Methacrylate Flood Seal, Item SPV.0180.xx;

**A Description**

This special provision describes surface preparation of bridge deck, furnishing and applying a protective methacrylate sealer and broadcast sand, and any incidentals necessary to complete the project as specified or as shown in plans or as authorized by the Engineer.

**B Materials**

The bridge deck sealer shall consist of a methacrylate sealant, sand to prefill cracks, and broadcast sand.

**B.1 Methacrylate Sealant**

The following methacrylate sealants are acceptable for use provided that the requirements of this specifications are met:

|  |  |
| --- | --- |
| **Product** | **Manufacturer** |
| MasterSeal 630 (formerly Degadeck Crack Sealer Plus) | BASF |
| T-78 | Transpo Industries |
| KBP 204 P SEAL | Kwik Bond Polymers |

 or an approved equal

**B.2 Fine Grade Sand**

Provide fine grade sand for prefilling large cracks unable to be prefilled with sealant alone. Fine grade sand shall pass the No. 20 sieve and be retained on the No. 40 sieve.

Submit sand material data to the Engineer for review and address all written comments. Submit storage and use plan to the Engineer documenting procedures for maintaining dry sand and within gradation requirements above.

**B.3 Broadcast Sand**

Provide a commercial quality dry blast sand with an average absorption of no more than 1%. 95% of the sand shall pass the No. 8 sieve and at least 95% shall be retained on the No. 20 sieve.

**C Construction**

**C.1 General**

**C.1.1 Pre-Installation Conference**

Conduct a pre-installation conference with the manufacturer's representative prior to construction to establish procedures for maintaining optimum working conditions and coordination of work. Furnish the engineer with a copy of the recommended procedures and the manufacturer’s instructions.

**C.1.2 Contractor Personnel Requirements**

Experienced personnel are required to be actively present during the seal application.

A technical representative from the sealer manufacturer must be present during first application. The need for manufacturer’s representative may be waived if the contractor provides evidence and reference contacts for work involving at least 5 bridges treated with the same products and within the last two years. Contractor experience record in no way relieves the contractor from applying in accordance with this specification and as recommended by the manufacturer.

**C.1.3 Material Storage and Safety Plan**

Store resin materials in their original containers in a dry area. Store and handle materials according to the manufacturer’s recommendations. Store all aggregates in a dry environment and protect aggregates from contaminants on the job site.

Safety Plan: Prior to arrival of the product on the job site, provide a product shipping, storage, and use safety plan to detail how the product will be delivered and stored on site in a manner that will not allow the constituent components to come in contact with each other in the event of a spill or container leakage. This plan must also include a description of the safety training workers applying the product have received regarding the product’s use, and list any and all safety precautions which must be taken during application of the product.

**C.2 Surface Preparation**

C.2.1: General:

Prepare the entire deck (or portion of the deck to be overlaid in one placement when staged construction is being employed) to ensure the concrete surface is dry, thoroughly clean, and free from dust or other loose material. Prepare concrete surfaces in accordance with these specifications dependent on whether the surfaces are of recently cast concrete (new construction) or of existing concrete.

Do not remove or damage striping or traffic markings in sound condition.

Do not perform surface preparation more than 24 hours prior to the application of the methacrylate sealer. The prepared surface shall not be exposed to vehicular or pedestrian traffic other than that required for sealer placement and approved by the Engineer. If the prepared surface is reopened to traffic prior to sealer placement, the surface shall be re-inspected for any contaminates and subsequently remove contaminates by use of abrasive blasting or shotblasting at no additional cost to the department.

The engineer may consider alternate surface preparation methods per the methacrylate sealer manufacturer’s recommendations. The engineer must approve the final surface preparation and deck cleanliness prior to the contractor placing the methacrylate sealer. Prior to methacrylate sealer placement, cure concrete for a minimum of 21 days.

 C.2.2: Surface Preparation for New Construction:

Remove substances such as dirt, oil, curing compound, paint, grease, slurry, laitance, and other foreign or potentially detrimental materials by water blasting, light sandblasting, wire brushing, or other methods acceptable to the Engineer, all in accordance with the penetrant sealer manufacturer’s recommendations. Determine an acceptable method that removes substances without damaging the underling substrate. Concrete removals shall not exceed 1/16 inch in depth.

 C.2.3: Surface Preparation for Existing Concrete:

Remove substances such as dirt, oil, asphalt, rubber, paint, carbonation, grease, slurry, membranes, rust, weak surface mortar, laitance, and other foreign or potentially detrimental materials by abrasive blasting. Determine an acceptable shotblasting machine operation (size of shot, flow of shot, forward speed, and/or number of passes) that provides a surface profile meeting CSP 3 (light shotblast) according to the ICRI Technical Guideline No. 310.2. If the engineer requires additional verification of the surface preparation, test the tensile bond strength according to ASTM C1593. The surface preparation will be considered acceptable if the tensile bond strength is greater than or equal to 250 psi or the failure area at a depth of 1/4 inches or more is greater than 50 percent of the test area. Continue adjustment of the shotblasting machine and necessary testing until the surface is acceptable to the engineer or a passing test result is obtained. Prepare the entire deck using the final accepted adjustments to the shotblasting machine as determined above. Thoroughly blast clean with hand-held equipment any areas inaccessible by the shotblasting equipment.

