

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 248—STONE MATRIX ASPHALT CONCRETE

SECTION 248—STONE MATRIX ASPHALT CONCRETE of the Specifications is amended as follows:

Section 248.02(a)—Coarse Aggregate is replaced with the following:

- (a) **Coarse Aggregate:** Coarse aggregate shall conform to the following requirements when tested in accordance with the specified tests:
- | | | |
|--|-------------|-----------|
| 1. Los Angeles Abrasion | AASHTO T96 | 40% max. |
| a. Exception for Northern Va. District – Prince William County Only | AASHTO T96 | 30% max. |
| 2. Flat and Elongated Particles: Measured on No. 4 VTM-121 retained, | | |
| 3 to 1 | | 20% max. |
| 5 to 1 | | 5% max. |
| 3. Magnesium Sulfate Soundness Loss, 5 cycles | AASHTO T104 | 15% max. |
| 4. Particles retained on No. 4 sieve shall have at least | ASTM D5821 | |
| 1 fractured face | | 100% min. |
| 2 fractured faces | | 90% min. |
| 5. Absorption | AASHTO T 85 | 2% max. |

Except for the determination of flat and elongated particles (Section 248.02(a)2 of the Specifications), the aggregate properties specified are for each stockpile of coarse aggregate material designated on the job mix form (Form No. TL-127). The material contained in each stockpile shall meet the minimum or maximum criteria specified.

For flat and elongated particles, these values are based on the mathematical blend of the coarse aggregate material designated on the job mix form (TL-127). During production, these values are based on the SMA material sampled during the acceptance process (QC testing).

SMA must contain two or more coarse aggregate sizes. At least two of the aggregate sizes must comprise a minimum of 10% of the total mix composition each. One cold feed bin shall be used for each aggregate size.

The use of slag will not be permitted.

At the discretion of the Engineer, mixes containing Reclaimed Asphalt Pavement (RAP) may be tested by VDOT for aggregate breakdown during lab compaction in accordance with VTM-99. If the percent of the total mix passing the No. 4 sieve increases by more than 10 percent after being compacted to N_{design} then the RAP component shall be changed or the authorization to use the mix will be discontinued.

Section 248.02(b)—Fine Aggregate is replaced by the following:

- (b) **Fine Aggregate:** Virgin fine aggregates shall consist of a blend of 100 percent crushed aggregate. If RAP is being used as a component in SMA then the portion of the final SMA blend passing the No. 8 sieve shall have a minimum Fine Aggregate Angularity value of 45 percent as determined in accordance with AASHTO T 304 (Method A). The

magnesium sulfate soundness loss in 5 cycles shall not exceed 20 percent. In addition, the liquid limit shall not exceed 25 as determined in accordance with AASHTO T89.

Section 248.02(c) Asphalt Binder is amended to replace the first paragraph with the following:

Asphalt Binder: Asphalt binders shall be performance graded binder PG 70-22 or polymer modified binder PG 76-22 conforming to the requirements of the mix designation (E) so designated by the Department. The supplier shall certify to the Department that the binder complies with the requirements for all properties of the grade as specified in AASHTO M320 Table 1 for performance-graded asphalt binder. This certification shall be based on testing performed on samples of binder provided to the Contractor for incorporation into the mixture. Certification based on testing performed on laboratory-produced binders will not be acceptable.

Section 248.02(f)—RAP is replaced with the following:

- (f) **RAP:** Reclaimed Asphalt Pavement (RAP) material may be used as a component material of SMA mixtures in conformance with the following:
1. SMA surface and intermediate mixtures containing RAP shall use the PG grade of asphalt cement designated by the mix specified on the plans or in the proposal e.g. an SMA-12.5 (76-22).
 2. The final asphalt mixture shall conform to the requirements for the type specified.
 3. During the production process, RAP material shall not be allowed to contact open flame.
 4. RAP material shall be handled, hauled and stored in a manner that will minimize contamination. Further, the material shall be stockpiled and used in such manner that variable asphalt contents and asphalt penetration values will not adversely affect the consistency of the mixture.

Section 248.03—Composition of SMA Mixture is amended by adding the following:

Allowable RAP Percentages:

TABLE I-C Specified Performance Grade of Asphalt and Use of RAP	
Mix Type & PG	Allowable RAP Percentage in Mix
SMA-9.5 (70-22), SMA-12.5 (70-22) & SMA-19.0(70-22)	0.0 to 20.0
SMA-9.5 (76-22), SMA-12.5 (76-22) & SMA-19.0 (76-22)	0.0 to 15.0

TABLE II-24 SMA DESIGN RANGE is amended to replace **Surface Mix Type SMA 12.5** as follows:

**TABLE II-24
SMA DESIGN RANGE**

Percentage by Weight Passing Square Mesh Sieves (in)

Type No. (See Note)	1	¾	1/2	3/8	No. 4	No. 8	No. 30	No. 200
<i>Surface Mixes</i>								
SMA 9.5	-	100	90-100	70-85	25-40	15-25	-	9-11
SMA 12.5	-	100	83-93	80 max	22-28	16-24	15-20	9-11

Section 248.04 “PROCESS TOLERANCE” Table is replaced with the following:

Process Tolerance

Tolerance on Each Laboratory Sieve and Asphalt Content: Percent Plus and Minus									
No. Tests	Top Size	¾”	½”	3/8”	No. 4	No. 8	No. 30	No. 200	A.C.
1	0.0	8.0	8.0	8.0	6.0	6.0	6.0	4.0	0.60
2	0.0	5.7	5.7	5.7	4.3	4.3	4.3	2.8	0.43
3	0.0	4.4	4.4	4.4	3.3	3.3	3.3	2.2	0.33
4	0.0	4.0	4.0	4.0	3.0	3.0	3.0	2.0	0.30
5	0.0	3.6	3.6	3.6	2.7	2.7	2.7	1.8	0.27
6	0.0	3.3	3.3	3.3	2.4	2.4	2.4	1.6	0.24
7	0.0	3.0	3.0	3.0	2.3	2.3	2.3	1.5	0.23
8	0.0	2.8	2.8	2.8	2.1	2.1	2.1	1.4	0.21
12	0.0	2.3	2.3	2.3	1.7	1.7	1.7	1.2	0.17

Section 248.04 is amended to replace the third paragraph with the following

The Contractor shall check and report the percentage of flat and elongated particles (F&E) in the coarse aggregates of the mix design during production. When the SMA material is sampled for acceptance (gradation and AC content), two of the eight sub-lots must be selected for F&E verification in the first lot. The F&E testing will be performed on the coarse aggregate material retained on the #4 sieve, in accordance with the requirements of VTM-121, after the gradation is performed. If passing results are obtained on each sample in the first lot, then F&E testing shall be performed on a frequency of every second lot of material produced (i.e., Lots 3, 5, 7, etc.) by randomly selecting two random sub-lots. If the F&E of the mix exceeds the specified limits, the Contractor shall stop production and notify the Engineer. Production shall not resume until the Contractor has taken corrective action and the Engineer has approved the corrective action. Once production has resumed, the Contractor shall determine the F&E of the mix for two consecutive lots by randomly selecting two sub-lots per lot. If passing results are obtained for these two lots, then the F&E testing frequency shall return to every second lot of material produced.

Section 248.05(d)—Mixing Temperature is replaced with the following:

- (d) **Mixing Temperature:** The recommended plant mixing temperatures for PG 70-22 should be 315 to 340 degrees F and at no time shall the temperature exceed 350 degrees F. For PG 76-22, the plant mixing temperatures shall be within the limits of the asphalt supplier’s recommendations.