KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, EDITION 2007

SECTION 611

HOT MIX ASPHALT (HMA)-COMMERCIAL GRADE

Page 600-55, replace Table 611-1 and its notes with the following:

TABLE 611-1: HMA-COMMERCIAL GRADE CLASS A and CLASS B MIX CRITERIA			
	CLASS A	**CLASS B**	
AGGREGATE:			
Coarse Angularity (min.%)	75	50	
Uncompacted Voids-Fine (min. %)	42	40	
Sand Equivalent (min. %)	40	40	
Natural sand (max. %)	35	-	
Reclaimed Asphalt Pavement (RAP) (max. %)	25	50	
Binder:	PG64-22 or PG58-28[1]	PG58-28 or PG64-22	
COMPACTION REVOLUTIONS:		(A)[3]	(B)[3]
N_{ini}	7	6	7
N_{des}	75	50	75
N_{max}	115	75	115
Level of Compaction at N_{ini}	≤90.5	≤91.5	≤91.5
MIX:			
VFA	65 – 78	66-80	65 – 78
Tensile Strength Ratio (TSR) (min. %)	80[2]	-	-

[1]In permanent locations with an asphalt mixture containing Recycled Asphalt Shingles (RAS) or 16% to 25% RAP, use PG58-28. In all other locations, the Contractor may use either grade of binder.
[2]Meet the minimum TSR requirement for design only. Depending on the anticipated exposure to the environment, the DME may waive the TSR requirement.
[3]Use either column A or B, Contractor's option.

Page 600-56, replace subsection 611.2c.(2) with the following:

(2) **TABLE 611-2**, Mix Design Requirements.

TABLE 611-2: MIX DESIGN REQUIREMENTS (Master Grading Limits and VMA)								
Nominal Maximum Size & Mix Designation	**Percent Retained - Square Mesh Sieves**							**Min. VMA (%)**
	1"	**3/4"**	**1/2"**	**3/8"**	**No. 4**	**No. 8**	**No. 200**	
SM-9.5A			0	0-10	10 min.	33-53	90.0-98.0	14.5
SR-9.5A			0-2	0-10	10 min.	33-53	90.0-98.0	14.5
SM-9.5T			0	0-10	10 min.	53-68	90.0-98.0	14.5
SR-9.5T			0-2	0-10	10 min.	53-68	90.0-98.0	14.5
SM-12.5A		0	0-10	10 min.		42-61	90.0-98.0	13.5
SR-12.5A		0-2	0-10	10 min.		42-61	90.0-98.0	13.5
SM-19A	0	0-10	10 min.			51-65	92.0-98.0	13.0
SR-19A	0-2	0-10	10 min.			51-65	92.0-98.0	13.0

- Meet the minimum VMA requirements with design only.
- Use an air void target of 4% (at N_{des}) to establish binder content.
- Using the combined gradation (RAP, if any, and virgin aggregate), select a single point for each sieve within the master grading limits and the No. 16, No. 30, No. 50 and No. 100 sieves. Also, provide the combined virgin aggregate gradation.

- When controlling a virgin mix by cold feed gradation testing, apply single point tolerances in **TABLE 611-3** to the design single points for the virgin aggregate. Do not exceed the tolerances for the Master Grading Limits.
- When controlling a mix that contains RAP by cold feed virgin gradation testing, apply single point tolerances in **TABLE 611-3** to the design single points for the virgin aggregate. The tolerances may exceed the Master Grading Limits.
- If RAP is used, the Effective Specific Gravity (G_{se}) of the RAP shall be calculated as shown in subsection 5.10.4, Part V and used as the G_{sb} of the RAP. If RAS is used, the Effective Specific Gravity (G_{se}) of the RAS shall be calculated as shown in subsection 5.10.4, Part V and used as the G_{sb} of the RAS.

