SP- 230286
(New)

SPECIAL PROVISIONS
FOR
POLYESTER POLYMER CONCRETE OVERLAY WITH HIGH MOLECULAR WEIGHT METHACRYLATE RESIN PRIMER ON NEW BRIDGE DECK

Warren County
BRF-065-3(083)--38-91

Effective Date
January 22, 2025

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

230286.01 DESCRIPTION.

Work consists of furnishing and placing a polyester polymer concrete (PPC) overlay system with a high molecular weight methacrylate (HMWM) resin primer on a new bridge deck. The surface of the concrete shall be prepared and the PPC overlay system shall be applied in accordance with these special provisions to the lines, grades, thickness and typical cross sections shown in the contract documents,

230286.02 MATERIALS.

A. General.

1. PPC shall consist of polyester resin binder and aggregates as specified. It shall also include a compatible primer meeting the component and composite material properties specified. All components shall be supplied collectively through the same provider, referred to as the system provider.

2. The Engineer reserves the right to obtain and test samples of components of the PPC overlay system. This includes requiring submittals of samples prior to the first installation or on-site sampling during construction.

B. Primer.

1. The prepared deck surface shall receive a wax-free, low odor HMWM primer consisting of a resin, initiator and promoter. HMWM shall meet the requirements in Table 1.

Table 1: HMWM Primer Resin Requirements

Property	Requirement	Test Method
Viscosity*	25 cps maximum (Brookfield RVT with UL adapter, 50 RPM at 77°F)	ASTM D 2196
Volatile Content*	30% maximum	ASTM D 2369
Specific Gravity*	0.90 minimum at 77°F	ASTM D 1475
Flash Point*	180°F minimum	ASTM D 3278
Vapor Pressure*	1.0 mm Hg maximum at 77°F	ASTM D 323
PCC Saturated Surface-Dry Bond Strength, with primer	500 psi minimum at 24 hours and 70 ± 2°F	California Test 551

* Test shall be performed before adding initiator.

2. The promoter and initiator for the HMWM resin shall consist of a metal drier and peroxide. If supplied separately from the resin, at no time shall the metal drier be mixed directly with the peroxide – a violent exothermic reaction will occur. The containers and measuring devices shall be stored in a manner that will not allow leakage or spillage from one material to contact the containers or material of the other.

C. Polyester Resin Binder.

Provide a polyester resin binder meeting the following requirements:

1. Shall be an unsaturated isophthalic polyester-styrene co-polymer. The resin content shall be 12% ± 1% of the weight of the dry aggregate.

2. Shall contain at least 1% by weight gamma-methacryloxypropyltrimethoxysilane, an organosilane ester silane coupler.

3. Shall be used with a promoter that is compatible with suitable methyl ethyl ketone peroxide and cumene hydroperoxide initiators.

4. Shall meet the requirements in Table 2. Accelerators or inhibitor may be required to achieve proper setting time of PPC. They shall be used as recommended by the overlay system provider.

Table 2: Polyester Resin Binder Requirements

Property	Requirement	Test Method
Viscosity*	75 - 200 cps (RVT No. 1 spindle, 20 RPM at 77°F)	ASTM D 2196
Specific Gravity*	1.05 - 1.10 at 77°F	ASTM D 1475
Styrene Content*	40% - 50% by weight	ASTM D 2369
Elongation	35% minimum Type I specimen, 0.25 ± 0.03" thick Rate = 0.45 inch/minute	ASTM D 638
	Sample conditioning: 18/25/50+5/70	ASTM D 618
Tensile Strength	2500 psi minimum Type I specimen, 0.25 ± 0.03" thick Rate = 0.45 inch/minute	ASTM D 638
	Sample conditioning: 18/25/50+5/70	ASTM D 618

* Test shall be performed before adding initiator.

