CITY OF DELAWARE
PUBLIC WORKS DEPARTMENT

SUPPLEMENTAL SPECIFICATION 1301
ASPHALT EMULSION PAVEMENT SEALANT
APRIL 20, 2023

1301.01 Description
1301.02 Materials
1301.03 Proportioning
1301.04 Weather Limitations
1301.05 Maintenance of Traffic
1301.06 Surface Preparation
1301.07 Application
1301.08 Acceptance
1301.09 Method of Measurement
1301.10 Basis of Payment

1301.01 Description. This work consists of installing a mineral filled asphalt emulsion sealer to existing asphalt pavements. The Contractor shall use SealMaster MasterSeal Concentrate Product Number S1010, Neyra AE or approved equal that meets ASTM D8099/D8099M-17 Standard Specification for Asphalt Emulsion Pavement Sealer. The concentrate shall be job-mixed with water and aggregate and applied in strict accordance with the manufacturer's specifications.

1301.02 Materials. A mineral filled asphalt emulsion pavement sealer concentrate shall be used in conjunction with dilution water, 40/70 mesh sand (210 µm – 425 µm, 0.0083 in. – 0.016 in). Polymer additive may be used at the direction of the Engineer.

Table 1: Physical Properties of the acceptable asphalt pavement sealer product:

ASTM	Test Description	Result
D5	Penetration of Bituminous Materials-Base Asphalt	12 – 45 Pen
D6937	Density of Emulsified Asphalt	1,000 – 1,300 g/l
D6930	Settlement and Storage Stability of Emulsified Asphalts	20% max/24 hr.
D113	Ductility of Bituminous Materials-Base Asphalt	5 – 20 cm.
E70	PH of Aqueous Solutions with Glass Electrodes	6 – 10 pH
D6378	Vapor Pressure (VPX), mm Hg @ 77° F (25° C)	22 – 26 mm Hg
D36	Softening Point of Emulsion Residue	> 200° F
D562	Viscosity Using a Stormer-Type Viscometer	75 – 140 KU
D4060	Abrasion Resistance – Taber Abraser Dry Method	< 1% Loss
D522	Mandrel Bend Test of Attached Coatings	No Cracking
D870	Water Resistance of Coatings Using Water Immersion	No Delamination
D6904	Resistance to Wind-Driven Rain	No Delamination
D4585	Water Resistance of Coatings Using Controlled Condensation	No Delamination

D1735	Water Resistance of Coatings Using Water Fog Apparatus	No Delamination
D2247	Water Resistance of Coatings in 100% Relative Humidity	No Delamination
D4541	Adhesion Strength Over Asphalt Pavement	> 200 psi
D3910-6.4	Wet Track Abrasion Test	< 15 g/ft^2 Loss
D2939-5	Uniformity of Emulsified Bituminous Coatings	PASS
D2939-7	Weight Per Gallon	9 – 11 lbs/gal
D2939-8	Residue by Evaporation, %	40 – 60 %
D2939-10	Ash Content of Residue, %	40 – 60 %
D2939-13	Drying Time – 50% Humidity, 73.4 ± 3.6° F	2 – 6 hrs
D2939-14	Resistance to Heat – No Blistering, Sagging or Slipping	PASS
D2939-15	Resistance to Water – No Softening, Delamination or Re-emulsification	PASS
D2939-16	Flexibility – No Cracking or Delamination	PASS
D2939-22	Wet Film Continuity	PASS
D2939-26	Resistance to Impact – No Chipping, Cracking or Delamination	PASS
D2939-27	Resistance to Impact After Accelerated Weathering	PASS
D95	Water Content, %	40 – 60 %
D2172	Asphalt Content by Weight, %	Min. 20 %
D4799	QUV UV Aging – 1,000 Hours	No Color Fade
D3359	Measuring Adhesion by Tape – No More Than a Trace of Peeling	PASS
VOCs	Determination of Volatile Organic Compounds in Various Coatings	< 10 g/l
PAH Content	Polycyclic Aromatic Hydrocarbon Content, %	< 0.10 %

