**2356.5 BASIS OF PAYMENT**

The Department will pay for bituminous material for fog seal in accordance with 2355.5, "Basis of Payment."

The contract gallon [liter] price for accepted quantities of Bituminous Material for Seal Coat, including necessary additives, includes the costs of providing and applying the material as required by the contract.

The contract square yard [square meter] unit price for Bituminous Seal Coat includes the cost of providing and applying the material as required by the contract. The contract square yard [square meter] price for Bituminous Seal Coat includes the cost of all applied aggregate.

**A Monetary Price Adjustments**

The Engineer may allow the Contractor to accept a monetary price adjustment instead of removing and replacing failing materials in accordance with the following:

1) The Department will assess a monetary price adjustment of $2,000 for each failing QA flakiness test.
2) The Department will reduce the contract unit price for bituminous seal coat by 0.5 percent for each 1 percent passing outside of the requirements for any sieve as specified in 3127, "Fine Aggregate for Bituminous Seal Coat", except for the #200 sieve, as determined by QA testing.
3) The Department will reduce the contract unit price for bituminous seal coat by 2 percent for each 0.1 percent passing outside of the requirements for the #200 sieve as specified in 3127, "Fine Aggregate for Bituminous Seal Coat", as determined by QA testing.

The monetary price adjustment for 2356.5A2 and 2356.5A3 are based upon the contract bid price for bituminous seal coat, however if the contract bid price is less than 75% of the Department's average bid price for bituminous Seal Coat, the Engineer may use the average bid price to assess the monetary price adjustment.

The Department will add the monetary price adjustments for all failing test results together.

The Department will pay for bituminous seal coat on the basis of the following schedule:

<table>
<thead>
<tr>
<th>Item No.:</th>
<th>Item:</th>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2356.505</td>
<td>Bituminous Material for Seal Coat</td>
<td>gallon [liter]</td>
</tr>
<tr>
<td>2356.506</td>
<td>Bituminous Seal Coat</td>
<td>square yard [square meter]</td>
</tr>
</tbody>
</table>

**2357 BITUMINOUS TACK COAT**

**2357.1 DESCRIPTION**

This work consists of applying bituminous material (emulsion or cutback asphalt) on a bituminous or concrete pavement prior to paving a new lift of Plant Mixed Asphalt.

**2357.2 MATERIALS**

**A Bituminous Material 3151**

The bituminous material for tack coat will be limited to one of the following kinds of emulsified asphalt. Use of medium cure cutback asphalt (MC-250) is allowed during the early and late construction season when it is anticipated the air temperature may drop below 32 degrees Fahrenheit.

Allowable grades are as follows:

- **Emulsified Asphalt**
  - AASHTO 208  Dilution of the emulsion to 7 parts emulsion to 3 parts water is only allowed by the supplier. **No field dilution is allowed.** The storage tank for diluted emulsion must have a recirculation system or agitator that will prevent settlement or separation of the material.
| Table 2357-1 |
|------------------|------------------|------------------|
| Residual Asphalt Content | Minimum Residual Asphalt Content | Diluted (7:3) |
| Emulsion | Undilated | 57% |
| CSS-1 or CSS-1h | 40% |

Cutback Asphalt
Medium Cure Liquid Asphalt MC-250

Only Certified Sources are allowed for use. MnDOT's Certified Source List is located at the following link: http://www.dot.state.mn.us/products/index.html.

2357.3 CONSTRUCTION REQUIREMENTS

A Restrictions
Conduct tack coat operations in a manner that offers the least inconvenience to traffic. Maintain movement in at least one direction at all times without pickup or tracking of the bituminous material.

Do not apply the tack coat when the road surface or weather conditions are unsuitable as determined by the Engineer. Limit the daily application of tack coat to approximately the area on which construction of the subsequent bituminous course can reasonably be expected to be completed that day.

B Equipment
Apply the bituminous material with a distributor meeting the requirements of 2360.3.B.2.d.

C Road Surface Preparations
Apply the bituminous tack coat material to a dry and clean roadway surface. All necessary repairs or reconditioning must have been completed as provided for in the Contract and approved by the Engineer.

