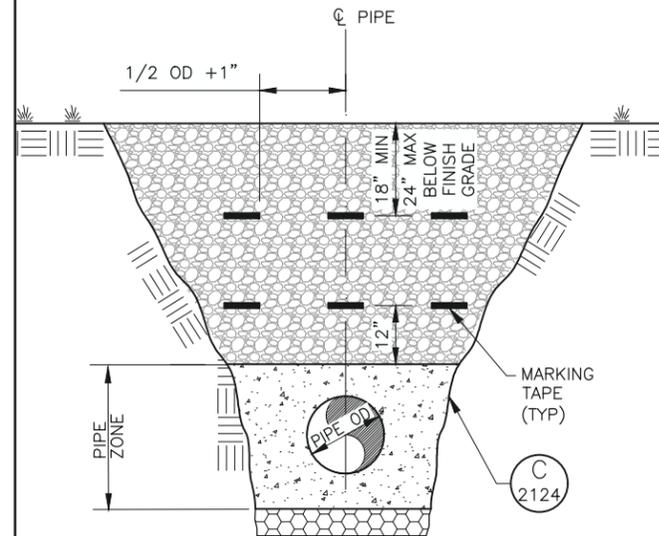
PROJECT: SR-154 BANGERTER HWY AT 5400 SOUTH AQUEDUCT RELOCATION
PROJECT NUMBER: S-0154(82)16
PIN: 14785
CPS ABANDONMENT DETAILS

SHEET NO. CP-05

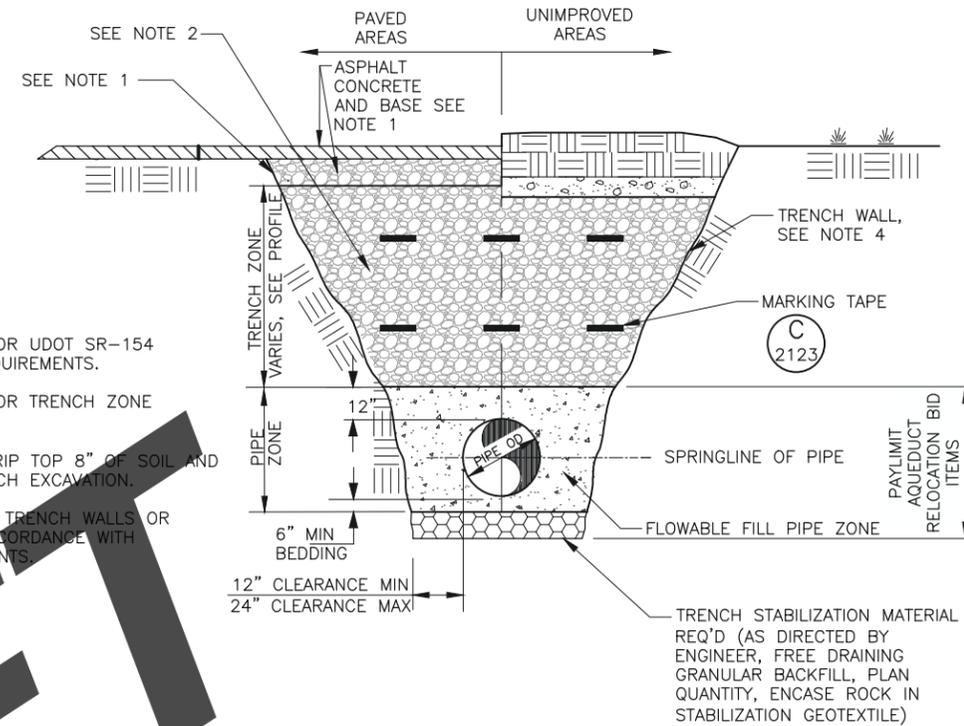


- A VERTICAL TRENCH WALL**
 1. MAX UNSUPPORTED HEIGHT=3.5 FT.
 2. FOR DEPTH OVER 3.5 FT SHORING OR SHEATHING REQUIRED.
- B SLOPING TRENCH WALL**
 1. NOT TO BE USED WITHOUT APPROVAL OF ENGINEER.
 2. REQUIRES IMPROVED PIPE ZONE BACKFILL OR INCREASE IN PIPE CLASS
- C COMBINATION VERTICAL/SLOPING TRENCH**
 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 (C) 2122
 NOT TO SCALE

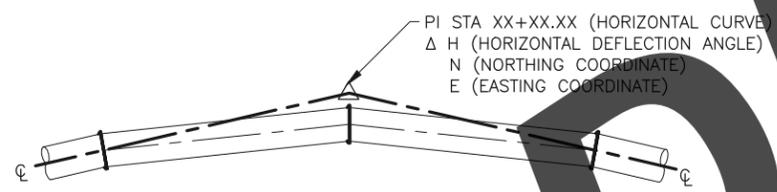


MARKING TAPE PLACEMENT (C) 2123
 NOT TO SCALE

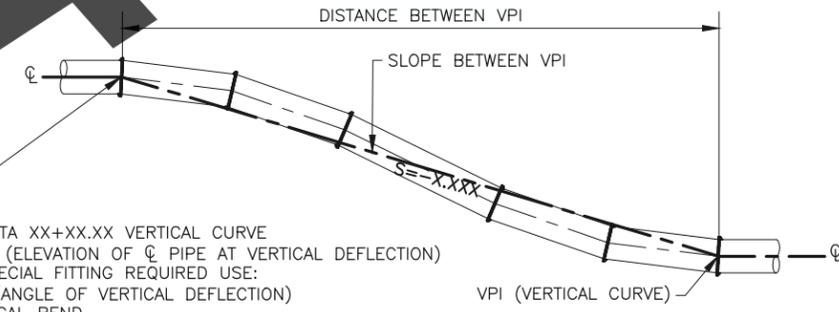


- NOTES:**
 1. SEE ROADWAY DRAWINGS FOR UDOT SR-154 SURFACE RESTORATION REQUIREMENTS.
 2. SEE ROADWAY DRAWINGS FOR TRENCH ZONE BACKFILL REQUIREMENTS.
 3. IN UNIMPROVED AREAS, STRIP TOP 8" OF SOIL AND STOCKPILE PRIOR TO TRENCH EXCAVATION.
 4. CONTRACTOR SHALL SLOPE TRENCH WALLS OR SHORE EXCAVATIONS IN ACCORDANCE WITH CURRENT OSHA REQUIREMENTS.

