Table 1 —Performance-Graded Asphalt Binder Specification ^a (Continued)
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Performance Grade:		PG 64							PG 70						
	10	16	22	28	34	40	10	16	22	28	34	40			
LTPPBind calculated max pavement design temp, °C ^b		<64						<70							
Min pavement design temp, $^{\circ}C^{b}$	>-10	>-16	>–22	>28	>34	>40	>-10	>-16	>-22	>28	>34	>40			
		Original Binder													
Flash point temp, T 48, min °C		230													
Viscosity, T 316: ^c max 3 Pa•s, test temp, °C		135													
Dynamic shear, T 315: G*/sin d, min 1.00 kPa test temp @ 10 rad/s, °C		64							70						
test temp @ 10 fau's, C					Polling 7	Thin Eilm (Juan Pacid	ba (T 240)						
Mass change, max, percent ^d		Rolling Thin-Film Oven Residue (T 240)													
MSCR, T 350:		1.00													
Standard Traffic "S" $J_{nr3.2}$, max 4.5 kPa ⁻¹ J_{nrdif} , max 75% ^e test temp, °C		64						70							
MSCR, T 350: Heavy Traffic "H" $J_{nr3,2}$, max 2.0 kPa ⁻¹ J_{nrdir} , max 75% ^e test temp, °C		64						70							
MSCR, T 350: Very Heavy Traffic "V" $J_{nr3.2}$, max 1.0 kPa ⁻¹ J_{nrdif} , max 75% ^e test temp, °C		64						70							
MSCR, T 350: Extremely Heavy Traffic "E" $J_{nr3,2}$, max 0.5 kPa ⁻¹ test temp, °C		64						70							
		-						Vessel Residue (R 28)							
PAV conditioning temp, °C ^f		100						100							
Dynamic shear, T 315: "S" G* sin d, * max 6000 kPa d, *min 42° test temp @ 10 rad/s, °C	31	28	25	22	19	16	34	31	28	25	22	19			
Dynamic shear, T 315: "H," "V," "E" G* sin d, max 6000 kPa test temp @ 10 rad/s, °C	31	28	25	22	19	16	34	31	28	25	22	19			
Creep stiffness, T 313: ^h S, max 300 MPa <i>m</i> -value, min 0.300 test temp @ 60 s, °C	0	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30			
Direct tension, T 314: ^h Failure strain, min 1.0% test temp @ 1.0 mm/min, °C	0	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30			

Continued on next page.

