

# BITUMINOUS TREATMENTS, SURFACE COURSES, AND CONCRETE PAVEMENT

## SECTION 300 PRIME AND TACK COATS

### **300-1 Description.**

Apply bituminous prime coats on previously prepared bases, and apply bituminous tack coats on previously prepared bases and on existing pavement surfaces.

### **300-2 Materials.**

**300-2.1 Prime Coat:** For prime coat, use a product listed on the Department's Approved Product List (APL), meeting the requirements of 916-3, or other types and grades of bituminous material if specified in the Contract Documents.

Where prime coats are to be diluted, certify the dilution was done in accordance with the specific dilution requirements for each product and for each load of material used.

The Contractor may select any approved prime coat unless the Contract Documents indicate the use of a specific material. The Engineer may allow types and grades of bituminous material other than those specified above if the Contractor can show the alternate material will properly perform the function of prime coat material.

**300-2.2 Cover Material for Prime Coat:** Uniformly cover the primed base by a light application of cover material. However, if using EPR-1 prime material, the Engineer may waive the cover material requirement if the primed base is not exposed to general traffic and construction traffic does not mar the prime coat so as to expose the base. The Contractor may use either sand or screenings for the cover material. For the sand, meet the requirements as specified in 902-2 or 902-6, and for the screenings, meet the requirements as specified in 902-5. If the primed base course will be exposed to general traffic, apply a cover material coated with 2 to 4% asphalt cement. Apply the asphalt coated material at approximately 10 pounds per square yard. Roll the entire surface of asphalt coated prime material with a traffic roller as required to produce a reasonably dense mat.

**300-2.3 Tack Coat:** Unless the Contract Documents call for a specific type or grade of tack coat, use PG 52-28 meeting the requirements of 916-2, heated to a temperature from 250 to 300°F or use an undiluted emulsion listed on the APL, meeting the requirements of 916-3. Heat the emulsion to the temperature recommended by the tack coat manufacturer.

For night paving, use PG 52-28 tack coat. The Engineer may approve an emulsified tack coat for night paving if the Contractor demonstrates, at the time of use, the emulsion will break and not affect the progress of the paving operation.

### **300-3 Equipment.**

**300-3.1 Pressure Distributor:** Provide a pressure distributor equipped with pneumatic tires having a sufficient width of rubber in contact with the road surface to avoid breaking the bond or forming a rut in the surface. Ensure the distance between the centers of openings of the outside nozzles of the spray bar is equal to the width of the application required, plus or minus two inches. Ensure the outside nozzle at each end of the spray bar has an area of opening not less than 25% or more than 75% in excess of the other nozzles. Ensure all other nozzles have uniform

openings. When the application covers less than the full width, the Contractor may allow the normal opening of the end nozzle at the junction line to remain the same as the interior nozzles.

**300-3.2 Sampling Device:** Equip all pressure distributors and transport tanks with an approved spigot-type sampling device.

**300-3.3 Temperature Sensing Device:** Equip all pressure distributors and transport tanks with an approved dial type thermometer.

Use a thermometer with a temperature range from 50 to 500°F, no greater than 25°F increments, and a minimum dial diameter of two inches.

Locate the thermometer near the midpoint of the tank's length and within the middle third of the tank's height, or as specified by the manufacturer (if in a safe and easily accessible location). Enclose the thermometer in a well with a protective window or by other means as necessary to keep the instrument clean and in the proper working condition.

#### **300-4 Contractor's Quality Control.**

Provide the necessary quality control of the prime and tack coats and application in accordance with the Contract requirements. If the application rate varies by more than 0.01 gallon per square yard from the rate set by the Engineer or varies beyond the range established in 300-7 or 300-8, immediately make all corrections necessary to bring the spread rate into the acceptable range. The Engineer may take additional measurements at any time. The Engineer will randomly check the Contractor's measurement to verify the spread rate.

#### **300-5 Cleaning Base and Protection of Adjacent Work.**

Before applying any bituminous material, remove all loose material, dust, sand, dirt, caked clay, and other foreign material which might prevent proper bond with the existing surface for the full width of the application. Take particular care in cleaning the outer edges of the strip to be treated, to ensure the prime or tack coat will adhere.

When applying prime or tack coat adjacent to curb and gutter, valley gutter, or any other concrete surfaces, cover such concrete surfaces, except where they are to be covered with a bituminous wearing course, with heavy paper or otherwise protect them as approved by the Engineer, while applying prime or tack coat. Remove any bituminous material deposited on such concrete surfaces.

#### **300-6 Weather Limitations.**

Do not apply prime and tack coats when the air temperature in the shade and away from artificial heat is less than 40°F at the location where the application is to be made or when weather conditions or the surface conditions are otherwise unfavorable.

#### **300-7 Application of Prime Coat.**

**300-7.1 General:** Clean the surface to be primed and ensure the moisture content of the base does not exceed the optimum moisture. Heat the prime coat material to the temperature recommended by the prime coat manufacturer. Apply the material with a pressure distributor. Determine the application amount based on the character of the surface. Use an amount sufficient to coat the surface thoroughly and uniformly with no excess.