TYPICAL TRENCH BACKFILL SECTION (C) 2124
 NOT TO SCALE



HORIZONTAL CURVES



VERTICAL CURVES

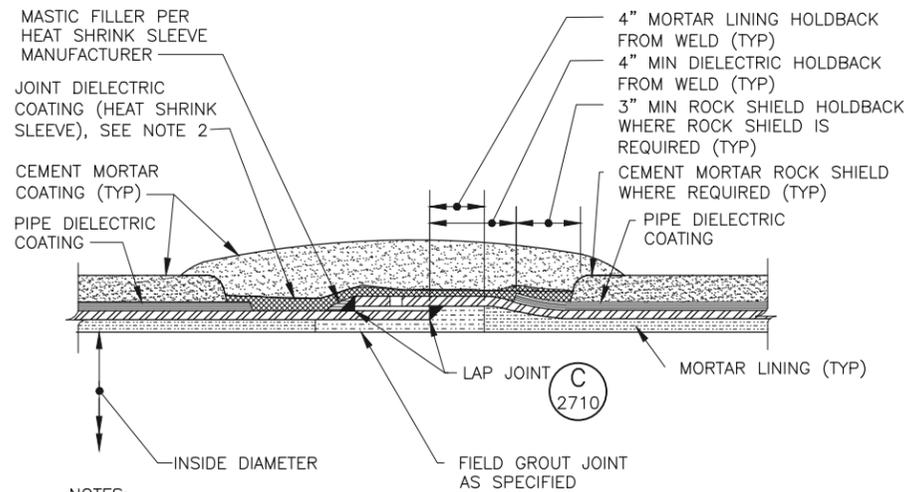
- NOTES:**
- ALL HORIZONTAL AND VERTICAL CURVES ARE CIRCULAR.
 - HORIZONTAL AND VERTICAL CURVES SHALL BE MADE USING BEVELED JOINTS AND/OR DEFLECTED JOINTS. DO NOT USE COMBINED BEVELED AND DEFLECTED JOINTS.
 - THE MAXIMUM BEVEL ANGLE FOR BEVELED PIPE ENDS SHALL BE 5 DEGREES. SEE SPECIFICATIONS FOR MAXIMUM (NON-BEVELED) JOINT DEFLECTIONS.
 - ALL BEVEL OR DEFLECTION ANGLES SHALL BE EQUALLY DIVIDED THROUGHOUT THE CURVE.
 - FOR COMBINATION VERTICAL AND HORIZONTAL CURVES THE REQUIREMENTS FOR BOTH CONDITIONS SHALL BE COMBINED.
 - REFER TO PLAN AND PROFILE DRAWINGS FOR VERTICAL AND HORIZONTAL CURVE LOCATIONS.
 - 50' PIPE LENGTHS WERE ASSUMED TO DEVELOP VERTICAL CURVE DATA SHOWN ON PLANS. COORDINATE WITH ENGINEER IF DIFFERENT.
 - ALL PROFILE ELEVATIONS ARE SHOWN TO CENTERLINE OF PIPE.
 - REDUCED PIPE SEGMENTS LENGTHS MAY BE USED IN LIEU OF BEVELED OR MITERED JOINTS THROUGH CURVES. COORDINATE SHOP DRAWINGS WITH ENGINEER.

PIPELINE CURVES (C) 2600
 NOT TO SCALE

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REVISIONS		NO.		DATE		APPROVED BY		REMARKS	
DRAWN		2016.07.20		18:07:50		0600'		ACCEPTED BY: BART LEFLANG, P.E. MANAGER, FIELD ENGINEERING DIVISION	
STATION: PROVO, UTAH		SR		QC		C		JL	
UTAH DEPARTMENT OF TRANSPORTATION		REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.		DATE		07/14/16		DATE	
SR-154 BANGERTER HWY		JORDAN AQUEDUCT PROTECTION AND RELOCATION		PIN		14785		GENERAL CIVIL DETAILS - 1	
PROJECT		PROJECT NUMBER		DATE		DATE		DATE	
SHEET NO.		GC-01		DATE		DATE		DATE	

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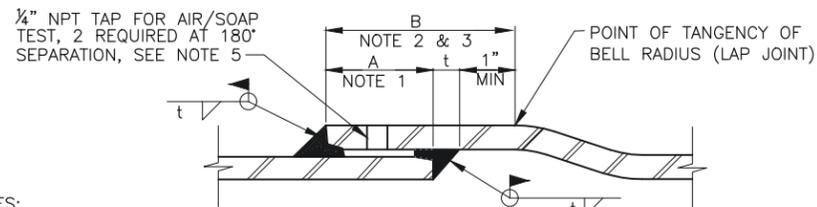


NOTES:

- 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.
- AFTER INSTALLATION OF JOINT DIELECTRIC COATING, A HOLIDAY TEST SHALL BE COMPLETED AS SPECIFIED BY NACE CERTIFIED SPECIALIST.

LAP WELDED STEEL PIPE JOINT (C) 2708
NOT TO SCALE

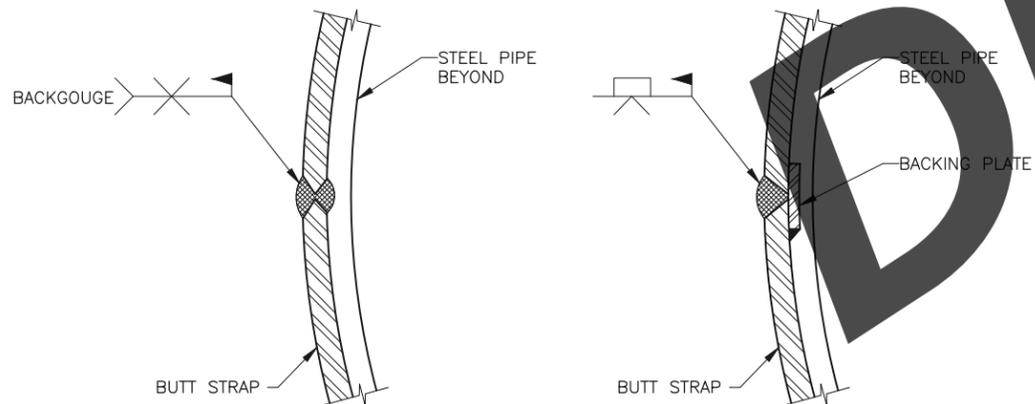
LINING AND COATING NOT SHOWN FOR CLARITY OF JOINT



NOTES:

- 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.
- 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.
- 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.
- FILLET WELDS FOR BELL AND SPIGOT LAP JOINTS SHOWN. FILLET WELDS ON OTHER JOINTS SIMILAR.
- 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.
- 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.
- LAP JOINTS SHALL BE DOUBLE LAP, UNLESS NOTED OTHERWISE. SINGLE LAP JOINTS SHALL BE INSIDE OR OUTSIDE AT CONTRACTORS OPTION.

LAP JOINT WELD (C) 2710
NOT TO SCALE



NOTES:

- LININGS AND COATINGS ARE NOT SHOWN FOR CLARITY.

