1. PRODUCT DESCRIPTION

1.1 Description

The specification for slow setting (SS) anionic emulsified asphalt applies to liquid asphaltic materials in the form of homogeneous aqueous emulsions of the anionic type. Slow setting (SS) anionic emulsified asphalts are specified by the following grades; SS-1, SS-1 (Slurry) and SS-1H.

1.2 Composition/Characteristics

Slow setting anionic emulsified asphalt shall consist of asphalt cements dispersed in an aqueous phase.

1.3 Application/Use

The slow setting emulsified asphalt described herein shall be suitable for use as outlined in Table 1 - Principal Uses of Asphalt Materials of the National Standards Board 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 an emulsifier to maintain the dispersion.

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 slow setting anionic emulsified asphalt described herein shall be free of contamination and shall be homogeneous and uniform in character throughout.

2.1.2 Delivery

The specified material shall be delivered in accordance with the Department's Specifications for Manufactured Materials (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 Slow Setting Anionic Emulsified Asphalt

GRADE	SS-1		SS-1(Slurry)		SS-1H		TEST
PROPERTY	Min	Max	Min	Max	Min	Max	METHOD
Tests on Emulsion							
Viscosity (SF), @ 25° C, (s)	20	60	20	60	20	60	ASTM D244
Residue by Distillation (% by mass)	55.0	-	55.0	-	55.0	-	ASTM D244
Storage Stability, 24 h, (% by mass)	-	1.0	-	1.0	-	1.0	ASTM D244
Sieve Test, Retained on 1000 um sieve, (% by mass)	-	0.10	-	0.10	-	0.10	ASTM D244
Coating Test	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	ASTM D244
Cement Mixing Test (% by mass)	-	-	-	2.0	-	2.0	ASTM D244
Dilution Test	Must Pass	Must Pass	-	-	-	-	Note 2
Particle Charge	Negative	Negative	Negative	Negative	Negative	Negative	Note 3
Tests on Residue							
Penetration @ 25° C 100 g, 5 s (0.1 mm)	100	225	100	200	40	100	ASTM D244
Ductility @ 25° C (cm)	60	-	60	-	60	-	ASTM D113
Solubility in Trichloroethylene (% by mass)	97.5	-	97.5	-	97.5	-	ASTM D2042

Note 1: No appreciable separation, uniform coating of the stone

Note 2: METHOD FOR DILUTION TEST

Mix together 50 grams SS-1 emulsified asphalt and 450 grams soft or demineralized water until homogeneous. Pour into 500 ml graduated cylinder. After 2 hours observe cylinder to determine if a line of separation of asphalt from water has appeared. If separation is apparent in 2 hours, emulsion is not acceptable. After 24 hours if asphalt has visually separated from water, remix contents of cylinder. Material is acceptable if homogeneous liquid is re-established.

Note 3: National Standard of Canada CAN/CGSB-16.2-M89 Par. 6.2.1.

3. QUALITY ASSURANCE

3.1 Samples

Samples for quality assurance testing will be collected in accordance with Standard Test Procedure (STP) 102 Sampling Asphalt Materials.

3.2 Testing

3.2.1 Sample Preparation

Sample preparation for all slow setting anionic emulsified asphalts shall be in accordance with the American Society for Testing and Materials (ASTM) D244 Standard Test Methods for Emulsified Asphalts, with the following qualifications:

a) Once the sample has reached the specified temperature of $50 + 3^{o}$ 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 of the sample until the sample is homogenous 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 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 shall be the tolerances for repeatability specified in the most recent ASTM Standard Test Method for that property. For the following

properties, 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	0.0-0.7
Penetration on 0.1 mm Residue (25^{o} C, 100 g, 5 s)	0.1 mm	15	80-200
		35	200-500

3.3 Acceptance and Rejection

Pay reductions on slow setting anionic emulsified asphalt which do not meet specification will be calculated as outlined in the attached form - FORM FOR DETERMINING THE PAY REDUCTION FOR SLOW SETTING ANIONIC EMULSIFIED ASPHALT THAT DOES NOT MEET SPECIFICATION.

FORM FOR DETERMINING THE PAY REDUCTION
FOR SLOW SETTING ANIONIC EMULSIFIED ASPHALT THAT DOES NOT MEET SPECIFICATION

MANUFACTURER: _____ LAB ADMITTANCE NO.: _____

PRODUCT TYPE: _____ CONTROL SECTION: _____

DELIVERY SLIP NO: _____ SHT CONTRACT NO: _____

DATE SAMPLED: _____ MAINTENANCE TANK LOCATION: _____

DATE TESTED: _____ PROJECT MANAGER: _____

ADJUSTMENT TEST	SPECIFICATION LIMITS MIN	MAX	TEST RESULTS	NO. UNITS OUTSIDE SPEC LIMITS		MULTIPLICATION FACTOR	NO. OF POINTS
Residue by Distillation(% by mass)					200		
Viscosity (SF) @ 50° C, (s)					(Note 1)		
Sieve Test, Retained on 1000µm Sieve (% by mass)					300		
Coating Test (%)					20		
Storage Stability Test, 24h (% by mass)					50		
Penetration of @ 25 °C, 100 g, 5 s, (0.1mm)					15		
Solubility in Trichloroethylene (% by mass)					10		
Cement Mixing Test (% by mass)					100		
Ductility (cm)					10		
				TOTAL ADJUSTMENT POINTS			

Note 1:
If test result < minimum Specified Value, Multiplier Factor is 35
If test result > maximum Specified Value, Multiplier Factor is 10

$$\text{PAY ADJUSTMENT POINTS} = \left[\frac{TOTAL\ ADJUSTMENT\ POINTS}{100}\right]$$

If Pay Adjustment Points $\leq$ 2, Pay Factor is: 1

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

Payment = (Price/Kilogram) x (Total Weight) x (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.