2016 PAPA REGIONAL PARTNER MEETINGS

March 14, 15 and 16, 2016

PA Asphalt Pavement Association
- Gary Hoffman, Director of Technical Services

Committed to:
- Safe, Smooth, Sustainable, Long Lasting Pavements!
New Tack Coat Specification
Requirements
Section 460

Neal Fannin P.E.
Pavement Materials Engineer
PENNDOT
Change in Tack material

• New Tack is similar to CSS-1h emulsified asphalt.
  ▫ The Minimum residual asphalt is 57% instead of 28%
  ▫ The application temperature is 90F to 150F (AET - 75F to 140F)

• Non-tracking Tack is also an option now.
  ▫ Minimum residual asphalt is 50%.
# Change to Application Rate

<table>
<thead>
<tr>
<th>Surface Type</th>
<th>Uniform Asphalt Residue Rate (RR) (Gallons per square yard)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Bituminous Paving</td>
<td>0.03 to 0.05</td>
</tr>
<tr>
<td>Existing Bituminous Paving</td>
<td>0.04 to 0.07</td>
</tr>
<tr>
<td>Milled Surface (Bituminous &amp; PCC)</td>
<td>0.04 to 0.08</td>
</tr>
<tr>
<td>Portland Cement Concrete</td>
<td>0.04 to 0.07</td>
</tr>
</tbody>
</table>
Test Section

- The specification includes a test section.
  - 100 Ft. test section required to ensure the proper application is being applied.
Implementation

- CT1 comments addressed.

- CT 2 should be out in a week or 2

- Specification should be approved by July 1.

- Change should be in Change 1 of 2016 Pub. 408.
  - Change 1 effective date is October 7, 2016.
Equipment Operation

Calibrated 4-10-01

J. D.

B.
### Etnyre Spray Bar Nozzles

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Part No.</th>
<th>Description</th>
<th>Application Per Square Yard</th>
<th>Application (Metric) Liters Per Square Meter</th>
<th>Flow Gallons Per Minute Per Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3351013**</td>
<td>1/16&quot; Coin Slot</td>
<td>.05 - .20</td>
<td>.19 - .75</td>
<td>3.0 to 4.5</td>
</tr>
<tr>
<td>2</td>
<td>3351008</td>
<td>S36-4 V Slot</td>
<td>.10 - .35</td>
<td>.38 - 1.30</td>
<td>4.0 to 7.5</td>
</tr>
<tr>
<td>3</td>
<td>3351009</td>
<td>S36-5 V Slot</td>
<td>.18 - .45</td>
<td>.57 - 1.50</td>
<td>7.0 to 10.0</td>
</tr>
<tr>
<td>4</td>
<td>3352368</td>
<td>Multi-Material V Slot</td>
<td>.15 - .40</td>
<td>.57 - 1.50</td>
<td>6.0 to 9.0</td>
</tr>
<tr>
<td>5</td>
<td>3351015</td>
<td>3/32&quot; Coin Slot</td>
<td>.15 - .40</td>
<td>.57 - 1.50</td>
<td>6.0 to 9.0</td>
</tr>
<tr>
<td>6</td>
<td>3352204*</td>
<td>Multi-Material V Slot</td>
<td>.35 - .95</td>
<td>1.30 - 3.60</td>
<td>12.0 to 21.0</td>
</tr>
<tr>
<td>7</td>
<td>3352205*</td>
<td>Multi-Material V Slot</td>
<td>.20 - .55</td>
<td>.75 - 2.08</td>
<td>7.5 to 12.0</td>
</tr>
<tr>
<td>8</td>
<td>3352210</td>
<td>End Nozzle (3352205)</td>
<td>.20 - .55</td>
<td>.75 - 2.08</td>
<td>7.5 to 12.0</td>
</tr>
<tr>
<td>9</td>
<td>3351014</td>
<td>3/16&quot; Coin Slot</td>
<td>.35 - .95</td>
<td>1.30 - 3.60</td>
<td>12.0 to 21.0</td>
</tr>
<tr>
<td>10</td>
<td>3351010</td>
<td>1/4&quot; Coin Slot</td>
<td>.40 - 1.10</td>
<td>1.50 - 4.16</td>
<td>15.0 to 24.0</td>
</tr>
</tbody>
</table>

* Recommended nozzles for seal and chip with emulsified asphalts.

** For application prior to laying a hot mat.
Nozzle Slot 30° from Spray Bar

Spray Bar (bottom view)
Triple-Lap Coverage

With nozzles on 4” centers, material sprayed from each nozzle overlaps two other sprays.
Tack Applications

- Is this a proper tack application?
- Potential issues with this application?
- Do you notice any tack near the paving joint?
Good Spray Pattern
Uniform Coverage
No Streaking
Effects of Tack on Pavement Performance

- Construction practices necessitate driving on the tack coat to place the mix
- Tracking of the tack from the surface may result
Light or Poor Tack Applications lead to Early Pavement Failure

- **Longitudinal cracking near the wheel path**
Benefit of Higher Tack Applications

- Higher tack rate creates an asphalt rich interlayer at the interface with the existing pavement

Bonded to existing pavement surface
Tack Application Rates

- Penn Dot Pub 408 Section 460
- Apply emulsified tack to leave a uniform asphalt residue from .02 to .07 gallons per square yard.
- AE-T application (30% residue) - .067 to .23 gals/sy
- New tack (58% residue)- .034 to .12 gals/sy
- Higher tack rates are better but tracking is a concern
Setting and Curing Factors

- Emulsion Reactivity
  - Emulsifier chemistry, concentration
  - Other additives
  - Asphalt viscosity
- Aggregate Reactivity
  - Surface area, surface charge, surface chemistry
  - Filler chemistry e.g. cement, lime
- Road and Air Temperature, Humidity, Wind Speed
  - Remove water from the system
- Mechanical Treatment e.g. compaction
  - Squeeze the droplets together and squeeze out water
What Were The Issues with Tack?

- Problem with tracking of tack coat materials
- Creates safety issues where build-up occurs
Non-Tracking Tack

- A specification is out on clearance transmittal
- All producers should have a non-tracking tack material available in 2016.
- The specification does not infringe on other material patents.
- No special equipment
- It is a good beginning but we have several challenges with the use of quick setting materials.
Handling Non-tracking tacks

- Material is designed to break quickly, storage stability may be limited.
- Current formulations are anionic, current tack materials have been cationic. Check with your supplier before mixing materials.
- Application rates are identical to conventional application rates.
Thank you!

Contact Information

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484.772.5801

• Resources: Stephanie Hogendoorn
• Akzo Nobel Surface Chemistry LLC
Wes McNett- McTish, Kunkel
2016 PENNDOT PAPA Eastern Regional Meeting
  - March 16, 2016 Holiday Inn, Lehigh Valley, Breinigsville

2016 Bus Tour & T² Session
  - July or August 2016 in District 1-0

2017 PAPA Annual Conference
  - January 16, 17 and 18, 2017

Please Contact Tina Holtzman @ 717-657-1881 or tina@pa-ashalt.org for more Information!
Questions??       Thank you!!

To contact  ........................................

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