

SECTION 2625

ASPHALT CHIP SEAL

PART 1 - GENERAL

1.1 Description

A. Description of Work

The chip seal work to be performed in accordance with this section includes the application of bituminous material, followed by the application of a cover material.

The **CONTRACTOR** shall provide the necessary, labor, equipment and materials to complete the chip sealing of those roadways described in the Contract Documents, in accordance with these Specifications, as specified in Special Provisions, and/or as directed by the City **ENGINEER**. All work shall be in accordance with Section 404 of the Arizona Department of Transportation Standard Specifications for Road and Bridge Construction, Edition of 1990 and supplemental Specifications, and all recent revisions to the same.

1.2 Quality Assurance

A. Reference Test Standards and Specifications

ASTM D977, Emulsified Asphalt
ASTM D2397, Cationic Emulsified Asphalt
ASTM D5546,94a, Polymer-Modified Asphalt Materials

1.3 Submittals

A. Certificates of Compliance

1. Bituminous Prime Coat
2. Bituminous Tack Coat

B. Suppliers' Recommendation

1. Mix Design
2. Type and Grade of Bituminous Prime Coat
3. Type and Grade of Bituminous Tack Coat
4. Application Temperature, Dilution Recommendations

1.4 Product Delivery Storage and Handling

Take all precautions in handling, storing and applying emulsified asphalt so as not to

damage the product or damage the environment.

PART 2 - MATERIALS

2.1 Asphalt Chip Seal

A. Surface Preparation

Prior to placement, the **CONTRACTOR** will clean the pavement. Each particular street must be cleaned not more than twenty-four (24) hours in advance of the chip seal being applied.

B. Bituminous Materials

CRS-2 - Bituminous material shall conform to the requirements of MAG Standard Specification for Emulsified Asphalt, Section 713 and Table 713-1 for Type CRS-2 emulsion undiluted with the following Exception:

Test on Residue from Distillation test: Penetration Min / Max of 40-50

CRS-2P - The amount of polymer added to CRS-2 shall be 3% by weight of the finished emulsion (solid or latex). Latex modified systems shall be “co-milled” not “post-milled” to the finish emulsion.

Torsional Recovery %	CTM 332	18 Min.
or		
Polymer Content %	CTM 401	2.5 Min

C. Cover Material

Aggregate for cover material shall be of clean sand, gravel or crushed rock and shall be free from lumps or balls of clay and shall not contain calcareous or clay coatings, caliche, synthetic materials, organic matter or foreign substances.

All aggregates must be washed prior to gradation.

The grading shall meet the following requirements when tested in accordance with the requirements of Arizona Test Method 201.

Sieve Size	Percent Passing
3/8 inch	100
No. 4	0-25
No. 8	0-5
No. 200	0-1.0

A representative portion of the coarse material will be taken and tested.

The loss on abrasion will be determined in accordance with the requirements of AASHTO T96 and shall meet the following requirements:

Maximum loss of 9% percent at 100 revolutions.

Maximum loss of 40% percent at 500 revolutions.

The percent of carbonates in aggregate shall be a maximum of 30 when tested in accordance with the requirements of Arizona Test Method 238.

The percent of crushed faces shall be at least 70 when tested in accordance with the requirements of Arizona Test Method 212.

The Flakiness Index shall be a maximum of 25 when tested in accordance with the requirements of Arizona Test Method 233.

The Bulk Specific Gravity shall range from 2.30 to 2.85 when tested in accordance with the requirements of Arizona Test Method 211.

D. Rate of Application

1. The rate of application for the bituminous material shall be approximately 0.4 gallons per square yard or as determined by the **ENGINEER**.
2. The rate of application for the cover material shall be approximately 24 pounds per square yard or as determined by the **ENGINEER**.

E. Application Temperatures

At the time of application, the temperature of the bituminous material shall be between 125° degrees and 185° degrees Fahrenheit.

PART 3 - EXECUTION

3.1 Preliminary Investigation of the Work

Verify all preliminary work has been performed in accordance with the Plans and Specifications prior to application of asphalt chip seals.

