

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

**ASPHALT BASE (REFLECTIVE CRACK INTERLAYER (RCI))**

**1.0 DESCRIPTION**

Construct the asphalt base (reflective crack interlayer (RCI)) as designated in the Contract Documents.

<u>BID ITEM</u>	<u>UNITS</u>
Asphalt Base (RCI) (*)	Ton
Quality Control Testing (HMA)	Ton
* Grade	

**2.0 CONTRACTOR QUALITY CONTROL REQUIREMENTS**

Perform quality control testing according to **subsection 602.2**.

**3.0 MATERIALS**

Provide performance graded asphalt binder that complies with **SECTION 1202**, with this exception:

Change the PG 70-28 separation test requirement (from 2) to 6 in **TABLE 1202-1: PERFORMANCE GRADE (PG)**.

Provide plant mix asphalt that complies with **DIVISION 602**, with these additions and exceptions:

**On page 600-5, in subsection 602.3d., delete the 4th paragraph "For all mixes used on the traveled way, the maximum quantity of natural sand is 35%."**

**Add the following to the end of subsection 602.3e.:**

For Reflective Crack Interlayer (RCI) mixes, the optimum percentage of asphalt material is the percentage that yields the design air voids at  $N_{max}$  (50 gyrations) and complies with the other requirements of the specifications. Submit test results for all design criteria. The values from the approved mix design become the values in the initial job mix formula (JMF) for the RCI. These values remain in effect for the JMF until a written request by the Contractor for a change is approved by the Engineer. Provide a new mix design when any change in materials occurs from those used in the mix design, unless waived by the District Materials Engineer.

**Replace TABLE 602-1 and all its notes with the following:**

<b>TABLE 602-1: COMBINED AGGREGATE REQUIREMENTS</b>								
<b>Mix Designation</b>	<b>Percent Retained - Square Mesh Sieves</b>							
	<b>3/8"</b>	<b>No. 4</b>	<b>No. 8</b>	<b>No. 16</b>	<b>No. 30</b>	<b>No. 50</b>	<b>No. 100</b>	<b>No. 200</b>
RCI	0	0-15	1-25	13-47	41-68	74-91	88-99	94-99

1. Aggregate Adjustment Limit: Do not exceed a 7% adjustment on any single sieve from the approved mix design to the Job Mix Formula (JMF). Submit a new mix design when requesting a change beyond this limit.
2. Do not use Reclaimed asphalt pavement (RAP) in the RCI design.
3. The flat and elongated particles in the combined coarse aggregate shall not exceed 10% for the total sample.
4. The maximum percent moisture in the final mixture shall not exceed 0.5.
5. There is no criteria for CAA, FAA, or D/B ratio.

Replace 602-5 with the following:

TABLE 602-5: RCI MIX REQUIREMENTS FOR DESIGN SUBMITTAL	
MIX CHARACTERISTIC	CRITERIA
Sand Equivalent (SE), minimum, %	45
Gyratory Compaction Revolutions, $N_{max}$	50
Air Voids ( $V_a$ ) range, % <sup>1</sup>	3.5 - 5.5
VMA, minimum, % <sup>1</sup>	18.0
VFA, minimum, % <sup>1</sup>	70
Hveem Stability (AASHTO T-246) @ 140°F, 4" (100 mm) molds, minimum <sup>1</sup>	18.0
Flexural Beam Fatigue (AASHTO T-321) <sup>3</sup> , 2000 microstrain, 10 Hz., 98% ± 1.0 of $G_{mb}$ @ $N_{max}$ , 59°F (Age samples for 4 hours at 275°F before compaction, reference AASHTO R30 Section 7.2)	200,000 cycles
Asphalt binder ( $P_b$ ), minimum, % <sup>2</sup>	8.0

