Aggregate Materials Training

Madison WI, Truax Office
Outline

1. Calendar year approval
2. Random numbers for production records
3. Recycled asphalt base for shoulders
4. Recycled concrete base
5. Lightweight pieces test for concrete aggregate
6. Deleterious materials
7. QMP base compaction.
106.3.4.2.2.1 General

Source approval begins January 1st of the sampling year. If a source is sampled after October 15th and is not incorporated into a project the same year, source approval begins January 1st of the following year.
Random Numbers for Production Records

701.3 Contractor Testing
Perform contract required QC tests for samples randomly located according to CMM 8-30.

Code of Federal Regulations
§637.205 Policy.

[...]

(e) Random Samples. All samples used for quality control and verification sampling and testing shall be random samples.
Examples for production: ASTM D3665

1. Time
   - Belt, Flow rate
2. Length
   - Windrow, distance (pavement length)
3. Weight
   - Tonnage
4. Volume
   - Cubic yards
5. Count
   - Number of trucks/loads

Bottom Line: have documentation of sampling process!
305.5.2.1 General

(2) Where the contract specifies or allows 1 ¼-inch base, do not place reclaimed asphalt, reprocessed material, or blended materials below virgin aggregate materials unless the contract specifies or the engineer allows in writing.
Recycled Asphalt Base

FDM 14-5-1 Figure 1.3

Should this be virgin or RAP?
305.5.2.1 General

Where the contract specifies or allows 1 1/4-inch base, do not place reclaimed asphalt, reprocessed material, or blended materials below virgin aggregate materials unless the contract specifies or the engineer allows in writing, or as follows. Virgin aggregate is allowed above reclaimed asphalt, reprocessed material, or blended materials in shoulder areas adjacent to Portland Cement Concrete pavement.
Recycled Concrete Base: STH 78, First Winter
Recycled Concrete Base: STH 78, 2018
## Recycled Concrete Base

<table>
<thead>
<tr>
<th>Material Type</th>
<th>T103-Percent Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recycled PCC</td>
<td>35.6</td>
</tr>
<tr>
<td></td>
<td>32.6</td>
</tr>
<tr>
<td></td>
<td>36.2</td>
</tr>
<tr>
<td></td>
<td>38.6</td>
</tr>
<tr>
<td>STH 78-Badger</td>
<td>53.5</td>
</tr>
<tr>
<td>STH 78-Test Pit #2</td>
<td>50.9</td>
</tr>
</tbody>
</table>
# Recycled Concrete Base 2020 Specification

<table>
<thead>
<tr>
<th>Freeze/thaw soundness AASHTO T103 loss by weight</th>
<th>dense</th>
<th>open-graded</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=18%</td>
<td>&lt;=18%</td>
<td>not allowed</td>
</tr>
<tr>
<td>note[2]</td>
<td></td>
<td>not allowed</td>
</tr>
</tbody>
</table>

[1] The final aggregate blend must conform to the specified gradation.

[2] No requirement for material taken from within the project limits. **LA Wear M**aximum of 50 percent loss, by weight, for material supplied from a source outside the project limits. **Freeze thaw maximum of ?? percent loss, by weight, for material supplied from a source outside the project limits.**

40?% Loss
Upgrading Testing Capabilities

Thermotron Model S-32-8200 (2)
Environmental Test Chamber

- Programable freeze-thaw cycles
- Maximize testing efficiency
- Increased capacity
Lightweight Pieces-Approved Products List
<table>
<thead>
<tr>
<th>Location Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/Q</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Q</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>P</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Location Description</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>PS SE 5 2N 13E Rock</td>
</tr>
<tr>
<td>Approved Use: HMA&lt;MT, HMA&gt;=MT, CONCRETE, OGBC, Base Aggregate</td>
</tr>
<tr>
<td>Q SW SW 1 25N 7E Portage</td>
</tr>
<tr>
<td>Approved Use: HMA&lt;MT, HMA&gt;=MT, OGBC, Base Aggregate</td>
</tr>
</tbody>
</table>
Deleterious Materials
WisDOT Geologist - Dan Reid
Most Prevelent Deleterious Particles

- Shale/chert
- Clay balls/lumps
- Phyllite
- Other soft, porous rocks (sandstone, slate, schist)
Shale/chert Pop-outs
Shale/chert/sandstone Pop-outs
Clay balls/Clay Lumps
Soft/altered aggregate particles
phyllite, talc-mica schist
What can you do to help?

- Visit project aggregate source(s) and observe the stockpiling practices.
- Inspect aggregate QMP samples for chert, clay balls, shale and other deleterious materials.
- Communicate with aggregate supplier.
QMP Base Aggregate Dense STSP 370-010

- New density target for control strip method: 96% max density.
- Tonnage to linear lot system.
- 4 to 1 minute nuclear density test time.
- Measure and pay the acceptably completed lot.
Aggregate Sample Sizes
QMP Base Stockpile Test

1. Must have conforming QC and QV stockpile test before placing base.
2. If either QC or QV test is non-conforming, do not place base. Re-sample and re-test.
3. If second test is non-conforming, do not place base. Contractor must submit a corrective action report to the project engineer for approval. Once approved, re-sample and re-test.
4. Conforming stockpile test can be used on multiple projects within 60 calendar days of sampling. One stockpile test is required per project.
Stockpile sampling

STSP: One stockpile test may be used for multiple projects up to 60 calendar days.

Standard Specification: Stockpile tests can be used for multiple projects. If placement on a project does not begin within 60 calendar days after the date the stockpile sample was obtained, retest the stockpile before placement begins.