

302-2 CHIP SEAL

302-2.1 General. A chip seal shall consist of an application of emulsified and screenings to an existing roadway surface. Streets shall be chip sealed to the edge of the existing pavement, excluding inverted shoulders except when shown on the Plans. Manholes, valves survey monuments, or miscellaneous frames and covers shall not receive a chip seal. If any frame and cover is sealed, it shall be cleaned to the satisfaction of the Engineer.

Chip seals are defined by type, which identifies the size of aggregate and the rate of application of the emulsified asphalt and screenings. Unless otherwise specified, a medium type chip seal shall be applied. (See Table 302-2.1 (A))

TABLE 302.-2.1 (A)

Chip Seal Types	Size of Screening
Fine	¼" X No. 10
Medium Fine	5/16" X No. 8
Medium	3/8" X No.6
Coarse	½" X No. 4
Double	
1 st Application	½" X No. 4
2 nd Application	¼" X No. 10

302-2.2 Surface Preparation. The Contractor shall remove any raised pavement markers within the area to be sealed, and the pavement surface shall be prepared as required by the Plans or Specifications. Immediately before applying the emulsified asphalt, the surface shall be clean and dry. Cleaning shall be performed by sweeping, flushing, or other means necessary to remove all loose particles of paving, all dirt, and all other extraneous material.

302-2.3 Application and Spreading. Chip Seals shall only be applied when:

- 1) Atmospheric temperature is above 60°F and pavement temperature is above 55°F.
- 2) The pavement is clean and dry.
- 3) Wind conditions are such that a uniform emulsion coverage can be achieved.
- 4) Rain is not imminent.
- 5) Sufficient screenings shall be on hand before the emulsified asphalt is applied.

Application of emulsified asphalt shall be stopped before the distributor tank is empty to assure designated application rate.

Stockpiling of screenings prior to placing will be permitted; however, any contamination resulting during storage or from reloading operations will be cause for rejection. Stockpiling of screenings within the right-of-way will require the approval of the Engineer.

The emulsified asphalt shall be covered with screenings before setting or “breaking” of the emulsion occurs. Operating the chip spreader at speeds which cause the chips to roll over after striking the bituminous covered surface will not be permitted. The speed of the distributor shall be governed by the speed of the chip spreader.

Screenings shall be spread by means of a self-propelled chip spreader, equipped with a mechanical device which will spread the screenings at a uniform rate over the full width of a traffic lane in one application.

The spreader will be capable of reducing the aggregate spreading width to accommodate variable widths.

Trucks for hauling screenings shall be tailgate discharge and shall be equipped with a device to lock onto the hitch at the rear of the aggregate spreader. Haul truck shall also be compatible with the aggregate spreader so that the dump bed will not push down on the spreader when fully raised or have to short an apron resulting in aggregate spillage while dumping into the receiving hopper. Screenings shall be surface damp at the time of application, but excess water on the aggregate surface will not be permitted. Screenings shall be redampened in the vehicles prior to delivery to the spreader when directed by the Engineer.

All joints edges shall be sweep clean of excess screenings prior to the adjacent application of emulsified asphalt material. Precautions shall be taken to avoid “skips” and “overlaps” at joints and to protect the surfaces of adjacent structures from being spattered or marred. Correction of any such defects shall be performed at the Contractor’s expense. All transverse joints shall be made by placing building paper over the ends of the previous applications, and the joining application shall start on the building paper. The paper shall be removed and disposed of as required by 7-8.1. The longitudinal joint between adjacent applications of screenings shall coincide with the line between designated traffic lanes.

Applications of emulsified asphalt shall be discontinued sufficiently early in the day to permit the termination of traffic control prior to darkness.

302-2.4 Emulsified Asphalt. Emulsified asphalt shall be Type CRS-2 per 203-3 and shall be applied by distributing equipment per 203-2.5 and 203-3.

The application rate of emulsified asphalt shall be within the following ranges. The exact rates will be determined by the Engineer.