3.2 Time of Application

Chip seal shall not be applied for at least seven (7) days after completion of new bituminous paving.

No asphalt chip seals shall be placed between the dates of November 1st through April 1st and between July 1st through August 31st, unless otherwise approved by the **ENGINEER**.

3.3 Weather Limitations

The chip seal shall be placed only when the roadway surface is dry and there is no imminent threat of rain. The roadway surface temperature must be at least 85° degrees Fahrenheit and rising, with air temperature at least 65° degrees Fahrenheit and rising.

3.4 Notification

Written notice of the approximate schedule and explanation of the work shall be given to each resident, homeowner, business or school at least five (5) days prior to the commencement of work in that area and again one (1) day prior to the work beginning. A copy of the notice must be provided to the **Engineer** for approval.

Business must be notified forty-eight (48) hours prior to any restrictions on normal parking areas used by their employees or patrons.

3.5 Temporary Pavement Markers

Temporary pavement markers conforming to ADOT Standard Drawing 4-M-2.05 or equal shall be provided by the **Contractor** for placement on streets indicated in the Special Provisions or as indicated by the **Engineer**. The **Contractor** will be responsible for placing the markers prior to the chip seal being placed. Immediately after the application of the chip seal coat, the plastic covers will be removed exposing the reflective tape surface.

3.6 Asphalt Chip Seal Application

A. Preparation of Surfaces

Immediately before applying the bituminous material, the area to be surfaced shall be cleaned of dirt and other objectionable material by the **CONTRACTOR**.

In urban areas, the surface shall be cleaned with a self-propelled pick-up sweeper. In rural areas, power brooms may be used. When necessary, cleaning shall be supplemented by hand brooms.

All manhole and valve covers, drop inlets, and other service entrances, etc. Shall be protected from the bituminous material by placing reinforced, waterproof, all-purpose paper or other suitable material, approved by the Engineer. The paper shall be held in place with spray glue and marked with a temporary pavement marker. The protection will be within forty-eight (48)

hours after the chip seal has been applied and covers will be in acceptable operating condition.

All raised pavement markers will be removed by the **CONTRACTOR** prior to the bituminous material being applied, and disposed of in an approved manner.

The bituminous material shall not be applied until an inspection of the surface has been made by the **ENGINEER** and he has determined that it is suitable.

B. Application of Bituminous Material

The bituminous material shall be applied as soon as possible after preparation of surfaces. At the time of application, temperatures of the asphalt shall be within the ranges specified. The **ENGINEER** may require a specific temperature within the ranges. Apply bituminous material at the rate specified.

The bituminous material shall be placed using a distributor as specified. Application methods shall ensure that a uniform distribution is obtained over the area to the sealed.

The chips shall be spread before the bituminous material sets. The maximum distance that the bituminous material is applied in advance of the chips will be determined by the **ENGINEER**.

The surfaces of structures, trees, and shrubbery adjacent to the area being seal coated shall be protected in such a manner as to prevent their being spattered with bituminous material or marred. The **CONTRACTOR** shall be responsible for all damage to such structures or landscaping.

C. Application of Cover Material

Immediately following the application of the bituminous material, the chips shall be spread with a self-propelled mechanical spreader. The chip spreading equipment shall be capable of applying a uniform application of cover material. The self-propelled requirement may be waived for projects under 10,000 square yards.

At the time of application, pre-coated aggregate shall be within the temperature range of 250° degrees Fahrenheit and 350° degrees Fahrenheit measured at a point 6 to 12 inches below the top of the load.

At the time of application, uncoated aggregate shall not contain moisture in excess of a saturated, surface dry condition when liquid or paving grade asphalt are used as the seal coat binder.

The application rate for cover material shall be as specified.

When so directed by the **ENGINEER** and within forty-eight (48) hours after application of the pre-coated chips, all chipped surfaces on major streets shall receive a fog seal. The exact rate of application shall be as directed by the **ENGINEER**.

