

## **Guidelines for Crack Sealing**

### **I. Work:**

1. All crack sealing work shall be limited to sealing uncut cracks (Blow & Go Operations) during the periods of spring and/or fall when pavement surfaces are dry and air temperatures are above 2°C.
2. All crack sealing work slated during the summer months shall include a combined treatment comprised of sealing cut cracks (Rout & Seal Operations) as described in Article III and sealing uncut cracks as described in Article II.
3. All crack sealing work shall be generally limited to the following types of cracks:
  - a) Longitudinal cracks greater than 3 mm wide and less than 25 mm wide.
  - b) Random cracks greater than 3 mm wide and less than 25 mm wide.
  - c) Transverse cracks greater than 3 mm wide and less than 25 mm wide.
4. All alligator cracks, block cracks, edge cracks located within 450 mm of the edge and all cracks exhibiting severe branching shall not be sealed.
5. All workers of the crack sealing crew are recommended to complete appropriate training before starting any work and become familiar with the maintenance and operation of the crack sealing equipment.
6. All crack sealing work shall be carried out under local jurisdiction's traffic control measures in accordance with the work area traffic control manual. The supervisor of the crack sealing crew will schedule and coordinate at the beginning of each day of work, all traffic control locations with the traffic control supervisor.
7. The supervisor and workers of the crack sealing crew shall become familiar with the scope of work described herein and fill out daily inspection records during the execution of work.

### **II. Crack sealing uncut cracks (Blow & Go Operation, no rout):**

1. Crack sealing uncut cracks will include the cleaning and sealing of open cracks (longitudinal, random and transverse cracks greater than 3 mm wide and less than 25 mm wide) during the spring and fall seasons.
2. The cleaning operations shall consist of high compressed air free of oil for cleaning the cracks complete with the warming of the cracks and the removal of some moisture using a hot air lance (HAL). Please note that all compressors specified for crack sealing will have moisture trapped in the compressed air and will depend largely on the humidity. It is critical especially during the morning and during days when the humidity is relatively high that the HAL be used to warm the cracks and remove moisture to supplement the cleaning operations.
3. All cracks and particularly transverse cracks shall be effectively cleaned and dried (exhibiting no evidence of moisture) prior to sealing. Additional care shall be used to demonstrate sufficient cleaning and drying of transverse cracks.
4. The configurations and placement for crack sealing shall conform to the overband method described as follows:

Overband configuration: Material is placed into an uncut crack (no rout), and the material is spread over the crack with a squeegee or with the wand. The material centred over the crack is shaped with a squeegee or wand as thin as possible into a band of approximately 50 mm to 100 mm wide.

### **III. Crack sealing cut cracks (includes routing):**

1. Crack sealing cut cracks will include routing, cleaning and sealing of cracks (longitudinal, random and transverse cracks greater than 3 mm wide and less than 10 mm wide) during summer seasons. All cracks greater than 10 mm wide shall be sealed according to the Blow & Go method as described in Article II.
2. The bits used to rout the cracks must be kept sharp and replaced promptly when dull.

3. The configuration and placement for crack sealing a cut crack (rout) shall conform to the reservoir & overband method described as follows:
  - a) Reservoir & Overband configuration: Material is placed into the confines of a cut crack (rout). The material centered over the crack is shaped into a band of approximately 50 mm to 100 mm wide using a squeegee or wand. The standard dimension of the cut crack (rout) is 19 mm wide by 10 mm deep. During construction, always ensure the rout does not contain bottoms or V-shaped routs.
4. The cleaning of the rout shall conform to the following:
  - a) The cleaning operations shall consist of high compressed air free of oil for cleaning the cracks complete with the warming of the cracks and the removal of some moisture using a hot air lance (HAL). Please note that all compressors specified for crack sealing will have moisture trapped in the compressed air and will depend largely on the humidity. It is critical especially during the morning and during days when the humidity is relatively high that the HAL be used to warm the cracks and remove moisture to supplement the cleaning operations.
  - b) All cracks and particular transverse cracks shall be effectively cleaned and dried (exhibiting no evidence of moisture) prior to sealing. Additional care shall be used to demonstrate sufficient cleaning and drying of transverse cracks.
  - c) Care shall be carried out to remove as much debris as possible from the surface of the pavement so that dust or foreign materials is not blown back into the rout before it is sealed.
  - d) The routing operation shall be periodically checked for cleanliness using duct tape. Press one meter of the adhesive surface of the tape into the rout and pull it out. After proper cleaning, there should be very little, if any residue on the tape.
  - e) Asphalt concrete pavements showing signs of aging, raveling, oxidation and typically greater than five (5) years old is not recommended to be routed.

