IDOT
HMA Update
2012

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Engineer of Materials and Physical Research

Illinois Department of Transportation

Illinois Asphalt Paving Association
PG Liquid Binder
Usage
% Grades Used - last 5 years

- 2007
- 2008
- 2009
- 2010
- 2011
AC Price Index
IDOT AC Price Index

• Based upon largest suppliers of previous year
• Prices submitted as of first of each month
• Average = Index
• BMPR Policy Memo 1-08.0
  • PERFORMANCE GRADED ASPHALT BINDER ACCEPTANCE PROCEDURE
AC/Oil/Gasoline Price Comparison

- **IDOT**
- **Other States AC**

$/Ton

Jan-08 to Jan-12

557.22
543.50
Don’t Get Rapped by RAP Aggregate
RAP as Aggregate

Know your spec – What is max top size??

3”  1 ½”  Other???

If providing unscreened/uncrushed RAP over 3” and IDOT pays for work as bid.

What have you done?

Did not follow spec.
Fraud?
Liquid AC Sampling at HMA Plants
Sampling Points – Let’s Count the Ways

1. Tanker
2. Tanker Unload Line
3. AC Tank Spigot
4. AC Tank Spigot
5. AC Tank Line
6. AC Tank Line
7. Supply Line
8. Inject Line

NEAT AC

POLY AC

AC Pump

Dryer Drum or Weigh Bucket

Inject Line

Anti-Strip Blender

Recirculation Line

Supply Line

Tanker Unload Line
Sample at closest point to the mix - at Injection Line

- NEAT AC Pump
- POLY AC Recirculation Line
- Anti strip Blender
- Dryer Drum or Weigh Bucket
- Sample Port Location per Specification
## District PG INV Field Samples

As of 12/31/11

<table>
<thead>
<tr>
<th>District</th>
<th>Sample Total</th>
<th>Off Test</th>
<th>% Off Test 2011</th>
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<tr>
<td>1</td>
<td>357</td>
<td>11</td>
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<td>122</td>
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<tr>
<td>9</td>
<td>99</td>
<td>1</td>
<td>1.0</td>
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<td><strong>TOTAL</strong></td>
<td><strong>1425</strong></td>
<td><strong>17</strong></td>
<td><strong>1.2 %</strong></td>
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<td><strong>1.2 %</strong></td>
<td><strong>1.6 %</strong></td>
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</table>
Warm Mix Asphalt

Hot  Warm
WARM MIX ASPHALT (WMA)

- Jan 1, 2012 – BDE permissive use Spec issued
  - Allows WMA to be used by contractor
  - Limited to N70 and below mixes
  - Additives and Mechanical processes (foaming) allowed
  - Developing approved list of additives and processes
Warm Mix Technology Use Procedure

• Contractor makes request for use to District
• District Coordinates with BMPR
• WMA Technology “Provisional” until TWO contracts completed within state.
• Evaluate on minimum of 2,000 tons of MAINLINE SURFACE MIX.
  – 1,000 tons of HMA control section
  – 1,000 tons of WMA Technology test section
• Mix testing
  – Four (4) gyros (HMA and WMA Technology).
Warm Mix Technology Use Procedure

