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| REVIEW OF NEW SPECIFICATION OR SPECIFICATION CHANGE  | **Log No.**  703-9 |
| **Specification Section No.:** 703 | **Item:** Aggregates for Stone Matrix Asphalt |
| **Originating Office:** Region 6 | **By:** Masoud Ghaeli |
| **Date Sent For Review:** September 3, 2010 | **Date Comments Due: October1, 2010** |
| Please submit response to: STANDARDS AND SPECIFICATIONS UNIT, ROOM 290, HEADQUARTERS, DENVER |
| **Reviewer** | **Concurrent Reviews – Others Commenting** | The attached Draft Specification is submitted for your review and comments. If not returned by Date Comments Due, the draft specification will be considered to be approved unless the Specification Unit of Staff Design [(303) 757-9474, (303) 757-9402] is advised otherwise.**REMARKS:** If these proposed modifications are approved, it will result in the issuance of a revised version of this standard special provision. |
|  | **Spec Committee Members:** |  |
|  | Chairman: Aschenbrener | X |
|  | Region 1: Cox | **X** |
|  | Region 2: Burch | **X** |
|  | Region 3: Alexander | **X** |
|  | Region 4: Frieler | **X** |
|  | Region 5: Beller | **X** |
|  | Region 6: Koenig | **X** |
|  | Project Development: Lacey | **X** |
|  | Specifications: Brinck | **X** |
|  | Bridge: Hasan | **X** |
|  | Agreements: Wassenaar | **X** |
|  | Materials: Zufall | **X** |
|  | Traffic Engineering: Matthews | **X** | REVIEWER COMMENTS:( ) Approved ( ) Disapproved ( ) ModifiedIf disapproved or modified, give reason why and show any modifications on the attached draft copy: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ Name/Signature Date |
|  | Maintenance: Mueller | **X** |
|  | FHWA: Urban | **X** |
|  | Attorney General: Spear | **X** |
|  | Attorney General: Morrow | **X** |
|  |  |  |
|  | **Others:** |  |
|  | Colorado Contractors Assoc.: Moody | **X** |
|  |  |  |
|  | **Technical Committees:** |  |
|  | Bridge |  |
|  | Culvert |  |
|  | Joint Co-op, CCA/CDOT |  |

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| SUBMITTAL OF NEW SPECIFICATION OR SPECIFICATION CHANGE  | **Log No. 703-9**(Assigned by Specification Unit) |
| **T0:** Standards & Specs Unit, Room 290 | **FROM**:  | Name: Masoud Ghaeli |
| Region, Branch, or Technical Committee: Region 6 |
| **SPECIFICATION SECTION NO.****703-9** | ITEMCompaction of Hot Mix Asphalt | PRIORITYRoutine [ X ] Fast [ ] |
| **Reason for this new or changed specification:**Stone Matrix asphalt (SMA) task force committee was jointly established with the industry to clarify specification requirements on (SMA) projects for uniformity in application.As a result of the task force, below specifications were revised to address the following issues:- To clarify specification requirements on stone matrix asphalt (SMA) projects for uniformity in application.- Mix design adjustments- Density Targets- Compaction Test Section |
| **New or Revised Specification:**1. Revision of Section 401, Compaction of Hot Mix Asphalt. 2. Revision of Section 401, Compaction Pavement Test Section (CTS). . 3. Revision of Section 401, Temperature Segregation. 4. Revision of Section 401 and 703, Stone Matrix Asphalt pavement. 5. Creation of new Standard Special Provision, Section 703, Mineral Filler 6. Creation of a new Standard Special Provision, Revision of Section 620, Field Office. |
| **NOTE: See Procedural Directive 513.1 for a description of appropriate specification development procedures.** |

**703.04 Aggregates for Hot Mix Asphalt.** Aggregates for hot plant mix bituminous

pavement (HMA) shall be of uniform quality, composed of clean, hard, durable

particles of crushed stone, crushed gravel, natural gravel, or crushed slag. Excess of

fine material shall be wasted before crushing. For Gradings S, SX, and SG, a

percentage of the aggregate retained on the 4.75 mm (No. 4) sieve shall have at least

two mechanically induced fractured faces when tested in accordance with Colorado

Procedure 45. This percentage will be specified in Table 403-1, as revised for the

project in Section 403. The angularity of the fine aggregate shall be a minimum of

45.0 percent when determined according to AASHTO T 304. For HMA and SMA

aggregate samples representing each aggregate stockpile shall be non-plastic if the percent of aggregate

passing the 2.36 mm (No. 8) sieve is greater than or equal to 10 percent by weight of

the individual aggregate sample. Plasticity will be determined in accordance with

AASHTO T 90. The material shall not contain clay balls, vegetable matter, or other

deleterious substances.

The aggregate for Gradings S, SX, and SG shall have a percentage of wear of 45 or

less when tested in accordance with AASHTO T 96.

