Specifications For Manufactured Materials

Section: EMULSIFIED ASPHALT

Subject: HIGH FLOAT MIXING GRADES

1. PRODUCT DESCRIPTION

1.1 Description

The specification for high float mixing grade (HFMG) emulsified asphalt applies to liquid asphaltic materials in the form of homogeneous aqueous emulsions of the anionic type. HFMG emulsified asphalts are specified by the following grades; HF500M and HF1000M.

1.2 Composition/Characteristics

High float emulsified asphalt shall consist of asphalt cements dispersed in an aqueous phase combined with a petroleum solvent. The residual bitumen has non-Newtonian flow characteristics and exhibits resistance to flow regardless of penetration of the residual bitumen.

1.3 Application/Use

The HFMG emulsified asphalt described herein shall be suitable for use as outlined in Table 1 - Principal Uses of Asphalt Materials of the National Standard of Canada CAN/CGSB-16.6-M89, PRINCIPAL USES AND TERMINOLOGY FOR ASPHALT MATERIALS FOR ROAD PURPOSES.

1.4 Method of Production

Emulsified Asphalt is a dispersion of asphalt cement suspended in water effected through the use of mechanical energy, thermal energy and the use of emulsifiers to maintain the dispersion.

If the supplier elects to incorporate non-traditional material components such as crude oil, waste products or by-products of other industrial and manufacturing processes in the HFMG emulsified asphalt, the Province must be advised in writing before any material is supplied.

1.5 Definitions

Asphalt Cement: A dark brown to black solid or semi-solid cementitious material which gradually liquifies when heated. One type of bitumen that is obtained as residue in refining crude oil.

Bitumen: Any mixture of hydrocarbons of natural or pyrogenous origin or both which is completely soluble in carbon disulphide.

Emulsified Asphalt: A mixture of asphalt cement with or without petroleum solvent and water containing an emulsifying agent, which maintains the asphalt cement globules in suspension. The water is the continuous phase and the asphalt cement globules are the discontinuous phase.

Residual Bitumen: The residual material which remains after the distillation of an emulsified asphalt as described by the test methods referenced in this specification.

2. PRODUCT SPECIFICATION

2.1 General Requirements

2.1.1 Uniformity

All grades of high float mixing grade emulsified asphalt described herein shall be free of contamination and shall be homogeneous and uniform in character.

2.1.2 Delivery

The specified material shall be delivered in accordance with the Department's SMM 104 General Provisions for Asphalt Supply Contracts.

2.1.3 Prequalification Samples

First time suppliers of products described in the specification shall comply with the prequalification requirements described in SMM 104.

2.2 Material Characteristics and Properties

TABLE 1

Requirements of High Float Mixing Grade Emulsified Asphalt

GRADE	HF-500M		HF-1000M		Test Method
Property	Min	Max	Min	Max	Note 2
Residue by Distillation (% by mass)	65		65		CAN2-16.5-M84 Par. 6.2.1
Oil Portion of Distillation (% by volume)	1	6	1	7	ASTM D244 CAN2-16.5-M84 Par. 6.2.1.3
Viscosity (SF) @ 50° C, (s)	50		50		ASTM D244
Sieve Test, Retained on 1000 um sieve, (% by mass)		0.1		0.1	CAN2-16.5-M84 Par. 6.2.2
Coating Test (see notes)	Note 1	Note 1	Note 1	Note 1	ASTM D244
Storage Stability Test, 24 h, (% by mass)		1.5		1.5	ASTM D244
Workability @ - 10° C			Pass		CAN2-16.5-M84 Par. 6.2.3

Tests on Residue

Apparent Viscosity at 60° C, (Pa.s)	8	50	2	30	Note 3
Float Test @ 60° C, (s)	1200		1200		CAN2-16.5-M84 Par. 6.2.6
Solubility in Trichloroethylene (% by weight)	97.5		97.5		ASTM D244

Note 1:Follow ASTM D244, except that the mixture of limestone and emulsified asphalt shall be mixed vigorously for 5 min, then allowed to stand for 3 hours, after which the mixture shall be capable of being mixed an additional 5 min. The mixture shall then be rinsed twice with approximately its own volume of tap water, without showing appreciable loss of bituminous film. After the second mixing the aggregate shall be at least 90% coated.

Note 2: Reference to ASTM Test Procedures shall be from the most recently approved version of the test procedure available at the time of supply contract award.

Note 3: Use appropriate size Cannon Manning tube that provides a flow time of 60 s or greater for the first flow time.

