2016 VAA Fall Conference
FHWA Increased In-Place Density Initiative
Contractor Perspective

October 4, 2016
David Wyant
SLWCO - Quality Control Manager
FHWA Increased In-Place Density Density Initiative

Project Mission:

Field Test 3 Different Methods for Increasing Field Density

- Normal Paving Operations (SOP)
- Increase effort to achieve higher density (Add Oscillatory Compaction)
- Implement a change to again achieve higher density (Add Additional Standard Roller)

At a Later Date by VDOT request (not part of FHWA study)

- Increase Evotherm Additive
- Increase Zycotherm Additive

SLWCO Team:

- Blair Williamson – President
- Junior Eppard – Vice President
- Anthony Wynn – Paving Superintendent
- Chris Baker – Field Density Technician
- Kim Snead – QC Lab Technician
- David Williams – QC Lab Technician
Sequence of events

• June 30, 2016 – SLWCO had our first meeting with Bryan Smith and Rob Crandol

• July 13, 2016 – Paving Superintendent and QC Manager attend FHWA/Asphalt Institute In-Place Density Workshop @ Germanna Community College, Fredericksburg Campus

• A myriad series of conference calls, in-person discussions, and emails ensued to hash out the details
Details Day 1

- Standard operating practices
- Normal mix and production practices
- Normal placement equipment (MTV, Paver)
- Same size rollers as normal
  - (11 ton breakdown & 9 ton intermediate/finish)
- Installed PaveIR camera on paver for data collection

- Installed PaveIR camera on paver for data collection
As is typical of daily activities, “ISSUES” arise

- MTV breakdown with mix lined up in front of paver

Once paving started we executed a standard VDOT Roller Pattern and Control strip using:

- Cat CB64B 11 ton breakdown roller (2 Vibratory and 3 Static passes)
- HAMM HD+90 Oscillatory 9 ton roller (4 Static Passes)

The expectation was a minimum 92.5% of design G\text{mm}

Control Strip 10 count average – 146.2 lbs/ft\textsuperscript{3}

- Field bulked density achieved – 94% of design G\text{mm}
Details Day 2

• Much like Day 1 why should Day 2 NOT have an “issue”?
  • MTV repaired and operational
  • After paving began we discovered Oscillatory roller water pumps not functioning.
• After roller repair we attempted to complete Roller Pattern #1 however the mat had cooled considerably
  • 2 Vibratory / 1 Static with 11 ton & 1 oscillatory vibration pass with 9 ton
  • 10 count average = 146.1 lbs/ft$^3$ – 93.3% of design $G_{\text{mm}}$
• Based on study criteria (94% minimum)
• Second RP performed on hot section of placement
• 3 vibratory passes / 1 static pass of 11 ton and 1 oscillatory pass / 1 static pass of 9 ton
• Average Control Strip 10 count = 148.1 lbs/ft³
• Field bulked density % of $G_{mm}$ = 94.8%
• Based on study criteria this was a passing RP
Details Day 3

- RP executed the same as Day 2 with the addition of a third roller (Ingersoll Rand DD-90 HF 9 ton) with target of 94% compaction
  - 3 vibratory/1 static pass – 11 ton
  - 1 oscillatory/1 static pass – 9 ton HAMM
  - 1 static pass – 9 ton Ingersoll
- Average 10 count = 146.1 lbs/ft$^3$
- 92.5% of design $G_{mm}$
- Based on study criteria RP failed
- Due to time constraints for the day second RP not attempted.
# Lab Data Summary

## Mix Summary

<table>
<thead>
<tr>
<th>Property</th>
<th>Part B</th>
<th>AVG</th>
<th>SD</th>
<th>MIN</th>
<th>MAX</th>
<th>RANGE</th>
<th>COUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/2&quot;</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3&quot;</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>12</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1&quot;</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

## Test Results

<table>
<thead>
<tr>
<th>Property</th>
<th>Part B</th>
<th>AVG</th>
<th>SD</th>
<th>MIN</th>
<th>MAX</th>
<th>RANGE</th>
<th>COUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/2&quot;</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3&quot;</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>12</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1&quot;</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

## Lot Summary

<table>
<thead>
<tr>
<th>Property</th>
<th>Part B</th>
<th>AVG</th>
<th>SD</th>
<th>MIN</th>
<th>MAX</th>
<th>RANGE</th>
<th>COUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/2&quot;</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3&quot;</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>12</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1&quot;</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
What Did We Learn?

- Use of the MTV
  - Required or not?

- Compaction on the mat sooner?

- Additional Rollers?

- PaveIR Camera?
What Does This Mean?

- In the coming years the FHWA may come back to the states and push for higher in-place density requirements and accountability.

- Balanced Mix Designs
- Percent within Limits (PWL) specifications
- More equipment requirements/specifications

Keep VDOT and the FHWA happy by continuing to execute Quality designs and Excellent construction practices!
That’s all Folks