TYPE A

(USED FOR PIPE > 36" Ø ACCESS TO BOTH INSIDE AND OUT)

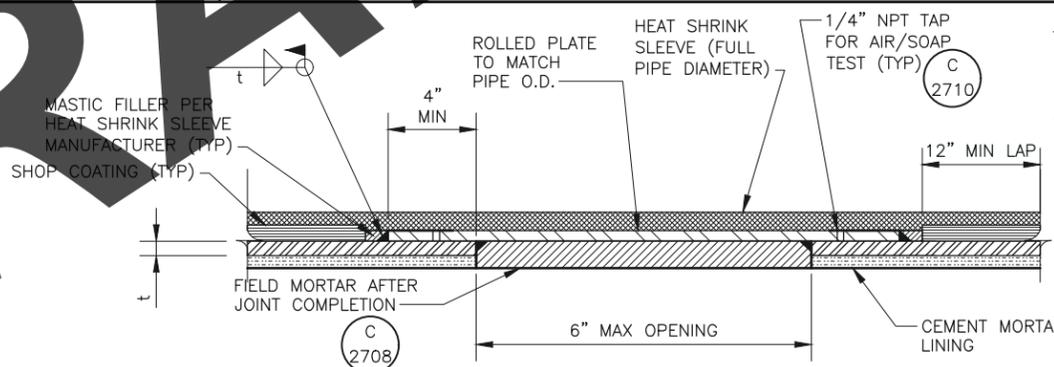
BUTT STRAP WELD (C) 2711
NOT TO SCALE

NOTES:

- LININGS AND COATINGS ARE NOT SHOWN FOR CLARITY.

TYPE B

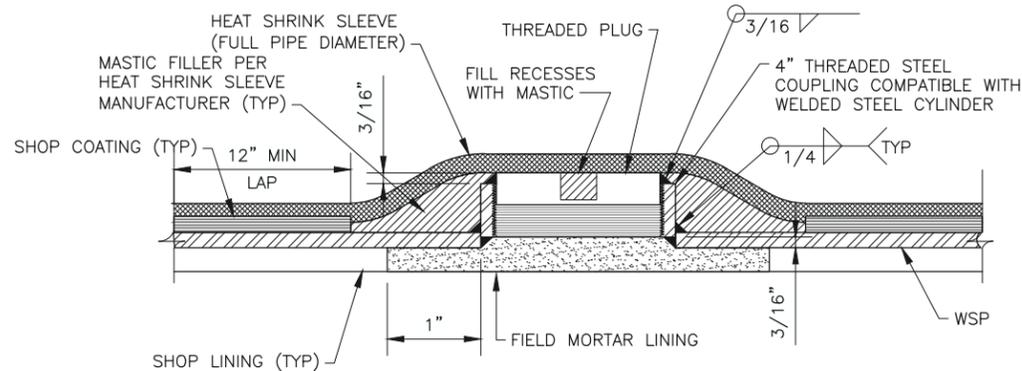
(USED FOR PIPE ≤ 36" Ø ACCESS TO OUTSIDE ONLY)



NOTES:

- PASS THROUGH FOR WELD LEADS MAY BE SPACED NO CLOSER THAN 500' FROM ACCESS MANWAY OUTLETS.
- 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 LEADS (C) 2712
NOT TO SCALE

NO.	DATE	APPROVED BY	REMARKS

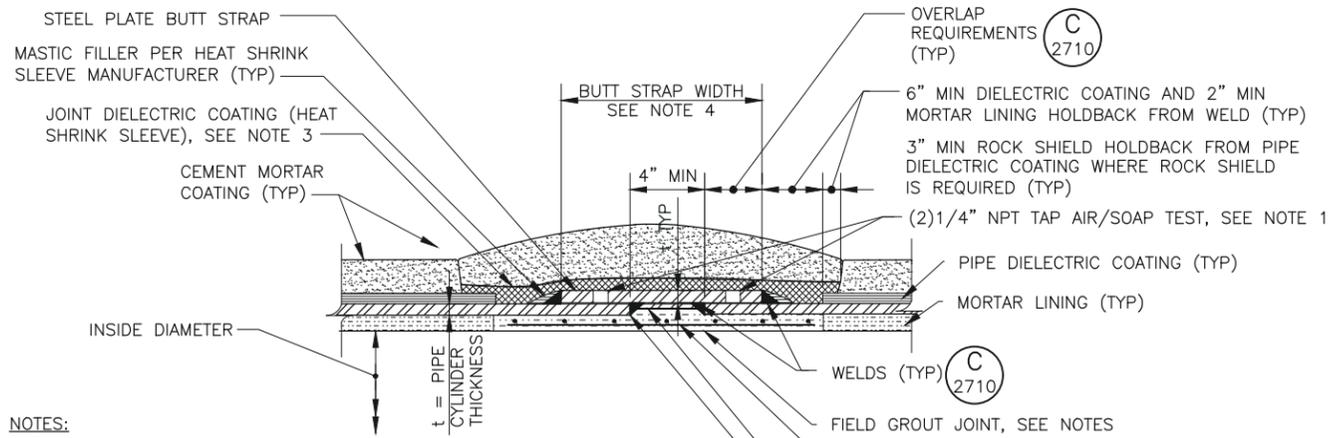
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CHECKED	18:08	MANAGER, FIELD ENGINEERING DIVISION	
DATE	04-06'0		

UTAH DEPARTMENT OF TRANSPORTATION	SR	JL
REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.	DRAWN BY	CHECKED BY
	QC	

APPROVED	07/14/16	DATE

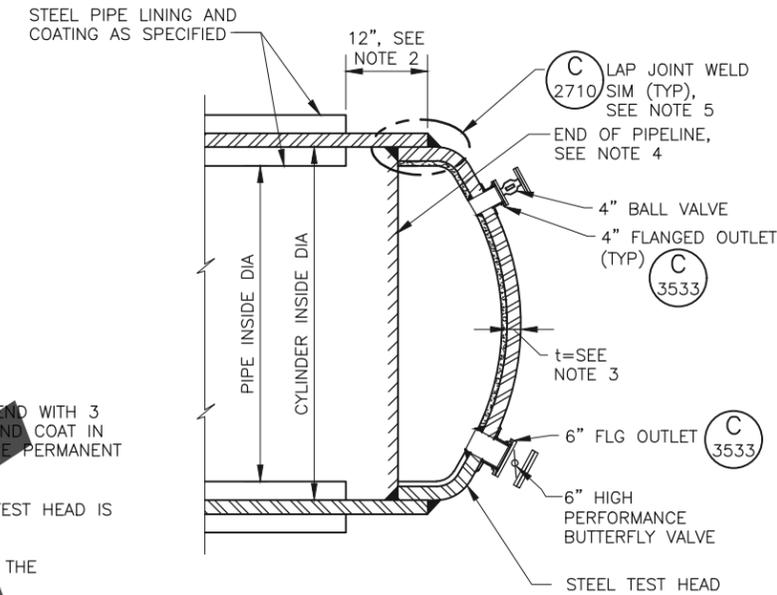
SR-154 BANGER TER HWY	14785	PIN
JORDAN AQUEDUCT PROTECTION AND RELOCATION	S-0154(82)16	

PROJECT	GENERAL CIVIL DETAILS - 2
PROJECT NUMBER	



- NOTES:**
- 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.
 - FOR FIELD WELDING OF INDIVIDUAL BUTT STRAP PIECES TO EACH OTHER USING BUTT WELDS. (C 2711)
 - AFTER INSTALLATION OF JOINT DIELECTRIC COATING, A HOLIDAY TEST SHALL BE COMPLETED AS SPECIFIED BY NACE CERTIFIED SPECIALIST.
 - UNLESS OTHERWISE NOTED, BUTT STRAP WIDTH SHALL CONFORM TO THE LIMITATIONS SHOWN FOR PIPE END SEPARATION AND STEEL OVERLAP REQUIREMENTS.
 - GROUT FOR JOINT LINING SHALL BE ONE PART CEMENT TO TWO PARTS SAND AND SUFFICIENT WATER FOR DRY-PACK CONSISTENCY.

