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**3.21 DOUBLE SEAL COAT****3.21.1 GENERAL**

Double Seal Coat shall consist of a wearing course composed of two applications of processed aggregate held in place by an asphalt binder, spread and rolled on a prepared surface to the lines and dimensions shown on the plans or as designated by the Consultant.

**3.21.2 MATERIALS****3.21.2.1 Aggregate**

The Contractor shall produce crushed aggregate in accordance with Specification 3.2, Aggregate Production and Stockpiling for the designation and class of material specified. The Contractor shall supply aggregate materials in accordance with Specification 5.2, Supply of Aggregate and haul aggregate in accordance with Specification 4.5, Hauling.

**3.21.2.2 Asphalt**

The Contractor shall supply a high float type emulsion binder in accordance with Specification 5.7, Supply of Asphalt.

**3.21.2.3 Line Painting Materials**

The Contractor shall supply all required line painting materials in accordance with Specification 5.20, Supply of Line Painting Materials.

**3.21.3 TESTING****3.21.3.1 Quality Control Testing**

Quality control and quality control testing are the responsibility of the Contractor throughout every stage of the Work from the crushing and production of aggregates to the final accepted product. The Contractor shall provide and pay for equipment and qualified personnel to perform all field testing necessary to determine and monitor the characteristics of the materials produced and incorporated into the Work, and the final product produced.

**3.21.3.2 Testing by the Consultant**

The Consultant may from time to time take samples, and carry out testing and inspection of materials incorporated or being incorporated into the Work. Tests performed by the Consultant will not be considered to be quality control tests. The Contractor shall cooperate with the Consultant for such sampling, testing and inspection. Such testing and inspection shall not relieve the Contractor from any obligation to perform all the Work strictly in accordance with the requirements of the Contract.

The Contractor shall provide, at his own expense, stands, sampling devices and other facilities as the Consultant may require to safely obtain representative samples of the item being produced.

3.21.4 EQUIPMENT

The following equipment shall be used:

- (i) A self-powered pressure asphalt distributor meeting the requirements as listed in Specification 3.19, Prime, Tack and Fog Coats.
- (ii) A self-propelled aggregate spreader capable of spreading the aggregate uniformly at the applicable rate in one application over the full width of the asphalt applied. The spreader shall be capable of controlling and adjusting the width and rate of spread. The spreader shall be equipped with the necessary devices to enable it to be attached securely to the aggregate haul truck while in the process of dumping the aggregates into the spreader.
- (iii) Self-propelled pneumatic tire rollers. Wobble wheel type rollers shall not be used. Vibratory rollers having rubber coated drums will be permitted providing they are operated in the static mode only. The rollers shall be capable of reversing direction without causing backlash or damage to the Seal Coat.
- (iv) A sufficient number of power sweepers to adequately broom loose aggregate from all sections of seal coated roadway. All power sweepers shall be equipped with a minimum of one yellow rotating warning light.
- (v) The Contractor shall supply pilot vehicles for convoying traffic. The pilot vehicles shall have sufficient accompanying personnel to provide convoy services on a 24 hour a day availability. The standard number of pilot vehicles to be provided shall be two for two lane highways or as specified in the special provisions. Additional vehicles may be required as determined by the Consultant at the time of construction. All pilot vehicles shall be equipped as follows:
  - A two way radio for communication.
  - An overhead revolving beacon with an amber lens a minimum of 180 mm high and 180 mm wide. The beacon shall be mounted on the top of the vehicle fully visible to traffic approaching from both the front and rear.
  - A sequential arrowboard meeting the requirements as shown in Specification 1.2 General.
  - The arrowboard shall be controlled from a console located in the vehicle cab.
  - The arrowboard display shall be visible to traffic approaching the rear of the trucks.
  - Additional pilot vehicles beyond the standard number specified, may be exempt from including a sequential arrowboard with the approval of the Consultant.

The Contractor shall cease seal coat application if any equipment integral to either the compaction, sweeping or traffic accommodation operations is not available or is not in good working order, as determined by the Consultant.

3.21.5 CONSTRUCTION3.21.5.1 **General**

Double Seal Coat construction shall be performed prior to September 15 and during daylight hours only.

The method of application of the Double Seal Coat including application rates for the asphalt binder and the processed aggregate shall be determined by the Contractor.

