



State of Utah

GARY R. HERBERT  
Governor

SPENCER J. COX  
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.  
Executive Director

SHANE M. MARSHALL, P.E.  
Deputy Director

May 24, 2016

TO ALL BIDDERS CONCERNED:

SUBJECT:

F-R299(217) / Pin 013158  
I-215; Knudsen Corner Bridge Preservation  
Addendum Number: 1

To Whom It May Concern:

We are submitting the following changes to the subject project.

1. The "Table of Contents" has been revised. Special Provision 03055M "Portland Cement Concrete" and Special Provision 03310M "Structural Concrete" has been added. Special Provision 03373S "Polyester Concrete Overlay" has been revised.
2. The "Bidding Schedule" has been revised.

Bidders must download the revised Bidder's Schedule "Bid Item Version 2" from the UDOT website at <http://www.udot.utah.gov/index.php?m=c&tid=317>

Item No. 21, 03310001P "Structural Concrete" has been changed to 03310001\* "Structural Concrete".

3. The "Measurement and Payment" has been revised.

Item No. 21 03310001P "Structural Concrete" has been changed to 03310001\*.

4. Special Provision 03055M "Portland Cement Concrete" and Special Provision 03310M "Structural Concrete" has been added.
5. Special Provision 03373S "Polyester Concrete Overlay" has been revised.

Please consider these revisions before submitting your bid.

\*\*\* ADDENDUM IS AVAILABLE AND MAY BE DOWNLOADED FROM THE UDOT WEBSITE AT <http://eprpw.dot.utah.gov>

RECEIPT OF THIS ADDENDUM MUST BE ACKNOWLEDGED WHEN YOU SUBMIT YOUR BID.  
**YOUR BID WILL BE DECLARED NON-RESPONSIVE IF YOU DO NOT ACKNOWLEDGE THIS ADDENDUM.**

Sincerely,

JOHN MONTOYA  
Project Manager  
Attach:

## Federal Projects With Full Size Plan Sheets

	<u>Section No.</u>	<u>Title – Type (current date)</u>
1.	00120M	Bidding Requirements and Conditions – Supplemental Specification (02/26/15)
2.	00221S	Bidding Contract Time – Innovative Contracting (P+T) Special Provision (Calendar Day Projects) (07/08/15)
3.	00250S	Prebid Conference – Department Special Provision (01/01/12)
4.	00515M	Contract Award and Execution – Construction Special Provision, Innovative Contracting (P+T) Special Provision (02/26/15)
5.	00515M	Contract Award and Execution – Supplemental Specification (02/26/15)
6.	00555M	Prosecution and Progress – Project Special Provision (03/21/06)
7.	00570M	Definitions – Supplemental Specification (10/22/15)
8.	00725M	Scope of Work – Innovative Contracting (P+T) Special Provision (03/12/15)
9.	00727M	Control of Work – Supplemental Specification (10/22/15)
10.	00820M	Legal Relations and Responsibility to the Public – Project Special Provision (3/24/16)
11.	00820M	Legal Relations and Responsibility to the Public – Supplemental Specification (08/27/15)
12.	01282M	Payment – Supplemental Specification (08/27/15)
13.	01315M	Public Information Services – Project Special Provision (04/29/13)
14.	01315M	Public Information Services – Supplemental Specification (10/31/13)
15.	01355M	Environmental Compliance – Supplemental Specification (10/31/13)
16.	01455M	Material Quality Requirements – Materials Special Provision (04/13/16)
17.	01455M	Material Quality Requirements – Supplemental Specification (02/25/16)
18.	01456M	Materials Dispute Resolution – Supplemental Specification (02/28/13)
19.	01554M	Traffic Control – Traffic and Safety Special Provision (05/16/13)
20.	01554M	Traffic Control – Supplemental Specification (11/06/14)
21.	01557S	Maintenance of Traffic (MOT) – Region 2 Special Provision (04/19/16)
22.	01559S	Highway Patrol Assistance – Project Special Provision (01/07/16)
23.	01721	Survey – Supplemental Specification (02/25/16)
24.	02221M	Remove Structure and Obstruction – Project Special Provision (03/22/16)
25.	02741M	Hot Mix Asphalt (HMA) – Materials Special Provision (09/08/14)
26.	02742S	Project Specific Surfacing Requirements – Department Special Provision (06/30/15)
27.	02748M	Prime Coat/Tack Coat – Supplemental Specification (10/22/15)
28.	02765M	Pavement Marking Paint – Materials Special Provision (10/05/15)
29.	02765M	Pavement Marking Paint – Supplemental Specification (02/26/15)

## Federal Projects With Full Size Plan Sheets

30. 02768M Pavement Marking Materials – Supplemental Specification (08/29/13)
31. 02769S Grinding for Grooved-In Pavement Markings – Materials Special Provision (07/30/15)
32. 02981M Grinding Pavement – Project Special Provision (03/07/13)
33. 03055M Portland Cement Concrete – Project Special Provision (05/26/16)
34. 03152M Concrete Joint Control – Project Special Provision (03/07/13)
35. 03154S Hydro-Demolition – Project Special Provision (02/09/16)
36. 03211M Reinforcing Steel and Welded Wire – Supplemental Specification (10/25/12)
37. 03310M Structural Concrete – Project Special Provision (05/26/16)
38. 03310M Structural Concrete – Supplemental Specification (10/22/15)
39. 03372S Thin Bonded Polymer Overlay – Project Special Provision (03/21/16)
40. 03372M Thin Bonded Polymer Overlay – Supplemental Specification (02/27/14)
41. 03373S Polyester Concrete Overlay – Project Special Provision (05/25/16)
42. 03390M Concrete Curing – Project Special Provision (02/22/16)
43. 03390M Concrete Curing – Supplemental Specification (10/22/15)
44. 03924M Structural Concrete Repair and Sealing – Supplemental Specification (08/30/12)
45. 03934S Structural Pothole Patching – Project Special Provision (02/18/16)
46. 03936S Deck Rehabilitation Concrete – Project Special Provision (02/09/16)
47. 05120M Structural Steel – Supplemental Specification (08/30/12)
48. 05833S Compression Joint Seal – Project Special Provision (02/09/16)

