State: Georgia	**Materials:** Re: Section 822 – Emulsified Asphalt
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Georgia		**Table 1: Requirements for Anionic Emulsified Asphalts (1)**				
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Rapid-Setting**	**Slow-Setting**		**Prime**
			RS-2h	**SS-1h**	**SS-1**	Non-Tracing Tack	EAP-1
EMULSIONS:							
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T59	-	20-100	20-100	15-150	10-100
	50 °C (122 °F)		75-400	-	-	-	-
Settlement, 5 days, % (2)			5 max.	5 max.	5 max.	5 max.	5 max.
Storage Stability Test, 24 hours, % (3)			1 max.	1 max.	1 max.	1 max.	1 max.
Sieve Test, %			0.10 max.	0.10 max.	0.10 max.	0.20 max.	0.10 max.
Demulsibility, % (4)			60 min.	-	-	-	70 max.
Cement Mixing Test, % (5)			-	2.0 max.	2.0 max.	-	-
Coating Ability and Water Resistance	Dry Aggregate		-	-	-	-	-
	After Spraying		-	-	-	-	-
	Wet Aggregate		-	-	-	-	-
	After Spraying		-	-	-	-	-
Residue, %			63 min.	57 min.	57 min.	50 min.	50 min.
Oil Distillate, volume of emulsion, %			-	-	-	1 max.	5-12
DISTILLATION RESIDUE:							
Penetration, 25 ºC (77 °F), tenths of mm		T49	80-140	40-90	100-200	90 max.	-
Ductility, 25 ºC (77 °F), cm		T51	40 min.	40 min.	40 min.	-	-
Softening Point, °F		T53	-	-	-	125 min.	-
Original DSR (86 °C, 10 rad/s), G*/sin (δ), kPa		T315	-	-	-	-	-
Solubility in trichloroethylene, %		T44	97.5 min.	97.5 min.	97.5 min.	-	97.5 min.
Float Test, 60 °C (140 °F), seconds		T50	-	-	-	-	20 min.

For Table 1 Notes, See Page 2

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TABLE 1 NOTES:	1. Anionic emulsified asphalt is not compatible with cationic emulsions (CRS, CMS< CSS, CQS, etc.). Ensure all equipment is thoroughly cleaned if cationic emulsion was previously present. 2. The test requirement for Settlement may be waived when the emulsified asphalt is used in less than five (5) days; or the Engineer 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 five (5) days, if there is an issue of quality. 3. The 24-hour (1 day) Storage Stability Test may be used but does not predict that the 5-day Settlement Test will pass. 4. Ensure the Demulsibility Test is made within 30 days from the date of shipment. Use 35 ml 0.02 *N* $CaCl_2$ solution. 5. Ensure the Cement Mixing Test will be applicable only if material is used in Asphalt Slurry Seal.

Georgia		Table 2: Requirements for Cationic Emulsified Asphalts						
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Rapid-Setting**				**Quick-Setting**	
			CRS-1h	**CRS-2h**	**CRS-3**	**CRS-2P (1,7)**	**CQS-1h (2,3)**	**CQS-1hP (7)**
Uses			**Tack Coat**	**Surface Treatment**			**Tack Coat Slurry Seal**	**Micro Surf.**
Tests on emulsion								
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T59	-	-	-	-	20-100	20-150
	50 °C (122 °F)		20-100	100-400	100-500	100-400	-	-
Settlement, 5 days, % (5)			-	5 max.	5 max.	5 max.	5 max.	5 max.
Storage Stability Test, 24 hours, % (5)			1 max.	1 max.	1 max.	1 max.	1 max.	1 max.
Sieve Test, %			0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.
Particle Charge			Positive	Positive	Positive	Positive	Positive	Positive
Demulsibility , % (6)			40 min.	40 min.	40 min.	40 min.	-	-
Cement Mixing Test, %			-	-	-	-	-	-
Coating Ability and Water Resistance	Dry Aggregate		-	-	-	-	-	-
	After Spraying		-	-	-	-	-	-
	Wet Aggregate		-	-	-	-	-	-
	After Spraying		-	-	-	-	-	-
Distillation Residue, % (7)			60 min.	65 min.	65 min.	65 min.	57 min.	60 min.
Oil Distillate, volume of emulsion, %			3 max.	3 max.	3 max.	3 max.	-	-
Evaporation Residue, % (8)			60 min.	65 min.	65 min.	65 min.	57 min.	60 min.
pH		-	-	-	-	-	-	
Tests on Residue								
Penetration, 25 ºC (77 °F), tenths of mm		T49	40-100	80-140	60-110	80-175	40-90	40-90
Ductility, 25 ºC (77 °F), cm		T51	40 min.	40 min.	40 min.	125 min.	40 min.	40 min.
Solubility in trichloroethylene, %		T44	97.5 min.	97.5 min.	97.5 min.	97.5 min.	97.5 min.	97.5 min.
Softening Point, °F		T53	-	-	-	125 min.	-	135 min.
Elastic Recovery, 25 °C (77 °F), %		T301	-	-	-	50 min.	-	-

