

ITEM P-609 EMULSIFIED PAVEMENT SEALER

DESCRIPTION

609-1.1 This item shall consist of preparing and applying a bituminous surface treatment in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

609-2.1 BITUMINOUS MATERIALS. The emulsion concentrate, in the undiluted state, shall be Asphalt Systems Inc. GSB-88, or approved equal. (The use of the name Asphalt Systems GSB-88 is intended to illustrate only a level of quality.) In order to be considered "equal", bidder must submit information that the substitute materials have the following salient properties:

Saybolt furol viscosity: 77°F (25 °C).....	20-100 seconds
Residue by distillation or evaporation:.....	57 percent, minimum
Sieve test:.....	0.2 percent maximum
pH, cationic:.....	2 to 6.5

The emulsion concentrate, when diluted in the proportion of one part of concentrate to one part of hot water, by volume and ready to apply, shall have the following properties:

Saybolt furol viscosity: 77°F (25 °C).....	10-50 seconds
Residue from Distillation, or Evaporation.....	28-42 percent, minimum
Sieve test:.....	0.1 percent, maximum
Pumping stability test:.....	pass
Hot water temperature at or above 100 degrees.	

Tests on Residue from Distillation, or Evaporation:

Viscosity at 275°F (135°C) ASTM D-4402.....	1750 cts maximum
Solubility in 1,1,1 trichloroethylene ASTM D-2404.....	97.5 percent minimum
Penetration ASTM D-5.....	50 dmm maximum
Asphaltenes ASTM D-2007.....	15 percent minimum
Saturates ASTM D-2007.....	15 percent maximum
Polar Compounds ASTM D-2007.....	25 percent minimum
Aromatics ASTM D-2007.....	15 percent minimum

- (1) pH may be used in lieu of the particle charge test which is sometimes inconclusive in slow setting bituminous emulsions.
- (2) Pumping stability is tested by pumping 1 pint, (475 ml) of sealer material diluted 1 part concentrate to 1 part water, at 77°F (25°C), through a ¼-inch gear pump operating 1750 rpm for 10 minutes with no significant separation or coagulation.

The bituminous base residue shall contain not less than 20 percent asphaltum, uintahite or uintaite (which is commonly referred in the trade as gilsonite), and will not contain any tall oil pitch or coal tar material. It shall be compatible with asphalt concrete and have a 4-year, minimum, proven performance record at airports with similar climatic conditions. Curing time, under recommended application conditions, shall not exceed 4 hours.

The Contractor shall furnish and submit to the Engineer, manufacturer's certification that the material is the type, grade, and quality specified for each loads of bituminous material delivered. The certification shall show the shipment number, refinery, consignee, destination, contract number, and date of shipment. Submit one 1-gallon samples of diluted, ready-to-apply bituminous material for each load delivered.

609-2.2 POLYMER. The vinyl acrylic copolymer shall be approved for use by the manufacturer of the bituminous material for compatibility and shall have the following properties:

Solids content, percent by weight	55 percent
Weight per gallon, lbs	
Emulsion	9.0 lbs
Resin Solids	9.8 lbs
pH	5.0
Viscosity, cps (as tested by the Brookfield RVT #3 spindle at 20 rpm and 25° C)	2,250
Particle charge	Nonionic
Free monomer, percent by weight	0.5 percent, max.
Mechanical stability	Excellent
Minimum film forming temperature, °C	+5
Tg °C	+1

The Contractor shall submit manufacturer's specifications for vinyl acrylic copolymer for review and approval, with the bituminous materials submittal.

609-2.3 SAND. The sand material shall be a dry, clean, angular, dust-free with a Mohs hardness of 6-8. The sand shall be per the manufacturer's recommendation to achieve the filling of voids and provide sufficient friction levels as shown as Maintenance Planning Friction Level in Table 3-2 of Federal Aviation Advisory Circular 150/5320-12, "Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces."

The sand gradation shall meet the requirements of FAA AC 150/5200-30A, "Aircraft Winter Safety and Operations. Paragraph 28, Sand". Any variation from these requirements must be submitted to the engineer with sufficient time to obtain FAA review and approval prior to use. The Contractor shall submit gradation and manufacturer's specification for review at or prior to the pre-construction conference for approval.

CONSTRUCTION METHODS

609-3.1 WEATHER LIMITATIONS. The Emulsion shall be applied only when the existing surface is dry and the pavement surface temperature is 50° F and rising. Application shall be scheduled so that at least three hours of daylight should remain after completing Emulsion application.

609-3.2 MIXING. The sealing material shall be obtained by blending bituminous concentrate material and water. Mix one part bituminous emulsion concentrate to one part water, by volume. Add (one) percent polymer, by volume, to the mix if recommended by manufacturer's representative. If the polymer is added to the mix at the plant, submit weigh scale tickets to the Engineer. As an option, the polymer may be added to the mix at the job site provided the polymer is added while the circulating pump is running, the mix is agitated for a minimum of 15 minutes, and the polymer is mixed to the satisfaction of the Owner.

609-3.3 PAVEMENT PREPARATION. The asphalt surface to be treated shall be free of all dirt, sand, weeds, grass and excessive oil and/or grease. The surface shall be cleaned with a power broom, power blower supplemented by a hand sweeping, power vacuum, or any other means required to remove deleterious matter to the satisfaction of the Engineer or Owner. Any crack sealing shall be completed and surface cleaned prior to applying pavement sealer. This work is considered incidental to the seal coating.

