

SECTION 02644**BITUMINOUS SURFACE TREATMENT****02644.01 GENERAL****A. Description**

Bituminous surface treatment shall include, but not necessarily be limited to, the application of one or more seal coats or the application of a prime coat followed by the application of one or more seal coats in accordance with the Contract Documents.

The prime coat, when required, shall consist of preparing and treating an existing surface with bituminous material.

A seal coat shall consist of an application of bituminous material followed by an application of cover coat aggregate.

B. Related Sections

Bituminous concrete pavement; Section 02641.

The materials in this section may be accepted based on the manufacturer's certification.

C. Quality Assurance**1. Manufacturer's Certification**

The manufacturer's certification shall contain the following information:

- a. Date, time, tank or blending system, and identification of the hauling unit.
- b. Type, grade, temperature, and quantity of material being loaded.
- c. Complete certified analysis.
- d. Lot number, if applicable.

2. Hauler's Certification

The hauler's certification shall include the following information:

- a. Identification of the hauling unit and owner.
- b. Type, grade, source, and date of the last previous delivery made using this hauling tank.

- c. The volume of residual material remaining in the tank at the time of loading.

D. Submittals

Submittals for bituminous surface treatment materials shall be as specified in Section 02641.01, Article D.

02644.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any materials for bituminous surface treatment.

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements

1. Aggregate

Aggregate for cover coat shall meet the applicable requirements of Section 02641.02, except that the grading shall be in accordance with AASHTO M 43. The gradation of the aggregate will be tested in accordance with AASHTO T 27 omitting AASHTO T 11. Samples of aggregate taken at the point of production and immediately before shipment shall have a maximum of 1.0 percent passing the No. 200 sieve when tested in accordance with AASHTO T 11. Samples taken at any point after shipment shall not have more than 1.5 percent passing the No. 200 sieve. Gradation shall be as follows:

<u>Sieve Sizes</u> <u>U.S. Standard</u>	<u>Mass Percent Passing</u> <u>AASHTO M 43</u>	
	<u>No. 7</u>	<u>No. 8</u>
3/4inch	100	-
1/2inch	90-100	100
3/8inch	40-70	85-100
No.4	0-15	10-30
No.8	0-5	0-10
No.16	-	0-5

Uncrushed gravel may be used on shoulders.

2. Bituminous Materials

- a. Asphalt Cements

Asphalt cements shall meet the requirements of AASHTO M 226, Grade AC-20, Table 2, except the requirements for percent loss on heating is deleted. If the use of a heat stable anti-stripping additive is required, it shall be added at the bituminous plant.

b. Tars

Tars shall meet the requirements of AASHTO M 52.

c. Cutback Asphalts

Cutback asphalts shall meet the requirements of AASHTO M 81 or M 82 except that the penetration on residue at 77°F shall be 50 to 120 for M 81 and 90 to 250 for M 82.

d. Emulsified Asphalts

Emulsified asphalts shall meet the requirements of AASHTO M 140 or M 208. An additional grade referred to as AE-BM may be specified. This material shall meet the requirements of AASHTO M 140, Grade SS-1, except the viscosity at 77°F shall be between 50 and 400 seconds. The cement-mixing test will be waived. An additional requirement allowing not more than 3.0% oil distillate by volume of emulsion will apply to all emulsified asphalt grades. The sieve test requirements for field samples will be a maximum of 0.4%.

e. Crackfiller

This material shall be a mixture of asphalt and mineral flour of such fineness that no appreciable separation will occur while being maintained in a liquid condition. The mixture shall meet the following requirements when evaluated by test methods noted in AASHTO M 115:

Penetration at 25°C, 100 g, 5 sec.	5.5 - 7.5 mm
Ductility at 25°C, mm, min	300
Insoluble in trichloroethylene, %	15 - 26
Evaporation loss, % weight, 50 g, 5 hr, 163°C, max.	2

02644.03 EXECUTION

A. Traffic Control

The Engineer will, whenever traffic conditions make it possible, permit existing and new roads to be closed to traffic during the application of the prime and/or seal coats. Traffic shall be detoured as described in Sections 01410 through 01470.

