SPG SPECIFICATION FOR 2015 IMPLEMENTATION

by

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Product 5-6616-01-P4
Project 5-6616-01
Project Title: Statewide Implementation of the Surface Performance-Graded (SPG) Specification for Seal Coat Binders

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SPECIAL PROVISION

300---054

Asphalts, Oils, and Emulsions

For this project, Item 300, "Asphalts, Oils, and Emulsions," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 300.2, "Materials," Section D, "Emulsified Asphalt," is supplemented by the following.

Table 7A
Surface Performance-Grade Emulsified Asphalt

Grade	Test Procedure	HFRS-2(SPG xy[1])		CRS-2(SPG xy)		CHFRS-2(SPG xy)	
		Min	Max	Min	Max	Min	Max
Tests on emulsions:							
Viscosity, Saybolt Furol at 50°C, SFs[2]	T 72	150	400	150	400	150	400
Storage stability test, 24 h., %[2]	T 59		1		1		1
Demulsibility, 35 mL, 0.02 N $CaCl_2$, %	T 59	60					
Demulsibility, 35 mL, 0.8% dioctyl sodium sulfosuccinate, %	T 59			60		60	
Particle charge test	T 59			positive		positive	
Sieve test, %[2]	T 59		0.10		0.10		0.10
Residue recovery	PP 72, Procedure B						
Residue, %		65		65		65	
Tests on recovered residue:							
Residue properties		Meet the specified SPG in Table 17A[3]					
Solubility in trichloroethylene, %	T 44	97.5		97.5			
Float test, 60°C, sec.[4]	T 50	1,200				1,200	

1. X is the average 7-day maximum pavement surface design temperature, and y is the minimum pavement surface design temperature used in Table 17A.
2. This test requirement on representative samples is waived if successful application of the material has been achieved in the field.
3. Meet original performance properties and PAV residue requirements only
4. If Float test is less than 1,200 sec. using PP 72, Procedure B, for residue recovery, then use T 59 for residue recovery.

Article 300.2, "Materials," Section J, "Performance-Graded Binders," is supplemented by the following.

Table 17A
Surface Performance Grade (SPG) Specification

Surface Performance Grade	SPG 64	SPG 67					SPG 70					SPG 73			
	-25	-13	-16	-19	-22	-25	-13	-16	-19	-22	-25	-16	-19	-22	-25
Average 7-day Max pavement surface design temperature[1], °C	<64	<67					<70					<73			
Min pavement surface design temperature[1], °C	>-25	>-13	>-16	>-19	>-22	>-25	>-13	>-16	>-19	>-22	>-25	>-16	>-19	>-22	>-25
Original Binder															
Flash point temp, T 48, Min, °C	230														
Viscosity, T 316: Max 0.15 Pa*s, test temp., °C	205														
Original Performance Properties															
Dynamic Shear, T 315: G*/sinδ, Min 0.65 kPa, Test temp @ 10 rad/s, °C	64	67					70					73			
Shear Strain Sweep, T 315: % strain @ 0.8 G_i*, Min: 17.5 Test temp. @ 10 rad/s linear loading from 1–50% strain, with measurement of 20–30 increments, °C	25	25					25					25			
Phase angle[3] (δ), Max, @ temp. where G*/sinδ = 0.65 kPa	80	–	–	–	80	80	–	–	80	80	80	80	80	80	80
Pressure Aging Vessel (PAV) Residue (R 28)															
PAV aging temperature, °C	100	100					100					100			
Creep stiffness, T 313: S, Max 500 MPa, Test temp. @ 8 sec., °C	-25	-13	-16	-19	-22	-25	-13	-16	-19	-22	-25	-16	-19	-22	-25
Shear Strain Sweep, T 315 G_i*, Max: 2.5 MPa Test temp. @ 10 rad/s linear loading at 1% strain, °C	25	25					25					25			

1. Temperatures are at the surface of the pavement structure. These may be determined from experience or may be estimated using equations developed by SHRP or LTPP, but modified to represent surface temperatures. Surface-grade high temperatures are generally 3°C to 4°C greater than those determined for Superpave PG binders.
2. The referee method will be AASHTO T 316 using a #21 spindle at 50 r/min, however alternate methods may be used for routine testing and quality assurance.
3. Phase angle is determined at the temperature where G*/sinδ = 0.65 kPa. For routine testing and quality assurance, the phase angle can be interpolated from testing at two temperatures, one above and one below where G*/sinδ = 0.65 kPa.

Special Provision to Item 300
Asphalts, Oils, and Emulsions

For this project, Item 300, "Asphalts, Oils, and Emulsions," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Section 300.2.4., "Emulsified Asphalt" is supplemented by the following.

Table 7A
Surface Performance-Grade Emulsified Asphalt

Grade	Test Procedure	HFRS-2(SPG xy[1])		CRS-2(SPG xy)		CHFRS-2(SPG xy)	
		Min	Max	Min	Max	Min	Max
Tests on emulsions:							
Viscosity, Saybolt Furol at 50°C, SFs[2]	T 72	150	400	150	400	150	400
Storage stability test, 24 h., %[2]	T 59		1		1		1
Demulsibility, 35 mL, 0.02 N $CaCl_2$, %	T 59	60					
Demulsibility, 35 mL, 0.8% dioctyl sodium sulfosuccinate, %	T 59			60		60	
Particle charge test	T 59			positive		positive	
Sieve test, %[2]	T 59		0.10		0.10		0.10
Residue recovery	PP 72,						
Residue, %	Procedure B	65		65		65	
Tests on recovered residue:							
Residue properties		Meet the specified SPG in Table 17A[3]					
Solubility in trichloroethylene, %	T 44	97.5		97.5			
Float test, 60°C, sec.[4]	T 50	1,200				1,200	

1. X is the average 7-day maximum pavement surface design temperature, and y is the minimum pavement surface design temperature used in Table 17A.
2. This test requirement on representative samples is waived if successful application of the material has been achieved in the field.
3. Meet original performance properties and PAV residue requirements only
4. If Float test is less than 1,200 sec. using PP 72, Procedure B, for residue recovery, then use T 59 for residue recovery.