# Measurement and Payment

## Project # F-R299(217)

05/26/2016

Item #	Bid Item Number	Bid Item Name	UOM
1	00830001U	On the Job Training	hour
<p>Training Commitments listed in the Table of Contents for Federal projects, XI § 5  <a href="http://www.udot.utah.gov/main/f?p=100:pg:::1:T,V:1940">http://www.udot.utah.gov/main/f?p=100:pg:::1:T,V:1940</a></p>			
2	012850010	Mobilization	lump sum
		<b>Amount Paid</b>	<b>When Paid</b>
		<p>The lesser of 25% of Mobilization or 2.5% of contract                      The lesser of 50% of Mobilization or 5% of contract                      The lesser of 75% of Mobilization or 7.5% of contract                      The lesser of 100% of Mobilization or 10% of contract                      Amount bid in excess of 10% of contract price.</p>	<p>With first estimate                      With estimate following completion of 5% of contract                      With estimate following completion of 10% of contract                      With estimate following completion of 20% of contract                      Project Acceptance-Final</p>
<p>Includes all costs associated with Railroad Flagging, inspection, and cleanup crew according to Section 00725.</p>			
3	01315001*	Public Information Services	lump sum
4	01554000P	Traffic Control	lump sum
<p>Stripe traffic lanes or provide temporary traffic markings before removing traffic control. All temporary striping and removal of striping is paid under traffic control. Includes cost for flagging as needed.</p>			
5	01557001*	Maintenance of Traffic	lump sum
<p>Amount paid is 25% to the bid item amount.                      Remaining portion of bid item paid as a percentage of the contract completed.                      Paid with the first estimate and then with each subsequent estimate. Includes all cost for protection and cleaning of all sidewalks, roadways, and trails under the bridge as directed by the Engineer.                      Includes temporary asphalt pavement wedge, removal of temporary asphalt pavement wedge and grinding pavement after temporary asphalt pavement has been removed. Includes all cost associated with crossover maintenance and removal should contractor elect to install.</p>			
6	02221005P	Remove Concrete Wall	foot
<p>Includes all material, labor and equipment needed in the cutting and removal of wall structure. Cut wall to be flush with roadway pavement on the elevated side of the road.</p>			
7	022210165	Remove Asphalt Pavement	square yard
<p>Regardless of the depth                      A. Does not include discontinued roads within the limits of the new roadbed or roads that are disturbed in performing other items of work.                      B. Exclude from measurement and payment under "Roadway Excavation."</p>			
8	022210170	Remove Precast Concrete Barrier	foot
9	027410050	HMA - 1/2 inch	ton
<p>Includes aggregates, asphalt binder, hydrated lime, tack coat, and other additives, etc.</p>			
10	027650050	Pavement Marking Paint	gallon
11	02769001*	Grinding for Grooved in Pavement Markings	foot
12	029610030	Rotomilling - 2 Inch	square yard
<p>Calculated from length multiplied by the average finished width of rotomilled surface</p>			
13	02981001P	Grinding Pavement	square yard
<p>Any environmental controls used to prevent concrete grinding slurry from entering drainage and storm drain systems are considered incidental and will not be paid for separately.</p>			
14	03152005P	Concrete Joint Control	foot
<p>Includes all labor and materials such as joint filler, joint sealer, water stops and backer rod to perform the work. Includes the work to clean the joints prior to sealing and sealing cavities left from removing any plow able pavement markers. Includes removal and disposal of all debris associated with concrete joint control work.</p>			
15	02221099*	Remove Deicer	lump sum
<p>1. Includes all materials, equipment and labor to remove the deicer system from the bridge.                      2. Includes repairs required because of removal of anchor bolts from concrete.</p>			
16	02225001P	Asphalt Surfacing Removal (Structures)	square yard
<p>Includes all equipment, materials, and labor required to remove existing asphalt surfacing and existing waterproofing membrane. Include proper disposal of all materials.</p>			
17	03154010*	Hydro-Demolition, Class A and B	square foot

# Measurement and Payment

Project # F-R299(217)