At locations where traffic, including construction equipment, is allowed to use a surface which is to be treated, the application shall be made to one-half the width of the roadway surface; and the remaining portion of the roadway shall be kept free of obstructions and open to traffic. The Contractor shall provide for the passage of traffic through the work area; and when directed by the Engineer, traffic shall be routed under one-way control. The erection of suitable barricades and posting of watchpersons and flaggers for the maintenance of traffic shall be as stipulated in the Contract Documents.

B. Weather Conditions

This work shall not be scheduled if the surface or air temperature in the shade and away from artificial heat is below 50°F. Construction shall not be started during rain, the threat of rain, fog, or if the surface to be treated is wet.

C. Utility Castings

Utility casting shall be protected as specified in Section 02641.03, Article B.

D. Tar or Asphaltic Materials

Tar or asphaltic materials may be used within the ranges set forth elsewhere in these Specifications. The grade, temperature, and rate of application of these materials as well as the rate of application of any aggregate for cover coat will be established by the Engineer.

E. Equipment

Pressure distributing equipment shall be capable of uniformly applying the specified bituminous material on variable widths of surface at rates of 0.1 to 1.0 gallons per square yard and with variations from any specified rate not to exceed 0.02 gallons per square yard. In addition, this equipment shall include the following features:

1. a fifth wheel tachometer for maintaining uniform speed (Ordinary speedometers will not be acceptable.)
2. a thermometer graduated to 2°F having sufficient range to determine the actual temperature of the material to be used
3. heaters for uniformly heating the materials to the proper temperatures
4. full circulation spray bars that are laterally and vertically adjustable and provide for a hand spray
5. a calibrated tank to check the quantity of asphalt in each load and the amount used
6. a sampling device built into the tank itself or into a recirculating or discharge line in a way to allow a sample to be drawn during circulation or discharge (It shall

have an inside diameter not less than 1/2 inch nor greater than 1 inch. It must be provided with a gate type valve or petcock.)

7. a motor driven pump with pressure gages to deliver the bituminous material to the spray bars (When a variable speed pump and metering system is used, the Contractor shall have available charts prepared by the manufacturer for selecting the proper pump speed for each application rate.)

All equipment will be inspected and calibrated by the County before use. All equipment which has been approved shall bear a County identification tag. A calibration chart showing the total capacity, in gallons, of the tank, and the fractional capacity for each 1/4-inch shall be carried in the unit.

F. Spreaders

The specified sizes and application rates of aggregates shall be applied from approved spreaders. These spreaders may be the mechanical type or the vane type attached to a truck tailgate.

G. Surface Maintenance

Rotary brooms or other approved equipment will be required for removing all loose and foreign materials from the surface to be treated.

H. Rollers

Steel wheel power rollers weighing not less than 6 tons nor more than 8 tons and/or smooth-tread pneumatic tired rollers, having a total compacting width of not less than 60 inches and a minimum contact pressure of 40 psi, shall be used to force the aggregate firmly into the bituminous material. Tires shall be uniformly inflated at the operating pressure specified by the engineer, so the difference between the pressure in any two tires shall never be greater than 5 psi. The Contractor shall provide means of checking the tire pressure on the job at any time. In addition, the Contractor shall have available a copy of the tire manufacturer's compaction specifications for each size and type of tire used.

I. Prime Coat

When specified, the surface to be primed shall be shaped to the required grade and section. It shall be free from ruts, corrugations or other irregularities and shall be uniformly compacted.

