

## Summary of Administrative Revisions to Standard Specifications 700 Series

<b>Section</b>	<b>Description of Revision</b>
<b>ALL</b>	<ul style="list-style-type: none"><li>• Formatting in accordance with CSI standards<ul style="list-style-type: none"><li>○ All Paragraphs identified by a letter<ul style="list-style-type: none"><li>▪ Sub-paragraphs identified by a number</li></ul></li></ul></li><li>• Replace pronouns with appropriate noun references</li><li>• Delete number word references and retain numeric number only</li><li>• Modify grammar structure for clarity</li><li>• Edit cross-references</li><li>• Delete references to self (Uniform Standard Specifications)</li><li>• Delete metric units</li><li>• Delete references to design and procedural guidelines</li><li>• Reformat Tables for consistency and clarity</li><li>• Delete references to codes and standards that do not specifically relate to the section</li></ul>

## SECTION 705

## AGGREGATES FOR BITUMINOUS COURSES

## SCOPE

## 705.01.01 MATERIALS COVERED

- A. This specification covers the quality and size of local mineral materials and commercial mineral fillers used in bituminous base and surface courses.

## REQUIREMENTS

## 705.02.01 GENERAL

- A. The mineral aggregate shall be the crushed and screened product of approved deposits.
- B. The Engineer reserves the right to prohibit the use of aggregates from any source when:
1. ~~(a)~~ The character of the material is such, in the opinion of the Engineer, as to make improbable the furnishing of aggregates conforming to ~~the requirements of~~ these specifications; or
  2. ~~(b)~~ The character of the material is such, in the opinion of the Engineer, that undue additional costs may be accrued by the Contracting Agency; or
  3. ~~(c)~~ The maximum allowable water absorption of either coarse or fine aggregate ~~shall not exceed~~ s 2.5 percent when tested in accordance with ASTM C127 (coarse aggregate) and ASTM C128 (fine aggregate).
- C. The mineral aggregate shall be clean, hard, durable, and free from frozen lumps, deleterious matter, and harmful adherent coatings.
- D. When producing plantmix aggregate, all natural fines passing the No. 4 sieve shall be screened from the coarse aggregate and may be reintroduced into the mix at a rate not to exceed ~~twenty (20)~~ percent by dry weight of the combined aggregates.
- E. The natural fines may be used only when all applicable mix design criteria have been met.

## 705.02.02 DEFICIENCIES

- A. If the product of any deposit is deficient in the fraction passing the No. 50 sieve, additional filler from other approved deposits meeting the physical requirements may be added.
- B. The added material shall be fed to the drier in a uniform manner from a separate stockpile.
- C. If the added material is a commercial mineral filler, it shall be uniformly fed directly to the plant. This ~~is~~ shall not ~~to~~ be construed as a waiver of any of the requirements contained herein.

## PHYSICAL PROPERTIES AND TESTS

## 705.03.01 PLANTMIX AND ROADMIX BITUMINOUS BASE AND SURFACE AGGREGATE, TYPES TWO FINE AND COARSE AND THREE

- A. The aggregate shall conform to ~~the following requirements~~ this subsection.

- B. Test specimens shall be prepared following dry preparation procedure described in ASTM D4318, Section 10.2 through Section 10.2.5.

**TABLE 1 – PLANTMIX AND ROADMIX AGGREGATE GRADATION**

Sieve Sizes	Percent By Weight Passing Sieve		
	Type 2 Coarse Arterials	Type 2 Fine Residential/Collector	Type 3
1-Inch	100	100	-----
3/4-Inch	84-97	90-100	-----
<del>1/2</del> 1/2-Inch	66-82	78-94	100
3/8-Inch	56-72	68-84	90-100
No. 4	35-50	50-65	55-85
No. 8	23-38	30-49	32-67
No. 50	5-19	7-25	7-27
No. 200	2-7	2-9	2-10

**TABLE 2 – PLANTMIX AND ROADMIX AGGREGATE SPECIFICATIONS**

Project Tests	Test Methods	Requirements
Sieve Analysis	AASHTO T27	Above
Sampling Aggregate	ASTM D75	-----
Fractured Faces	NEV. T230	<del>Traffic Category I: 90% Minimum (2 Fractures minimum)</del> <sup>3</sup>
		<del>95% Minimum (1 fracture minimum)</del>
		<del>Traffic Category II: 35% Minimum (2 Fractures minimum)</del> for Traffic Category II
Plasticity Index	ASTM D4318	<del>All Traffic Categories: 6 Maximum</del> -All TC <sup>2</sup>
Liquid Limit	ASTM D4318	<del>All Traffic Categories: 35 Maximum</del> -All TC
<sup>3</sup> Methylene Blue Test	AASHTO TP57	<del>10 Maximum</del>
<sup>3</sup> Fine Aggregate Angularity	AASHTO T33	<del>Traffic Category I: 45% TC-4</del>

