BITUMINOUS CRACK AND JOINT SEALING.

(6-4-12)

The following new Section is inserted after Section 300.

SECTION 305
BITUMINOUS CRACK AND JOINT SEALING

305-1 Description.

Clean and seal joints and cracks in asphalt concrete roadway surfaces using the Cut and Seal method or the Crack Fill method.

305-2 Materials.

305-2.1 General Requirements: Use only hot applied sealants as described in this specification. Use either asphalt rubber or polymer modified asphalt rubber sealants as shown in the Contract Documents. Certify that each lot of premixed material meets the requirements of this Section and submit the test results of each lot used. Deliver each lot of sealant in containers with the manufacturer's name and lot number plainly marked.

305-2.2 Asphalt Rubber Binder Joint and Crack Sealer: Meet the following requirements:

305-2.2.1 Rubber Type and Content: Use ambient ground rubber at 18 plus or minus 1% by weight of virgin asphalt cement meeting the following gradation requirements:

Sieve Size	Percent Passing
No. 10	100
No. 16	95 to 100
No. 30	40 to 80
No. 80	0 to 5

305-2.2.2 Workability: The mixture pours readily and penetrates a 0.25 inch pavement joint or crack to a depth of at least 1.0 inch when the application temperature of the fully reacted mixture is 350ºF and the air temperature is 35ºF or higher.

305-2.2.3 Curing: The mixture, when placed in conventional field installation equipment, readily melts to a pumping consistency after being heated to 400°F for 2 hours maximum. The mixture remains in a pumping consistency when the temperature of the field installation equipment is reduced to the normal operating temperature range of 300ºF to 350ºF.

305-2.2.4 Softening Point: The minimum softening point shall be 185ºF when tested in accordance with ASTM D36.

305-2.2.5 Flexibility: Bend a 0.125 inch thick x 1.0 inch wide x 6.0 inches long mixture specimen after conditioning to 10.0ºF at a minimum bending rate of 9 degrees per second (10 seconds maximum for a 90º bend) over a 1.0 inch diameter mandrel without cracking in accordance with ASTM D3111.

305-2.2.6 Separation: Test for phase separation by pouring a representative sample of the mixture into aluminum tubes 1.0 inch in diameter and 5.5 inches long as described in AASHTO PP5. Cure the samples at 325ºF for 48 hours. Take samples from the top and bottom of the tube and determine the softening point as described in ASTM D36. Average the test

results from the top and bottom samples. If there is 4.0% or more difference between the average test result and either of the top or bottom test results, reject the mixture due to separation.

305-2.2.7 Adhesion: When cooled, the mixture shall bond strongly to both asphalt and concrete pavement surfaces. The mixture shall contain no materials that chemically react with these surfaces to reduce the short-term and long-term adhesion bonds.

305-2.3 Polymer Modified Asphalt Rubber Binder Joint and Crack Sealer: In addition to the requirements provided in 305-2.2, meet the following additional requirements:

Property	Specification
Cone Penetration, 77.0ºF (ASTM D5329)	30 - 60 dmm
Resilience, 77.0ºF, % Recovery (ASTM D5329)	30% minimum
Ductility, 77ºF, 50 mm/minute (AASHTO T 51)	300 mm minimum
Asphalt Compatibility (ASTM D3407)	Pass
Bitumen Content (ASTM D4)	60% minimum
Tensile Adhesion (ASTM D3583)	500% minimum
Rotational Viscosity (Brookfield), No. 5 spindle, 20 RPM, 400 ºF (AASHTO T 316)	3,000 – 15,000 cp

305-2.4 Delivery, Storage, and Handling: Package the premixed sealant material in units weighing no more than 30 pounds with a maximum of two 30-pound units per shipping container. Ensure that the plastic film used to package the units melts at normal application temperatures when placed in the installation equipment.

305-2.5 Field Performance: There shall be no pulling or tracking of the in-place crack sealant material by vehicle traffic after 20 minutes of material application. Failure to meet this requirement is cause for rejection of the material regardless of specified laboratory test results.

305-3 Equipment.

Use field equipment that produces or maintains specified temperatures, even if filled to capacity. Ensure that the equipment produces or maintains a homogeneous mixture of asphalt and rubber at a uniform temperature without hot or cool spots or segregation in the mixture. Ensure that the equipment for filling the joints and cracks directs the sealant into the crack. Ensure that the air compressors are satisfactory to the Engineer.

305-4 Construction.

305-4.1 General: All single transverse cracks in the travel lanes shall be sealed by the Cut and Seal method. All other cracks in the travel lanes, shoulders, and other auxiliary areas may be filled by either the Cut and Seal method or the Crack Fill method. Do not begin operations when the ambient air temperature is less than 40°F or when the roadway surface is moist.

305-4.2 Cut and Seal Method: Cut, clean and seal cracks and joints that are 1/16 inch or greater in width. Cut along the crack or joint to construct a uniform rectangular reservoir in which the sealant is to be placed. The reservoir shall be between 1/2 inch and 3/4 inch in width. The depth of the reservoir shall be between 1/2 inch and 1 inch. The cut reservoir shall have vertical, intact sides with no loosely bonded aggregate. Following cutting, the reservoir shall be cleaned using the air blast method or other acceptable method. The reservoir shall be inspected prior to the application of the sealant to ensure that it is clean, dry, and free of dirt, debris, adhered fines, or other contamination. If reservoirs are not clean and dry, they shall be re-cleaned to achieve the required condition. Sealant shall be applied to slightly overfill the reservoir and

then struck off using a "V" shaped squeegee. The remaining squeegee material shall be flush with the pavement surface. In no case shall the remaining material be lower than the pavement surface or exceed 1/16 inch above the pavement surface. In no case shall the width of excess material on the pavement surface exceed 3 inches.

305-4.3 Crack Fill Method: Clean and seal joints and cracks that are 1/16 inch or greater in width. Clean joints and cracks with air blast cleaning or other acceptable methods to a depth of at least twice the joint or crack width. Joints and cracks shall be inspected prior to the application of the sealant to ensure that they are clean, dry, and free of dirt, debris, adhered fines, or other contamination. Apply sealing material with a pressure nozzle. Completely fill cracks and joints. Sealant shall be applied to slightly overfill the crack or joint and then struck off using a "V" shaped squeegee. The remaining squeegee material shall be flush with the pavement surface. In no case shall the remaining material be lower than the pavement surface or exceed 1/16 inch above the pavement surface. In no case shall the width of excess material on the pavement surface exceed 3 inches.

305-4.4 Other: Prevent tracking with an application of fine sand, unless it can be demonstrated that the crack and joint sealer will not track without the application of sand. Other methods may be used if approved by the Engineer. Repair any pavement striping or markings affected by the application of crack and joint sealer. Repair any pavement striping or markings using material meeting the Department's specifications.

305-5 Method of Measurement.

The quantity of crack sealing to be paid for will be the linear feet of cracks or joints completed and accepted, determined by field measure.

305-6 Basis of Payment.

Price and payment will be full compensation for furnishing all materials and performing the work specified in this Section.

Item No. 305- 1- Bituminous Crack and Joint Sealing - per linear feet.