Immediately before application of the bituminous material, the base shall be swept for its full width and then sprayed with the specified type of material at the rate of 0.1 to 0.5 gallon per square yard at the following spraying temperatures:

<u>Bituminous Material</u>		<u>Spraying Temperature Range</u>
<u>Type</u>	<u>Grade</u>	<u>°F</u>
MC	30	75-100
MC	70	105-175
RT	2	60-125

The bituminous prime coat shall be allowed to thoroughly penetrate the base and cure for at least 24 hours before receiving any additional applications. Any pools of excess bitumen remaining on the surface at this time shall be removed. To prevent overlap of material when additional applications are made, building paper shall be spread over the end of a previous application; and spraying of the second application shall be started on the building paper.

J. First Seal Coat

When included in the Contract Documents, but not sooner than 24 hours after application of the prime coat, a seal coat of bituminous material with cover coat aggregate may be applied. Bituminous material of the type specified shall be sprayed at the rate of 0.3 to 0.5 gallon per square yard at the following spraying temperatures:

<u>Bituminous Material</u>		<u>Spraying Temperature Range</u>
<u>Type</u>	<u>Grade</u>	<u>°F</u>
CRS	1	70-140
CRS	2	140-160
RS	1	70-140
RS	2	140-160

K. Aggregate for Cover Coat

Immediately following the application of bituminous material, a cover coat aggregate that is dry, dust free, and meeting the requirements of AASHTO M 43, No. 7, shall be uniformly spread by approved spreaders at the rate of 25 to 50 pounds per square yard. The dry and dust free condition of the aggregate will be determined by the Engineer. Excess aggregate shall be carefully removed, and all areas containing insufficient aggregate shall be corrected by dragging equipment.

L. Rolling Sequence

Rolling shall begin immediately after distribution of the cover coat aggregate. Unless otherwise directed, rollers shall begin at the outer edge of the treatment and proceed in a longitudinal direction, working toward the center of the road or the high side in superelevated sections. Each pass shall overlap the previous pass approximately one-half the width of the front wheels. Rolling shall be continued until the aggregate is firmly embedded into the bitumen. Rolling shall be discontinued if cover aggregate begins to crush.

M. Second Seal Coat

When specified, but not sooner than 24 hours after the application of the first seal coat, a second seal coat shall be constructed. The previously cured seal coat shall receive an application of bituminous material of the same type and grade used in constructing the first seal coat. The approved bituminous material shall be sprayed at a rate of 0.2 to 0.4 gallons per square yard and at the applicable temperature recommended in Article I above. Immediately following this application, dry, dust free cover coat aggregate meeting the requirements of AASHTO M 43, No. 8, shall be uniformly spread by approved spreaders at the rate of 20 to 35 pounds per square yard. The dry, dust free condition of the aggregate will be determined by the Engineer. Excess aggregate shall be carefully removed, and all areas containing insufficient aggregate shall be corrected by dragging equipment. Rolling shall be accomplished as described in Article K.

N. Traffic

Completed sections shall not be opened to traffic until the final seal coat has completely cured. The Contractor shall maintain the treated surface after it has been opened to traffic until final acceptance. No additional compensation will be allowed for this work.

02644.04 METHOD OF MEASUREMENT**A. Bituminous Material**

Measurement for the quantity of bituminous material used for this item will be the actual number of gallons of bituminous material distributed, corrected to the corresponding volume at 60°F as determined by use of conversion tables furnished by the County.

B. Aggregate

The quantity of cover coat aggregate will be determined by the shipping weights of the material used in the accepted work.

02644.05 BASIS OF PAYMENT**A. General**

Payment will be made at the unit prices bid. The prices bid shall include furnishing all labor, tools, equipment, and materials necessary to satisfactorily complete the work as shown and specified in strict accordance with the Contract Documents, and accepted by the Engineer.

B. Bituminous Material

Payment for bituminous material will be made at the price bid per gallon of bituminous material.

C. Aggregate

Payment for aggregate will be made at the price bid per ton or accepted cover coat aggregate. No payment will be made for aggregate in excess of the computed maximum tonnage.

END OF SECTION