Performance Grade: 10 16 22 28 34 10 16 22 28 LTPPBind calculated max pavement design temp, °C ⁶ <76 <722 >28 >-34 >-10 >-16 >22 >82 Min pavement design temp, °C ⁶ >-10 >-16 >-22 >-28 >-34 >-10 >-16 >-22 >-28 Viscosity, T 316." max 3 Pars, test temp, °C 135 $> $	PG 82					
pavement design temp, °C* < 10 >-16 >-22 >-28 >-34 >-10 >-16 >-22 >-28 Original Binder Original Binder Viscosity, T 316.° G*/sin d, min 1.00 kPa 135 82 test temp, °C Original Binder Dynamic shear, T 315. G*/sin d, min 1.00 kPa 76 82 test temp (°C NGCR, T 350: Standard Traffic "S" 1.00 MSCR, T 350: Statum, precent ^d MSCR, T 350: 82 Heavy Traffic "H" 76 82 Ju-ati, max 75% ' 82 82 User temp, °C 76 82 MSCR, T 350: 82 82 Heavy Traffic "H" 76 82 Ju-ati, max 75% ' 82 82 Very Heavy Traffic "H" 76 82 Ju-ati, max 75% ' 82 82 MSCR, T 350: 82 82 Very Heavy Traffic "H" 76 <td< td=""><td>34</td></td<>	34					
$\begin{array}{c c c c c c c c c c c c c c c c c c c $						
temp, °C° >-10 >-10 >-22 >-28 >-34 >-10 >-16 >-22 >-28 Original Binder Bash point temp, T48, min°C 230 Viscosity, T 316: max 3 Pavs, test temp, °C Dynamic shear, T 315: G*/sin d, min 1.00 kPa test temp @ 10 rad/s, °C Rolling Thin-Film Oven Residue (T 240) Mass change, max, percent d' Junding Thin-Film Oven Residue (T 240) Mass change, max, percent d' Junding Thin-Film Oven Residue (T 240) Mass change, max, percent d' Junding Thin-Film Oven Residue (T 240) Mass change, max, percent d' Junding Thin-Film Oven Residue (T 240) Mass change, max, percent d' Junding Thin-Film Oven Residue (T 240) Mass change, max, percent d' Junding Thin-Film Oven Residue (T 240) Mass change, max, percent d' Junding Thin-Film Oven Residue (T 240) Mass, change, max, 55% et test temp, °C <td< td=""><td></td></td<>						
Original Binder Original Binder Flash point temp, 748, min°C 230 Viscosity, T 316: max 3 Pavs, test temp, °C 135 Dynamic shear, T 315: G*/sin d, min 1.00 kPa 76 82 Colspan="2">Rolling Thin-Film Oven Residue (T 240) Mass change, max, percent ^d 1.00 MSCR, T 350: Standard Traffic "S" Juna: max 4.5 kPa ⁻¹ Junat, max 75% Rolling Thin-Film Oven Residue (T 240) MSCR, T 350: Standard Traffic "S" Junat, max 75% Rolling Thin-Film Oven Residue (T 240) MSCR, T 350: Heavy Traffic "H" Junat, max 75% Rolling Thin-Film Oven Residue (R 28) Very Heavy Traffic "V" Rolling Thin-Film Oven Residue (R 28) Very Heavy Traffic "V" Junat, max 75% Rolling Thin-Film Oven Residue (R 28) Pressurized Aging Vessel Residue (R 28) PAV conditioning temp, °C' C	>-34					
Plash point temp, T 48, min°C 230 Viscosity, T 316.° 135 max 3 Pa*s, test temp, °C 135 Dynamic shear, T 315: 76 82 rest temp @ 10 rads, °C Rolling Thin-Film Oven Residue (T 240) Mass change, max, percent ^d 1.00 Mss change, max, percent ^d 1.00 MSCR, T 350: 82 Heavy Traffic "S" 76 82 J_mdift, max 75%' 76 82 test temp, °C 82 82 MSCR, T 350: 76 82 Heavy Traffic "H" 76 82 J_mdift, max 75%' 82 82 Very Heavy Traffic "Y" 76 82 J_mdift, max 75%' 82 82 Used temp, °C 76 82 MSCR, T 350: 82 82 82 J_mdift, max 75%' 76 82 82 Lest temp, °C 76						
Viscosity, T 316:* 135 max 3 Pars, test temp, °C 135 Dynamic shear, T 315: 76 82 est temp @ 10 rad/s, °C Rolling Thin-Film Oven Residue (T 240) 82 Mass change, max, percent ^d 1.00 1.00 MSCR, T 350: Standard Traffic "S" 1.00 Standard Traffic "S" 76 82 Juraz, max 4.5 kPa ⁻¹ 76 82 MSCR, T 350: 82 82 Heavy Traffic "H" 76 82 Jurat, max 4.5 kPa ⁻¹ 76 82 MSCR, T 350: 82 82 Very Heavy Traffic "H" 76 82 Jurat, max 75% * 82 82 Usez, max 1.0 kPa ⁻¹ 76 82 Jurat, max 75% * 82 82 Usez, max 1.0 kPa ⁻¹ 76 82 Jurat, max 75% * 82 82 Usez, max 1.0 kPa ⁻¹ 76 82 Jurat, max 75% * 82 82 Usez, max 1.0 kPa ⁻¹ 76 82 Jurat, max 75% * 82 82 Usez, may						