The Contractor shall also determine the amount of compaction required based on consideration of compaction equipment, atmospheric conditions and acceptance requirements.

Double Seal Coat shall be constructed in two courses in accordance with the following sections of this specification. A minimum of 48 hours shall be allowed for curing of the first course before application of the second course.

#### **3.21.5.2 Surface Preparations**

Before the asphalt binder is applied, the surface to be treated shall be swept clean of all dirt, sand, dust or objectionable matter by means of a power sweeper. If base courses become ravelled, the loose material shall be compacted before brooming and a prime coat applied. Prime coat shall be repaired at no direct expense to the Department. Dried mud or other foreign matter which cannot be removed with the power sweeper shall be removed by hand, blade, or other methods.

Application of prime coats shall be in accordance with Specification 3.19, Prime, Tack and Fog Coats.

#### **3.21.5.3 Application of Asphalt Binder**

For all courses, asphalt binder shall not be applied until the surface has been cleaned as required and the section approved by the Consultant.

The asphalt binder shall be applied with a pressure distributor in a single uniform continuous spread over the section to be treated.

Skipped areas shall be corrected by hand spray. The application of asphalt binder shall not precede the application of seal coat aggregate by more than 30 metres. Asphalt binder shall not be spilled, sprayed or tracked on completed sections of seal coat.

#### **3.21.5.4 Application of Aggregate**

The application of asphalt binder shall be followed immediately with the applicable course of aggregate, of the designation and class shown on the plans. It shall be uniformly spread by means of an approved mechanical spreader.

#### **3.21.5.5 Rolling**

Immediately after spreading of each course, the aggregate shall be rolled. One total compaction coverage by the rollers shall be completed within one quarter hour after the aggregate has been spread and rolling shall continue until a smooth, thoroughly compacted surface has been obtained.

#### **3.21.5.6 Initial Brooming**

Between the time period of 4 hours and 6 hours after rolling of each course has been completed or after the initial set of the asphalt, the surface shall be broomed to remove any remaining loose aggregate.

**3.21.5.7 Repair of Improperly Covered Areas**

Any areas of either course that have not been properly covered after brooming, shall be treated using hand methods if necessary.

**3.21.5.8 Final Brooming**

The Contractor shall continue to broom the surface to remove any loose aggregate when required, and as often as required, during a two week period following the final application or as directed by the Consultant.

All highway-to-highway junctions and all junctions of paved highways with municipal roads shall be swept clear of loose aggregate.

The Contractor shall use a pickup broom for all brooming in urban and other areas where loose aggregate cannot be swept onto sideslopes or onto ditches.

**3.21.5.9 Traffic Accommodation and Signing**

The Contractor shall erect and maintain temporary construction signs in accordance with the Traffic Accommodation in Work Zones manual.

A Traffic Accommodation Strategy as outlined in Specification 7.1, Temporary Construction Signing will be required for all phases of construction including line painting activities. The signing strategy shall be developed based upon the requirements of the Traffic Accommodation in Work Zones manual.

**3.21.5.9.1 Traffic Convoy**

Traffic shall be accommodated through the work. The Contractor shall, at his own expense, provide flagmen, pilot vehicles and/or illuminated arrow boards as required.

Traffic and construction equipment including aggregate haul trucks shall not travel over uncovered surfaces of fresh asphalt binder. Traffic shall not use the sections of seal coat until after rolling is complete. Traffic convoy, at speeds not exceeding 50 km per hour, shall commence at the start of seal coat application and shall continue up to six hours after all rolling has been completed as directed by the Consultant.

**3.21.5.10 Interim Lane Markings**

The Contractor shall provide interim painted lane markings on all newly constructed surfaces once sufficient brooming has been complete, or on tacked surfaces that are to be exposed to traffic overnight. All paint spots shall be 100 mm wide and 300 mm long, shall be applied lengthwise to the road surface, shall be spaced 15 m apart on centre in tangent sections and 7.5 m apart on curves, shall employ the same paint colour as the permanent marking and shall be completely covered with glass beads at the time of painting.

**3.21.5.11 Protection of Highway Appurtenances**

The Contractor shall ensure that all highway appurtenances including wheel guards, guardrail, signs and delineators as well as bridge structures and appurtenances are protected from asphalt and/or aggregate contamination.