D. Aggregate.

Aggregate for PPC shall meet the following requirements:

1. Provide fine aggregate consisting of natural sand only.

2. Aggregate shall meet the requirements in table 3 and gradation requirements in Table 4.

Table 3: Aggregate Requirements

Property	Requirement	Test Method
Crushed particles	45% maximum retained on No. 8 sieve	AASHTO T335
Weighted average aggregate absorption	1% maximum	AASHTO T84 and T85
Moisture content (at time of mixing with resin)	One half of weighted average aggregate absorption maximum	AASHTO T255
Aggregate hardness	7 minimum	Moh's hardness test

Table 4: PPC Aggregate Gradation Requirements

Sieve Size	Percent Passing
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

3. Sand used for abrasive sand finish shall meet the following properties:
- **a.** Shall be a commercial-quality blast sand.
- **b.** Shall not have less than 95% pass the No. 8 sieve and not less than 95% retained on the No. 20 sieve when tested under AASHTO T27.
- **c.** Shall be kiln dried and protected from moisture until time of placement to ensure dryness at the time of application.

E. PPC Composite System.

The composite PPC system shall meet the requirements in Table 5.

Table 5: PPC Composite System Requirements

Property	Requirement	Test Method
PCC Saturated-Surface Dry Bond Strength, without primer*	500 psi minimum at 24 hours and 70 ± 1°F	California Test 551
Abrasion Resistance*	2g weight loss maximum	California Test 550
Modulus of Elasticity*	1,000,000 to 2,000,000 psi	ASTM C 469

* Initiated polyester concrete tested at 12% resin content by weight of dry aggregate.

F. Packaging and Shipment.

Provide a Safety Data Sheet prior to use for each shipment of polyester resin binder and HMWM resin. All components shall be shipped in strong, substantial containers bearing the manufacturer's label specifying batch/lot number, brand name, and quantity. If bulk resin is to be used, the contractor shall notify the Engineer in writing 10 days prior to the delivery of the bulk resin to the job site. Bulk resin is any resin that is stored in containers in excess of 250 gallons. In addition, the mixing ratio shall be provided to the Contractor by the System Provider prior to shipment.

G. Storage of Materials.

All materials shall be stored in a cool, dry location and in their original containers in accordance with the System Provider's recommendation to ensure their preservation until used in the work. The shelf life for liquid materials stored out of direct sunlight and at temperatures 80°F and below shall be at least 12 months. All aggregates shall be stored in a clean, dry location away from moisture. Applicable fire codes may require special storage facilities for some components of the overlay system.

H. Material Submittals.

The Contractor shall submit the following:

- PPC system information.
- PPC system installation instructions.
- Safety Data Sheets (SDS) for all materials used in the PPC system.
- Certified test reports from independent labs demonstrating compliance with all required material and composite properties associated with the PPC overlay, as specified in Tables 1 to 5.

230286.03 CONSTRUCTION.

A. Placement Plan.

1. Submit a placement plan with a detailed construction work schedule to the Engineer for review and approval at least 30 days prior to the scheduled PPC overlay placement. The following list is intended as a guide and may not address all the means and methods the contractor may elect to use. The Contractor is expected to assemble a comprehensive list of all necessary items for executing the placement of the PPC overlay.

- **a.** Schedule of overlay work and testing.
- **b.** Responsible personnel and hierarchy.
- **c.** Staging plan describing overlay placement sequence including:
  - **1)** Construction joint locations.
  - **2)** Sequence of placement.
  - **3)** Paving widths.
  - **4)** Anticipated paving lengths.
  - **5)** Paving directions.
  - **6)** Joint locations.
  - **7)** Location of proposed trial overlay(s).
- **d.** Description of equipment used for:
  - **1)** Surface preparation including grinding and shot blasting.
  - **2)** Applying HMWM primer resin.
  - **3)** Measuring, mixing, placing, and finishing the polyester concrete overlay.
  - **4)** Applying surface finish sand.
- **e.** Placement procedure, including but not limited to, surface preparation of existing concrete surfaces, application and spreading of HMWM primer, application and spreading of PPC overlay, finishing of PPC overlay, and application of surface finish sand.
- **f.** Quality control of batch proportions, mixing times, and batch placement times.
- **g.** Threshold limits for ambient temperature, ambient relative humidity, batch consistency, batch temperature, batch times, moisture content of deck and related corrective action
- **h.** Method of protecting and finishing inlets and bridge drains.
- **i.** Method for isolating expansion joints.
- **j.** Method for measuring and maintaining overlay thickness and profile.
- **k.** Cure time for polyester concrete.
- **l.** Storage and handling of HMWM resin and polyester concrete components.
- **m.** Procedure for disposal of excess HMWM resin, polyester concrete, and containers.
- **n.** Procedure for cleanup of mixing and placement equipment.