Table 1, Source: SealMaster MasterSeal Concentrate Product No. S1010 SMT – 110, Revised April 04, 2023

1301.03 Proportioning. The Contractor shall verify the compatibility of the binder, aggregate, mineral filler, and other additives. Consult the mix design of the selected product and adhere strictly with the manufacturer's recommendations. An example of a common mix design* is as follows:

Mineral Filled Asphalt Emulsion Concentrate……100 gallons

Water……15 - 25 gallons

Polymer Additive (Optional)……0.5 – 2 gallons

Sand (40/70 mesh) ……200 – 500 pounds

**Manufacturer recommendations accepted by The Engineer supersede the example mix design*

1301.04 Weather Limitations. Apply the Asphalt Sealant only when rain is not in the forecast for 24 hours. Surface and ambient temperature shall be a minimum of 50° F and rising during application. Emulsion Pavement Sealant shall not be applies when the temperature is expected to drop below 50° F during application and for a period of at least twenty-four (24) hours after application.

1301.05 Maintenance of Traffic. Maintain one-lane, two-way traffic on two lane streets and highways in accordance with the Contract Documents. Provide drums, traffic cones, flaggers, signs, and other equipment as directed by the Engineer.

1301.06 Surface Preparation. Surface must be clean and free from loose material and weeds before sealant is applied. Oil stains shall be cleaned and primed prior to sealant application. Cracks shall be sealed per ODOT Item 423 or with an asphalt mastic that conforms to ASTM

D8260-20 as specified by the Engineer prior to asphalt sealant application. Allow a period of at least twenty-four (24) hours to elapse after crack sealing is completed before applying sealant.

1301.07 Application. Protect drainage structures, monument boxes, valve boxes, etc. during material application. Apply product by mechanical squeegee/brush equipment or spray equipment that is capable of spraying coatings containing sand. Application equipment shall have continuous agitation or mixing capabilities to maintain homogenous consistency of mixed material throughout the application process.

Truck mounted or self-propelled squeegee/brush equipment shall have at least two (2) squeegee or brush devices (one behind the other) to assure adequate distribution and penetration of mixed sealant into bituminous pavement. Hand squeegees and brushes shall be acceptable in areas where practicality prohibits the use of mechanized equipment.

Apply sealant at the rate required by the manufacturer's instructions. The contractor shall not overspray any concrete sidewalk, concrete parking block, or any other surface than the intended asphalt area.

Apply a minimum of two (2) coats of sealant. Allow each coat to dry thoroughly before applying successive coats. Allow the final coat to dry for 24 hours prior to opening surface to vehicle traffic.

1301.08 Acceptance. The Engineer will base acceptance of the Asphalt Sealant on the Engineer's summary of quantities used each day. The Engineer will approve and accept a day's application of sealant provided:

A. The Engineer's summary indicates conformance with the above control requirements for proportioning and spread rate, and

B. The pavement is free from excessive scratch marks, tears, rippling, and other surface irregularities.

1301.09 Method of Measurement. The Department will measure Asphalt Sealing by the number of square feet (ft^2) completed and accepted in place. The department will base the width of the pavement course on the width shown on the plans, or width directed by the Engineer. The Department will measure the length along the centerline of each roadway or ramp.

1301.10 Basis of Payment. The department will not pay for materials, equipment, or labor to make corrections.

The cost of any removal of existing longitudinal pavement markings is incidental to Asphalt Sealing.

The Department will pay for accepted quantities complete in place at the contract prices as follows:

Item	Unit	Description
1301	Square Foot	Asphalt Emulsion Pavement Sealant

Note for Project Engineer/Estimating: The contractor will need 8-10 gals for every 100 SQFT, or and that quotes in 2023 should come between $0.18 - $0.25 per SQFT