SPECIAL SPECIFICATION

ITEM 3109

COAL-TAR SEALER/REJUVENATOR

1. Description. This Item shall govern for an application of coal-tar sealer/rejuvenator, applied to a previously prepared bituminous surface, in accordance with these specifications, as shown on the plans or as directed by the Engineer.

   The purpose of this product is to rejuvenate oxidized or otherwise aged asphalt binder and/or provide a fuel resistant surface.

2. Materials. The bituminous materials shall total 100 percent of the following range of materials.

Materials	Minimum	Maximum
Coal-tar pitch	35%	50%
Maltenous type petroleum Distillate	32%	42%
Coal-tar oils	14%	40%

The coal-tar oils shall conform to the requirements of Table 1. The coal-tar pitch shall conform to the requirements of ASTM D 490, Grade RT-12, and the maltenous type petroleum distillate (CAS no.64742-95-6) shall be compatible with the tar components. The bituminous materials shall meet the requirements of Table 2. Coal-tar solvent components will not be deemed to meet the coal-tar oil requirements of Table 2. Coal-tar solvent naphtha will not be allowed.

TABLE 1. COAL-TAR OIL PROPERTY REQUIREMENTS

Specific Gravity @ 25/25 C	1.06 min.
Water % by weight	2.0% max.
Brookfield Viscosity @ 25 C	60 cps. max
Soluble in CS2 by weight	95% min.
Flash Point C.O.C. min.	82 C (180 F) min.

ASTM D-86 Distillation:

Initial Boiling Point 160 C (320 F)			
180 C (356 F)	0-2%	250 C (482 F)	0-20%
190 C (374 F)	0-3%	260 C (500 F)	5-30%
200 C (392 F)	0-4%	270 C (518 F)	10-40%
210 C (410 F)	0-5%	280 C (536 F)	15-50%
220 C (428 F)	0-6%	290 C (554 F)	20-60%
230 C (446 F)	0-8%	300 C (572 F)	25-60%
240 C (464 F)	0-12%		

Table 2. BITUMINOUS MATERIAL PROPERTY REQUIREMENTS

Test Property	Test Method	Requirements
Specific Gravity @ 25/25 C (77/77 F)	ASTM D 70	1.04 min
Viscosity Engler 50 cc@ 50C (122 F)	ASTM D 1665	4.5 max.
Water % by Volume	ASTM D 95	2.0 max.
Distillation % by weight	ASTM D 20	
170 C (338 F)		20 max.
270 C (518 F)		25-45
300 C (572 F)		30-55
Softening Point of residue from 300 C (572 F) distillation test	ASTM D 36	40-55 C (104-131 F)

(1) Verification of Bituminous Materials. The bituminous materials listed in Article 2., "Materials" of this specification shall be verified by the Contractor by submitting a sample of the product to the Engineer along with the results of an independent material testing lab that confirm full compliance with the property requirements, and a statement from the manufacturer that the sample tests by the independent lab and the sample provided to the Engineer are an accurate representation of the materials to be used on the project. The test report, the Contractor shall submit, shall be certified by a Registered Professional Engineer from the independent material testing lab.

(2) Testing Requirements.

ASTM D20	Distillation of Road Tars
ASTM D36	Softening Point of Bitumen
ASTM D70	Specific Gravity of Semi-Solid Bituminous Materials
ASTM D95	Water in Petroleum Products and Bituminous by Distillation
ASTM D1665	Engler Specific Viscosity of Tar Products
ASTM D2171	Standard Test Method by Viscosity of Asphalts by Vacuum Capillary Viscometer
ASTM D2172	Quantative Extraction of Bitumen from Bituminous Paving Mixtures
ASTM D3666	Inspection and Testing Agencies for Bituminous Paving Materials

3. Construction Methods.

(1) Weather Limitations. The sealer/rejuvenator shall be applied only when the existing surface is dry and the air temperature is at least 50 F or higher and rising.

(2) Equipment. The Contractor shall furnish all equipment, and hardware necessary for the performance of the work. The product shall be delivered in dedicated tankers and/or containers with filters. The distributor shall be designed and equipped as follows:

(a) Adequate heating capability for rapid heating of the sealer/rejuvenator to the proper application temperature.

(b) A positive displacement pump capable of pumping low viscosity material and providing a preselected constant pressure of 20-60 psi to deliver the specified rates of application.

(c) A full circulation spray bar and applicator which maintains proper nozzles which provide the specified rates of applications.

(d) A hooded spray bar and applicator which maintains proper nozzle height.

(e) A positive shut-off for the spray bar.

(f) A hand spray, with hose, equipped with a positive shut-off at the spray gun.

(g) A thermometer installed in the distributor tank to measure the temperature of the sealer/rejuvenator at the time of application.

(h) A tachometer calibrated to a minimum of tenths of miles per hour.