max 3 Pars, test temp, °C 155 Dynamic shear, T 315: 76 82 G*/sin d, min 1.00 kPa 76 82 Rolling Thin-Film Oven Residue (T 240) Mass change, max, percent ^d 1.00 MSCR, T 350: Standad Traffic "S" Jundar, max 75%" Jundar, max 75%" 76 82 MSCR, T 350: Standad Traffic "H" 76 82 Jundar, max 75%" 76 82 82 MSCR, T 350: Heavy Traffic "H" 76 82 Jundar, max 75% * 76 82 82 <td colspan="6">230</td>	230					
G*/sin d, min 1.00 kPa test temp @ 10 rad/s, °C 76 82 Rolling Thin-Film Oven Residue (T 240) Mass change, max, percent ^d 1.00 MSCR, T 350: Standard Traffic "S" J_maiz, max 4.5 kPa ⁻¹ J_mair, max 75% ° test temp, °C 76 82 MSCR, T 350: Heavy Traffic "H" J_maiz, max 2.0 kPa ⁻¹ J_mair, max 75% ° test temp, °C 76 82 MSCR, T 350: Very Heavy Traffic "V" J_mair, max 75% ° test temp, °C 76 82 MSCR, T 350: Very Heavy Traffic "V" J_mair, max 75% ° test temp, °C 76 82 MSCR, T 350: Very Heavy Traffic "V" J_mair, max 75% ° test temp, °C 76 82 Very Heavy Traffic "V" J_mair, max 75% ° test temp, °C 76 82 PAV conditioning temp, °C' 100 100 Dynamic shear, T 315: "S" 100 100	135					
test temp @ 10 rad/s, °C Rolling Thin-Film Oven Residue (T 240) Mass change, max, percent ^d 1.00 MSCR, T 350: Standard Traffic "S" 82 J _{ndat} , max 75% ⁶ 82 test temp, °C 82 MSCR, T 350: 82 Heavy Traffic "H" 76 J _{ndat} , max 75% ⁶ 82 test temp, °C 82 MSCR, T 350: 82 Heavy Traffic "H" 76 J _{ndat} , max 75% ⁶ 82 test temp, °C 82 MSCR, T 350: 82 Very Heavy Traffic "V" 76 82 J _{ndat} , max 10. kPa ⁻¹ 76 82 MSCR, T 350: 82 82 Very Heavy Traffic "V" 76 82 J _{ndat} , max 10. kPa ⁻¹ 76 82 J _{ndat} , max 0. kPa ⁻¹ 76 82 J _{ndat} , max 10. kPa ⁻¹ 76 82 J _{ndat} , max 10. kPa ⁻¹ 76 82 J _{ndat} , max 0. kPa ⁻¹ 76 82 J _{ndat} , max 0.						
Rolling Thin-Film Oven Residue (T 240) Mass change, max, percent ^d 1.00 MSCR, T 350: 1.00 Standard Traffic "S" 76 82 J _{nrdaff} , max 75% ^e 76 82 Itest temp, °C 82 82 MSCR, T 350: 82 82 Heavy Traffic "H" 76 82 J _{nrdaff} , max 75% ^e 82 82 Use themp, °C 76 82 MSCR, T 350: 82 82 Very Heavy Traffic "Y" 76 82 J _{nrdaff} , max 75% ^e 82 82 Use temp, °C 76 82 MSCR, T 350: 82 82 Very Heavy Traffic "V" 76 82 J _{nrdaff} , max 75% ^e 82 82 test temp, °C 76 82 MSCR, T 350: 76 82 Laway Traffic "E" 76 82 J _{nradaff} , max 0.5 kPa ⁻¹ 76 82 Lest temp, °C 76 82						
Mass change, max, percent d 1.00 MSCR, T 350: Image: max f5% f J_{m32} , max 4.5 kPa ⁻¹ 76 J_{m32} , max 75% f 82 Itest temp, °C 82 MSCR, T 350: 82 Heavy Traffic "H" 76 J_{m32} , max 2.0 kPa ⁻¹ 76 J_{m47} , max 75% f 82 test temp, °C 82 MSCR, T 350: 82 Very Heavy Traffic "V" 76 J_{m417} , max 75% f 82 test temp, °C 82 MSCR, T 350: 82 Very Heavy Traffic "V" 76 J_{m417} , max 75% f 82 test temp, °C 82 MSCR, T 350: 82 Extremely Heavy Traffic "E" 76 J_{m32} , max 0.5 kPa ⁻¹ 76 test temp, °C 76 PAV conditioning temp, °C f 100 100 Dynamic shear, T 315: 100 100						
MSCR, T 350: Standard Traffic "S" $J_{n^2,2, \max 4.5 \text{ kPa}^{-1}}$ 76 82 $J_{n^2,4ff, \max 75\%^c}$ rest temp, °C 82 $J_{n^2,4ff, \max 75\%^c}$ 82 MSCR, T 350: Heavy Traffic "H" 76 82 $J_{n^2,4ff, \max 75\%^c^c}$ 82 Heavy Traffic "H" $J_{n^2,4ff, \max 75\%^c^c}$ 82 $J_{n^2,4ff, \max 75\%^c^c}$ 82 MSCR, T 350: Very Heavy Traffic "V" $J_{n^2,2, \max 1.0 \text{ kPa}^{-1}$ 82 $J_{n^2,2, \max 1.0 \text{ kPa}^{-1}$ 76 82 MSCR, T 350: Very Heavy Traffic "V" $J_{n^2,2, \max 1.0 \text{ kPa}^{-1}$ 82 MSCR, T 350: Very Heavy Traffic "E" 76 82 MSCR, T 350: Target provide the stremp, °C 82 82 MSCR, T 350: Target provide the stremp, °C 76 82 MSCR, T 350: Target provide the stremp, °C 76 82 PAV conditioning temp, °C' 100 100 100 Dynamic shear, T 315: 100 100 100						
