

**SPECIAL SPECIFICATION****3278****Seal Coat**

1. **Description.** Construct a surface treatment consisting of 1 or more applications of a single layer of asphalt material covered with a single layer of aggregate.
2. **Materials.** Furnish materials of the type and grade shown on the plans in accordance with the following:

**A. Asphalt.**

Furnish asphalt materials meeting the requirements of Item 300, "Asphalts, Oils, and Emulsions."

Furnish Type II or Type III A-R binder in accordance with Section 300.2.I, "Asphalt-Rubber Binders," as shown on the plans. Furnish a blend design for approval. Include in the design, at a minimum, the following:

- manufacturer and grade of asphalt cement;
- manufacturer and grade of crumb rubber;
- manufacturer, type, and percentage of extender oil, if used;
- test report on crumb rubber gradation in accordance with Tex-200-F, Part I;
- design percentage of crumb rubber versus asphalt content;
- blending temperature; and
- test results on the properties at reaction times of 60, 90, 240, 360, and 1,440 min. in accordance with Section 300.2.I, "Asphalt-Rubber Binders."

Furnish a new asphalt-rubber blend design if the grade or source for any of the components changes.

If a tack coat is specified when using asphalt-rubber, unless otherwise shown on the plans or approved, furnish CSS-1H, SS-1H, or a performance grade (PG) binder with a minimum high temperature grade of PG 58 for tack coat binder. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use. If required, verify that emulsified asphalt proposed for use meets the minimum residual asphalt percentage specified in Item 300.

- B. Aggregate.** Furnish aggregate meeting Item 302, "Aggregates for Surface Treatments," of the type and grade shown on plans. For final surfaces, unless otherwise shown on the plans, furnish aggregate with a minimum B surface aggregate classification.
  - C. Materials Selections.** Furnish asphalt and aggregate according to the alternates selected in the Seal Coat Material Selection Tables as shown in the plans.
3. **Equipment.**

- A. Distributor.** Furnish a distributor that will apply the asphalt material uniformly at the specified rate or as directed.
- 1. Transverse Variance Rate.** When a transverse variance rate is shown on the plans, ensure that the nozzles outside the wheel paths will output a predetermined percentage more of asphalt material by volume than the nozzles over the wheel paths.
  - 2. Agitation for Asphalt-Rubber.** If using asphalt-rubber, furnish a distributor capable of keeping the rubber in uniform suspension and adequately mixing the asphalt, rubber, and any additional additives.
  - 3. Calibration.**
    - a. Transverse Distribution.** Furnish a distributor test report, no more than 1 yr. old, when tested in accordance with Tex-922-K, Part III. The Department reserves the right to witness the calibration testing. Notify the Engineer three (3) days prior to calibration testing.

Include the following documentation on the test report:

      - the serial number of the distributor,
      - a method that identifies the actual nozzle set used in the test, and
      - the fan width of the nozzle set at a 12-in. bar height.

When a transverse variance rate is required, perform the test using the type and grade of asphalt material to be used on the project. The Engineer may verify the transverse rate and distribution at any time. If verification does not meet the requirements, correct deficiencies and furnish a new test report.
    - b. Tank Volume.** Furnish a volumetric calibration and strap stick for the distributor tank in accordance with Tex-922-K, Part I.

Calibrate the distributor within the previous 5 yr. of the date first used on the project. The Engineer may verify calibration accuracy in accordance with Tex-922-K, Part II.
- B. Aggregate Spreader.** Use a continuous-feed, self-propelled spreader to apply aggregate uniformly at the specified rate or as directed. If raked in aggregate is specified in the plans, furnish a second aggregate spreader for the raked in aggregate to apply aggregate uniformly at the specified rate.
- C. Rollers.** Unless otherwise shown on the plans, furnish light pneumatic-tire rollers in accordance with Item 210, "Rolling."
- D. Broom.** Furnish rotary, self-propelled brooms.
- E. Asphalt Storage and Handling Equipment.** When the plans or the Engineer allows storage tanks, furnish a thermometer in each tank to indicate the asphalt temperature continuously. Keep equipment clean and free of leaks. Keep asphalt material free of contamination.

- F. **Aggregate Haul Trucks.** Unless otherwise authorized, use trucks of uniform capacity to deliver the aggregate. Provide documentation showing measurements and calculation in cubic yards. Clearly mark the calibrated level. Truck size may be limited when shown on the plans.
- G. **Digital Measuring Instrument.** Furnish a vehicle with a calibrated digital-measuring instrument accurate to  $\pm 6$  ft. per mile.
- H. **Water Truck.** The contractor shall have available a water truck, The water truck will be paid for by force account by the day as needed. The daily price of the water truck shall include the water supplied.