o. Method for cleaning up spills or discharge of HMWM resin and polyester concrete, including materials and equipment.

2. An overlay prepour meeting will be required to review the Contractor's placement plan prior to placement of the PPC overlay. Required attendees include the system provider's representative, the Contractor's staff, the Engineer, and representatives from the Iowa DOT District Office. Optional attendees include the Bridges and Structures Bureau and the Construction and Materials Bureau. No PPC overlay pour will be permitted until the placement plan has been submitted by the Contractor and approved by the Engineer.

3. Construction loads applied to the bridge during PPC overlay placement are the responsibility of the contractor. Submit the weight and location of concrete placing equipment, grinding equipment or other significant construction loads for review as part of the proposed placement plan.

B. Equipment.

All equipment for cleaning the existing concrete surface and mixing and applying the overlay system shall be as specified, in accordance with the system provider's recommendations, and as approved by the Engineer prior to commencement of any work.

1. General.

Provide an overall combination of labor and equipment with the capability of proportioning and mixing the PPC components and placing the HMWM primer and PPC overlay in accordance with these special provisions and the system provider's recommendations.

2. Surface Preparation Equipment.

a. Shot-blasting equipment capable of removing all loose, disintegrated concrete, dirt, paint, oil, asphalt, laitance, carbonation, curing materials, grease, slurry, or rust from the deck surface.

b. Automatic shot-blasting units shall be self-propelled and include a vacuum to recover spent abrasives. The abrasive shall be steel shot.

c. In areas inaccessible to shot-blasting equipment, the surface may, with the Engineer's approval, be cleaned with sandblasting equipment.

3. Mixing Equipment.

Polyester concrete shall be mixed in either mechanically operated mixers of appropriate size for proposed batches and as recommended by the system provider or continuous automated mixers meeting the following requirements:

a. Employ an auger screw/chute device capable of sufficiently mixing catalyzed resin with dry aggregate.

b. Employ a plural component pumping system capable of handling polyester binder resin and catalyst, while maintaining proper ratios to achieve set/cure times within the specified limits. Catalyzed resin shall flow through a static mix tube for sufficient duration to completely mix the liquid system.

c. Be equipped with an automatic metering device that measures and records aggregate and resin volumes. Record volumes at least every five minutes, including time and date. Submit recorded volumes at the end of the work shift.

d. Have a visible readout gage that displays running totals of aggregate and resin being recorded.

e. Produce a satisfactory mix consistently during the entire placement.

f. The Contractor shall submit documentation of current certification that mixing equipment has been calibrated (Caltrans test CT 109 or similar)

4. Finishing Equipment.

a. A self-propelled slip-form paving machine, which is modified or specifically built to effectively place the PPC overlay in a manner that meets the objectives and requirements

of the project shall be used for PPC overlay applications. The machine shall meet the following requirements:

1) Employ a vibrating pan to consolidate and finish the PPC overlay. Paver primary finishing pan size shall measure not less than 2 feet in the dimension parallel to the direction of paver travel. Secondary profile finishing attachments, bolt-on sections, and trailing pan extensions shall not be included in this measurement.

