IDOT HMA Update

57th Annual Bituminous Conference

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Topics

- I-FIT
- Spec Revisions for 2017
- Thicker Level Binder
- LJS
- Tack Coat
- PG Binder Usage
I-FIT

- Findings to Date
- 2016 Pilot Projects
- Spec Revisions for 2017
- Training Classes
- 2017 Round Robins
- Implementation Goals

Findings to Date: (> 500 mixes)

- Grade bumping makes a significant impact in terms of FI improvement
  - > 20% ABR results demonstrate need for bumping
  - > 35% ABR results demonstrate need for second bump
- Poly mod => significant improvement in FI
- Smaller NMAS => increased FI
- Increases in VMA => increased FI
- Increases in Total AC => increased FI
- Increases in Virgin AC => increased FI
Observations

- Most everything passed except 4 production tests
- Some production FI increase from Design
  - Moisture blocking absorption of AC
- FI from cores typically much higher
  - Due to being thin

*Fl adjusted for thickness = Fl \cdot (\text{Thickness} / 50)*

Where: Thickness \geq 2.5 \cdot \text{NMAS (recommended)}
I-FIT Spec Changes for 2017

- Eliminated DCT testing requirement
- Clarify best 3 out of 4 results
- Reduced Production Sample Size
- RAP/RAS Incentives Remain for I-FIT Projects

Training Classes

- CTL ½ day Classes
  - 11/29 : 2 Classes @ CTL in Chicago
  - 12/1 : 1 Class @ LL College in Mattoon
- Course Content
  - Sample Prep
  - Running Test
  - Use of Software
- Future Training – HMA Level I @ LL
2017 I-FIT Round Robins

- All I-FIT’s (State & Industry)
- 3 Round Robins - Same Mix
  1. Perform Test
  2. Make All Necessary Cuts / Perform Test
  3. Compact Gyratory Spec / Make Cuts / Perform Test

Implementation Goals

- 2017
  - 2 – I-FIT Projects / District
  - 3- I-FIT Round Robins
  - ICT Phase 2 Research – Develop Long Term Aging Protocol (LTA)
- 2018 & 2019
  - Increase # of I-FIT Projects
  - Implement LTA Protocol
  - ICT Phase 3 Research - Develop Precision & Bias for AASHTO TP-124
Spec Revisions for 2017

Quality Management Programs

- PFP - ≥ 8,000* tons
  - No Temp pavements, incidental, shoulders*
  - No Apps where Thickness < 3 X NMAS
  - No Level binder applications
- QCP – 1,200 → 8,000 tons
- QC/QA (modified)
  - < 1,200 tons
  - Shoulders placed w/ Road Widener
  - Patching & Incidental
Leveling Binder

- 9.5 CG – 100% for Density Pay Factor

- 9.5 FG & IL-4.75 – QCP Pay Adj Apply
  - Thin Cores < 3/4 inch excluded from Pay Adj
  - Contractor marks longitudinal offsets along shoulder for defects such as punchouts, patches, scabs etc..

Variable Depth Leveling Binder

- QCP Pay Adjustments Apply or
  - Thin Cores < 3/4 inch excluded from Pay Adj

- Intelligent Compaction to monitor passes/temp/speed prescribed in Mix Reqmnts Table
The following HMA mixture requirements are applicable for this project:

<table>
<thead>
<tr>
<th>Location(s):</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixture Use(s):</td>
<td></td>
</tr>
<tr>
<td>PG</td>
<td></td>
</tr>
<tr>
<td>Design Air Voids:</td>
<td></td>
</tr>
<tr>
<td>Mixture Composition:</td>
<td>(Mixture Gradation)</td>
</tr>
<tr>
<td>Friction Aggregate:</td>
<td></td>
</tr>
<tr>
<td>Mixture Weight:</td>
<td></td>
</tr>
<tr>
<td>Quality Management Program:</td>
<td></td>
</tr>
</tbody>
</table>

Roller Type / Number of Passes / Compaction Temperature Range

Sublot Size:

1/ When this field is filled out the contractor may use intelligent compaction according to the Procedure for Intelligent Compaction in the Department’s Manual of Test Procedures to receive 100% pay for density.

HMA MIXTURE REQUIREMENTS TABLE

Figure 53-4.M

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Moving Random Core Locations

- For Obstacles
- When Paving over Distressed Areas
Pursuing 1 inch Lev Binder for Policy Overlay (Off Int.)

- If successful, eliminate 9.5 CG Lev Binder
- Adopt 9.5 FG or IL 4.75 w/ Density Reqmnt for Lev Binder

Why Thicker?

- 3P overlay (non-interstate): ¾” LB and 1.5” surface course.
- ¾” IL-9.5 LB does not meet 3 times nominal maximum aggregate size (NMAS) and therefore is difficult to get compaction => No Density Requirement
- Increasing LB to 1” will bring the lift much closer to 3 times NMAS.
Longitudinal Joint Seal (LJS)

Longitudinal Joint Spec

- Implementation Goals:
  - 2016 – 2 Projects per District
  - 2017 – 50% of Projects per District
  - 2018 – Full Implementation
2016 - LJS Projects

- Total of 20-plus projects statewide
- Average awarded cost $2.17 / lineal ft

Observations:
- Shear tear will occur if required tack not in place
- Pressure Distributor Operators getting better
- Adjustable Guide Chain on Distributor Beneficial
- Mix will pull up over unbonded scabs
LJS - Life Cycle Cost Analysis

Cost per two lane mile vs. Additional Service Life (Years)

Breakeven LJS Unit Price vs. Ave. Awarded LJS Unit Price

LJS - Life Cycle Cost Analysis

Cost per lane mile vs. Additional Service Life (Years)

Breakeven LJS Unit Price vs. Ave. Awarded LJS Unit Price
LJS - Spec changes for 2017

- No longer exclude IL-4.75 mixes
- Increase Dynamic Shear test temp from 82°C to 88°C
- Increase Elastic Rec. Min. from 58 to 65%
- Ash Content range 1.0 to 4.0% instead of 0.0 to 6.0%
- Add max LJS temp of 330°
- Remove reqmnt of sandwiching LJS in NWJ
- One LJS sample per job from Applicator

Longitudinal Joint Spec

- Implementation Goals:
  - 2016 – 2 Projects per District
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New Tack Coat Products

- Evaluate Bond Strength of New Products
  - Bond Strength $\geq$ SS-1h
    - Lab Shear Test using ATREL Device Lab Specimens
  - Products to be Evaluated:
    - PG64-22
    - LJS at 0.10 #/ft² (gal/yd²)
    - Tri-State QS
    - Tri-State QST

PG Binder Usage
2010 to 2015 Grade Usage

Bituminous Price Index
Percent Polymer Used vs. Time

Questions