Section 2542. Crack and Joint Cleaning and Sealing (Portland Cement Concrete Pavement)

2542.01 DESCRIPTION.

A. Rout or saw and clean random cracks and existing transverse and longitudinal joints in PCC pavement. Seal the prepared cracks and joints with an approved sealing material.

B. Crack and joint cleaning and sealing is intended to address longitudinal cracking, transverse cracking, and corner breaks. Crack and joint cleaning and sealing is not intended to clean or seal durability ("D") cracking or map cracking. Definitions for these pavement distress types can be found in the „Distress Identification Manual for the Long-Term Pavement Performance Program" (Publication No. FHWA-RD-03-031, dated June 2003, web address: (http://www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltpp/reports/03031/03031.pdf).

2542.02 MATERIALS.

A. Use hot poured joint sealer and backer rod that meet the requirements of Article 4136.02.

B. Installation of preformed elastomeric joint seals meeting the requirements of Article 4136.02 may be required in the contract documents. Substitution of elastomeric joint seal material for poured joint sealer material will not be allowed unless specified otherwise in the contract documents.

2542.03 CONSTRUCTION.

A. Equipment.

1. Routing or Sawing Equipment.

a. Use power driven routing or sawing equipment, where required, capable of cutting the cracks to the required dimensions without excessive spalling of the adjacent surface.

b. Use power driven sawing equipment (wet or dry), where required, capable of sawing the sealant reservoir to the dimensions shown in the contract documents.

2. Water and Abrasive Blasting Cleaning Equipment.

a. To remove existing joint sealer, debris, and loose material from the crack or joint, use water cleaning equipment capable of delivering water with a pressure of 2,000 psi (13.8 MPa) from a nozzle.

b. Use abrasive blast equipment capable of removing the existing sealant, saw slurry, silt, or other foreign material from the vertical face of the crack or joint to the specified depth. Ensure the equipment leaves a clean, dry, newly exposed concrete surface.

3. **Air Compressors.**
Use air compressors that provide moisture and oil free air and are of sufficient size to blow sand and other foreign material from the crack or joint prior to placing the sealant material.

4. **Equipment for Heating and Placing Sealant Material.**
Use an oil jacketed, double boiler type, heating kettle or other thermostatically controlled equipment of a type approved by the Engineer, capable of heating the material to 400°F (205°C) and pumping the material into the prepared crack or joint.

5. **Auxiliary Equipment.**
Provide auxiliary equipment, such as brooms, scrapers, etc., as necessary to perform the work.

B. Construction.

1. A partial depth finish patch may be required when joints or cracks have edge spalls or other distress greater than 3 inches (75 mm) in width. If not otherwise included as part of the contract work, these areas will be designated by the Engineer as extra work. Construct partial depth finish patches according to Section 2530. Seal joints or cracks less than or equal to 3 inches (75 mm) in width without patching.

2. Clean cracks and joints of existing joint sealer, vegetation, dirt, and all other foreign material to the depth of the bottom of the backer rod. Sand blast the edges throughout the proposed depth of the joint sealer, leaving a clean, dry, newly exposed concrete surface on the vertical edges. This will require two passes of the sand blasting operation for each joint and crack: one pass for each joint or crack edge. Set the angle of approach of the sand blast nozzle to each vertical face of the reservoir to be approximately 30 degrees. The sand blast nozzle shall have a guide which inserts in the joint and assures positive location and directional control of the nozzle.

3. Perform sand blasting just prior to the application of the joint sealer. When cleaned joints or cracks are contaminated before being sealed, reclean them by sand blast before sealing. Rain will be considered contamination.

4. Place a backer rod at the bottom of the joint or crack as a bond breaker. Install it dry. If the width of opening exceeds the maximum size available, approved alternates of bond breakers at the bottom of the crack or joint may be used.

5. Widen cracks and joints in partial depth HMA finish patches to 1/2 inch (13 mm), if widening is necessary. Extend the cleaning and sealing operation across the joint or crack.

6. Prior to placing backer rod and joint sealer:
- Ensure cracks and joints are dry.
- Use compressed air to blow cracks and joints clean.

7. Fill joints and cracks to the level shown in the contract documents.

8. Heat, handle, and apply the sealer material according to the manufacturer's recommendations.

9. Rout or saw cracks and joints with an average opening of 3/8 inch (10 mm) or less to provide a minimum sealant reservoir of 3/8 inch (10 mm) in width by a nominal 1/2 inch (13 mm) in depth. For cracks and joints with an existing width greater than 3/8 inch (10mm), place backer rod to a depth that will provide at least 5/8 inch (16 mm) clearance above the backer rod for the sealer. Clean cracks and joints of all foreign material to a depth necessary to accommodate the sealer material and the backer rod to be used. Ensure backer rod is dry when placed.