2) Be fitted with hydraulically controlled grade automation to establish the finished profile. The automation shall be fitted with substrate grade averaging devices on both sides of the new placement; the device shall average 15 feet in front and behind the automation sensors; or the sensor shall be constructed to work with string-line control. It is acceptable to match grade when placing lanes adjacent to previously placed PPC.

3) Have sufficient engine power and weight to provide adequate vibration of the finishing pan while maintaining consistent forward placement speed.

4) Be capable of forward and reverse motion under its own power.

5) Wheel or rubber tire mounted paving machines will not be allowed.

b. Shoulder pours of 6 feet wide or less may be placed without the use of a paving machine.

c. A vibratory screed riding on preset forms or rails may be used for placement lengths of less than 300 feet. Roller type screeds will not be allowed.

d. The contractor shall provide all other hand tools and labor necessary to distribute and strike off the PPC overlay ahead of the finish machine.

C. Surface Preparation.

1. For newly constructed bridge decks, the deck shall cure a minimum of 28 days and attain the 28 day design compressive strength prior to overlay placement.

2. The surface of concrete substrate shall be prepared for application of the overlay by abrasive blasting in order to remove all existing loose, disintegrated concrete, dirt, paint, oil, asphalt, laitance, carbonation, curing materials, grease, slurry, rust or any other contaminants that could interfere with the proper adhesion of the overlay system.

3. The final prepared surface shall meet the following requirements:

a. The areas to receive overlay shall be cleaned by shotblasting, or abrasive sandblasting if the shotblast equipment cannot access areas to be prepared. All contaminants shall be picked up and stored in the vacuum unit and minimal dust shall be created during the blasting operation that will obstruct the view of motorists in adjacent roadways. The travel speed, size of shot, flow of shot, and/or number of passes of the shotblasting unit shall be adjusted to result in all weak or loose surface mortar being removed, aggregates within the concrete being exposed, and open pores in the concrete exposed, as well as a visible change in the concrete color. Cleaned surfaces shall not be exposed to vehicular traffic unless approved by the Engineer. If the deck becomes contaminated before placing the overlay, the Contractor shall shotblast or abrasive sandblast the contaminated areas to the satisfaction of the Engineer at no additional cost to the Contracting Authority.

b. Produce a surface relief that falls in the range of International Concrete Repair Institute (ICRI) Surface Preparation Level 5 to 7.

c. Any loose particles shall be removed prior to the overlay placement by magnets and oil free compressed air such that no trapped particles remain. Hydro blasting and pressure washing will not be allowed.

d. The areas to be overlaid shall be blown off with oil-free and moisture-free compressed air just prior to placement of the primer.

e. Measure the surface moisture content of the substrate surface using a moisture meter before installing overlay system. The moisture content shall not exceed 4.5%.

f. Cleaning methods other than those detailed may be suggested by the system provider and approved by the Engineer.

D. Trial Application.

1. Prior to constructing the PPC overlay, one or more trial applications shall be placed on the bridge deck to demonstrate proper initial set time as specified herein and the effectiveness of the surface prep, mixing, placing, and finishing equipment/methods proposed. The set time can be determined as the time elapsed from resin catalyzation until the in-place PPC cannot be deformed by pressing with a finger, indicating the resin binder is no longer in a liquid state. Each trial application shall be the planned paving width, at least 25 feet long, and the same thickness as the specified overlay. The location of the trial application shall be approved by the Engineer. Alternately, a trial pad may be poured on the project site at a location approved by the Engineer. The trial pad shall be poured during the bridge deck pour, at the same thickness as the bridge deck, and shall be finished and cured using the same methods as the bridge deck. The trial pad width shall be the planned paving width plus any additional width required to support the paving machine or vibrating screed. The trial pad length shall be 25 feet long.

2. A representative of the system provider knowledgeable in surface preparation, supplying, mixing, transporting, placing, finishing, curing and testing of the PPC system, including the HMWM primer, must be present during placement. Do not start mixing or placing the primer or PPC overlay until the system provider's representative is on-site.