TABLE 611-3: SINGLE POINT TOLERANCES

Nominal Maximum Size & Mix Designation	Percent Retained - Square Mesh Sieves							
	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
SM-9.5A or SR-9.5A		±5	±5	±5	±4	±4	±3	±2
SM-9.5T or SR-9.5T		±6	±5	±5	±4	±3	±3	±2
SM-12.5A or SR-12.5A	±6	±6	±5	±5	±4	±4	±3	±2
SM-19A or SR-19A	±6	±6	±5	±5	±4	±4	±4	±2

Comply with the certification requirements for the appropriate categories listed in the Policy and Procedure Manual for the Certified Inspection and Testing Training (CIT^2) Program. Use calibrated testing equipment with prescribed procedures in the KDOT Construction Manual, Part V, Section 5.17.10.

Page 600-57, replace subsection 611.2d with the following:

d. Process Control. Prior to making a single point or proportion change, receive approval from the Engineer. Depending upon the change, the Engineer may require another mix design before granting approval. On the first Lot only of production of any mix designation, any gradation penalty for the entire Lot will be assessed on the basis of the revised design job-mix (if any), provided no change in asphalt content is required as a result of the revision. For changes made in the design job-mix on subsequent Lots, computation of adjusted payment will not be retroactive within the Lots. Make any gradation change for the Lot before starting the gradation testing for that Lot.

During mix production on non-QC/QA projects, the Engineer may conduct tests (randomly located) to verify compliance with the approved mix design, and make adjustments to the binder content (Note: Plant produced mix may have a lower VMA and require a reduction in binder content.).

On projects with less than 500 tons of commercial grade asphalt mixture, testing (QC/QA or cold-feed gradations) is at the Engineer's discretion. On projects with 500 tons or more, testing of the asphalt mixture is required. The type of testing (QC/QA or cold-feed gradations) is the Contractor's option.

- The Engineer will test the combined virgin gradation at a frequency of 1 test for each 500 ton Lot or fraction thereof.
- On projects with more than 2000 tons of HMA–Commercial Grade mixture the Contractor may request the lot be increased to 750 ton provided the following criteria are met:
  - The plant is producing more than 500 tons of HMA–Commercial Grade mixture per day.
  - Previous 3 consecutive lots were produced without penalty.
  - Immediate notification of lot size change shall be provided to the Engineer any time a change is made.
- If any lot fails to meet all of the above criteria, the lot size shall resort to 500 tons until such time that the aforementioned criteria are met.
- Or, the Contractor and Engineer will test (QC/QA respectively) the asphalt mixture according to the testing requirements and frequencies in Part V, Appendix B.

KDOT will perform tests at the Contractors lab or at a location agreed to by the Engineer and Contractor. Testing will be completed and the results reported to the contractor within 24 hours. If the test results indicate there

is non-compliant material, make the appropriate adjustments to the mix proportions to comply with the approved mix design.

Page 600-57, add subsection 611.2f.:

f. Additives. Provide a method for the Engineer to continually monitor the percent of each additive being added.

When more than 25% of the mix is comprised of siliceous virgin aggregates and siliceous RAP, add anti-strip to the mix. The minimum amount of anti-strip required in the mix is 0.01% for every percent of natural sand and siliceous RAP in the mix. Thus, if 25% natural sand and 10% siliceous RAP is in a mix, then 0.35% anti-strip by weight of virgin asphalt binder is required in the mix. The District Materials Engineer will determine the composition of the RAP aggregates.

If during production, the TSR values (both KDOT and Contractor) exceed 85%, then the Contractor and the District Materials Engineer, working together, may decide on a lower amount of anti-strip.

Provide Warm Mix Asphalt (WMA) additives or processes that comply with **special provision 07-12002, latest revision**. The Contractor is permitted to use WMA unless otherwise shown on the plans.

For mixes containing Warm Mix Asphalt (WMA) additives, submit for the Engineer's review and approval, the additive or process used, the recommended rate of application, and the temperature ranges for mixing and compaction.

Mixing temperature range is provided by the Asphalt Binder Supplier. When using WMA, the mixing temperature may be reduced no more than 30°F for WMA water foaming processes, and no more than 70°F for WMA chemical and organic additives. The minimum mixing temperature for WMA is 220°F.