Cover as necessary existing runway edge lights, taxiway edge lights, informational signs, retro-reflective marking and in-pavement duct markers before applying the seal. If the seal gets on any light or marker clean

immediately. The Contractor shall replace any light, sign or marker with equal equipment at no cost to the Owner if cleaning is not satisfactory to the Owner.

609-3.4 EQUIPMENT. The emulsion may be applied with manufacturer-approved standard bituminous distributors. The equipment shall be in good working order and contain no contaminants or diluents in the tank. Spreader bar tips must be clean, free of burrs, and of a consistent size to maintain an even distribution of the seal material. Any type of tip or pressure source is suitable that will maintain a constant flow through the nozzles during the application process regardless of the speed of the truck. Test the equipment under pressure for leaks and to ensure it is in good working order before use.

The distributor truck shall be equipped with a 12-foot (3.6 m), minimum, spreader bar with individual nozzle control. It shall be capable of specific application rates in the range of 0.05 to 0.25 gallons per square yard (0.15 to 0.80 liters per square meter). These rates shall be computer-controlled rather than mechanical. It shall have an easily accessible thermometer that constantly monitors the temperature of the seal coat.

In the event there is a temperature problem a distributor truck will be provided that is equipped to effectively heat and mix the material to the required temperature prior to application. Heating and mixing will be done in accordance with the manufacturer's recommendations. Care shall be taken not to over heat or over mix material.

The distributor shall be equipped to hand spray the seal coat areas identified by the Engineer.

609-3.5 APPLICATION. The sealing product shall be uniformly applied using equipment as described in Section 609-3.4 and in accordance with the manufacturer's recommendations. Apply the emulsion only when the existing surface is clean and dry as described in Section 609-3.3. The application target range is **0.12 to 0.17 gallons** per square yard.

APPLICATION TEST SECTION. A qualified manufacturer's Representative shall be present in the field to assist the Contractor in carrying out spot tests and/or test strips on the pavement to be sealed to determine the optimum application rate of both sealant and sand. This shall be done just prior to the full application or any time there is a change in the consistency of the pavement surface. The final application rate of both sealant and sand shall be approved by the engineer.

FRICTION TESTING. After the optimum application rate of sealant and sand is determined and prior to full application on any airfield pavement, the contractor shall run tests to assure friction test acceptability.

On Runway surfaces friction measurements shall be performed before and after application of this pavement sealer material. The contractor shall test the optimum application rate area to determine that the application rate of sealant and sand results in an average Mu value on the wet pavement surfaces not less than that shown for the Maintenance Planning Friction Level in Table 3-2 of Federal Aviation Advisory Circular 150/5320-12, "Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces." Application rates that result in an average Mu value on the wet runway pavement surface less than the Maintenance Planning Friction Level in Table 3-2 of Federal Aviation Advisory Circular 150/5320-12, "Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces" must not be approved for full application. Engineer shall determine type, size and amount of friction testing and administration of the program and its testing results. All friction tests including but not limited to before, after and retesting necessary to successfully complete this project shall be the responsibility of the contractor and considered incidental to the overall project costs.

609-3.6 SANDING. The sanding shall be done immediately after application of the sealant material. The speed of the distributor shall be such that the sanding material shall be applied before the sealant begins to break. Apply sand at the rate of 0.50 to 0.75 pounds per square yard as determined by the sealant Manufacturer Representative.

Sanding shall be accomplished using a drop-type sander equipped with a full spread bar to ensure even distribution of the sand. Tinkle or skip applicator bars will not be permitted. Spinner or whirly-bird type sanders will not be permitted. The sanding unit must have the ability to apply sand in both the forward and

backward direction in order to minimize driving on the freshly applied sealant and to enable negotiating sand application onto areas where turning around is not possible. The sander must have finite controls to regulate sand distribution. Push-type hand sanders will be allowed for use around lights, signs and other obstructions.

Contractor shall schedule this work so the sealant application and the sanding operation work as a cohesive unit with the sanding unit immediately following the sealant distributor. Sanding will be done in a manner so as to prevent any sand from going onto any pavement prior to the sealant being applied.

Clean up areas with excess or loose sand and dispose of off airport property.

609-3.8 FREIGHT AND WEIGH BILLS. Before the final estimate is allowed, the Contractor shall file with the Owner certified weigh bills of the emulsion materials actually used in the construction work covered by the contract. Copies of weigh bills shall be furnished to the Owner during the progress of the work.

METHOD OF MEASUREMENT

609-4.1 The quantity of Emulsified Pavement Sealer to be paid for will be the number of square yards of material actually applied and accepted by the Engineer as complying with the plans and specifications.

BASIS OF PAYMENT

609-5.1 Payment will be made at the contract unit price per square yard for Emulsified Pavement Sealer actually applied and accepted by the Engineer. This price will be full compensation for furnishing all materials, for all preparation, delivery, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item, including the furnishing, and placing of sand and any other work necessary to complete this item.

Payment will be made under:

Item P-609-5.1 Emulsified Pavement Sealer -- per square yard

END OF ITEM P-609