

ITEM 13 A CRACK SEALING OR CRACK FILLING OF ASPHALT PAVEMENTS

13.1 DESCRIPTION

This item shall consist of furnishing all materials, equipment, labor, cleaning and clean up, traffic control and incidental items necessary for sealing or filling cracks of asphalt pavements. The purpose of crack sealing and crack filling is to prevent the intrusion of water and incompressibles. Crack sealing shall be applicable for cracks 1/4" to 3/4" wide or as recommended by manufacturer. Crack filler is recommended for cracks that are 1" or wider and / or exhibit edge deterioration.

Crack **Sealer** is used for working cracks, cracks that have more than 1/4" seasonal movement. Both hot and cold materials are currently available for crack sealing; however, this specification is meant to only apply to hot applied materials.

Crack **Filler** should be used for nonworking cracks. Non-working cracks are cracks that have annual movement less than 1/4". Non working crack types may include wide transverse cracks. If a crack exhibits edge deterioration it should be filled not sealed.

13.2 MATERIALS

Materials used for crack **sealing** shall meet or exceed requirements of ASTM D 6690 Type II and be listed on the CDOT approved products list. Crack sealers are typically viscous at high temperatures and applied with a wand and excess material is spread with a squeegee. The **CONTRACTOR** shall provide material certifications and manufacturer's instructions for heating and application.

<http://www.coloradodot.info/business/apl>

Materials used for crack **filling** shall be a premixed blend of polymer modified asphalt binder and wear resistant aggregates heated and mixed in a specialized melter. They are usually spread using a specialized device and smoothed with a heated float. The **CONTRACTOR** shall provide material certifications and manufacturer's instructions for heating and application. Material shall be listed on the CDOT approved products list.

NOTE:

If CDOT approved crack filler is not available see MGPEC website for product recommendations made by other municipalities.

13.3 EQUIPMENT

Equipment shall be as specified by the sealant manufacturer and approved by the **AGENCY**. All equipment and machinery shall be kept in good working order, free of leaks and properly muffled. All taxes, licenses and fees shall have been paid and proper licenses and permits shall be posted as required by law.

An oil jacketed type melting unit equipped with both agitation and recirculation systems shall be used to heat the sealant. Direct Fire Melters will not be allowed. The unit shall be equipped with separate thermometers for both the oil bath and the crack sealing material. Thermometers shall be calibrated on a weekly basis to ensure the proper heating of the material.

Materials shall be heated according to the manufacturer's specifications. Fresh material shall not be added to material that was overheated in an attempt to make it acceptable. Material that has been overheated shall be discarded.

13.4 CONSTRUCTION REQUIREMENTS

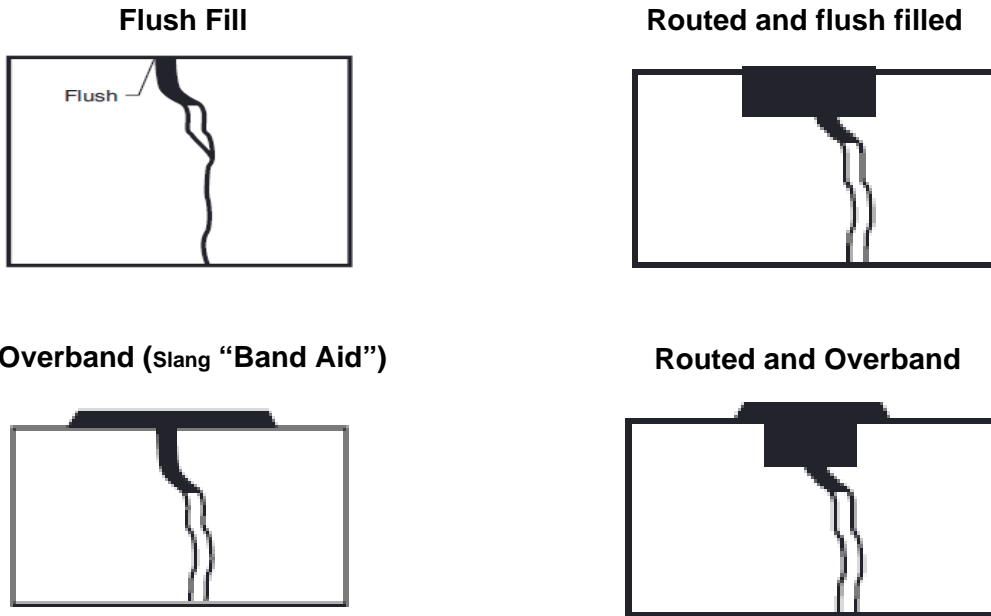
Prior to sealing, all loose material shall be blown out of cracks using a heat lance. Care shall be taken not to burn or scorch the pavement. Torches shall not be used. The **CONTRACTOR** shall ensure that blown debris shall not strike pedestrians, workers, or cause damage to vehicles and/or private property during cleaning and sealing operations. The **CONTRACTOR** shall clean debris from streets and sidewalks as soon as sealant has hardened sufficiently.

Cracks shall be free of moisture, residue from deicing chemicals, vegetation and loose matter prior to sealing. If sealant boils when applied additional drying is required before sealing resumes.