C. Traffic Control.

1. When there is a separate item for traffic control, furnish all signs and traffic control devices, such as flaggers, barricades, traffic cones, warning lights, and pilot car signs (when required) according to Section 2528. Erect, maintain, and remove all traffic control devices.

2. Conduct the work on only one lane of the pavement width at a time. ~~When work encroaches on an adjacent lane, a flagger will be required at that location.~~

3. Apply Articles 1107.08, 1107.09, and 1108.03.

D. Limitations.

1. When other work is included in the contract, sequence operations in the following order:
   - **a.** Undersealing,
   - **b.** Longitudinal subdrains,
   - **c.** Patching,
   - **d.** Installation of retrofit load transfer,
   - **e.** Grinding or milling, and then
   - **f.** Crack and joint sealing.

2. Perform joint and crack sealing only when the ambient air and pavement surface temperatures are above 40°F (4°C). When near this minimum temperature, additional air blasting or drying time, or both, may be necessary to assure a satisfactory bond to the joint surfaces.

3. Lanes may be opened to traffic only after the sealer has set sufficiently so it will not pick up under traffic. Blotting material may be applied to the sealer, but only after the sealer surface has set so as to avoid penetration of the blotting material into the sealer.

4. Remove old sealant, other debris, and saw slurry from the pavement surface before the pavement is opened to traffic.

5. Before the pavement is opened to traffic, clean the dry sawed or routed joints or cracks with a stream of air sufficient to remove all dirt, dust, and deleterious material that can adhere to the joint face. Complete this work within 3 hours after the joint or crack has been dry sawed or routed.

6. Clean wet sawed joints using high pressure water immediately after sawing to remove residue produced by the sawing operation.

7. Seal joints and cracks within 5 working days after completion of any sawing or routing or removing old joint sealant material or debris from the crack or joint.

8. Do not perform crack and joint sealing after September 30. When joint sealer cannot be placed in an otherwise completed joint or crack prior to this date due to temperature or other conditions, temporarily seal these joints or cracks with a joint sealer over the winter shutdown period. Remove this seal and reclean and reseal the joint or crack according to this specification during the next construction season (at no additional cost to the Contracting Authority).

9. Do not overfill with sealant. Immediately remove sealant placed on the pavement surface.

2542.04 METHOD OF MEASUREMENT.

Measurement will be as follows:

A. Crack and Joint Cleaning and Sealing (PCC Pavement).

1. Miles (kilometers), calculated to the nearest 0.1 mile (0.1 km), of main line pavement and shoulders on which cracks and joints were cleaned and sealed. Calculations will be based on the center line distance of main line, two-lane pavement, corrected for main line pavement of more than two lanes, including climbing lanes.

2. Shoulders 4 feet (1.2 meters) or less in width will not be measured separately for payment.

3. At intersections, rest areas, and interchanges designated for cleaning and sealing, the additional areas of widened pavement, ramps, storage lanes, turning lanes, paved medians, and parking in rest areas will not be separately measured for payment.

4. Between limits for which cleaning and sealing is intended for either pavement or shoulders, no deductions will be made for bridges, intersections, or other interruptions where cracks or joints are not to be cleaned and sealed.

B. Sealer Material (PCC Pavement).

Pounds (kilograms) of sealer material used in cracks and joints.

2542.05 BASIS OF PAYMENT.

Payment will be the contract unit price as follows:

A. Crack and Joint Cleaning and Sealing (PCC Pavement).

1. Per mile (kilometer) for pavement or shoulders on which the cracks and joints were cleaned and sealed.

2. Shoulders 4 feet (1.2 meters) or less in width are incidental to the price bid for Crack and Joint Cleaning and Sealing (PCC Pavement).

3. Payment is full compensation for all labor, equipment, and materials (except for sealer, but including backer rod) for cleaning and sealing cracks and joints.

B. Sealer Material (PCC Pavement).

1. Per pound (kilogram). Price is predetermined.

2. Payment is full compensation for furnishing the sealer material only.

C. Partial Depth Finish Patches.

If not included otherwise as part of the contract work, payment for partial depth finish patches designated by the Engineer will be as extra work according to Article 1109.03, B.