

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

SPECIAL PROVISION

Section 828—Hot Mix Asphaltic Concrete Mixtures

Delete Subsection 828.2.A.6.d and substitute the following:

- d. On PR, LARP, airport, bridge replacement, and parking lot projects designated at Mix Design Level I, asphalt cement may include an approved, heat-stable, anti-stripping additive that meets the requirements of Subsection 831.2.04, "Heat Stable Anti-Stripping Additive" instead of hydrated lime, unless specified in the Pay Item.
 - 1) Add at a minimum rate of 0.5 percent of the AC portion.
 - 2) Ensure the additive treated mix meets the minimum tensile splitting ratio:

Tensile Splitting Ratio	Type of Asphaltic Concrete
0.4	4.75 mm mix
0.6	All other mixes

Delete Subsection 828.2.A.8 and substitute the following:

8. Use of local sand is restricted as follows:
 - a. No more than 20 percent, based on total aggregate weight, may be used in mixtures for shoulder construction and on projects designed at Mix Design Level I.
 - b. For mixtures placed on the mainline traveled way of projects designed at Mix Design Level II (except interstate projects), local sand may be used only in the 25 mm Superpave and shall not exceed 20 percent based on total aggregate weight.
 - c. Do not use local sand in any mixture placed on the traveled way of Interstate mainline or ramps. No more than 20 percent local sand, based on total aggregate weight, may be used in mixtures for shoulder construction.
 - d. Do not use local sand that contains more than 7 percent clay.
 - e. Do not use local sand that contains any clay lumps as determined by AASHTO T 112.

Delete Subsection 828.2.C and substitute the following:

C. Acceptance

Ensure the mix design has been reviewed and approved by the Department prior to beginning production.

1. Rutting Susceptibility Testing
 - a. Fabricate three beams or six cylindrical specimens from each asphalt mix for the test using GDT 115.
 - b. Design mixtures which meet the following criteria for rutting where tested using GDT 115:
 - Mix Design Level I – 7 mm maximum
 - Mix Design Level II – 5 mm maximum
 Test 25 mm Superpave mixes and 9.5 mm Level I Superpave mixes at 120 °F (49 °C), and test other Superpave and SMA mixes at 147 °F (64 °C).

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Tests will not be required for mixtures designed exclusively for trench widening nor for the 4.75 mm mix, nor for OGFC and PEM mixtures.

2. Fatigue Testing

The Department may perform the test according to AASHTO TP 8-94 or other Department approved procedure.

3. Permeability Testing

a. Fabricate three cylindrical specimens (3-inch in height) each with air voids of 7.0 ± 1 percent for permeability where tested using ASTM PS 129-01 and the average permeability coefficient meets the following Criteria:

- Do not exceed 125×10^{-5} cm/sec (3.6 ft/day).

Delete Subsection 828.2.03 and substitute the following:

828.2.03 Superpave Asphaltic Concrete Mixtures

A. Requirements

Use the information in the following table for job mix formula and design limits:

Mixture Control Tolerance	Asphaltic Concrete	9.5 mm Superpave Level I	9.5 mm Superpave Level II	12.5 mm Superpave	19 mm Superpave	25 mm Superpave
	Grading Requirements	Percent Passing				
	1-1/2 in (37.5 mm) sieve					100
± 8.0	1- in (25.0 mm) sieve				100*	90-100
±8.0**	3/4 in (19.0 mm) sieve			100*	90-100	55-89
±6.0***	1/2 in (12.5 mm) sieve	100*	100*	90-100	60-89	50-70
±5.6	3/8 in (9.5 mm) sieve	90-100	90-100	70-85	55-75	
±5.6	No. 4 (4.75 mm) sieve	65-85	55-75			
±4.6	No. 8 (2.36 mm) sieve	53-58	42-47	34-48	30-36	30-40
±2.0	No. 200 (75 µm) sieve	4.0-7.0	4.0-7.0	3.5-7.0	3.5-6.0	3.0-7.0

* Mixture control tolerance not applicable to this sieve for this mix.