3. If the cleaning practice, materials, installation, finishing and/or texturing are not acceptable, the Contractor shall remove the failed trial application and reinstall the trial application at no additional cost to the Contracting Authority until satisfactory results are obtained.

4. The number of trial applications required shall be as many as necessary for the Contractor to demonstrate the ability to construct an acceptable trial overlay section and competency to perform the work. The system provider and/or proposed equipment/techniques may be rejected by the Engineer if not shown to be acceptable after three failed trial applications.

5. Notify Engineer at least 15 days before constructing the trial overlay.

E. Application of Overlay

1. General.

a. A representative of the system provider knowledgeable in surface preparation, supplying, mixing, transporting, placing, finishing, curing and testing of the PPC system, including the HMWM primer, must be present during placement. Do not start mixing or placing the primer or PPC overlay until the system provider's representative is on-site.

b. Methods indicated in these special provisions are typical of general installations. If recommended by the system provider, modified methods may be submitted for review, subject to approval by the Engineer.

c. The concrete substrate surface must be dry before placing the HMWM primer and PPC. 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.

d. The concrete surface temperature shall be between 40°F to 100°F. Night work may be required when temperatures cannot be met during the day.

e. During surface preparation and overlay application, provide shielding and take all appropriate precautions to assure that traffic is protected from rebound, dust, and construction activities, to the Engineer's satisfaction.

f. During overlay application, provide suitable coverings (e.g. heavy duty drop cloths) as needed to protect all exposed areas not to receive overlay, such as curbs, sidewalks,

parapets, etc. Clean and/or repair all damage or defacement resulting from the application to the Engineer's satisfaction at no additional cost.

g. Application of HMWM primer and placement of PPC overlay shall not commence if rain is forecast by the National Weather Service within 24 hours of overlay placement.

2. HMWM Primer Application

a. Primer shall be mixed and applied in accordance with the system provider's recommendations.

b. Immediately before placing primer, all exposed surfaces shall be dry in accordance with SP-230286.03, E, 1, c, and blown clean with oil-free compressed air from 185 CFM minimum compressor. Exposed surfaces shall be protected from precipitation and heavy dew during and after the application of the primer.

c. After the exposed surfaces have been prepared and are dry, primer shall be applied in accordance with the system provider's recommendations. Primer shall be placed within 5 minutes of mixing at approximately 75 to 100 square feet per gallon. Ensure any cracks present on the deck are filled with primer.

d. Primer shall be applied by flooding and uniformly spread to completely cover all surfaces to receive overlay, including any adjacent vertical surfaces to the limits specified in the contract documents. Care should be taken to avoid heavy application that results in excess puddling. Excess material shall be removed or distributed to meet the recommended application rate. Primer shall be reapplied to any areas that appear visibly dry prior to overlay placement.

3. Polyester Polymer Concrete Application

a. PPC shall be mixed and applied in accordance with the system provider's recommendations.

b. The PPC shall be applied after 15 minutes and within 2 hours after the primer has been applied. The polyester concrete shall be placed prior to gelling or 15 minutes following addition of initiator, whichever occurs first.

c. The polyester resin binder shall be initiated and blended completely. Aggregate shall be added and mixed sufficiently when a portable mechanical mixer is used.

d. Polyester concrete shall have an initial set time of at least 20 minutes and at most 90 minutes following resin catalyzation. The initial set time can be determined in the field when the in-place PPC cannot be deformed by pressing with a finger, indicating that the resin binder is no longer in a liquid state. If the initial set is not within 90 minutes of catalyzation, the material shall be removed and replaced.

e. The overlay shall be consolidated and finished to the required grade and cross-section using PPC placement equipment as defined herein. Finish within tolerance specified in Article 2413.03, E, 2, e of the Standard Specifications. The minimum PPC overlay thickness shall be as shown on the plans. A variation of +1/4 inch and -0 inch is acceptable.

