

ITEM 555.3525 18 - THIN POLYMER OVERLAY WEARING SURFACES FOR STRUCTURAL SLABS

DESCRIPTION

This work shall consist of furnishing and applying a thin polymer overlay where indicated on the Contract Plans and as directed by the Engineer. The work shall include the preparation of concrete surfaces.

The Contractor shall have the option of using any of the polymer overlay systems included in this specification except that only one system may be used on any one structure.

MATERIALS

A. Thin Polymer Overlay. Materials for this work shall be one of the following systems:

- 1. FLEXOLITH.** This overlay shall consist of an epoxy binder and aggregate, all as manufactured by TAMMS Industries Co., Mentor, Ohio.

The epoxy binder shall be Flexolith and the aggregate shall be Dural Basalt containing aluminum oxide.

- 2. TRANSPO T17X.** This overlay shall consist of a two-component methyl-methacrylate polymer concrete (PCMMA) as manufactured by Transpo Industries, Inc., New Rochelle, New York.

The liquid shall be Transpo T17 resin and the powder shall be Transpo T17X powder component.

- 3. SILIKAL URETHANE MODIFIED ACRYLIC OVERLAY.** This overlay shall consist of a primer, a urethane-modified base course, and wearing surface, all as manufactured by Silikal North America, Inc., Stratford, Connecticut.

The primer shall be Silikal R41S, the base course shall be Silikal R17 (Modified), and the wearing surface shall be Silikal R7X.

B. Patching Material. The material used to repair deck spalls prior to overlay application will be dependent on the overlay system chosen. The patching material shall be as recommended by the overlay manufacturer and shall be approved by the Director, Materials Bureau prior to commencement of work.

At least ten (10) days before the start of work the Contractor shall submit to both the Materials Bureau and the Engineer a written identification of the patching material proposed for use. At a minimum this identification shall include the physical characteristics, and the directions for use and curing of the patching material.

C. Samples. Samples of materials for all components of the overlay system excluding patching material shall be submitted by the manufacturer to the Materials Bureau a minimum of thirty (30) days prior to overlay application. Samples shall be representative of the materials to be used in the

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overlay application and shall consist of a 3.8 liter sample for each liquid component and a 4.5 kg sample for each dry component.

These samples will be evaluated to verify that they are representative of the same product previously tested and accepted for use.

- D. Packaging and Shipment.** All components shall be shipped in strong, substantial containers, bearing the manufacturer's label specifying date of manufacture, batch number, brand name, quantity, and date of expiration or shelf life. In addition, the mixing ratio shall be printed on the label of at least one of the system components.
- E. Basis of Acceptance.** Project acceptance of thin polymer overlay materials will be based on the following:
1. Delivery of the overlay materials to the project site in acceptable containers bearing all the label information as required in this specification.
 2. Verification testing by the Materials Bureau to determine that the samples submitted are representative of the same materials previously approved by the Materials Bureau.

CONSTRUCTION DETAILS

- A. General.** At least ten (10) days before the start of work the Contractor shall provide the Engineer with two (2) copies of the manufacturer's written instructions for the installation of the overlay system.

When directed by the Engineer, the manufacturer's technical representative shall be made available for up to five (5) working days to make recommendations to facilitate the overlay installation. This shall include, but not be limited to, surface preparation, overlay application, and overlay cure.

During surface preparation and blast cleaning work, precautions shall be taken to assure that traffic is protected from rebound and dust. Appropriate shielding shall be provided as required and directed by the Engineer.

During overlay application, the contractor shall provide suitable coverings (e.g. heavy duty drop cloths) to protect all exposed areas not to be overlaid, such as curbs, sidewalks, parapets, etc. Any damage or defacement resulting from this application shall be cleaned and or repaired to the Engineer's satisfaction, at the Contractor's expense.

- B. Storage of Materials.** All materials shall be stored in accordance with the manufacturer's recommendations to insure their preservation until used in the work.
- C. Equipment.**
1. **Surface Preparation.** All equipment to be used for surface preparation shall be as

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specified by the overlay manufacturer and approved by the Engineer. Unless otherwise specified, the Contractor shall use automatic shot blasting units to clean pavement surfaces. In those areas not accessible to this machinery, the surface may, with the Engineer's approval, be cleaned with sandblasting equipment.

Automatic shot blast units shall be self propelled and include a vacuum to recover spent abrasives. The abrasive shall be steel shot. Magnetic rollers shall be used to remove any spent shot remaining on the deck after vacuuming.

2. **Application.** The equipment used for proportioning, mixing, and applying overlay materials shall meet the overlay manufacturer's requirements and shall be approved by the Engineer. The proportioning equipment shall be adjustable so that mixing ratios may be altered to account for temperature fluctuations.
3. **Finishing.** Screeding shall be performed using a vibratory-type mechanical screed riding on preset rails. Screeds shall be approved by the Engineer prior to the application of the overlay.

