

SPECIFICATIONS FOR BITUMINOUS SEAL COATING OF BRIDGES1056. 1. DESCRIPTION

The work will consist of the supply of labour, plant, tools, equipment and materials required for supplying and placing of bituminous seal coat on bridge decks and approach slabs.

1056. 3. MATERIALS TO BE SUPPLIED BY THE CONTRACTOR

(a) Liquid Asphalt MC-3.

(b) Aggregate.

The bituminous seal coat cover aggregate shall consist of sound durable particles of gravel, crushed stone and sand and the aggregate shall meet the following grading requirements.

Passing 9.5 mm sieve	100%
Passing 4.75 mm sieve	10 - 30%
Passing 2.00 mm sieve	0 - 10%
Passing 75 um sieve	0 - 3%

Not less than 40% by mass of the particles retained on the 4.75 mm sieve shall have at least one fractured face.

When subjected to the Los Angeles Rattler Test A.S.T.M. Designation C131 (latest edition), the aggregate shall not show a loss exceeding 35% by mass. In addition, no 15% by mass portion of the prepared test sample, composed of particles selected by hand, shall show a loss exceeding 50% by mass. The entire sample of the aggregate shall not contain more than 5% by mass of shale.

The aggregate shall be free from clay, iron oxide, organic matter, or other deleterious substances.

1056. 4. TESTING

The Contractor shall notify the Engineer as to the source of supply of the materials to be used in the work covered by these Specifications, and samples of the materials shall be supplied by the Contractor to the Department's Testing Laboratory, for approval of their quality and nature, at least 10 d prior to their use in the work. Every sample shall contain not less than 25 kg, and the Contractor shall assume all costs incurred in obtaining and transporting the samples. Preliminary approval of the quality and nature of the material in the samples will not constitute general acceptance of all the materials in the deposit or source of supply. Material of a quality or nature not suitable for its intended use will be rejected. No payment will be made for rejected material.

Prior to the production of aggregates, the source of supply shall be cleared, grubbed and stripped of overburden to an extent and in a manner satisfactory to the Engineer.

1056. 5. EQUIPMENT

The Contractor shall supply tools, machinery and equipment required in the execution of all phases of the work. The equipment shall be maintained in first class working condition and shall be operated by skilled and experienced operators. The equipment as to its type and size will be subject to the approval of the Engineer.

1056. 5. EQUIPMENT (Cont'd)

## 5.1 Distributor

The distributor used in applying the liquid bituminous tack coat shall be so constructed and equipped as to meet the following requirements:

- (a) It shall be capable of applying bituminous material on the deck and approach slabs in accurately measured quantities.
- (b) It shall be equipped with:
  - (i) A heating unit capable of maintaining the asphalt in the tank at the specified temperature.
  - (ii) A thermometer so placed as to accurately measure the temperature of the material in the tank.
  - (iii) A tachometer operated by an independent wheel, or a similar suitable device, which will allow the operator to determine the correct travel speed for applying the specified quantity of asphaltic material.
  - (iv) A pressure gauge to indicate to the operator that the required nozzle pressure is being maintained.
  - (v) Spray nozzles, with quick acting positive shutoff, of a design which will ensure a uniform fan-shaped spray.
  - (vi) A strainer on the discharge line to prevent clogging.
  - (vii) A spray bar of adjustable length that can be raised or lowered.
  - (viii) A spray bar having a heating device, asphalt circulation system, or other device which will provide a uniform viscosity of material in all portions of the spray bar.
  - (ix) A hose and nozzle attachment to be used for spraying, by hand, areas inaccessible to the distributor spray bar.
- (c) On smaller bridge decks, the use of manual spraying equipment suitable for applying the liquid bituminous material uniformly at the desired rate will be allowed.

## 5.2 Mechanical Cover Aggregate Spreader

The mechanical cover aggregate spreader shall be so constructed that the cover aggregate will be uniformly distributed by positive feed at the rate specified. The edges of the application of the bituminous material shall be sharply defined by the spreader. The width of the spread shall be adjustable for a lane width of 2.4 m to 3.7 m.

## 5.3 Broom Drag

The broom drag shall be so constructed that the cover aggregate shall be uniformly distributed over the surface. The mass of the drag shall be such that the cover aggregate keyed into the bituminous material will not be disturbed.

1056. 5. EQUIPMENT (Cont'd)H

## 5.4 Rollers

The rolling equipment shall consist of not less than one self-propelled steel wheeled roller weighing not less than 9.0 t, and one self-propelled pneumatic tired roller weighing not less than 5.5 tonne per 1 metre of overall rolling width. "Wobbly wheeled" rollers will not be permitted. At no time shall the maximum mass of any roller be such as to cause excessive crushing of the aggregate particles.