Remove all foreign matter on the road surface before applying tack coat and dispose of as approved by the Engineer.

Before placing an abutting bituminous course, provide a uniform coating of liquid asphalt or emulsified asphalt to the contact surfaces of all fixed structures and at the edge of the in-place mixture in all courses at transverse joints and in the final wearing course at longitudinal joints.

D Application of Bituminous Tack Coat Material
Unless otherwise indicated in the Plans or provisions, apply the bituminous tack coat material within the application rates shown below in Table 2357-2, Tack Coat Application Rates, as based on pavement type or condition and type of bituminous material. **Dilution of asphalt emulsion in the field is not allowed.**

All tack must break, turn from brown to black, before paving the subsequent lift or course. Do not allow vehicles to drive on tack that has not broken.

Apply a uniform tack coat to the existing asphalt or concrete surface and to the surface of each course or lift constructed, except for the final course or lift. Tack each lift when placing multiple lifts in the same day. Uniform application will not have streaks (corn rows), bare spots, puddles, or other irregular patterns. The Engineer will compare the freshly sprayed emulsion to a brown sheet of construction paper or a black sheet of construction paper for broken tack to determine conformance with tack application uniformity.

Using a distance of 1,000 feet [300 meter] perform a yield check at the beginning of each project to verify the application rate is correct. The Engineer may require additional yield checks be performed if the application rate is questioned.

The Engineer may also require the Contractor to verify application is within 10% of the intended application rate by ASTM D 2995 test method A.
### Table 2357-2
Tack Coat Application Rates

<table>
<thead>
<tr>
<th>Surface Type</th>
<th>Undiluted Emulsion</th>
<th>Diluted Emulsion (7:3)</th>
<th>MC Cutback</th>
<th>Cutback</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Asphalt</td>
<td>0.05 to 0.07</td>
<td>0.08 to 0.10</td>
<td>0.05 to 0.07</td>
<td>0.23 to 0.32</td>
</tr>
<tr>
<td>Old Asphalt</td>
<td>0.08 to 0.10</td>
<td>0.13 to 0.15</td>
<td>0.09 to 0.11</td>
<td>0.41 to 0.50</td>
</tr>
<tr>
<td>and PCC</td>
<td>0.36 to 0.45</td>
<td>0.59 to 0.68</td>
<td>0.41 to 0.50</td>
<td></td>
</tr>
<tr>
<td>Milled Asphalt and Milled PCC</td>
<td>0.07 to 0.11</td>
<td>0.10 to 0.13</td>
<td>0.09 to 0.11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.41 to 0.50]</td>
<td>[0.45 to 0.59]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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1. As provided by the asphalt emulsion supplier (see 2357.2.A)
2. Use when approved by the Engineer
3. Older than 1 year

**E** Bituminous Temperature

The application temperature of the bituminous material will be:

CSS-1, CSS-1H 70 to 160°F (21 to 71°C)
MC-250 165 to 220°F (74 to 104°C)

**F** Bituminous Sampling

Sample asphalt emulsion from either the spigot or a nozzle on the distributor according to the schedule of materials control.

**G** Pedestrian Crossings

Spread sand on newly tacked surfaces at regularly utilized and open for public use pedestrian crossings.

**H** Acceptance of Tack Material

Assess a monetary deduction of 5% of the mix price for failures related to 3151 or workmanship/application, as determined by the Engineer. The basis of measurement for deficiencies related to material and workmanship/application is full with of the lane by station.

**2357.4 METHOD OF MEASUREMENT**

Bituminous material used for tack coat will be measured by volume at 15°C (60°F).

**2357.5 BASIS OF PAYMENT**

Payment for the accepted quantity of asphalt emulsion and cutback shall be at the Contract price per unit of measure for undiluted asphalt emulsion and neat cutback. The Department will include the cost of providing and applying sand at pedestrian crossings with other relevant contract items.

Payment for the tack coat will be made on the basis of the following schedule:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2357.502</td>
<td>Bituminous Material for Tack Coat</td>
<td>gallon [liter]</td>
</tr>
</tbody>
</table>

If the contract does not contain Bituminous Material for Tack Coat, the Department will include the cost of providing and applying bituminous tack coat material with other relevant pay items.