**300-7.2 Application Rate:** Use an application rate as defined in Table 300-1. Control the application rate within the minimum and plus 0.01 gallon per square yard of the minimum application rate. The minimum application rate may be adjusted by the Engineer to meet specific

field conditions. Determine and record the application rate a minimum of twice per day, once at the beginning of each day's production and, as needed, to control the operation.

Table 300-1 Prime Coat - Minimum Application Rates	
Base Type	Minimum Application Rate (gal/yd <sup>2</sup> )
Limerock, Limerock Stabilized, Shell-Rock, Recycled Concrete Aggregate and Local Rock Bases	0.10
Sand-Clay, Cemented Coquina, Shell, and Shell Stabilized Bases	0.15

**300-7.3 Sprinkling:** If required by the Engineer, lightly sprinkle the base with water and roll it with a traffic roller in advance of the prime coat application.

**300-7.4 Partial Width of Application:** If traffic conditions warrant, the Engineer may require the application be made on only one-half the width of the base at one time, in which case, use positive means to secure the correct amount of bituminous material at the joint.

### 300-8 Application of Tack Coat.

**300-8.1 General:** Where the Engineer requires a tack coat prior to laying a bituminous surface, apply the tack coat as specified herein below.

**300-8.2 Where Required:** Place a tack coat on all asphalt layers prior to constructing the next course. In general, the Engineer will not require a tack coat on primed bases except in areas that have become excessively dirty and cannot be cleaned, or in areas where the prime has cured to the extent all bonding effect has been lost.

**300-8.3 Method of Application:** Apply the tack coat with a pressure distributor except on small jobs, if approved by the Engineer, apply it by other mechanical devices or by hand methods. Heat the bituminous material to a suitable temperature as designated by the Engineer, and apply it in a thin, uniform layer.

**300-8.4 Application Rate:** Use an application rate defined in Table 300-2. Control the application rate within plus or minus 0.01 gallon per square yard of the target application rate. The target application rate may be adjusted by the Engineer to meet specific field conditions. Determine and record the application rate a minimum of twice per day, once at the beginning of each day's production and again, as needed, to control the operation. When using PG 52-28, multiply the target application rate by 0.6.

Table 300-2 Tack Coat Application Rates		
Asphalt Mixture Type	Underlying Pavement Surface	Target Tack Rate (gal/yd <sup>2</sup> )
Base Course, Structural Course, Dense Graded Friction Course	Newly Constructed Asphalt Layers	0.04 minimum
	Milled Surface or Oxidized and Cracked Pavement	0.07
	Concrete Pavement	0.09
Open Graded Friction Course	Newly Constructed Asphalt Layers	0.06
	Milled Surface	0.08

**300-8.5 Curing and Time of Application:** Apply tack coat sufficiently in advance of placing bituminous mix to permit drying, but do not apply tack coat so far in advance that it might lose its adhesiveness as a result of being covered with dust or other foreign material.

**300-8.6 Protection:** Keep the tack coat surface free from traffic until the subsequent layer of bituminous hot mix has been laid.

### **300-9 Method of Measurement.**

**300-9.1 General:** The quantity specified will be the volume, in gallons, of bituminous material actually applied and accepted. This spread rate will be determined from measurements made by the Contractor and verified by the Engineer based on tank calibrations, as specified in 300-9.2. Where it is specified prime coat or tack coat material is to be diluted with water, the amount specified for the spread rate will be the volume after dilution.

**300-9.2 Calibration of Tanks:** Ensure all distributors used for applying tack or prime coats are calibrated prior to use by a reliable and recognized firm engaged in calibrating tanks. Submit a certification of calibration and the calibration chart to the Engineer prior to use. In lieu of a volumetrically calibrated distributor, use a distributor equipped with a calibrated meter approved by the Engineer.

**300-9.3 Temperature Correction:** Measure the volume and increase or decrease the volume actually measured to a corrected volume at a temperature of 60°F.

Make the correction for temperature by applying the applicable conversion factor (K), as shown below.

For petroleum oils having a specific gravity (60°F/60°F) above 0.966,  $K = 0.00035$  per degree.

For petroleum oils having a specific gravity (60°F/60°F) of between 0.850 and 0.966,  $K = 0.00040$  per degree.

For emulsified asphalt,  $K = 0.00025$  per degree.

When volume-correction tables based on the above conversion factors are not available, use the following formula in computing the corrections for volumetric change:

$$V = \frac{V^1}{K(T - 60) + 1}$$

Where:

V= Volume of bituminous material at 60°F (pay volume).

V1= Volume of bituminous material as measured.

K= Correction factor (Coefficient of Expansion).

T= Temperature (in °F), of bituminous material when measured.

### **300-10 Basis of Payment.**

There is no direct payment for the work specified in this Section, it is incidental to, and is to be included in the other items of related work.