1056. 7. CONSTRUCTION METHODS

## 7.1 Surface Preparation

Immediately prior to the application of the emulsified asphalt, the Contractor shall clean the existing surface to be treated, of dirt, dust and powdery and weak surface concrete. The concrete surface shall then be acid etched using a 10% to 15% muriatic acid solution. This solution shall be prepared by blending 1 part of commercial 30% muriatic acid with 2 parts of water. The quantity used for etching shall be 680 mL/m<sup>2</sup>. The acid shall be applied using a polyethylene plastic sprinkling can or spray bar and the solution shall be scrubbed into the surface with a stiff-bristled broom. Fresh acid must contact all concrete surfaces. The acid shall be allowed to stand at least 5 min or until it stops bubbling. The concrete surface shall then be flushed thoroughly with water using not less than 11.0 L/m<sup>2</sup>. The concrete surfaces shall be rinsed two more times with water. The acid etching operation may have to be repeated if deemed necessary by the Engineer. All free water shall be removed from the concrete surfaces prior to the application of the seal coat.

## 7.2 Application of Bituminous Material

The quantity of bituminous material to be uniformly applied shall not exceed 1.35 L/m<sup>2</sup>. The actual rate will be set by the Engineer in the field. The temperature of the material shall be as directed by the Engineer, within the limits of 38°C and 70°C.

The progress of the application of the bituminous material shall be as permitted by the Engineer and shall be governed by the progress of the application of the cover aggregate. The bituminous material shall be applied during daylight hours only, when the air temperature is 15°C or higher. It shall not be applied when, in the opinion of the Engineer, the weather or deck conditions are unsuitable.

Longitudinal laps shall be one-half the width of the spray from the end nozzle. In order to prevent lapping at transverse joints, the spray bar shall be promptly shut off and, if necessary to prevent dripping, a drip pan shall be inserted under the nozzles when the spray begins to thin. Before continuing the application, building paper shall be spread over the treated surface for a sufficient distance back so that the nozzles are operating at full force when the uncovered surface is reached. Hand spraying from a distributor hose attachment shall be used to cover bare areas.

1056. 7. CONSTRUCTION METHODS (Cont'd)

## 7.3 Application of Cover Aggregate

The cover aggregate shall be applied by means of the mechanical spreader and shall follow the application of the bituminous material by a period of time as directed by the Engineer. The length of the interval will be governed by the weather conditions and the type of bituminous material used. The spreading of aggregate which, in the opinion of the Engineer, contains excessive moisture will not be permitted. The cover aggregate shall be uniformly distributed at a rate of not more than 22 kg/m and in such a manner that the bituminous material will be covered before any wheels of the spreader travel over it. The actual rate will be determined by the Engineer in the field. Uneven distribution of cover aggregate shall be corrected by hand brooming, with care being taken not to disturb the bituminous material.

## 7.4 Rolling and Brooming

After the aggregate spreading operations, the surface shall be rolled sufficiently to embed the aggregate into the bituminous material. The initial rolling with the steel wheeled roller shall commence as soon as possible but not later than 10 min after the aggregate spreading, and the final rolling with the pneumatic tired roller shall commence not more than 45 min after the aggregate spreading. The time and extent of the rolling shall be as directed by the Engineer in order to ensure the satisfactory embedment of the aggregate. The speed of the rollers may be limited by the Engineer. The drag broom may be used simultaneously with the rolling, if permitted by the Engineer. At any time, the Engineer may direct additional aggregate to be spread and rolled to ensure uniformity of the completed surface.

## 7.5 Provision for Traffic

The Contractor shall not permit traffic or equipment to travel over the uncovered bituminous application, nor shall traffic be allowed to travel faster than 25 km/h over sections where the cover aggregate has been applied until a 24 h period has elapsed from the time of the cover aggregate application. The Contractor shall be responsible for traffic control and shall supply and maintain the necessary barricades, signs, flares, watchmen and flagmen, and also make such other provisions for traffic as may be outlined in the Special Provisions.

1056. 9. METHOD OF MEASUREMENT

Bituminous seal coating will be measured on an area basis. The area to be paid for will be the total number of square metres computed from the plan dimensions.

1056. 11. BASIS OF PAYMENT

Bituminous seal coating will be paid for at the contract Unit Price per square metre for "Bituminous Seal Coating", measured as specified herein, which price will be payment in full for performing all operations herein described and all other items incidental to the work included in these Specifications.