

## SECTION 455 ASPHALTIC MATERIALS

### 455.1 Description

- (1) This section describes asphaltic materials including asphaltic binders, cements, cut-back asphalts, emulsified asphalts, and similar products. This section also describes applying tack coat.

### 455.2 Materials

#### 455.2.1 General

- (1) Furnish asphaltic material conforming to the department's "Combined State Binder Group Certification Method of Acceptance for Asphalt Binders". Do not change the grade of PG materials.

#### 455.2.2 Sampling

##### 455.2.2.1 PG Asphalts

- (1) Sample according to the department's "Combined State Binder Group Certification Method of Acceptance for Asphalt Binders".

##### 455.2.2.2 MC, SC, and Emulsified Asphalts

- (1) Sample asphaltic material at the job site either before or during unloading. Obtain the engineer's approval of sampling methods and have the engineer observe the sampling. If sampling outside established job working hours, arrange for a department representative to be present.
- (2) Obtain a sample from each railroad tank car or tanker truck of material. If sampling from smaller hauling units or from storage tanks, obtain at least one sample for each 10,000 gallons.
- (3) Obtain representative samples according to AASHTO T40 except as follows:
  - If bleeding through a drain-cock in the transfer line, allow at least 5 minutes between samples.
  - If sampling from a valve installed in the side or end of the delivery vehicle tank, the valve must be between the quarter points of the tank's vertical diameter. Draw off and discard enough material to clear the intake line of material from previous loads before sampling.
- (4) Use only clean, dry sample containers free from cleaning oil or other contamination. Do not contaminate samples. Tightly seal, mark for identification, and submit to the engineer immediately after filling. The department's laboratory will test the material.

### 455.2.3 Testing

#### 455.2.3.1 PG Asphalts

- (1) Test according to the department's "Combined State Binder Group Certification Method of Acceptance for Asphalt Binders".

#### 455.2.3.2 MC, SC, and Emulsified Asphalts

- (1) Test MC and SC materials according to the following:

TEST	AASHTO	ASTM
Flash point, open tag	T 79	_____
Flash point, Cleveland cup	T 48	D 92
Kinematic viscosity	T 201	D 2170
Distillation	T 78	D 402
Penetration	T 49	D 5
Ductility	T 51	D 113
Solubility in trichloroethylene	T 44	D 2042
Water	T 55	D 95

- (2) Test emulsified asphalts according to AASHTO T59.

### 455.2.4 Physical Properties

#### 455.2.4.1 PG Asphalts

- (1) Furnish material conforming to the department's "Combined State Binder Group Certification Method of Acceptance for Asphalt Binders".

#### 455.2.4.2 MC and SC Asphalts

- (1) Furnish material conforming to the following:

Type MC asphalts.....AASHTO M82

Type SC asphalts ..... AASHTO M141

(2) If sampling at the job site, also conform to kinematic viscosity requirements as follows:

TYPE	GRADE	VISCOSITY (in centistokes at 6	
		MINIMUM	MAXIMUM
MC	30	25	70
MC and SC	70	60	160
MC and SC	250	230	540
MC and SC	800	700	1800
MC and SC	3000	2600	7000

#### 455.2.4.3 Emulsified Asphalts

(1) Furnish material conforming, before dilution, to the following:

Anionic emulsified asphalts ..... AASHTO M140

Cationic emulsified asphalts ..... AASHTO M208

Polymer-modified cationic emulsified asphalts ..... AASHTO M316

(2) If diluting emulsified asphalt, mix thoroughly with an equal amount of potable water. If undiluted samples are not available, test the diluted material and modify AASHTO M140, M208, or M316 to reflect properties resulting from dilution of the asphalt.

#### 455.2.5 Tack Coat

(1) Under the Tack Coat bid item, furnish type MS-2, SS-1, SS-1h, CSS-1, CSS-1h, or modified emulsified asphalt, unless the contract specifies otherwise.

### 455.3 Construction

#### 455.3.1 General

(1) Heat asphaltic materials so that the temperature when entering the mixer or at application is within the limits the supplier specifies.

#### 455.3.2 Tack Coat

##### 455.3.2.1 General

(1) Apply tack coat only when the air temperature is 36 F or more and the surface is dry and reasonably free of loose dirt, dust, or other foreign matter. Do not apply if weather or surface conditions are unfavorable or before impending rains.