Page 600-57, replace subsection 611.3a. with the following:

a. General. Use equipment that complies with **DIVISION 150** to produce, haul, spread and compact the HMA-Commercial Grade mixture.

Use a minimum of 2 rollers to compact the mixture to the maximum density before the mixture temperature falls below 175°F. When using WMA, achieve the maximum density before the temperature of the WMA falls below 165°F. Do not crush the aggregate. On incidental or miscellaneous work, the Engineer may waive the minimum roller requirement if conditions warrant. Roller marks may be removed with a self-propelled static roller when the pavement surface temperature falls below 175°F or 165°F for WMA, roller marks may be removed from the mat with a self-propelled static steel roller.

Excluding side roads, entrances and non-traffic areas, the Engineer may test the completed surface with a 10 foot straightedge, and the maximum allowable surface variation is 3/16 inch in 10 feet. Correct areas that exceed the allowable variation as directed by the Engineer.

Prepare the road surface according to **subsection 602.4b**.

Lift Thickness. Except for leveling courses or when shown otherwise in the Contract Documents, **TABLE 602-9** applies. The Engineer may adjust lift thickness to utilize the most efficient method of acquiring specified density and surface quality. The minimum lift thickness for any HMA mixture is 3 times the nominal maximum aggregate size, unless otherwise designated in the Contract Documents or approved by the Engineer.

TABLE 602-9: NOMINAL COMPACTED THICKNESS

Lift	Maximum Nominal Compacted Thickness
Surface	2 inches
Base	4 inches

Page 600-58, replace Table 611-4 with the following:

TABLE 611-4: ASPHALT PLACEMENT TEMPERATURE LIMITATIONS							
Paving Course	**Thickness (inches)**	**Air Temperature (ºF)**			**Surface Temperature (ºF)**		
		HMA	**WMA Foam**	**WMA Chem**	**HMA**	**WMA Foam**	**WMA Chem**
Surface	All	50	45	40	55	50	45
Subsurface	<1.5	50	45	40	55	50	45
Subsurface	≥1.5 and < 3	40	35	30	45	40	35
Subsurface	≥ 3	30	30	30	35	32	32

Page 600-58, replace subsection 611.4 with the following:

611.4 MEASUREMENT AND PAYMENT

The Engineer will measure HMA-Commercial Grade and HMA-Commercial Grade (Patching) by the ton.

Payment for "HMA-Commercial Grade (Class*)" at the contract unit prices is full compensation for the specified work. Payment for and "HMA-Commercial Grade (Class *) (Patching)" includes all excavation, compaction of subgrade or subbase if required, disposal of waste material and all material (including emulsified asphalt for tack), all labor, equipment, tools, supplies, incidentals and mobilization necessary to complete the work.

If the gradation test results or air void test results indicate there is non-compliant material, the Engineer will compute the price adjustment according to one of the following and assess a lump sum dollar value on the Contractor's payment voucher.

(1) Use **TABLE 611-5**, on each Lot of asphalt mixture represented by non-compliant cold-feed gradation (acceptance) tests:

- Determine the absolute value of the deviation between the acceptance test results (rounded to the nearest 0.01%) and the design virgin aggregate single point for the No. 4, No. 8, No. 30 and the No. 200 pay sieves.
- Use the 1 Test Column in **TABLE 611-5** to determine payment for the Lot.
- Use the deviation from the sieve that produces the greatest price adjustment.

(2) The Engineer will assess an air void price adjustment (negative price adjustment only), as outlined in **SECTION 602**, on the asphalt material (taken from each QC/QA Lot) represented by non-compliant QC/QA (acceptance) tests.