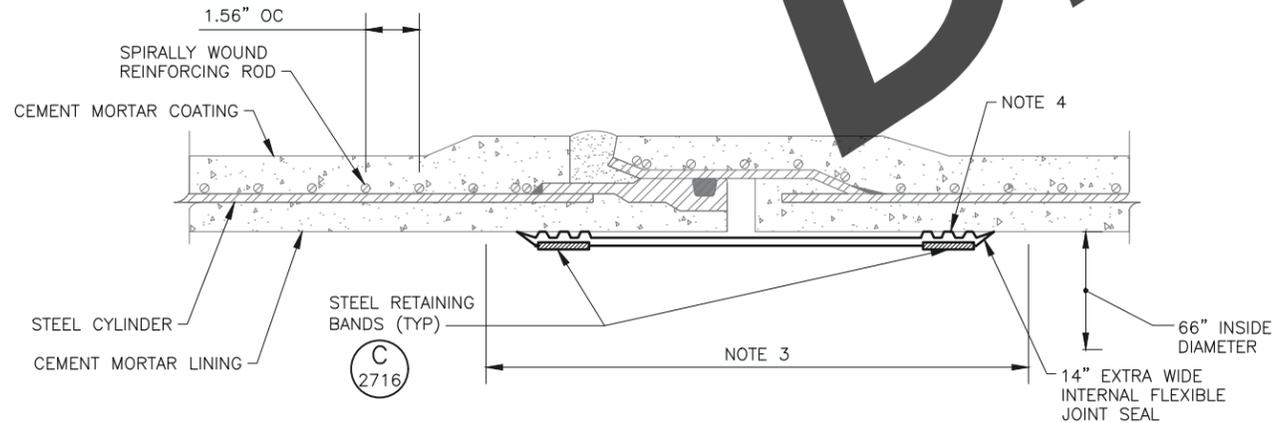
EXTERIOR BUTT-STRAP JOINT (C 2713)
NOT TO SCALE



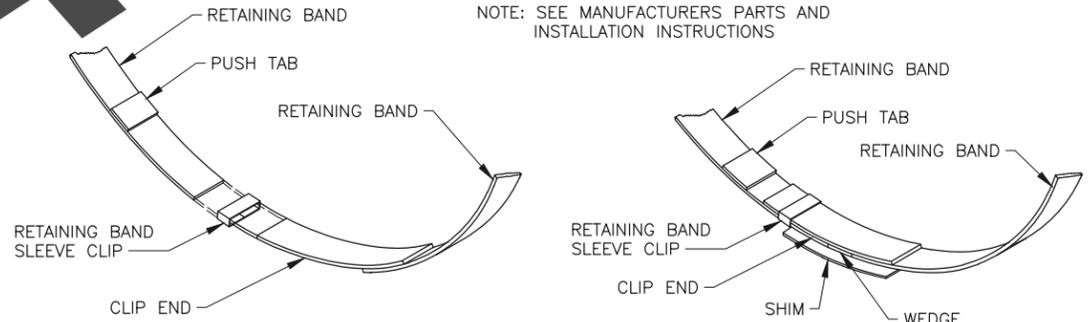
- NOTES:**
- COAT TEMPORARY TEST HEAD AND PLAIN END WITH 3 MILS MIN RUST INHIBITING PRIMER. LINE AND COAT IN ACCORDANCE WITH SECTION 02621S WHERE PERMANENT END CAP IS SHOWN ON PLANS.
 - MINIMUM 8" HOLDBACK REQUIRED AFTER TEST HEAD IS CUT OFF.
 - WALL THICKNESS SHALL BE THE SAME AS THE ADJOINING PIPE.
 - FOR STATION AND LOCATION OF PIPELINE ENDS, SEE DRAWINGS.
 - BUTT STRAP CONNECTION, OR FULL PENETRATION BUTT WELDS MAY BE SUBSTITUTED FOR LAP JOINT SHOWN.

DISH HEAD END CAP (C 2714)
NOT TO SCALE

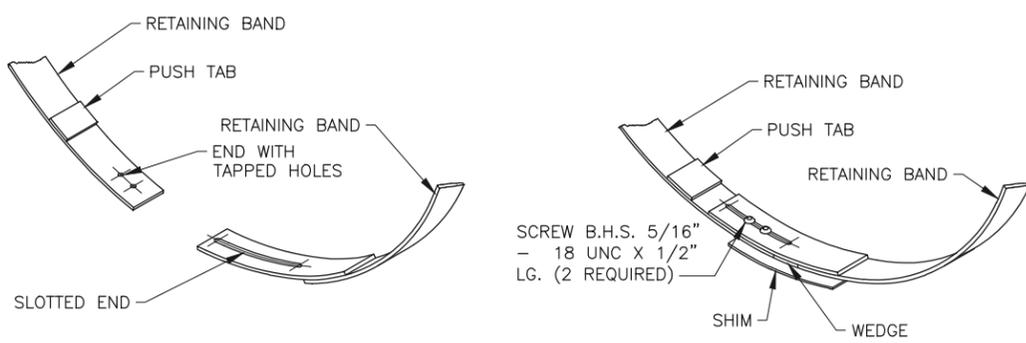
- NOTES:**
- FLEXIBLE JOINT SEALS PROVIDED BY OWNER FOR INSTALLATION BY CONTRACTOR.
 - SEALS AND RETAINING BANDS BASED UPON WEKO-SEAL INTERNAL JOINT SEALS, MILLER PIPELINE CO.
 - CLEAN CONCRETE SURFACE OF DEBRIS 3" BEYOND EITHER SIDE OF THE SEAL POSITION.
 - ALL HIGH/LOW SURFACE IMPERFECTIONS RUNNING THROUGH OR PART WAY THROUGH THE SEALING SURFACE MUST BE REMOVED BEFORE INSTALLATION OF SEALS.



