

Section 660

Heat and apply the sealant material according to the manufacturer's recommendations. Use a portable melting kettle for heating the material that is equipped with indirect heating (air-jacketed flow) and is capable of constantly agitating the joint sealer to maintain a uniform temperature. Equip the kettle with either mechanically operated paddles and/or a continuous circulating pump to maintain agitation. Use heating equipment capable of controlling the sealant material temperature within the manufacturer's recommended temperature range and that is thermostatically-control calibrated between 200°F to 600°F. Locate a thermometer on the kettle so the Engineer can safely check the temperature of the sealant material. Overheating of the sealant material will not be permitted.

Apply sealant in the prepared cracks and joints within the manufacturer's recommended temperature range, using a pressure screed shoe to completely fill the crack or joint, leaving a sealed 2 inch overband. Excessive overbanding or waste of sealant materials will not be tolerated. Immediately squeegee the crack seal material to minimize the height of the overband. All sealed cracks and joints shall have a minimum of 1/8 inch depth of sealant installed.

Do not apply the hot applied joint sealer when the surface temperature of the pavement is below 32°F. Follow manufacturer's recommendations.

After the crack or joint has been sealed, promptly remove any surplus sealer on the pavement. Do not permit traffic over the sealed cracks and joints without approval by the Engineer. When approved by the Engineer, place sand or other approved material over the crack or joint to prevent tracking.

657-4 MEASUREMENT AND PAYMENT

Sealing existing pavement cracks and joints will be measured and paid as the actual number of pounds of material that has satisfactorily been used to seal pavement cracks and joints in the designated highway. Any material spilled, used in excessive overbanding, wasted, misapplied or unsatisfactorily used in any way will be deducted in determining quantities for payment. The Engineer will determine the quantity, if any, to be deducted. The Engineer's decision on the quantity to be deducted will be final and binding.

Payment will be made under:

Pay Item	Pay Unit
Sealing Existing Pavement Cracks and Joints	Pound

SECTION 660 ASPHALT SURFACE TREATMENT

660-1 DESCRIPTION

Perform the work covered by this section including, but not limited to, furnishing, hauling, spreading and rolling the emulsion and aggregate consisting of one or more applications of liquid asphalt material and one or more applications of aggregate cover coat material on a prepared surface; and maintaining and repairing the asphalt surface treatment (AST).

660-2 MATERIALS

Refer to Division 10.

Item	Section
Aggregates for Asphalt Surface Treatment	1012-2
Emulsified Asphalt, Grade CRS-2L	1020-3
Emulsified Asphalt, Grade CRS-2P	1020-3
Fine Aggregate	1014-1
Mineral Filler	1012-1(D)
Water	1024-4

Before any asphalt surface treatment is placed, obtain from the asphalt supplier and furnish to the Engineer a Certification of Compatibility of the emulsion with the aggregate proposed for use.

660-3 WEATHER AND SEASONAL LIMITATIONS

Do not place any asphalt surface treatment between October 15 and April 1, except for asphalt surface treatment that is to be overlaid immediately with asphalt plant mix.

Apply AST only when the surface to be treated is dry and when the air or surface temperatures, measured at the location of the AST operation away from artificial heat, is 50°F and rising. Do not place AST when air temperature is 98°F and rising.

When placing AST that is to be immediately overlaid with asphalt plant mix, the seasonal and temperature limitations of Article 610-4 shall apply.

Do not apply asphalt material when the weather is foggy or rainy.

660-4 SURFACE PREPARATION

Clean the surface to be treated of dust, dirt, clay, grass, and any other deleterious matter before application of the AST.

660-5 ACCEPTANCE OF ASPHALT MATERIALS

The acceptance of asphalt materials will be in accordance with Article 1020-1.

660-6 APPLICATION EQUIPMENT

Use asphalt application equipment that meets Article 600-5.

Apply aggregate by the use of a self-propelled, pneumatic-tire aggregate spreader capable of maintaining a specified rate with a uniform application for the width of asphalt material being covered. Tailgate spreaders will not be permitted. Areas that are inaccessible to the aggregate spreader shall be covered by hand spreading or other acceptable methods.

660-7 AGGREGATE TYPE AND APPLICATION RATES

Contractor shall provide aggregate types and rates as specified in the contract.

660-8 CONSTRUCTION METHODS

For any type of AST work, demonstrate that all equipment has been calibrated in the presence of the Engineer with a minimum 100 foot test section. If approved by the Engineer, test section may be incorporated into the production section. If the test section is not feasible, submit a calibration plan to the Engineer with detailed information on equipment and a designated area for calibration.

(A) Asphalt Seal Coat

Use the type of seal coat as required by the contract. Seal coat aggregates shall be drained of free moisture and have an amount passing the #200 sieve no greater than 1.5% in accordance with Table 1005-1 before use. Place the seal coat in full-lane widths.

Adjust the aggregate rates to provide a sufficient quantity of cover material to be spread over the surface of the seal coat preventing traffic damage, where it is necessary to permit traffic on sections of a completed seal coat.

