

ROAD COMMISSION FOR OAKLAND COUNTY

SPECIAL PROVISION
FOR
ACCEPTANCE OF HOT MIXED ASPHALT

RCOC/DESIGN:SH/JO

PAGE 1 OF 6

RCOC20SP501A

ORG:03-20-21

FHWA:04-20-21

a. Description

This special provision applies to all Hot Mix Asphalt (HMA) acceptance testing for all Road Commission for Oakland County (RCOC) roads. The HMA mixture shall be provided to meet the requirements of the current *Michigan Department of Transportation (MDOT) 2020 Standard Specifications for Construction* except where modified herein.

b. Materials

Aggregates, mineral filler (if required), and asphalt binder shall be combined as necessary to produce a mixture of the type(s) specified on plans.

Superpave Hot Mix Asphalt Mixtures shall be proportioned within the limits set by the *MDOT 2020 Standard Specifications for Construction*.

Marshall Hot Mix Asphalt shall be proportioned within the limits set by the MDOT Special Provision for Marshall Hot Mix Asphalt Mixture included elsewhere in this proposal book. The MDOT Special Provision for Marshall Hot Mix Asphalt Mixture shall be used for establishing mix design only.

No topsoil, clay or loam shall be present with aggregates that are to be used in plant mixed HMA mixtures.

For mixtures meeting the definition of top or leveling course, field regress air void content to 3.5 percent with liquid cement unless specified otherwise on HMA application estimate. For mixtures meeting the definition of base course, field regress air void content to 3.0 percent with liquid asphalt cement unless specified otherwise on HMA application estimate.

c. Construction

After the job-mix-formula is established and approved by the Engineer, the aggregate gradation and the binder content of the HMA mixture furnished for the work shall be maintained within Range 1 uniformity tolerance limits permitted for the job-mix-formula specified in Table 1. When mixtures are tested for Air Voids, Voids in Mineral Aggregate (VMA), Maximum Specific Gravity (GMM), and Binder Content, based on calculated value using Maximum Specific Gravity (GMM), the mixtures shall also meet specifications listed in Table 2. However, if deviations are predominantly either below or above the job-mix-formula, even if within Range 1, the Engineer may order the Contractor to make alterations to bring the mixture to the job-mix-formula. If two consecutive Aggregate Gradations on one sieve, or Binder Content, as determined by the field tests, are outside

Range 1, but within Range 2 tolerance limits, Table 1, or if two consecutive tests are out of tolerance limits for Air Voids, Voids in Mineral Aggregate (VMA), Maximum Specific Gravity (GMM), or Binder Content using calculated value, Table 2, the Contractor shall suspend all operations. Contract time will continue during these times when the plant is not producing material. Before resuming any production, the contractor shall propose, for the Engineer's approval, all necessary alterations to the materials or plant so that the job-mix-formula can be maintained. The Engineer, after evaluating for effects on AWI and mix design properties, will approve or disapprove such alterations.

Acceptance sampling and testing will be performed by RCOC using the sampling method and testing options selected by the Engineer. All sampling will be done in accordance with MTM 313 (Sampling HMA Paving Mixtures) or MTM 324, (Sampling HMA Paving Mixtures Behind the Paver). Each day of production, RCOC will determine the number of samples to be taken for each mix type. Acceptance testing will be performed at minimum frequency of once per 1000 tons. Quality Control measures to ensure job control are the responsibility of the Contractor. All persons performing QC and QA HMA field sampling must be Local Agency HMA Sampling Qualified.

All persons performing HMA testing must be at a minimum Hot Mix Asphalt Level One certified and maintain certification through an approved program. The MDOT HMA certification program administered by Ferris State University is an approved program.

All labs performing Acceptance testing or Quality Control testing shall be qualified labs per the MDOT HMA Production Manual and participate in the MDOT round robin process, or as a minimum be AASHTO Materials Reference Laboratory (AMRL) accredited for AASHTO T 30 or T27, and AASHTO T164 or T 308.

