

ALABAMA DEPARTMENT OF TRANSPORTATION

General Application Special Provision

DATE: May 8, 2024

GASP No. 22-GA0039

EFFECTIVE DATE: August 1, 2024

SUBJECT: Scrub Seal.

Alabama Standard Specifications, 2022 Edition, SECTION 433 shall be replaced by the following:

SECTION 433 SCRUB SEAL

433.01 Description.

This Section covers the placement of a polymer modified asphalt rejuvenating scrub seal.

433.02 Materials.

All materials shall comply with the requirements of Division 800, Materials, except as noted herein. Special reference is made to the following:

(a) Emulsion.

Sources for scrub seal shall meet the requirements given in Article 804.01 and the requirements given in AASHTO M 345-22 Section 5 including 5.1 through 5.5.9. and all tables therein.

AASHTO M345 shall be amended as follows:

- There shall be no requirement for Demulsibility.
- The requirement for Residue by distillation shall be 60% minimum

Where AASHTO M 345-22 Table 1 gives options for alternate tests the following shall be used:

- Viscosity, Saybolt Furol, 50°C (122°F), s
- Penetration, 4°C (39°F), 200g, 60 s, 0.1mm
- T 350 Percent Recovery at 0.1 kPa, 52°C (126°F), %
- T 350 J_{nr} at 3.2 kPa, 52°C (126°F), kPa-1

The emulsion manufacturer shall submit certification that the emulsion meets the specification. The manufacturer of the recycling agent, through the emulsion supplier and the contractor, shall submit the test results for the recycling agent and certification that the recycling agent meets the required specifications.

Laboratories performing testing on emulsion or rejuvenator must be accredited for the test procedures they perform. Certifications and test results for the emulsion and the recycling agent shall be submitted to the Materials and Tests Engineer and approved prior to starting the work.

(b) Aggregate.

The aggregate shall be an ALDOT Size No. 89 or No. 89 Modified in accordance with the material requirements for bituminous surface treatments given in Section 801 and the modified No. 89 gradation below:

Sieve % Passing	
1/2"	100
3/8"	90-100
#4	20-55
#8	0-15
#16	0-10
#50	0-5

433.03 Construction Requirements.

(a) Placement Rates.

The placement rate for the emulsion shall be from 0.25 to 0.35 gallons per square yard. The Engineer will require that the placement rate be adjusted up or down as necessary to fill the cracks in the roadway while achieving approximately 60-70% aggregate embedment after rolling.

The placement rate for the aggregate shall be from 18 to 25 pounds per square yard. The Engineer will require that the placement rate be adjusted so that no bleed through occurs during rolling.

(b) Temperature Limitations.

The scrub seal shall only be placed when the ambient and pavement temperatures are above 50 °F (10 °C) and rising but below a pavement surface temperature of 140 °F (60 °C). The emulsion shall not be placed if there are freezing conditions forecast for 72 hours after placement.

(c) Surface Preparation.

The area to be covered shall be dry to damp with no standing water and cleaned of dirt, vegetation, and dust and other deleterious materials prior to the application of the surfacing.

On pavements where the scrub seal is to be the final layer, the Contractor shall remove all existing thermoplastic striping, markings, and legends flush with the surface within the scrub seal limits prior to the scrub seal operation. If a subsequent surface treatment or pavement layer will be placed over the scrub seal, removal of the existing thermoplastic may not be required.

Prior to the scrub seal operation, the Contractor shall remove all raised pavement markers including any excessive adhesive left on the pavement caused from the removal of raised pavement markers.

Prior to the scrub seal operation, all drain inlet covers, monument covers, and all other utility covers shall be protected from the Contractor's scrub seal operations by applying a sheet of plastic over the exposed facilities, or other methods approved by the Engineer.

(d) Blank.

(e) Equipment.

1. Asphalt Distributor.

An asphalt distributor shall be furnished for the application of the asphalt emulsion. The distributor shall have a full circulating spray bar that is adjustable to at least 16 feet wide in two foot increments and is capable of heating and circulating the emulsion simultaneously. It shall have computerized rate control for adjusting and controlling the application from the cab. The rate shall be adjustable by .01 gallons per square yard increments. The distributor shall also be equipped with a volume measuring device and a thermometer for measuring the emulsion temperature in the tank.

2. Emulsion Broom.

The emulsion broom sled frame shall be constructed of metal. The emulsion broom sled shall be attached to and pulled by the distributor truck. The emulsion broom sled must be equipped with a means of raising and lowering the emulsion broom sled at desired points. It shall be towable in the elevated position. The broom sled assembly shall be adjustable so that it does not squeegee the emulsion off the roadway surface or outside the framework of the broom sled.

