



## **4220 – SPECIFICATION FOR SEAL COAT**

### **4220.1 DESCRIPTION**

4220.1.1 The work shall consist of constructing a wearing surface composed of asphalt and graded aggregate compacted on a prepared surface.

### **4220.2 MATERIALS**

4220.2.1 The Department will supply the asphalt. The type of asphalt will be HF-150s unless otherwise specified in the Special Provisions or the Schedule of Quantities.

4220.2.2 The Contractor shall produce the seal coat aggregate unless the aggregate is provided by the Department as indicated on the Plans or in the Special Provisions.

4220.2.2.1 When the Contractor produces the aggregate, it shall meet the requirements for Specification 4210 For Seal Coat Aggregate.

### **4220.3 CONSTRUCTION**

#### **4220.3.1 Equipment**

4220.3.1.1 The Contractor shall supply a self-powered pressure asphalt distributor in accordance with the following requirements:

4220.3.1.1.1 Equipped with a device that measures the truck speed in metres per minute and distance travelled in metres.

4220.3.1.1.2 The distributor is capable of maintaining a uniform speed.

4220.3.1.1.3 The capacity of the distributor shall not be less than 4 500 L.

4220.3.1.1.4 A heating system capable of applying even heat to the asphalt.

4220.3.1.1.5 A device capable of measuring the asphalt temperature in the tank.

4220.3.1.1.6 A positive displacement asphalt pump with separate power unit or hydrostatic drive.

4220.3.1.1.7 Equipped with a gauge that measures spray bar pressure.

4220.3.1.1.8 The spray bar is capable of being maintained at a constant height throughout the entire operation.

4220.3.1.1.9 An adjustable length spray bar on which the nozzles on any portion may be closed off.

4220.3.1.1.10 The spray bar has been provided with a positive shutoff to prevent leaking.

4220.3.1.1.11 Spray bar nozzles are of the same manufacture, type and size.

4220.3.1.1.12 Spray bar nozzles are in good working condition.

4220.3.1.1.13 A device capable of measuring spray nozzle angle.

4220.3.1.1.14 Nozzles have been set in the spray bar so that the nozzle slots make the same angle, 15 to 30 degrees, with the longitudinal axis of the spray bar.

4220.3.1.2 The Contractor shall supply a self-propelled aggregate spreader capable of spreading the aggregate at a uniform rate in one application over the full width of the applied asphalt. The spreader shall be equipped with the following:

4220.3.1.2.1 Controls for adjusting width and rate of spread and capable of closing off any portion of the spreader.

4220.3.1.2.2 A hook or clamp mechanism which enables the towing of the trucks.

4220.3.1.3 The use of truck mounted hydrodrum aggregate spreaders will not be allowed.

4220.3.1.4 The Contractor shall supply sufficient pneumatic-tired rollers to meet the production rate. The rollers shall meet the following requirements:

4220.3.1.4.1 They shall be fully ballasted.

4220.3.1.4.2 They shall be constructed so that wheels on either the front or back end oscillate either independently or in pairs.

4220.3.1.4.3 The tires shall be smooth-treaded and uniformly inflated to a minimum of 450 kPa when the tires are cold.

4220.3.1.5 Vibratory rollers having rubber-coated drums will be permitted providing they are operated in static mode only and in conjunction with pneumatic-tired rollers.

4220.3.1.6 Pull type rollers shall not be used except for the first seal coat placed on subgrades.

4220.3.1.7 Wobble type rollers shall not be used.

4220.3.1.8 The Contractor shall supply sufficient mechanically operated, rotary-type power brooms to meet the specified cleaning requirements. The brooms shall be equipped with the following:

4220.3.1.8.1 A broom wider than the width of the power unit when the broom is mounted in front of the power unit.

4220.3.1.8.2 A flashing or rotating amber light with not less than 55 W halogen bulbs and mounted not less than 2.5 m above the ground surface.

4220.3.1.8.3 Devices that enable the operator to control the action of the broom from the towing unit for a pull type power broom.

#### **4220.3.2 Inspection and Calibration of Distributor**

4220.3.2.1 Prior to commencing seasonal operations, all distributors shall be calibrated in accordance with STP 203-20 For Distributor Application Rate.