NOTES:	1. May be acceptable for limited use in conjunction with OMAT's recommendation 2. Slurry Seal containing CQS-1h must set sufficiently within 2 hours to allow traffic to resume. 3. In the laboratory, Slurry Seal containing CQS-1h shall not set while being mixed according to GDT 91 for a minimum of 90 seconds. 4. Failure to break within 30 minutes after application and/or other than minor tracking of the tack once it has broken may subject the non-tracking tack product to re-evaluation for QPL 7 "Georgia's List of Approved Bituminous Materials". 5. The 24-hour storage stability test may be used. However, this test does not predict whether the 5-day settlement test will pass. 6. Perform the demulsibility test within 30 days from date of manufacture. 7. AASHTO T 59 modified to include a maximum temperature of 350 °F ± 10 °F to be held for 20 minutes. 8. Use Residue by Evaporation for all testing on residue material. Residue by Distillation may be used if penetration, softening point and/or ductility test fail on residue by evaporation.

Georgia		Table 2: Requirements for Cationic Emulsified Asphalts Continued					
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Medium-Setting**			**Slow-Setting**	
			CMS-2	**CMS-1P (1)**	**CMS-1P(R) (1,5)**	**CSS-1h**	**ECR-1**
Uses			**Pre-coating**	**Scrub Seal**	**Rejuv. Seal**	**Slurry Seal**	**(2)**
Tests on emulsion							
Viscosity, Saybolt Furol seconds	25 °C (77 °F)	T59	-	50-350	20-100	20-100	50-500
	50 °C (122 °F)		50-450	-	-	-	-
Settlement, 5 days, % (3)			5 max.	5 max.	5 max.	5 max.	5 max.
Storage Stability Test, 24 hours, % (3)			1 max.	1 max.	1 max.	1 max.	1 max.
Sieve Test, %			.10 max.	.10 max.	.10 max.	.10 max.	.10 max.
Particle Charge			Positive	Positive	Positive	Positive	Positive
Demulsibility , % (4)			-	-	-	-	-
Cement Mixing Test, %			-	-	-	-	-
Coating Ability and Water Resistance	Dry Aggregate		Good	-	-	-	-
	After Spraying		Fair	-	-	-	-
	Wet Aggregate		Fair	-	-	-	Good
	After Spraying		Fair	-	-	-	-
Distillation Residue, % (6)			65 min.	60 min.	57 min.	57 min.	60 min.
Oil Distillate, volume of emulsion, %			12 max.	0.5 max.	0.5 max.	-	6 max.
Evaporation Residue, % (6)			65 min.	60 min.	57 min.	57 min.	60 min.
pH		-	-	-	-	-	-
Tests on Residue							
Penetration, tenths of mm	25 ºC (77 °F)	T49	100-250	-	-	40-90	125-225
	4 ºC (39.2 °F)		-	30-90	30-90	-	-
Ductility, 25 ºC (77 °F), cm		T51	40 min.	-	-	40 min.	40 min.
Solubility in trichloroethylene, %		T44	97.5 min.	-	-	97.5 min.	97.5 min.
Softening Point, °F		T53	-	125 min.	125 min.	-	-
Elastic Recovery, 25 °C (77 °F), %		T301	-	-	-	-	-

NOTES:	1. May be acceptable for limited use in conjunction with OMAT's recommendation 2. Use ECR-1 in cold mix recycling of reclaimed pavements. 3. The 24-hour storage stability test may be used. However, this test does not predict whether the 5-day settlement test will pass. 4. Perform the demulsibility test within 30 days from date of manufacture. 5. Use CMS-1P(R) as a Rejuvenation Seal diluted 1:1. Sample undiluted for testing at the manufacture site. Sample diluted for testing from distributor on project (Minimum Residue 29 %). 6. Use Residue by Evaporation for all testing on residue material. Residue by Distillation may be used if penetration, softening point and/or ductility test fail on residue by evaporation.