FLEXIBLE INTERNAL JOINT SEAL FOR CCP (C 2716)
NOT TO SCALE



DETAIL - RETAINING BAND SLEEVE CLIP OVERLAP RETAINER

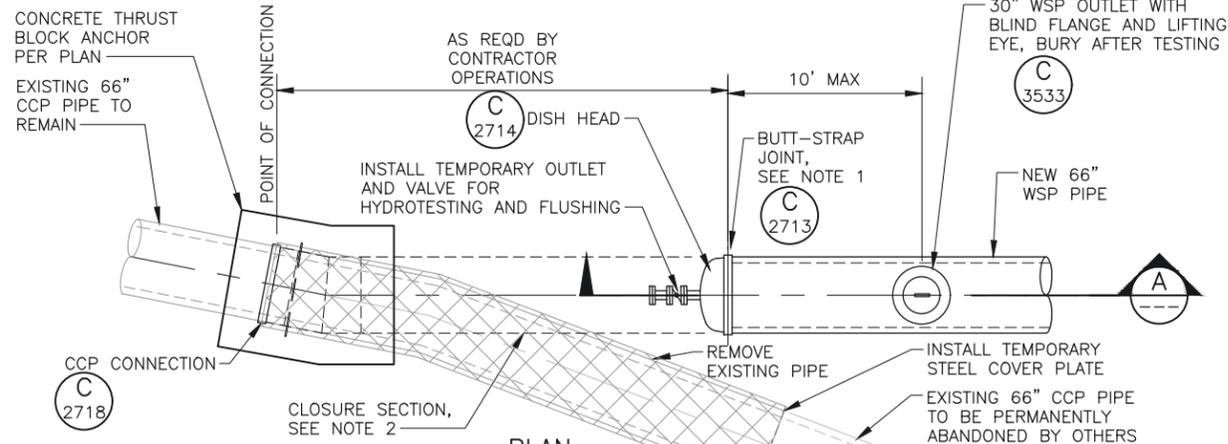


DETAIL - RETAINING BAND MECHANICAL LOCK OVERLAP SCREW LOCK

INTERNAL JOINT REPAIR STEEL RETAINING BANDS (C 2716)
NOT TO SCALE

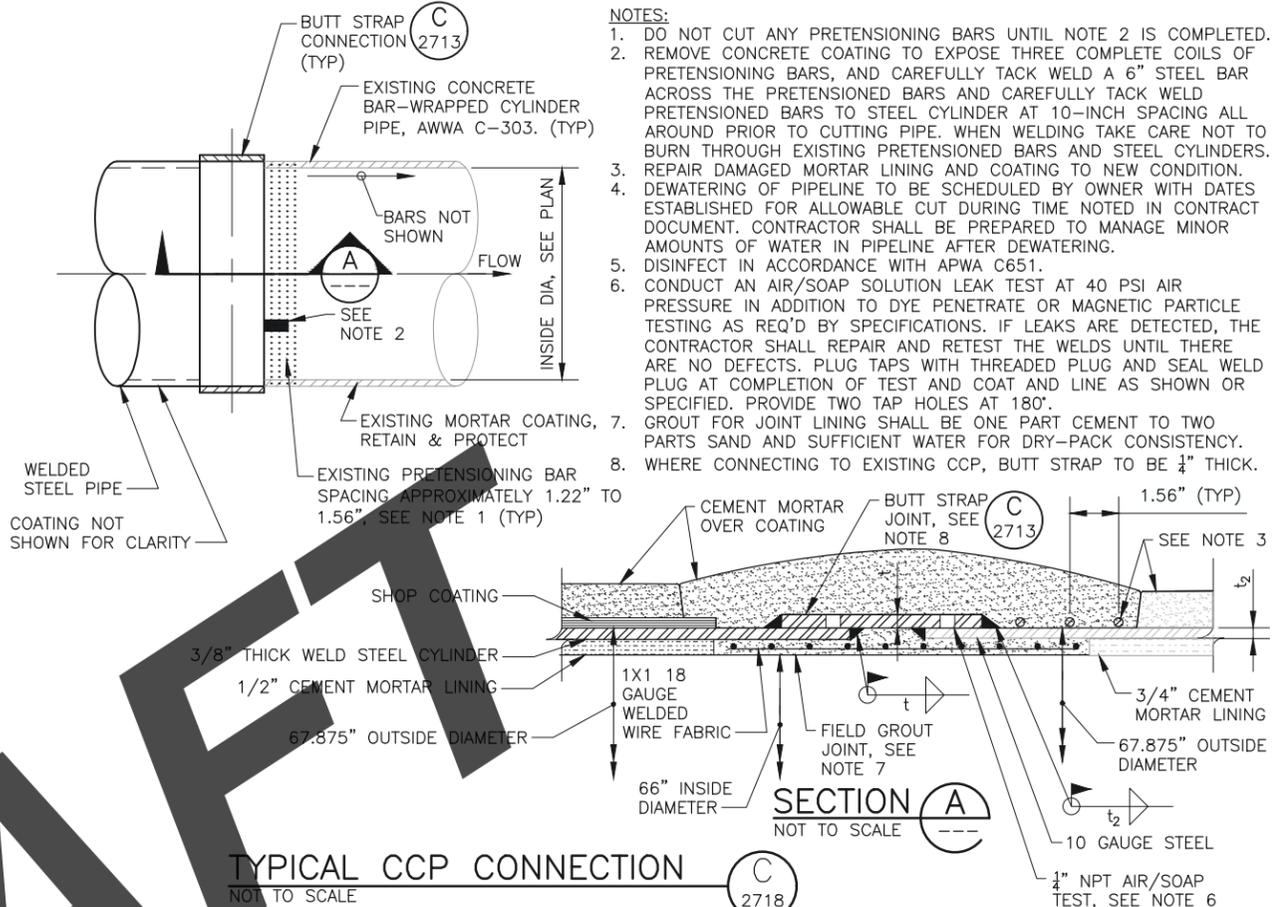
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REVISIONS		NO.		DATE		APPROVED BY		REMARKS	
DRAWN: 01/16/2016		2016.07.20		18:08		ACCEPTED		BART LEFLANG, P.E. MANAGER, FIELD ENGINEERING DIVISION	
STATION: PROVO, UTAH		DATE: 07/14/16		DATE: 07/14/16		DATE: 07/14/16		DATE: 07/14/16	
UTAH DEPARTMENT OF TRANSPORTATION		REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.		APPROVED		PROFESSIONAL ENGINEER		GENERAL CIVIL DETAILS - 3	
SR-154 BANGER TER HWY		JORDAN AQUEDUCT PROTECTION AND RELOCATION		PROJECT NUMBER: S-0154(82)16		PIN: 14785		PROJECT: SR-154 BANGER TER HWY	
SHEET NO. GC-03		DATE: 07/14/16		DATE: 07/14/16		DATE: 07/14/16		DATE: 07/14/16	