3. QUALITY ASSURANCE

3.1 Samples

Samples will be in accordance with STP 102 - Sampling Asphalt Materials.

3.2 Testing

3.2.1 Sample Preparation

Sample preparation of all high float mixing grade emulsified asphalts shall be in accordance with ASTM D244 Standard Test Methods and Practices for Emulsified Asphalts, with the following qualifications:

a) Once the sample has reached the specified temperature of 50 + 3°C, it shall be removed from the heat source within 24 hours, mixed and individual test samples poured; and

b) Mixing shall be by hand stirring until the sample is homogeneous in character, taking care to ensure that air is not being entrained into the emulsion during mixing.

3.2.2 Pay Reduction Tests

The Province has the option to do any one or more of the tests listed in Table 1 on any of the samples obtained by it. Pay reductions will be based on results of the tests performed.

If a test result is found to fall outside of the specification limits, a second test will be done on another portion of the same sample and the results averaged to assess the pay adjustment.

Should the duplicate test results differ by more than the tolerances for repeatability stated in 3.2.4 of this specification, then the average of the two test values shall not be used and instead the test result numerically nearest the specification limit shall govern.

3.2.3 Time Limits

Loads on which no tests are performed or where tests have not been made within four weeks of the sampling date, will be accepted without pay adjustment.

3.2.4 Interpretation of Results

The criteria for judging the acceptability of test results for each property specified herein should be the tolerances for repeatability specified in the most recent ASTM Standard Test Method for that property. For the following property, testing within a lab or between two labs shall meet the following requirements.

Repeatability

Property	Unit of Measure	Within a lab (same operator)	Range of Measurement
Oil Portion of Distillate	% by volume	0.5	0.0 - 7.0

3.3 Acceptance and Rejection

Pay Reductions on HFMG emulsified asphalt which do not meet specification will be calculated as outlined in the attached form - FORM FOR DETERMINING THE PAY REDUCTION ADJUSTMENT FOR HFMG EMULSIFIED ASPHALT THAT DOES NOT MEET SPECIFICATION.

4. MEASUREMENT

Measurement of HFMG emulsified asphalt will be in accordance with SMM 104.

5. DELIVERY

Delivery of HFMG emulsified asphalt will be in accordance with SMM104.

6. PAYMENT

Payment for HFMG emulsified asphalt will be in accordance with SMM104 and the following:

FORM FOR DETERMINING THE PAY REDUCTION ADJUSTMENT
FOR HFMG EMULSIFIED ASPHALT THAT DOES NOT MEET SPECIFICATION

MANUFACTURER _____ LAB ADMITTANCE NO._____

PRODUCT TYPE _____ CONTROL SECTION_____

DELIVERY SLIP NO. _____ DEPARTMENT CONTRACT NO_____

DATE SAMPLED _____ MAINTENANCE TANK LOCATION_____

DATE TESTED _____ PROJECT MANAGER_____

	SPECIFICATION LIMITS					
TEST	**MIN**	**MAX**	**TEST RESULTS**	**NO. OF UNITS OUTSIDE SPEC LIMITS**	**MULITPLIER FACTOR**	**NO. OF ADJUSTMENT POINTS**
Residue by Distillation (% by mass)					110	
Oil Portion of Distillation (% by volume)					200	
Viscosity (SF) @50° C, (s)					35	
Sieve Test, Retained on 1000 um sieve, (% by mass)					400	
Coating Test (see notes)					15	
Storage Stability Test, 24 h, (% by mass)					75	
Apparent Viscosity at 60° C, (Pa.s)					Note 1	
Float Test @60° C, (s)					1	
Solubility in Trichloroethylene (% by weight)					65	
				TOTAL ADJUSTEMENT POINTS		

Note 1:
If Apparent Viscosity test result is less than specified value, Multiplier Factor is 100
If Apparent Viscosity test result is greater than specified value, Multiplier Factor is 25

$$\text{PAY ADJUSTMENT POINTS} = \left(\frac{TOTAL\ ADJUSTMENT\ POINTS}{100}\right)^{2.3}$$

If Pay Adjustment Points < 2, Pay Factor is 1.

If Pay Adjustment Points > 2, Pay Factor is: $1 - \frac{PAY\ ADJUSTMENT\ POINTS}{100}$

Payment = (Price/Kilogram) (Total Weight) (Pay Factor); Except that, if the calculated pay adjustment points exceed 2, the pay reduction will be $200.00 or the calculated pay reduction, whichever is greater.