

## 405 BITUMINOUS SURFACE TREATMENT

### 405.01 DESCRIPTION

The work shall consist of Bituminous Surface Treatment of stabilized soil, macadam, or other designated surfaces or bases including the furnishing of the materials and their application. Work also includes furnishing and placing all materials required for Asphalt Surface Treatment of the roadway shoulders.

### 405.02 MATERIALS

Materials used for Bituminous Surface Treatment shall conform to the requirements of [401.02](#) except as modified herein:

- (1) Asphalt, for cold surface treatment – AASHTO M 208, Grade CRS-2, or AASHTO M 140, Grade RS-2, or as specified.
- (2) Asphalt, for cold weather construction – AASHTO M 81, Grade RC-250.
- (3) Asphalt, for hot weather construction – AASHTO M 208, Grade CRS-2.
- (4) Aggregate, for bituminous surface treatment – [803.09](#).
- (5) Aggregate, for shoulder treatment – shall be light colored crushed stone to provide delineation under conditions of poor visibility between the traveled roadway and treated shoulder area. The Contractor shall submit to the Chief Engineer a 10 pound sample of aggregate from at least 3 different sources so that proper color selection may be made.

### 405.03 CONSTRUCTION REQUIREMENTS

- (A) **SURFACE PREPARATION.** The surface of the roadway to be treated shall be swept thoroughly clean of dust or other extraneous materials by a mechanical sweeper immediately in advance of the application of the bituminous material. Leavings of the mechanical sweeper shall be removed by hand brooming. In any closely-built section, hand brooming only shall be done if so directed by the Chief Engineer.

Following the brooming and cleaning, which shall be done to the satisfaction of the Chief Engineer, signs, barricades, flags and other warning devices furnished at the Contractor's expense shall be stationed in such quantities and position as directed by the Chief Engineer. All manhole covers, water box frames and covers and utility openings shall be covered with sand or paper to prevent the application of bituminous material thereon. The sand or paper shall be removed and disposed of as soon as the aggregate has been applied. On streets where there is curb and gutter, the gutter edges directly abutting the surface to be treated shall be built up with a dike of sand or earth to prevent spotting of concrete curb or gutter with the bituminous material.

### (B) APPLICATION OF BITUMINOUS MATERIALS

- (1) **WEATHER LIMITATION.** The ambient temperature shall be 50°F or above, and the weather not foggy or rainy. Temperature and seasonal requirements may be adjusted only when so directed by the Chief Engineer in writing.

- (2) **BITUMEN TEMPERATURE.** The temperature of cold bituminous materials at the time of application shall be between 125°F and 175°F. The temperature of hot bituminous materials at the time of application shall be between 275°F and 325°F.
- (3) **METHODS.** Bituminous material for surface treatment shall be applied only when the condition of the surface is satisfactory to the Chief Engineer.

Ninety percent of the application shall be accomplished by means of a pressure distributor meeting the requirements of [904.03](#), but when so directed by the Chief Engineer, a hand hose shall be used.

The amount and rate of application will vary due to surface texture, roughness or cracking of the old surface and shall be set for each individual street by the Engineer. This rate will be from 1/4 to 1/2 gallon per square yard for any single application.

At all starting places, the nozzles shall be going full force when starting the treatment on the pavement and upon the completion of any application of bitumen from the distributor, care shall be exercised to prevent nozzles from dripping on the adjacent pavement.

In cases where an entire load of bitumen will not be applied in a continuous run, short runs will be made as directed by the Engineer.

Ruts, thin spots, or bare streaks occurring from faulty operations or other causes shall be remedied before the cover material is spread.

Bituminous material shall not be applied to any stretch of roadway when aggregate and rolling equipment is not immediately available. Bituminous application shall be suspended sufficiently early in the day to permit covering and rolling of all treatment portions before the close of the work period of that day.

- (C) **SPREADING AND COMPACTING AGGREGATES.** Aggregates shall be free of surface moisture when spread. They shall be spread in a uniform layer by means of a mechanical spreader, unless otherwise permitted by the Engineer, at the rates directed for the respective roadways and immediately following the application of the bituminous material and before the same shall have become set.

A hand spreading crew shall immediately follow the mechanical spreader to remove excess material and touch up bare spots prior to rolling.

The rates of application of aggregates will vary as directed by the Chief Engineer from 15 to 30 pounds per square yard.

