

Bracketed section numbers refer to the 2006 *Standard Specifications*.

Section 94 Asphaltic Emulsions

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4-9401 General

Asphaltic emulsions are described in Section 94, “Asphaltic Emulsions,” of the *Standard Specifications*. They are used for bituminous seals and tack coat. Asphaltic emulsions are also used for other purposes, such as curing seals for lime stabilization and cement-treated base and for coating the surface of cement-treated permeable base to facilitate measuring the thickness of concrete pavement.

4-9401 General

In addition to the specifications for asphaltic emulsions in Section 94, of the *Standard Specifications*, refer to the requirements for asphaltic emulsions in other sections of the *Standard Specifications*—Sections 18, 24, 27, 37, 39, 40, 66, 86—covering work in which asphaltic emulsions are used.

Refer to the *Tack Coat Guidelines* for more information at the following address:

<http://www.dot.ca.gov/hq/construc/publications/tackcoatguidelines.pdf>

4-9402 Before Work Begins

Before work begins, take the following steps:

- Verify that Form CEM-3101, “Notice of Materials to Be Used,” includes asphaltic emulsion. Refer to Section 6-202, “Responsibilities for Acceptance of Manufactured or Fabricated Materials and Products,” of this manual for additional information.
- Examine the distributor truck to ensure it meets the specified requirements.
- Ensure the contractor properly equips delivery trucks, storage tanks, and spreading equipment with specified devices for measuring volumes of asphaltic emulsion.
- Verify the receipt of a certificate of compliance.
- If the polymer content of polymer modified asphaltic emulsion is determined under California Test Method 401, verify that the contractor has submitted a sample to the Office of Engineering Materials and Testing Services.

4-9402 Before Work Begins

4-9403 During the Course of Work

During the work, take the following steps:

- If asphaltic emulsion is used before sampling and testing, obtain a certificate of compliance containing the specified information.
- Check the temperature of the asphaltic emulsion to ensure it is within the specified range when applied.
- Before asphaltic emulsion is applied, ensure the surface to be treated is clean and dry.

4-9403 During the Course of Work

- Ensure that asphaltic emulsion is not sprayed outside designated areas and that bituminous material does not drip from distribution equipment.
- Check the application rate of asphaltic emulsion to ensure the designated rate. After the first few hundred feet of application, check the initial spread rate. The frequency for checking the spread rate will depend on the accuracy and consistency of the first few checks. Record the spot-check results and the overall daily spread rate in the daily report.
- Sample asphaltic emulsion in accordance with the table in Section 6-1, “Sample Types and Frequencies,” and the instructions in Section 6-203C, “Materials Accepted on the Basis of a Certificate of Compliance,” of this manual. If water has been added to the asphaltic emulsion, note on Form TL-0101, “Sample Identification Card,” the ratio of added water to the total mixture.

**4-9404
Measurement and
Payment**

4-9404 Measurement and Payment

Section 94, “Asphaltic Emulsions,” of the *Standard Specifications*, does not contain provisions for payment. Asphaltic emulsion is paid for as part of the item of the work, unless a separate bid item requires payment by ton measured in accordance with Section 93, “Liquid Asphalts,” of the *Standard Specifications*. Asphaltic emulsion is subject to adjustment for price index fluctuations in accordance with Section 9-1.07 of the *Standard Specifications*.

Obtain weight tickets for deliveries of asphaltic emulsion.

It is a good practice, before the asphaltic emulsion is discharged, to measure the volume in the distributor and to make this volumetric measurement again whenever a partial load leaves the work. These actions result in a good check against scale weights, and the second measurement may be used if the contractor fails to submit a weight ticket for the unused asphaltic emulsion.

When the specifications provide for additional water to be mixed with asphaltic emulsion, it is necessary to determine the mass of asphaltic emulsion without the mass of the added water. Delivery weight tickets will show the mass of the emulsion before water was added and the total mass of asphaltic emulsion and added water.

When making volumetric measurements, measure the temperature and apply the proper factors for converting volume to mass.

In a partial load using volumetric measurements, the procedure for determining the mass of asphaltic emulsion with added water is as follows:

- Measure the volume and temperature of the mixture in the partial load. Calculate the volume of emulsion in the original load at the temperature of the partial load. Convert tons of added water in the original load to gallons.
- Based on the final temperature reading, calculate the ratio of the volume of asphaltic emulsion to the total volume in the original load.
- Calculate the volume, at 60°F of emulsion in the partial load.
- Determine the mass of emulsion remaining in the partial load.

Example:

Assume the following:

- Weight ticket shows 10.00 tons of emulsion and 5.00 tons of added water. (Total = 15 tons) Temperature at the time of weighing was 131°F.
- 534 gallons of emulsion and added water remain in the partial load. At the time of measuring, the temperature of the mixture is 131°F.

Using these assumptions, calculate as follows:

1. Volume of emulsion at 131°F in the original load:
 $10.00 \text{ tons} \times 240 \text{ gallons/ton at } 60^\circ\text{F} \div 0.98225$ (see the conversion table in Section 94-1.04 [94-1.07], "Payment," of the *Standard Specifications*) = 2443 gallons
2. Volume of added water in the original load:
 $(5 \text{ tons} \times 2000 \text{ lbs.}) / 8.33 \text{ lb./gallon} = 1200 \text{ gallons}$
3. Ratio of volume of emulsion at 131°F to total volume in the original load:
 $2443/3643 = 0.671$
4. Volume at 60°F of emulsion in the partial load:
 $0.671 \times 534 \times 0.98225 = 352 \text{ gallons}$
5. Mass of emulsion in partial load:
 $352 \div 240 = 1.46 \text{ tons}$
6. Emulsion used on the project:
 $10.00 - 1.46 = 8.54 \text{ tons}$