#### 4. Construction.

- A. **General.** Comply with the seal coat season as stated in the plans. Asphalt and aggregate rates shown on the plans are for estimating purposes only. The Engineer will adjust the rates for the existing conditions.
- B. **Temporary Aggregate Stockpiles.** The Engineer will approve the location of temporary aggregate stockpiles on the right of way before delivery. Place stockpiles in a manner that will not:
  - obstruct traffic or sight distance,
  - interfere with the access from abutting property, or
  - interfere with roadway drainage.

Locate stockpiles a minimum of 30 ft. from roadway when possible. Sign and barricade as shown on the plans.

- C. **Aggregate Furnished by the Department.** When shown on the plans, the Department will furnish aggregate to the Contractor without cost. Stockpile locations are shown on the plans.
- D. **Adverse Weather Conditions.** Do not place surface treatments when, in the Engineer's opinion, general weather conditions are unsuitable. Meet the requirements for air and surface temperature shown below.
  - 1. **Standard Temperature Limitations.** Apply surface treatment when air temperature is above 50°F and rising. Do not apply surface treatment when air temperature is 60°F and falling. In all cases, do not apply surface treatment when surface temperature is below 60°F.
  - 2. **Polymer-Modified Asphalt Cement Temperature Limitations.** When using materials described in Section 300.2.B, "Polymer Modified Asphalt Cement," apply surface treatment when air temperature is above 70°F and rising. Do not apply surface treatment when air temperature is 80°F and falling. In all cases, do not apply surface treatment when surface temperature is below 70°F.

3. **Asphalt-Rubber Temperature Limitations.** Do not place hot asphalt-rubber surface treatment when, in the Engineer's opinion, general weather conditions are unsuitable. Apply surface treatment when the air temperature is 80°F and above, or above 70°F and rising. In all cases, do not apply surface treatment when surface temperature is below 70°F.
  4. **Cool Weather Night Air Temperature.** The Engineer reserves the right to review the National Oceanic and Atmospheric Administration (NOAA) weather forecast and determine if the nightly air temperature is suitable for asphalt placement to prevent aggregate loss.
  5. **Cold Weather Surface Treatments.** When asphalt application is allowed outside of the above temperature restrictions, the Engineer will approve the binder grade and the air and surface temperatures for asphalt material application. Apply surface treatment at air and surface temperatures as directed.
  6. **Hurricane Warning & Excavation Routes.** The Engineer will issue an order to cease removal of raised pavement markers and seal coat operations. This order can be up to 48 hours prior to the state order to ensure all sections of roadways have been inspected for Barricades, Signs, work zone tabs and pavement markings.
- E. Mixing Hot A-R Binder.** If using asphalt-rubber, mix in accordance with the approved blend design required in Section 318.2.A.

At the end of each shift, provide the Engineer with production documentation, which includes the following:

- amount and temperature of asphalt cement before addition of rubber,
  - amount of rubber and any extender added,
  - viscosity of each hot A-R batch just before roadway placement, and
  - time of the rubber additions and viscosity tests.
- F. Surface Preparation.** Remove existing raised pavement markers. Repair any damage incurred by removal as directed. Remove dirt, dust, or other harmful material before sealing. When shown on the plans, remove vegetation and blade pavement edges. When directed by the Engineer, apply a tack coat before applying the hot asphalt-rubber treatment on an existing wearing surface in accordance with Section 340.2.E, "Tack Coat."
- G. Rock Land and Shot.**
1. **Definitions.**
    - A "rock land" is the area covered at the aggregate rate directed with 1 truckload of aggregate.
    - A "shot" is the area covered by 1 distributor load of asphalt material.
  2. **Setting Lengths.** Calculate the lengths of both rock land and shot. Adjust shot length to be an even multiple of the rock land. Verify that the distributor has enough asphalt material to complete the entire shot length. Mark shot length before applying asphalt. When directed, mark length of each rock land to verify the aggregate rate.

3. **Adjustment to shot length.** The contractor shall adhere to Item 502 and Item 510, if the contractor does not have sufficient flaggers to handle traffic per Item 502 and 510 the shot length shall be re-calculated based the number of entry points and available flaggers to handle traffic per Item 502 and Item 510.

#### **H. Asphalt Placement.**

1. **General.** The maximum shot width is the width of the current transverse distribution test required under Section 316.3.A.2, "Transverse Distribution," or the width of the aggregate spreader box, whichever is less. Adjust the shot width so operations do not encroach on traffic or interfere with the traffic control plan, as directed. Use paper or other approved material at the beginning and end of each shot to construct a straight transverse joint and to prevent overlapping of the asphalt. Unless otherwise approved, match longitudinal joints with the lane lines. The Engineer may require a string line if necessary to keep joints straight with no overlapping. Use sufficient pressure to flare the nozzles fully.

