Regional Engineers

Jack A. Elston

Special Provision for Emulsified Asphalts

April 19, 2019

This special provision was developed by the Central Bureau of Materials to update the Department’s specifications in accordance with the AASHTO Standard Specifications for emulsified asphalts, including polymer modified emulsions (M 316). This special provision will change the nomenclature for the following emulsion types.

|  |  |
| --- | --- |
|  | New Acronym (Former Acronym) |
| Polymer Modified | CRS-2P (CRSP)  HFRS-2P (HFP)  CQS-1hP (CSS-1h Latex Modified) |
| Non-Tracking | NTEA (SS-1vh) |

This special provision should be inserted into contracts involving emulsified asphalts which are generally used in the following types of work.

Section 302 Soil Modification

Section 310 Lime Stabilized Soil Mixture

Section 312 Stabilized Subbase (CAM II)

Section 352 Soil Cement Base Course

Section 403 Bituminous Surface Treatment (Class A-1, A-2, A-3)

Section 404 Micro-Surfacing and Slurry Sealing

Section 405 Cape Seal

Section 406 HMA Binder and Surface Course

Section 407 HMA Pavement (Full-Depth)

Section 408 Incidental HMA Surfacing

Section 443 Reflective Crack Control Treatment

Section 582 HMA Surfacing on Bridge Decks

Section 661 HMA Shoulder Curb

Recurring Check Sheet #35 PCC Partial Depth HMA Patching

The districts should include the BDE Check Sheet marked with the applicable special provisions for the August 2, 2019 and subsequent lettings. The Project Coordination and Implementation Section will include a copy in the contract.

This special provision will be available on the transfer directory April 19, 2019.

80415m

# Emulsified asphalts (bde)

Effective: August 1, 2019

Revise Article 1032.06 of the Standard Specifications to read:

“1032.06 **Emulsified Asphalts.** Emulsified asphalts will be accepted according to the current Bureau of Materials Policy Memorandum, “Emulsified Asphalt Acceptance Procedure”. These materials shall be homogeneous and shall show no separation of asphalt after thorough mixing, within 30 days after delivery, provided separation has not been caused by freezing. They shall coat the aggregate being used in the work to the satisfaction of the Engineer and shall be according to the following requirements.

1. Anionic Emulsified Asphalt. Anionic emulsified asphalts RS-1, RS-2, HFRS-2, SS-1h, and SS-1 shall be according to AASHTO M 140, except as follows.
2. The cement mixing test will be waived when the emulsion is being used as a tack coat.
3. The Solubility in Trichloroethylene test according to AASHTO T 44 may be run in lieu of Ash Content and shall meet a minimum of 97.5 percent.
4. Cationic Emulsified Asphalt. Cationic emulsified asphalts CRS-1, CRS-2, CSS-1h, and CSS-1 shall be according to AASHTO M 208, except as follows.
5. The cement mixing test will be waived when the emulsion is being used as a tack coat.
6. The Solubility in Trichloroethylene test according to AASHTO T 44 may be run in lieu of Ash Content and shall meet a minimum of 97.5 percent.

(c) High Float Emulsion. High float emulsions HFE-90, HFE-150, and HFE-300 are medium setting and shall be according to the following table.

|  |  |  |  |
| --- | --- | --- | --- |
| Test | HFE-90 | HFE-150 | HFE-300 |
| Viscosity, Saybolt Furol, at 122 °F (50 °C),  (AASHTO T 59), SFS 1/ | 50 min. | 50 min. | 50 min. |
| Sieve Test, No. 20 (850 µm), retained on sieve, (AASHTO T 59), % | 0.10 max. | 0.10 max. | 0.10 max. |
| Storage Stability Test, 1 day,  (AASHTO T 59), % | 1 max. | 1 max. | 1 max. |
| Coating Test (All Grades),  (AASHTO T 59), 3 minutes | stone coated thoroughly | | |
| Distillation Test, (AASHTO T 59): |  |  |  |
| Residue from distillation test to  500 °F (260 °C), % | 65 min. | 65 min. | 65 min. |
| Oil distillate by volume, % | 7 max. | 7 max. | 7 max. |
| Characteristics of residue from distillation test to 500 °F (260 °C): Penetration at 77 °F (25 °C), (AASHTO T 49), 100 g, 5 sec, dmm | 90-150 | 150-300 | 300 min. |
| Float Test at 140 °F (60 °C),  (AASHTO T 50), sec. | 1200 min. | 1200 min. | 1200 min. |

1/ The emulsion shall be pumpable.

