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Priming

Recommended Construction Specification Guideline

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1 Scope

The scope of this sample construction specification guideline is limited and intended to provide general information regarding the design, component material specification, application, inspection, measurement and payment of a Solventless Penetrating Prime Coat.

2 Description

A Solventless Penetrating Prime Coat is an application of an asphalt emulsion containing no solvent. It is used to protect dirt work during staged construction of new pavement structures and to promote a satisfactory bond for the initial layer of bituminous mix. Solventless Prime Coats are recommended for use when same day paving is desired or when required to meet non-attainment or other environmental regulations.

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Ergon Asphalt & Emulsions, Inc.

3 Materials

Asphalt emulsion delivered to the project shall be accompanied by a laboratory certification of analysis and any other certifications as deemed necessary or advisable. The asphalt emulsion shall be designated ePrime and shall comply with the following specifications:

Property (on concentrate)	Test Procedure (AASHTO)	Specification (min)	(max)
Emulsion Tests			
Viscosity, Saybolt-Furol, 77°F (25°C)	T59	20	100
Sieve Test, %	T59		0.1
Oil Distillate, %	T59		1.00
Storage Stability, 24hr, 25°C, %	T59		1.0
Residue by distillation, 500°F, % by weight	T59	58	
Residue Tests			
Penetration, 77°F (25°C), 100g, 5 sec	T49	30	120
Residue Tests			
PennDOT Sand Penetration Test Modified Method, mm	MM-App 2	5.0	

3.1 Dilution

It is permissible to dilute ePrime with potable water either before shipment at the manufacturing facility or after delivery of the concentrated material at the jobsite. A typical dilution rate is 1-part concentrated emulsion to 2-parts water (1:2) but other dilution ratios may be required as determined by the agency and manufacturer representative. To assure accuracy and control of the process, dilute the product at the manufacturing facility when possible.

Emulsion property tests are to be conducted on non-diluted product. It is permissible to conduct an asphalt residue test on a properly mixed and representative sample of diluted ePrime to confirm accuracy of the dilution procedure. All asphalt emulsions can become unstable within a relatively short time following dilution, settlement of asphalt residue can occur. Best practices encourage the same-day usage of diluted products, however when this is not possible, assure the diluted product is fully mixed prior to application by employing sufficient circulation/agitation in the field storage tank, drop trailer or application equipment.

4 Equipment

4.1 Asphalt Distributor

The distributor shall be self-powered and capable of providing a uniform application rate of asphalt binder varying from .05-1.00 gal/yd^2 (0.23-4.5 liters/m^2) over a variable width up to 16 feet (4.88 meters) in a single pass, include computerized application controls and be capable of heating material to 160° F (71.1° C). Nozzles on the distributor bar shall be fully operational and of the size suggested by the manufacturer to apply the intended application rate.

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5 Calibration

5.1 Asphalt Distributor

The distributor shall be calibrated by applying asphalt emulsion for a minimum 300-foot (91.4 m) continuous section. The amount of material distributed shall be within 5% of the intended application rate at the intended width to be used on the project and shall be verified by use of the strapping stick as supplied by the equipment manufacturer. Neither a visual gauge indicating volume nor the computer readout shall be used as a calibration method.

6 Design

There shall be no mix design required for a Solventless Prime Coat. Typical application rates are in the range of 0.20 - 0.40 gal/yd^2 (0.9 - 1.8L/m^2). Dense, clayey or tightly packed soils typically require less material than sandy or loosely packed soils. The ideal application rate will result in full coverage and only very slight pooling of the emulsion in depressed areas. An excessive rate will result in run-off and ponding. An inadequate application rate will result in incomplete coverage and bare spots. The application rate may be adjusted based on visual or physical characteristics. The contractor and the emulsion supplier may make recommendations as to the required application rate.

7 Test Strip

Prior to the beginning of the project, perform a test strip in a suitable area of the project to assure the materials, contractor personnel and equipment are suitable to produce a satisfactory Solventless Prime Coat. The test strip may be conducted as part of the calibration procedure and may be considered as part of the project. The test strip may be used to determine final application rate.

8 Weather

The Solventless Prime Coat shall not be placed when rain is imminent or when freezing conditions are expected within 24 hours of application. Ambient temperature shall be minimum 50 F (10 C) and rising before beginning application.

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9 Traffic Control

A traffic control plan is typically not required for a Solventless Prime Coat as the roadway is typically not open to traffic. Steps will be taken to protect the freshly applied Solventless Prime Coat from damage by construction traffic and any other. Such protection shall not be removed until the product has sufficiently cured to withstand construction traffic with minimal to no damage. Damage to the Solventless Prime Coat determined to be detrimental to the success of the project shall be repaired to the satisfaction of the Agency and at the contractor's expense.

10 Surface Preparation

The roadway shall be graded and shaped according to the project plans prior to application of the asphalt emulsion. The surface should not be dry and dusty. Penetration is improved in tightly packed, clayey soils by pre-wetting and or scarifying the surface. The use and extent of these pre-application activities may be adjusted by the contractor and the Agency by evaluating the penetration and cure properties and as field conditions vary.

11 Application

The asphalt emulsion shall be applied by means of a pressure distributor. Application shall be a uniform continuous, full coverage spread, and under such pressure as to thoroughly coat the surface at the specified rate. The temperature of the asphalt emulsion during application shall be maintained between 120 -160°F (48.9 – 71.1 °C).

12 Material Storage and Handling

Asphalt emulsion stored on the job site must be agitated and heated using the distributor prior to use. Stored emulsion shall be inspected by the contractor for suitability prior to use on the project. At no time shall the emulsion be heated above 180°F (82.2° C). While being heated, the emulsion shall also be circulated and/or agitated.

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13 Inspection

Assure all distributor operations are functional. Assure material is within required temperature range. The nozzles shall be clean and producing a consistent fan of material providing full and complete coverage of material across the roadway surface with no evidence of inconsistent flow across the spray bar. Verify distributor is operating at the application rates by use of strapping stick.

14 Quality Control

The asphalt emulsion delivered to the project shall be accompanied by a certificate of analysis indicating satisfactory test results as required by the specification. A one (1) gallon representative sample of the emulsion may be taken from the transport trailer and either retained or tested by a certified laboratory at the agency's expense. Proper sampling and handling techniques shall be followed, and any testing must be performed within 14 days of sampling.

15 Measurement

The Solventless Prime Coat shall be measured in square yards (square meters) covered.

16 Payment

Payment shall be in consideration of all materials, tools, labor and other items as necessary to complete the project as required by the plans. The Solventless Prime Coat shall be paid by:

Volume in Gallons (liters) of emulsion used on the project

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