Select an application temperature, as approved, in accordance with Item 300, "Asphalts, Oils, and Emulsions." Uniformly apply the asphalt material at the rate directed, within 15°F of the approved temperature, and not above the maximum allowable temperature.

2. **Limitations.** Do not apply asphalt to the roadway until:
  - traffic control methods and devices are in place as shown on the plans or as directed,
  - the loaded aggregate spreader is in position and ready to begin,
  - haul trucks are loaded with enough aggregate to cover the shot area, and
  - haul trucks are in place behind the spreader box.
3. **Nonuniform Application.** Stop application if it is not uniform due to streaking, ridging, puddling, or flowing off the roadway surface. Verify equipment condition, operating procedures, application temperature, and material properties. Determine and correct the cause of nonuniform application. If the cause is high or low emulsion viscosity, replace emulsion with material that corrects the problem.
4. **Test Strips.** The Engineer may stop asphalt application and require construction of test strips at the Contractor's expense if any of the following occurs:
  - nonuniformity of application continues after corrective action;
  - on 3 consecutive shots, application rate differs by more than 0.03 gal. per square yard from the rate directed; or
  - any shot differs by more than 0.05 gal. per square yard from the rate directed.

The Engineer will approve the test strip location. The Engineer may require additional test strips until surface treatment application meets specification requirements.

- I. **Aggregate Placement.** As soon as possible, apply aggregate uniformly at the rate directed without causing the rock to roll over.

**J. Rolling.** Start rolling operation on each shot as soon as aggregate is applied. Use sufficient rollers to cover the entire mat width in 1 pass, i.e., 1 direction. Roll in a staggered pattern. Unless otherwise shown on the plans, make a minimum of:

- 5 passes or
- 3 passes when the asphalt material is an emulsion.

If rollers are unable to keep up with the spreader box, stop application until rollers have caught up, or furnish additional rollers. Keep roller tires asphalt-free.

**K. Patching.** Before rolling, repair spots where coverage is incomplete. Repair can be made by hand spotting or other approved method. When necessary, apply additional asphalt material to embed aggregate.

**L. RACK in Aggregate.** If specified in the plans, apply racked in aggregate after patching, uniformly at the rate directed. The racked in aggregate shall be applied prior to opening the roadway or intersection to traffic.

**M. Brooming.** After rolling, sweep as soon as aggregate has sufficiently bonded to remove excess. In areas of rack in aggregate sweep as directed.

**N. Final Acceptance.** Maintain surface treatment until the District Construction Engineer accepts the work. Repair any surface failures. Before final project acceptance, remove all temporary stockpiles and restore the area to the original contour and grade.

## 5. Measurement.

**A. Asphalt Material.** Asphalt material, including all components, will be measured at the applied temperature by strapping the tank before and after road application. The distributor calibrated strap stick will be used for measuring the asphalt level in the distributor asphalt tank. The certified tank chart will be used to determine the beginning gallons and the final gallons in the distributor tank. Gross asphalt gallons are the difference between the beginning gallons and the final gallons.

The volume of asphalt in gallons for payment will be determined as follows:

1. **AC Asphalts.** The net payment gallons will be the gross asphalt gallons.
2. **Emulsion Asphalts.** The net payment gallons will be the gross asphalt gallons.

The Engineer shall take random project samples of the emulsion to verify the emulsion meets specifications requirements.

3. **A-R BINDER Asphalts.** The net asphalt gallons for payment will be determined by multiplying the gross asphalt gallons by the AC / A-R Asphalt Ratio.

The AC / A-R Asphalt Ratio will be stated in the General Notes – Basis of Estimate.

**B. Aggregate.** Aggregate will be measured by the cubic yard in the trucks as applied on the road. The Engineer may require loaded aggregate to be struck off for accurate measurement.

- C. Loading, Hauling, and Distributing Aggregate.** When the Department furnishes the aggregate, the loading, hauling, and distributing will be measured by the cubic yard in the trucks as applied on the road.
- 6. Payment.** The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit prices bid for Asphalt as specified in the Surface Treatment Material Selection Tier Table as shown in the plans and “Loading, Hauling, and Distributing Aggregate” for various locations shown on the plans. These prices are full compensation for surface preparation; furnishing, preparing, hauling, and placing materials; removing existing pavement markers and excess aggregate; rolling; cleaning up stockpiles; and equipment, labor, tools, and incidentals.