Section 300.2.10., "Performance-Graded Binders," is supplemented by the following.

Table 17A
Surface Performance Grade (SPG) Specification

Surface Performance Grade	SPG 64	SPG 67					SPG 70					SPG 73			
	-25	-13	-16	-19	-22	-25	-13	-16	-19	-22	-25	-16	-19	-22	-25
Average 7-day Max pavement surface design temperature[1], °C	<64	<67					<70					<73			
Min pavement surface design temperature[1], °C	>-25	>-13	>-16	>-19	>-22	>-25	>-13	>-16	>-19	>-22	>-25	>-16	>-19	>-22	>-25
Original Binder															
Flash point temp, T 48, Min, °C	230														
Viscosity, T 316: Max 0.15 Pa*s, test temp., °C	205														
Original Performance Properties															
Dynamic Shear, T 315: G*/sinδ, Min 0.65 kPa, Test temp @ 10 rad/s, °C	64	67					70					73			
Shear Strain Sweep, T 315: % strain @ 0.8 G_i*, Min: 17.5 Test temp. @ 10 rad/s linear loading from 1–50% strain, with measurement of 20–30 increments, °C	25	25					25					25			
Phase angle[3] (δ), Max, @ temp. where G*/sinδ = 0.65 kPa	80	–	–	–	80	80	–	–	80	80	80	80	80	80	80
Pressure Aging Vessel (PAV) Residue (R 28)															
PAV aging temperature, °C	100	100					100					100			
Creep stiffness, T 313: S, Max 500 MPa, Test temp. @ 8 sec., °C	-25	-13	-16	-19	-22	-25	-13	-16	-19	-22	-25	-16	-19	-22	-25
Shear Strain Sweep, T 315 G_i*, Max: 2.5 MPa Test temp. @ 10 rad/s linear loading at 1% strain, °C	25	25					25					25			

1. Temperatures are at the surface of the pavement structure. These may be determined from experience or may be estimated using equations developed by SHRP or LTPP, but modified to represent surface temperatures. Surface-grade high temperatures are generally 3°C to 4°C greater than those determined for Superpave PG binders.
2. The referee method will be AASHTO T 316 using a #21 spindle at 50 r/min, however alternate methods may be used for routine testing and quality assurance.
3. Phase angle is determined at the temperature where $G^*/\sin\delta = 0.65$ kPa. For routine testing and quality assurance, the phase angle can be interpolated from testing at two temperatures, one above and one below where $G^*/\sin\delta = 0.65$ kPa.

Seal Coat Material Selection Table		
Tier I: Heavy Use - Use only the selected materials.		
Types	Asphalt Rubber (A-R)	Surface Performance Grade (SPG)
Grades	☐ A-R Ty II ☐ A-R Ty III	SPG - ☐ Hot Applied ☐ HFRS-2 SPG ☐ CRS-2 SPG ☐ CHFRS-2 SPG
Tier II: Moderate Use - Use these materials or any selected Tier I material combinations of the allowed types.		
Allowed Types	Surface Performance Grade (SPG) ☐ SPG Only ☐ Hot Applied Only ☐ Emulsified Only	
Grades	SPG - ☐ Hot Applied ☐ HFRS-2 SPG ☐ CRS-2 SPG ☐ CHFRS-2 SPG	
Tier III: Light Use - Use these materials or any selected Tier I or Tier II material combinations of the allowed types.		
Allowed Types	Surface Performance Grade (SPG) ☐ SPG Only ☐ Hot Applied Only ☐ Emulsified Only	
Grades	SPG - ☐ Hot Applied ☐ HFRS-2 SPG ☐ CRS-2 SPG ☐ CHFRS-2 SPG	
Districtwide Seal Coat Project Seasons: Refer to Item 316 for temperature and weather restrictions.		
Season 1:	AMA, CHS, LBB	May 15 to Aug 31
Season 2:	ABL, ATL, BWD, DAL, FTW, LFK, ODA, PAR, SJT, TYL, WAC, WFS	May 1 to Aug 31
Season 3:	AUS, BMT, BRY, ELP, HOU, SAT, YKM	May 1 to Sept 15
Season 4:	CRP, LRD, PHR	Apr 1 to Sept 30
Note: Seal coats on routine maintenance contracts must be completed by August 31 unless otherwise shown on the plans.		

Instructions to Contractor:

1. Provide materials according to the alternates selected for the roadway tier designations specified at various roadway locations shown on the plans;
2. Alternately, supply selected binders from a higher tier, but only if the type of material is allowed for the designated tier; payment will only be made for the tier designated for the pavement;
3. Supply the aggregate type, grade and surface aggregate class that is shown on the plans; and
4. Adhere to the application season selected.

There are working days allowed for this project. The latest roadway start work date is .