700 MATERIAL DETAILS

Materials shall conform to the stated requirements and/or the requirements of the referenced specifications including modifications as noted.

Copies of all Supplemental Specifications referenced in this section are on file with the City of Columbus Transportation Division.

702 - *ASPHALT* MATERIAL

Acceptance. Asphalt *binders* meeting the requirements of 702.01 and liquid asphalts 702.02, 702.03 and 702.04 may be accepted for shipment to and immediate use in construction projects by asphalt manufacturer's certification, at the option of the Contractor in lieu of sampling by City Inspectors at manufacturing plants, when requested by an asphalt manufacturer and agreed to by both the requesting asphalt manufacturer and the City. The procedure for this type of acceptance is set forth in ODOT Supplement 1032 on file in the ODOT Office of the Director.

702.00 Application Temperatures. *When applying asphalt materials according to the specifications, conform to the temperature ranges specified in the following table*:

Type and Grade of Material	**Application Temperature, Range F° (C°)**	
	Spray	**Mix**
RT 1-2-3	60-130 (16-54)	___
RT 4-5-6	85-150 (29-66)	85-150 (29-66)
RT 7-8-9	150-225 (66-107)	150-225 (66-107)
RT 10-11-12	175-250 (79-121)	175-250 (79-121)
RC-70	75-150 (24-66)	___
RC-250	100-175 (38-79)	80-150 *(27-66)*
RC-800	150-225	150-200

	(66-107)	(66-*93*)
RC-3000	200-275 (93-135)	175-225 (79-107)
MC-30	50-120 (10-49)	___
MC-70	75-150 (24-66)	___
MC-250	100-225 (38-107)	100-225 (38-107)
MC-800	150-250 (66-121)	150-225 (66-*107*)
MC-3000	225-275 (107-135)	200-250 (93-121)
All Emulsions	50-160 (10-71)	50-140 (10-60)
Asphalt Primer for Waterproofing	50-80 (10-27)	
Asphalt for Waterproofing	300-350	(149-177)
CBAE 350, CBAE 350 Sp	100-150 (38-66)	100-150 (38-66)
CBAE 800, CBAE 800 Sp	125-175 (52-79)	125-175 (52-79)
Primer 20	60-120 (16-49)	___
Primer 100	75-125 (24-52)	___
Asphalt *Binders*	350 *Max.* (177)	325 *Max.* (163)
Asphalt Binders-Polymer Modified with SB, SBR, Or SBS	___	*350 Max.* *(177)*

702.01 Asphalt *Binders.* *Provide asphalt binders conforming to ODOT Supplemental Specification 908.*

702.02 Cut-Back Asphalt. *Provide rapid curing cut-back asphalt conforming to AASHTO M 81 and medium curing cut-back asphalt conforming to AASHTO M 82. Instead of viscosity on the residue, the penetration in note 3 (AASHTO M 81) or Note 4 (AASHTO M 82) shall govern.*

702.03 Cut-Back Asphalt Emulsions. *Prepare emulsions by compounding a suitable volatile solvent and water with 702.01 asphalt to produce emulsions conforming to the following table.*

	CBAE-350	CBAE-350 Special	CBAE-800	CBAE-800 Special	Primer 20	Primer 100
Kinematic Viscosity at 60 °C, Centistokes	350-700	350-700	800-1600	800-1600	20-40	100-200
Water Content[1], %	4-12	4-12	4-12	4-12	3-8	3-8
Volatile Solvent[1], %	12-25	12-25	10-20	10-20		
Asphalt Content[1], %	67+	67+	72+	72-	45+	60-
Adhesion Test[1]	[2]	[2]	[2]	[2]		
Wet Stone Coating Test[1]		[2]		[2]	[2]	[2]
Stripping Test[1]		[2]		[2]		
Tests on Residue From Distillation						
Penetration at 25 °C	80-150	80-150	80-150	80-150	100-200	100-200
Ductility at 25 °C, in cm	100+	100+	100+	100+	100+	100+
Total Binder (Sol. in CSx), %	99+	99+	99+	99+	99+	99+

[1] Perform tests according to ODOT Supplement 1014.

[2] Shall meet.

702.04 Emulsified Asphalts. *Provide emulsified asphalts conforming to AASHTO M 140 or AASHTO M 208.*

702.05 Asphalt Primer for Waterproofing. *Provide asphalt primer for waterproofing conforming to ASTM D 41.*

702.06 Asphalt for Waterproofing. *Provide asphalt for waterproofing conforming to ASTM D 312, Type III.*

702.07 Asphalt Emulsion MWS. *Prepare asphalt emulsion MWS from a base material conforming to 702.01, except vary the penetration to meet the float test and penetration specified below. Ensure that the emulsion coats the aggregate readily, thoroughly, and uniformly. Ensure that the specified characteristics do not change*

during transportation or normal storage and that the emulsion conforms to the following when tested according to AASHTO T 59:

Saybolt furol viscosity at 77 °F (25 °C), seconds..... 50+ (a)
Asphalt residue, percent .....68+
Settlement, 7 days, percent.....5-
Sieve test.....0.1-
Coating test .....(b)
Oil distillate, percent 7-
Withstand freezing to .....-10 ºF (-23 °C) (c)
Particle charge .....Negative
Penetration, 77 °F (25 °C) (f) .....(d)
Float test at 140 °F (60 °C), seconds (f).....1200+ (e)
Total bitumen soluble CS2 (f) .....97.5+
Ash content, percent (f).....2.0-

(a) Pumpable.

