2016 APAM Conference
Hot Mix Asphalt (HMA)
Update

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Michigan Department of Transportation
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Hot Mix Asphalt (HMA) Update

- Acceptance of HMA on Local Agency Projects
- HMA Paving Operations Certification
- HMA Base Price Special Provision
- Price Adjustments on Performance Grade (PG) Asphalt Binders
- Pavement Milling Modified
- Miscellaneous HMA Items
- Longitudinal Joint Density
Acceptance of HMA on Local Agency Projects

- Covers Roller Method and Density Testing with Nuclear Gauge
- Revises Tolerance Limits and Penalty Structure for HMA Mixtures
- Strengthens Sampling and Testing Requirements
- Adds Time Frame for Reporting Quality Assurance Test Results
### Table 1 – Uniformity Tolerance Limits for HMA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Top and Leveling Course</th>
<th>Base Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Description</td>
<td>Range 1 (a)</td>
</tr>
<tr>
<td>1</td>
<td>% Binder Content</td>
<td>-0.30 to +0.40</td>
</tr>
<tr>
<td>2</td>
<td>% Passing</td>
<td># 8 and Larger Sieves</td>
</tr>
<tr>
<td></td>
<td></td>
<td># 30 Sieve</td>
</tr>
<tr>
<td></td>
<td></td>
<td># 200 Sieve</td>
</tr>
<tr>
<td>3</td>
<td>Crushed Particle Content (b)</td>
<td>Below 10%</td>
</tr>
</tbody>
</table>

* 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.
* b. Deviation from Job-Mix-Formula.
Acceptance of HMA on Local Agency Projects:
Sampling and Testing Requirements

- All persons performing testing must be Bituminous (Bit) Level One certified or Bit Quality Assurance/Quality Control (QA/QC) Technician certified.
- All laboratories performing local acceptance testing must be qualified laboratories.
  - Qualified per the *HMA Production Manual* and participate in the Michigan Department of Transportation (MDOT) Round Robin process.
  - or
  - Laboratory must be American Association of State Highway and Transportation Officials (AASHTO) Materials Reference Laboratory (AMRL) accredited for AASHTO T 30 or T 27, and AASHTO T 164 or T 308.
- Contractor Laboratories:
  - Non-National Highway System (NHS): Allowed
  - NHS: Not Allowed
Acceptance of HMA on Local Agency Projects: Sampling and Testing Requirements

• Qualified Samplers Required
  o Qualifying of Samplers Handled by Ferris State University
  o MTM 313 (Sampling HMA Paving Mixtures)
  o MTM 324 (Sampling HMA Paving Mixtures Behind the Paver)
  o 230 Technicians Trained in 2015, Training in Every Region in 2016

• Minimum – Obtain and Test Two Samples Per Day (No longer testing at frequency determined by Engineer.)

• Quality Assurance Test Results – Time Requirement
  o 7 days – Projects more than 5000 tons
  o 14 days – Projects less than 5000 tons
  o Days exclude Sundays and Holidays
### Table 3: Penalty Per Parameter

<table>
<thead>
<tr>
<th>Mixture Parameter out-of-specification per Acceptance Tests</th>
<th>Mixture Parameter out-of-specification per Dispute Resolution Test Lab</th>
<th>Price Adjustment per Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>YES</td>
<td>NO</td>
<td>None</td>
</tr>
<tr>
<td>YES</td>
<td>YES</td>
<td>Outside Range 1 but not Range 2: decrease by 10%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outside Range 2: decrease by 25%</td>
</tr>
</tbody>
</table>

Out of specification- 2 Consecutive Tests Outside of Range 1 or Range 2
Acceptance of HMA on Local Agency Projects: Density Testing

• Two Options
  o Direct Density Method
    ✓ Nuclear Density Gauge
    ✓ 92-98 Percent of Density Control Target (Gmm from JMF)
  o Roller Method
    ✓ Added Table for Minimum Number of Rollers Recommended Based on Placement Rate
    ✓ Added Table for Density Frequency Curve Development.