05/26/2016

Item #	Bid Item Number	Bid Item Name	UOM
		<ol style="list-style-type: none"> <li>1. Includes materials, labor and equipment required to complete the work.</li> <li>2. Removal of deck or approach slab concrete to a depth shown on the plans.</li> <li>3. Covers depth of removal from top of deck surface to a maximum depth of the top of the bottom mat of reinforcement.</li> <li>4. Includes removal and proper disposal of all materials.</li> <li>5. Includes all permits necessary for work and disposal of materials.</li> <li>6. Includes containment of all materials to the bridge deck or approach slabs.</li> <li>7. Includes survey of the existing deck surface prior to hydro-demolition.</li> <li>8. Includes containment of all materials to the bridge deck of approach slabs.</li> <li>9. Includes the protection and repair of steel reinforcement to remain in place.</li> <li>10. Does not include replacement of steel reinforcement because of 25% section loss.</li> <li>11. Includes temporary bracing of the overhang.</li> <li>12. Includes removal of thin bonded polymer overlay before or during hydro-demolition.</li> <li>13. Deduction for any penalties or fines incurred as part of the contractor operations being in violation of permits and regulations.</li> </ol>	
18	03154020*	Hydro-Demolition, Class B	square foot
		<ol style="list-style-type: none"> <li>1. Includes materials, labor and equipment required to complete the work.</li> <li>2. Removal of deck or approach slab concrete to a depth shown on the plans.</li> <li>3. Covers depth of removal from top of deck surface to a maximum depth of the top of the bottom mat of reinforcement.</li> <li>4. Includes removal and proper disposal of all materials.</li> <li>5. Includes all permits necessary for work and disposal of materials.</li> <li>6. Includes containment of all materials to the bridge deck or approach slabs.</li> <li>7. Includes survey of the existing deck surface prior to hydro-demolition.</li> <li>8. Includes containment of all materials to the bridge deck of approach slabs.</li> <li>9. Includes the protection and repair of steel reinforcement to remain in place.</li> <li>10. Does not include replacement of steel reinforcement because of 25% section loss.</li> <li>11. Includes temporary bracing of the overhang.</li> <li>12. Includes removal of thin bonded polymer overlay before or during hydro-demolition.</li> <li>13. Deduction for any penalties or fines incurred as part of the contractor operations being in violation of permits and regulations.</li> </ol>	
19	03154030*	Hydro-Demolition, Class C	square foot
		<ol style="list-style-type: none"> <li>1. Includes materials, labor and equipment required to complete the work.</li> <li>2. Removal of deck or approach slab concrete to a depth shown on the plans.</li> <li>3. Covers depth of removal from top of deck surface to the bottom of the deck surface.</li> <li>4. Includes all falsework required to contain existing concrete, surry, water, and other debris from falling on the surfaces below or leaving the bridge or approach slab.</li> <li>5. Includes all formwork required to place new concrete or patch material as shown on the plans.</li> <li>6. Includes removal and proper disposal of all materials.</li> <li>7. Includes all permits necessary for work and disposal of materials.</li> <li>8. Estimated plan quantities are based on preliminary field review for bidding purposes only. Quantity may be reduced, deleted, or increased over the bid quantities from the contract. The price of the actual quantity will be paid at the contract unit price if any of these situations occur.</li> <li>9. Includes the protection and repair of steel reinforcement to remain in place.</li> <li>10. Includes survey of the existing deck surface prior to hydro-demolition.</li> <li>11. Includes containment of all materials to the bridge deck of approach slabs.</li> <li>12. Does not include replacement of steel reinforcement because of 25% section loss.</li> <li>13. Includes temporary bracing of the overhang.</li> <li>14. Includes removal of thin bonded polymer overlay before or during hydro-demolition.</li> <li>15. Deduction for any penalties or fines incurred as part of the contractor operations being in violation of permits and regulations.</li> </ol>	
20	032110015	Reinforcing Steel - Coated	pound
		<ol style="list-style-type: none"> <li>A. Do not include the mass of the coating or the specified test bars as computed weight.</li> <li>B. Department will not make allowances for extra reinforcing steel required to provide lap splices that are requested by the Contractor.</li> <li>C. Department will not make allowances for clips, chairs, wire, or other materials used for fastening reinforcement in place.</li> </ol>	
21	03310001*	Structural Concrete	cubic yard
		<ol style="list-style-type: none"> <li>A. Measured by ticket of concrete placed in structure.</li> <li>B. Department will pay for reinforcing steel for structures separately, unless otherwise noted.</li> <li>C. Department will make no separate payment for excavation for structures.</li> </ol>	
22	03372001*	Thin Bonded Polymer Overlay, Type I	square foot
		Includes the cost of the two part polymer resin, aggregate, labor, and incidental items required to install the Thin Bonded Polymer Overlay. This also includes the cost for any repairs that are needed in compliance with the warranty letter.	
23	03373005*	Place Polyester Concrete Overlay	square foot
		<ol style="list-style-type: none"> <li>1. Includes cost for all materials, equipment, labor, manufacturer's representative, and all incidental items necessary to install the polyester concrete overlay.</li> <li>2. Includes surface preparation, application of High Molecular Weight Methacrylate (HMWM) primer and placement of the polyester concrete overlay.</li> <li>3. Includes all costs associated with constructing and disposing of trial overlays and base.</li> </ol>	

# Measurement and Payment

## Project # F-R299(217)

05/26/2016

Page 3  
02:04:47 PM

Item #	Bid Item Number	Bid Item Name	UOM
		4. Includes replacement of overlay areas not in compliance with the contract.	
24	03373010*	Furnish Polyester Concrete Overlay	square foot
		1. Includes all materials, equipment and incidentals for furnishing polyester concrete, including furnishing HMWM resin primer and materials for trial overlays. 2. Includes volume of material to achieve the thickness shown on the plans as well as the volume to fill minor defects in the deck surface.	
25	03373020*	Furnish Polyester Concrete Overlay on Hydro-Demolition Surface	square foot
		1. Includes all materials, equipment and incidentals for furnishing polyester concrete, including furnishing HMWM resin primer and materials for trial overlays. 2. Includes volume of material to achieve the thickness shown on the plans as well as the volume to fill minor defects in the deck surface. 3. Includes volume of material needed to fill irregular surface left by hydro-demolition process.	
26	039340010	Structural Pothole Patching	square foot
		Estimated plan quantities are based on preliminary field review for bidding purposes only. Repair the actual quantities determined by the Engineer. Pothole patching may be reduced, deleted, or increased over the bid quantities from the contract. The price of the actual quantity will be paid at the contract unit price if any of these situations occur. Department will not allow additional compensation for repairing blow throughs or removing and repairing failed patches.	
27	03936000*	Deck Rehabilitation Concrete	square foot
		1. Material, equipment and labor required to place concrete as shown in the plans. 2. Measured in plan view and is not dependent on depth of material.	
28	05833000*	Compression Joint Seal, Type A	foot
		1. Materials, equipment and labor required to prepare and place new joint. 2. Measured along the joint.	

**SPECIAL PROVISION**

**PROJECT # F-R299(217)  
PIN # 13158**

**SECTION 03055M**

**PORTLAND CEMENT CONCRETE**

**Add the following to Article 1.3:**

- S. ASTM C 1116: Fiber-Reinforced Concrete
- T. ASTM C 1609: Flexural Performance of Fiber-Reinforced Concrete (Using Beam with Third-Point Loading)
- U. International Code Council (ICC) Engineering Services (ES) Acceptance Criteria (AC) 32.

**Add the following to Article 1.4:**

- B. Microsynthetic Fiber – Synthetic fibers with diameters or equivalent diameters less than 0.012 inch.
- C. Macrosynthetic Fiber – Synthetic fibers with diameters or equivalent diameters greater than 0.012 inch.
- D. Monofilament- Single filament fiber, typically cylindrical in cross-section.

**Delete Article 2.1, Table 2 and replace with the following:**

Table 2

<b>Concrete Classes and Mix Requirements</b>							
<b>Class</b>	<b>Coarse Aggregate or Sieve Size</b>	<b>Max. Water/Cementitious Ratio</b>	<b>Air Content Percent (%)*</b>	<b>Mix Design Compressive Strength <math>f'_{cr}</math> (Psi)</b>	<b>28 Day Minimum Compressive Strength <math>f'_c</math> (Psi) **</b>	<b>Microsynthetic Fiber (lb/yd<sup>3</sup>)</b>	<b>Macrosynthetic Fiber (lb/yd<sup>3</sup>)</b>
AA(AE)	2" to No. 4	0.40	4.0 - 7.0	5,200	4,000	2	4
	1½" to No. 4	0.40	4.5 - 7.5	5,200	4,000	2	4
	1" to No. 4	0.40	5.0 - 7.5	5,200	4,000	2	4
	¾" to No. 4	0.40	5.0 - 7.5	5,200	4,000	2	4

\* Values listed represent in-place air content. Make necessary adjustments for impacts to air content due to placement.