– Notify BMPR before production.
– Samples taken.
– Must meet Hamburg Wheel Tracking Device test requirements.
– Once two projects completed with success WMA technology has “approved” status.
<table>
<thead>
<tr>
<th>Company</th>
<th>WMA Technology</th>
<th>Date Approved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astec Industries, Inc.</td>
<td>Generation One (G1) of the Asteo® Double Barrel Green System</td>
<td></td>
</tr>
<tr>
<td>GENCOR INDUSTRIES, INC.</td>
<td>Gencor Ultrafoam GX™</td>
<td>12/2011</td>
</tr>
<tr>
<td>MAXAM Equipment, Inc.</td>
<td>MAXAM®, AQUABlack</td>
<td>12/2011</td>
</tr>
<tr>
<td>Stansteel</td>
<td>Stansteel AccuShear™</td>
<td>12/2011</td>
</tr>
<tr>
<td>Stansteel</td>
<td>Stansteel EcoShear™</td>
<td>12/2011</td>
</tr>
<tr>
<td>Terex Corporation</td>
<td>Terex®i Warm Mix Asphalt System</td>
<td>12/2011</td>
</tr>
<tr>
<td>MeadWestvaco</td>
<td>EVOTHERM™</td>
<td>12/2011</td>
</tr>
<tr>
<td>Sael Wax North America Corporation</td>
<td>SASOBIT®</td>
<td>12/2011</td>
</tr>
<tr>
<td>Akzo Nobel Surfactants</td>
<td>REDISET™</td>
<td>12/2011</td>
</tr>
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</table>
Reclaimed Asphalt Shingle (RAS) Update
Shingle Legislation

- HB 1326 signed into law by Gov. Quinn
  - Now Public Act 097-0314
  - Effective 1/1/12
- CDD sites: Credit of 2 tons for every ton of shingles recycled to reach 75% goal
- Requires IDOT to maximize the use of shingles for binder replacement in HMA mixes on State highways
Other Provisions of PA 97-0314

- Maximize the use of recycled materials
- Reduce the carbon footprint
- Reduce average cost
- Report annually to the Legislature all Department efforts initiated or abandoned in each District/Region
RAS Usage Status

- BDE Special Provision for Reclaimed Asphalt Shingles (RAS) Effective 1/1/12
  - Allows RAS to be used statewide
  - Works with BDE Special Provision for Reclaimed Asphalt Pavement (RAP)
- Expecting to see a number of mix designs adopting shingles in 2012 – Especially D-1, 2, 3 and 4
- Includes Hamburg requirement

<table>
<thead>
<tr>
<th>Asphalt Binder Grade</th>
<th># Repetitions</th>
<th>Maximum Rut Depth in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG76-XX</td>
<td>20,000</td>
<td>1/2 (12.5)</td>
</tr>
<tr>
<td>PG70-XX</td>
<td>15,000</td>
<td>1/2 (12.5)</td>
</tr>
<tr>
<td>PG64-XX</td>
<td>10,000</td>
<td>1/2 (12.5)</td>
</tr>
<tr>
<td>PG58-XX</td>
<td>10,000</td>
<td>1/2 (12.5)</td>
</tr>
</tbody>
</table>
RAS Specs and Policy

• Two Specs that work together
  – Will combine into single spec for 2013

• Policy revised issued August 2011
## RAS Sources

<table>
<thead>
<tr>
<th>Owner</th>
<th>Location</th>
<th>Type</th>
</tr>
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<tbody>
<tr>
<td>Falcon Green Resources, Inc</td>
<td>1200 N Rose Farm Rd</td>
<td>Type 1</td>
</tr>
<tr>
<td>P.O. Box 638</td>
<td>Woodstock, IL 60098</td>
<td></td>
</tr>
<tr>
<td>Harvard, IL 60033</td>
<td></td>
<td></td>
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<tr>
<td>Southwind RAS, LLC</td>
<td>1950 Vulcan Blvd</td>
<td>Type 2</td>
</tr>
<tr>
<td>2250 Southwind Boulevard</td>
<td>Bartlett, IL 60103</td>
<td></td>
</tr>
<tr>
<td>Bartlett, IL 60103</td>
<td></td>
<td></td>
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<tr>
<td>Southwind RAS, LLC</td>
<td>6616 Darst Street</td>
<td>Type 2</td>
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<tr>
<td>2250 Southwind Boulevard</td>
<td>Peoria, IL 60103</td>
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<tr>
<td>Bartlett, IL 60103</td>
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<tr>
<td>Southwind RAS, LLC</td>
<td>4401 S. First Avenue</td>
<td>Type 2</td>
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<td>2250 Southwind Boulevard</td>
<td>Lyons, IL 60534</td>
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<tr>
<td>Bartlett, IL 60103</td>
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Hamburg Wheel
Specimen Prep
Hamburg Wheel
50 Passes/Minute

