

FORM 350



GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Transportation and Works
Highway Design Division

SECTION 350 CRACK SEALING

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350.01 SCOPE

This specification covers the work of sealing pavement cracks with a crack sealant compound. The purpose of crack sealing is to prevent moisture from penetrating the roadway structure, to prevent the intrusion of incompressible material into the cracks and to prevent the spalling of material from the edges of the cracks.

This specification covers two methods of sealing pavement cracks. During the periods of spring and/or fall, a Blow & Go method involving no routing will be conducted. During the summer months, crack sealing work will include a combination of Blow & Go method and a Rout & Seal method whereby cracks are cut using a router and sealed.

350.02 MATERIALS

350.02.01 General

The crack sealing material shall be hot-poured, rubberized joint and crack sealing conforming to ASTM D6690 Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements or an approved equivalent.

The crack sealing material shall meet Type IV classification of the specification, capable of maintaining an effective seal in climates experiencing very cold temperatures. Crack sealing material having a lower resilience modulus may be acceptable if it can be shown that the product has been used successfully in

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similar climatic conditions. Final approval and acceptance of the crack sealing material will be at the Department's discretion.

Portland cement or agricultural lime will be required to sprinkle over sealed cracks to prevent tacking.

The use of any controlled products must be in accordance with the Workplace Hazardous Materials Information System (WHMIS). Workers should become familiar with Materials Safety Data Sheets for these products.

350.02.02 Samples

The Contractor shall be prepared to submit a 1 kilogram or a 1 liter sample of crack sealing material to the Department of Transportation and Works at least two weeks prior to commencing work.

During the process of placing, the Engineer may require the Contractor to take samples of the crack sealing material directly from the heating kettle.

350.03 EQUIPMENT

All equipment shall be safety approved.

350.01.01 Router

Routing equipment shall consist of mechanical routers capable of continually creating well-defined right angle routs. The routing equipment shall be sufficiently portable and flexible to accurately follow wandering cracks without tearing, chipping or spalling the crack edges. Equipment must produce a clean, neat square cut with vertical sidewalls.

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 router must be capable of cutting a groove as shown in FORM 1215 "Crack Sealing Detail". Open "V" shaped grooves are not permitted

Bits used to rout the cracks must be kept sharp and replaced promptly when dull.

350.03.02 Compressor

Compressed air equipment is required to effectively clean the cracks. The compressor, which may be attached to the hot air lance, shall provide a clean oil-free air jet of a minimum flow of 4m³/min, a minimum velocity of 990 m/s and a minimum pressure of 600 kPa.

350.03.03 Hot Air Lance

A hot air lance is required to dry and pre-heat cracks prior to applying crack sealing material. The hot air lance must be used at all times to warm the crack and remove moisture. It is acceptable to use the compressor and air lance simultaneously. Tiger torches are not permitted.

350.03.04 Heating Kettle

The heating kettle shall be a double-jacketed melting boiler capable of providing indirect heating and constant agitation of the crack sealing material. The kettle must be equipped with positive thermostatic temperature controls that will prevent overheating of the crack sealing material and heat transfer oil.

A calibrated thermometer capable of +/- 5°C from 100° to 400° C will be located so that the workers may safely and frequently check and record the crack seal material temperature.

A heated sealant applicator wand shall be attached to a heated hose and attached to a heated

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sealant chamber. Temperature controls will be capable of maintaining the temperature of the sealant within manufacturer's tolerances.

350.04 TRAFFIC CONTROL

The Contractor shall be responsible for the maintenance and directing of traffic during crack sealing in accordance with Division 7, Temporary Condition Signs and Devices of the Department's Specification Book.

Treated areas shall be protected from vehicle traffic for either thirty (30) minutes after the crack sealing material has been poured or in accordance with the manufacturer's specifications, whichever is longer.

Where traffic is to be maintained during crack sealing, the surface of the crack sealing material shall be dusted with Portland cement or agricultural lime prior to allowing traffic on the sealed areas.

Each vehicle used by the Contractor for the application of crack sealing material shall be equipped with a clearly visible rotating amber light.

350.05 PREPARATION OF UNCUT CRACKS (BLOW AND GO METHOD, NO ROUTING)

Crack sealing shall be limited to sealing uncut cracks (Blow & Go Method) during the periods of spring (April 01 to June 01) and fall (September 15 to November 30). Pavement surfaces and crack edges must be dry and the air temperature must be above 2°C.

Crack sealing will include cleaning and sealing open cracks greater than 3 mm wide and less than 25 mm wide during the spring and fall seasons.

The cleaning operation shall consist of high compressed air free of oil to rid cracks of debris and/or moisture. The hot air lance will be used to warm the cracks and to remove any remaining moisture. The operation of the compressed air and hot air lance may be conducted in combination or separately. All cracks shall be dry (exhibiting no evidence of moisture) prior to sealing.

The Contractor shall remove all dirt, dust and debris from the pavement and this shall be considered as incidental to the work.

350.06 PREPARATION OF CUT CRACKS (ROUT AND SEAL METHOD INCLUDES ROUTING)

During the summer season, all cracks greater than 3 mm wide and less than 10 mm wide will be routed and cleaned. All cracks greater than 10 mm wide and less than 25 mm wide shall be sealed according to the Blow & Go method. The standard dimension of the cut crack (rout) is 20 mm wide by 20 mm deep or as directed by the Engineer.

