SECTION 703 – BITUMINOUS MATERIALS

**PHYSICAL PROPERTIES AND TESTS**

***DELETE TABLES 7, 8, AND 9 AND REPLACE WITH THE FOLLOWING:***

| **TABLE 7**  **UNIFORM PACIFIC COAST SPECIFICATIONS FOR CATIONIC EMULSIFIED ASPHALT** | | | | | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Test** | **Test Method** | | **Rapid Setting** | | | | | **Medium Setting** | | | | | | **Slow Setting** | | | | **Quick Setting6** | |
| **AASHTO** | **ASTM** | **CRS-1** | | **CRS-2** | | | **CMS-2S** | | **CMS-2** | | **CMS-2h** | | **CSS-1** | | **CSS-1h** | | **CQS-1h** | |
| **Min.** | **Max.** | **Min.** | | **Max.** | **Min.** | **Max.** | **Min.** | **Max.** | **Min.** | **Max.** | **Min.** | **Max.** | **Min.** | **Max.** | **Min.** | **Max.** |
| **Test on Emulsions** | | | | | | | | | | | | | | | | | | | |
| Viscosity SSF @ 77°F, sec. | T59 | D88 | -- | -- | | -- | -- | -- | -- | -- | -- | -- | -- | 20 | 100 | 20 | 100 | 20 | 100 |
| Viscosity SSF @ 122°F, sec. | T59 | D88 | 20 | 100 | | 100 | 400 | 50 | 450 | 50 | 450 | 50 | 450 | -- | -- | -- | -- | -- | -- |
| Settlement, 5 days, %1 | T59 | D244 | -- | 5 | | -- | 5 | -- | 5 | -- | 5 | -- | 5 | -- | 5 | -- | 5 | -- | 5 |
| Storage Stability, 1 day2 | T59 | D244 | -- | 1 | | -- | 1 | -- | 1 | -- | 1 | -- | 1 | -- | 1 | -- | 1 | -- | 1 |
| Demulsibility, 35 ml 0.8% sodium dioctyl sulfosuccinate, %3 | T59 | D244 | 40 | -- | | 40 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Coating Ability/Water Resistance: | T59 | D244 | -- | -- | | -- | -- | -- | -- | -- | -- |  |  | -- | -- | -- | -- | -- | -- |
| Coating, dry aggregate | -- | -- | | -- | -- | Good | -- | Good | -- | Good | -- | -- | -- | -- | -- | -- | -- |
| Coating, after spraying | -- | -- | | -- | -- | Fair | -- | Fair | -- | Fair | -- | -- | -- | -- | -- | -- | -- |
| Coating, wet aggregate | -- | -- | | -- | -- | Fair | -- | Fair | -- | Fair | -- | -- | -- | -- | -- | -- | -- |
| Coating, after spraying | -- | -- | | -- | -- | Fair | -- | Fair | -- | Fair | -- | -- | -- | -- | -- | -- | -- |
| Particle Charge Test | T59 | D244 | Positive | | | Positive | | Positive | | Positive | | Positive | | Positive5 | | Positive5 | | Positive | |
| Sieve Test, % | T59 | D244 | -- | 0.10 | | -- | 0.10 | -- | 0.10 | -- | 0.10 | -- | .10 | -- | 0.10 | -- | 0.10 | -- | 0.10 |
| Cement Mixing Test, % | T59 | D244 | -- | -- | | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.0 | -- | 2.0 | -- | -- |
| **Distillation** | | | | | | | | | | | | | | | | | | | |
| Oil Distillate by volume of emulsion, % | T59 | D244 | -- | 3 | | -- | 3 | -- | 20 | -- | 12 | -- | 12 | -- | -- | -- | -- | -- | -- |
| Asphalt Residue, % | T59 | D244 | 60 | -- | | 65 | -- | 60 | -- | 65 | -- | 65 | -- | 57 | -- | 57 | -- | 65 | -- |
| Asphalt Residue, % Microsurfacing | T59 | D244 | 60 | -- | | 65 | -- | 60 | -- | 65 | -- | 65 | -- | 57 | -- | 57 | -- | 65 | -- |
| **Tests on Residue from Distillate Test**4 | | | | | | | | | | | | | | | | | | | |
| Penetration, 77°F, 100g, 5sec. | T49 | D5 | 100 | 250 | | 100 | 250 | 100 | 250 | 100 | 250 | 40 | 90 | 100 | 250 | 40 | 90 | 35 | 50 |
| Ductility, 77°F, 5cm/min., cm | T51 | D113 | 40 | -- | | 40 | -- | 40 | -- | 40 | -- | 40 | -- | 40 | -- | 40 | -- | 40 | -- |
| Solubility in Trichloroethylene, % | T44 | D2042 | 97.5 | -- | | 97.5 | -- | 97.5 | -- | 97.5 | -- | 97.5 | -- | 97.5 | -- | 97.5 | -- | 97.5 | -- |
| Softening Point | T53 | D36 |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | 135 | |

1 The test requirement for settlement may be waived when the emulsified asphalt is used in less than 5 days time; or the purchaser may require that the settlement test be run from the time the sample is received until it is used, if the elapsed time is less than 5 days.

