Thin, Maintenance Mixes

Brian D. Prowell, Ph.D., P.E.
Three Examples

• Ohio – Item 424, “Smoothseal”
• Missouri – Item 402, Plant Mix Bituminous Surface Level
• Maine – Special Provision Section 401 – Light Capitol Paving
Ohio DOT’s Fine-Graded Polymer Asphalt Concrete (a.k.a. Smoothseal)

• General
  ‣ Developed in the early 1990’s by Ohio’s asphalt paving industry.
  ‣ Non-proprietary Hot Mix Asphalt product capable of being placed in thin lifts
  ‣ Governed by ODOT, Item 424, Fine Graded Polymer Asphalt Concrete
  ‣ For use as a pavement preservation (PM) treatment or long-life pavement applications.
  ‣ Between 2002 and 2007 approx. 228K CY placed
Ohio DOT’s Fine-Graded Polymer Asphalt Concrete (a.k.a. Smoothseal)

• Description of Candidate Projects
  ‣ Pavements suitable for a surface treatment overlay show the following distresses:
    ▪ Dry-looking, “bony” pavements that are porous or permeable
    ▪ Pavements that have begun to ravel
    ▪ Pavements with extensive cracking too fine for crack sealing
    ▪ Pavements with cracking of the surface too extensive for crack sealing alone
    ▪ Pavements where curb reveal does not permit heavy lift thicknesses
What do these mixes look like?

<table>
<thead>
<tr>
<th>Sieve Size, in</th>
<th>Ohio 424</th>
<th>Missouri</th>
<th>Maine</th>
<th>SCDOT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>402</td>
<td>LCP</td>
</tr>
<tr>
<td>3/8</td>
<td>100</td>
<td>95-100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>95-100</td>
<td>85-95</td>
<td>90-100</td>
<td>75-90</td>
</tr>
<tr>
<td>8</td>
<td>90-100</td>
<td>53-63</td>
<td>30-60</td>
<td>70-100</td>
</tr>
<tr>
<td>16</td>
<td>80-100</td>
<td>37-47</td>
<td>30-60</td>
<td>30-60</td>
</tr>
<tr>
<td>30</td>
<td>60-90</td>
<td>25-35</td>
<td>30-60</td>
<td>36-70</td>
</tr>
<tr>
<td>50</td>
<td>30-65</td>
<td>9-19</td>
<td>30-60</td>
<td>10-30</td>
</tr>
<tr>
<td>100</td>
<td>10-30</td>
<td></td>
<td>10-30</td>
<td>4-28</td>
</tr>
<tr>
<td>200</td>
<td>3-10</td>
<td>3-8</td>
<td>7-12</td>
<td>0-8</td>
</tr>
<tr>
<td>AC% approx</td>
<td>8.5</td>
<td>6.4</td>
<td>6.4</td>
<td>6.4</td>
</tr>
</tbody>
</table>
Ohio DOT’s Fine-Graded Polymer Asphalt Concrete (a.k.a. *Smoothseal*)
Recycle

- Ohio – 10% RAP in Type B
- Maine – 20% RAP and RAS, maximum 5% RAS
- Missouri – 20% effective binder replacement
  - Lowered design voids (3.5%); increased VMA (14.5%)
  - 35 blows or 35 gyrations
  - Allow rejuvenators
Before and After
What Can Go Wrong?

Drag  Bridgeing
Ohio DOT’s Fine-Graded Polymer Asphalt Concrete (a.k.a. *Smoothseal*) (2007 prices)

<table>
<thead>
<tr>
<th>Smoothseal Type</th>
<th>$ per CY</th>
<th>$ per SY</th>
<th>Lift Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>$ 124</td>
<td>$ 2.58</td>
<td>¾ inch</td>
</tr>
<tr>
<td>Conventional HMA</td>
<td>$ 92</td>
<td>$ 3.19</td>
<td>1 ¼ inch</td>
</tr>
<tr>
<td>Conventional HMA</td>
<td>$ 92</td>
<td>$ 3.83</td>
<td>1 ½ inch</td>
</tr>
</tbody>
</table>

- Maine DOT (2014) pave 90 miles for $3.5 million
Thanks!

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