158 Lbs

50 C

AASHTO T-324
Implementation Schedule

• 2011
  – High Replacement RAP and RAS
  – Warm Mix

• 2012 - 2013
  – Other New mixes (fine graded) and Renewals

• 2014 on
  – Full Implementation
Most mixes pass

For those that don’t:

- Review anti-strip usage
  - Liquid
  - Lime
- Add shingles – fibers and harder AC help
- Add RAP
- Change WMA technology
Life Cycle Cost Audit
Audit

- 20 ILCS 2705/2705-590
  - Requires Life Cycle Costing (LCC) on all projects over $500,000
  - Award construction to lowest LCC
  - Models based upon data
  - If don’t have data may use other similar states data

- Audit to determine if IDOT following law
- Not concluded yet
Pavement Design Update
Pavement Design Update
April 2011

• Thickness Design
  – HMA
  – PCC (Jointed)

• Maintenance Models
  – HMA + Rubblizing
  – PCC (Jointed, CRC and Unbonded PCC Overlay)

• Alternate bids for projects within 10%
Common to Both Designs

• Additional Subgrade treatment
  – Added aggregate/lime combo
• Reduced Non-Interstate Minimum Design Traffic
• Complete Recheck of Design Theory
  – Compared to AASHTO – MEPDG
  – Outside Reviewers for Both Designs and Selection Process as a QA Check
Pavement Thickness

• PCC Thickness
  – Little change

• HMA Thickness
  – Revised fatigue algorithm
  – Updated pavement temperature data
  – PG asphalt grade
  – Included limiting strain criteria
    • Low strain = unlimited life
PAY FOR PERFORMANCE
PFP Implementation Schedule

✓ 2010
   ✓ Min. One PFP project / District
     ✓ ≥ 8,000 tons individual mix

✓ 2011
   ✓ Min. 50% of all Interstate or Supplemental Expressway
     ✓ ≥ 8,000 tons / mix

• 2012
  – All Interstate & Supplemental Expressway
     • ≥ 8,000 tons / mix
## 2011 PFP Projects

<table>
<thead>
<tr>
<th>District</th>
<th>Projects</th>
<th>Tons</th>
<th>% Jobsite Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3 (4 w/ carryover)</td>
<td>29,011 (42,988)</td>
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</tr>
<tr>
<td>2</td>
<td>(3 carryover)</td>
<td>(67,463)</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>20,000</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>31,300</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>(2)</td>
<td>36123</td>
<td>100</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>9,737</td>
<td>100</td>
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<td>8</td>
<td>2</td>
<td>177,000</td>
<td>100</td>
</tr>
<tr>
<td>9</td>
<td>(1 carryover)</td>
<td>(12,946)</td>
<td>0</td>
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<tr>
<td>Total</td>
<td>10 (17)</td>
<td>267,048 (397,557)</td>
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## 2011 PFP Projects

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<tbody>
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<td><strong>93.4%</strong></td>
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*Average*= **99.0%**
Spec Revisions for 2012

• Increase core/edge distance to 4-inches
• Disputes within precision limits will no longer be allowed
• Dispute cores taken with District cores
• Better filling of core holes
• Lab fees increased
  – Mix       $1,000
  – Core      $300
QUALITY CONTROL FOR PERFORMANCE
QCP - Quality Control for Performance

• For use below PFP (8,000 tons) & other projects not suited for PFP
• Uses pay adjustment concept
• Pay based upon owner test
• Less effort for owner than PFP
• Roll out
  – 2012 - 2 state projects/district
  – 2013 - 50%
  – 2014 - Full implementation on state
  – 2014 - Start LR&S
N – Design Mix Reduction
NCHRP Report 573 by NCAT

- Gyration Levels for $N_{design}$

- For mixes under PG 76-xx
  - Four levels
  - 50, 65, 80, 100

- Possible IDOT mixes
  - 30, 50, 70, 90 – may not be far off