**Mixture control tolerance shall be ± 10.0% for this sieve for 25 mm Superpave.

***Mixture control tolerance shall be ± 8.0% for this sieve for 19 mm Superpave.

Superpave mixtures shall also meet the following requirements:

1. The Mixture Control Tolerance for asphalt cement shall be ± 0.4%.
2. Volumetric Criteria

Design Parameter	Design Criteria
a. Percent of Maximum Specific Gravity (%G _{mm}) at the design number of gyrations, (N _d) (See Note 1)	96%
b. % G _{mm} at the initial number of gyrations, (N _i)	Level I <91.5% Level II <90.0%*
c. Percent voids in mineral aggregate (VMA) at N _d	See Table 828.2.03.A.3
d. Percent voids filled with asphalt (VFA) at N _d	See Table 828.2.03.A.4
e. Fines to effective asphalt binder ratio (F/P _{be})	
1) Asphaltic concrete 9.5 mm Superpave (Level I)	0.6-1.4

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2) All Superpave mixtures excluded in Item 1	0.8-1.6
f. Tensile strength (GDT 66)	
1) Ratio (See Note 2)	80% min.
2) Stress	60 psi (414 kPa) min.
g. Retention of Coating (GDT 56)	95% min.

*This requirement may be waived by the State Bituminous Engineer if mix meets all other criteria in the specification.

Note 1: Maximum specific gravity (G_{mm}) determined in accordance with AASHTO T 209.

Note 2: A tensile splitting ratio of no less than 70% may be acceptable so long as all individual test values exceed 100 psi (690 kPa).

3. VMA Criteria

Nominal Maximum Sieve Size	Minimum % VMA*
1 in (25 mm)	13
3/4 in (19 mm)	14
1/2 in (12.5 mm)	15
3/8 in (9.5)	16

* VMA is to be determined based on effective specific gravity of the aggregate (G_{se}).

4. VFA Criteria*

MIX DESIGN LEVEL	RANGE % VFA	
	Minimum	Maximum
I	72	80
II	70	76

* This requirement may be waived by the State Bituminous Engineer if mix meets all other criteria in the specification.

5. Superpave Gyrotory Compaction Criteria

MIX DESIGN LEVEL	NUMBER OF GYRATIONS	
	N_i	N_d
I*	6	Note 1
II*	8	Note 2

* Design all 25 mm Superpave mixes at Level I gyrations. Design other mixes at Level I gyrations, as specified in Note 1 if the current 2-way ADT is less than 10,000. Otherwise design other mixes at Level II gyrations as specified in Note 2.

Note 1: Compact Level I mix to “the first locking point” or 65 gyrations whichever is less. The “first locking point” for a given sample is defined as the number of gyrations at which, in the first occurrence, the same height has been recorded for the third time.

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Note 2: Compact Level II mix to “the second locking point” or 80 gyrations whichever is less. The “second Locking point” for a given sample is defined as the number of gyrations at which, in the first occurrence, the same height has been recorded for the fourth time.

6. Initial Asphalt Contents for Determination of “Locking Points”

MIX TYPE	MIX DESIGN LEVEL	
	I	II
9.5 mm Superpave	6.0%	5.7%
12.5 mm Superpave	4.9%	4.6%
19 mm Superpave	4.5%	4.2%
25 mm Superpave	4.3%	4.0%

Use mix Design Level I for all Superpave mixes used as shoulder surface mixture, trench widening, temporary detour, or sub-base mixture under Portland cement concrete pavement unless specified otherwise in the plans.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

See Subsection 828.2.C.

D. Materials Warranty

General Provisions 101 through 150.

Delete Subsection 828.2.04.A and substitute the following:

A. Requirements

Use the following table for the job mix formula and design limits:

ASPHALTIC CONCRETE - 4.75 mm Mix		
	MIXTURE CONTROL TOLERANCE	Design Ranges % Passing
1/2 in (12.5 mm) sieve	±0.0	100*
3/8 in (9.5 mm) sieve	±5.6	90-100
No. 4 (4.75 mm) sieve	±5.7	75-95
No. 8 (2.36 mm) sieve	±4.6	60-65
No. 50 (300 μm) sieve	±3.8	20-50
No. 200 (75 μm) sieve	±2.0	4-12
Range for % AC	±0.4	6.00-7.50
Design optimum air voids (%)		4-7
% Aggregate voids filled with AC		50-80
Tensile splitting ratio after freeze-thaw cycle (GDT 66) if hydrated lime is used		80% minimum

* Mixture control tolerance not applicable to this sieve for this mix.

Design this mixture with 50 gyrations of Superpave gyratory compactor.