ASPHALT

THE SMOOTH QUIET RIDE

ASPHALT 100% RECYCLABLE

2017 Local Roads Workshop

Local Agency HMA Acceptance Specification

March 2017

ASPHALT PAVEMENT ASSOCIATION OF MICHIGAN

MICHIGAN RIDES ON US Asphalt.

Local Agency HMA Acceptance Specification

Review of Existing Spec

Next Steps

Local Agency HMA Acceptance Specification

12SP-501J-05

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
ACCEPTANCE OF HOT MIX ASPHALT MIXTURE ON LOCAL AGENCY PROJECTS

CFS:KPK 1 of 7 APPR:CJB:JWB:07-05-16
FHWA:APPR:07-05-16

a. Description. This special provision provides sampling and testing requirements for local agency projects using the roller method and the nuclear density gauge testing. Provide the hot mix asphalt (HMA) mixture in accordance with the requirements of the standard specifications, except where modified herein.

Local Agency HMA Acceptance Specification

Table 1: Uniformity Tolerance Limits for HMA Mixtures

Parameter			Top and Leveling Course		Base Course	
Number	Description		Range 1 (a)	Range 2	Range 1 (a)	Range 2
1	% Binder Content		-0.30 to +0.40	±0.50	-0.30 to +0.40	±0.50
2	% Passing	# 8 and Larger Sieves	±5.0	±8.0	±7.0	±9.0
		# 30 Sieve	±4.0	±6.0	±6.0	±9.0
		# 200 Sieve	±1.0	±2.0	±2.0	±3.0
3	Crushed Particle Content (b)		Below 10%	Below 15%	Below 10%	Below 15%

a. This range allows for normal mixture and testing variations. The mixture must be proportioned to test as closely as possible to the Job-Mix-Formula (JMF).
b. Deviation from JMF.

Parameter number 2 as shown in Table 1 is aggregate gradation. Each sieve will be evaluated on one of the three gradation tolerance categories. If more than one sieve is exceeding Range 1 or Range 2 tolerances, only the one with the largest exceedance will be counted as the gradation parameter.

Local Agency HMA Acceptance Specification

Construction

1. **Mix Design**
   a. **Submit Mix design and JMF to Engineer for approval**
   b. **Maintain the binder content, aggregate gradation, and the crushed particle content of the HMA mixture within the Range 1 uniformity tolerance limits in Table 1.**
   c. **Field regress air void content to 3.5 %**

Local Agency HMA Acceptance Specification

Sampling

1. All persons performing QC and QA HMA field sampling must be “Local Agency HMA Sampling Qualified” samplers
2. For production/mainline type paving, obtain a minimum of two samples, each being 20,000 grams, each day of production, for each mix type
3. Obtain samples that are representative of the day’s paving

Local Agency HMA Acceptance Specification

Mixture Testing

1. All persons performing testing must be Bit Level One certified or Bit Quality Assurance/Quality Control (QA/QC) Technician certified
   a. Daily test samples must be obtained, except, if the first test results show that the HMA mixture is in specification, the Engineer has the option of not testing additional samples from that day

Local Agency HMA Acceptance Specification

Mixture Testing

b. At the Pre-Production or Pre-Construction meeting, the Engineer and Contractor will collectively determine the test method for measuring AC content using MTM 319 (Determination of Asphalt Content from Asphalt Paving Mixtures by the Ignition Method) or MTM 325 (Quantitative Extraction of Bitumen from HMA Paving Mixtures)

c. Back calculation will not be allowed for determining asphalt content

Local Agency HMA Acceptance Specification

Qualified Labs

1. Testing labs must be qualified labs per the HMA Production Manual and participate in the MDOT round robin process, or they must be AASHTO Materials Reference Laboratory (AMRL) accredited for AASHTO T 30 or T 27, and AASHTO T 164 or T 308
   a. On non-NHS routes, Contractor labs must be made available, and may be used, but they must be qualified labs
   b. Contractor labs may not be used on NHS routes

Local Agency HMA Acceptance Specification

Material Acceptance Testing

1. Material acceptance testing will be completed by the Engineer
   a. Within 14 calendar days for projects with less than 5,000 tons (plan quantity) of HMA
   b. Within 7 calendars days for projects with 5,000 tons (plan quantity) or more of HMA
   c. Quality Assurance test results will be provided to the Contractor after the Engineer receives the Quality Control test results

Local Agency HMA Acceptance Specification

Material Acceptance Testing

2. Correlation procedure for ignition oven
   a. Asphalt binder content based on ignition method from MTM 319
   b. Gradation (ASTM D 5444) and Crushed particle content (MTM 117) based on aggregate from MTM 319
   c. The incineration temperature will be established at the Pre-Production Meeting
   d. The Contractor will provide a laboratory mixture sample, a minimum of 14 calendar days prior to production to the acceptance laboratory to establish the correction factor for each mix

Local Agency HMA Acceptance Specification

Material Acceptance Testing

3. Visual Inspection

a. For production/mainline type paving, the mixture may be accepted by visual inspection up to a quantity of 500 tons per mixture type, per project (not per day)

b. For non-production type paving defined as driveways, approaches, and patching, visual inspection may be allowed regardless of the tonnage

Local Agency HMA Acceptance Specification

Material Acceptance Testing

4. **Out-of-specification material**

   a. Two consecutive tests per parameter are outside Range 1 or Range 2 tolerance limits

   b. Consecutive refers to the production order and not necessarily the testing order

   c. Out-of-Specification mixtures are subject to a price adjustment per the Measurement and Payment section