D. Surface Preparation. All structural slab surfaces and other surfaces against which the polymer system is to be placed shall be prepared as follows:

1. All spalls and other surface defects shall first be repaired with patching material in accordance with manufacturer's recommendations. Work shall be performed as directed by and to the satisfaction of the Engineer.
2. After the patching material has completely cured all concrete surfaces shall be shot blasted using the equipment and procedures recommended by the overlay manufacturer. Concrete surfaces not accessible for cleaning with shot blasting shall be dry sandblasted using conventional methods approved by the Engineer. At no time will wet blasting be allowed.
3. Wherever the overlay will abut transverse expansion joints, open steel grates or scuppers the structural slab concrete shall be removed to a minimum depth of 13 mm (See Details 1 and 2). This removal shall extend a minimum of .5 m in all directions, on all surfaces to be overlaid. The method and extent of concrete removal will be as directed by the Engineer.

Concrete removal shall not be required on structural decks consisting of concrete filled steel grids. If the Engineer determines that a smooth transition over joints, etc. is required the overlay shall be feathered at joints, grates and scuppers. Feathered edges shall have a minimum thickness of 4 mm at their termination edge. The length of taper (transition) shall be as directed by the Engineer (see Detail 3).

4. All steel surfaces that will be in contact with the overlay shall be cleaned in accordance with SSPC-SP No. 10, Near-White Blast Cleaning, except that wet blasting methods shall not be allowed.

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After cleaning and concrete removal operations are complete there shall be no visible evidence of oil, grease, dirt, rust, loose particles, spent abrasives or other foreign material on any of the surfaces to be overlaid.

- E. Application.** On any portion of the pavement surface no more than one working day shall elapse between the completion of surface cleaning and overlay application. If the overlay is not applied within one working day the pavement shall be recleaned as directed by and to the satisfaction of the Engineer. No additional payment will be made for recleaning work.

The application of the polymer overlay shall be performed in accordance with the manufacturer's written instructions. Materials shall only be applied to dry surfaces and when surface and ambient temperatures are above 4°C and below 37°C.

The overlay shall be placed at a minimum thickness of 13 mm. If the Silikal overlay system is used the base course and wearing course shall each be a minimum 6.5 mm thick. Screeding shall be done continuously to avoid producing an uneven surface.

Termination edges of the overlay may require application and finishing by hand trowel due to obstructions such as a curb. All hand trowelling shall be followed by broadcasting aggregate and/or surface texturing to provide acceptable surface friction characteristics.

Provisions shall be made to protect expansion joints by masking or other method so that no polymer seeps in and contaminates the joint openings.

- F. Surface and Thickness Requirements.** The overlay surface shall be checked at random by the Engineer during the application of the overlay to assure that no depressions exist that will pond water. The surface shall be tested with a straight-edge not less than three (3) meters long. The straight-edge shall be placed in contact with the overlay surface in successive positions parallel to and perpendicular to the deck's centerline. All depressions greater than 5 mm shall be repaired after the overlay hardens in the manner recommended by the manufacturer and approved by the Engineer.

To insure adequate pavement friction, the completed 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 in the manner recommended by the manufacturer and approved by the Engineer.

Thickness of the overlay shall be checked prior to its initial set using a ruler. If the Engineer determines that the minimum thickness has not been attained, an additional layer shall be applied after the overlay hardens. This layer shall be a minimum of 6 mm and shall be applied at no additional cost to the State.

- G. Curing.** The polymer overlay shall be allowed to reach final cure before subjecting it to traffic or loads of any nature that may damage it. Cure time is dependent upon the ambient and deck temperatures. Actual degree of cure and suitability of the overlay for traffic shall be as determined

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by the manufacturer and directed by the Engineer.

METHOD OF MEASUREMENT

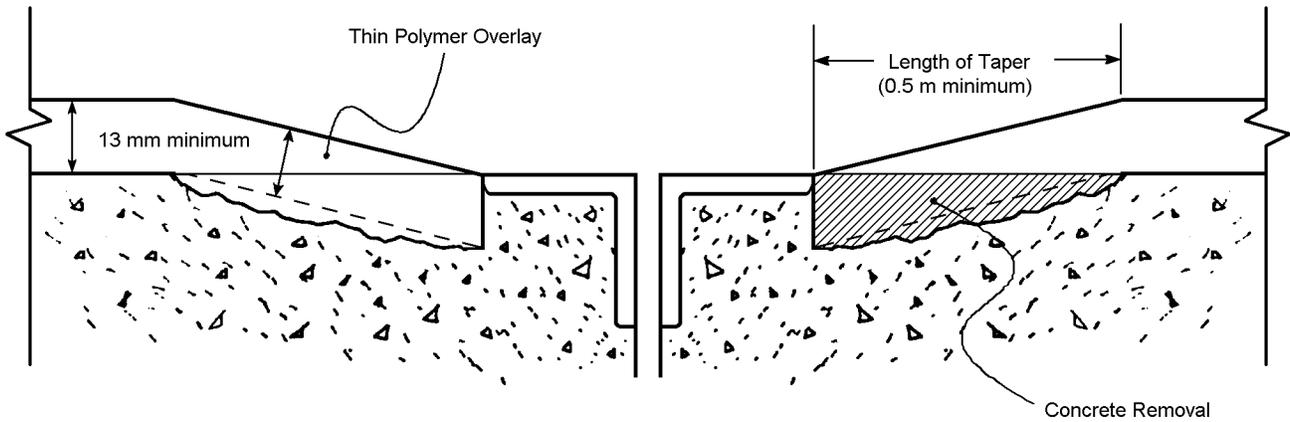
The work shall be measured by the number of square meters of the polymer overlay stated in the Estimate of Quantities. No field measurements will be taken except to provide progress payments.