(2) Use tack material of the type and grade the contract specifies. The contractor may, with the engineer's approval, dilute tack material as allowed under [455.2.4](#). Apply at 0.025 gallons per square yard, after dilution, unless the contract designates otherwise. Limit application each day to the area the contractor expects to pave during that day.

(3) Unless the contract specifies otherwise, keep the road open to all traffic during the work. Plan and prosecute tacking operations to adequately provide for traffic without damaging the work.

##### 455.3.2.2 Equipment

###### 455.3.2.2.1 General

(1) Provide equipment adequate to perform the work and obtain the progress and quality the contract contemplates as specified in [108.7](#). Have all necessary equipment available on the job before beginning tack coat operations.

###### 455.3.2.2.2 Tank Car Heating Equipment

(1) Heat the tack material by circulating steam through the coils of the tank or use another engineer-approved system. Use equipment designed to heat without burning or overheating any portion of the material. Provide effective and positive control of the heat at all times.

(2) The department will reject tack material from tank cars without heating coils, or with defective heating coils, unless the contractor uses engineer-approved alternate methods to heat the material without introducing moisture. Do not agitate or heat the tack coat material by directly introducing live steam.

###### 455.3.2.2.3 Tack Distributors

(1) Provide a tachometer, pressure gauges, and accurate volume measuring devices or a calibrated tank. Also provide a thermometer for measuring the temperature of the tank contents.

- (2) Equip distributors with a pump power unit and full circulation spray bars adjustable laterally and vertically. Provide a heating system that circulates material through the spray bar during the entire heating process. Also provide a hose and spray nozzle to apply tack to areas inaccessible to the spray bar.

#### **455.3.2.3 Preparing the Existing Surface**

- (1) Prepare the base or existing surface as specified for preparing the foundation for asphalt surfacing in [section 211](#). Immediately before applying tack material, sweep existing surfaces to remove dust, dirt, or other objectionable material.

#### **455.3.2.4 Heating and Applying Asphaltic Materials**

- (1) The department will reject overheated or otherwise damaged tack material.
- (2) Place tack in a single application unless the contract or engineer specifies otherwise. Determine the appropriate width for the application based on traffic handling and sequencing of subsequent surface course construction. Distribute uniformly over the surface to be treated.
- (3) Determine an application rate for the surface condition required to effectively bond the overlying material. Obtain the engineer's approval for the application rate. Correct for under application by applying additional material. If the contractor cannot maintain the application rate within tolerances, discontinue operations and make the necessary corrections to personnel or equipment required to remedy the problem.
- (4) Turn outside edges nozzles to spray parallel to the road centerline. Do not operate with any clogged nozzles.
- (5) Protect structures, as the engineer approves, to prevent spatter or marring by tacking operations. Include surfaces of railings, curbs, gutters, and other appurtenances of existing structures. Also protect adjacent concrete pavement that will not be resurfaced with asphaltic pavement or surfacing.

#### **455.3.2.5 Maintaining Tack Coat**

- (1) Except as provided under [104.6](#), maintain the tack coat during all construction stages until final or partial acceptance. Protect and repair the existing surface and the tack coat. Correct areas with excess or deficient tack material and any breaks, raveled spots, or other areas where bond might be affected.

### **455.4 Measurement**

#### **455.4.1 General**

- (1) The department will not measure nonconforming asphaltic materials unless the engineer allows those materials to remain in place. The department will deduct for material wasted or not actually incorporated in the work.
- (2) The department will measure asphaltic material, liquid asphalts, and similar products in calibrated tank cars, tank trucks, or storage tanks. Calibrate storage tanks and provide the engineer with charts indicating the depth versus liquid volume relationship.
- (3) The department will correct the measured volume to a temperature of 60 F for PG, MC, and SC asphalts as follows:

- If the specific gravity at 60 F is greater than 0.966:

$$V = V1(1.021 - 0.00035T)$$

- If the specific gravity at 60 F is from 0.850 to 0.966 inclusive:

$$V = V1(1.0246 - 0.00041T)$$

**Where:**

**V** = Volume in gallons at 60 F.

**V1** = Volume in gallons at observed temperature, F.

**T** = Observed temperature, F.

- (4) Calculate the volume correction for emulsified asphalts as follows:

$$V = V1 / (0.985 + 0.00025T)$$

**Where:**

**V** = Volume in gallons at 60 F.

**V1** = Volume in gallons at observed temperature, F.

T = Observed temperature, F.