**Table 703-4**

**MASTER RANGE TABLE FOR HOT MIX ASPHALT**

|  |  |
| --- | --- |
| **Sieve Size** | **Percent by Weight Passing Square Mesh Sieves** |
|  | **Grading SX** | **Grading S** | **Grading SG** |
| 37.5 mm (1½″) |  |  | **100** |
| 25.0 mm (1″) |  | **100** | **90 - 100** |
| 19.0 mm (¾″) | **100** | **90 - 100** |  |
| 12.5 mm (½″) | **90 - 100** | **\*** | **\*** |
| 9.5 mm (3/8″) | **\*** | **\*** | **\*** |
| 4.75 mm (#4) | **\*** | **\*** | **\*** |
| 4.75 mm (#4) | **28 - 58** | **23 – 49** | **19 - 45** |
| 2.36 mm (#8) |  |  |  |
| 1.18 mm (#16) | **\*** | **\*** | **\*** |
| 600 m (#30) |  |  |  |
| 300 m (#50) |  |  |  |
| 150 m (#100) |  |  |  |
| 75 m (#200) | 2 – 10 | 2 - 8 | 1 - 7 |
| \* These additional Form 43 Specification Screens will initially be establishedusing values from the As Used Gradation shown on the Design Mix.Aggregates for |

Aggregates for stone matrix asphalt (SMA) shall be of uniform quality, composed of

clean, hard, durable particles of crushed stone, crushed gravel, or crushed slag. A

minimum of 90 percent of the particles retained on the 4.75 mm (No. 4) sieve shall

have at least two mechanically induced fractured faces when tested in accordance with

Colorado Procedure 45. The particles passing the 4.75 mm (No. 4) sieve shall be the

product of crushing rock larger than 12.5 mm (½ inch). ~~and shall be non-plastic when~~

~~tested in accordance with AASHTO T 90.~~

REVISION OF SECTION 703

AGGREGATE FOR STONE MATRIX ASPHALT

Section 703 of the Standard Specifications is hereby revised for this project as follows:

In subsection 703.04, delete the first paragraph and replace with the following:

**703.04 Aggregates for Hot Mix Asphalt.** Aggregates for hot plant mix bituminous pavement (HMA) shall be of uniform quality, composed of clean, hard, durableparticles of crushed stone, crushed gravel, natural gravel, or crushed slag. Excess of

fine material shall be wasted before crushing. For Gradings S, SX, and SG, a percentage of the aggregate retained on the 4.75 mm (No. 4) sieve shall have at least two mechanically induced fractured faces when tested in accordance with Colorado

Procedure 45. This percentage will be specified in Table 403-1, as revised for the project in Section 403. The angularity of the fine aggregate shall be a minimum of 45.0 percent when determined according to AASHTO T 304. For HMA and SMA

aggregate samples representing each aggregate stockpile shall be non-plastic if the percent of aggregate passing the 2.36 mm (No. 8) sieve is greater than or equal to 10 percent by weight of the individual aggregate sample. Plasticity will be determined in accordance with AASHTO T 90. The material shall not contain clay balls, vegetable matter, or other deleterious substances.

In subsection 703.04 delete the third paragraph and replace with the following:

Aggregates for stone matrix asphalt (SMA) shall be of uniform quality, composed of clean, hard, durable particles of crushed stone, crushed gravel, or crushed slag. A minimum of 90 percent of the particles retained on the 4.75 mm (No. 4) sieve shall

have at least two mechanically induced fractured faces when tested in accordance with Colorado Procedure 45. The particles passing the 4.75 mm (No. 4) sieve shall be the product of crushing rock larger than 12.5 mm (½ inch).

In subsection 703.04, delete Table 703-5 and replace with the following:

**Table 703-5**

**Master Range Table for Stone Matrix Asphalt**

|  |  |
| --- | --- |
| **Sieve Size** | **Percent by Weight Passing Square Mesh Sieves** |
| **4.75 mm (#4) nominal** | **9.5 mm (3/8”) nominal** | **12.5 mm (1/2”) nominal** | **19.0 mm (3/4”) nominal** |
| 25 mm (1”) |  |  |  | 100 |
| 19.0 mm (3/4”) |  |  | 100 | 90-100 |
| 12.5 mm (1/2”) | 100 | 100 | 90-100 | 50-88 |
| 9.5 mm (3/8”) | 100 | 90-100 | 50-80 | 25-60 |
| 4.75 mm (#4) | 90-100 | 26-60 | 20-35 | 20-28 |
| 2.36 mm (#8) | 28-65 | 20-28 | 16-24 | 16-24 |
| 1.18mm (#16) | 22-36 |  |  |  |
| 600 µm (#30) | 18-28 | 12-18 | 12-18 | 12-18 |
| 300 µm (#50) | 15-22 | 10-15 |  |  |
| 150 µm (#100) |  |  |  |  |
| 75 µm (#200) | 12-15 | 8-12 | 8-11 | 8-11 |