3.7 Rolling

Immediately following the application of the cover material, the surface shall be rolled with self-propelled pneumatic-tired rollers. Three coverages shall be made with a pneumatic roller. Each roller shall carry a minimum of 2,000 pounds on each wheel and a minimum of 60 psi in each tire. The roller shall not travel in excess of 12 miles per hour. A minimum of three (3) self-propelled pneumatic rollers shall be required for projects over 10,000 square yards, one (1) roller may be used provided it performs the same number of coverages.

3.8 Joints

All joints shall be constructed as approved by the **ENGINEER** such that there be a uniform application of cover material and bituminous material.

3.9 Surplus Aggregate Removal

Surplus aggregate will be removed from the surface area by the **CONTRACTOR** within twenty-four (24) hours of application using self-propelled pick-up type sweepers. Surplus aggregate will be stockpiled at designated storage locations and/or properly disposed of. In no event will surplus aggregate be left on the pavement for more than one day (24 hours). All stray and scattered chips will be removed from intersections, adjacent sidewalks and driveways by the Contractor in a timely manner or as directed by the Engineer. All newly resurfaced streets will require another full sweeping within one (1) week of the chip seal application with pick-up type sweepers. The Contractor will sweep each street until all loose aggregate has been removed.

3.10 Distributing Equipment

Distributor trucks shall be of the pressure type with insulated tanks. Gravity distributors will not be permitted.

Spray bars and extensions shall be of the full circulating type. The spray bar shall be adjustable to permit varying height above the surface to be treated.

The nozzle spacings, center to center, shall not exceed 6 inches. The valves shall be operated so that one or all valves may be quickly opened or closed in one operation. The valves which control the flow from the nozzles shall be of a positive acting design so as to provide a uniform, unbroken spread of bituminous material on the surface.

The distributor shall be equipped with devices and charts to provide for accurate, rapid determination and control of the amount of bituminous material being applied. The distributor shall be equipped with a tachometer of the auxiliary wheel type registering speed in feet per minute. The distributor shall also be equipped with pressure gauges and an accurate thermometer for determination of the temperature of bituminous material. The spreading equipment shall be designed so that the uniform application of a bituminous material can be applied in controlled amounts ranging from 0.05 to 2.0 gallons per square yard. Transverse variation rate shall not exceed ten (10%) percent of the specified application rate. The distributor shall be equipped with a hose and nozzle attachment to be used for spotting skipped areas and areas inaccessible to the distributor. Distributor and booster tanks shall be maintained as to prevent dripping of bituminous material from any part of the equipment.

3.11 Traffic

A. Traffic Control

Traffic will not be permitted on the surface until the cover aggregate has set. Traffic control shall be in accordance with Section 2650.

B. Speed Limits

When using paving grade or liquid grade asphalt chip seal, the speed limit must be maintained at 15 mph for all equipment and traffic until the cover material is swept.

C. Seal Coats

When using emulsified asphalt chip seals, only emergency or local access traffic will be allowed until the seal coat has had time to set.

D. Warning Signs

"Loose Gravel" and "15 mph" signs shall be provided by the **CONTRACTOR** at each end of each street being worked on. Longer streets may require additional signs at all locations designated by the City **ENGINEER** or his authorized representative. Permanent speed signs must be bagged or covered while "15" mph signs are in place. All construction warning signs shall remain in place until all of the surplus aggregate has been removed.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Measurement

- A.** The quantity of Equipment and Crew Services to be paid for will be determined by the number of square yards of material placed by the contractor and accepted by the OWNER as complying with specifications.
- B.** The quantity of CRS-2P Oil to be paid for will be determined by the number of Tons of material applied and accepted by the owner as complying with the drawings and specifications. The quantity shall be based on plan dimensions.

4.2 Payment

- A.** Payment for the Equipment and Crew Services shall be at the contract unit price per square yard. The price per square yard shall be full compensation for the preparation of the surface, furnishing, delivering, applying the CRS-2P and cover material, rolling, loose chip removal, hauling, final sweeping, and for all labor and incidentals necessary to complete the work as specified herein.
- B.** Payment for CRS-2P Oil will be at the contract unit price per Ton. The price per ton shall be full compensation for supplying the CRS-2P oil including labor and equipment necessary for the application as specified herein.

See Section 00310 Bid Schedule for Bid Item