#### 455.4.2 Asphaltic Materials Bid Items

- (1) The department will measure the Asphaltic Material bid items, Asphaltic Material Special, and Asphaltic Material Seal Coat by the ton or gallon acceptably completed. The department may measure using one or more of the following:
  1. Asphaltic material shipment net weights.
  2. If batch weights are recorded, the weight of asphaltic material in each batch.
  3. If delivery is intermittent or in such minor quantities that measuring net weight is impracticable, the theoretical percentage of asphaltic material in the mixture.
- (2) If the contractor uses salvaged asphaltic pavement material or RAP in a paving mixture, the department will calculate the quantity of asphaltic material from those sources using the following formula:

$$Q = (P)(p)(T)$$

Where:

Q = Quantity of recovered asphaltic material, in tons.

P = Percentage of recovered asphaltic material used in the mix design.

p = Percentage of salvaged asphaltic pavement material and RAP fed into the plant, expressed as a percentage of the total mixture.

T = Total weight of mixture produced under the contract, in tons.

- (3) When conversion to liquid volume is required, the department will convert as follows:

$$V = 239.5 Q$$

Where:

V = Liquid volume of recovered asphaltic material, in gallons.

Q = Quantity of recovered asphaltic material, in tons.

#### 455.4.3 Tack Coat

- (1) The department will measure Tack Coat by the ton or gallon acceptably completed, based on asphaltic material shipment net weights.
- (2) If the contract requires dilution, the department will measure emulsified asphalts after dilution.

#### 455.5 Payment

##### 455.5.1 General

- (1) The department will pay for measured quantities at the contract unit price under the following bid items:

<u>ITEM NUMBER</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
455.0100 - 0199	Asphaltic Material (PG grade)	TON
455.0200 - 0299	Asphaltic Material (PG grade)	GAL
455.0300	Asphaltic Material Special	TON
455.0400	Asphaltic Material Special	GAL
455.0500	Asphaltic Material Seal Coat	TON
455.0505	Asphaltic Material Seal Coat	GAL
455.0600	Tack Coat	TON
455.0605	Tack Coat	GAL

##### 455.5.2 Asphaltic Materials Bid Items

- (1) Payment for the Asphaltic Material bid items, Asphaltic Material Special, and Asphaltic Material Seal Coat is full compensation for providing the asphaltic material, including recovered asphaltic material as calculated under [455.4.2](#); and for transporting, heating, and placing in the mixer.
- (2) The department will pay for nonconforming material the engineer allows to remain in place at 75 percent of the contract unit price.
- (3) The department will administer pay reduction for nonconforming QMP mixture under the Nonconforming QMP Asphaltic Material administrative item. The department will reduce pay based on the contract unit

price for the Asphaltic Material bid items used in HMA pavement subject to the QMP adjustments as specified in [460.2.8.2.1.7](#).

- (4) The department will administer disincentives for density under the Disincentive Density Asphaltic Material administrative item. The department will reduce pay based on the contract unit price for the Asphaltic Material bid items used in HMA pavement subject to the density disincentive as specified in [460.5.2.2](#).

### 455.5.3 Tack Coat

- (1) Payment for Tack Coat is full compensation for providing tack coat; for preparing the surface; for transporting and heating; for diluting with water; and for maintaining the completed work.
- (2) The department will adjust pay for Tack Coat based on whichever one of the following yields the lowest contractor compensation:
  - 1. The department will pay for nonconforming material the engineer allows to remain in place at 75 percent of the contract unit price.
  - 2. The department will pay for excessively diluted tack coat, material diluted with a greater amount of water than specified under [455.2.4.3](#), as follows:

AMOUNT OF WATER <sup>[1]</sup> (percent of diluted asphaltic material)	PERCENT OF THE CONTRACT PRICE
<= 60	100
> 60 but <= 80	50
> 80	0

<sup>[1]</sup> Does not include water used to produce the emulsified asphalt.