1. Criteria based on 50 gyrations ( $N_{max}$ )
2. Asphalt Binder Adjustment Limit: The target asphalt binder content during production (JMF) will be the asphalt binder content from the approved mix design. Submit a new mix design when a new target asphalt binder content is requested.
3. AASHTO T-321 will be used for analysis with the following exceptions:
  - Section 8.7: Replace the last sentence with the following:  
This stiffness is the Initial Beam Modulus, which is used as a reference for determining the specimen failure.
  - Section 8.8: Delete the second sentence.
  - Section 8.9: Delete the last sentence.
  - Section 9.1.3: Change "Flexural Stiffness" to "Beam Modulus"
  - Section 9.1.6: Replace this section with the following:  
Normalized Modulus = (Beam Modulus x Cycle Number) / (Initial Beam Modulus x 50)  
Figure 6 - Plot the Normalized Modulus x Cycles versus Load Cycles (Repetitions)
  - Section 9.1.7 and Section 9.1.8: Delete
  - Section 9.1.9: Replace with the following:  
Failure Point – Failure is defined at the maximum or peak Normalized Modulus when Normalized Modulus x Cycles is plotted versus Load Cycles.
  - Section 9.1.10: Delete
  - Section 10.4, Table 2: Change the last two headings to "Normalized Modulus" and "Normalized Modulus x Cycles", respectively
  - Section 10.7: Delete
  - Section 10.8: Replace with the following:  
Prepare a plot of Normalized Modulus x Cycles versus load cycles

Add the following to TABLE 602-13: MINIMUM HMA PLACEMENT TEMPERATURES:

Paving Course	Thickness (inches)	Air Temperature (°F)	Road Surface Temperature (°F)
RCI	All	50	55

#### 4.0 CONSTRUCTION REQUIREMENTS

Construct the asphalt base (RCI) according to **subsection 602.4**.

Add the following to the end of subsection 602.4:

##### h. Special RCI Requirements:

Technical Support: Personnel familiar with the process will provide technical support for production and placement of the RCI.

Tack Coat: Place a tack coat prior to the placement of the RCI.

Thickness: Compact the RCI to a minimum thickness of 1 inch. Thicknesses less than this are not acceptable and may result in removal and replacement at no additional cost to KDOT.

Longitudinal Joint: Overlap the PCCP or HMA longitudinal joint with the RCI by at least 6 inches.

Compaction and Density: Control the in-place density of all lots of the RCI using an approved rolling procedure as outlined in **subsection 602.4e**. If cores are taken use extreme care when handling the cores. Use a solid flat and un-textured surface to transport and store the cores prior to testing.

Release to Traffic and Overlay Placement: Cover the RCI with a hot mixture overlay within 5 days after placement. The RCI may be opened to traffic or covered with the hot mix overlay after cooling to less than 140°F or as determined by the Engineer.

Appearance: After final rolling, the RCI should be deep black in appearance. Remove and replace areas determined unacceptable by the Engineer, in accordance with this specification, at no additional cost to KDOT.

Damaged Areas: Replace any traffic-damaged or marred areas at no additional charge.

Blisters: Perforate blisters that have not disappeared by the time of the overlay using a method approved by the Engineer.

**Replace TABLE 602-12: SPECIFICATION WORKING RANGES (QC/QA) with the following:**

<b>TABLE 602-12: SPECIFICATION WORKING RANGES (QC/QA)</b>				
<b>Mix Characteristic</b>	<b>Tolerance from JMF</b>			
	<b>Single Test Value</b>	<b>Plot</b>	<b>4 Point Moving Average Value</b>	<b>Plot</b>
Binder Content	±0.3%	*	±0.3%	*
<b>Tolerance for Specification Limits</b>				
<b>Mix Characteristic</b>	<b>Single Test Value</b>	<b>Plot</b>	<b>4 Point Moving Average Value</b>	<b>Plot</b>
Gradation (applicable sieves shown in <b>TABLE 602-1</b> )	**	*	zero tolerance	*
Air Voids @ N <sub>max</sub> gyrations	3.0% – 5.5%	*	3.0% – 5.5%	
Voids in Mineral Aggregate	1.0% below min.	*	zero tolerance	*
Voids Filled with Asphalt	zero tolerance		n/a	
Sand Equivalent	zero tolerance		n/a	

\*Values to plot. For gradations, as a minimum, plot the No. 4, No. 8, No. 30, and No. 200 sieves.

\*\* The maximum deviation from the JMF shall be ±4.0% for No. 16 sieve and ±1.0% for No. 200 sieve.

**Delete subsection 602.9d. and replace with the following:**

**d. Air Void Payment.** For RCI, the air void bonus or deduct will not apply.