Perform rolling of each layer immediately after the aggregate has been uniformly spread. Rolling will consist of at least three complete coverages with one pneumatic-tire roller followed by at least one complete coverage with a 5 to 8 ton steel-wheel roller. All roller coverages shall be completed within 5 minutes of the asphalt emulsion being placed. Do not allow crushing of the aggregate or picking up of the material by the rollers.

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The use of a combination steel-wheel and pneumatic-tire roller will be permitted instead of the 5 to 8 ton steel-wheel roller.

After the aggregate is thoroughly seated, broom all excess aggregate off of the surface of the seal coat after 3 calendar days but no more than 7 calendar days. If necessary, use a vacuum truck as directed by the Engineer. Traffic may be permitted on the seal coat immediately after the rolling is complete.

Clean driveways, ditches, turn lanes, and areas adjacent to the AST construction of excess aggregate, excess emulsion run off, over spray or debris from construction.

Blotting sand may be required as directed by the Engineer and shall be applied in accordance with Section 818.

The construction of the various types of seal coats will be in accordance with the following additional requirements:

(1) Single Seal

Apply emulsion to the existing surface followed immediately by an application of aggregate as specified in the contract. Uniformly spread the full required amount of aggregate in one application and correct all non-uniform areas before rolling.

Immediately after the aggregate has been uniformly spread, perform rolling as previously described.

(2) Double Seal

Apply emulsion to the existing surface followed immediately by an application of aggregate as specified in the contract ensuring each is uniformly placed over the existing surface and rolled as previously described.

Immediately after the first application of seal aggregate has been made uniform and rolled, apply the second application of the required amount of emulsion and seal coat aggregate and roll as previously described.

(3) Triple Seal

Follow the procedure outlined in Subarticle 660-8(A)(2) and apply emulsion and aggregate as a third layer and roll as previously described.

(4) Sand Seal

Place the fully required amount of asphalt material in one application and immediately cover with the seal coat aggregate. Uniformly spread the fully required amount of aggregate in one application and correct all non-uniform areas before rolling.

Immediately after the aggregate has been uniformly spread, perform rolling.

Broom excess aggregate material from the surface of the seal coat.

When the sand seal is to be constructed for temporary sealing purposes only and will not be used by traffic, use other grades of asphalt material meeting the requirements of Articles 1020-5 and 1020-6.

(B) Asphalt Mat and Seal

Construct the mat coat in accordance with Subarticle 660-8(A) using the size aggregate required by the contract.

Construct the seal coat in accordance with Subarticle 660-8(C) using the type seal required by the contract.

(C) Asphalt Mat Coat for Soil Subgrade

The surface on which the mat coat is to be applied shall be approved by the Engineer before the mat coat emulsion is applied.

Place a string line guide for application equipment. Place the mat coat in full-lane widths.

Existing surface shall be damp prior to placement of the mat coat.

Immediately follow the application of emulsion with the spreading of the aggregate. No more than 5 minutes can elapse from the time the emulsion is applied and the rolling is completed when using CRS-2L or CRS-2P.

Mat coat aggregate shall be drained of free moisture and have an amount passing the #200 sieve no greater than 1.5% in accordance with Table 1005-1 before use. Spread the aggregate uniformly at the required rate and correct all non-uniform areas before rolling.

Roll immediately after the aggregate is uniformly spread. Rolling consists of at least three complete coverages with two 5 to 10 ton steel-wheel rollers. Continue rolling until the aggregate is thoroughly keyed into the emulsion. Do not allow crushing of the aggregate or picking up of the material by the rollers. A combination steel-wheel and pneumatic-tire roller will not be permitted. Use two individual steel-wheel rollers. The three coverages shall be completed within 5 minutes of the spraying of the emulsion.

At the discretion of the Engineer, at the beginning of each emulsion application, spread a paper over the end of the previously completed mat coat and begin the asphalt application on the paper. After application, remove and dispose of the paper.

After the aggregate is thoroughly seated, traffic may be permitted on the mat coat after the rolling is complete. No brooming shall be performed on the mat coat.

Correct defects or damage to the mat coat before the application of seal coat or plant mix overlay. The seal coat or plant mix may be applied the same day the mat coat is placed provided the mat coat has been satisfactorily applied and rolled.

(D) Asphalt Mat Coat for Pavement Surfaces

For mat coats with an asphalt overlay, construct the mat coat in accordance with Subarticle 660-8(C). The same grade of emulsion used for the mat coat may be used for the tack coat of the asphalt overlay.

For mat coats constructed on existing pavement surfaces, construct the mat coat in accordance with Subarticle 660-8(C) using the size aggregate required by the contract and the application rates specified in the contract.

660-9 TEMPORARY TRAFFIC CONTROL (TTC)

All AST operations shall be conducted in daylight hours.

Provide temporary traffic control for the asphalt surface treatment operations in accordance with the contract and in accordance with the provision RWZ-1 TEMPORARY TRAFFIC CONTROL (TTC) found elsewhere in the proposal except the following sections do not apply:

TRAFFIC OPERATIONS, Drop-Off Requirements and Time Limitations

TRAFFIC OPERATIONS, Project Requirements

Install advance/general warning work zone signs according to the Detail Drawing titled *Signing for Asphalt Surface Treatment* provided in the plans.