Georgia		Table 3: Requirements for Latex Modified Cationic Emulsified Asphalts	
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**CRS-2L**
EMULSIONS:			
Viscosity, Saybolt Furol Seconds	25 °C (77 °F)	T59	-
	50 °C (122 °F)		100-400
Settlement, 5 days			5 max.
Storage Stability Test, 24 hours, %			1 max.
Sieve, %			0.10 max.
Particle Charge			Positive
Demulsibility , % (1)			40 min.
Distillation Residue, % (2)			65 min.
Oil Distillate, volume of emulsion, %			3 max.
Evaporation Residue, % (4)		(3)	65 min.
Polymer Content, % by mass of residual asphalt		-	-
RESIDUE FROM DISTILLATION:			
Penetration, 25 °C (77 °F), tenths of mm		T49	80-175
Ductility, 25 °C (77 °F), cm		T51	125 min.
Elastic Recovery, 25 °C (77 °F), %		T301	50 min.
Softening Point, °F		T53	125 min.
Torsional Recovery		-	-
Solubility in toluene by centrifuge, %		D5546-01	97.5 min.
Polymer solids content, %		T302	3.0 min.
NOTES:		1. Use 35 ml 0.8% dioctyl sulfosuccinate solution. 2. AASHTO T 59 modified to include a maximum temperature of 350 °F ± 10 °F to be held for 20 minutes. 3. GDT-135, Residue by Evaporation. 4. Use Residue by Evaporation for all testing on residue material. Residue by Distillation may be used if penetration, softening point and/or ductility tests fail on residue by evaporation.	

Georgia		Table 4: Requirements for Cationic Non-Tracking Tack	
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**Manufacturer Specific (1)**
EMULSIONS:			
Viscosity, Saybolt Furol Seconds	25 °C (77 °F)	T59	15-150
	50 °C (122 °F)		-
Settlement, 5 days (2)			5 max.
Storage Stability Test, 24 hours, % (2)			1 max.
Sieve, %			0.20 max.
Particle Charge			Positive
Demulsibility , %			-
Distillation Residue, % (3)			50 min.
Oil Distillate, volume of emulsion, %			1 max.
Evaporation Residue, % (3)		(3)	50 min.
Polymer Content, % by mass of residual asphalt		-	-
RESIDUE FROM DISTILLATION:			
Penetration, 25 °C (77 °F), tenths of mm		T49	90 max.
Ductility, 25 °C (77 °F), cm		T51	-
Elastic Recovery, 25 °C (77 °F), %		T301	-
Softening Point, °F		T53	125 min.
Torsional Recovery		-	-
Solubility in toluene by centrifuge, %		D5546-01	-
Polymer solids content, %		T302	-
NOTES:		1. Failure to break within 30 minutes after application and/or other than minor tracking of the tack once it has broken may subject the non-tracking tack product to re-evaluation for QPL 7 “Georgia’s List of Approved Bituminous Materials”. 2. The 24-hour storage stability test may be used. However, this test does not predict whether the 5-day settlement test will pass. 3. Use Residue by Evaporation for all testing on residue material. Residue by Distillation may be used if penetration, softening point and/or ductility test fail on residue by evaporation.	

Georgia		Table 5: Requirements for Cutback Asphalt Emulsion		
Property		**Test Method AASHTO (T), ASTM (D), or Other**	**CBAE-2**	**CBAE-3**
EMULSIONS:				
Viscosity, Saybolt Furol Seconds	60 °C (140 °F)	T72	100-350	400-700
Residue, %		GDT-11	67 min.	72 min.
Naphtha content (by difference), % by weight			12-25	10-20
Water content, % by weight		T55	4-12	4-12
RESIDUE FROM DISTILLATION:				
Penetration, 25 °C (77 °F), tenths of mm		T49	60-150	60-150
Ductility, 25 °C (77 °F), cm		T51	100 min.	100 min.
Ash, % by weight		T111	1.0 max.	1.0 max.
Solubility in trichloroethylene, %		T44	99 min.	99 min.
NOTES:		None.		