Standard Traffic "S" J _{n²32,} max 4.5 kPa ⁻¹ J _{n²diff} , max 75% ^e 82 MSCR, T 350: Heavy Traffic "H" J _{n²32,} max 2.0 kPa ⁻¹ J _{n²diff} , max 75% ^e 82 MSCR, T 350: Very Heavy Traffic "V" J _{n²32,} max 1.0 kPa ⁻¹ J _{n²diff} , max 75% ^e 82 MSCR, T 350: Very Heavy Traffic "V" J _{n²32,} max 1.0 kPa ⁻¹ S ¹ 76 82 MSCR, T 350: Very Heavy Traffic "E" J _{n²3,} max 0.5 kPa ⁻¹ test temp, °C 82 MSCR, T 350: Extremely Heavy Traffic "E" J _{n²3,} max 0.5 kPa ⁻¹ test temp, °C 82 PAV conditioning temp, °C ^f 100 100 Dynamic shear, T 315: "S" 100 100						
Standard Traffic "S" J _{n²,2,} max 4.5 kPa ⁻¹ J _{n²,0,} max 4.5 kPa ⁻¹ 82 J _{n²,0, max 4.5 kPa⁻¹ 76 82 MSCR, T 350: Heavy Traffic "H" J_{n²,2,} max 2.0 kPa⁻¹ 76 82 MSCR, T 350: Very Heavy Traffic "V" J_{n²,2,} max 1.0 kPa⁻¹ 76 82 MSCR, T 350: Very Heavy Traffic "V" J_{n²,2,} max 1.0 kPa⁻¹ 76 82 MSCR, T 350: Very Heavy Traffic "V" J_{n²,2,} max 1.0 kPa⁻¹ 76 82 MSCR, T 350: Very Heavy Traffic "S" J_{n²,2,} max 0.5 kPa⁻¹ 76 82 MSCR, T 350: Extremely Heavy Traffic "E" J_{n²,2,} max 0.5 kPa⁻¹ 82 82 PAV conditioning temp, °C' 100 100 Dynamic shear, T 315: "S" 100 100}						
Jardiff, max 75%" test temp, °C MSCR, T 350: Heavy Traffic "H" 76 Jardaff, max 75% " 82 test temp, °C 82 MSCR, T 350: 82 Very Heavy Traffic "V" 76 Jardaff, max 75% " 82 test temp, °C 76 MSCR, T 350: 82 Very Heavy Traffic "V" 76 Jardaff, max 75% " 82 test temp, °C 76 MSCR, T 350: 82 Extremely Heavy Traffic "E" 76 Jardaff, max 0.5 kPa ⁻¹ 76 test temp, °C 76 MSCR, T 350: 82 Extremely Heavy Traffic "E" 76 Jardaff, max 0.5 kPa ⁻¹ 82 Very Heavy Traffic "E" 76 Strenge C 82 PAV conditioning temp, °C/ 100 100 Dynamic shear, T 315: 100 100						
test temp, °C Image: Constraint of the second s						
MSCR, T 350: Heavy Traffic "H" $J_{n/32, max 2.0 \text{ kPa}^{-1}}$ 76 82 $J_{n/diff}, max 75\% ^{e}$ test temp, $^{\circ}C$ 82 82 MSCR, T 350: Very Heavy Traffic "V" $J_{n/32, max 1.0 \text{ kPa}^{-1}}$ 82 $J_{n/32, max 1.0 \text{ kPa}^{-1}$ 76 82 $J_{n/32, max 75\% ^{e}$ 76 82 Use test temp, $^{\circ}C$ 76 82 MSCR, T 350: 76 82 Extremely Heavy Traffic "E" 76 82 $J_{n/32, max 0.5 \text{ kPa}^{-1}$ 76 82 Use temp, $^{\circ}C$ 76 82 PAV conditioning temp, $^{\circ}Cf$ 100 100 Dynamic shear, T 315: 100 100						
Heavy Traffic "H" J _{nr32} , max 2.0 kPa ⁻¹ 76 82 J _{nrdiff} , max 75% e rest temp, °C 82 MSCR, T 350: Very Heavy Traffic "V" 82 J _{nr32} , max 1.0 kPa ⁻¹ 76 82 J _{nr32} , max 1.0 kPa ⁻¹ 76 82 MSCR, T 350: 76 82 Extremely Heavy Traffic "E" 76 82 MSCR, T 350: 76 82 Extremely Heavy Traffic "E" 76 82 J _{nr32} , max 0.5 kPa ⁻¹ 76 82 Very Leavy Traffic "E" 76 82						
J _{n/3.2} , max 2.0 kPa ⁻¹ 76 82 J _{n/diff} , max 75% e 82 test temp, °C MSCR, T 350: 82 Very Heavy Traffic "V" 76 82 J _{n/3.2} , max 1.0 kPa ⁻¹ 76 82 J _{n/diff} , max 75% e 76 82 MSCR, T 350: 76 82 Extremely Heavy Traffic "E" 76 82 MSCR, T 350: 76 82 Extremely Heavy Traffic "E" 76 82 MSCR, T 350: 76 82 Extremely Heavy Traffic "E" 76 82 J _{n/3.2} , max 0.5 kPa ⁻¹ 76 82 Very Heavy Traffic "E" 76 82 J _{n/3.2} , max 0.5 kPa ⁻¹ 100 100 Very Heavy Traffic "E" 100 100 PAV conditioning temp, °C ^f 100 100 Dynamic shear, T 315: 100 100						
