

**608 - CHIP SEALS**

**SECTION 608**

**CHIP SEALS**

**608.1 DESCRIPTION**

Apply asphalt material to the existing surface, followed by an application of cover material, as specified in the Contract Documents.

**BID ITEMS**

Cover Material (\*)  
Cutback Asphalt (\*)  
Emulsified Asphalt (\*)  
Asphalt Cement (\*)  
Water (Flexible Pavement) (Set Price)  
Manipulation (Chip Seals)  
\*Type and Grade

**UNITS**

Cubic Yard  
Ton  
Ton  
Ton  
M Gallon  
Station

**608.2 MATERIALS**

Provide materials that comply with the applicable requirements.

Aggregate for Cover Material ..... **DIVISION 1100**  
Asphalt Material ..... **DIVISION 1200**  
Water ..... **DIVISION 2400**

**608.3 CONSTRUCTION REQUIREMENTS**

**a. Preparation of Surfaces.** Before applying asphalt material, clean all foreign material from the surface to be treated. Broom surface to remove dust.

**b. Protection of Adjacent Structures.** Protect the surfaces of all structures and other roadway appurtenances from damage or splatter of asphalt material. Restore any damaged or splattered appurtenances to their original condition at own expense.

**c. Temperature of Asphalt Materials at Time of Application.** Apply asphalt material at the temperature specified in **TABLE 601-1**, or as shown on the producer's Bill of Lading.

**d. Application of Asphalt Material.** Using a distributor (see **subsection 155.2**), uniformly apply asphalt material at the rate shown in the Contract Documents. Equip and operate the distributor to prevent asphalt material from dripping on the pavement.

At the beginning of each spread, start the application on a strip of building paper, approximately 3 feet in width and 1 foot longer than the spray bar. If the spray cut-off is not positive, use paper at the end of each spread. Remove and dispose of the paper in a satisfactory manner. Open the spray bar when the distributor is moving forward at proper speed, unless the distributor is equipped to apply the specified rate from a standing start. Correct any skipped areas or deficiencies. Construct junctions (joints) of spreads to obtain a smooth riding surface.

Do not spread more asphalt material than can be immediately covered.

Regulate the distribution of the asphalt material to obtain a uniform application. Do not allow the distributor to "blow".

Frequently check and adjust the angle of the spray nozzles and the height of the spray bar to obtain uniform distribution. If the spray bar rises as the load is removed, contributing to drilling and streaking, modify the distributor to maintain a constant spray bar height. Immediately stop distribution should any nozzle malfunction. Correct any deficiency before distribution is resumed.

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**e. Application of Aggregate.** Immediately following the application of the asphalt material, spread cover material with a self-propelled aggregate spreader in quantities designated in the Contract Documents. The tires of the trucks or aggregate spreaders shall not come in contact with the fresh asphalt material at any time.

Do not allow the asphalt material to remain uncovered long enough to impair retention of the cover material. Do not apply the spread width of the cover material greater than 6 inches wider than the spread width of asphalt material.

Uniformly cover the asphalt before rolling. Equip and operate spreading equipment to provide complete coverage. Brooming, dragging or blading of the cover material is prohibited before initial rolling. Perform any rearrangement of the cover material by hand methods. Avoid overlapping applications of cover material and remove all spillage from the surface.

At the time of delivery to the roadway, the moisture content of the cover material shall not exceed 3% by weight plus ½ the water absorption of the aggregate. Do not let free moisture drain from the truck. The moisture limitations do not apply if lightweight aggregate is used.

When directed by the Engineer, moisten the cover material with water to eliminate or reduce the dust coating of the aggregate. Perform the moistening the day before the aggregate is used.

Any operation of equipment that results in displacement of the cover material or damage to the seal course is prohibited.

**f. Rates of Application of Aggregate.** When alternate types of cover material are shown in the Contract Documents, the quantities of aggregate and asphalt material are for the purpose of estimating and bidding only. Once the Contractor designates the alternate type of aggregate to be supplied, the total quantities to be used and paid for are determined by using the application rates in **TABLE 608-1**. No change in the contract unit price will be made.

The application rate shown in **TABLE 608-1** may be changed with written approval from the Engineer.

