TECHNICAL SPECIFICATIONS
FOR
FOG SEAL

1. Description

This work shall consist of the application of bituminous material on a prepared, existing pavement to provide a protective seal over the asphaltic surface, in accordance with the requirements of these Specifications.

2. Materials

Bituminous materials shall conform to the following:

Emulsified Asphalt SS-1, or SS-1h	AASHTO M-140

3. Equipment & Construction Requirements

(a) Equipment and Construction Requirements shall conform to all applicable parts of Subsections 403.03 and 403.04 TDOTSS, January 1, 2015, and all Special Provisions which are dated prior to the advertisement of this Contract. Requirements shall also conform to the Asphaltic Emulsion Manufacturers Association recommended performance guidelines for fog seals.

(b) A properly calibrated emulsion distributor or a hand sprayer shall be used for spraying emulsions. ASTM D2995 can be used for distributor calibration. The distributor shall be free of any contaminants which can harm the emulsion. A pump for circulation of emulsion through the spray bar shall be provided. Pumps should have clearance of at least 0.030 in. to prevent over-shearing. Pressure created within the distributor should be as low as possible. Heat applied to the tank or spray bar shall not exceed 185EF at any point.

(c) Recommended spray nozzle sizes are 1/8 to 3/16 inch. Spray nozzle angles and spray bar height should be adjusted to produce correct overlap. A hand sprayer should be used for applying small amounts of fog seal to small areas which cannot be sprayed by the distributor.

(d) The surface shall be free from dust, loose, or foreign matter and any objectionable material which would hinder adhesion of the emulsion. If the dust layer is minimal and brooming is not deemed necessary, a very light 0.15 gal/yd^2 spray of clean water prior to application can significantly improve penetration into the surface cracks by the fog seal. Allow excess water to run off before applying emulsion. Parking lots or other areas with heavy oil drippings should be cleaned with detergent or by other methods prior to spraying with emulsions.

(e) Emulsion applied by pressure distributor shall be applied at a uniform rate, without splattering or drilling from the spray bar, by using low pressure. See table on sheet TS-52.0-4 for suggested application rates for fog seal. Ideally, the peaks of most aggregate particles should remain uncoated with asphalt to prevent reduction of skid resistance. Two or more successive applications of the

respective proportion of the desired total application can aid in preventing excess over-application. The distributor should be operated in opposite directions on each pass to minimize inconsistencies in spray pattern. Upon over-application and at the discretion of the supervising Engineer, a light cover of clean, fine sand may be applied onto the uncured fog seal at the rate of 6 to 10 lb/yd^2 to provide for a safe, skid resistant surface. A pass of a pneumatic tired roller should be made over this light sand dusting to firmly embed the fine sand. The fog seal should be allowed to completely cure before opening to traffic.

4. Storage and Handling

Suitable storage and handling facilities shall be provided for the emulsion, so as to:

(a) Prevent contamination by water, oils, or other liquids.

(b) Prevent contamination by other incompatible emulsions.

(c) Protect from freezing or boiling temperatures which break the emulsion and cause separation into asphalt and water.

(d) Protect from local overheating by high temperature heating coils. Use of hot water is recommended for heating emulsion. Where steam, hot oil, or direct fire must be used, control must keep coil surfaces below 185EF.

(e) Use bottom loading wherever possible or employ full length drop hose to eliminate foaming. Foaming may cause a volume gauge error due to inclusion of air from free fall.

(f) Allow surface crust which forms on emulsion in storage to float without disturbance. Vertical tanks can help maintain constant and minimal surface area. Return lines into tanks should have outlets near the tank bottom and circulation should not free fall or disturb surface crust.

(g) Reduce high shear which can break emulsions by enlarging clearances on new gear pumps by milling if necessary.

(h) Prevent unnecessary circulation which can cause drop in emulsion viscosity or actual emulsion breakdown.

(i) Do not agitate emulsion with forced air as it may cause the emulsion to break in the tank.

5. Method of Measurement

Bituminous material will be measured by the number of gallons used in the accepted work, as determined by the Engineer, and at the temperature of application.

6. Payment

Fog seal will be paid at the Contract unit price per gallon and shall be full compensation for all work, materials, labor, and incidentals required to complete the work in accordance with the Plans and Specifications.

SUGGESTED APPLICATION RATES
FOG SEAL

TYPE OF SURFACE TO BE FOG SEALED

RATE OF DILUTION	DENSE SURFACE low absorption	OPEN SURFACE high absorption
% Emulsion (emulsion + water)	gal/yd2	gal/yd2
Net residual asphalt desired	0.01 to 0.03	0.03 to 0.05
50% (1+1)	0.03 to 0.10	0.09 to 0.23
40% (2+3)	0.04 to 0.12	0.11 to 0.28
25% (1+3)	0.06 to 0.19	0.19 to 0.46
20% (1+4)	0.08 to 0.24	0.23 to 0.57
16.7% (1+5)	0.10 to 0.29	too high
14.3% (1+6)	0.13 to 0.39	too high
12.5% (1+7)	0.15 to 0.44	too high