IDOT HMA Update

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Illinois Department of Transportation

Illinois Asphalt Paving Association
Annual Meeting
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PG Binder Usage

- Percent Polymer Usage
- Asphalt Grade Usage
- Bituminous Price Index
- AC/Petroleum Price Index
Percent Polymer Usage Over the Last Eight Years

<table>
<thead>
<tr>
<th>Year</th>
<th>Percent Polymer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>23.8</td>
</tr>
<tr>
<td>2002</td>
<td>24.0</td>
</tr>
<tr>
<td>2003</td>
<td>28.2</td>
</tr>
<tr>
<td>2004</td>
<td>19.1</td>
</tr>
<tr>
<td>2005</td>
<td>22.9</td>
</tr>
<tr>
<td>2006</td>
<td>24.5</td>
</tr>
<tr>
<td>2007</td>
<td>23.9</td>
</tr>
<tr>
<td>2008</td>
<td>26.7</td>
</tr>
</tbody>
</table>
Asphalt Grade Usage Over the Last Eight Years
Bituminous Price Index
AC / Petroleum Price Index

$ Gas = $ AC

$$/Ton

IDOT AC
Crude Oil
Gasoline
Other State AC *
Green Movement
Impacts to HMA

- RAP
- WMA
- Tire Rubber
RAP Update
## 2008 Max RAP % Changes

<table>
<thead>
<tr>
<th>N-Design</th>
<th>Binder/Level Binder</th>
<th>Surface</th>
<th>With Polymer</th>
</tr>
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<tbody>
<tr>
<td>30</td>
<td>30</td>
<td>30</td>
<td>NA</td>
</tr>
<tr>
<td>50</td>
<td>25</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>70</td>
<td>$15/25^*$</td>
<td>$10/15^*$</td>
<td>10</td>
</tr>
<tr>
<td>90</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>105</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

*RAP Max Percentage 3/8” Top size*
Production History w/RAP Percent

<table>
<thead>
<tr>
<th>Year</th>
<th>Tons of HMA (Millions)</th>
<th>% RAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>8.3</td>
<td>8.3</td>
</tr>
<tr>
<td>2004</td>
<td>10.2</td>
<td>10.2</td>
</tr>
<tr>
<td>2005</td>
<td>7.7</td>
<td>7.7</td>
</tr>
<tr>
<td>2006</td>
<td>8.8</td>
<td>8.8</td>
</tr>
<tr>
<td>2007</td>
<td>10.3</td>
<td>10.3</td>
</tr>
<tr>
<td>2008</td>
<td>9.3</td>
<td>9.3</td>
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</table>
RAP Usage

- Still have issues
- District 1 area still has significant RAP surplus
- High RAP Mixes difficult to control with single feed
- Would like industry to move to fractionation with 2 or more bins
Aggregate Quality of RAP

- Quality Issue
  - Surface A or B quality
  - Binder A, B or C quality
  - Shoulders A, B, C or D quality

- Tracking quality is difficult

- Mixed piles could have multiple qualities

- Recently developed procedures for assigning aggregate quality of RAP
Aggregate Quality of RAP

- Quality determination procedures:
  - Crush/screen pile up to 5,000 tons
  - Sample – Multi locations and blend
  - Extract AC off aggregate
    - Trichloroethylene
    - N-Propyl Bromide (a bit safer)
  - Send aggregate sample to Springfield for testing
  - If passes assigned “B” Quality to aggregate
RAP Aggregate Quality Micro Deval Test

Sample + with Water

9,500 Revolutions
Before
Note sharp edges

After
Rounded edges
Latest RAP Spec

- Encourages Fractionated and Warm Mix Asphalt (WMA)

- Added Options for:
  - Fractionated RAP (FRAP)
    - Allows higher RAP percentages
  - Warm Mix Asphalt (WMA)
    - Reduced grade bumping:
      - > 20% - Single grade bump
      - > 30% - Double grade bump

- Department has provided tools - up to industry to increase usage
Warm Mix Asphalt

- WMA – Contractor’s proposal
- Key elements:
  - Technology to be used will be reviewed
    - Limiting “wax” type modifiers to overlays due to impacts to PG grading of asphalt
    - Haul time concerns for water based systems
  - Still must meet specifications
    - Density
    - Mix properties
Ground Tire Rubber
Modified AC

- Developing Spec for use on State jobs
  - Based upon approved PG 64-22
  - Add 10% approved Ground Tire Rubber
- Will be specified as “64-22 GTR 10”
- Will not be running PG grading on final product as test are not valid (rubber particles give false readings)
- Will be used as a replacement for SBS 70-22
Full Depth AC and Rubblization Design Updated

Generally:
• Included in Bureau of Design and Environment Manual
• Working to update both Design and Selection Processes
Recent Meeting w/ FHWA (DC & IL) & IAPA

- Concern that a recent national survey identified IL’s QC/QA as having fraud risk.
- Increased pressure on Illinois to change HMA QA.
- IDOT will work w/ FHWA to develop a plan for improvement.
Ratings of State QA Systems

Advanced
Intermediate
Opportunity

12/17/2008
HMA Pay for Performance

- New roles for Construction and Materials
  - Mix may be sampled behind paver at random locations
  - Department must witness
  - Immediately take possession or securely seal it
- Security of samples **must** be maintained
- Dist 1 moving forward quickly with trials
- Downstate expect 1-2 projects for 2009
Pay for Performance (PFP)

- PFP is ERS w/ pay based on Dept. test results
- PFP does address all of FHWA’s concerns
- District #1 awarded 3 PFP contracts & constructed 2 in 2008
- Positive experience on 2 constructed:
  - Extra vib. roller on both projects (better density)
  - Voluntarily replaced paver on 1 project
  - Voluntarily called off paving w/ forecast of rain on 1 project
Pavement Warranties

Legislative Mandate (1999):

- 20 Contracts
  - 10 Contracts to have **30-year life cycle**
- 5-years in length
- Transfers risk from the Department to the contractor.
# Warranty Projects by Project Type

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Number of Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMA Overlay</td>
<td>3</td>
</tr>
<tr>
<td>Full Depth HMA (20-yr.)</td>
<td>2</td>
</tr>
<tr>
<td>Full Depth HMA (30-yr.)</td>
<td>7</td>
</tr>
<tr>
<td>Concrete (20-yr.)</td>
<td>3</td>
</tr>
<tr>
<td>Concrete (30-yr.)</td>
<td>12</td>
</tr>
<tr>
<td>Concrete (40-yr.)</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>28</strong></td>
</tr>
</tbody>
</table>
Warranty Repairs

HMA
- Sealing (3 projects)
- Patching (1 project)

PCC
- Patching (3 projects)
Warranty Future

- Three projects with warranties expiring in 2009.
- Remainder do not expire until 2010 or 11.
- Will continue to monitor sections.
- No future plans to warranty new projects at this time.
Thank You

Lincoln’s Home