

ITEM 404.XYZQ291 – WARM MIX ASPHALT

DESCRIPTION. This work shall consist of developing, producing and paving a Warm Mix Asphalt (WMA) mixture. WMA is standard HMA produced using a WMA technology typically resulting in a production mixture temperature of 135°C or lower. A WMA technology may include an additive, specialty equipment, or both.

WMA pavement course shall be constructed in accordance with this specification and in reasonably close conformity with the required lines, grades, thicknesses, and typical sections shown on the plans or established by the Engineer. The Contractor is responsible for compacting pavement to a specified density requirement.

The words “hot mix asphalt” and “HMA” in the standard specifications and other documents referenced by this specification shall apply to WMA.

MATERIALS. Requirements of §401-2 and §402-2 shall apply except as noted herein.

WMA Technology. Use a WMA technology appearing on the State’s Approved List for Warm Mix Asphalt Technologies.

WMA Design. Modify a HMA design, currently in production status according to MM 5.16, *Superpave Hot Mix Asphalt Mixture Design and Mixture Verification Procedure*, using a WMA technology. Comply with the manufacturer’s recommendations for incorporating the WMA technology. Notify the Regional Material Engineer (RME) how the WMA technology will be incorporated prior to fabricating the test specimens. Test specimens may be made from plant produced or laboratory prepared WMA. Test specimens must be made from plant produced WMA if adding the WMA technology in the lab does not simulate the production process. The RME may require a State representative be present during the fabrication and testing. Submit the WMA design to the RME for review and verification at least 14 calendar days before production, including:

- Test data from the one point verification comparing the original HMA design to the WMA design satisfying all design criteria in MM 5.16.
- Name of WMA technology, target rate and acceptable variation (min/max rate)
- AASHTO T 283 moisture susceptibility test results meeting the requirements in MM 5.16 for both the HMA and WMA.
- Samples of the PG Binder, any WMA additive, and MSDS if requested by RME.
- Production Quality Control Plan revisions incorporating the WMA technology if not previously submitted. WMA Quality Control guidelines are available from the Materials Bureau.
- Test results for both the HMA and WMA samples using one of the test methods in Table 1, Allowable Mixture Rut Performance Tests. The HMA and WMA must be tested using the same test.

TABLE 1 ALLOWABLE MIXTURE RUT PERFORMANCE TESTS				
Type of Test	AASHTO Test Method	Test Specimen Air Voids¹	Test Temperature	
			Upstate	Downstate
Asphalt Pavement Analyzer (APA)	T 340	7.0 ± 1.0%	58°C	64°C
Hamburg Wheel Track (HWT)	T 324	7.0 ± 1.0%	50°C	50°C
Asphalt Mixture Performance Tester (AMPT)	TP 79	7.0 ± 1.0%	50°C	53°C

Note 1: Condition the mixture for 2 hours ± 5 minutes at the desired field compaction temperature.

Shim Course. Select a desired WMA mixture temperature within the mixing and compaction range as recommended by the WMA technology provider.

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Due to the experimental nature of this specification and on-going research, rut performance test result criteria are not listed. The Director, Materials Bureau, will provide Contractors and Producers the current criteria being used to evaluate test results, upon request. When test results do not meet the current criteria, the Contractor and Producer will have the opportunity to meet with Department representatives to discuss additional data and information indicating the mix will perform as expected. Based on additional data and information, the mix may be considered accepted for general use, accepted for restricted use, or unacceptable.

The Director, Materials Bureau will review and make the final decision regarding the status of WMA mix designs. The State reserves the right to suspend any mixture design when the mixture demonstrates unacceptable paving quality or exhibits properties that will affect the anticipated pavement performance. The Contractor may request to use a HMA design if the submitted WMA mixture design is considered unacceptable or is subsequently suspended.

CONSTRUCTION DETAILS. Requirements of §401-3 and §402-3 shall apply except as noted herein.