(i) A chart listing the capacity of the tank, in gallons shall be carried in each unit. This chart shall show gallons for each 1 inch of depth. A chart showing speed/pressure application rates will also be included.

(j) The distributor shall be equipped with filters, which shall be fully functional during both the loading and unloading of the product.

(3) Cleaning Existing Surface. Unless otherwise shown on the plans, prior to placing the sealer/rejuvenator, the Contractor, utilizing a power broom or approved equal, shall clean the surfaces of the pavement to be treated and assure that it is free of all debris, dust, dirt, or other loose matter. The pavement surface shall be properly cleaned by the Contractor to the satisfaction of the Engineer.

(4) Test Section. Prior to full production, the Contractor shall place a series of one square yard test sections at rates between 0.05 and 0.10 gallons per square yard in integrals of 0.01 gallons per square yard as are necessary and, as determined by the Engineer to develop the proper application rate. On runways and taxiways, test sections shall be placed every 1000 feet along the length of the runway or taxiway. On apron areas, at least one (1) of the test sections shall be placed for every 150,000 square feet. The area to be tested will be approved by the Engineer and will be located on the existing pavement. The Contractor shall examine the test sections 24 hours after placement and recommend to the Engineer the application rate to be used for the remainder of the project. A test section will be required for each different type and category of runway, taxiway, or apron pavement surface. The Engineer will have the final decision, including approvals, of the application rate for each pavement type.

(5) Application Rate. The coal-tar sealer/rejuvenator shall be uniformly applied with a bituminous distributor at the rate determined as specified above. The application rate shall not be varied without the approval of the Engineer. The application temperature shall be between 70 F and 120 F. Following the application, the surface shall be allowed to cure without being

disturbed until the sealer has thoroughly dried. This period of time shall be coordinated between the Contractor and the Engineer. Suitable precautions shall be taken by the Contractor during this period to protect the applied product, including the proper application of any sand necessary to blot up any excess material. Any sand used will not be measured and paid for directly but will be considered subsidiary to this bid Item.

(6) Contractor's Submittal Responsibilities. In addition to the submittals otherwise addressed herein, including but not limited to the material sample, the independent material testing lab results, the manufacturer's confirmation and the freight and/or weight bills, when directed by the Engineer, the Contractor shall provide viscosity, fuel resistance, and skid resistance test results as follows:

(a) Viscosity will show a decrease when compared to untreated pavement as measured by ASTM D2171. The binder to be compared will be extracted (ASTM D2172)from the upper 3/8 inch of pavement.

(b) Fuel resistance will be tested via ASTM D1308 Chemical Resistance of Organic Coatings.

(c) Skid resistance for aviation application will demonstrate that post treatment surfaces do not have their skid resistance lowered below FAA acceptable standards.

The Contractor shall provide test results from an airport in Texas of similar or higher FAA classifications as the one being treated. Irrespective of when the tests were taken, the material shall have been in place for at least two (2) years, and the Department shall be satisfied with it's performance.

The manufacturer of reference material shall be the same as the manufacturer supplying the coal-tar sealer/rejuvenator to be used on this project. Should the Contractor utilize a manufacturer who has not supplied their material to a Texas airport in a manner that can satisfy this specification, the Contractor may use an airport of similar or higher classification, in an area of climate similar to the airport being treated on this project. The Contractor shall also provide a certification from the airport authority with contact information, that states that the airport was treated with the same product at least two (2) years ago, gives the treatment date(s), and includes a statement from the airport authority that it is satisfied with the product performance.

The manufacturer's authorized representative will warrant that from the date the coal-tar sealer/rejuvenator is applied and for a period of three (3) years thereafter, the material will not flake, peel, chip, or spall or the manufacturer's authorized representative will reapply the coal-tar sealer/rejuvenator, as necessary, at no cost to the airport owners or the State. Further the manufacturer's authorized representative will warrant the treated surface to be fuel resistant and remain fuel resistant for a period of three (3) years after the date of application. This guarantee shall be effective only if spills are cleaned up as required by local Environmental Protection Agency (EPA) regulations.

(7) Freight and Weigh Bills. The Contractor shall furnish the Engineer with the receipted bills when railroad shipments are made, and certified weigh bills when materials are received in any other manner, for the coal-tar sealer/rejuvenator used in the construction covered by this contract. The Contractor's representative shall not remove material from the tank car or storage tank until initial outage and temperature measurements have been verified.

4. Measurement. This Item will be measured by the square yard of surface area treated or gallons of coal-tar sealer/rejuvenator applied.

5. Payment. The work performed and materials furnished in accordance with the Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Coal-Tar Sealer/Rejuvenator". This price shall be full compensation for cleaning existing surface when required; for furnishing all materials, including freight; for all heating, hauling, distributing and/or placing all materials, as specified, including sand; and for all manipulations, labor, tools, equipment and incidentals necessary to complete the work.