Jardiff, max 75% e [*] test temp, °C MSCR, T 350: Very Heavy Traffic "V" Jardaff, max 75% e [*] Jardaff, max 75% e [*] 76 test temp, °C 82 MSCR, T 350: 82 Extremely Heavy Traffic "E" 76 Jardaff, max 75% e [*] 82 test temp, °C 76 MSCR, T 350: 82 Extremely Heavy Traffic "E" 76 Jardaff, max 0.5 kPa ⁻¹ 76 test temp, °C 82						
test temp, °C MSCR, T 350: Very Heavy Traffic "V" J _{n/3.2} , max 1.0 kPa ⁻¹ J _{n/3.2} , max 1.0 kPa ⁻¹ 76 J _{n/3.2} , max 75% f 82 test temp, °C 82 MSCR, T 350: 82 Extremely Heavy Traffic "E" 76 J _{n/3.2} , max 0.5 kPa ⁻¹ 76 test temp, °C 76 PAV conditioning temp, °C ^f 100 Dynamic shear, T 315: 100 "S" 100						
MSCR, T 350: Very Heavy Traffic "V" $J_{n/32,2}$, max 1.0 kPa ⁻¹ 76 $J_{n/diff}$, max 75% ^c 82 test temp, °C 76 MSCR, T 350: 82 Extremely Heavy Traffic "E" 76 J_m/32, max 0.5 kPa ⁻¹ 76 test temp, °C 76 PAV conditioning temp, °C ^f 100 Dynamic shear, T 315: 100						
Very Heavy Traffic "V" J _{n/32} , max 1.0 kPa ⁻¹ 76 82 J _{n/diff} , max 75% ^e rest temp, °C 82 MSCR, T 350: Extremely Heavy Traffic "E" 76 82 J _{n/32} , max 0.5 kPa ⁻¹ 76 82 Very Heavy Traffic "E" 76 82 J _{n/32} , max 0.5 kPa ⁻¹ 100 100 Pressurized Aging Vessel Residue (R 28) PAV conditioning temp, °C ^f Dynamic shear, T 315: 100 100						
J _{nr32} , max 1.0 kPa ⁻¹ 76 82 J _{nrdiff} , max 75% ^e test temp, °C 82 MSCR, T 350: Extremely Heavy Traffic "E" J _{nr32} , max 0.5 kPa ⁻¹ test temp, °C 76 82 PAV conditioning temp, °C ^f 100 100 Dynamic shear, T 315: "S" 100 100						
J _{nrdiff} , max 75% ^e test temp, °C 82 MSCR, T 350: Extremely Heavy Traffic "E" J _{nr32} , max 0.5 kPa ⁻¹ test temp, °C 76 82 Pressurized Aging Vessel Residue (R 28) Pressurized Aging Vessel Residue (R 28) PAV conditioning temp, °C ^f 100 100 Dynamic shear, T 315: "S" 100 100						
MSCR, T 350: Extremely Heavy Traffic "E" 76 82 J _{n322} , max 0.5 kPa ⁻¹ 76 82 test temp, °C Pressurized Aging Vessel Residue (R 28) PAV conditioning temp, °C ^f 100 100 Dynamic shear, T 315: 100 100						
Extremely Heavy Traffic "E" 76 82 $J_{n/3,2, \text{ max } 0.5 \text{ kPa}^{-1}}$ test temp, °C 82 Pressurized Aging Vessel Residue (R 28) PAV conditioning temp, °C ^f 100 Dynamic shear, T 315: "S" Image: Second Secon						
J _{n32} , max 0.5 kPa ⁻¹ test temp, °C 70 82 Pressurized Aging Vessel Residue (R 28) Pressurized Aging Vessel Residue (R 28) 100 PAV conditioning temp, °C ^f 100 100 100 Dynamic shear, T 315: "S" 100 100 100						
J _{n732} , max 0.5 kPa ⁻¹ test temp, °C Pressurized Aging Vessel Residue (R 28) PAV conditioning temp, °C ^f 100 Dynamic shear, T 315: "S" 100						
Pressurized Aging Vessel Residue (R 28) PAV conditioning temp, °C ^f 100 100 Dynamic shear, T 315: "S"						
PAV conditioning temp, °C ^f 100 100 Dynamic shear, T 315: "S"						
Dynamic shear, T 315: "S"						
"S"						
G* sin d, ^g max 6000 kPa 37 34 31 28 25 40 37 34 31	28					
$d_s^g \min 42^\circ$						
test temp @ 10 rad/s, °C						
Dynamic shear, T 315:						
"H," "V," "E" 37 34 31 28 25 40 37 34 31	28					
G* sin d, max 6000 kPa	20					
test temp @ 10 rad/s, °C	_					
Creep stiffness, T 313 th						
S, max 300 MPa 0 -6 -12 -18 -24 0 -6 -12 -18	-24					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						
	+					
Direct tension, T 314: ^h Failure strain, min 1.0% 0 -6 -12 -18 -24 0 -6 -12 -18	-24					
Failure strain, min 1.0% 0 -6 -12 -18 -24 0 -6 -12 -18 test temp @ 1.0 mm/min, °C	-24					

