ITEM 584.50010018 – THIN POLYMER (EPOXY) OVERLAYS FOR STRUCTURAL SLABS

DESCRIPTION
Furnish and apply a two course thin polymer (epoxy) overlay wearing surface on an existing bridge deck surface in accordance with the Contract Documents and as directed by the Engineer.

MATERIALS
A. Thin Polymer (Epoxy) Overlay System. Shall meet Materials Requirements of 734-01.

B. Packaging and Shipment. All components shall be shipped in appropriate containers, bearing the manufacturer's label specifying date of manufacture, batch number, brand name, quantity, and date of expiration or shelf life.

CONSTRUCTION DETAILS
A. General. The Materials Details and Material Safety Data Sheets (MSDS) for the thin polymer (epoxy) overlay system are readily available on the Department Approved List on the internet @ www.dot.ny.gov under Approved List of Materials and Equipment. The materials details will provide the following:

• Product Information
• Surface Preparation
• Application Procedure
• Curing Procedure

For Epoxy and Aggregate Suppliers, use NYSDOT Materials and Equipments Approved List: Thin Polymer (Epoxy) Overlays for Structural Slabs

A technical representative from the overlay manufacturer shall be on-site during all phases of the work to make recommendations and to facilitate the overlay installation. This shall include, but not be limited to, surface preparation, deck surface repairs, overlay application, and overlay cure.

Contractor shall provide adequate shielding to protect traffic and surrounding environment from rebound and dust during surface preparation and shot-blast cleaning work. Any spent shot blast beads, shot blast waste shall be removed from the project by the end of the day.

Contractor shall provide suitable coverings (e.g. heavy duty drop cloths) during overlay application to protect all exposed areas not to be overlaid, such as curbs, sidewalks, parapets, expansion joints, etc. Any damage or defacement resulting from this application shall be thoroughly cleaned and/or repaired to the Engineer's satisfaction and at no additional cost to the State.

B. Storage of Materials. All materials will be stored in accordance with the Materials Details.
C. Installation Procedure:

1. Surface Preparation. The Contractor will perform all necessary deck repair work prior to placement of the epoxy overlay. Once the required repair area(s) have been identified, confer with the preapproved selected supplier of the Thin Polymer (Epoxy) Overlay system to ensure that the repair material is compatible with the selected system. Allow for all repair materials to properly cure prior to placement of Thin Polymer (Epoxy) Overlay system. The deck repairs will be made where indicated on the plans or where directed by the Engineer. Repairs will be paid for under the appropriate structural concrete removal item. Concrete patches will be completely cured prior to placement of the epoxy overlay. After deck repairs are completed, cured and prior to placement of the overlay, the Contractor will blast the entire deck surface to remove asphaltic materials, oil, grease, dirt, sealers, rust, laitance, curing compounds, paint and weak concrete materials that would inhibit successful bonding of the epoxy overlay to the wearing surface.

Automatic shot-blast units will use a vacuum to recover spent abrasives. Magnetic rollers or other devices will be used to remove any spent shot remaining on the deck after vacuuming. Traffic paint lines shall be completely removed prior to placement of the overlay and reapplied upon completion of the overlay. Freshly repaired and cured concrete areas will be cleaned per Section 584-3.02A of the Standard Specifications. All steel surfaces that will be in contact with the overlay will be cleaned according to SSPC-SP No.10, Near-White Blast Cleaning. A profile of CSP5-6 is desired.

The bridge deck surface must be dry prior to the application of the thin polymer (epoxy) overlay system. No visible moisture shall be present on the bridge deck at the time of placement. Prior to overlay application, moisture content reading must be ≤ 5.0% using a moisture meter, or you can use ASTM D4263 - Indicating Moisture in Concrete by the Plastic Sheet Method for a minimum of 2 hours. If using ASTM D4263, no visible moisture is considered acceptable.

*Do not apply overlay if rain is expected during installation or curing time.*

**Bond Strength to structure:** Acceptability of the surface preparation may be determined by the use of a vertical axis pull bond test. Test shall be performed in accordance to ACI 503R-30 or ASTM C1583/C1583M and shall have a minimum bond strength of 250 psi or achieve failure of the concrete. The test should be performed every 100 linear feet (LF) minimum or 300 LF maximum. Minimum 4 pull-off tests are required per structure. The Engineer will determine the test locations or per manufacturer representative recommendation.

Immediately prior to application of the overlay, the Contractor shall request and receive approval to proceed from the Engineer to assure that the surface is acceptable for application of the thin polymer (epoxy) overlay.
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2. Application The thin polymer (epoxy) overlay shall be applied in accordance with this specification and the Manufacturer Materials Detail Sheets (MDS).

**Epoxy Resin Application Rate:**
Course #1: Epoxy rate is 30 ft²/gal  
Course #2: Epoxy rate is 20 ft²/gal

**Aggregate Application Rate:** Approximately ~ 1.5 lb/ft² or to refusal per course.

The two courses of the thin polymer (epoxy) overlay shall be applied within 24 hours following final surface preparation. If the overlay is not applied within 24 hours, or the accepted prepared surface is opened to traffic and/or contaminated in any way, the pavement shall be re-cleaned to the satisfaction of the Engineer at no additional cost to the State. Traffic may be allowed prior to completion of 2nd course at discretion of EIC and manufacturer’s representative.

Expansion joints shall be protected from contaminates by masking or other methods as approved by the Engineer. Consult with manufacturer’s representative and approved Material Details to address details at joints and drainage structures. The Contractor will demonstrate that these requirements are met to the Engineer’s satisfaction.

3. Finishing The Contractor shall use methods and equipment for finishing the overlay materials in accordance with the Materials Details. The completed overlay surface shall be free of any smooth or "glassy" areas such as those resulting from insufficient quantities of surface aggregate. Contractor shall repair such surfaces as recommended by the manufacturer and approved by the Engineer at no additional cost to the State.

4. Surface and Thickness Requirements. The specified thickness requirements will be verified by the manufacturer’s representative to the Engineer’s satisfaction.

D. **Curing.** The thin polymer (epoxy) overlay will be cured before subjecting it to traffic or any loads that would damage the overlay. Cure time is dependent upon both ambient and deck temperatures. Material shall not be placed if ambient temperature is less than 50°F or is expected to fall below 50°F during the placement period. The degree of cure and suitability of the overlay for traffic loads shall be determined by the manufacturer representative and approved by the Engineer.

**METHOD OF MEASUREMENT**
This work will be measured as the number of square feet of thin polymer (epoxy) overlay system satisfactorily applied as determined by deck measurements and as shown in the Contract Documents.

**BASIS OF PAYMENT**
The unit price bid per square foot shall include the cost of all labor, materials and equipment necessary to satisfactorily complete the work. The unit price bid shall include the cost of having the epoxy overlay manufacturer's representative onsite during the work as required.

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