• Timing
  o During Paving Operations
  o Prior to Traffic Staging Changes
  o Prior to Subsequent Lifts and Opening to Traffic
Acceptance of HMA on Local Agency Projects: Additional Significant Changes

• Regress Air Voids in Production to 3.5%

• Dispute Process
  o Range 1- Independent Laboratory
  o Range 2- Construction Field Services HMA Laboratory (MDOT Central Laboratory)
Acceptance of HMA on Local Agency Projects: Future Changes

• Move Towards Volumetric Testing

• Air Voids, VMA, ??

• Doesn’t Necessarily Mean SuperPave

• Warranties
CA 2015-12
Paving Operations Certification

- Expiration Date for MDOT HMA (Bituminous) Paving and Michigan HMA (Bituminous) Paving Operations Certifications.

<table>
<thead>
<tr>
<th>Construction Year</th>
<th>Acceptable Certificate Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>2008 - 2016</td>
</tr>
<tr>
<td>2017</td>
<td>2010 - 2017</td>
</tr>
<tr>
<td>2018</td>
<td>2012 - 2018</td>
</tr>
<tr>
<td>2019</td>
<td>2014 - 2019</td>
</tr>
<tr>
<td>2020</td>
<td>2016 – 2020</td>
</tr>
</tbody>
</table>
HOT MIX ASPHALT PRICES FOR ADJUSTMENTS

• If the Contractor’s bid is lower than the established base price any negative adjustment will use the base price established herein in the calculation for the adjustment.

• All other situations, use bid price.

• Frequently Asked Questions:
  o Gap Graded- Yes, but need to establish price and add to special provision (7000 number).
  o ASCRL- No, not subject to incentive.
  o Longitudinal Joint- No, incentive not tied to bid price.
  o Local Agency Items- Is there incentive?
The Engineer will witness and obtain a minimum of one asphalt binder sample for every PG asphalt binder grade being supplied to the project.

Penalties on one day failure.

Dispute resolution process.

Asphalt binder prepared with reclaimed engine oil based products is prohibited.

The Contractor may substitute a better asphalt binder grade at no cost to the Department.

- PG 58-22 specified, the Contractor could use PG 64-22, PG 58-28, or PG 64-28.
- Test to what is provided, not what is specified.
• The milling machine must be configured with either a 0.3 inch tooth spacing, a 0.6 inch tooth spacing operated at a maximum speed of 40 feet per minute, or approved equal configuration and speed capable of meeting ASTM E 965 testing requirements (maximum macro texture of .108)

• Open to traffic for 72 hours

• Milled area is free from gouges, continuous grooves, ridges and has a uniform texture

• Maximum horizontal gouge in the vertical edge milling of 1 inch
• .3 inch tooth spacing at 30 FPM
.6 tooth spacing 45
FPM
Miscellaneous HMA Items

• Low Tracking Bond Coat
• CA 2015-10 -Utilizing Reclaimed Asphalt Pavement (RAP) Millings from the Same Project When Using a Portable HMA Plant
• HMA Mixture Selection Guidelines
• Practical Target Density vs Vibratory Exclusion Areas
  o VIBRATORY EXCLUSION AREAS-An area of inadequate base condition shown on the plans; or identified by the Contractor and Engineer prior to or during the paving operation; or an area having conditions that are sensitive to vibration as determined by the Engineer...The contract requirements for density still apply.
  o PRACTICAL TARGET DENSITY ON HMA- Use in all Trunkline projects with shoulder paving. For projects with mainline paving only, use when recommended by the Region Soils Engineer and when areas to be applied are identified on the plans.
Longitudinal Joint 12SP501Y

Density History

- 2009- Informational Average Density 89.8
- 2011- Pilot 90.7
- 2012- FUSP 91.6
- 2013- FUSP 92.4
- 2014- FUSP 92.2
Questions?

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