\*\* For  $f'c$  over 4,000 psi, design and proportion mixes according to ACI Manual of Concrete Practice 301: Specifications for Concrete and project specific criteria. Use Table 2 Class AA(AE) Air Content Percentages according to Coarse aggregate size for these mixes.

**Add the following to Part 2:**

## **2.7 SYNTHETIC FIBER**

- A. Provide products from one manufacturer.
- B. Microsynthetic Fiber, use monofilament synthetic fibers.
- C. Macrosynthetic Fiber, a minimum flexural strength ratio ( $R_{e,3}$ ) of 25 percent when tested in accordance with ASTM C 1609 is required.
- D. Store the fibers in a dry, covered area, free of contamination.
- E. Evaluate trial batches to ensure workability of the concrete.
- F. Conform to ASTM C 1116, Type III and the requirements of ICC ES AC32 Section 3.1.1 (plastic shrinkage crack reinforcement) and Section 3.1.2 (shrinkage and temperature reinforcement).
- G. Do not introduce fibers at the same time the cement is being introduced. Mix for at least five minutes after the addition of the fibers.

**Delete Article 3.3, paragraph B and replace with the following:**

- B. Design the cementitious system to mitigate potential alkali-aggregate reactivity.
  - 1. Use at least 20 percent fly ash by weight of the total cementitious system.

END OF SECTION

May 26, 2016

**SPECIAL PROVISION**

**PROJECT # F-R299(217)  
PIN # 13158**

**SECTION 03310M**

**STRUCTURAL CONCRETE**

**Delete Article 1.1, paragraphs A and B and replace with the following:**

- A. Materials and procedures for producing low shrinkage Portland cement concrete for bridge deck and approach slabs.
- B. Materials and procedures for constructing structural concrete for bridge decks and approach slabs.

**Delete Article 1.5, paragraph B and replace with the following:**

- B. Material Submittals
  - 1. Mix design for all Class AA(AE) concrete to be used according to Section 03055 and this Section, article 2.1. Submit the design and trial batch results including:
    - a. Shrinkage results according to AASHTO T 160.
  - 2. Surface evaporation plan according to this Section, Article 3.9G.

**Delete Article 2.1, paragraph A and replace with the following:**

- A. Class AA(AE) Concrete
  - 1. Refer to Section 03055.
  - 2. Maximum shrinkage 0.03 percent at 28 days. Refer to AASHTO T 160.

**Delete Article 2.1, paragraph D.**

END OF SECTION

**SPECIAL PROVISION**

**PROJECT # F-R299(217)  
PIN # 13158**

**SECTION 03373S**

**POLYESTER CONCRETE OVERLAY**

**Add Section 03373:**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Materials and procedures for the preparation and placement of a bridge deck and approach slab overlay system consisting of high molecular weight methacrylate (HMWM) resin primer, polyester concrete, and finishing sand.

**1.2 RELATED SECTIONS**

- A. Section 01452: Pavement Smoothness
- B. Section 03934: Structural Pothole Patching

**1.3 REFERENCES**

- A. AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates
- B. AASHTO T 84: Specific Gravity and Absorption of Fine Aggregate
- C. AASHTO T 85: Specific Gravity and Absorption of Coarse Aggregate
- D. AASHTO T 96: Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- E. AASHTO T 112: Clay Lumps and Friable Particles in Aggregate
- F. AASHTO T 255: Total Evaporable Moisture Content of Aggregate by Drying
- G. AASHTO T 308: Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method

- H. AASHTO T 335: Determining the Percentage of Fracture in Coarse Aggregate
- I. ASTM C 469: Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression
- J. ASTM C 805: Rebound Hammer of Hardened Concrete
- K. ASTM C 1583: Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)
- L. ASTM D 323: Vapor Pressure of Petroleum Products (Reid Method)
- M. ASTM D 618: Conditioning Practices for Testing
- N. ASTM D 638: Tensile Properties of Plastics
- O. ASTM D 1475: Density of Liquid Coatings, Inks, and Related Products
- P. ASTM D 2196: Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield type) Viscometer
- Q. ASTM D 2369: Volatile Content of Coatings
- R. ASTM D 3278: Flash Point of Liquids by Small Scale Closed-Cup Apparatus
- S. ASTM D 4285: Indicating Oil or Water in Compressed Air
- T. ASTM E 303: Measuring Surface Frictional Properties Using the British Pendulum Tester
- U. California Test (CT) 550: Method for Determining the Surface Abrasion Resistance of Concrete Specimens
- V. California Test (CT) 551: Determining Suitability of Materials for Overlayment and Repair of Portland Cement Concrete Pavement and Structures

#### **1.4 DEFINITIONS**

- A. Primer – A HMWM resin system consisting of a resin, promoter, and initiator that is applied as a preparatory coat to the concrete substrate surface. The primer bonds the polyester concrete to the receiving concrete substrate.

- B. Polyester Concrete – A type of concrete that uses polyester polymer resin in place of cement as a binder.
- C. Overlay – A polyester concrete overlay system consisting of a primer, polyester concrete, and a sand finish that are all fully compatible with one another and the receiving concrete substrate.
- D. Provider – The manufacturer furnishing the polyester concrete overlay system.
- E. Installer – The Contractor or subcontractor preparing all receiving concrete substrate surfaces and installing and finishing the polyester concrete overlay system.
- F. Initial Set Time – The number of minutes between the time the catalyst is added to the resin, when mixing the polyester concrete, and the time that the in-place polyester concrete cannot be deformed when pressed with a finger, indicating that the resin binder is no longer in a liquid state.
- G. Final Set Time – The number of minutes between the time the catalyst is added to the resin, when mixing the polyester concrete, and the time that that in-place polyester concrete reaches a Schmidt rebound number of at least 25.
- H. Working Drawings – Drawings produced by the Contractor that supplement the contract drawings to provide information not included in the contract documents but required for installation as specified in the plans. Working drawings do not supersede the contract drawings.
- I. Approval of Working Drawings – Acceptance of the working drawings by the Department for use on the project. The Department will review working drawings for general conformance with the design concept and compliance with the contract documents. Review and approval do not relieve the Contractor from responsibility for errors, correctness of details, conformance with the contract, and successful completion of the work.

