

## **ASPHALT PAVEMENTS - WARM MIX ASPHALT SUPERPAVE:**

(5-19-09) (Rev 2-15-11)

R6 R02A

Warm Mix Asphalt (WMA) is defined as additives or processes that allow a reduction in the temperature at which asphalt mixtures are produced and placed.

Notify the Engineer at least 2 weeks before producing the WMA so the Engineer can arrange a pre-pave meeting. Discuss special testing requirements necessary for WMA at the pre-pave meeting. Include at the pre-pave meeting the Contractor's QC manager, Paving Superintendent, and manufacturer's representative for the WMA technology, the Department's Roadway Construction Engineer, Resident Engineer, State Pavement Construction Engineer, and Quality Assurance Supervisor.

Require a manufacturer's representative for the WMA technology used to be present on site at the plant during the initial production and on the roadway during the laydown of the warm mix asphalt.

The requirement for the manufacturer's representative to be present at the pre-pave meeting and on-site at the plant may be waived by the Engineer based on previous work experience with the specific WMA technology used.

If the use of WMA is suspended during production, and the Contractor begins using Hot Mix Asphalt (HMA), then the Contractor shall be required to use HMA for the remainder of the specific route or map unless otherwise approved by the Engineer.

Revise the *2006 Standard Specifications* as follows:

### **Page 6-8, Article 609-1 Description, insert the following as the second paragraph:**

Warm Mix Asphalt (WMA) is defined as additives or processes that allow a reduction in the temperature at which asphalt mixtures are produced and placed. Use WMA at the Contractor's option when shown in the contract.

### **Page 6-9, Article 609-4 Field Verification of Mixture and Job Mix Formula Adjustments, second paragraph, insert the following immediately after the first sentence:**

When producing a WMA, perform field verification testing including Tensile Strength Ratio (TSR) testing in accordance with AASHTO T 283 as modified by the Department.

### **Third paragraph, delete the third sentence and replace with the following:**

Verification is satisfactory for HMA when all volumetric properties except  $\%G_{mm}@N_{ini}$  are within the applicable mix design criteria and the gradation, binder content, and  $\%G_{mm}@N_{ini}$  are within the individual limits for the mix type being produced. Verification is satisfactory for WMA when all volumetric properties except  $\%G_{mm}@N_{ini}$  are within the applicable mix design criteria, the TSR meets the design criteria, and the gradation, binder content, and  $\%G_{mm}@N_{ini}$  are within the individual limits for the mix type being produced.

**Page 6-12, Subarticle 609-5(C)(2)(d) Bulk Specific Gravity of Compacted Specimens, add after (AASHTO T 312):**

When producing WMA, gyrate specimens to specified  $N_{des}$  compaction effort without reheating mix other than to desired compaction temperature. Record time needed to reheat samples (if any).

**Page 6-14, Subarticle 609-5(C)(2)(e) Tensile Strength Ratio, insert the following immediately after the third paragraph:**

When producing WMA, perform TSR testing:

- (i.) Prior to initial production for each JMF and
- (ii.) Every 15,000 tons.

After three (3) consecutive passing TSR tests for a specific JMF, a request may be submitted to the State Asphalt Design Engineer to revert to the *Hot-Mix Asphalt QMS Manual* procedures for TSR testing on that JMF. This request shall be submitted in writing and shall include all test result data (Material and Tests Unit Form 612s) performed on the specific JMF.

**Page 6-27, Article 610-1 Description, insert the following as the third paragraph:**

Warm Mix Asphalt (WMA) is defined as additives or processes that allow a reduction in the temperature at which asphalt mixtures are produced and placed. Use WMA at the Contractor's option when shown in the contract.

**Page 6-27, Article 610-2 Materials, insert the following at the end of this Article:**

Use only WMA technologies on the allowable routes listed on the Department's approved list maintained by the Materials and Tests Unit. The Department's approved list can be found at the following website: <http://www.ncdot.org/doh/operations/materials/pdf/wma.pdf>.

**Page 6-31, Subarticle 610-3(B) Mix Design-Criteria, add the following as the fifth paragraph:**

When WMA is used, submit the mix design without including the WMA additive.

**Page 6-32, Subarticle 610-3(C) Job Mix Formula, add the following as the second paragraph:**

When WMA is used, document the technology used, the recommended dosage rate, and the requested plant mix temperature on the JMF submittal. Verify the JMF based on plant produced mixture from the field verification test.

**Immediately following PG 76-22 335°F, add the following paragraph:**

When WMA is used, produce an asphalt mixture within the temperature range of 225°F to 275°F.