660-10 WARRANTY

The AST shall be warranted by the project payment and performance bonds for a period of 12 months.

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(A) Warranty Period

The Department will conduct an inspection of the work and provide written acceptance in accordance with Article 105-17. Written acceptance of the work will constitute the start date for the 12 month AST warranty period.

(B) Situations Affecting the Warranty

During the warranty period, the Contractor will not be held responsible for distresses that are caused by factors not related to materials and workmanship. These include, but are not limited to, chemical and fuel spills, vehicle fires, base failures, and snow plows. Other factors considered to be beyond the control of the Contractor, which may contribute to pavement distress, will be considered by the Engineer on a case by case basis upon receipt of a written request from the Contractor. Maintaining traffic on the pavement surface prior to the Engineer's acceptance will not be a condition for voiding the warranty.

(C) Emergency Repairs

If, in the opinion of the Department, a pavement condition covered by the warranty requires immediate attention for the safety of the traveling public, the Contractor will be notified immediately. If the Contractor cannot perform the work in a timely manner, the Department may directly perform or have the corrective work performed by another entity at the Contractor's expense. Any emergency work performed will not alter the requirements, responsibilities, or obligations of the warranty.

(D) Warranty Performance Criteria

TABLE 660-1 PERFORMANCE CRITERIA		
Surface Defects	Severity	Extent (Per Lot)
Surface Patterns	Alternate lean and heavy lines streaking over the entire pavement surface.	Greater than 20% of a lot affected; distress spotted evenly over the lot or over localized areas within the lot.
Bleeding/Flushing	Distinctive appearance (with excess asphalt binder already free).	Greater than 20% of the wheel tracks within a lot affected.
Loss of Cover Aggregate	Large patches of cover aggregate lost from the pavement surface.	Greater than 20% of a lot affected; distress spotted evenly over the lot or over localized areas within the lot.

Lot – A 1,000 foot section of pavement or portion thereof, a lane width wide, on which AST is constructed on a single map.

The beginning point of the first lot will be the beginning point of each day's operation or the beginning of a map, whichever is applicable.

The Department will review the AST and advise the Contractor of any required corrective work in writing prior to expiration of the warranty period.

The Department will approve all materials and methods used in warranty work.

The Department will determine if warranty work performed by the Contractor meets the contract and provide written acceptance of the warranty work when complete.

1 The Chief Engineer will review any disputes for corrective work covered under the
2 warranty.

3 **660-11 MAINTENANCE**

4 Maintain the asphalt surface treatment in an acceptable condition until final acceptance of the
5 project.

6 **660-12 MEASUREMENT AND PAYMENT**

7 *Asphalt Surface Treatment: Single Seal, Double Seal, Triple Seal, Mat and Single Seal, Mat*
8 *and Double Seal, Sand Seal, and Mat Coat, No. ___Stone.* All AST will be measured and
9 paid at the contract unit price per square yard. Payment at the above prices will be made for
10 replacing any satisfactorily completed AST when such replacement has been made necessary
11 by defects in subgrade or base constructed by others.

12 *Emulsion for Asphalt Surface Treatment* will be measured by the actual surface area of
13 application and the specified application rate (gallon/sy) and paid at the contract unit price per
14 gallon, which price will be full compensation for all materials including modifiers and
15 additives, tack coat, labor, tools, equipment, and all other incidentals necessary to complete
16 the work.

17 *Vacuum truck* will be measured and paid on a weekly basis for each week or any portion
18 thereof that the Engineer directs the use of a vacuum truck.

19 Price adjustments herein shall apply concurrently; however, price adjustment will not apply in
20 the event the material is rejected.

21 Furnishing and applying prime will be paid as provided in Article 600-9 for *Prime Coat*.

22 If included in the contract, furnishing and applying blotting sand will be paid as provided in
23 Article 818-4 for *Blotting Sand*.

24 **Adjustment for *Emulsion for AST* will be paid per the following formula:**

$$25 \quad A = B + ((D - C) / 235) 0.65$$

26 Where:

27 A = Adjusted Contract Unit Price of *Emulsion for AST* per gallon

28 B = Contract Unit Price of *Emulsion for AST* per gallon

29 C = Base Price Index of PG 64-22 per ton

30 D = Monthly Average Terminal F.O.B. Selling Price for PG 64-22 per ton

31 See Price Adjustment – Asphalt Binder Special Provision found elsewhere in this proposal for
32 the base price index of PG 64-22 per ton.

33 Payment will be made under:

Pay Item

Asphalt Surface Treatment, Single Seal
Asphalt Surface Treatment, Double Seal
Asphalt Surface Treatment, Triple Seal
Asphalt Surface Treatment, Mat and Single Seal
Asphalt Surface Treatment, Mat and Double Seal
Asphalt Surface Treatment, Sand Seal
Asphalt Surface Treatment, Mat Coat, No. ___Stone
Emulsion for Asphalt Surface Treatment
Vacuum Truck

Pay Unit

Square Yard
Square Yard
Square Yard
Square Yard
Square Yard
Square Yard
Square Yard
Gallon
Per Week