- NOTES:**
- SEQUENCE FOR TESTING NEW CONNECTIONS TO THE EXISTING AQUEDUCT:
 - INSTALL TEST HEAD ON NEW PIPE.
 - TEST AND DISINFECT NEW PIPE IN ACCORDANCE WITH SPECIFICATIONS.
 - COORDINATE WITH JWCD AND BOR TO REMOVE EXISTING AQUEDUCT FROM SERVICE. DEWATER EXISTING AQUEDUCT AND REMOVE EXISTING PIPE AT CONNECTION LOCATIONS. SEE SPECIFICATIONS.
 - CONNECT THE EXISTING PIPE TO THE NEW PIPE USING CLOSURE SECTIONS AS SHOWN, PER PLAN.
 - TEST JOINTS AS REQUIRED.
 - INSTALL FIELD APPLIED LININGS AND COATINGS AT THE CLOSURE SECTION JOINTS.
 - DISINFECT CONNECTION FITTING AND SURROUNDING AQUEDUCT. COORDINATE WITH JWCD TO RETURN AQUEDUCT TO SERVICE.
 - CONCRETE THRUST COLLAR TO CURE MINIMUM 48 HRS PRIOR TO RETURNING AQUEDUCT TO SERVICE.
 - VERIFY OD, GEOMETRY AND ALIGNMENT OF EXISTING PIPE PRIOR TO ORDERING CLOSURE PIECES.
 - 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.
 - SOUTH AQUEDUCT CONNECTION SHOWN. SIMILAR FOR NORTH AQUEDUCT CONNECTION.

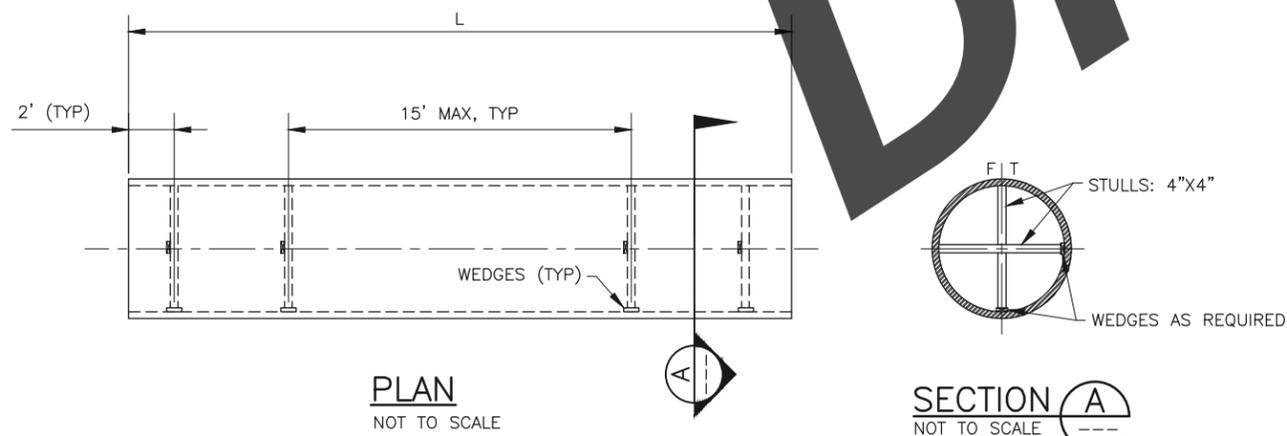
FINAL TIE-IN CONNECTION TO EXISTING AQUEDUCT (C 2717)
NOT TO SCALE



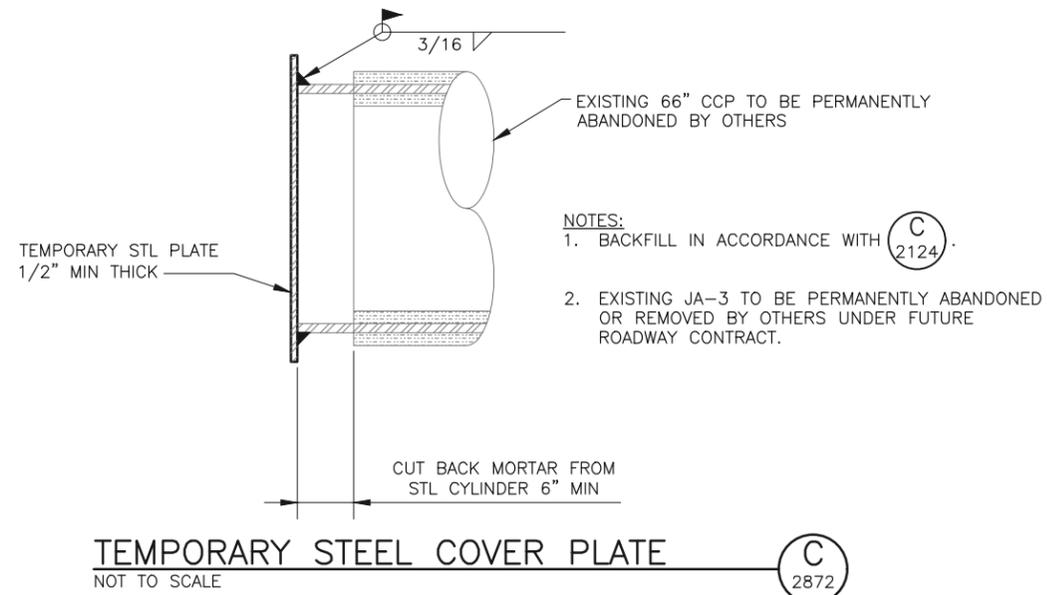
- NOTES:**
- DO NOT CUT ANY PRETENSIONING BARS UNTIL NOTE 2 IS COMPLETED.
 - REMOVE CONCRETE COATING TO EXPOSE THREE COMPLETE COILS OF PRETENSIONING BARS, AND CAREFULLY TACK WELD A 6" STEEL BAR ACROSS THE PRETENSIONED BARS AND CAREFULLY TACK WELD PRETENSIONED BARS TO STEEL CYLINDER AT 10-INCH SPACING ALL AROUND PRIOR TO CUTTING PIPE. WHEN WELDING TAKE CARE NOT TO BURN THROUGH EXISTING PRETENSIONED BARS AND STEEL CYLINDERS.
 - REPAIR DAMAGED MORTAR LINING AND COATING TO NEW CONDITION.
 - 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.
 - DISINFECT IN ACCORDANCE WITH APWA C651.
 - 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°.
 - GROUT FOR JOINT LINING SHALL BE ONE PART CEMENT TO TWO PARTS SAND AND SUFFICIENT WATER FOR DRY-PACK CONSISTENCY.
 - WHERE CONNECTING TO EXISTING CCP, BUTT STRAP TO BE 1/2" THICK.

TYPICAL CCP CONNECTION (C 2718)
NOT TO SCALE

- NOTES:**
- STULLING IS DESIGNED FOR HAULING PURPOSE ONLY. PERFORMANCE OF PIPE BRACING USED DURING INSTALLATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.