f. Although the paver should yield a finished surface, additional finishing may be necessary. PPC shall be finished as necessary through traditional concrete finishing methods, producing a slight resin sheen indicating complete consolidation of aggregates.

g. Resin content shall be as specified herein and to yield a PPC consistency that requires surface applied consolidation and finishing to consolidate aggregates and yield a slight sheen of bleed resin on top surface yet does not yield excess bleed resin.

h. A surface friction sand finish of at least 2.2 pounds per square yard shall be broadcast onto the glossy surface immediately after sufficient finishing and before resin gelling occurs. To ensure adequate pavement friction, the completed PPC overlay surface shall be free of any smooth or "glassy" areas such as those resulting from insufficient quantities of surface aggregate. Any such surface defects shall be repaired by the Contractor in the manner recommended by the system provider and approved by the Engineer at no additional cost to the Contracting Authority.

i. Wait a minimum of 24 hours for any surface correction grinding or longitudinal grooving. Perform longitudinal grooving according to Article 2412.03, D, 4, a of the Standard Specifications. Transverse grooving or tining in plastic PPC will not be allowed.

j. Extend all working deck joints through the overlay and seal according to the details in the plans.

k. Collect a ticket for each pass or portion of a pass that is provided by each mixer, and ensure that the following information is shown on each ticket. Provide copies of tickets to the Engineer for use in tabulating quantities.

- Project Number
- Bridge Number
- Date and Time
- Location of Placement (Lane and Station Limits)
- Aggregate Weight
- Polyester Resin Binder Weight

F. Curing.

Protect the overlay from moisture, traffic, and equipment for at least 4 hours after final finishing. The final finish must have a rebound test reading of at least 3000 psi per ASTM C805 before traffic or equipment is allowed on the overlay. The rebound test may not be used to reduce the minimum 4 hour cure time of the overlay. The Engineer may extend the cure time if the rebound test requirement is not met. Cure time depends upon the ambient and deck temperatures as well as initiator/accelerator levels.

G. Acceptance Testing.

1. General.

a. Acceptance of the surface preparation and PPC overlay will be determined by the Engineer based on vertical axis bond tests, rebound hammer impact compression testing, smoothness quality testing, and sounding performed by the Contractor, witnessed by the Engineer.

b. Notify the Engineer at least 48 hours prior to anticipated testing to allow them the opportunity to view the operation.

2. Concrete Substrate Direct Tension Bond Testing.

a. Vertical axis pull bond tests shall be performed on the prepared concrete deck surface prior to overlay installation by an independent testing company, arranged by the Contractor, in accordance with ASTM C1583. At a minimum, one test site shall be selected on the trial overlay and three test sites shall be selected on each stage of overlay construction, with one site located in each span. The Engineer will select the test site locations. Three pull bond tests shall be performed at each test site location. Additional testing may be required as directed by the Engineer if any element of the substrate or surface prep changes after initial testing.

b. The test results shall be the average of the three tests for each test site. Test cores shall be drilled a minimum of 0.25 inch but no greater than 0.50 inch below the prepared deck surface.

c. Repair all bond test locations with PPC overlay in accordance with these special provisions.

3. Overlay Direct Tension Bond Testing.

a. Vertical axis pull bond tests shall be performed after 24 hours by an independent testing company, arranged by the Contractor, in accordance with ASTM C1583. At a minimum, one test site shall be selected on the trial overlay and three test sites shall be selected on each stage of overlay construction, with one site located in each span. The Engineer will select the test site locations. Three pull bond tests shall be performed at each test site location. Additional testing may be required as directed by the Engineer if any element of the substrate, surface prep, PPC system, or placement changes after initial testing.

b. The test results shall be the average of the three tests for each test site. Test cores shall be drilled a minimum of 0.25 inch but no greater than 0.50 inch below the substrate to overlay bond line.

c. The minimum bond strength of the PPC overlay system shall be 250 psi. An acceptable test will demonstrate that the overlay bond strength is sufficient by producing a concrete subsurface failure area greater than 50% of the test surface area (type (a) per test method). Failure at the epoxy/overlay interface (type (d) per test method) is also acceptable provided the failure occurs at not less than 250 psi.

d. Repair all bond test locations with PPC overlay in accordance with these Special Provisions.