4220.3.2.1.1 The Contractor shall provide the Engineer with the approved calibration form. The Contractor shall verify that the distributor's settings and attachments including but not limited to pumps and spray bars are in accordance with the approved calibration.

4220.3.2.1.2 The Contractor shall recalibrate the distributor if deemed necessary by the Engineer.

#### **4220.3.3 Preparation of Aggregate**

4220.3.3.1 When aggregate is supplied by the Department no further processing will be required unless directed by the Engineer.

4220.3.3.2 The following shall apply during loading of aggregate:

4220.3.3.2.1 The Contractor shall minimize wastage of aggregate.

4220.3.3.2.2 The Contractor shall not contaminate the aggregate with organic or other deleterious materials.

4220.3.3.2.3 All vegetation shall be removed by the Contractor prior to loading the aggregate.

4220.3.3.3 When the Contractor is finished using a stockpile, it shall be reshaped to allow for proper drainage with no slopes steeper than 1.5:1.

**4220.3.4 Seal Coat Limitations**

4220.3.4.1 The Contractor shall adhere to the following time and length limitations:

**TABLE 4220.3.T1**

**TIME AND LENGTH LIMITATIONS**

<b>Description</b>	<b>Seal on Subgrade</b>	<b>Seal on Primed Base Course</b>	<b>Seal on Other Surfaces</b>
1 <sup>st</sup> Seal, Earliest Start Date	Not Specified	Not Specified	May 16
1 <sup>st</sup> Seal, Completed By	October 10	October 10	August 31
2 <sup>nd</sup> Seal, Earliest Start Date	June 15	June 15	n/a
2 <sup>nd</sup> Seal, Completed By	August 31	August 31	n/a
Minimum Cure Time of Cutback Asphalt Prime	Greater of: 4 days or actual cure time	Greater of: 4 days or actual cure time	n/a
Minimum Cure Time of Emulsified Asphalt Prime	Greater of: 1 day or actual cure time	Greater of: 1 day or actual cure time	n/a
Maximum Time a Primed Surface Shall Remain Unsealed	3 weeks	3 weeks	n/a
Minimum Time Between the 1 <sup>st</sup> & 2 <sup>nd</sup> Seal	10 days *	10 days *	n/a
Maximum Length of Unsealed Primed Surface Before October 1	5 km	7 km	n/a
Maximum Length of Unsealed Primed Surface After October 1	5 km	3 km	n/a
* The second seal coat shall be applied no sooner than 10 days after the application of the first seal coat provided the minimum atmospheric temperature remains above 4 °C. For each day the minimum atmospheric temperature is below 5 °C or rain occurs, an additional day shall be required prior to application of the second seal coat.			

4220.3.4.2 The Contractor shall adhere to the following weather limitations:

4220.3.4.2.1 Asphalt shall not be applied to a prepared surface when:

4220.3.4.2.1.1 The atmospheric temperature is less than 5 °C or,

4220.3.4.2.1.2 The surface temperature is less than 10 °C or,

4220.3.4.2.1.3 The atmospheric high temperature for the day is forecast to be less than 10 °C or,

4220.3.4.2.1.4 The atmospheric low temperature for the day is forecast to be less than 0 °C or,

4220.3.4.2.1.5 The surface temperature is 50 °C or greater or,

4220.3.4.2.1.6 The road surface is wet or,

4220.3.4.2.1.7 The weather is misty, rainy, or if rain is impending or,

4220.3.4.2.1.8 The relative humidity is greater than 85%.

4220.3.4.2.2 If the Seal Coat is applied when the surface temperature is greater than 40 °C the first cleaning shall be a minimum of 24 hours after the seal coat was applied.