WSP TEMPORARY BRACING LOCATIONS (C 2853)
NOT TO SCALE



TEMPORARY STEEL COVER PLATE (C 2872)
NOT TO SCALE

- NOTES:**
- BACKFILL IN ACCORDANCE WITH (C 2124).
 - EXISTING JA-3 TO BE PERMANENTLY ABANDONED OR REMOVED BY OTHERS UNDER FUTURE ROADWAY CONTRACT.

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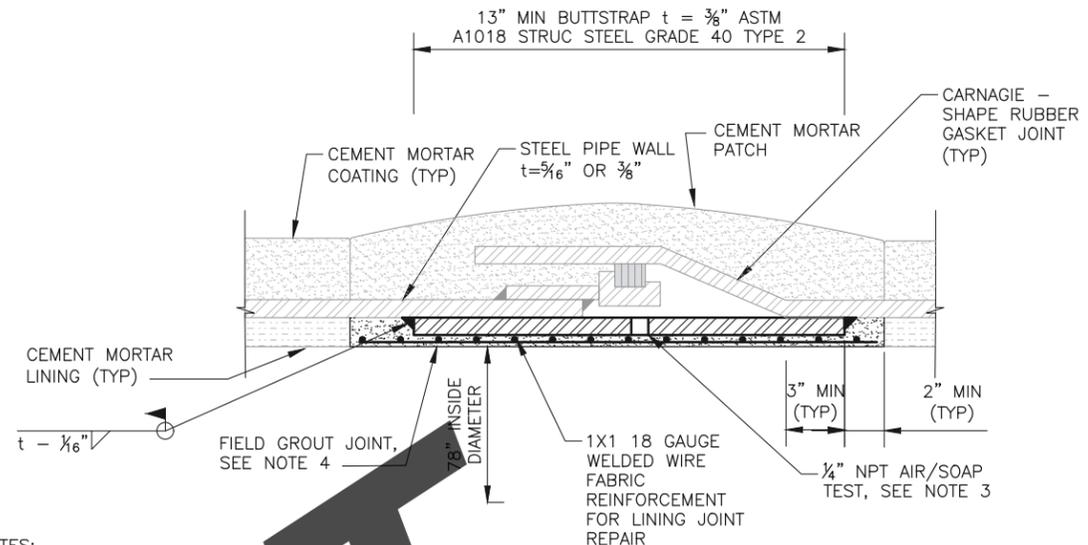
UTAH DEPARTMENT OF TRANSPORTATION REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.		DATE: 07/14/16	DATE: 2016.07.20	DATE: 18:08	DATE: 27-06'00'
PROJECT: SR-154 BANGERTER HWY	PROJECT NUMBER: S-0154(82)16	PIN: 14785	DATE: 07/14/16	DATE: 27-06'00'	DATE: 18:08
JORDAN AQUEDUCT PROTECTION AND RELOCATION		PROFESSIONAL ENGINEER	DATE: 07/14/16	DATE: 27-06'00'	DATE: 18:08
GENERAL CIVIL DETAILS - 4		DATE: 07/14/16	DATE: 27-06'00'	DATE: 18:08	DATE: 18:08
APPROVED:	DATE: 07/14/16	DATE: 27-06'00'	DATE: 18:08	DATE: 18:08	DATE: 18:08
STATION: PROVO, UTAH	STATION: PROVO, UTAH	STATION: PROVO, UTAH	STATION: PROVO, UTAH	STATION: PROVO, UTAH	STATION: PROVO, UTAH
REVISIONS:	REVISIONS:	REVISIONS:	REVISIONS:	REVISIONS:	REVISIONS:
NO.	DATE	APPROVED BY	REMARKS	NO.	DATE

NO.	DATE	APPROVED BY	REMARKS

DRAWN: 2016.07.20 18:08
 36
 06'0
 ACCEPTED BY: BART LEIFLANG, P.E.
 MANAGER, FIELD ENGINEERING DIVISION
 STATION: PROVO, UTAH

UTAH DEPARTMENT OF TRANSPORTATION
 REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.
 APPROVED: [Signature]
 DRAWN BY: SR
 QC CHECKED BY: JL
 DATE: 07/14/16
 PROFESSIONAL ENGINEER

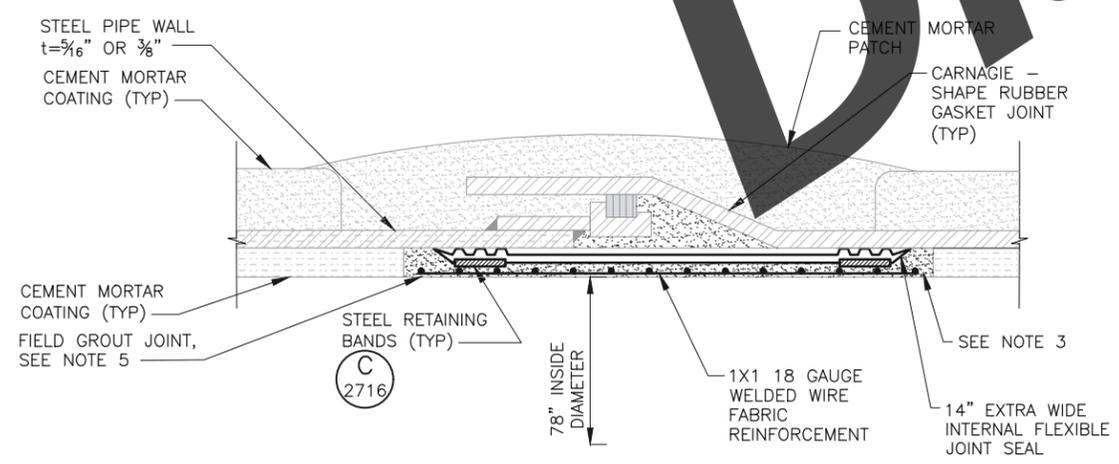
SR-154 BANGERTER HWY
 JORDAN AQUEDUCT PROTECTION AND RELOCATION
 PROJECT NUMBER: S-0154(82)16
 PIN: 14785
 GENERAL CIVIL DETAILS - 5



- 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.