2 The 24 hour (1 day) storage stability test may be used instead of the 5 day settlement test.

3 The demulsibility test shall be made within 30 days from date of shipment.

4 A harder base asphalt meeting current paving asphalt specifications may be specified with the provision that the test requirements on the Residue from Distillation be waived.

5 Must meet a pH requirement of 6.7 maximum (ASTM E 70) if the Particle Charge Test result is inconclusive. 3

6 Does not apply to polymer modified emulsion

|  |  |  |
| --- | --- | --- |
| **SPECIFICATION FOR SLURRY SEAL MIX**  **TABLE 8** | | |
| **TEST ON MIXTURE**  Residual Asphalt, % of dry wt. of aggregate  Consistency, flow  Wet Cohesion, 30 minute set  Wet Cohesion, 60 minute set  Set Time, 30 minutes  Excess Asphalt by LWT & Sand Adhesion  Wet Stripping, % coating  Wet track Abrasion (6-day soak)  Wet track Abrasion (1-hour soak)  System Compatibility  Mix time @ 77°F  Mix time @ 104°F | **TEST METHOD**  ASTM D3910/ISSA T106  ISSA T139  ISSA T139  ASTM D3910  ASTM T109  ASTM T114  ASTM D3910/ISSA T100  ASTM D3910/ISSA T100  ISSA T115  ASTM D-3910/ISSA T113  ASTM D-3910/ISSA T113 | **REQUIREMENTS**  8.8 - 13.5  2 - 3 cm  12 -13 kg/cm  20 - 21 kg/cm  Negative  50 g/ft² max.  90 min.  75 g/ft² max.  75 g/ft² max.  pass  Controllable to 180  sec minimum  Controllable to 180  sec minimum |

|  |  |  |
| --- | --- | --- |
| **SPECIFICATION FOR MICRO-SURFACING MIX**  **TABLE 9** | | |
| **TEST ON MIXTURE**  Residual Asphalt, % of dry wt. of aggregate  Wet Cohesion, 30-minute set  Wet Cohesion, 60-minute set  Excess Asphalt by LWT & Sand Adhesion  Wet Stripping, % coating  Wet track Abrasion (6-day soak)  Wet track Abrasion (1-hour soak)  Mix time @ 77°F  Mix time @ 104°F  Lateral Displacement  Classification Compatibility | **TEST METHOD**  ISSA T139  ISSA T139  ISSA T109  ISSA T114  ASTM D3910/ISSA T100  ASTM D3910/ISSA T100 ASTM D3910/ISSA T113  ASTM D3910/ISSA T113  ISSA T147  ISSA T144 | **REQUIREMENTS**  6.5 - 9.5  12 kg/cm  20 kg/cm  50 g/ft² max.  90 min.  75 g/ft² max.  50 g/ft² max.  Controllable to 120  sec minimum Controllable to 120  sec minimum  5% Max.  (AAA, BAA) 11 grade points minimum |

***ADD THE FOLLOWING TO THIS SUBSECTION:***

**703.03.08 RUBBER-ASPHALT CRACK SEALANT**

A. The material shall pour readily over its specified application temperatures and penetrate a ¼ inch minimum width crack for the entire ambient temperature range recommended by the manufacturer for application of the material.

B. The product shall cure sufficiently within 30 minutes of application, over the manufacturer’s recommended ambient temperature range for use, to allow normal traffic without tracking or pullout.

C. The crack sealant shall conform to the requirements of Table 7

D. The Contractor shall submit test data for each lot of material delivered, in writing, verifying conformance with the listed materials specifications. The Contractor, at his own expense, shall have one sample tested by an acceptable independent testing laboratory. This samples shall be taken at a time and location designated by the Engineer.

***ADD THE FOLLOWING TABLE:***

|  |  |  |
| --- | --- | --- |
| **TABLE 11 – RUBBER ASPHALT CRACK SEALANT** | | |
| **Test** | **Test Method** | **Requirements** |
| Ductility | ASTM D113 | 77° F, 5 cm/minute, 30 cm minimum |
| Penetration | ASTM D5 | 77° F, 150 g/5 second, 40 maximum |
| Resilience | ASTM D5329 | 77° F, 30% minimum |
| Flow | ASTM D5329 | 3 mm @ 140° F maximum |
| Softening Point | ASTM D36 | 210° F minimum |

**GENERAL REQUIREMENTS:**

1. Weight per gallon at 77° F, not to exceed 10.3 pounds

2. Flexibility 1 inch mandrel, bend 90 degrees, conditioned to 20° F, time to bend = 2 seconds. (1/8 inch by 1 inch by 4 inch long sample)

**END OF SECTION 703**