If ignition method is chosen for acceptance of asphalt binder content, the correlation procedure for ignition oven will be established as follows. Asphalt binder content based on ignition method from MTM 319. Gradation (ASTM D5444) and Crushed particle content (MTM 117) based on aggregate from MTM 319. The incineration temperature will be established by Contractor. The Contractor will provide RCOC a laboratory mixture sample to establish the correction factor for each mix. Ensure this sample is provided to the Engineer a minimum of 14 calendar days prior to production.

Pavement density will be measured for acceptance by RCOC with a Nuclear Density Gauge using the Maximum Theoretical Specific Gravity (GMM) from the job-mix-formula (JMF) for acceptance. The minimum required in place density shall be **93.0** percent. The Contractor shall be responsible for establishing a rolling pattern that will achieve the required in- place density. Any time minimum in place density is not being achieved, the Contractor shall immediately notify the Engineer. The Engineer may suspend placement operations until the Contractor can establish a rolling pattern that will achieve the required in place density. Contract time will continue, and the Contractor will not be compensated for down time.

At the sole discretion of the Engineer, HMA density/compaction for residential driveways and low traffic volume commercial driveways, as determined by the Engineer, will be accepted by visual inspection by the Engineer, based upon number of roller passes and roller pattern acceptable to the Engineer, in lieu of **93.0** percent density/compaction specified elsewhere for other HMA pavements.

At least one core per Job-Mix-Formula shall be obtained after final rolling is completed. The asphalt cores shall be tested to correlate the actual density with RCOC Nuclear Density Gauge(s) according to the MDOT Procedure for Determining Pavement Density as described in MTM 315. The Engineer will mark the core location with a two-inch diameter paint dot which represents the center of the core. The Contractor shall drill a 6-inch core sample at the core location. The Contractor shall notify the Engineer sufficiently in advance of coring to ensure that RCOC has a representative to witness the coring operation and take immediate possession of the cores. The minimum thickness of the core shall comply with MTM 315. If it is insufficient, or if the core is damaged, the Engineer shall document the problem and select another location for coring if necessary.

Project Engineer may elect not to core if the Job-Mix-Formula has already been correlated to the RCOC nuclear density gauges from a previous project.

Table 1: Uniformity Tolerance Limits for HMA Mixtures

PARAMETERS	TOP & LEVELING COURSE		BASE COURSE	
	Range 1 (a)	Range 2	Range 1 (a)	Range 2
Binder Content Ignition Oven, Vacuum or Centrifuge Extraction Method	-0.30 to +0.40	+/- 0.50	-0.30 to +0.40	+/- 0.50
% Passing # 8 and Larger Sieves	+/- 5.0	+/- 8.0	+/- 7.0	+/- 9.0
% Passing #30 Sieve	+/- 4.0	+/- 6.0	+/- 6.0	+/- 9.0
% Passing #200 Sieve	+/- 1.0	+/- 2.0	+/- 2.0	+/- 3.0
Crush Particle Content	-10%	-15%	-10%	-15%
a. This range allows for normal mixture and testing variations. The mixture shall be proportioned to test as closely as possible to the Job-Mix-Formula.				

RCOC will test for Uniformity Tolerances in Table 2 at least once per Job Mix Formula. RCOC reserves the right to vary the testing frequency for volumetric specifications at the Engineer’s discretion depending on the daily production. The Contractor will still be required to meet stated tolerances in Table 2.

Table 2: Uniformity Tolerance Limits for HMA Mixtures

	Marshall Mixtures	Superpave Mixtures
Binder Content	+/- 0.5%	+/- 0.5%
Air Voids	+/- 1.0%	+/-1.0% (% @ Ndes)
Voids in Mineral Aggregate (VMA)	+/- 1.2%	+/- 1.0%
Maximum Specific Gravity (GMM)	+/- 0.019	+/- 0.019

1. Rejected Mixtures

If for any one mixture, two consecutive aggregate gradations on one sieve, crushed particle content or binder content, as determined by field tests, exceed the uniformity tolerance of Range 2 under Table 1, the mixture will be rejected. This will include removal, at Contractors Sole Expense if already in place. If for any one mixture, two consecutive samples have shown that the results for Binder Content, Air Voids, Voids in Mineral Aggregate (VMA), or Maximum Specific Gravity (GMM) tests, have exceeded the tolerances in Table 2, the mixture will be rejected. This will include removal, at Contractors Sole expense if already in place.

