KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 2015 EDITION

SECTION 1116

AGGREGATES FOR ON GRADE CONCRETE

Page 1100-41, delete subsection 1116.2a.(1) and replace with the following:

(1) Provide aggregate for concrete that complies with the following requirements. Crushed aggregates with less than 20% material retained on the 3/8" sieve must be produced from a source complying with these requirements prior to crushing. Fine Aggregates for Concrete have additional Quality Requirements stated in s**ubsection 1116.2e.(2).**

Soundness by Freeze/Thaw (min.) (KTMR-21)*.. 0.90
Wear Grading B (max.)(AASHTO T 96)**... 50%
Additional Requirements:***
Modified Soundness by Freeze/Thaw (min.) (KTMR-21).. 0.90
Relative Dynamic Modulus of Elasticity, minimum (KTMR-22 @ 660 F/T cycles) ... 95
Expansion, maximum (KTMR-22 @ 660 F/T cycles)... 0.025%
* Soundness (KTMR-21) requirements do not apply to aggregates having less than 10% material retained on the No. 4 sieve.
** Wear (AASHTO T 96) requirements do not apply to aggregates having less than 10% retained on the No. 8 sieve.
***The additional requirements do not apply for uncrushed sand-gravel aggregates having less than 5% material retained on the ½" sieve.

Page 1100-43, delete subsection 1116.2b.(2) and replace with the following:

(2) Product Control.
(a) Gradations such as those shown in **TABLE 1116-2** have proven satisfactory in reducing water demand while providing good workability. Adjust mixture proportions whenever individual aggregate grading varies during the course of the work. Use the gradations shown in **TABLE 1116-2**, or other gradation approved by the Engineer.

Optimization is not required for concrete for patching pavements more than 10 years old, or Commercial Grade Concrete. The Engineer may waive the optimization requirements if the concrete meets all the requirements of **DIVISION 400** and/or **DIVISION 500**.

Follow these guidelines:
1. Do not permit the percent retained on two adjacent sieve sizes to fall below 4%;
2. Do not allow the percent retained on three adjacent sieve sizes to fall below 8%; and
3. When the percent retained on each of two adjacent sieve sizes is less than 8%, the total percent retained on either of these sieves and the adjacent outside sieve should be at least 13%.
   (for example, if both the No. 4 and No. 8 sieves have 6% retained on each, then:
   1) the total retained on the 3/8 in. and No. 4 sieves should be at least 13%, and
   2) the total retained on the No. 8 and No. 16 sieves should be at least 13%.)

		Percent Retained - Square Mesh Sieves												
Type	**Usage**	**1 ½"**	**1"**	**¾"**	**½"**	**⅜"**	**No. 4**	**No. 8**	**No. 16**	**No. 30**	**No. 50**	**No. 100**	**No. 200**
MA-3	Optimized All Concrete		0	2-12	Note[1]	Note[1]	Note[1]	Note[1]	Note[2]	Note[2]	Note[2]	95-100[4]	98-100[5]
MA-4	Optimized All Concrete[3]	0	2-12	Note[1]	Note[1]	Note[1]	Note[1]	Note[1]	Note[2]	Note[2]	Note[2]	95-100[4]	98-100[5]
MA-5	Optimized All Concrete		0	2-12	8 min	22-34		55-65		75 min		95-100	98-100
MA-7	Contractor Design KDOT Approved	Proposed Grading that does not correspond to other limits in this table but meet the requirements for concrete in **DIVISION 400 and/or DIVISION 500**.											98-100

TABLE 1116-2: ALLOWABLE GRADING FOR MIXED AGGREGATES FOR CONCRETE

[1] Retain a maximum of 22% and a minimum of 6% of the material on each individual sieve.
[2] Retain a maximum of 15% and a minimum of 6% of the material on each individual sieve.
[3] Maximum top size of Limestone is ¾".
[4] Retain a maximum of 7% on the No. 100 sieve
[5] Retain a maximum of 2% on the No. 200 sieve

(b) Optimization Requirements for all Gradations.
 ▪ Actual Workability must be within ± 5 of Target Workability.

Where: W_A = Actual Workability
   W_T = Target Workability
   CF = Coarseness Factor

1. Determine the Grading according to KT-2
2. Calculate the Coarseness Factor (CF) to the nearest whole number.

$$CF = \frac{+3/8" \text{ Material \% Retained}}{+\#8 \text{ Material \% Retained}} \times 100$$

3. Calculate the Actual Workability (W_A) to the nearest whole number as the percent material passing the #8 sieve.
$$W_A = 100 - \% \text{ retained on } \#8 \text{ sieve}$$

4. Calculate the Target Workability (W_T) to the nearest whole number where
   For 517 lbs cement per cubic yard of concrete
$$W_T = 46.14 - (CF/6)$$

For each additional 1 lb of cement per cubic yard, subtract 2.5/94 from the Target Workability.

(c) Deleterious Substances. Maximum allowed deleterious substances by weight are:
• Clay lumps and friable particles (KT-7) 1.0%
• Coal (AASHTO T 113) 0.5%
• Shale or Shale-like material (KT-8) 0.5%
• Sticks (wet) (KT-35) 0.1%
• Sum of all deleterious 1.5%

(d) Uniformity of Supply.   Designate or determine the fineness modulus (grading factor) for each aggregate according to the procedure listed in Section 5.10.5-Fineness Modulus of Aggregates (Gradation Factor) of Part V before delivery, or from the first 10 samples tested and accepted. Provide aggregate that is within ±0.20 of the average fineness modulus.

Provide a single point grading for the combined aggregates along with a plus/minus tolerance for each sieve. Use plus/minus tolerances to perform quality control checks and by the Engineer to

perform aggregate grading verification testing. The tests may be performed on the combined materials or on individual aggregates, and then theoretically combined to determine compliance.

Maintain an Actual Workability within ± 5 of the Target Workability for combined aggregates.

Page 1100-44, subsection 1116.2e.(3)a. In the first sentence, change "TABLE 1116-5" to "TABLE 1116-4".

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Jul-15 Letting