<b>TABLE 608-1: RATES OF APPLICATION FOR CHIP SEAL</b>				
<b>Type</b>	<b>Composition</b>	<b>Aggregate Cu. Yd./Mile 24 foot width*</b>	<b>Asphalt Material Gal/Sq. Yd. Residue*</b>	<b>Asphalt Type**</b>
CM-A	Sand-Gravel	105	0.20	CRS-1H
CM-B	Sand-Gravel	135	0.23	CRS-1H
CM-D	Crushed Sandstone	145	0.27	CRS-1H or RS-1H
CM-K	Limestone	140	0.24	RS-1H
CM-L-1	Lightweight	85	0.17	CRS-1H
CM-L-2	Lightweight	115	0.26	CRS-1H
CM-L-3	Lightweight	150	0.30	CRS-1H

\*Rates shown are estimated and will be adjusted to comply with actual field conditions.

\*\* Asphalt type may be changed with approval of the DME.

If the quantity of cover material computed from **TABLE 608-1** exceeds the amount used on the roadway, the Engineer will designate a stockpile location for this excess quantity. Locate the stockpile along the project, or at locations requiring a haul distance no longer than the most distant end of the project.

The maximum quantity of cover material to be stockpiled is as follows:

- The amount shown on the Contract Documents minus the amount used on the road when one type of cover material is shown in the Contract Documents.
- The amount determined by using the application rates in **TABLE 608-1** minus the amount used on the road when alternate types of cover material are shown in the Contract Documents.
- The amount specified by the Engineer minus the amount used on the road when the Engineer changes the application rates in **TABLE 608-1**.

Payment for the stockpiled material will be at the contract unit price per cubic yard of cover material.

**g. Manipulation.** Immediately following the application of cover material, embed using pneumatic rolling. Provide a minimum of 3 self-propelled pneumatic rollers. Check the tire pressures of all tires on all rollers every morning. Inflate all tires on a roller to the same pressure. Provide this information to the Engineer before work

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begins. Complete the initial rolling within 5 minutes after application of cover material. If the air temperature is less than 70°F, then complete the initial rolling within 2 minutes after applying the aggregate. Proceed at a speed less than or equal to 5 miles per hour to prevent turning over aggregate. Make a minimum of 3 complete passes over the aggregate. Roll the aggregate so the entire width of the treatment area is covered in one pass of all the rollers. The total compacting width of each pneumatic-tired roller shall exceed 5 feet. The number of rollers for shoulders may be reduced based on the width of the shoulders and the width of the rollers.

If emulsified asphalt is used, cure the asphalt material a minimum of 4 hours before opening the roadway to unrestricted traffic. If polymer modified emulsified asphalt is used, the cure time shall be a minimum of 1 ½ hours before the traveled way is opened to unrestricted traffic. If traffic causes excessive chip loss, increase the cure time until excessive chip loss is eliminated.

On seals using CM-A, or B, the Engineer may require the use of a steel roller for one of the coverages, provided excessive crushing of the cover material does not occur.

Do not turn rollers on the sealed surface.

When required, apply additional cover material and roll it with the pneumatic rollers as directed by the Engineer.

Broom the loose cover material from the surface of the traveled way as soon as the asphalt material has cured enough to prevent damage by brooming or vehicular traffic. Continue periodic brooming until all loose aggregate has been removed. Perform a minimum of 1 light brooming of the cover material, before opening to traffic. Additional broomings may be required before opening to traffic to prevent the cover material from being picked up by moving vehicles. Broom excess cover material from the shoulder.

The Contractor may seal in 1 lane for the entire day.

When CM-B and cutback asphalt are specified in the Contract Documents, begin a second period of manipulation on the day following the first rolling, or as soon thereafter as weather conditions permit. This manipulation consists of spreading the loose cover material uniformly over the surface and rolling with the type of rollers specified by the Engineer. The rolling operation consists of 2 complete coverages of the previous day's work. Following the second day's rolling, broom excess cover material off the traveled way and shoulders, as directed by the Engineer.

**h. Maintenance of Completed Work.** When directed by the Engineer, add asphalt material and aggregate to completed portions of the project. All additional asphalt material and aggregate so ordered will be included in the pay quantities. Spreading and rolling of additional aggregate will not be paid for separately, but is considered as subsidiary to the item of "Manipulation (Chip Seals)".

