Indiana Superpave5 Project Update
August 9, 2018
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INDOT - State Materials Engineer
Superpave5

- Indiana Specs
  - Agency testing
  - Volumetric properties → plate samples
  - Density → cores

- Frequency
  - Base/Intermediate → 1000 tons
  - Surface → 600 tons
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- Design a mix at 5% air voids
- Target 5% AV (95% density) in field

- >3M ESAL
  - 100 gyrations → 50 gyrations

- <3M ESAL
  - 75 gyrations → 30 gyrations
Superpave5

- Design a mix at 5% air voids
- Target 5% AV (95% density) in field

<table>
<thead>
<tr>
<th>Mixture Designation</th>
<th>Minimum VMA, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.75 mm</td>
<td>17.0</td>
</tr>
<tr>
<td>9.5 mm</td>
<td>16.0</td>
</tr>
<tr>
<td>12.5 mm</td>
<td>15.0</td>
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<tr>
<td>19.0 mm</td>
<td>14.0</td>
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<tr>
<td>25.0 mm</td>
<td>13.0</td>
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</tbody>
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<table>
<thead>
<tr>
<th>SPECIFICATION LIMITS</th>
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<tbody>
<tr>
<td>MIXTURE</td>
</tr>
<tr>
<td>LSL*</td>
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<tr>
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<tr>
<td>Air Voids at $N_{des}$, %</td>
</tr>
<tr>
<td>Voids In Mineral Aggregate at $N_{des}$, %</td>
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<table>
<thead>
<tr>
<th>DENSITY</th>
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<tbody>
<tr>
<td>LSL*</td>
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<tr>
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<tr>
<td>Roadway Core Density (% Gmm), %</td>
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</tbody>
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* LSL, Lower Specification Limit
** USL, Upper Specification Limit
Superpave®5 Pilot Projects

• 3 Pilot Projects Completed to date
  • **2013** SR 13 – Middlebury
    • Control Density = 91.8%, S5 Density = 94.7%
  • **2015** Georgetown Rd. – Indianapolis
    • Control Density = 92.2%, S5 Density = 95.7%
  • **2016** US 40 – Richmond
    • Control Density = 93.3%, S5 Density = 95.4%
Superpave5 Pilot Projects

• 2018
• 12 projects
  • 2 per District

• Implementation Study
  • Observe pilot projects
  • Document mix production and construction
  • Analyze the data
SR 23 – 12.5 mm Surface

Gyratory = 5.66%
In-Place = 4.93%
**US 231–9.5 mm Surface**

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<tr>
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<th>1</th>
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<tbody>
<tr>
<td>Gyratory Air Voids</td>
<td>5.79</td>
<td>4.49</td>
</tr>
<tr>
<td>In Place Air Voids</td>
<td>5.78</td>
<td>5.99</td>
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<tr>
<td>Density</td>
<td>94.22</td>
<td>94.01</td>
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</tbody>
</table>

**Gyratory** = 5.14%

**In-Place** = 5.89%
US 30 – 19.0 mm Intermediate

Gyratory = 5.42%
In-Place = 6.33%
US 30 – 9.5 mm Surface

Gyratory = 5.69%
In-Place = 6.47%
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• What’s next?
  • Continue to review pilot project data
  • Full implementation by Spring 2019 contract lettings
Superpave5 Added Benefits

• INDOT miscellaneous mixtures
  • Small quantity, thin shoulders, patching, local roadways
  • Density acceptance → Number of passes (no density control)
  • All of these mix designs will now be Superpave5
    • Easier to compact
    • Even though we don’t measure it, density will improve
Indiana Binder Contents

Indiana Binder Content Trends

Mix Design Binder Content

- 9.5
- 12.5
- 19
- 25
Thank you!

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