## **1.5 SUBMITTALS**

- A. Provider Qualifications for approval at least 10 calendar days before ordering any material. Include the following:
  - 1. The company name.
  - 2. The name, phone number, and documented experience of the Provider's Technical Support Representative.
    - a. Technical Support Representative must have a minimum of 5 years of experience with the specified system and with guiding and assisting Installers in Overlay installation.

3. List of at least 15 projects of similar size, scope, and climatic conditions completed in the last 5 years in which the Overlay from the Provider has been used with satisfactory performance. For each project list the following:
  - a. Project name, bridge locations (state, routes, and bridge identifiers), owner, scope of work, and approximate date of project opening to traffic.
  - b. The Overlay quantities, components, mix proportions, pothole patching quantities and material type, application methods, and equipment used.
  - c. Two owner/agent references and their contact information (phone and email). Satisfactory references are those responsible for oversight or inspection of the project.
  
- B. Installer Qualifications for approval at least 10 calendar days before ordering any material. Include the following:
  1. List of at least 10 projects of similar size and scope completed in the last 5 years in which the Installer's superintendent and the Installer's continuous mixer operator have, in these roles, placed and finished polyester concrete overlay for Caltrans and to Caltrans standards with satisfactory performance. Thin bonded polymer overlay installations do not qualify. For each project list the following:
    - a. Project name, bridge locations (state, routes, and bridge identifiers), owner, scope of work, and approximate date of project opening to traffic.
    - b. The polyester concrete overlay quantities, pothole patching material type and quantities, application methods, and equipment used.
    - c. Two owner/agent references and their contact information (phone and email). Satisfactory references are those responsible for oversight or inspection of the project.
  
- C. Materials
  1. Submit the following for approval at least 10 calendar days before ordering any material:
    - a. Product Data Sheets including recommended installation instructions for all Overlay components.
    - b. Material Safety Data Sheets for all Overlay components.
    - c. The Provider's certification stating that the Provider is the sole provider of all components of the polyester concrete overlay system and that all components:
      - 1) Are in accordance with this Section.
      - 2) Are fully compatible with one another.
      - 3) Have been used on projects identified in the Provider qualifications.

- d. The Installer's certification, with the Provider's written concurrence, that the Overlay is fully compatible with all proposed pothole patching materials.
  2. Representative samples of material for all components of the overlay system at the request of the Engineer.
    - a. 1 gal each of primer and binder.
    - b. Catalysts, promoters, and other additives in quantities that are equivalent to the amount used in 1 gal of primer or binder, as applicable.
    - c. 50 lb of each dry component.
  3. Certificate of Compliance for all properties of polyester concrete overlay system components (primer, resin binder, aggregate, and sand) listed in Tables 1 to 5 of this Section.
    - a. Certificate of Compliance must be accompanied by test results from an independent nationally recognized laboratory as defined in this Section.
    - b. Each lot of resin binder must be tested and certified.
    - c. Tests must be performed and certification must be provided within the one-year period before the Overlay installation unless otherwise specified.
- D. A warranty letter to the Engineer and the Department Bridge Management Engineer stating that the Contractor guarantees the Overlay against all material and installation defects incurred under traffic for a period of 5 years.
  1. The guarantee period starts on the date of Substantial Completion.
  2. Include in the letter:
    - a. State Project Designation
    - b. State Project Name
    - c. State Structure Numbers
    - d. Contractor, Provider, and Installer Name
  3. Defects (performance failures) include:
    - a. Spalling: Broken or missing pieces of Overlay due to material degradation.
    - b. Scaling: Visible, exposed, rough surface texture resulting from a loss of aggregate or resin.
    - c. Delamination: Visible or audible debonding of the Overlay at the interface between the Overlay and the concrete substrate.
    - d. Cracking: Any visible crack not reflected from a crack in the existing concrete substrate.
    - e. Loss of skid resistance: Skid resistance less than 45 as measured using a 3-in. pad according to ASTM E 303.
  4. The guarantee covers 100 percent of the polyester concrete overlay system materials and installation costs.

5. The Contractor is responsible for quality control to ensure proper placement of the materials as well as all other factors that affect the service life of the system.
  6. The Contractor removes and replaces 100 percent of the Overlay for all failed sections at no cost to the Department in the event of a performance failure as stated above. If another remedy for correcting a failed section is recommended by the Contractor, it must be approved in advance by the Department.
- E. A public safety plan for approval at least 10 calendar days before beginning Overlay placement. Include the following:
1. All materials, equipment, and methods to be used.
  2. All potential health, environment, and safety risks.
  3. Provider's safety requirements.
  4. Precautions that will be taken by personnel performing or inspecting the work.
  5. Safety monitoring plan.
- F. An Overlay placement plan for approval at least 10 calendar days before beginning Overlay placement. A separate Overlay placement plan is required for any bridge that has deck hydro-demolition specified. Include the following:
1. Schedule of Overlay work and testing for each bridge.
  2. Description of materials and processes for cleaning and preparing the bridge deck and approach slabs.
  3. Description of equipment for applying HMWM resin primer.
  4. Description of equipment for measuring, mixing, placing, and finishing the Overlay.
  5. Method for grade control for finished surface.
  6. Method for isolating expansion joints and protecting drains in the deck and approach slabs.
  7. Expected initial and final set times for polyester concrete.
  8. Storage and handling of HMWM resin and polyester concrete (resin binder and aggregates).
  9. Disposal of excess HMWM resin, polyester concrete, and containers.
- G. Continuous Mixer Printouts
1. Furnish recording of aggregate volumes and the corresponding resin volumes at the end of each work shift.

## **1.6 ACCEPTANCE**

- A. Calibration
1. Calibrate mixer in the presence of the Engineer.