a MSCR test on RTFO residue should be performed at the PG grade based on the environmental high pavement temperature. Grade bumping is accomplished by requiring a lower Jnr value while testing at the environmental temperature.

b Pavement temperatures are estimated from air temperatures using an algorithm contained in the LTPPBind program, or may be provided by the specifying agency.

c This requirement may be waived at the discretion of the specifying agency if the supplier warrants that the asphalt binder can be adequately pumped and mixed at temperatures that meet all applicable safety standards.

d The mass change shall be less than 1.00 percent for either a positive (mass gain) or a negative (mass loss) change.

e The J_{ardiff} requirement shall not apply to asphalt binders having a Jnr3.2 value of 0.5 kPa–1 or lower at the selected test temperature.

f For climates with an LTPPBind high pavement temperature of 76°C or above, the PAV conditioning temperature shall be 110°C.

g If the intermediate temperature stiffness, G* sin d, is below 5000 kPa, the phase angle minimum limit is not required. If the intermediate temperature stiffness, G* sin d, is between 5000 and 6000 kPa, the intermediate phase angle minimum limit is required.

h If the creep stiffness is below 300 MPa, the direct tension test is not required. If the creep stiffness is between 300 and 600 MPa, the direct tension failure strain requirement can be used in lieu of the creep stiffness requirement. The m-value requirement must be satisfied in both cases.

¹ Formerly AASHTO Provisional Standard MP 19. First published as a full standard in 2014.