4220.3.4.2.3 The first cleaning will not be allowed when the surface temperature is greater than 40 °C.

#### **4220.3.5 Preparation and Maintenance of Existing Surface**

4220.3.5.1 When the Contractor is responsible for the surface on which the seal coat is to be applied, the Contractor shall ensure the following are completed prior to sealing:

4220.3.5.1.1 Ravelled base courses, potholes and other failures are repaired and primed.

4220.3.5.1.2 The surface is swept clean of dust, loose aggregate, mud and excess moisture.

4220.3.5.2 When the Contractor is not responsible for the surface on which the seal coat is to be applied, the Contractor shall ensure the following is completed prior to sealing:

4220.3.5.2.1 The surface is swept clean of dust, loose aggregate, mud and excess moisture.

4220.3.5.3 When a second seal coat is specified, the Contractor shall be responsible for maintenance of the first seal coat.

#### **4220.3.6 Application of Asphalt**

4220.3.6.1 The asphalt shall be applied only after a written authorization has been received from the Engineer. The authorization is valid for only 24 hours.

4220.3.6.2 The application rate of the asphalt will be as directed by the Engineer and will generally be in the range of 1.5 to 1.8 L/m<sup>2</sup>.

4220.3.6.3 The asphalt shall meet the temperature requirements listed in the following table and shall also be maintained within ± 10 °C of the temperature of the asphalt at the time the distributor was calibrated:

**TABLE 4220.3.T2**

**TEMPERATURE RANGE OF ASPHALT**

Type of Asphalt	Temperature, Degrees Celsius	
	Minimum	Maximum
HF100P	50	80
HF150P	50	80
HF100S	50	80
HF150S	50	80
HF250S	50	80
HF350S	50	80
RC & MC 250	65	100
RC & MC 800	80	120

4220.3.6.4 The asphalt application shall be started on a strip of building paper each time the distributor starts spraying unless the Contractor can demonstrate to the Engineer that an acceptable joint can be obtained without building paper. The paper shall be removed and disposed of following the asphalt application.

4220.3.6.5 The spray pattern shall provide a minimum double lap coverage.

4220.3.6.6 The Contractor shall remove any splattered asphalt from structures, wheel guards, curbs, guardrail, and other roadway appurtenances.

4220.3.6.7 Asphalt shall not be spilled, sprayed, or tracked on completed sections of seal coat.

**4220.3.7 Delivering Aggregate to the Road**

4220.3.7.1 Hauling seal coat aggregate shall be carried out in accordance with Specification 2405 For Haul On The Basis Of The Kilometre.

4220.3.7.2 Vehicles used to haul aggregate shall be equipped with clean metal boxes.

4220.3.7.3 Trucks shall not travel on the seal coat until rolling is completed.

4220.3.7.4 Trucks shall refrain from sharp turning movements and sudden stops and starts on the fresh seal coat.

**4220.3.8 Application of Aggregate**

4220.3.8.1 The amount of surface moisture on the aggregate shall be subject to the approval of the Engineer before application.

4220.3.8.2 Immediately after the asphalt is applied, aggregate shall be spread uniformly over the entire sprayed surface.

4220.3.8.2.1 The aggregate application rate will be as directed by the Engineer and will generally be in the range of 16 to 22 kg/m<sup>2</sup>.

4220.3.8.2.2 The asphalt shall be covered with aggregate within 10 minutes of the application of the asphalt when there is a disruption in the operation.

4220.3.8.3 No aggregate shall be spilled from the back end of the spreader. If this occurs, the sealing operation shall cease until the problem is rectified.

4220.3.8.4 The speed of the aggregate spreader shall be such that a uniform wave of asphalt is maintained and shall be commensurate with the asphalt and aggregate application rate to aid in providing a uniform seal coat. Once the rate of application has been established the aggregate spreader shall be maintained at a constant speed.

4220.3.8.5 Communications shall be available between the Contractor's distributor operator and the Contractor's Field Supervisor on site, so that adjustments can be made without stopping the sealing operation.

#### **4220.3.9 Rolling**

4220.3.9.1 Immediately after the aggregate has been spread it shall be rolled. Rolling shall be continuous with the entire fresh seal coat being rolled until a thoroughly compacted surface is obtained. A minimum of 5 rolling passes are required.

4220.3.9.2 The roller speed shall not exceed 8 km/h.

4220.3.9.3 The line of rolling shall not be suddenly changed or the direction of rolling suddenly reversed.

4220.3.9.4 If the road surface is subject to a sudden rain during the seal coat operation, the Contractor shall perform extra rolling to preserve the seal.