No traffic, except at intersections, shall be permitted upon the freshly covered roadway prior to a thorough rolling. The rolling shall be accomplished with 3 wheel rollers, weighing not less than 8 or more than 10 tons and conforming to the requirements of [904.05](#). The Contractor shall be required to have 2 rollers upon the job at all times and rolling shall be continued to the satisfaction of the Engineer.

- (D) **ASPHALT SHOULDER TREATMENT.** The asphalt surface treatment for shoulders shall consist of a single application each of asphalt binder and aggregate, and then rolling, all in accordance with requirements of [401.11](#).

The application rate for shoulder treatment shall be approximately as follows:

Aggregate	Distribution Rate	Gallons of Binder
Grading	Lbs. per Sq. Yd.	per Sq. Yd.
No. 8	20	0.2 – 0.3

If asphalt material is shipped to the job in a tank truck, the Contractor shall furnish the Chief Engineer a certified chart showing dimensions and volume at 60°F per inch depth for each tank until the final measurement has been taken by the Engineer.

All asphalt shoulder treatment aggregate that is shipped to the job shall have a ticket marked with the weight, truck number, and railroad car number, if applicable.

**405.04 CLEANING UP**

In addition to the requirements of [401.16](#), cleaning up shall include the following:

Aggregate swept off the surface by traffic shall be thrown or swept back after completion of rolling until all excess bituminous material has been absorbed. Any aggregate remaining free on the roadway or adjacent thereto after completion shall be removed at the Contractor’s expense as directed by the Engineer. The aggregate so removed shall be dumped in a designated stockpile.

**405.05 MEASUREMENT**

**(A) BITUMINOUS MATERIAL FOR BITUMINOUS SURFACE TREATMENT.** The unit of measure for Bituminous Material for Bituminous Surface Treatment will be the gallon. In determining the quantities of bituminous material for payment, the original volume (gallons) shown on the shipper’s car invoice corrected to 60°F shall govern when the material is shipped in a railroad tank car. When the material is shipped in a tank truck, the Contractor shall furnish the Chief Engineer a certified chart showing the dimensions and volume at 60°F per inch depth for each tank until the final measurement has been taken by the Engineer. The measurements shall be taken when the bituminous material is of a uniform temperature and free from air bubbles. The quantity shall be corrected to 60°F, as specified in the current “ASTM-IP Petroleum Measurement Tables”, ASTM Designation D 1250, or ASTM Designation D 633, “Volume Correction Table for Tar and Coal Tar Pitch”.

The quantity of bituminous material in gallons may be determined by securing the net weight of the material used and converting the weight into gallons at 60°F. If this method is used, an individual ticket showing the weight and volume (gallons) shall be furnished for each load of bituminous material.

**(B) AGGREGATES FOR BITUMINOUS SURFACE TREATMENT.** The unit of measure for Aggregate for Bituminous Surface Treatment will be the ton. Railroad weights for tonnage of aggregate may be accepted or the Contractor may be required to reweigh this material on a platform scale as each load leaves the unloading point. Each individual truck load of material shall have a ticket marked with the weight, truck number and railroad car number.

**(C) ASPHALT SHOULDER TREATMENT.** The unit of measure for Asphalt Shoulder Treatment will be the square yard, complete in place.

**405.06 PAYMENT**

- (A) **BITUMINOUS MATERIAL FOR BITUMINOUS SURFACE TREATMENT.** The number of gallons of Bituminous material, as measured in [405.05\(A\)](#), will be paid for at the contract unit price per gallon, which payment will include all preparatory work such as sweeping and cleaning the surface, maintenance of barricades, furnishing, hauling, and placing the material, and all labor, materials, tools, equipment and incidentals necessary to complete the work as specified herein.
- (B) **AGGREGATES FOR BITUMINOUS SURFACE TREATMENT.** The number of tons of Aggregates, as measured in [405.05\(B\)](#), will be paid for at the contract unit price per ton, which payment will include all preparatory work, maintenance of barricades, furnishing, hauling, and placing the material and all labor, materials, tools, equipment and incidentals necessary to complete the work as specified herein.
- (C) **ASPHALT SHOULDER TREATMENT.** Payment for Asphalt Shoulder Treatment will be made at the contract unit price per square yard, which payment will include furnishing, hauling, and placing all materials and for furnishing all labor, materials, tools, equipment and incidentals needed to complete specified work.