POROUS ASPHALT PAVEMENT SURFACE COURSE

OCTOBER 19, 2007 (Revised 15-Apr-11)

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PAPS.01 Description. This work shall consist of constructing a Porous Asphalt Pavement Surface (PAPS) course comprised of aggregate and polymer-modified asphalt binder mixed in a central plant and spread and compacted on a prepared surface. All numbered specification references in this document refer to Ohio Department of Transportation (ODOT), Construction and Material Specifications. Comply with the requirements of 401 with the following deviations:

PAPS.02 Composition. Use a job mix formula (JMF) that meets the requirements of ODOT Supplemental Specification 803 and has previous approval by the ODOT Laboratory. If a previously approved JMF is not available, design the mixture to conform to the materials requirements provided below.

Furnish materials conforming to:
- Asphalt binder: PG 64-22 Modified with 5-percent SBR Latex, or PG76-22M(ER80) (ER80 denotes Elastic Recovery to be 80 min.)
- Aggregates: Coarse aggregate angularity, percent fractured (two or more faces), ASTM D5821 = 100
- Mineral filler
- Rubber compound

Notes:
1. Provide a quantity of asphalt binder and rubber compound as required to produce a composition of 95 ± 0.3 percent asphalt binder to 5 ± 0.3 percent rubber solids by weight.

Do not use reclaimed asphalt concrete.

Proportion the materials such that the resulting blend is within the following limits:

<table>
<thead>
<tr>
<th>Sieve</th>
<th>Total Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 inch (12.5 mm)</td>
<td>100</td>
</tr>
<tr>
<td>3/8 inch (9.5 mm)</td>
<td>85 - 96</td>
</tr>
<tr>
<td>No. 4 (4.75 mm)</td>
<td>28 – 45</td>
</tr>
<tr>
<td>No. 8 (2.36 mm)</td>
<td>9 – 17</td>
</tr>
<tr>
<td>No. 200 (75 μm)</td>
<td>2 – 5</td>
</tr>
</tbody>
</table>

Determine asphalt binder (percent by weight of total mix) = 6.0 – 12.0

Determine the mixture proportions using the design procedure outlined in FHWA Technical Advisory T5040.31 (available from Flexible Pavements of Ohio).

Determining Gmm for Mix Design:

- Determine Gmm of the mixture at binder contents: Pb=5.0, Pb=5.5
- Determine Gse at Pb=5.0 and Pb=5.5. If the difference of the Gse values is within ± 0.012 use the average value. If the difference exceeds 0.012 repeat the process. [Note: hand mixing the “Rice” mixtures in a heated glass Pyrex bowl for 5 to 8 minutes generally gives a more reproducible Gse value than mechanical mixing.]
• Back-calculate Gmm using the average Gse.

Compose the mixture to assure 15 to 20 percent air voids in the compacted pavement.

Ensure Volume Increase Ratio (VIR) = 11.5% minimum. \[ \text{VIR\%} = \left\{ \frac{(P_{be}/G_b)/(P_s/G_{sb})} \right\} \times 100 \]

Use an approved ODOT Level 3 Asphalt Laboratory and Level 3, Asphalt Concrete Technician to determine the job mix formula (JMF).

**PAPS.03 Design Verification.** A minimum of 3 weeks before the production of the mixture, submit for approval a computed blend of aggregate and asphalt binder, and production temperature range. Use ODOT JMF forms for this submittal. Final design acceptance is subject to field verification and actual performance. Field verification may include additional testing by the owner.

**PAPS.04 Mixing.** Mix the aggregate and asphalt binder material within the established temperature range until all the aggregate is coated. Establish the mixing temperature at a binder viscosity of 800 ± 100 cSt. Provide a mixture that does not show draindown of the asphalt binder, is shiny, completely coated, and is not dull or brown in appearance; a sign of excessive absorption or low asphalt binder content.

**PAPS.05 Weather Limitations.** Spread the mixture when the surface temperature is at least 55°F (13°C) and rising. Do not place the mixture when rain is imminent. Cease all operations if rain occurs during placement. Do not place the mixture during any weather conditions that would cause its degradation, segregation, or contamination.

**PAPS.06 Spreading and Compacting.** Spread the mixture in a method that produces a smooth, uniform layer before compacting. Take measures to ensure the surface over which the PAPS is being placed is not displaced or damaged during the paving process. Using a rubber-tired paver is permitted unless it displaces or damages the underlying layer; otherwise, use a track-mounted paver.

Establish the compaction temperature at a binder viscosity of 1400 ± 200 cSt. Compact the mixture using a minimum of four (4) passes of a static tandem steel wheel roller having a minimum weight of 8 tons.. Complete rolling before the mix temperature has dropped below 180°F.

**PAPS.07 Protection of the PAPS.** Do not haul over the mixture. Protect the mixture at all times from contamination by soil or other fine material.

**PAPS.08 Quality Control Testing.** Test the mix according to 441.09 for asphalt binder content, gradation and air voids of placed and compacted mix. Control the mixture production and placement as follows:

A. If during production a single asphalt binder content is more than ±0.30 percent beyond the JMF, immediately take and test a verification sample. Stop production and verify the mix design if the average of the original and verification tests exceeds JMF asphalt binder content by ±0.2 percent. Verification will include an evaluation of on-site aggregate gradations, specific gravities, and mix proportions. Validate the minimum VIR is being met.

B. If the Range difference in any three consecutive asphalt binder content tests is greater than 0.4 percent immediately notify the owner’s representative.

C. If the Range difference in any three consecutive gradation tests for the No. 4 (4.75 mm) sieve is greater than 10.0 percent, immediately notify the owner’s representative.

D. If range deviations as specified continue, cease production.

Range is defined as the difference between the largest and the smallest acceptance test result within an acceptance period (production day or lot).

**PAPS.09 Acceptance.** Production is considered acceptable if the following tolerances and the design bands are not exceeded:

<table>
<thead>
<tr>
<th>Mix Characteristic</th>
<th>Deviation of the Mean from the Design</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binder content</td>
<td>±0.3 percent</td>
<td>0.4</td>
</tr>
<tr>
<td>3/8 inch (9.5 mm) sieve</td>
<td>±5 percent</td>
<td>5</td>
</tr>
<tr>
<td>No. 4 (4.75 mm) sieve</td>
<td>±5 percent</td>
<td>5</td>
</tr>
<tr>
<td>No. 8 (2.36 mm) sieve</td>
<td>±4 percent</td>
<td>5</td>
</tr>
<tr>
<td>No. 200 (75 μm) sieve</td>
<td>±2 percent</td>
<td>5</td>
</tr>
</tbody>
</table>

**PAPS.10 Method of Measurement.** The conversion factor (lbs. per cubic yard) will be based on the unit weight of the material as determined by the job mix formula.

**PAPS.11 Basis of Payment.** Payment will be made for accepted quantities, complete in place, at the contract price as follows:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAPS</td>
<td>Cubic Yard</td>
</tr>
</tbody>
</table>