#### **IV. Materials:**

1. The materials necessary to complete the work are listed below:
  - a) Hot applied joint and crack sealant (Beram 3060 LM) used to seal cracks and option to use Beram 195 LM for steep grades.
  - b) Toilet paper, Glenzoid, Lime or Portland Cement used to cover sealed cracks.
  - c) Toilet paper shall not be used if the crack is located off the pavement markings.
2. The workers of the crack sealing crew shall become familiar with the Material Safety Data Sheet (MSDS) provided by the supplier. All material handled and stored shall be in accordance with the MSDS. Ensure all materials are stored and sheltered from rain and sun.
3. The joint sealant materials will consist of 25 lb (11.33 kg) pucks supplied in boxes. There are two pucks per box. For handling purposes, the box dimensions measure 20" x 10" x 8". Each box weighs 50 lbs (22.67 kg). The crack sealing crew shall ensure the material placed into the melter is free of any debris or foreign matter stuck to the material.

#### **V. Equipment:**

1. The routing equipment shall be sufficiently portable and flexible to accurately follow random cracks without undue spalling of the crack edge.
2. The router shall be guided so that the crack lies entirely within the routed channel. Vertical sides of the cut shall be perpendicular to the pavement surface. The bits used to route the cracks must be kept sharp and replaced promptly when dull.
3. Compressed air equipment shall be capable of delivering high velocity (300 m/s), clean, oil-free air that can effectively clean the crack.
4. The hot air lance is not a cleaning tool and shall be only used when the tip is 5 cm to 10 cm from the crack or rout necessary to warm and remove moisture.

5. The melting equipment will include a double jacketed melting boiler capable of providing indirect heating and constant agitation and equipped with a positive thermostatic temperature control in both the sealing compound and heat transfer oil. A calibrated thermometer capable of +/- 5°C from 100°C to 400°C will be located so that the workers may safely and frequently check and record the sealant temperature. All probes shall be calibrated each year.
6. A sealant applicator wand (heated) shall be used to deliver the sealant from the sealant chamber to the rout or crack. Temperature controls will be capable of maintaining the temperature of the sealant within manufacturer's tolerances.

#### **VI. Hot sealant preparation:**

1. The sealing compound shall be heated and melted in the melting kettle. The kettle should be charged by adding a few units of sealing compound at a time. When the compound has reached a fluid condition, additional material can be added until the kettle is full.
2. The compound shall be subjected to continuous and positive agitation during melting. The temperature used in melting the compound will be in accordance with the manufacturer's recommendations. Material which is heated in excess of the maximum specified temperature shall be properly discarded from the work.
3. When the pouring temperature has been reached, the compound shall be maintained at this temperature until it is placed in the crack, and in no cases shall the material be held at fluid temperatures for more than three (3) hours.

#### **VII. Hot sealant application:**

1. All cracks and joints shall be thoroughly dried and cleaned of all residual dust and debris with high compressed air followed by the heating of the crack or rout with the hot air lance.
2. The hot air lance must be kept moving at a pace that will avoid burning the surrounding pavement.
3. The pavement area to be treated shall be clean and dry with no signs of moisture present.
4. The sealing compound shall be applied by a mechanical pressure type applicator equipped with a satisfactory means of keeping the sealer heated. The crack sealant shall be placed within 2 minutes after heating of the crack with the hot compressed air lance.
5. Following the application of the crack sealant and before the area is open to traffic, all treated areas will be thoroughly checked as part of the quality control for areas exhibiting adhesion failure, damage to the sealant, missed cracks, foreign objects in the sealant or other problems. All areas not meeting the acceptable criteria shall be prepared and resealed until satisfactory.
6. The toilet paper, Glenzoi, lime cement or fine sand shall be applied after the sealant has cooled enough to form a film over its exposed surface.
7. Treated areas shall be protected from vehicle traffic for at least 30 minutes after the sealant has been poured or in accordance with the manufacturers' specifications, the stringent of the two.

#### **VIII. Quality Control:**

1. The workers of the crack sealing operations shall be responsible for the quality control of the work.
2. All workers shall become familiar with the daily maintenance and operational procedures for checking the equipment.
3. All workers shall wear personal protective equipment, in accordance with local regulations.
4. The workers shall follow all safety procedures for handling, transporting and disposal of materials and shall use and demonstrate just care during the execution of the work.