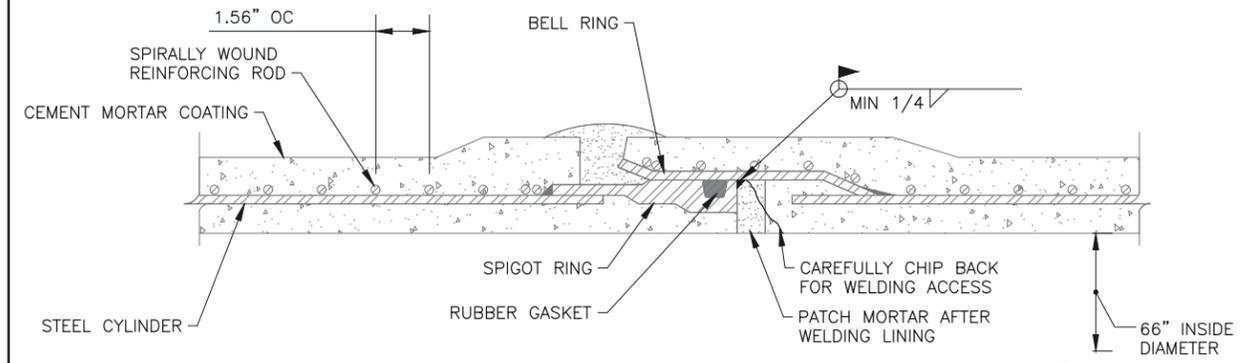
INTERIOR BUTTSTRAP JOINT FOR STEEL PIPE (C) 2951
NOT TO SCALE

- 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) 2716.



FLEXIBLE INTERNAL JOINT SEAL FOR STEEL PIPE (C) 2954
NOT TO SCALE

- 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.

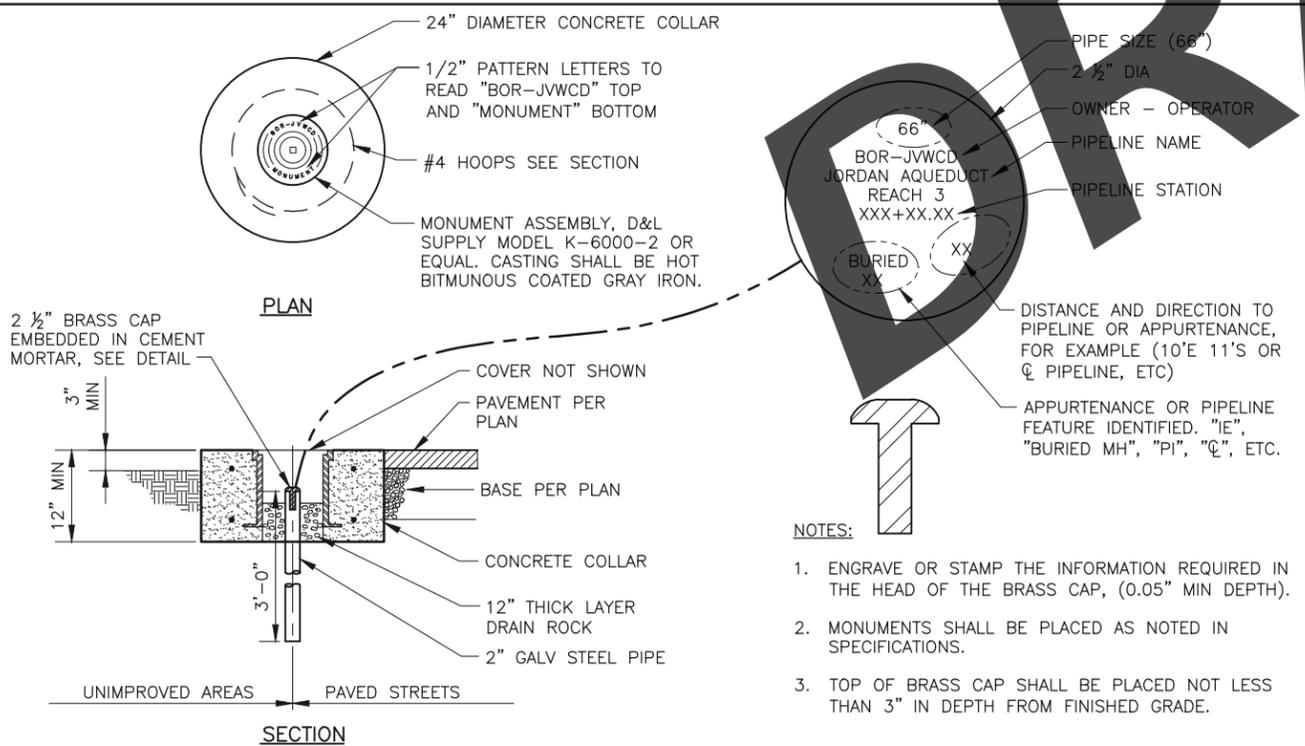


INTERIOR WELDED JOINT FOR CCP (C) 2956
NOT TO SCALE

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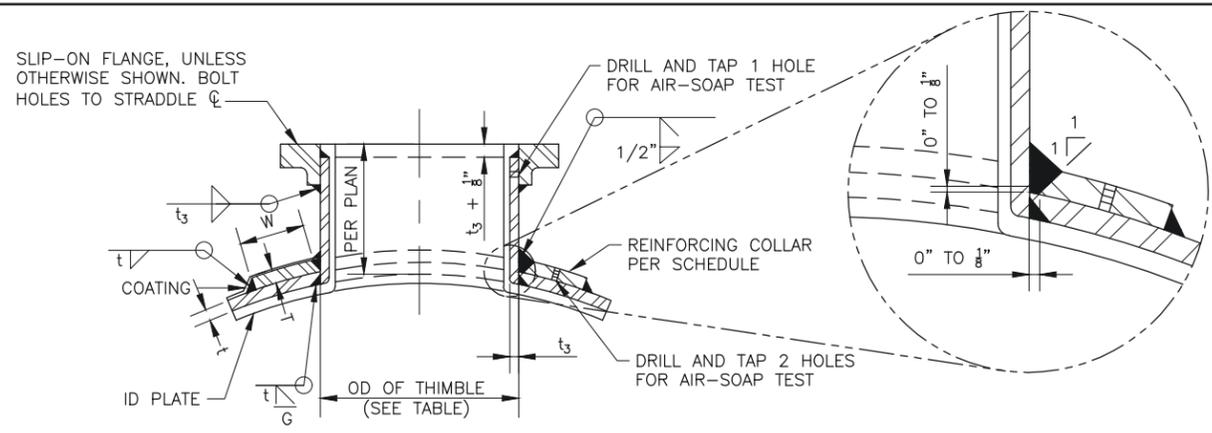
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PIPELINE MARKERS
NOT TO SCALE

C
2965

- 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.



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

- 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 DETAIL
NOT TO SCALE

C
3533

PROJECT SR-154 BANGERTER HWY	PROJECT NUMBER S-0154(82)16	PIN 14785	PROJECT DESCRIPTION JORDAN AQUEDUCT PROTECTION AND RELOCATION	APPROVED PROFESSIONAL ENGINEER	DATE 07/14/16	DRAWN BY RG	CHECKED BY JL	STATION: PROVO, UTAH
UTAH DEPARTMENT OF TRANSPORTATION REGION 2 - BOWEN COLLINS & ASSOCIATES, INC.				2016.07.20 18:08 ACCEPTED BART LEEFLANG, P.E. MANAGER, FIELD ENGINEERING DIVISION		NO. DATE APPROVED BY		REMARKS