#### **4220.3.10 Longitudinal Seams**

4220.3.10.1 Longitudinal seams from successive seal coats shall have a minimum separation of 0.3 m.

4220.3.10.2 Longitudinal seams on the final seal coat will only be permitted on the edge of any Lane.

4220.3.10.3 The longitudinal edge of a previously constructed seal coat shall be swept prior to construction of the adjacent seal coat. All loose aggregate shall be removed to at least 150 mm from the proposed longitudinal seam with a minimum dislodgement of embedded aggregate.

4220.3.10.4 Asphalt for the adjacent seal coat shall be applied such that a minimum of half the spray fan from the end nozzle overlaps the longitudinal seam. No excessive overlap will be allowed.

#### **4220.3.11 Cleaning and Sweeping**

4220.3.11.1 Cleaning is defined as removal of all loose aggregate by sweeping.

4220.3.11.2 The maximum length of seal coat that has not received its first cleaning shall not at any time exceed 8 km.

4220.3.11.3 The seal coat shall be cleaned a total of 3 times as follows:

4220.3.11.3.1 The first cleaning shall be a light sweeping and shall not commence until the seal has set. The set time shall be a minimum of 6 hours after the seal coat is applied subject to weather limitations. Initial sweeping shall not dislodge aggregate that was embedded into the seal coat.

4220.3.11.3.2 The second cleaning shall commence 16 to 24 hours after the first cleaning is completed.

4220.3.11.3.3 The third cleaning shall commence 36 to 72 hours after the second cleaning is completed.

4220.3.11.4 All excess aggregate shall be swept completely off the Roadway.

4220.3.11.5 The Contractor may be required to use water for dust abatement during the sweeping process when directed by the Engineer. The work shall be in accordance with Specification 2500 For Watering with the following exceptions:

4220.3.11.5.1 The Contractor shall furnish the source of water.

4220.3.11.5.2 The repair, maintenance and construction of haul roads for water sources shall be in accordance with General Provision 1300.7.1.4.

4220.3.11.5.3 Water used for dust abatement during the sweeping process will be paid for at the rate specified in the Special Provisions. Payment will be based on the square metres of seal coat to which the water is applied.

#### **4220.3.12 Traffic Control**

4220.3.12.1 The Contractor shall not allow equipment on uncovered surfaces of fresh asphalt.

4220.3.12.2 The Contractor shall not allow traffic on the seal coat until rolling is completed.

4220.3.12.3 All equipment shall use approaches to turn around.

4220.3.12.4 The Contractor shall supply and operate pilot vehicles in accordance with the following:

4220.3.12.4.1 Both directions of traffic shall be piloted until the first cleaning is completed excepting the period between dusk and dawn.

4220.3.12.4.2 Any individual vehicle shall not be required to wait any longer than 15 minutes.

4220.3.12.4.3 All piloting on uncleaned seal coat shall be conducted at speeds not exceeding 40 km/h.

#### **4220.3.13 Acceptance**

4220.3.13.1 The seal coat will be considered acceptable after the final cleaning if there is no streaking or ravelling, the finished surface has a uniform and even texture, there are no surface defects, the seams are straight, the ride is smooth, there are no bleeding areas and loose aggregate is not evident.

4220.3.13.1.1 Work that does not meet these requirements shall be repaired or reconstructed to the satisfaction of the Engineer at no direct expense to the Department.

#### **4220.4 MEASUREMENT**

4220.4.1 Applying Seal Coat Aggregate In Place On The Road will be measured in square metres.

#### **4220.5 PAYMENT**

4220.5.1 Payment for Applying Seal Coat Aggregate In Place On The Road will be at the contract unit price per square metre and will include compensation for all work except those for which specific provision for payment is made in this section.

4220.5.2 When the Department supplies the aggregate, payment for the following will be on an Extra Work basis.

4220.5.2.1 Handling more than an average of 5 oversize rocks per load of aggregate.

4220.5.2.2 Moistening or drying aggregate.