The cracks shall be routed taking care to follow the crack precisely. Avoid leaving small islands of pavement, which are or could be broken loose. Two or more cracks shall not be joined by routing through uncracked pavement or routed in areas where a crack does not exist.

Following routing, the pavement surface and the routed crack shall be cleaned with high compressed air free of oil to rid cracks of debris and/or moisture. Ensure that no debris or moisture enters the routed crack before sealing. All routed cracks shall be sealed within four (4) hours of routing.

The hot air lance will be used to warm the cracks and to remove any remaining moisture. All cracks shall be dry (exhibiting no evidence of moisture) prior to sealing.

The routing operation shall be periodically checked for cleanliness using duct tape by pressing one meter of the adhesive surface of the tape into the rout and inspecting it. After proper cleaning, there should be very little, if any residue on the tape.

The Contractor shall remove all dirt, dust and debris from the pavement. This shall be considered as incidental to the work.

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350.07 MELTING AND PREPARING HOT CRACK SEALING MATERIAL

The Contractor shall fully comply with the crack sealing material manufacturer's instructions for heating and preparing sealant for application using the specified equipment.

The crack sealing material shall be heated and melted in the melting kettle. The kettle should be charged by adding a few units of crack sealing material at a time. When the compound has reached a fluid condition, additional material can be added until the kettle is full.

The crack sealing material shall be subjected to continuous and positive agitation. The temperature used in the melting the compound will be in accordance with the manufacturer's recommendation. Overheated, burned or under heated material shall not be used. If applied, it shall be removed and replaced at the Contractor's expense, as directed by the Engineer.

When the pouring temperature has been reached, the crack sealing material shall be maintained at this temperature until it is placed in the crack. In no case, shall the material be held at fluid temperatures for more than three (3) hours.

The Contractor shall ensure that crack sealing material packaging or other foreign material does not get into the melting unit.

350.08 HOT SEALANT APPLICATION

All cracks 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. The compressor and hot air lance may be used in combination or separately.

The hot air lance should be used at all times and kept moving at a pace that will avoid burning the surrounding pavement. A qualified operator should be used to adjust the cleaning speed, flame size and the distance of the heat lance tip from the road.

All cracks shall be carefully inspected prior to sealing to ensure they are thoroughly dry, clean and free from dust and debris. Adjacent pavement surface must also be clean and dry. The sealant compound shall not be applied with evidence of any dampness on or within the pavement or in the pavement pores.

The crack sealing material shall not be applied when the ambient temperature is below 2°C or according to the sealant manufacturer's instructions.

No sealing shall proceed under unfavorable conditions having regard to the foregoing stipulations, until same have been rectified to the satisfaction of the Engineer.

The crack sealing material shall be applied by the heated sealant applicator wand. The crack sealing material shall be placed within two (2) minutes after heating of the crack with the hot compressed air lance. Care should be taken to avoid spillage of the material on the pavement. Should spillage occur, then the contractor shall clean it up at his own expense.

Pour pots shall not be allowed unless they are used to seal cracks or routs which were previously sealed by the heater kettle and only need a second application to be topped up.

The crack sealing material is placed into the prepared crack or rout, and the material is spread over the crack with a squeegee or with the wand. The crack sealing material centered over the crack or rout shall be shaped with a squeegee or wand as thin as possible into an overband approximately 50 mm wide.

Following the application of the crack sealing material and before the area is open to traffic, all treated areas will be thoroughly checked 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. To prevent tacking prior to curing, the Contractor shall sprinkle the sealant with Portland cement, neat cement or agricultural

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lime as traffic warrants.

350.09 WARRANTY

The Contractor shall guarantee that subject to normal wear and tear, all work performed under this contract will remain in acceptable condition for a period of twelve (12) months from the date of acceptance of all work by the Engineer.

An acceptable condition would be when 95% of the crack seal performs as required over the 12 month period. If the less than 95% of the crack sealant performs as required, the Contractor will have to repair all failed areas within the contract at the Contractor's expense. All material, haul, traffic control and related work shall be paid by the Contractor.

The Contractor shall, within 14 days after receiving written notice from the Engineer (or an agreed upon date), make good at his expense, in a manner satisfactory to the Engineer, any imperfections due to faulty materials or workmanship discovered in the work.

The Performance Bond will be held and retained by the Department until the twelve-month period has expired. This will be held to ensure that sufficient funds will be available to the Department in the event of non-performance of the crack sealing.

350.10 MEASUREMENT FOR PAYMENT

Measurement for payment for crack sealing will be by means of the required completed and accepted crack seal, measured in metres rounded to one decimal place. The crack sealing of cracks which the Engineer did not require to be treated, will not be included in measurement for payment.

350.12 BASIS OF PAYMENT

Payment at the contract price for crack sealing shall be compensation in full for all labour, materials and equipment-use to : supply samples of sealant to the Department, clean out and/or rout the cracks that the Engineer requires to be treated, clean the routed cracks, dry the cracks, supply and apply sealant to the required depth, clean up all sealant spillage on the pavement, supply and apply cement or lime to the treated cracks to prevent tacking, together with that portion of the cost of providing the required traffic control not covered by the provisions of Section 125 "Wages of Flagperson".

The Contractor is advised that Section 125 "Wages of Flagperson" shall apply.