**SB2016-2433.7**

***Only use when recommended by the Regional Br. Const. Eng. {[use for new or rehab. when crack width is .007 (just wide enough to see at five feet from the surface) - .025 inches, bigger cracks will require a more appropriate filler to be used first] [ACI states: the crack width of.025+ was selected because this is the size that the epoxies will fill easily and also the cracks are usually smaller below the surface]}***

**CREATED 4/2/2007**

**REVISED 6/2/2015 (4)**

## SB- BRIDGE DECK CRACK SEALER

### SB- Description

UAR

Furnish and apply a protective (methyl methacrylate) or (epoxy) sealer to _____ of the roadway surface areas of Bridge No. _____, excluding the sidewalk, raised median and concrete railings. Perform this work in accordance with the applicable provisions of 2433, "Structure Renovation," the plans, as directed by the Engineer, and the following:

### SB- General

Apply a MnDOT approved, methyl methacrylate or epoxy sealer. Provide the Engineer with the sealer Manufacturer's written instructions for application and use, at least 30 calendar days before the start of the work.

### SB- Materials

Furnish only one of the materials on the Department's "Approved/Qualified Product Lists of Bridge Crack Sealers" (http://www.dot.state.mn.us/products/index.html). For products not on the Department's prequalified list, provide information as required on the web site and as stated in the following tables.

| **Table 1: Requirements for High Elongation Epoxy Crack Sealers** | |
|---|---|
| Viscosity, ASTM D 2196 | 250 cps (or less) |
| Gel Time, ASTM C 881 | Report |
| 14 Day Bond Strength, ASTM C 882 | 300 psi minimum |
| Compressive Yield Strength , ASTM D 695 | 500 psi 7 day minimum |
| Tensile Strength, ASTM D 638 | 150 psi minimum |
| Tensile Elongation, ASTM D 638 | 25 % minimum |

| **Table 2: Requirements for High Strength Epoxy Crack Sealers** | |
|---|---|
| Viscosity, ASTM D 2196 | 125 cps (or less) |
| Gel Time, ASTM C 881 | Report |
| 14 Day Bond Strength, ASTM D 695 | 1500 psi minimum |
| Compressive Yield Strength , ASTM D 638 | 4000 psi 7 day minimum |
| Tensile Strength, ASTM D 638 | 6000 psi minimum |
| Tensile Elongation, ASTM D 638 | 2.5 – 5.0% |

| Table 3: Requirements for Methacrylate Resin Crack Sealers | |
|---|---|
| Viscosity, ASTM D 2196 | 25 cps (or less) |
| Gel Time, ASTM D 2471 | 60 minutes maximum |
| Tack Free Time, ASTM D 1640 | 5 Hours maximum at 72° F and 50% R.H. |
| Tensile Elongation, ASTM D 638 | 1.5% minimum |
| Shear Bond Adhesion, ASTM C 882 | >1500 psi |

The manufacturer of the selected product must directly ship a one quart sample of the sealer to the MnDOT Materials Lab (1400 Gervais Avenue; Maplewood, MN 55109) for quality assurance testing and IR scanning at least 30 calendar days prior to the start of the work.

## SB- Application Requirements

A. Surface Preparation

Clean all areas to be sealed by removing dirt, dust, oil, grease, curing compounds, waxes, laitance, or other contaminants by performing a light sweep sandblast that does not expose the aggregate. Collect all debris and other material removed from the surface and cracks, and dispose of it in accordance with applicable federal, state, and local regulations. Immediately before applying the sealer direct a 125 psi air blast, from a compressor unit with a minimum pressure of 365 $ft^3$ / min. [10 $m^3$ / min.], over the entire surface to remove all dust and debris paying special attention to carefully clean all deck cracks. Use a suitable oil/water trap between the air supply and nozzle. Provide shielding as necessary to prevent dust or debris from striking vehicular traffic. Have the Engineer approve the prepared surface prior to applying the sealer.

Air dry a wet deck for a minimum of seventy-two hours before applying the sealer.

Cover all expansion joints in a manner that will prevent the sealer from contacting the neoprene seals but will allow sealer to penetrate the steel/concrete interface on each side of the joint. Secure the materials used to cover the neoprene seals with duct tape or another material approved by the Engineer.

B. Weather Limitations

Do not apply sealer materials during wet weather conditions or if adverse weather conditions are anticipated within 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.

C. Sealer Application

Do not thin or alter the 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 or 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. Do not allow running or puddling of the sealer to occur. Apply the sealant at a minimum rate of 100 $ft^2$ / gal [9.3 $m^2$ / gal] and apply in two coats if running or puddling cannot be controlled. Apply a second treatment on very porous substrates.

Broadcast to refusal an oven-dried 30 grit or similar sand into the wet, uncured resin.

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.

D. Test Section

Apply the sealant to a test area of at least 50 $ft^2$ [4.6 $m^2$] on the shoulder of Bridge No _____. The selected test area must contain a crack that is visible from 5 ft. [1500 mm] above the deck (.007 inches [.2 mm]) but not be larger than .025 in [.60 mm]. The test section will be used to evaluate the application equipment, coverage rate, drying times, traffic control, etc. Propose the specific location and application time for the test section at least 5 days prior to applying the sealer. A technical representative from the sealer manufacturer must be present during application and drying of the test section.

Add a dissipating UV Dye to the sealant prior to placing it on the test area. This dye will help determine the crack penetration of the sealant. Within 30 days of placing the test panel, recover a core that is no greater than four inches in diameter and includes a sealed crack as determined above. Conduct independent certified laboratory tests for crack width and penetration depth of the sealer. Send results to Structural Concrete Engineer at the MnDOT Materials Lab (1400 Gervais Avenue; Maplewood, MN 55109). All the test results are for MnDOT informational purposes only.

Prior to application of the sealant, hold a meeting with the Manufacturer's Representative, the Engineer, and the Contractor to discuss all necessary safety precautions and application considerations.

## SB- Method of Measurement

Measurement will be made to the nearest square foot of concrete area sealed based on surface area.

## SB- Basis of Payment

Payment for Item No. 2433.618 "BRIDGE DECK CRACK SEALER", will be made at the Contract price per square foot and shall be compensation in full for all costs of furnishing and applying the sealer to the bridge decks, as described above, including surface preparation, and all incidentals thereto.