(d) Penetrating Emulsified Prime. Penetrating Emulsified Prime (PEP) shall be according to AASHTO T 59, except as follows.

|  |  |
| --- | --- |
| Test | Result |
| Viscosity, Saybolt Furol, at 77 °F (25 °C), SFS | 75 max. |
| Sieve test, retained on No. 20 (850 µm) sieve, % | 0.10 max. |
| Distillation to 500 °F (260 °C) residue, % | 38 min. |
| Oil distillate by volume, % | 4 max. |

The PEP shall be tested according to the current Bureau of Materials Illinois Laboratory Test Procedure (ILTP), "Sand Penetration Test of Penetrating Emulsified Prime (PEP)". The time of penetration shall be equal to or less than that of MC-30. The depth of penetration shall be equal to or greater than that of MC-30.

(e) Delete this subparagraph.

(f) Polymer Modified Emulsified Asphalt. Polymer modified emulsified asphalts, e.g. SS-1hP, CSS-1hP, CRS-2P (formerly CRSP), CQS-1hP (formerly CSS-1h Latex Modified) and HFRS-2P (formerly HFP) shall be according to AASHTO M 316, except as follows.

(1) The cement mixing test will be waived when the polymer modified emulsion is being used as a tack coat.

(2) CQS-1hP (formerly CSS-1h Latex Modified) emulsion for micro-surfacing treatments shall use latex as the modifier.

(3) Upon examination of the storage stability test cylinder after standing undisturbed for 24 hours, the surface shall show minimal to no white, milky colored substance and shall be a homogenous brown color throughout.

(4) The distillation for all polymer modified emulsions shall be performed according to AASHTO T 59, except the temperature shall be 374 ± 9 °F (190 ± 5 °C) to be held for a period of 15 minutes and measured using an ASTM 16F (16C) thermometer.

(5) The specified temperature for the Elastic Recovery test for all polymer modified emulsions shall be 50.0 ± 1.0 °F (10.0 ± 0.5 °C).

(6) The Solubility in Trichloroethylene test according to AASHTO T 44 may be run in lieu of Ash Content and shall meet a minimum of 97.5 percent.

(g) Non-Tracking Emulsified Asphalt. Non-tracking emulsified asphalt NTEA (formerly SS-1vh) shall be according to the following.

|  |  |
| --- | --- |
| Test | Requirement |
| Saybolt Viscosity at 77 °F (25 °C),  (AASHTO T 59), SFS | 20-100 |
| Storage Stability Test, 24 hr, (AASHTO T 59), % | 1 max. |
| Residue by Distillation, 500 ± 10 °F (260 ± 5 °C), or Residue by Evaporation, 325 ± 5 °F (163 ± 3 °C),  (AASHTO T 59), % | 50 min. |
| Sieve Test, No. 20 (850 µm), (AASHTO T 59), % | 0.3 max. |
| Tests on Residue from Evaporation | |
| Penetration at 77 °F (25 °C), 100 g, 5 sec,  (AASHTO T 49), dmm | 40 max. |
| Softening Point, (AASHTO T 53), °F (°C) | 135 (57) min. |
| Ash Content, (AASHTO T 111), % 1/ | 1 max. |

1/ The Solubility in Trichloroethylene test according to AASHTO T 44 may be run in lieu of Ash Content and shall meet a minimum of 97.5 percent

The different grades are, in general, used for the following.

|  |  |
| --- | --- |
| Grade | Use |
| SS-1, SS-1h, RS-1, RS-2, CSS-1, CRS-1, CRS-2, CSS-1h, HFE-90, SS-1hP, CSS-1hP,  NTEA (formerly SS-1vh) | Tack Coat |
| PEP | Prime Coat |
| RS-2, HFE-90, HFE-150, HFE-300,  CRS-2P (formerly CRSP), HFRS-2P (formerly HFP), CRS-2, HFRS-2 | Bituminous Surface Treatment |
| CQS-1hP (formerly CSS-1h Latex Modified) | Micro-Surfacing  Slurry Sealing  Cape Seal” |

80415