TABLE 302-2.4 (A)

Chip Seal Types	Application Rate (gal. /sq. yard)
Fine	0.15 to 0.30
Medium Fine	0.20 to 0.35
Medium	0.30 to 0.40
Coarse	0.30 to 0.40
Double	
1 st Application	0.20 to 0.35

2 nd Application	0.20 to 0.30
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The distribution of emulsified asphalt shall not vary more than 15 percent transversely, nor more than 10 percent longitudinally from the specified rate of application as determined by Calif. Test 339.

302-2.5 Screenings. Screenings shall conform to 200-1.2.1. The spread rate of screenings for the various types of chip seals shall be within the following ranges. The exact rate will be determined by the Engineer.

TABLE 302-2.5 (A)

Chip Seal Types	Spread Rate (lbs. /sq. yard)
Fine	12 to 20
Medium Fine	16 to 25
Medium	20 to 30
Coarse	23 to 35
Double	
1 st Application	23 to 30
2 nd Application	12 to 20

302-2.6 Finishing. After the screenings have been spread, any piles, ridges, or uneven distribution shall be carefully removed to ensure against permanent ridges, bumps or depressions in the completed surface. Additional screenings shall be spread in whatever quantities may be required to prevent picking up by the rollers or traffic.

Initial rollings shall commence immediately following spread of screenings. The compaction of screenings shall be accomplished by a minimum of three self-propelled, pneumatic-tired rollers meeting the requirements of 302-5.6.1, except that tires shall be inflated to 100 psi and the operating weight shall be 5,000 pounds per tire. The rolling equipment shall maintain a distance of not more than 200 feet behind the chip spreader on the first pass. The rollers shall operate at a maximum speed of 5 miles per hour. There shall be at least three complete coverages by the pneumatic-tired rollers (one initial and two secondary) to embed particles firmly into the emulsified asphalt.

After completion of pneumatic-tired rolling and the emulsified asphalt has broken, traffic will be permitted to travel over the chip seal if necessary. Guide vehicles shall be used to limit traffic speeds on the chip seal to 15 mph for a period of 2 to 4 hours as determined by the Engineer.

Sweeping shall be a multi-step operation following placement of the screenings. A power broom shall be used to remove loose material without dislodging aggregate set in the asphalt. The initial sweeping shall be a light brooming performed before the roadway may be opened to unguided traffic but no sooner than 3 hours following placement, with a second sweeping completed the day following placement. Additional sweeping shall be performed as necessary during the 5-day period following placement of the chip seal. If because of high temperatures or other causes there is dislodgement of cover aggregate, sweepings shall be discontinued

until such time as there will be satisfactory retention of cover aggregate. Final sweeping shall be done and all loose aggregate shall be removed prior to acceptance.

Within 24 hours after placement, the Contractor shall also start removing loose aggregate from parkways, sidewalks, and intersecting streets. Both operations shall continue until all excess or loose aggregate is removed from the roadway surface and abutting right-of-way. The aggregate shall be disposed of by the Contractor at no cost to the Agency.

The sweeping operations shall be accomplished without the use of gutter brooms or steel-tined brooms unless approved by the Engineer.

Blotter material, either fine screenings or concrete sand, may be required immediately after the initial pass if the rollers or after sweeping and opening to traffic so as to prevent bleeding and pickup of the aggregate.

The completed surface shall present a uniform appearance and shall be thoroughly compacted, and free from ruts, humps, depressions, or irregularities due to an uneven distribution of emulsified asphalt or screenings.

302-2.7 Weightmaster Certificates. The Contractor shall supply the Engineer with licensed weightmaster's certificates of weight for all materials delivered to the job during the course of each day. Materials so certified as being delivered for use in the Contract shall also present weightmaster's certificates for the amount of such material remaining unused at the completion of the work at no cost to the Agency. Payment will be determined by deducting the amount of unused material from the total amount of materials delivered, all as shown on the licensed weightmaster's certificates. The certificates shall be presented to the Engineer at the time of delivery.

302-2.8 Measurement and Payment. Emulsified asphalt and screenings will be paid per square yard. Such price shall include full compensation for specified surface preparation, removals, sweeping, and sanding if necessary, and for doing all the work involved in construction the chip seal complete in place.