August 11, 2016

REVISION OF SECTION 409  
CHIP SEAL

**NOTICE**

This is a standard special provision that revises or modifies CDOT’s *Standard Specifications for Road and Bridge Construction.* It has gone through a formal review and approval process and has been issued by CDOT’s Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by CDOT’s Standards and Specifications Unit. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

**Instructions for use on CDOT construction projects:**

Use in projects having Chip Seal

# Section 409 of the Standard Specifications is hereby deleted and replaced with the following:

# DESCRIPTION

**409.01** This work consists of furnishing and applying asphalt emulsion and cover coat material on an existing surface, in accordance with these specifications and in conformity with the lines shown on the plans or established. When rejuvenating agent or emulsified asphalt is used as a fog seal, cover coat material will not be required.

# MATERIALS

**409.02 Asphalt Emulsion.** Emulsified asphalt shall be polymerized or latex modified, and shall be rapid set or medium set conforming to the requirements of subsection 702.02 (b).

Rejuvenating agent shall conform to the requirements of subsection 702.02(f).

**409.03 Cover Coat Material.** Cover coat material shall meet the requirements of subsection 703.05 for the type specified. The material will be accepted at the spreader.

# CONSTRUCTION REQUIREMENTS

**409.04 Weather Limitations.** Asphalt emulsion shall not be applied on a damp surface, when either the air or pavement surface temperature is below 70 °F, or when weather conditions would prevent the proper construction of the chip seal.

**409.05 Equipment.** The following equipment or its equivalent shall be used:

1. Asphalt distributor and equipment shall be capable of uniformly distributing asphalt emulsion at even temperature and uniform pressure on variable widths of surface up to 15 feet at readily determined and controlled rates from 0.05 to 2.0 gallons per square yard. The allowable variation from any specified rate shall not exceed plus or minus 0.02 gallon per square yard. The distributor’s spreading capabilities shall be computer controlled or it shall be calibrated to conform to the distributor manufacturer’s procedure prior to applying the emulsified asphalt. Distributor equipment shall include a tachometer, pressure gauges, accurate volume measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank contents. Distributors shall be equipped with a power unit for the pump, and full circulation spray bars adjustable laterally and vertically. Distributors shall be equipped with an automatic heater capable of maintaining the asphalt emulsion at the manufacturer’s recommended application temperature or at 140 °F, whichever is higher.
2. A rotary power broom.
3. A minimum of two pneumatic tire rollers, which weigh at least 10 tons each.
4. One self-propelled aggregate spreader of approved design supported by at least four wheels equipped with pneumatic tires on two axles. The aggregate spreader shall be capable of applying the larger cover coat material to the surface ahead of the smaller cover coat material and shall have positive controls so the required quantity of material is deposited uniformly over the full width of the asphalt emulsion. Other types of aggregate spreaders may be used provided they accomplish equivalent results and are approved.

**409.06 Preparation of Surface.** The entire surface that is to receive a chip seal shall be cleaned of loose sand, dust, rock, mud, and all other debris that could prevent proper adhesion of the asphalt coating. The cleaning shall be accomplished by power broom, scraping, blading, or other approved measures. Chip sealing operations shall not be started until the surface is approved.

**409.07 Applying Asphalt Emulsion.** Asphalt emulsion shall be applied by a pressure distributor in a uniform, continuous spread and within the temperature range specified. The distributor’s spreading capability shall be computer controlled or calibrated to conform to the distributor manufacturer’s procedure prior to applying the emulsified asphalt. If streaking occurs, the distributor operation shall be stopped immediately until the cause is determined and corrected. Streaking is alternating, narrow, longitudinal areas of excessive and then insufficient quantities of asphalt emulsion. The quantity of asphalt emulsion per square yard may vary from the rate shown in the Contract, as directed. A strip of building paper, at least 3 feet in width and with a length equal to that of the spray bar of the distributor plus 1 foot shall be used at the beginning of each spread. If the distributor does not have a positive cut-off, the paper shall be used at the end of each spread. The paper shall be removed and disposed of in a satisfactory manner. The distributor shall be moving forward at proper application speed at the time the spray bar is opened***.*** Skipped areas and deficiencies shall be corrected. Junctions of spreads shall be carefully made to assure a smooth riding surface.

The length of spread of asphalt emulsion shall not be in excess of the area that trucks loaded with cover coat material can immediately cover.

The spread of asphalt emulsion shall not be more than 6 inches wider than the width covered by the cover coat material from the spreading device. Under no circumstances shall operations proceed so asphalt emulsion will be allowed to chill, set up, dry, or otherwise impair retention of the cover coat.

The distributor shall be parked so that asphalt emulsion will not drip on the surface of the traveled way.

**409.08 Application of Cover Coat Material.** Immediately following the application of the asphalt emulsion, cover coat material shall be spread in quantities as designated. The spreading rate may vary from the rate shown in the Contract when approved. Spreading shall be accomplished so the tires of the trucks or aggregate spreader do not contact the uncovered and newly applied asphalt emulsion.

The cover coat material shall be moistened with a sufficient amount of water to reduce the dust coating of the aggregate prior to spreading. The cover coat material shall not contain free moisture as evidenced by drain down in the delivery truck bed.

Immediately after the cover coat material is spread, deficient areas shall be covered with additional material. Rolling shall begin immediately behind the spreader and shall continue until three complete coverages are obtained. Rolling shall be completed the same day the asphalt emulsion and cover coat materials are applied.

The completed roadway surface shall be lightly broomed the following morning to remove any excess material, without removing any imbedded material. The Contractor shall conduct additional brooming if so directed.

A fog seal shall be applied to the surface of the completed chip seal at the rate of 0.11 ± 0.04 gallon per square yard of diluted emulsion when directed. The fog seal shall have a 3:2 emulsion to water dilution rate. The application rate and the dilution rate may be changed by the Engineer.

# METHOD OF MEASUREMENT

**409.09** Chip seal will be measured by the number of tons, cubic yards or square yard of the designated type of cover coat aggregate.

# BASIS OF PAYMENT

**409.10** The accepted quantities of chip seal will be paid for at the contract price per ton, cubic yard or square yard for cover coat material.

Payment will be made under:

|  |  |
| --- | --- |
| **Pay Item** | **Pay Unit** |
| Cover Coat Material (Type \_\_) | Ton |
| Cover Coat Material (Type \_\_) (Lightweight) | Cubic Yard |
| Cover Coat Material (Type \_\_) | Square Yard |

Asphalt emulsion, including the asphalt emulsion used for fog seal, will be measured and paid for in accordance with Section 411.