

SECTION TABLE OF CONTENTS DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 01 17.61 SEALING CRACKS IN ASPHALT PAVING

05/17

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SEALING CRACKS IN ASPHALT PAVING

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PART 1 GENERAL.

1.1 UNIT PRICES.

1.1.1 Measurement

Determine the quantity of each sealing item to be paid for by actual measurement of the number of linear feet of in-place material that has been approved.

1.2 REFERENCES.

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C509	(2006; R 2015) Elastomeric Cellular Preformed Gasket and Sealing Material
ASTM D789	(2015) Determination of Relative Viscosity and Moisture Content of Polyamide (PA)
ASTM D6690	(2015) Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

1.3 SUBMITTALS.

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the government officer that will review the submittal for the Government.

SD-03 Product Data

Installation of Sealant

SD-04 Samples

Materials; G,COR

SD-06 Test Reports

Laboratory Tests

1.4 DELIVERY, STORAGE, AND HANDLING.

Inspect materials delivered to the job site for defects; unload, and store them with a minimum of handling to avoid damage. Provide storage facilities at the job site to protect materials from weather and maintain them at the temperatures recommended by the manufacturer.

1.5 EQUIPMENT, TOOLS, AND MACHINES.

Equipment, tools, and machines used in performance of the work are subject to approval by the Contracting Officer. Maintain in a satisfactory working condition at all times.

1.5.1 Routing Equipment

Provide routing equipment which is a self-powered machine operating a power driven tool or bit specifically designed for routing bituminous pavements. Use a bit rotating about a vertical axis at sufficient speed to cut a smooth vertical-walled reservoir in the pavement surface and maintain accurate cutting without damaging the sides or top edges of the reservoir. Provide a router capable of following the trace of the crack without deviation. The use of rotary impact routing devices will not be permitted for cleaning cracks.

1.5.2 Concrete Saw

Provide a self-propelled power saw with small diameter (6 inches or less) water-cooled diamond or abrasive saw blades for cutting cracks to the depths and widths specified and for removing filler that is embedded in the cracks or adhered to the crack faces. Use a saw blade with a diameter small enough to allow the saw to closely follow the trace of the crack.

1.5.3 Sandblasting Equipment

Include in the sandblasting equipment an air compressor, hose, and long-wearing venturi-type nozzle of proper size, shape and opening. Use a nozzle with a maximum opening not exceeding 1/4 inch. Use air compressors that are portable and capable of furnishing not less than 150 cfm and maintaining a line pressure of not less than 90 psi at the nozzle while in use. Demonstrate compressor capability under job conditions before approval. Equip the compressor with traps that will maintain the compressed air free of oil and water. Use nozzle with an adjustable guide that will hold the nozzle aligned with the crack about 1 inch above the pavement surface. Adjust the height, angle of inclination and the size of the nozzle as necessary to secure satisfactory results.

1.5.4 Waterblasting Equipment

Include with the waterblasting equipment a trailer-mounted water tank, pumps, high-pressure hose, wand with safety release cutoff control, nozzle, and auxiliary water resupply equipment. Use water tank and auxiliary resupply equipment with sufficient capacity to permit continuous operations. Use hoses, wands, and nozzles capable of cleaning the crack faces and the pavement surface on both sides of the crack for a width of at least 13 mm 1/2 inch beyond the crack. Use pump with a mounted pressure gauge that shows the pressure in kPa psi at which the equipment is operating at all times. Limit the pressure so that the sides of the crack are not damaged during the cleaning operation.

1.5.5 Hand Tools

Hand tools may be used, when approved, for removing defective sealant from cracks and repairing or cleaning the crack faces.

1.5.6 Crack Sealing Equipment

Provide unit applicators, used for heating and installing the hot-poured crack sealant materials, that are mobile and equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the crack to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. Allow the sealant to circulate through the delivery hose and return to the inner kettle when not in use, due to the applicator unit design.

1.6 ENVIRONMENTAL REQUIREMENTS.

Apply the materials only when the ambient air temperature and the pavement temperature within the joint wall are at least 10 degrees C 50 degrees F and rising. Do not apply sealant if moisture is observed in the crack.

PART 2 PRODUCTS.

2.1 SEALANTS.

Provide sealants conforming to ASTM D6690, Type II or ASTM D6690, Type I. Use sealing materials for sealing cracks in the various paved areas indicated on the drawings.

2.2 BACKER ROD MATERIALS.

Provide backer rod material that is a compressible, nonshrinking, nonstaining, nonabsorptive material and nonreactive with the crack sealant. Use backer rod with a melting point temperature of at least 5 degrees F greater than the maximum pouring temperature of the sealant being used, when tested in accordance with ASTM D789. Use material that has a water absorption of not more than 5 percent by weight when tested in accordance with ASTM C509. Use backer rod material that is 25 percent (plus or minus 5 percent) larger in diameter than the nominal width of the crack.

PART 3 EXECUTION.

3.1 PREPARATION OF CRACKS.

Immediately before the installation of the crack sealant, thoroughly dry and clean the cracks to remove oxidized pavement, loose aggregate and foreign debris. Prepare cracks as follows:

3.1.1 Cracks

3.1.1.1 Hairline Cracks

Cracks that are less than 1/4 inch wide do not need to be sealed.

3.1.1.2 Small Cracks

Route cracks that are 1/4 to 3/4 inch wide to a nominal width 1/8 inch greater than the existing nominal width and to a depth not less than 3/4 inch, waterblasted or wire brushed and cleaned and dried using compressed air.