Page 600-59, replace Table 611-5 and its notes with the following:

TABLE 611-5: SCHEDULE OF ADJUSTED PAYMENT FOR ASPHALT MIXES					
		Accumulated Deviation of the Acceptance Tests from the Design Job-Mix Single Point			
Tolerance	**Pay Factor**	**1 Test**	**2 Tests**	**3 Tests**	**4 Tests**
± 7	1.00	0.00 - 7.00	0.00 - 9.00	0.00 - 12.12	0.00 - 14.00
	0.98	7.01 -7.50	9.91 - 10.60	12.13 - 12.99	14.01 - 15.00
	0.95	7.51 - 8.00	10.61 - 11.32	13.00 - 13.86	15.01 - 16.00
	0.92*	8.01 - 8.50	11.33 - 12.02	13.87 - 14.73	16.01 - 17.00
	0.88*	over 8.50	over 12.02	over 14.73	over 17.00
± 6	1.00	0.00 - 6.00	0.00 - 8.48	0.00 - 10.38	0.00 - 12.00
	0.98	6.01 - 6.50	8.49 - 9.20	10.39 - 11.25	12.01 - 13.00
	0.95	6.51 - 7.00	9.21 - 9.90	11.26 - 12.12	13.01 - 14.00
	0.92*	7.01 - 7.50	9.91 - 10.60	12.13 - 12.99	14.01 - 15.00
	0.88*	over 7.50	over 10.60	over 12.99	over 15.00
± 5	1.00	0.00 - 5.00	0.00 - 7.08	0.00 - 8.61	0.00 - 10.00
	0.98	5.01 - 5.50	7.09 - 7.78	8.62 - 9.54	10.01 - 11.00
	0.95	5.51 - 6.00	7.79 - 8.48	9.55 - 10.38	11.01 - 12.00
	0.92*	6.01 - 6.50	8.49 - 9.20	10.39 - 11.25	12.01 - 13.00
	0.88*	over 6.50	over 9.20	over 11.25	over 13.00
± 4	1.00	0.00 - 4.00	0.00 - 5.66	0.00 - 6.93	0.00 – 8.00
	0.98	4.01 - 4.50	5.67 - 6.36	6.94 - 7.80	8.01 – 9.00
	0.95	4.51 - 5.00	6.37 - 7.08	7.81 - 8.67	9.01 - 10.00
	0.92*	5.01 - 5.50	7.09 - 7.78	8.68 - 9.54	10.01 - 11.00
	0.88*	over 5.50	over 7.78	over 9.54	over 11.00
± 3	1.00	0.00 - 3.00	0.00 - 4.24	0.00 - 5.19	0.00 – 6.00
	0.98	3.01 - 3.20	4.25 - 4.52	5.20 - 5.55	6.01 – 6.40
	0.95	3.21 - 3.40	4.53 - 4.80	5.56 - 5.97	6.41 – 6.80
	0.92*	3.41 - 3.80	4.81 - 5.38	5.98 - 6.57	6.81 – 7.60
	0.88*	over 3.80	over 5.38	over 6.57	over 7.60
± 2.5	1.00	0.00 - 2.50	0.00 - 3.54	0.00 - 4.32	0.00 – 5.00
	0.98	2.51 - 2.70	3.55 - 3.82	4.33 - 4.68	5.01 – 5.40
	0.95	2.71 - 2.90	3.83 - 4.10	4.69 - 5.01	5.41 – 5.80
	0.92*	2.91 - 3.30	4.11 - 4.66	5.02 - 5.73	5.81 – 6.60
	0.88*	over 3.30	over 4.66	over 5.73	over 6.60
± 2	1.00	0.00 - 2.20	0.00 - 3.12	0.00 - 3.81	0.00 – 4.40
	0.95	2.21 - 2.40	3.13 - 3.40	3.82 - 4.17	4.41 – 4.80
	0.92*	2.41 - 2.75	3.41 - 3.88	4.18 - 4.77	4.81 – 5.56
	0.88*	over 2.75	over 3.88	over 4.77	over 5.56

*If approved by the Engineer, the Contractor may accept the indicated partial pay. KDOT may require removal and replacement at no additional cost. At any time, the Contractor has the option to remove and replace at no cost to KDOT.