- a. Measure weight of each of three consecutive batches of 125 lb of aggregate using the mixer and a certified scale. Repeat until three consecutive weights are within 2%.
  - b. Measure weight of each of three consecutive batches of 20 lb of resin using the mixer and a certified scale. Repeat until there consecutive weights are within 2%.
2. Calibrate before Overlay Test Section and again before production for the first application.
- B. Average Resin Content
1. Obtain at least one sample per 2500 ft<sup>2</sup> of Overlay placed. Sampling occurs after the polyester concrete exits the mixer and before it enters the paver.
  2. The Department witnesses the sampling, takes possession of the sample immediately, and begins testing resin content.
  3. The average resin content must be 12 ( $\pm 1$ ) percent by weight of dry aggregate as measured using AASHTO T 308 Method A.
  4. The Department rejects any Overlay placed that does not meet a resin content of 12 ( $\pm 1$ ) percent by weight of dry aggregate. Remove and replace rejected Overlay.
- C. Schmidt Rebound Number
1. Perform at least one test per 500 ft<sup>2</sup> of Overlay after 30 minutes and before 4 hours of Overlay placement on concrete substrate.
  2. A Schmidt rebound number of at least 25, measured according to ASTM C 805, is required.
  3. The Engineer determines testing locations that are representative of the Overlay area being evaluated.
  4. The Schmidt rebound number at a given location is the highest value obtained from three individual measurements performed in rapid succession at that location.
  5. The Department witnesses the measurements.
  6. The Department rejects any Overlay placed that does not meet a Schmidt rebound number of at least 25 within 4 hours of being placed on the concrete substrate. Remove and replace rejected Overlay.
  7. Do not open to traffic or equipment until a Schmidt rebound number of at least 25 has been reached.
- D. Skid Resistance
1. Perform at least one test per 2500 ft<sup>2</sup> of Overlay after the Overlay reaches a Schmidt rebound number of at least 25.
  2. A skid resistance of at least 45, measured using a 3-in pad according to ASTM E 303, is required for the Overlay surface at each test location.

3. The Engineer determines testing locations that are representative of the Overlay area being evaluated.
4. Measure and record skid resistance.
5. The skid resistance at a given test location is the average value recorded from four swings of the pendulum applied at the same location in rapid succession after an initial, unrecorded swing is applied.
6. The Department witnesses the measurements.
7. Deficient Skid Resistance – Correct all Overlay that does not meet a skid resistance of at least 45 by a method approved by the Engineer.

F. Thickness

1. Measure Overlay thickness at 25 ft or less intervals in the longitudinal direction for each pass of the Overlay placement.
2. The average Overlay thickness must be within  $\frac{1}{8}$  inch of the thickness specified.
3. The Overlay thickness at a given test location is the vertical distance between the lower edge of a 10 ft straightedge, placed transversely across the top of the overlay and overhanging a longitudinal edge of the Overlay, and the top surface of the receiving concrete substrate immediately beneath the overhanging end of the straightedge. Measure and record the Overlay thickness to the nearest  $\frac{1}{16}$  inch. A depth probe may be used to verify Overlay thickness in lieu of a straightedge when approved by the Engineer.
4. The Department witnesses the measurements.
5. Deficient Thickness – Correct all Overlay that is  $\frac{1}{8}$  inch less than the Overlay thickness specified by a method approved by the Engineer.

G. Bond Strength

1. Perform at least one test per 2500 ft<sup>2</sup> of Overlay 24 hours after the Overlay is placed.
2. A bond strength of at least 250 psi, measured according to ASTM C 1583, between the Overlay and the concrete substrate is required at each test location. The Department does not reject the Overlay if the concrete substrate fails at a strength less than 250 psi.
3. The Engineer determines testing locations that are representative of the Overlay area being evaluated.
4. Measure and record Overlay bond strength results.
5. The Department witnesses the measurements.
6. Correct all Overlay areas that do not meet the bond strength of at least 250 psi by a method approved by the Engineer.
7. Repair all test locations with the approved Overlay.

- H. Surface Smoothness
  - 1. Limit transverse pavement deviations to less than  $\frac{1}{8}$  inch from the lower edge of a 10 ft straightedge.
  - 2. Limit longitudinal profile deviations according to the requirements of Section 01452 Category 1.
  - 3. Correct all deviations by a method approved by the Engineer.

## **1.7 PROVIDER SERVICE REQUIREMENTS**

- A. The Provider's Technical Representative must:
  - 1. Provide technical support and training to the Installer and Department regarding handling, storage, production, and placement.
  - 2. Attend the preconstruction meeting.
  - 3. Be present at all times during any placement of polyester concrete for pothole patching or overlay application for the project, including the test section.
  - 4. Instruct the Installer, Contractor, and Engineer of anything that could adversely affect the performance of the Overlay.

## **1.8 INSTALLER REQUIREMENTS**

- A. The Installer's approved Superintendent and the Installer's approved continuous mixer operator must:
  - 1. Attend the preconstruction meeting.
  - 2. Be present at all times during any placement of polyester concrete for pothole patching or overlay application for the project, including the test section.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- A. Primer
  - 1. HMWM resin system
    - a. Must not be used if resin primer containers have been unsealed for one year or longer.
    - b. Must be low-odor and wax-free.
    - c. Meet all requirements of Table 1.

Table 1

Primer		
Property	Test Method	Requirement
Volatile Content *	ASTM D 2369	30% maximum
Viscosity *	ASTM D 2196	25 cP maximum (Brookfield RVT with UL adaptor, 50 RPM at 77°F)
Specific Gravity *	ASTM D 1475	0.90 minimum, at 77°F
Flash Point *	ASTM D 3278	180°F minimum
Vapor Pressure*	ASTM D 323	0.039 in. Hg maximum, at 77°F
PCC Saturated Surface-Dry Bond Strength	CT 551, Part 5**	700 psi minimum at 24 hours and 70 ± 1°F
* Test must be performed before adding initiator.		
** CT 551 specification is available from the Engineer		

- B. Polyester concrete
1. Polyester concrete mix consists of a polyester resin binder and aggregate.
    - a. Initial set time of at least 30 minutes and at most 120 minutes.
    - b. Final set time not exceeding 4 hours.
  2. Polyester resin binder
    - a. Comprised of an unsaturated isophthalic polyester-styrene co-polymer.
    - b. Contains at least 1% by weight gamma-methacryloxypropyltrimethoxysilane, an organosilane ester silane coupler.
    - c. Use a promoter compatible with suitable methyl ethyl ketone peroxide and cumene hydroperoxide initiators.
    - d. Meet all requirements of Table 2.
  3. Aggregate for polyester concrete
    - a. Comprised of fine aggregate (aggregate passing the No. 8 sieve) consisting of natural sand only.
    - b. Meet all requirements of Table 3.
    - c. Meet all requirements of Table 4.
- C. Finishing sand
1. Commercial-quality blast sand.
  2. At least 95 percent passing the No. 8 sieve and at most 5 percent passing the No. 20 sieve according to AASHTO T 27.

3. Have an average absorption of at most 1 percent according to AASHTO T 84 and AASHTO T 85.
4. Tested and certified within the two-year period before the Overlay placement.

