ITEM – POLYMER MODIFIED REJUVENATING EMULSION FOG COAT

Note to C&S:

This specification is to be used in conjunction with Contracts and Specifications Stored Specification "1001MATL", and replaces Contracts and Specifications Stored Specification "404BITUM".

The polymer modified rejuvenating emulsion fog coat shall be as specified in Section 404 of the Standard Specifications, with the following exceptions:

404-2.02 (A) General: the first paragraph of the Standard Specifications is revised to read:

The contractor shall provide a source of aggregate material in accordance with the requirements of Section 1001.

404-3.13 Fog Coat: of the Standard Specifications is revised to read:

Bituminous material used in the polymer modified rejuvenating emulsion fog coat shall be applied to an existing bituminous surface only when the existing bituminous surface is dry, the pavement surface temperature is at least 60 degrees F but does not exceed 175 degrees F, and the ambient temperature at the beginning of the application of bituminous material is at least 50 degrees F and rising but does not exceed 110 degrees F. The application of bituminous material shall be stopped when the ambient temperature is 55 degrees F or less and falling.

The temperature of the bituminous material at the time of application shall be 90 to 185 degrees F.

Application of the bituminous material shall not occur if rain is forecast within 48 hours of the scheduled application.

At any time, the Engineer may require that the work cease or that the work day be reduced in the event that weather conditions, either existing or expected, are anticipated to have an adverse effect upon the bituminous treatment.

The type of bituminous material shall be a polymer modified rejuvenating emulsion, and shall meet the following specifications.

POLYMER MODIFIED REJUVENATING EMULSION (FOR FOG COAT)		
TEST PROPERTY	**TEST METHOD**	**REQUIREMENTS**
TESTS ON EMULSION (PRIOR TO DILUTION):		
Viscosity, Saybolt Furol seconds, @ 25 °C, range	AASHTO T 59	50 - 150
Residue, by distillation[(1)], % by weight, minimum	AASHTO T 59	65
Oil distillate, % by volume, maximum	AASHTO T 59	0.5
Particle Charge [(2)]	AASHTO T 59	Positive
Sieve Test, retained on No. 20, % by weight, maximum	AASHTO T 59	0.10
Storage Stability, 24 hours, %, maximum	AASHTO T 59	1.0
Tests on Residue from Distillation:		
Viscosity [(3)], @ 60 °C, poises, maximum	AASHTO T 315	5000
Penetration, @ 4 °C, 200 grams, 60 seconds, 0.1 mm	AASHTO T 49	20 - 70
Elastic Recovery [(4)], @ 10 °C, %, minimum	AASHTO T 301	50
LATEX/POLYMER CERTIFICATION: The manufacturer or supplier of the polymer modified rejuvenating emulsion shall certify that the emulsion contains a minimum of 2 percent polymer solids, by weight of the residual asphalt. The manufacturer or supplier shall also certify that the polymer possesses long term stability in the presence of the asphalt and rejuvenating agent blend utilized.		
TESTS ON REJUVENATING AGENT:		
Flash point, Cleveland Open Cup, °C, minimum	AASHTO T 48	190
Kinematic Viscosity, @ 60 °C, cSt	AASHTO T 201	50 - 175
Saturates, % by weight, maximum	ASTM D 2007	30
Asphaltenes, % by weight, maximum	ASTM D 2007	1.0
Tests on Residue (AASHTO T 240):		
Mass Change, %, maximum	AASHTO T 240	6.5
Kinematic Viscosity @ 60 °C, cSt	AASHTO T 201	Report
Kinematic Viscosity Ratio[(5)], maximum	- - - - -	3
(1) Exception to AASHTO T 59: Bring the temperature on the lower thermometer slowly to 350 °F ± 10 °F. Maintain at this temperature for 20 minutes. Complete total distillation in 60 ± 5 minutes from first application of heat.		

(2) If the result of the particle charge test is inconclusive, material having a pH of 2.0 to 5.0 when tested in accordance with ASTM E 70, will be acceptable.

(3) Using procedures outlined in AASHTO T 315, the dynamic shear rheometer can be used to measure the complex dynamic shear viscosity (η^*), which in turn is converted to viscosity, in poises, as shown below. This method is recommended when the emulsion residue contains polymer material that might interfere with measurement of absolute viscosity using capillary tubes.

1. Compute η^* using the following equation:

$$\eta^* = (G^*/\omega) \times 1000$$

Where: η^* = complex dynamic shear viscosity in Pa·s.
G^* = complex shear modulus of the emulsion residue in kPa, measured at 60 ºC (AASHTO T 315)
ω = angular frequency @ 10 radians/second (AASHTO T 315)
1000 = unit conversion from Pa to kPa

2. Convert η^* to viscosity, in poises, using the following equation:

$$\mu = \eta^* \times 10$$

Where: μ = viscosity in poises.
η^* = complex dynamic shear viscosity in Pa·s.
10 = unit conversion from Pa·s to poises.

(4) Molds utilized for determining elastic recovery shall have straight sides, as shown in Figure 1 of AASHTO T 301. Molds with "hour-glass" sides, as shown in Figure 1 of ASTM D 113, shall not be used.

(5) Viscosity Ratio =

$$\frac{\text{Kinematic Viscosity of RTFO residue of rejuvenating agent at 60 } ^{O}\text{C, cSt}}{\text{Original Kinematic Viscosity of rejuvenating agent at 60 } ^{O}\text{C, cSt}}$$

The material shall be diluted with one part water to one part bituminous material. The bituminous material shall be applied at the approximate rate of _*_ gallons per square yard.

An application of blotter material may be required following the application of bituminous material and prior to opening to traffic. When required by the Engineer, blotter material shall be applied to the treated surface in one or more applications for a total application of approximately 2 pounds per square yard.

Blotter material shall not be applied on an asphaltic concrete friction course unless required by the Engineer to minimize tracking of bituminous material in isolated areas, or to provide adequate friction.

The estimated haul distance for the blotter material is _**_ miles.

DESIGNER:

* To be supplied by the Bituminous Engineer.

** To be supplied by the Geotechnical Site Supervisor.