3.1.1.3 Medium Cracks

Waterblast or Wire brush cracks that are 3/4 to 2 inches wide and clean and dry using compressed air.

3.1.1.4 Large Cracks

Repair cracks that are greater than 2 inches wide using pothole repair techniques instead of sealing.

3.1.2 Existing Sealant Removal

Cut loose the in-place sealant from both crack faces and to a depth shown on the drawings using a concrete saw or hand tools as specified in paragraph EQUIPMENT, TOOLS, AND MACHINES. Remove sealant to a depth sufficient to accommodate any backer rod material that is required to maintain the depth of new sealant to be installed. Prior to further cleaning operations, remove all old loose sealant remaining in the crack opening by blowing with compressed air.

3.1.3 Routing

Perform routing of the cracks using a rotary router with a bit that is at least 1/8 inch wider than the nominal width of the crack to remove all residual old sealant (resealing), oxidized pavement and any loose aggregate in the crack wall.

3.1.4 Sawing

Perform sawing of the cracks using a power-driving concrete saw as specified in paragraph EQUIPMENT, TOOLS, AND MACHINES. Stiffen the blade as necessary with suitable dummy (or used) blades or washers. Immediately following the sawing operation, clean the crack opening using a water jet to remove all saw cuttings and debris.

3.1.5 Waterblasting

Waterblast clean the crack faces and the pavement surfaces extending a minimum of 1/2 inch from the crack edges. Use a multiple-pass technique until the surfaces are free of dust, dirt, old sealant residue, or foreign debris that might prevent the sealant material from bonding to the asphalt pavement. After final cleaning and immediately prior to sealing, blow out the cracks with compressed air and leave them completely free of debris and water. Ensure that waterblasting does not damage the pavement.

3.1.6 Backer Rod Material

When required, use backer rod material in all cracks that otherwise would require excessive sealant. Insert the backer rod material into the lower portion of the crack as shown on the drawings. Place the backer rod so that the top of the backer rod is at least 3/4 inch below the top of the pavement. Ensure that the backer rod material is placed at the specified depth and is not stretched or twisted during installation.

3.1.7 Rate of Progress of Crack Preparation

Limit the stages of crack preparation, which include routing, sandblasting of the crack faces, air pressure cleaning and placing of the backer rod material, to only that linear footage that can be sealed during the same day.

3.2 PREPARATION OF SEALANT.

Do not heat hot-poured sealants in excess of the safe heating temperature recommended by the manufacturer, as shown on the sealant containers. Withdraw and waste sealant that has been overheated or subjected to application temperatures for over 4 hours or that has remained in the applicator at the end of the day's operation.

3.3 INSTALLATION OF SEALANT.

Submit manufacturer's instructions 7 days prior to the use of the material on the project. Installation of the material will not be allowed until the instructions are received.

3.3.1 Time of Application

Seal cracks immediately following final cleaning and drying of the crack walls and following the placement of the backer rod material (when required). Place sealant only when cracks are dry. Reclean cracks that cannot be sealed under the conditions specified, or when rain interrupts sealing operations, and allow to dry or dry by mechanical means prior to installing the sealant.

3.3.2 Sealing the Crack

Immediately preceding, but not more than 50 feet ahead of the crack sealing operations, perform a final cleaning and drying with compressed air. Fill the cracks from the bottom of reservoir formed by the routing or the top of the backer rod up to 1/4 inch below the pavement surface. Remove excess or spilled sealant from the pavement by approved methods and discard it. Install the sealant in a manner which prevents the formation of voids and entrapped air. Several passes with the applicator wand may be necessary to obtain the specified sealant depth from the pavement surface. Do not use gravity methods or pouring pots to install the sealant material. Do not permit traffic over newly sealed pavement until authorized by the Contracting Officer. Check cracks frequently to ensure that the newly installed sealant is cured to a tack-free condition within 3 hours. Immediately notify the Contracting Officer of the location of any sealant that has not cured to a tack-free condition within 3 hours.

3.4 CRACK SEALANT INSTALLATION TEST SECTION.

Following the completion of the test section and before any other crack is sealed, inspect the test section to determine that the materials and installation meet the requirements specified. If materials or installation do not meet requirements, remove the materials and reclean and reseal the cracks at no cost to the Government.

3.5 CLEANUP.

Upon completion of the project, remove unused materials from the site and leave the pavement in a clean condition.

3.6 QUALITY CONTROL PROVISIONS.

3.6.1 Crack Cleaning

Provide quality control provisions during the crack cleaning process to correct improper equipment and cleaning techniques that damage the bituminous pavement in any manner. Cleaned cracks must be approved by the Contracting Officer prior to installation of the crack sealant.

3.6.2 Crack Seal Application Equipment

Inspect the application equipment to ensure conformance to temperature requirements and proper installation. Evidences of bubbling, improper installing, and failing to cure or set will cause to suspend operations until causes of the deficiencies are determined and corrected.

3.6.3 Crack Sealant

Inspect the crack sealant for proper cure and set rating, tack free surface, bonding to the bituminous pavement, cohesive separation within the sealant, reversion to liquid, and entrapped air and voids. Remove sealants exhibiting any of these deficiencies, at any time prior to the final acceptance of the project, and replace as specified herein at no additional cost to the Government.

-- End of Section --