Local Agency HMA Acceptance Specification

Density Testing

1. **Option 1 – Direct Density Method**

    a. Use of a nuclear density gauge requires measuring the pavement density using the Gmm from the JMF for the density control target

    b. The required in-place density of the HMA mixture must be 92.0 to 98.0 percent of the density control target

    c. Nuclear density testing and frequency will be in accordance with the *MDOT Density Testing and Inspection Manual*

Local Agency HMA Acceptance Specification

Density Testing

2. Option 2 – Roller Method

   a. The Engineer may use the Roller Method with a nuclear or non-nuclear density gauge to document achieving optimal density
   b. Use of the Roller Method requires developing and establishing density frequency curves
   c. The Engineer will perform density tests using an approved nuclear or non-nuclear gauge per the manufacturer's recommended procedures

Local Agency HMA Acceptance Specification

Density Testing

Table 2: Minimum Number of Rollers Recommended Based on Placement Rate

Average Laydown Rate, Square Yards per Hour	Number of Rollers Required (a)	
	Compaction	Finish
Less than 600	1	1 (b)
601 - 1200	1	1
1201 - 2400	2	1
2401 - 3600	3	1
3601 and More	4	1

a. Number of rollers may increase based on density frequency curve.
b. The compaction roller may be used as the finish roller also.

Local Agency HMA Acceptance Specification

Density Testing

Table 5: Density Frequency Curve Development

Tested by: _____ Date/Time: _____

Route/Location:		Air Temp:
Control Section/Job Number:		Weather:
Mix Type:	Tonnage:	Gauge:
Producer:	Depth:	Gmm:

Roller #1 Type:

Pass No.	Density	Temperature	Comments
1			
2			
3			
4			
5			
6			
7			
8			
Optimum			

Roller #2 Type:

Pass No.	Density	Temperature	Comments
1			
2			
3			
4			
5			
6			
7			
8			
Optimum			

Roller #3 Type:

Pass No.	Density	Temperature	Comments
1			
2			
3			
4			
5			
6			
7			
8			
Optimum			

Summary: _____

_____

Local Agency HMA Acceptance Specification

Measurement and Payment

1. Mix parameter Exceeds Range 1 (but not Range 2)
   - 10 % penalty

2. Mix parameter Exceeds Range 2
   - 25 % penalty

3. In all cases, when penalties are assessed, the penalty applies to each parameter, up to two parameters, that is out of specification
   - Maximum penalty = 50 %

Local Agency HMA Acceptance Specification

Measurement and Payment

Table 4: Calculating Total Price Adjustment

Cost Adjustment as a Sum of the Two Highest Parameter Penalties		
Number of Parameters Out-of-Specification	Range(s) Outside of Tolerance Limits of Table 1 per Parameter	Total Price Adjustment
One	Range 1	10%
	Range 2	25%
Two	Range 1 & Range 1	20%
	Range 1 & Range 2	35%
	Range 2 & Range 2	50%
Three	Range 1, Range 1 & Range 1	20%
	Range 1, Range 1 & Range 2	35%
	Range 1, Range 2 & Range 2	50%
	Range 2, Range 2 & Range 2	50%

Local Agency HMA Acceptance Specification

Dispute Resolution

1. The Contractor has 4 calendar days from receipt of the acceptance test results to notify the Engineer, in writing, that dispute resolution testing is requested

2. The Contractors QC test results for the corresponding QA test results must result in an overall payment greater than QA test results

3. The Engineer has 4 calendar days to send the dispute resolution sample to the lab once dispute resolution testing is requested

Local Agency HMA Acceptance Specification

Dispute Resolution (Range 1)

4. **Independent lab selected by the Local Agency**
   - **MDOT QA/QC qualified lab or an AMRL HMA qualified lab**
   - **No conflicts of interest with the Contractor or Local Agency**
5. **If test results are out-of-spec, Contractor pays for testing, and price adjustments are made according to the specification**
6. **If test results are in-spec, Local Agency pays for testing, and no price adjustments are made**

Local Agency HMA Acceptance Specification

Dispute Resolution (Range 2)

7. MDOT Central Laboratory

8. If test results are out-of-spec, Contractor pays for testing, and price adjustments are made according to the specification

9. If test results are in-spec, Local Agency pays for testing, and no price adjustments are made

10. All Dispute Resolution testing will be completed and return test results to the Engineer, who will provide them to the Contractor, within 13 calendar days upon receiving the Dispute Resolution samples

Local Agency HMA Acceptance Specification

Overview of Existing Spec

Next Steps

Local Agency HMA Acceptance Specification

Volumetric Acceptance

1. APAM has drafted a volumetric acceptance specification
2. Working with partners (CRA, MDOT, & FHWA)

Local Agency HMA Acceptance Specification

Volumetric Acceptance

1. Spec based on single test acceptance methodology
2. Density same as existing spec.

Local Agency HMA Acceptance Specification

Volumetric Acceptance

1. One test per day, up to 1000 tons.
2. Test for Air Voids, VMA and Binder Content
3. Not PWL

Local Agency HMA Acceptance Specification

Questions?

www.apa-mi.org
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2017 Local Roads Workshop

Regional Focus Areas

March, 2017

ASPHALT PAVEMENT ASSOCIATION OF MICHIGAN

MICHIGAN RIDES ON US

Asphalt.

Regional Focus Areas

- Need for Volumetric Testing
- MDOT Oversight
- Overlay Performance
- Others ??

2017 Local Road Workshops

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