In addition to being responsible for the cleanup of any contaminated areas, the Contractor is advised that many bridge components and materials are affected by cleanup and any costs for repair of damaged structures will be charged to the Contractor.

### **3.21.6      PAINTED ROADWAY LINES AND PAVEMENT MESSAGES**

The Contractor shall paint all roadway lines and pavement messages for the areas receiving Seal Coat in accordance with Specifications 7.2, Painted Roadway Lines and 7.3, Painted Pavement Messages.

All painted roadway lines and painted pavement messages applied to the final Seal Coat surface shall be applied twice at the full application rate for each application. The second application shall be completed after the Contractor's final brooming. On two lane highways the second application will be from the opposite direction of the initial application.

In all cases, the roadway shall not be posted at gazetted highway speeds until all work including line painting has been completed. The maximum length of roadway posted at less than gazetted highway speeds shall not exceed 30 km.

### **3.21.7      REQUIREMENTS FOR ACCEPTANCE**

Requirements for the acceptance of the completed Double Seal Coat include the following:

- (i) Materials shall meet all specified requirements;
- (ii) A minimum of 99% chip coverage shall be obtained with no single bare area greater than 0.01 m<sup>2</sup> in any one square metre;
- (iii) There shall be no streaking or ravelling;
- (iv) The finished surface shall have a uniform, even texture;
- (v) No over-rich or bleeding areas shall be evident;
- (vi) No loose aggregate shall be evident; and
- (vii) All new lane markings as required, have been applied in accordance with Specifications 7.2, Painted Roadway Lines.

Work that does not meet the foregoing requirements shall be repaired or reconstructed to the satisfaction of the Consultant.

### **3.21.8      COMPLETION OF LINE PAINTING**

The Contractor shall complete the painting of roadway lines within five days of completing the placing of the double seal on each individual roadway. Failure to meet this requirement will result in a penalty of \$900.00 per day for each calendar day delay in completing the painting. The Department may extend the time allowed to complete the painting up to a maximum of ten days providing:

- (i) The Contractor submits a written request to the Consultant accompanied by a detailed proposed line

painting schedule.

- (ii) The reason for the request, stated in the request, is one of the following:
- (a) The double seal coat requires additional curing time and subsequent brooming work prior to painting the traffic markings, or
  - (b) The work site is not available to the Contractor through no fault of the Contractor, or
  - (c) The Consultant suspends the Work and standby payments are due in accordance with Specification 1.2, General, or
  - (d) There is a delay resulting from an order of a court, or from strikes or lock-outs, or
  - (e) The traffic markings cannot be painted for reasons of inclement weather, or conditions resulting from inclement weather.

### 3.21.9 MEASUREMENT AND PAYMENT

The Double Chip Seal Coat will be measured in square metres and payment will be made at the unit price bid per square metre for "Application of Seal Coat", for each course applied. This payment will be full compensation for preparing the existing surface; supplying paint and painting interim lane markings; supplying and applying the asphalt binder; supplying, processing, hauling, placing and rolling the aggregate; brooming; quality control; traffic accommodation and traffic convoy services using the standard number of pilot vehicles as specified.

Payment for additional pilot vehicles, as approved by the Consultant, shall be paid as Extra Work in accordance with Specification 1.2, General.

No separate payment will be made for any additional equipment, tools or labour employed to satisfy special brooming requirements.

No payment will be made for any costs incurred to rectify defective work.

#### 3.21.9.1 **Line and Pavement Message Painting**

Payment for supplying paint and painting roadway lines, intersections, interchanges and messages will be made in accordance with the applicable sections of Specifications 7.2, Painted Roadway Lines and 7.3, Painted Pavement Messages. This payment will be made separately for each application of painted roadway lines and/or painted pavement messages.

#### 3.21.9.2 **Supply of Aggregate**

Contrary to Specification 5.2, Supply of Aggregate, no separate payment will be made for supplying aggregate for the seal coat. However, if the Contractor supplies aggregate from a Crown source on undeeded land, operated primarily under lease or licence and for which the Department does not have a reservation, the Department will deduct \$ 0.48 per tonne from the total payments made under the Contract. The tonnage will be determined by multiplying the total square metres for each course applied, by a conversion factor of 20 kilograms per square metre.