FIBER REINFORCED MEMBRANE - INTER LAYER, (FRM-IL)

DESCRIPTION

This work shall consist of constructing a fiber reinforced membrane interlayer (FRM-IL) after which a wearing surface shall be placed upon. The FRM-IL shall be constructed in a single operation comprised of a layer of polymer modified asphaltic emulsion, a layer of chopped and placed fibers, and a layer of polymer modified asphaltic emulsion, to which a cover of aggregate is immediately applied. The layered materials shall completely seal the entire pavement surface and provide a uniform plane suitable as an interlayer for a wearing surface of Hot Mix Asphalt, Microsurfacing, or other surface as defined in the plans.

MATERIALS

Polymer Modified - Asphaltic Emulsion (PM-AE). The PM-AE shall conform to Table 1 below and shall be compatible with the aggregate used. Emulsion viscosity to be maintained within the stated specification range to achieve uniform distribution across the road surface.

TABLE 1: Requirements for Polymer Modified Asphaltic Emulsion

Type	Anionic		Cationic	
Properties	Min	Max	Min	Max
Test on Emulsions:				
Viscosity, SSF @ 50°C, sec	50	150	50	150 *(2)*
Storage Stability, 1 day, %	--	1	--	1
Sieve Test, %	--	0.1	--	0.1
Demulsibility, %	60	--	40	--
Particle Charge	Negative		Positive	
Residue by Distillation, %	65	--	65	--
Test on Residue from Distillation Test:				
Elastic Recovery *(1)*	55	75	55	75

References:
(a) ASTM Designation: D 3723
(b) AASHTO Designation: T49
(c) AASHTO Designation: T51

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1) Elastic Recovery ran according to ASTM D-6084 Method B, 25°C, 20cm, 5 min Relaxation
2) Emulsion Viscosity to be maintained within 50-150 seconds SSF for optimum spray-ability and application

APPLICATION RATES

Unless otherwise specified, the application rate of the emulsion for the FRM-IL process should be approximately 10% +/- higher than the rate for a standard chip seal surface application. The contractor or supplier must adjust the actual emulsion application rate during the work to accommodate project conditions. In no case shall the rate fall below the minimum, 0.20 gal/sq. yd.

Glass Fiber.

Glass fiber shall be Type E in accordance with ASTM D578-05, paragraph 4.2.2 and be so certified by the supplier. The glass fiber shall be supplied in internally wound spools, coils, or cheeses. During placement the glass fiber shall be immediately cut into 60mm, (2.38") nominal lengths and uniformly distributed across and between two parallel applications of the PM-AE.

	Range
FRM-IL	0 .16-0.22 lbs. per yard²

*The supplier shall adjust delivery rate to accommodate project conditions.

Aggregate Requirements. Insert aggregate requirements per state or local specifications or provisions here.

CONSTRUCTIONS REQUIREMENTS

Preparation for Membrane.

Insert roadway preparation requirements per state or local specifications or provisions here.

Application of the FIBER REINFORCED MEMBRANE (FRM)

Application of the FRM shall be performed by a Fiber Reinforced Membrane Application Vehicle (FRMAV). The FRMAV shall consist of an integrated bituminous distributor and a glass fiber applicator specifically designed to apply the bitumen and glass fiber at a controlled and uniform rate across the entire road surface in one continuous application. The FRMAV shall be towed behind a tank truck containing the PM-AE during the application process.

The equipment shall be constructed to include an open-bottom spray housing equipped with a fan or blower producing a down draft within the housing and two asphalt emulsion spray bars, one mounted immediately before the application of fibers and one mounted immediately after the application of fibers. The spray bars and housing unit shall be capable of applying the materials up to 13.5 feet in width in a single pass. The distributor shall be capable of heating and recirculating PM-AE to the specified temperature and shall be capable of holding no less than 7,000 lbs. of fiber per each full charge of the machine. The FRMAV shall have a computerized rate of control that automatically adjusts the delivery of PM-AE and glass fiber so that a change in the forward speed of the unit will automatically change the application rate of each material. Additionally these controls shall be equipped with a digital monitor that is capable of reporting the square yards completed, the quantity of glass fiber applied per square yard, the quantity of PM-AE applied per square yard and the total quantity of glass fiber and PM-AE. The FRMAV shall be capable of shutting off both the application of fibers and PM-AE in increments of 8 Inches while travelling down the roadway.

PM-AE SHALL BE A MAXIMUM OF 175ºF AT THE TIME OF APPLICATION.

Spreading Aggregate. Insert aggregate spreading requirements per state or local specifications here.

Finishing Insert Compaction, Sweeping and Traffic Control requirements per state or local specifications here.

Measurement and Payment

- Quantities of aggregate shall be paid for by the ton.
- Quantities of PM-AE shall be paid for by the ton.
- Quantities of the Glass fiber shall be paid for by the ton