If the shoulder vegetation is not sufficient to define the edge of the traveled way, broom and blade the excess cover material off the shoulder to provide delineation.

**i. Treatment of Adjacent Areas.** When shown in the Contract Documents, seal the existing intersections and entrances, mailbox turnouts, etc. having asphalt surfaces. Seal all widened areas. Asphalt and cover material for this work is included in the contract quantities and will be paid for at the contract unit price.

**j. Maintenance of Traffic.** Maintain traffic according to **DIVISION 800** and the following.

Coordinate all construction operations to result in the least practicable delay of traffic. Maintain one-way traffic and restrict traffic speeds to 30 MPH on bare pavement and 20 MPH on freshly applied seal. Use pilot cars to lead one-way traffic through the areas of distribution and curing. Coordinate the work so the pilot car completes a round trip in 15 minutes or less. Do not delay traffic at more than 2 separate locations of work on a project.

Station one flagger immediately ahead of the application of the asphalt material and one flagger immediately behind the section being cured. Move the signs and flaggers forward as the work progresses.

Complete all brooming activities before opening the traveled way to unrestricted traffic.

On projects where asphalt sealing is constructed in connection with other work from which traffic is detoured, the provisions of this subsection do not apply. Restrict the speed of all equipment traveling on the freshly applied seal to 20 MPH for 24 hours.

**k. Seasonal and Weather Limitations.**

(1) Construct asphalt sealing using cutback asphalt between May 1 and October 15, when the ambient air temperature is 60°F and rising.

(2) Construct asphalt sealing using emulsified asphalt between June 1 and September 15, when the ambient air temperature is 60°F and rising, and the pavement temperature is a minimum of 70°F.

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(3) Construct asphalt sealing using asphalt cement between June 1 and September 1, when the ambient air temperature is 70°F and rising, and the pavement temperature is a minimum of 80°F.

When aggregate retention is unsatisfactory, suspend sealing. Do not seal when the surface is wet, or the weather is foggy or rainy. These limitations may be modified with written approval from the Engineer.

If the seal is damaged or lost, due to rain or wet pavement, repair or re-seal the damaged pavement.

**l. Observation Period.** If the chip seal is constructed in accordance with the seasonal limitations in **subsection 608.3k.**, the Engineer, along with the Contractor, will inspect the seal, 30 days after work is completed on the seal. If the seasonal limitations in **subsection 608.3k.** are modified, the Engineer, along with the Contractor, will inspect the seal between May 1 and April 1 the following year. Repair areas where there is no cover material left in place (bare areas) as directed by the Engineer:

- In 5% the wheel paths; and
- Individual areas  $\geq$  10 square yards; and
- Where the total square yards of bare areas is greater than 5% of the total square yards of the seal.

**m. Pavement Smoothness.** Chip seals are excluded from profilograph testing, and not eligible for pay adjustments.

### 608.4 MEASUREMENT AND PAYMENT

The Engineer will measure cover material by the cubic yard. The material will be measured in the vehicle at the time and place of unloading. No deductions will be made for moisture in the cover material.

The Engineer will measure asphalt material by the ton. Deductions will be made for the number of tons that are not placed on the road surface.

The Engineer will measure manipulation by the Station, along the centerline. On divided highways, the Engineer will measure manipulation by the Station, along the centerline of each divided direction. This includes all widened and irregular areas and irregular variations in depth.

The Engineer will measure ordered water by the M Gallon by means of calibrated tanks or water meters.

Payment for "Cover Material", "Cutback Asphalt", "Emulsified Asphalt", "Asphalt Cement" and "Manipulation (Chip Seals)" at the contract unit prices and "Water (Flexible Pavement) (Set Price)" at the contract set unit price is full compensation for the specified work.

When the Contract Documents call for asphalt cement for chip seals, the following provisions apply:

- If the work is not completed by September 1, and when ordered by the District Engineer in writing, change the type of asphalt material to cutback asphalt.
- If approved changes are made, the unit price for cutback asphalt will be the contract price for asphalt cement plus or minus the difference in the invoice price of the two materials at the refinery at the time of application.

Such measurement and payment is full compensation for the work specified.