Table 2

<b>Polyester Resin Binder Properties</b>		
<b>Property</b>	<b>Test Method</b>	<b>Requirement</b>
Viscosity *	ASTM D 2196	75 to 200 cP (RVT, No. 1 Spindle, 20 RPM at 77°F)
Specific Gravity *	ASTM D 1475	1.05 to 1.10 at 77°F
Elongation	ASTM D 638	35% minimum Type I at 0.45 inch/min. Thickness = 0.25 ± 0.04 inch
	ASTM D 618	Sample Conditioning: 18/25/50 + 5/70
Tensile Strength	ASTM D 638	2500 psi minimum Type I at 0.45 inch/min. Thickness = 0.25 ± 0.04 inch
	ASTM D 618	Sample Conditioning: 18/25/50 + 5/70
Styrene Content *	ASTM D 2369	40% to 50% by weight
*Test before adding Initiator.		

Table 3

<b>Aggregate Properties</b>		
<b>Property</b>	<b>Test Method</b>	<b>Requirement</b>
Sieve Analysis	AASHTO T 27	Gradation limits indicated in Table 4 of this Section
Clay Lumps and Friable Particles in Aggregate	AASHTO T 112	1% maximum
Fractured Face	AASHTO T 335	45% maximum (for particles retained on the No. 8 sieve)
Weighted Average Aggregate Absorption	AASHTO T 84 and T 85	< 1%
Moisture Content at Time of Mixing with the Resin	AASHTO T 255	≤ the lesser of ½ of Weighted Average Aggregate Absorption or 0.5%

Table 4

<b>Aggregate Gradation</b>	
<b>Sieve Size</b>	<b>Percentage Passing (by weight)</b>
	$\frac{3}{8}$ " Maximum
$\frac{3}{8}$ inch	100
No. 4	62-85
No. 8	45-67
No. 16	29-50
No. 30	16-36
No. 50	5-20
No. 100	0-7
No. 200	0-3

- D Polyester concrete overlay system
1. Obtain primer, polyester concrete, and sand from a single source Provider with experience supplying and servicing projects of similar size and scope.
  2. Deliver all materials in their original containers bearing the Provider's label specifying manufacture date, lot number, trade name, and quantity.
  3. Composite properties
    - a. Tested and certified within the one-year period before the Overlay placement.
    - b. Meet all the requirements of Table 5.

Table 5

<b>Polyester Concrete Overlay System Properties</b>		
<b>Property</b>	<b>Test Method</b>	<b>Requirement</b>
Abrasion Resistance	CT 550*	< 2 g weight loss (at 12% resin content by weight of the dry aggregate)
PCC Saturated Surface Dry Bond Strength	CT 551*	500 psi minimum at 24 hrs and 70 degrees F (without primer, at 12% resin content by weight of the dry aggregate, on Saturated Surface Dry Specimen)
Modulus of Elasticity	ASTM C 469	1,000 ksi to 2,000 ksi (at 12% resin content by weight of the dry aggregate)
* CT 550 and CT 551 specifications are available from the Engineer		

## **2.2. EQUIPMENT**

- A. Use a continuous mixer that:
  - 1. Employs an auger screw/chute device and produces a satisfactory product consistently during the Overlay Test Section and production.
  - 2. Is equipped with an automatic metering device that measures and records aggregate volumes and corresponding resin volumes. Record volumes at a minimum of 5 minute intervals along with the time and date of each recording.
  - 3. Has a visible readout gauge that displays volumes of aggregate and resin being recorded.
  - 4. Is calibrated with certified scales provided by the Contractor.
  
- B. Use paving and finishing equipment that:
  - 1. Has grade control capabilities that can provide a roadway surface meeting the smoothness requirements of this Section. Use of fixed-height skid-supported strike-off equipment is not allowed.
  - 2. Involves a specialized slip-form paver modified for polyester concrete and hydraulically controlled grade automation. Obtain the Engineer's approval for alternative equipment.
  - 3. Is used to strike off the polyester concrete to the established grade and cross slope.
  - 4. Is fitted with vibrators or other mechanisms capable of consolidating the polyester concrete to the required Overlay thickness.
  - 5. Has a 12 ft minimum paving width.
  - 6. Is equipped with automatic grade controls and sensing devices that control the thickness, longitudinal grade, and transverse cross slope.
  - 7. Is self-propelled and capable of forward and reverse motion under its own power. Advancing finishing equipment with winches or pulling devices is not allowed.

## **PART 3 EXECUTION**

### **3.1 OVERLAY TEST SECTION**

- A. Complete a test section before starting production. The test section must:
  - 1. Measure at least 12 ft wide and 10 ft long and be the same thickness as the project Overlay.
  - 2. Have a width equal to the maximum width proposed in the Overlay placement plan unless otherwise approved by Engineer.
  - 3. Be placed on a previously cast and cured concrete surface with a surface slope equal to  $\pm 1\%$  of the transverse surface slope and  $\pm 1\%$  of the longitudinal surface slope of the actual project.

4. Be placed within the project limits at a location approved by the Engineer. Locations outside the project limits must be approved by the Engineer.
  5. Be constructed using the same equipment and personnel as the production work.
  6. Replicate field conditions and preparation of the concrete substrate surface and installation procedures of the production work.
  7. Demonstrate the effectiveness of the mixing, placing, and finishing equipment.
  8. Determine the polyester concrete initial and final set times.
  9. Be completely removed if not determined to be acceptable by the Engineer.
- B. Perform acceptance requirements according to this Section, article 1.6.
- C. Notify the Engineer 10 calendar days before placing the test section. Place the test section in the presence of the Engineer.
1. The test section is evaluated by the requirements of this section and the visual appearance of the test section.
- D. Complete a second test section if the first test section is not approved. Provide written modifications to the Overlay placement plan that remedy the issues and failures noted by the Engineer from the first test section before proceeding with the second test section.
1. The Department will find the Installer unqualified after two unapproved or failed test sections.
  2. Replace an unqualified Installer. Submit qualifications for approval of a new Installer according to Section 1.5.
- E. Remove and dispose of all material used in the test section unless directed otherwise by the Engineer.
- F. Allow a minimum of 48 hours for acceptance of each test section by the Engineer.
- G. Do not proceed with Overlay work before receiving the Engineer's approval of the test section.