The main body of the emulsion broom sled shall have a minimum frame size of 6.5 feet wide and 10 feet long. The maximum transverse rigid frame width at any point shall not exceed 6.75 feet. The nearest and furthest members, paralleling the back of the spreader truck, and diagonal members shall be equipped with street brooms. The leading member and the trailing member shall have brooms heads angled at 10 to 15 degrees off the centerline of the supporting member. The diagonal members shall have broom heads attached in line with the centerline of the supporting member. Each individual street broom attached to the emulsion broom sled assembly shall be 3.5 inches wide x 6.5 inches high x 16 inches long and have stiff nylon bristles. Bristle height is to be maintained at a minimum of five inches (5"). The emulsion broom shall be equipped with hinged wing assemblies attached to the main body not to exceed 4.5 feet per side, with diagonals and equipped with street brooms. The purpose of the maximum rigid frame width and the hinged wing extensions is not only for maximum width of 16 feet but to maintain the scrubbing process evenly as contours and cross-sections change across the existing road surface.

3. Aggregate Spreader.

A self-propelled spreader with computerized rate control shall be used to spread the aggregate. The spreader shall have front discharge and shall be capable of evenly distributing the aggregate at the required placement rates.

4. Rollers.

Two pneumatic tire rollers shall be used to seat the aggregate into the emulsion. The rollers shall be self-propelled. The minimum total weight of each roller shall be 5 tons.

5. Aggregate Removal Equipment.

A mechanically powered pick-broom shall be furnished with a vacuum for the removal of excess aggregate.

(f) Material Application.

The emulsion broom shall be attached to and be pulled behind the emulsion distributor immediately after the application of the emulsion. All cracks in the pavement shall be filled by emulsion by the movement of the weighted emulsion broom through the emulsion.

The aggregate shall be dry during spreading. The aggregate shall be evenly spread over the scrubbed emulsion.

The seal should be rolled immediately after the aggregate is applied. There shall be at least three passes made with a pneumatic roller.

The scrub seal system shall be stiff enough to allow removal of excess aggregate without damage to the pavement surface. The excess aggregate shall be removed with the vacuum broom within two hours of rolling or as directed by the Engineer.

The roadway shall not be opened to traffic until at least two hours after the completion of the placement of the emulsion and aggregate and the sweeping operation completed. The Engineer may require a second power sweeping to remove any loose aggregate. Excess aggregate shall be removed from the project unless otherwise approved by the Engineer.

For inner layer applications the scrub seal shall be sufficiently cured prior to placing a bituminous overlay, micro-surfacing, or other asphalt surface treatments. The Engineer will require a second power sweeping of the scrub seal surface at least 72 hours after completion of the placement of the emulsion and aggregate to determine the status of the scrub seal being cured. For instances where the scrub seal is to be placed beneath hot mix asphalt of 134 lb/sy or less, the curing period shall be raised from 72 hours to at least 7 days. The ability to sweep all loose aggregate from the surface without removing any aggregate adhered to the bituminous emulsion shall determine that the scrub seal is cured.

Longitudinal joints shall not overlap. The longitudinal construction joint shall coincide with the painted lane line or at the outside edge of shoulder.

(g) Sampling.

A minimum of one daily sample of the aggregate will be taken from the application vehicle and tested for gradation. If the average test results vary from the gradation requirements, production shall stop. The Contractor shall identify the cause and document in detail what corrective action was taken. Documentation of the corrective action shall be furnished to the Engineer before placement will be allowed.

(h) Acceptance.

The Contractor shall be responsible for the maintenance of the surface treatment until the work is accepted by the Engineer. Damage or loss of aggregate in the surface exceeding 2 % of the surface area in any 500-foot-long section shall be repaired by use of additional emulsion and aggregate. All bleeding (excess asphalt) surfaces shall be covered with additional concrete sand in such a manner that the asphaltic material will not adhere to or be picked up by the wheels of vehicles.

If in the Engineer's judgment, defective areas warrant removal, the Contractor shall remove and replace those areas at the Contractor's expense with materials meeting specification requirements.

433.04 Method of Measurement.

Scrub seal will be measured in units of square yards.

433.05 Basis of Payment.

(a) Unit Price Coverage.

The unit price of the scrub seal shall be full compensation for all materials, equipment, tools, and labor required for furnishing and placing the scrub seal, for removing and disposing of raised pavement markers, and for post-sweeping. If removal of thermoplastic striping, markings, or legends is required, it will be paid for under Item 701D or Item 703C.

(b) Payment will be made under Item No.:

433-A Scrub Seal - per square yard