4. Compressive Strength Testing.

a. Rebound hammer impact compressive strength tests shall be performed after 4 hours or more by an independent testing company, arranged by the Contractor, in accordance with ASTM C805. At a minimum, one test area shall be selected on the trial overlay and three test areas shall be selected on each stage of overlay construction, with one area located in each span. Ten test readings shall be obtained in each test area.

b. The average of ten readings in each test area shall correspond to a compressive strength of 3000 psi or higher. See test method for procedure to account for outlying readings.

5. PPC Density Testing.

Determine the unit weight of the PPC overlay material according to ASTM C 138. Testing shall be completed prior to placement of overlay material. Perform testing on each batch of material prepared in continuous automated mixers. System provider shall provide the unit weight to be used for acceptance.

6. Smoothness Quality Testing.

Evaluate the overlay smoothness per Section 2428 of the Standard Specifications. Any required surface corrections shall be completed prior to installation of longitudinal grooving.

7. Sounding.

The entire overlay surface shall be chain dragged for soundness, witnessed by the Engineer. Any areas of delamination shall be removed and replaced.

H. Corrective Work.

1. Repair of Surface Defects.

The repair materials and finishing methods for surface defects in the overlay shall be in accordance with those used for application of the overlay. All surface defects shall be repaired to the satisfaction of the Engineer before acceptance of the work is made.

2. Repair of Cracking.

If cracks appear in the overlay after the cure period, they shall be filled with properly catalyzed and mixed HMWM primer material. Care shall be taken to fill the cracks only and ensure minimal HMWM primer is left on the finished surface of the overlay.

3. Correction for Smoothness.

Corrections for smoothness shall be in accordance with Section 2428 of the Standard Specifications. Areas with low spots requiring correction shall be marked and prepared with shot blasting or sandblasting, primed, and filled with either catalyzed resin and broadcast sand or mixed PPC slurry material. The use of resin or mixed slurry material shall be as recommended by the System Provider and approved by the Engineer. Minimal fill depth that is compatible with the longitudinal grooving process shall be as recommended by the System Provider. Grinding removal of fill area boundary may be required.

4. Replacement of Defective Overlay.

A defective overlay, or portion thereof, as evidenced by lack of sound bond to substrate or resulting in failing overlay pull bond test results shall be removed and replaced at the Contractor's expense. The Contractor shall submit a written corrective work proposal to the Engineer, which shall include the methods and procedures that will be used. The Contractor shall not commence corrective work until the methods and procedures have been approved in writing by the Engineer. The Engineer's approval shall not relieve the Contractor of the responsibility of producing work in conformity with the Contract.

230286.04 METHOD OF MEASUREMENT.

A. The quantity of Deck Overlay (PPC) will be measured as the number of square yards of PPC placed and accepted. The area will be computed using the dimensions shown on the plans.

B. Construction and removal (if required) of trial applications, including concrete base surfaces, will not be measured and paid for separately, but shall be included in the work.

230286.05 BASIS OF PAYMENT.

A. The quantity of Deck Overlay (PPC) will be paid at the Contract unit price per square yard. Price and payment will constitute full compensation for all trial applications needed for compliance with these Special Provisions, surface preparation, supplying, mixing, transporting, forming, placing, finishing, curing, grinding and for furnishing all equipment, tools, labor, and incidentals required to complete the work.

B. Additional quantity of PPC material used for testing and determination of material properties as described herein will be furnished at no additional cost to the Contracting Authority.

C. If the PPC overlay does not meet the minimal material properties as described herein, it will be removed and replaced or remediated to the satisfaction of the Engineer at the Contractor's expense. No additional payment will be made for remedial solutions to insufficient bonding between the PPC overlay and underlying bridge elements.