Cracks shall be sealed to a minimum depth equal to 2 X crack width or the full thickness of the pavement. Overband, if used, shall not exceed 3" in width and 1/8" in height above the pavement surface. Over band width is critical when sealing longitudinal cracks or in stopping zones to avoid creating hazards for cyclists or reducing the tire friction.

When the **AGENCY** specifies routing of cracks, routing shall precede blowing out cracks.

AGENCY shall specify if routing is required prior to placement of **Crack Seal**:



The finished level of **Crack Seal** or **Crack Filler** shall be **flush to 1/8" above the asphalt surface**. Excess material shall be removed by the **CONTRACTOR** at the **CONTRACTOR's** expense.

The **CONTRACTOR** shall apply the sealant material **according to manufacturer's recommendations** with approval by the **AGENCY**. **CONTRACTOR** shall be solely responsible for safety during all operations and making sure material is placed only in cracks with or without overband as shown above. Costs of damage, cleanup and/or material placed incorrectly shall be borne by the **CONTRACTOR**.

Traffic shall be kept off sealant until sufficiently hard to not be picked up by traffic. Cooling of sealant can be accelerated using a commercial solution or water. Blotting with sand or paper is not acceptable.

NOTE FOR ASPHALT OVERLAYS:

According to CDOT Research Report 2009-9, bumps caused by crack sealant under an overlay can be prevented by using a pneumatic roller for the breakdown roll. Age of crack seal is not a factor in the development of bumps from crack seal material.

QUALITY CONTROL REQUIREMENT CHECKLIST

Climatic Conditions

- Surface temperature is at least 45°F and rising or per manufacturer's recommendations.
- No moisture, fog or dew is present.
- Early morning operations should be performed in direct sunlight.

Routing

- Cutting tips are sufficiently sharp to minimize spalling and cracking.
- Proper safety garments are worn (hard hat, reflective vest, long-sleeved shirt, pants, steel toed boots, safety goggles, and hearing protection).
- Guards and safety mechanisms on equipment work properly.
- Router follows cracks without difficulty.
- Routed cracks do not exhibit spalling.

Material Preparation

- Proper safety garments are worn (hard hat, reflective vest, long-sleeved shirt, pants, steel toed boots, safety goggles, and hearing protection).
- Heating oil in melter jacket is not fuming and level is adequate.
- Temperature gauge on the melter has been calibrated to the satisfaction of the **AGENCY**.
- If the temperature gauge has not been calibrated:
 - Measure sealant temperature with a thermometer.
 - Ensure that the reading on the thermometer is the same as the reading on the melter temperature gauge.
- Sealant is never reheated above the manufacturer's recommended pouring temperature.
- Material safety data sheet (MSDS) is available on-site.

Cleaning of Cracks and Routs

- Proper safety garments are worn (hard hat, reflective vest, long-sleeved shirt, pants, steel toed boots, safety goggles, and hearing protection).
- A power sweeper or vacuum cleaner is being used to remove dirt and debris from the pavement surface.
- Compressor for high-pressure air provides at least 100 psi.
- Oil and moisture filters on compressor work properly.
- Temperature of the hot-air lance is below 930°F and the tip is 2 to 4 inches from the crack or rout.
- The cleanliness of the crack or rout is being checked every 30 minutes.
- The crack or rout is dry.
- No deicing chemical residue is present.

Sealant Application

- Hot-pour sealant is poured at the manufacturer's recommended temperature.
- The material is applied to the inside of the cracks.
- Insure that sealant is placed up to the asphalt surface.
- There is sufficient sealant to allow for overband (if applicable).
- There are no bubbles due to moisture present.

Overbanding of Sealant (if applicable)

- Over band is not more than 3 inches wide.
- Over band is not more than 1/8 inch above the pavement surface.
- Over band is formed during, or immediately after, sealant application.
- Excess sealant is removed before hardening.

Sealant Protection

- Traffic is rerouted until sealant is set.

13.5 MEASUREMENT

Crack sealant shall be measured and paid by the ton complete in place and accepted. If routing is specified it will not be measured and paid separately but shall be included in the cost of material.

The CONTRACTOR shall measure and the inspector verify the following:

Before work starts each day:

- Amount of material in melter
- Number and weight of containers of material on site
- All containers are clearly marked with manufacturer's information.

At the end of work each day:

- Amount of material in melter.
- Number of containers of material not used.

CONTRACTOR shall certify that material in the melter is per the specifications and has not been overheated.

Measurement will not begin before inspector arrives.

Inspector shall be given adequate notice if material is to be delivered during the work day and have the opportunity to verify quantity.

Counting or delivering boxes or lids shall not be an acceptable method of verifying quantity of material.

13.6 TESTING AND INSPECTION - GUIDANCE

When pulled vertically using a flattened sharp tipped ¼" rod bent at 90° the bond between the sealant and asphalt should be stronger than the sealant or the asphalt. Sealant or existing asphalt pavement should fail before the bond is broken.

13.7 PAYMENT

Payment shall include all equipment, supervision, labor, material, traffic control; clean up including sweeping of streets and other areas where debris may have traveled and any other items necessary to perform the work. Payment for crack seal and / or crack filler shall be made for material placed and accepted at the unit prices provided in the bid schedule. Crack seal and crack filler shall be paid at the contract unit price per ton of material placed and accepted.

<u>Item Description</u>	<u>Payment</u>
13.1 Joint and Crack Sealant	\$/Ton
13.2 Joint and Crack Filler	\$/Ton