If such mixtures are in place in pavement and Contractor does not agree with results, the Contractor can within seven days after being notified that material did not meet specification, request in writing that the remaining portions of the field sample(s) (split sample) be sent to an Independent Testing Laboratory to confirm the field test results. For the request to be considered, Contractor must include Quality Control test results along with the written request for Independent Testing. Quality Control results must have been performed from samples that were taken the same day that Quality Assurance samples were taken. If the Engineer agrees, the sample(s) (split sample) will be sent out for testing within seven days after Engineer approves Contractors request. If the Laboratory's results do not confirm the field test results and there are no price adjustments required due to test failures on the asphalt binder, then no price adjustments will be made for the mixture involved. If the Laboratory's results confirm the test results, and if in the Engineer's judgment the defective mixture can remain in place, and there are no price adjustments required due to test failures on the asphalt binder, the contract base price for the defective mixture involved, as determined from field tests, will be decreased on the following basis:

The contract base price for material outside of Range 2 (Table 1) or with crushed particle content below that specified in Table 1, will be decreased 25 percent.

The contract base price for material outside of tolerances (Table 2) for Air Voids, Voids in Mineral Aggregate (VMA) or Maximum Specific Gravity (GMM) will be decreased 50 percent.

The contract base price for material outside of tolerances (Table 2) for Binder Content

using calculated value will be decreased 25 percent.

If three consecutive aggregate gradations on one sieve, crushed particle content or binder contents as determined by field tests are outside Range 1 but within Range 2 tolerance limits (Table 1), the mixture produced from the time the third sample was taken until the gradation, crushed particle content or binder content is corrected back into Range 1 will be decreased in contract base price by 10 percent. Field tests indicating that mixtures are subject to the 10 percent penalty will be confirmed in the same manner as mixtures subject to the 25 percent penalty as described herein.

Any delays for additional Independent Laboratory Testing shall not be considered grounds for any extension of time to the contract.

2. Pavement Density

For HMA Mixtures that fall below the required 93.0 percent in place density, based on the Maximum Theoretical Specific Gravity (GMM), the Contract Unit Price will be adjusted, calculated from a Contract Base Price adjustment, as follows:

Contract Base Price Adjustment = Contract Base Price * ((93.0%-average Density%)/10)/100 for average HMA densities between and including 91.0% and 92.9%.

Contract Base Price Adjustment = Contract Base Price * 0.25 for average HMA densities between and including 90.0% and 90.9%.

Adjusted Contract Unit Price = Contract Unit Price – Contract Base Price Adjustment

If the density is below 90.0 percent, the material placed shall be removed and replaced at the sole expense of the Contractor.

If the Contractor disputes RCOC's density testing results, the Contractor can request to take cores to verify the original density results within seven days after they are notified that the material did not meet specifications. If the Engineer approves, the Engineer will establish the limits of the area, or separate discrete areas, to be represented by the cores and the core locations. Not more than one core for every 100 linear feet of any discrete area in question will be taken. The Contractor shall notify the Engineer 24 hours in advance of coring to ensure that RCOC has a representative to witness the coring operation and to take immediate possession of the cores. After the cores are taken, the core holes shall be filled with hot mixture asphalt, and thoroughly compacted as part of the coring operation.

After the Engineer takes possession of the cores, RCOC will complete the density testing of the cores. The density of the cores shall supersede the nuclear density tests. The

resulting core density for any areas, discrete, or total, established by the Engineer, shall be applied to the above contract Base Price adjustments or if required the HMA shall be removed and replaced. After completion of the core testing the Engineer will notify the Contractor of the results.

All costs associated with this additional testing, will be borne by the Contractor. Delays for this additional testing shall not be considered grounds for any extension of time to the contract.

d. Measurement and Payment

The above items will not be paid for separately and are considered included in the contract unit price for the standard HMA pay items shown on plan.

1. Base Price

Price established by the Department to be used in calculating incentives and adjustments to pay items and shown in the contract.