Source Tests	Test Methods	Requirements
<sup>3</sup> Stripping Test	ASTM D1664	Satisfactory
Percentage of Wear (500 Rev EV)	ASTM C131	<del><sup>3</sup>All Traffic Categories: 35% Maximum</del> -All TC
<sup>3</sup> Elongation @ 5:1	ASTM D4791	<del>Traffic Category I: 10% Maximum</del> -TC-4
<sup>3</sup> Soundness Test	ASTM C88	<del>All Traffic Categories: 8% Maximum</del> -TC
<sup>3</sup> Deleterious Materials	ASTM C142	<del>All Traffic Categories: 0.3% Maximum</del> -All TC

<sup>4</sup>~~Test Specimens shall be prepared following dry preparation procedure described in Sections 10.2 through 10.2.5 of ASTM D4318.~~

<sup>2</sup>~~TC = Traffic Category~~

<sup>3</sup>~~Test requirements shall become effective January 1, 2002.~~

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## 705.03.02 BLANK

## 705.03.03 PLANTMIX BITUMINOUS OPEN-GRADED SURFACE AGGREGATE

A. The aggregate shall conform to the following requirements:

**TABLE 3 – OPEN GRADE AGGREGATE GRADATION**

Sieve Sizes	Percentage By Weight Passing Sieve
<del>1/2</del> 1/2-Inch	100
3/8-Inch	90-100
No. 4	35-55
No. 8	5-15
No. 200	0-3

**TABLE 4 – OPEN GRADE AGGREGATE SPECIFICATIONS**

Project Tests	Test Methods	Requirements
Sieve Analysis	AASHTO T27	Above
Sampling Aggregate	ASTM D75	----
Fractured Faces	NEV. T230	90% Minimum (2 fractures minimum)

  

Source Tests	Test Methods	Requirements
Percentage of Wear (500-Rev. EV).	ASTM C131	37% Maximum

## 705.03.04 COMMERCIAL MINERAL FILLER

- A. Commercial mineral filler shall conform to ~~the requirements of~~ ASTM C977 for quicklime, ASTM C1097 for hydrated lime, and ~~or~~ ASTM D-3910 and ASTM D-242 for slurry seal and microsurfacing.
- B. Sampling of the mineral aggregate and mineral filler shall conform to AASHTO T2/ASTM ~~D-~~75 methods.
1. All aggregate shall be from the same source.
  2. No field blending will be allowed.
- C. When tested according to the following tests, the mineral aggregate shall meet the following requirements:

**TABLE 5 - MINERAL FILLER AGGREGATE GRADATION**

Property	Test Method	Specification
Sand Equivalent	AASHTO T176/ ASTM D2419	50 Minimum for Slurry <del>&amp;and</del> 65 <del>Minimum</del> for Micro-surfacing
Plasticity Index	ASTM D4318	NP
Soundness, %	AASHTO T104/ ASTM C88	15 <del>Maximum</del> (using NA <sub>2</sub> SO <sub>4</sub> )
Abrasion Resistance, %	AASHTO T96/ ASTM C131	30 <del>Maximum</del> . <u>Abrasion test shall be run on the aggregate before it is crushed*</u> .

~~\*The abrasion test is to be run on the aggregate before it is crushed.~~

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- D. When tested in accordance with AASHTO T27, ~~& AASHTO T11, /ASTM C136, and ASTM & C117,~~ the mineral aggregate with mineral filler shall conform to the ~~requirements of~~ gradations ~~as~~ indicated below. ~~\_(The p~~Percentage passing shall not vary from the high limit to the low limit on any ~~two~~ 2 consecutive sieves).

**705.03.05 SCREENINGS**

- A. The screenings shall conform to the following requirements:

**TABLE 6 – SCREENINGS GRADATION**

Sieve Sizes	Percentage By Weight Passing Sieve	
	<del>1/2</del> 1/2-Inch	3/8-Inch
<del>1/2</del> 1/2-Inch	100	----
3/8-Inch	90-100	100
No. 4	15-35	20-45
No. 16	0-4	0-6
No. 200	0-2	0-2

**TABLE 7 SCREENINGS SPECIFICATIONS**

Project Tests	Test Methods	Requirements
Sieve Analysis	AASHTO T27	Above
Sampling Aggregate	ASTM D75	----
Fractured Faces	NEV. T230	90% Minimum (2 fractures minimum)

Source Tests	Test Methods	Requirements
Percentage of Wear (500 Rev <del>EV</del> .)	ASTM C131	37% Maximum

**705.03.06 SAND BLOTTER**

- A. The sand shall conform to the following requirements:

**TABLE 8 – SAND BLOTTER GRADATION**

Sieve Sizes	Percentage By Weight Passing Sieve
<del>1/2</del> 1/2-Inch	100
No. 4	90-100
No. 16	30-75
No. 200	0-12

**TABLE 9 – SAND BLOTTER SPECIFICATIONS**

Project Tests	Test Methods	Requirements
Sieve Analysis	AASHTO T27	Above
Sampling Aggregate	ASTM D75	----
Organic Impurities	ASTM C40	----

**TABLE 10 - ISSA, TYPE I GRADATION**

Sieve Size	Mix Design Range (Percentage By Weight Passing Each Sieve)	Stockpile Tolerance
3/8"-Inch	100	0
No. 4	100	0
No. 8	90-100	±5%
No. 16	65-90	±3%
No. 30	40-65	±3%
No. 50	25-42	±3%
No. 100	15-30	±2%
No. 200	10-20	±2%

**TABLE 11 - ISSA, TYPE II GRADATION**

Sieve Size	Mix Design Range (Percentage By Weight Passing Each Sieve)	Stockpile Tolerance
3/8"-Inch	100	0
No. 4	90-100	±5%
No. 8	65-90	±5%
No. 16	45-70	±3%
No. 30	30-50	±3%
No. 50	18-30	±3%
No. 100	10-21	±2%
No. 200	5-15	±2%

**TABLE 12 - ISSA, TYPE III GRADATION**

Sieve Size	Mix Design Range (Percentage By Weight Passing Each Sieve)	Stockpile Tolerance
3/8"-Inch	100	0
No. 4	70-90	±5%
No. 8	45-70	±5%
No. 16	28-50	±3%
No. 30	19-34	±3%
No. 50	12-25	±3%
No. 100	7-18	±2%
No. 200	7-15	±2%

**705.03.07 SET CONTROL ADDITIVES**

- A. The type and quantity of additives in slurry seal and microsurfacing mix shall be determined by the material mix design and conform to the applicable sections of ASTM D3910 and ISSA T102.

**705.03.08 PLANTMIX AND ROADMIX ASPHALT CONCRETE SURFACE COURSE UTACS TYPE S1 THROUGH S3**

- A. The Ultrathin Asphalt Concrete Surface (UTACS) shall use one of the gradation types listed below as required by the Engineer.

**Table 13 - Ultrathin Asphalt Concrete Surface (UTACS) Gradations**

Sieve Size	Type S1	Type S2	Type S3	Tolerance
3/4-Inch <sup>1</sup>	--	--	100	--
1/2-Inch	--	100	85-100	±6
3/8-Inch	100	85-100	60-80	±6
No. 4	40-55	22-40	22-38	±4
No. 8	19-32	19-32	19-32	±4
No. 16	15-25	15-23	15-23	±3
No. 30	10-18	10-18	10-18	±3
No. 50	8-13	8-13	8-13	±3
No. 100	6-10	6-10	6-10-	±3
No. 200	4-7	4-7	4-7	±2

- B. Coarse aggregate testing shall comply with Table 2. Coarse aggregate is defined as aggregate that is retained on and above the No. 4 (~~4.75 Minimum~~) sieve.

**Table 2-14 UTACS Coarse Aggregate Specifications**

Tests	Method	Limit
Los Angeles abrasion value, % loss	AASHTO T96-94	35 <del>Maximum</del>
Soundness, % loss	AASHTO T104-94	18 <del>Maximum</del>
Magnesium Sulfate or Sodium Sulfate	AASHTO T104-94	12 <del>Maximum</del>
Flat & Elongated Ratio, % @ 3:1	ASTM D4791	25 <del>Maximum</del>
% Crushed, single face	ASTM D5821	95 <del>Minimum</del>
% Crushed, Two or more Mechanically crushed faces	ASTM D5821	85 <del>Minimum</del>
Micro-Deval, % loss	AASHTO TP58-99	18 <del>Maximum</del>

- C. For the Los Angeles abrasion value, the values shown for these tests are targets for aggregate selection purposes. The results of these tests should not be the sole basis for rejection.
- D. Fine aggregate testing shall comply with Table 3.

**Table 3-15 - UTACS Fine Aggregate Specifications**

Tests	Method	Limit
Sand Equivalent	AASHTO T176-86	45 min <del>imum</del>
Methylene Blue (on materials passing 200)	AASHTO TP57-99	10 max <del>imum</del>
Un-compacted Void Content	AASHTO T304-96	40 min <del>imum</del>

- E. Values for sand equivalent shown for these tests are targets for aggregate selection purposes. If the finished bituminous mixture passes the AASHTO ~~T-283~~ requirement in the Mix Design section, the sand equivalent and methylene blue requirements may be waived.