Mix Temperature. Select a desired WMA mixture temperature within the mixing and compaction range as recommended by the WMA technology provider.

METHOD OF MEASUREMENT. Requirements of §401-4 and §402-4 shall apply except as noted herein.

The WMA will be measured by the number of tons of compacted mixture in the accepted work. In addition, quality payment adjustments are applicable for all warm mix asphalt in accordance with this specification.

Plant Production Quality Payment Adjustment. The quality assurance technician (QAT) will determine the quality adjustment factor (QAF) for each day's production in accordance with MP 401 and this section. Production meeting the specification requirements will be assigned a QAF of 1.00. Production failing to meet the specification requirements will be assigned a QAF of 0.85 and be subject to evaluation according to §401-4.03 Evaluation of Sublots Represented by 0.85 QAF. The Engineer will use the Daily QAF to calculate the quality payment adjustment for each day's production and apply it to the accepted quantity.

BASIS OF PAYMENT. The unit price bid for WMA mixtures shall meet the requirements specified in §402-5 Basis of Payment

Item No.	Item	Pay Unit
404.01790291	True & Leveling F9, Superpave WMA, 70 Series Compaction	Metric Ton
404.01890291	True & Leveling F9, Superpave WMA, 80 Series Compaction	Metric Ton
404.05890291	Shim Course F9, Warm Mix Asphalt	Metric Ton
404.09510291	9.5 F1 Superpave WMA, 50 Series Compaction	Metric Ton
404.09512291	Pavement Density Quality Adjustment to 404.09510291	Quality Units
404.09515291	Test Section Adjustment to 404.09510291	Quality Units
404.09520291	9.5 F2 Superpave WMA, 50 Series Compaction	Metric Ton
404.09522291	Pavement Density Quality Adjustment to 404.09520291	Quality Units
404.09525291	Test Section Adjustment to 404.09520291	Quality Units
404.09610291	9.5 F1 Superpave WMA, 60 Series Compaction	Metric Ton
404.09612291	Pavement Density Quality Adjustment to 404.09610291	Quality Units
404.09615291	Test Section Adjustment to 404.09610291	Quality Units