BASIS OF PAYMENT

The unit price bid per square meter shall include the cost of all labor, materials, equipment, and incidentals necessary to complete the work. The unit price bid shall also include the cost of having the polymer manufacturer's representative present as required. Under no circumstances shall the total of all progress payments exceed the Estimate of Quantities.

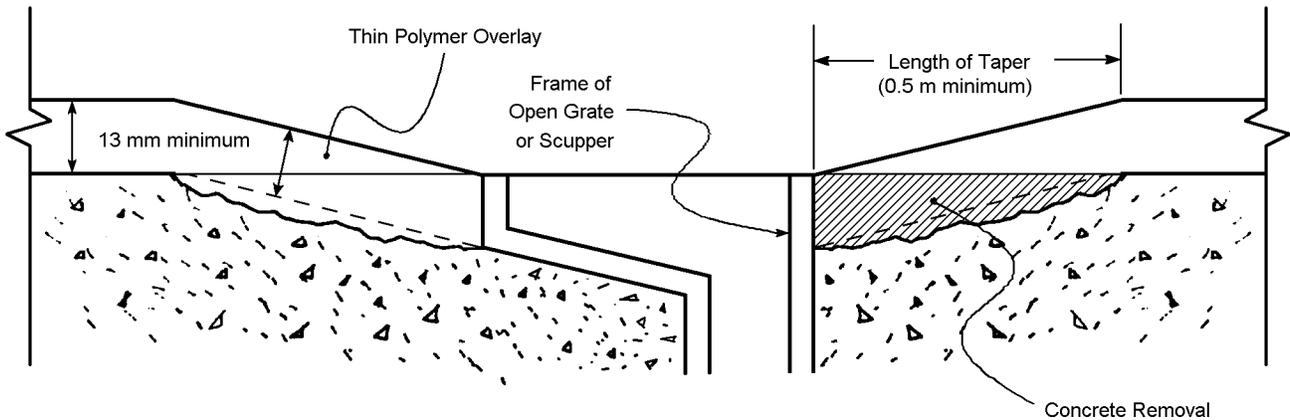
**DISAPPROVED
BY EI 10-001**

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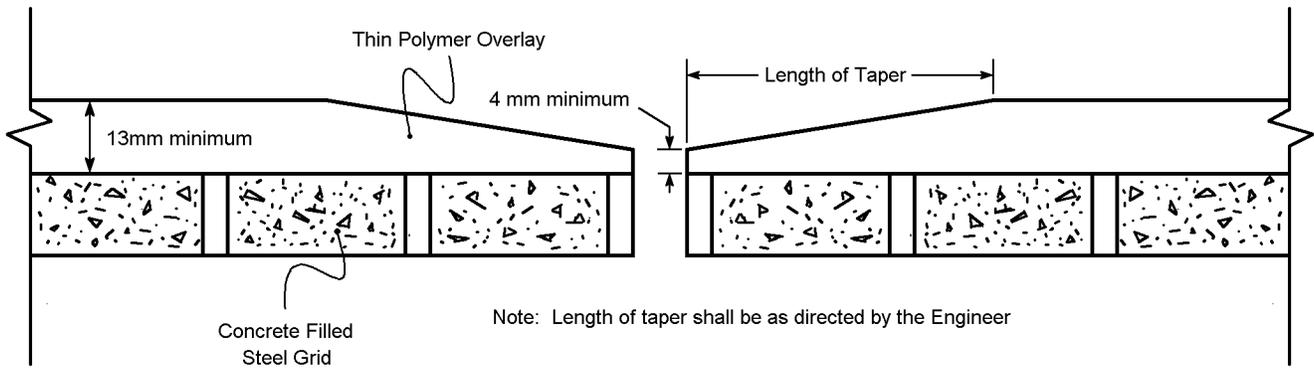
Detail No. 1 - Concrete Removal at Joint

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Detail No. 2 - Concrete Removal at Scupper

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Detail No. 3 - Feather Edge