SECTION 300
PRIME AND TACK COATS FOR BASE COURSES

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 Cut-back Asphalt Grade RC-70 or RC-250 meeting the requirements of 916-3; Emulsified Asphalt Grades SS-1 or CSS-1, SS-1H, or CSS-1H diluted in equal proportion with water; Emulsified Asphalt Grade AE-60, AE-90, AE-150, or AE-200 diluted at the ratio of six parts emulsified asphalt to four parts water; Special MS-Emulsion diluted at the ratio of six parts emulsified asphalt to four parts water; Asphalt Emulsion Prime (AEP), Emulsion Prime (RS Type), or EPR-1 Prime meeting the requirements of 916-4, or other types and grades of bituminous material which may be specified in the Contract Documents.

Where the above materials for use as a prime coat are to be diluted, certify that the dilution was done in accordance with this Section for each load of material used.

The Contractor may select any of the specified bituminous materials 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 that 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 exposing the primed base course to general traffic, apply a cover material that has been coated with 2 to 4% asphalt cement. Apply the asphalt coated material at approximately 10 lb/yd^2 [5.5 kg/m^2]. 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 undiluted Emulsified Asphalt Grades RS-1 or RS-2 meeting the requirements of 916-4. Heat RS-1 or RS-2 to a temperature of 140 to 180ºF [60 to 82ºC]. The Contractor may use RS-1 modified to include up to 3% naphtha to improve handling of the material during the winter months.

For night paving, use AC-5 tack coat meeting the requirements of 916-1 heated to a temperature of 250 to 300ºF [120 to 150ºC].

The Engineer may approve RS-1 or RS-2 for night paving if the Contractor demonstrates, at the time of use, that the emulsion will break to allow paving in a timely manner.

300-3 Equipment.

300-3.1 Pressure Distributor: Provide a pressure distributor that is 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 that the distance between the centers of openings of the outside nozzles of the spray bar is equal to the width of the application required, within an allowable variation of 2 inches [50 mm]. Ensure that 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 that 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 those of 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 500ºF [10 to 260ºC] with maximum 25ºF [10ºC] increments with a minimum dial diameter of 2 inches [50 mm].

Locate the thermometer near the midpoint in length and within the middle third of the height of the tank, 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 Cleaning Base and Protection of Adjacent Work.

Before applying any bituminous material, remove all loose material, dust, 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 that the prime or tack coat will adhere.

When applying the 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 the prime or tack coat. Remove any bituminous material deposited on such concrete surfaces.

300-5 Weather Limitations.

Do not apply prime and tack coats when the air temperature in the shade and away from artificial heat is less than 40ºF [5ºC] at the location where the application is to be made or when weather conditions or the surface conditions are otherwise unfavorable.

300-6 Application of Prime Coat.

300-6.1 General: Clean the surface to be primed and ensure that the moisture content of the base does not exceed 90% of the optimum moisture. Ensure that the temperature of the prime material is between 100 and 150ºF [40 and 65ºC]. The Engineer will designate the actual temperature to ensure uniform distribution. 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.

300-6.2 Rate of Application:

300-6.2.1 Limerock, Limerock Stabilized, and Local Rock Bases: For these bases, use a rate of application that is not less than 0.10 gal/yd^2 [0.50 L/m^2], unless a lower rate is directed by the Engineer.

300-6.2.2 Sand-Clay, Shell and Shell Stabilized Bases: For these bases, use a rate of application that is not less than 0.15 gal/yd^2 [0.7 L/m^2], unless a lower rate is directed by the Engineer.

300-6.3 Sprinkling: If so required by the Engineer, lightly sprinkle the base with water and roll it with a traffic roller in advance of the application of the prime coat.

300-6.4 Partial Width of Application: If traffic conditions warrant, the Engineer may require that the application be made on only 1/2 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.

300-7 Application of Tack Coat.

300-7.1 General: Where the Engineer requires a tack coat prior to laying a bituminous surface, apply the tack coat as specified herein below.

300-7.2 Where Required: 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 that it has lost all bonding effect. Generally, the Engineer will require a tack coat on hot bituminous base courses before placing the surface course.

300-7.3 Method of Application: Apply the tack coat with a pressure distributor except that 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.

300-7.4 Rate of Application: Use a rate of application between 0.02 and 0.08 gal/yd^2 [0.09 and 0.36 L/m^2]. For tack coat applied on concrete pavement which is to be surfaced, use a rate of application that exceeds the upper limit when directed by the Engineer. For open-graded friction course, set the target rate of application at 0.045 gal/yd^2 [0.20 L/m^2].

300-7.5 Curing and Time of Application: The Engineer will designate the curing period for the tack coat. Apply the tack coat sufficiently in advance of the laying of the bituminous mix to permit drying, but do not apply the tack coat so far in advance that it might lose its adhesiveness as a result of being covered with dust or other foreign material.

300-7.6 Protection: Keep the tack coat surface free from traffic until the subsequent layer of bituminous hot mix has been laid.

300-8 Method of Measurement.

300-8.1 General: The quantity to be paid for will be the volume, in gallons [liters], of bituminous material actually applied and accepted. This quantity will be determined from measurements made by the Engineer based on tank calibrations, as specified in 300-8.2. Where it is specified that prime coat material or tack coat material is to be diluted with water, the quantity to be paid for will be the volume after dilution.

300-8.2 Calibration of Tanks: Ensure that all distributors used for applying tack or prime coats are calibrated prior to use by the Engineer or by a reliable and recognized firm engaged in calibrating tanks. The Engineer will review and approve of all calibrations.

300-8.3 Temperature Correction: The Engineer will measure the volume and increase or decrease the volume actually measured to a corrected volume at a temperature of 60ºF [15ºC].

The Engineer will make the correction for temperature by applying the applicable conversion factor (K), as shown below.

For petroleum oils having a specific gravity (60ºF/60ºF) [(15ºC/15ºC)] above 0.966, K = 0.00035 [0.00063] per degree.

For petroleum oils having a specific gravity (60ºF/60ºF) [(15ºC/15ºC)] of between 0.850 and 0.966, K = 0.00040 [0.00072] per degree.

For emulsified asphalt, K = 0.00025 [0.00045] per degree.

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

$$V = \frac{V^1}{K\,(T - 60)[(T15)] + 1}$$

Where:

V= Volume of the bituminous material at 60ºF [15ºC](pay volume).

V^1= Volume of bituminous material as measured.

K= Correction factor (Coefficient of Expansion).

T= Temperature (in ºF [ºC]), of the bituminous material when measured.

300-9 Basis of Payment.

Price and payment will be full compensation for all the work specified in this Section, including heating, hauling, and applying.

Prime and tack materials for Optional Base and Turnout Construction will be paid for under 285-9 and 286-6, respectively.

No separate payment will be made for prime coat cover material (including hot-asphalt coated cover material and the bituminous material therein), but the Contractor shall include the costs for furnishing and applying such material in the Contract unit price for Bituminous Material (Prime Coat).

Payment will be made under:

Item No.	300- 1-	Bituminous Material - per gallon.
Item No.	2300- 1-	Bituminous Material - per liter.