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404.09620291	9.5 F2 Superpave WMA, 60 Series Compaction	Metric Ton
404.09622291	Pavement Density Quality Adjustment to 404.09620291	Quality Units
404.09625291	Test Section Adjustment to 404.09620291	Quality Units
404.09630291	9.5 F3 Superpave WMA, 60 Series Compaction	Metric Ton
404.09632291	Pavement Density Quality Adjustment to 404.09630291	Quality Units
404.09635291	Test Section Adjustment to 404.09630291	Quality Units
404.09710291	9.5 F1 Superpave WMA, 70 Series Compaction	Metric Ton
404.09715291	Test Section Adjustment to 404.09710291	Quality Units
404.09720291	9.5 F2 Superpave WMA, 70 Series Compaction	Metric Ton
404.09725291	Test Section Adjustment to 404.09720291	Quality Units
404.09730291	9.5 F3 Superpave WMA, 70 Series Compaction	Metric Ton
404.09735291	Test Section Adjustment to 404.09730291	Quality Units
404.09810291	9.5 F1 Superpave WMA, 80 Series Compaction	Metric Ton
404.09820291	9.5 F2 Superpave WMA, 80 Series Compaction	Metric Ton
404.09830291	9.5 F3 Superpave WMA, 80 Series Compaction	Metric Ton
404.09890291	9.5 F9 Superpave WMA, Shoulder Course, 80 Series Compaction	Metric Ton
404.12510291	12.5 F1 Superpave WMA, 50 Series Compaction	Metric Ton
404.12512291	Pavement Density Quality Adjustment to 404.12510291	Quality Units
404.12515291	Test Section Adjustment to 404.12510291	Quality Units
404.12520291	12.5 F2 Superpave WMA, 50 Series Compaction	Metric Ton
404.12522291	Pavement Density Quality Adjustment to 404.12520291	Quality Units
404.12525291	Test Section Adjustment to 404.12520291	Quality Units
404.12610291	12.5 F1 Superpave WMA, 60 Series Compaction	Metric Ton
404.12612291	Pavement Density Quality Adjustment to 404.12610291	Quality Units
404.12615291	Test Section Adjustment to 404.12610291	Quality Units
404.12620291	12.5 F2 Superpave WMA, 60 Series Compaction	Metric Ton
404.12622291	Pavement Density Quality Adjustment to 404.12620291	Quality Units
404.12625291	Test Section Adjustment to 404.12620291	Quality Units
404.12630291	12.5 F3 Superpave WMA, 60 Series Compaction	Metric Ton
404.12632291	Pavement Density Quality Adjustment to 404.12630291	Quality Units
404.12635291	Test Section Adjustment to 404.12630291	Quality Units
404.12710291	12.5 F1 Superpave WMA, 70 Series Compaction	Metric Ton
404.12715291	Test Section Adjustment to 404.12710291	Quality Units
404.12720291	12.5 F2 Superpave WMA, 70 Series Compaction	Metric Ton
404.12725291	Test Section Adjustment to 404.12720291	Quality Units
404.12730291	12.5 F3 Superpave WMA, 70 Series Compaction	Metric Ton
404.12735291	Test Section Adjustment to 404.12730291	Quality Units
404.12810291	12.5 F1 Superpave WMA, 80 Series Compaction	Metric Ton
404.12820291	12.5 F2 Superpave WMA, 80 Series Compaction	Metric Ton
404.12830291	12.5 F3 Superpave WMA, 80 Series Compaction	Metric Ton
404.12890291	12.5 F9 Superpave WMA, Shoulder Course, 80 Series Compaction	Metric Ton
404.19590291	19 F9 Superpave WMA, 50 Series Compaction	Metric Ton
404.19592291	Pavement Density Quality Adjustment to 404.19590291	Quality Units
404.19595291	Test Section Adjustment to 404.19590291	Quality Units
404.19690291	19 F9 Superpave WMA, 60 Series Compaction	Metric Ton
404.19692291	Pavement Density Quality Adjustment to 404.19690291	Quality Units
404.19695291	Test Section Adjustment to 404.19690291	Quality Units
404.19790291	19 F9 Superpave WMA, 70 Series Compaction	Metric Ton
404.19795291	Test Section Adjustment to 404.19790291	Quality Units
404.19890291	19 F9 Superpave WMA, 80 Series Compaction	Metric Ton

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404.25590291	25 F9 Superpave WMA, 50 Series Compaction	Metric Ton
404.25592291	Pavement Density Quality Adjustment to 404.25590291	Quality Units
404.25595291	Test Section Adjustment to 404.25590291	Quality Units
404.25690291	25 F9 Superpave WMA, 60 Series Compaction	Metric Ton
404.25692291	Pavement Density Quality Adjustment to 404.25690291	Quality Units
404.25695291	Test Section Adjustment to 404.25690291	Quality Units
404.25790291	25 F9 Superpave WMA, 70 Series Compaction	Metric Ton
404.25795291	Test Section Adjustment to 404.25790291	Quality Units
404.25890291	25 F9 Superpave WMA, 80 Series Compaction	Metric Ton
404.37690291	37.5 F9 Superpave WMA, 60 Series Compaction	Metric Ton
404.37692291	Pavement Density Quality Adjustment to 404.37690291	Quality Units
404.37695291	Test Section Adjustment to 404. 37690291	Quality Units
404.37790291	37.5 F9 Superpave WMA, 70 Series Compaction	Metric Ton
404.37795291	Test Section Adjustment to 404.37790291	Quality Units
404.37890291	37.5 F9 Superpave WMA, 80 Series Compaction	Metric Ton

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