(b) Use aggregates to test the emulsion that are from sources standardized by the Laboratory. Aggregates shall consist of 100 percent passing a 3/8 inch (9.5 mm) sieve and 0 percent passing a 1/4 inch (6.3 mm) sieve. Wash the standard reference aggregates with distilled water until free of dust, and dry them.

Weigh 3.280 ounces (93 grams) of the dry graded reference aggregate into a suitable container. Weigh 0.247 ounces (7 grams) of the emulsion onto the aggregate in the container, and vigorously mix the contents for 5 minutes. After mixing, thoroughly coat the stone. Completely immerse the mixture in tap water, and immediately pour off the tap water. Ensure that the aggregate surface area is at least 90 percent coated.

(c) When shipped after October 1 and before April 15, except if the emulsion is stored and mixed at temperatures of emulsion, aggregate, and atmosphere above 40 °F (5° C).

(d) Select the penetration within the following ranges of the designation specified:

Designation	***Penetration at 77 °F (25 °C)***
MWS 300	*300+*
MWS 150	*150 to 300*
MWS 90	*90 to 150*
MWS 60	*60 to 90*

(e) AASHTO T 50, except immediately pour residue from distillation into the float collar at 500°F (260°C); or if the residue has been allowed to cool, heat it again to 500°F (260°C) and pour it into the float collar.

(f) Test on residue from distillation.

702.13 Rubberized Asphalt Emulsion. *This material consists of asphalt emulsion SS-1 or SS-1h, conforming to 702.04, blended with rubber compound, conforming to 702.14, to produce a residual mixture of asphalt and rubber solids having a composition of 95 ± 0.3 percent asphalt and 5 ± 0.3 percent rubber solids by weight.*

Furnish a certification to the Laboratory showing the following:

1. *The weight of rubber compound blended with the emulsion.*
2. *The weight of SS-1 or SS-1h emulsion blended with the rubber compound.*
3. *The Laboratory Report Number and/or the approved Notice of Shipment Number of the SS-1 or SS-1h emulsion.*
4. *The certified lot or batch number of the rubber compound.*
5. *The percent of asphalt in the emulsion residue by distillation.*
6. *The percent of rubber solids in rubber compound.*
7. *The percent of rubber solids in the mixture of asphalt residue by distillation and rubber solids.*

Determine the weight of the rubber compound to be added to a designated weight of SS-1 or SS-1h emulsion to provide the percent of rubber solids in the mixture of asphalt residue by distillation and rubber solids specified herein using the following formula:

$$X = \frac{0.0526(B)(W)}{(A)}$$

Where:

X = pounds (kilograms) of rubber compound
A = percent of rubber solids in the rubber compound
B = percent of asphalt residue by distillation of SS-1 or SS-1h emulsion
W = pounds (kilograms) of SS-1 or SS-1h Emulsion

702.14 Rubber Compound. *Provide a dispersible rubber compound for use in rubberized sand-asphalt. The rubber compound shall consist of unvulcanized virgin synthetic rubber in the liquid latex form. The manufacturer of the rubber compound shall furnish a written certification of the total rubber solids content of the rubber compound and provide written certification containing actual test results showing compliance with the requirements of these specifications.*

Provide a rubber compound conforming to the following:

1. *Rubber compound:*

Total rubber solids, percent by weight (Certification) .....49+
Ash, percent of total rubber solids (ASTM D 297) 3.5-

2. *Combination of rubber compound with reference asphalt, mixed according to Supplement 1012.02:*

Flow, cm 5-
Softening point, °C raise from reference asphalt, ASTM D 36 .....12+
Penetration @ 25 °C., 100 g, 5 sec., mm/10 drop from reference asphalt, ASTM D 5.....10+
*Viscosity, Brookfield units, Model RVF, spindle No. 7 @ 10 RPM @ 94 °C *.....175,000+*
Toughness inch-pounds (N×m) .....150+(17+)
Tenacity, inch-pounds (N×m) .....90+(10+)
Peak load, pounds (N).....65+(289+)
Elongation, inches (mm) .....20+(500+)
Ductility @ 4 °C, 1 cm/min., ASTM D 113 .....150+

**Take the reading 60 seconds after spindle is actuated.*

3. *Mixture of the rubber compound with the reference asphalt and reference aggregate:*

Dispersion of rubber, number of remaining black rubbery particles visible to the naked eye.....None
Resistance to flexure fatigue, number of flexural units.....1500+

Perform the testing according to ODOT Supplement 1012.