 C.2.4: Concrete Surface Cleaning Operation:

Just prior to methacrylate sealer placement, clean all dust, debris, and concrete fines from the deck surface including vertical faces of curbs and barrier walls up to a height of 2-in above the surface with compressed air. Use a direct 125 psi air blast, from a compressor unit with a minimum pressure of 365 ft3 / min., over the entire surface to remove all dust and debris paying special attention to carefully clean all deck cracks. Use a suitable oil trap between the air supply and nozzle. Use ASTM D4285 "Standard Test Method for Indicating Oil or Water in Compressed Air" to ensure the compressed air is oil and moisture free. The air stream must be free of oil and moisture. Any grease, oil, or other foreign matter that rests on or has absorbed into the concrete shall be removed completely.

Perform a visual inspection of the surface that is to receive the methacrylate sealer. Locate and mark all cracks greater than 0.024 inch. Unless directed otherwise on the plans, prefill all cracks greater than 0.024 inch with the same methacrylate sealer or a pre-promoted version of the sealer prior to the methacrylate sealer. Where sealant soaks-in/withdraws from top of crack, place fine grade sand in crack and reapply methacrylate sealant to seal to top of crack. When sealant has not retreated after gel time, the crack is considered prefilled. Do not fill crack with sand beyond top of concrete surface.

Protect drains, expansion joints, access hatches, or other appurtenances on the deck from damage by cleaning and blasting operations and from material adhering and entering. Tape or form all construction joints to provide a clean straight edge.

Provide shielding as necessary to prevent dust or debris from striking vehicular traffic.

Air dry a wet deck for a minimum of forty-eight (48) hours before applying the sealer. Dry time may be reduced to 24 hours if an approved ASTM D4263 moisture test reveals the concrete is dry. Do not apply sealer materials during wet weather conditions or if adverse weather conditions are anticipated within twelve (12) hours of the completion of sealer application. Do not mix or apply any of these products at temperatures lower or higher than those specified in their product literature. Apply the sealant at the coolest time of the day within these limitations. Application by spray methods will not be permitted during windy conditions, if the Engineer predicts unsatisfactory results.

The Engineer shall approve the prepared surface prior to applying the methacrylate sealer.

**C.3 Application of the Sealer**

Apply the sealer conforming to the manufacturer’s instructions.

Apply an approved methacrylate to bridge deck or on surfaces as directed by the Engineer. At least 30 calendar days before the start of the work, provide the Engineer with the sealer Manufacturer's written instructions for application and use.

Do not thin or alter the methacrylate sealer unless specifically required in the Manufacturer's instructions.

Mix the sealer before and during its use as recommended by the Manufacturer. Distribute the sealant as a flood coat in a gravity-fed process by broom, roller, or with a spray bar near the surface so the spray pattern and coverage rates are reasonably uniform to the satisfaction of the Engineer. Apply the sealant at a minimum rate of 90 square feet/gallon.

Protect all expansion joints and prevent the crack sealant from contacting the strip seal glands. Protect all striping and traffic markings from marring, sealant application and reduction in reflective properties. Replace any striping and traffic markings that are marred by sealant.

Prior to completion of gel time of the flood seal and before broadcasting sand, broom uncured sealant in the direction of tining or deck grooves to promote maintenance of the deck texture for traction.

Broadcast sand to refusal into uncured resin to create traction and absorb sealant that is not penetrating into cracks. Broadcast approved sand into the wet, uncured resin no sooner than 10 minutes after applying resin but within gel time of product, unless directed otherwise by the Manufacturer. Apply approved sand at a minimum rate of 250 lbs. per 1000 square feet.

Allow the sealant to dry according to the Manufacturer's instructions. Do not allow vehicular traffic onto the treated areas until the sealer has dried and the treated surfaces provide safe skid resistance and traction. Remove non-adhered sand from bridge deck and joints by power sweeping the deck and vacuuming the joints. Traffic or equipment will be allowed on the sealed deck after the Engineer has determined:

1. The treated deck surface is tack-free and non-oily;

2. The sand cover adheres and resists brushing by hand;

3. Excess sand and absorbent material has been removed; and

4. No sealant material will be tracked beyond limits of treatment by traffic

**D Measurement**

The department will measure Methacrylate Flood Seal bid item in area by the square yard acceptably completed.

**E Payment**

The department will pay for measured quantities at the contract unit price under the following bid item:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0180 |  Methacrylate Flood Seal | SY |

Payment for Methacrylate Flood Seal is full compensation for furnishing and applying the sealer to the bridge decks, as described above, including surface preparation, and all incidentals thereto. Cleanup of excess sand in joints and on bridge deck will not be paid for separately. Restoration of damaged or marred striping will be considered incidental to application requirements of Methacrylate Flood Seal. (20241028)