### **3.2 PREPARATION**

- A. Remove deteriorated concrete and repair the area with suitable patch material (compatible with the Overlay) before preparing the surface for the overlay according to Section 03934 with the following exceptions:

1. Use polyester concrete for the patch material for potholes in concrete that are less than 1½ inch deep and where the reinforcement is not exposed.
    - a. Prepare, mix, and install polyester concrete according to this Section.
    - b. Strike off and finish patches so they are level with the existing surface.
  2. Do not use patching material that contains magnesium phosphate.
  3. Use patching material that has a minimum compressive strength of 3,000 psi at a curing time of 24 hours.
  4. Do not apply polyester concrete overlays to patches with portland cement binders until they have cured for a minimum of 72 hours and have reached 80 percent of their 28-day compressive strength.
- B. Prepare the entire concrete substrate surface by removing all materials that may be detrimental to Overlay bonding and curing according to the Provider's recommendations.
1. Remove all loose disintegrated concrete, dirt, paint, oil, asphalt, rubber, laitance, carbonation, curing materials, and other foreign material from the concrete substrate. Preparation must include shot blasting with steel shot.
  2. Remove surface mortar and expose aggregates as required by the Provider.
  3. Protect metal deck drains and areas of the curb or railing above the proposed surface from the shot blast.
  4. Use a vacuum truck or air compressor to remove dust and other loose materials. Do not use brooms. Refer to ASTM D 4285.
- C. Isolate expansion joints before placing the overlay. Saw cutting at bridge expansion joints is not allowed.
- D. Comply with the Provider's recommendations for preparation if they exceed the requirements specified herein.
- E. Protect deck and approach slab drains to prevent surface preparation and Overlay materials from entering the drains.
- F. Do not expose cleaned surfaces to vehicular or pedestrian traffic other than that required by the Overlay operation.
- G. All pothole patching and surface preparation operations will be inspected and approved by the Engineer before the Overlay is placed.

### **3.3 APPLICATION**

- A. Before beginning application

1. The concrete substrate surface must be dry before placing the HMWM primer. The surface must be free of any standing water or surface darkening that would indicate locations of previously standing water. The entire concrete substrate surface must appear to be uniformly light in color and show no further lightening when drying methods such as blowing compressed air or heating with a propane torch are applied. Cracks in the concrete substrate must also be dry.
2. The temperature of the concrete substrate surface must be between 50 degrees F and 90 degrees F.
3. The concrete substrate surfaces must be cured as follows:
  - a. New structural concrete (excluding pothole patches): 28 days minimum.
  - b. New pothole patches:
    - 1) Using polyester concrete – Follow Overlay Provider’s recommendations.
    - 2) Using other patch materials – Attain a minimum compressive strength of 3,000 psi, cure for a minimum of 72 hours, reach 80 percent of their 28-day compressive strength, and follow patch material supplier’s and Overlay Provider’s recommendations.
4. Clean the concrete substrate surface once again by blowing it with clean and dry compressed air immediately before applying the primer.
5. Extend all functional deck and approach slab joints through the overlay. Align the joint edges of the polyester concrete and the concrete substrate in a single vertical plane. Seal joints according to the details in the plans.

B. Primer

1. Thoroughly mix all components of the HMWM resin primer.
2. Apply the HMWM resin primer to the concrete substrate surface:
  - a. Within five minutes of mixing.
  - b. At 90 ft<sup>2</sup>/gal or a rate recommended by the Provider.
  - c. With uniform and complete coverage of the surfaces to be overlaid.

C. Polyester Concrete

1. Initiate the polyester resin binder and blend completely. Add aggregate, proportion binder content in polyester concrete mix such that the resin binder is 12 (±1) percent of the weight of the dry aggregate, and mix until uniform in texture and appearance.
2. Place the polyester concrete:
  - a. After 15 minutes and up to 120 minutes from when the primer was applied.

- b. Within 15 minutes of adding initiator or earlier as needed to ensure proper placement and finishing. Discard polyester concrete not placed within this time.
3. Determine the polyester concrete initial and final set times in the field according to this Section, article 3.1, paragraph A.8. If the set times do not meet the requirements defined in this Section, article 2.1, paragraph B.1, the material must be removed and replaced.
4. Consolidate and finish the overlay to the specified thickness, longitudinal profile, and transverse cross slope using paving and finishing equipment required in this Section, article 2.2.
  - a. Keep a slight excess of polyester concrete in front of the cutting edge at all times.
5. Taper the Overlay edges if the Overlay is not completed within the allowable lane closure time and is more than ½ inch higher in elevation than the adjacent deck surface.
  - a. Taper both longitudinal and transverse edges at a 4:1 (horizontal:vertical) slope or as specified by the Engineer.
  - b. Tapers may remain and be overlaid with a subsequent overlay pass.

D. Sand

1. Apply the finishing sand at a rate of at least 1.9 lb/yd<sup>2</sup> before initial set of the polyester concrete occurs.
  - a. Apply sand until refusal, eliminating glassy or smooth areas.
2. Finish and texture the Overlay on the bridge deck and approach slabs before initial set of the polyester concrete occurs.
  - a. Use a texture process that produces regular ⅛ inch wide transverse grooves spaced randomly from ½ inch to ¾ inch on centers and ⅛ inch deep.

E. After sand finishing

1. Protect the Overlay from moisture for at least 4 hours after finishing.
2. Do not allow traffic or equipment on the Overlay until a minimum Schmidt rebound number of 25 is reached.
3. Sound the entire overlay surface in a manner approved by and in the presence of the Engineer after final set of the polyester concrete to ensure total bond of the Overlay to the concrete substrate.
  - a. Remove and replace unbonded areas of polyester concrete.
4. Thoroughly fill and seal all cracks in the Overlay with HMWM resin, except those that are determined by the Engineer to be of sufficient extent and/or severity that removal and replacement of the affected Overlay sections is required.
  - a. Apply two applications of HMWM resin to cracks that are greater than or equal to 1/16 inch in width.

- b. Coat the wetted surface with sand for an abrasive finish immediately following the application of the HMWM resin.
- F. Comply with the Provider's recommendations for application if they exceed the requirements in this Section.
- G. Remove and dispose of the loose/excess sand that has not properly bonded to the Overlay before opening the Overlay to traffic.

### **3.4 QUALITY ASSURANCE**

- A. The Provider's Technical Support Representative may consult with the Engineer to suspend any item of work that is suspect and does not meet the requirements of this Section. Work may resume only after the Provider's Representative and the Engineer are satisfied that the Installer has taken appropriate remedial action.

END OF SECTION