Plant Certification Program

An Update on
PennDOT Asphalt Specifications

2019
Your Role with PennDOT Specifications

• You must be
  – familiar with specifications that cover your project.
  – be aware of the effective change dates and your project let date.
<table>
<thead>
<tr>
<th>Year (Version)</th>
<th>Effective Dates</th>
</tr>
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<tbody>
<tr>
<td>2000</td>
<td>April 3, 2000 to September 30, 2003</td>
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<td>2003</td>
<td>October 1, 2003 to April 1, 2007</td>
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<td>2007</td>
<td>April 2, 2007 to March 31, 2011</td>
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<td>2011</td>
<td>April 1, 2011 to March 31, 2016</td>
</tr>
<tr>
<td>2016</td>
<td>April 1, 2016 to April 2, 2020</td>
</tr>
</tbody>
</table>
Publication 408/ Pub 408

PennDOT’s Rewriting Initiative for 2020 Edition

- Work in progress
- Consolidate Information from SSP and SOL
- Probably merging 409 and 411 into one section
- Similarly for 309 and 311
- Initial Edition: April 2020
PennDOT Specifications (Publication 408)

Pub 408/2016
(Effective April 1, 2016)
Publication 408/2016

• PennDOT Pub 408/2016 contains current Construction Specifications for PennDOT Projects

• Available in Hardcopy Binder, Bound Book and Web Version

• PennDOT Website:  
  http://www.penndot.gov/ProjectAndPrograms/construction/Pages/ConstructionSpecifications.aspx
Sections of Publication 408/2016

Question: How Many Sections Are There in Spec 408?
Sections
Publication 408/2016

• 100 - General Provisions
• 200 - Earthwork
• 300 - Base Courses
• 400 - Flexible Pavements
• 500 – Rigid Pavements
• 600 – Incidental Construction
Sections
Publication 408/2016

• 700 - Materials
• 800 – Roadside Development
• 900 – Traffic Accommodation & Control
• 1000 - Structures
• 1100 – Manufactured Materials
• 1200 – Intelligent Transportation System Devices
Sections of Publication 408/2016

- 100 - General Provisions
  - Abbreviations and definitions
  - Bidding requirements and conditions
  - Award and contract execution
  - Scope and control of work
  - Control of materials (Section 106)
  - Measurement of quantities
  - Payment
  - Several others
Sections of Publication 408/2016

- 300 – Base Courses
  - SP HMA Base design/construction (Section 309)
  - SP WMA Base design/construction (Section 311)
  - Cold Mixes (Sections 341 and 342)
  - Asphalt Treated Permeable Base (Section 360)
Sections of Publication 408/2016

400 – Flexible Pavements
  - SP HMA design/construction  (Section 409)
  - SP HMA design/construction fine graded (Section 410)
  - SP WMA design/construction  (Section 411)
  - SMA  (Section 419)
Sections of
Publication 408/2016

• 700 – Materials
  – Bituminous materials (Section 702)
  – Aggregates (Section 703)
Discussion of Specification Changes
# Publication 408/2011

<table>
<thead>
<tr>
<th>Version</th>
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<tbody>
<tr>
<td>Initial Edition</td>
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<td>October 7, 2011</td>
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<td>Change No. 3</td>
<td>October 5, 2012</td>
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<td>April 5, 2013</td>
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<td>October 4, 2013</td>
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<td>Change No. 8</td>
<td>April 3, 2015</td>
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# Publication 408/2016

<table>
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<td>Change No. 5</td>
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<td>Change No. 6</td>
<td>April 5, 2019</td>
</tr>
<tr>
<td>Change No. 7</td>
<td>October 4, 2019</td>
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</table>
## Relevant Sections Added in Pub 408 within the Last 5 Years:

<table>
<thead>
<tr>
<th>Date</th>
<th>Section</th>
<th>Description</th>
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<tbody>
<tr>
<td>April 2015</td>
<td>496</td>
<td>60-Month Warranty Projects</td>
</tr>
<tr>
<td>October 2015</td>
<td>344</td>
<td>Full Depth Reclamation</td>
</tr>
<tr>
<td>October 2016</td>
<td>420</td>
<td>Pervious Bituminous Pavement System</td>
</tr>
<tr>
<td>October 2016</td>
<td>489</td>
<td>Ultra-Thin Bonded Wearing Course</td>
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Sections of Publication 408 Containing Asphalt Specifications (2016, Chg. 5)

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<tr>
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<th>Description</th>
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<tr>
<td>106</td>
<td>Controls of Material Statistics</td>
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<tr>
<td>309</td>
<td>Superpave Asphalt Mixture Design, HMA Base Course (Standard)</td>
</tr>
<tr>
<td>311</td>
<td>Superpave WMA Design/Construction for Base Course</td>
</tr>
<tr>
<td>316</td>
<td>Flexible Base Replacement</td>
</tr>
<tr>
<td>320</td>
<td>Aggregate Bituminous Base Course</td>
</tr>
<tr>
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<td>Description</td>
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<td>Aggregate-Lime Pozzolan Base Course</td>
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<td>Cold Recycled Bituminous Base Course (In-Pace)</td>
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<tr>
<td>342</td>
<td>Cold Recycled Bituminous Base Course (Central Plant)</td>
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<td>344</td>
<td>Full Depth Reclamation</td>
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<td>360</td>
<td>Asphalt Treated Permeable Base</td>
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## Sections of Publication Containing Asphalt Specifications (2016, Chg. 5)

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<tr>
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<td>Evaluation and Payment of Bituminous Pavement Ride Quality Incentive</td>
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<td>405</td>
<td>Evaluation of Bit. Pavement Longitudinal Joint Density, Payment of Incentive/Disincentive</td>
</tr>
<tr>
<td>409</td>
<td>Superpave Asphalt Mixture Design HMA Wearing Course, Standard, RPS</td>
</tr>
<tr>
<td>410</td>
<td>SP. Mix Design, Stand. and RPS Construction of Plant-Mixed HMA Fine Graded Courses</td>
</tr>
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<td>411</td>
<td>Superpave WMA Design/Construction</td>
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<tr>
<th></th>
<th>Description</th>
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<tbody>
<tr>
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<td>SMA  Design &amp; RPS Construction of Wearing Course</td>
</tr>
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<td>420</td>
<td>Pervious Bituminous Pavement System</td>
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<tr>
<td>460</td>
<td>Bituminous Tack Coat</td>
</tr>
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<td>470</td>
<td>Bituminous Seal Coat</td>
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<td>471</td>
<td>Bituminous Seal Coat using Precoated Aggregate</td>
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<td>480</td>
<td>Bituminous Surface Treatment</td>
</tr>
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<tr>
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<th>Description</th>
</tr>
</thead>
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<td>Slurry Seal</td>
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<td>Polymer-Modified Emulsified Asphalt Paving System (Micro Surfacing)</td>
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<td>489</td>
<td>Ultra-Thin Bonded Wearing Course</td>
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<td>496</td>
<td>Asphalt Concrete Pavement, 60-month Warranty</td>
</tr>
</tbody>
</table>
Changes in Specification 2011

Changes 6 through 9

April 2014 – October 2015
Spec 408/2011-Section 409
Change No. 6 (Partially Completed Lots)

- Raised the upper density limits for all mixes.
- Raised the lower density limit of base courses.

**Density Limits for Partially Completed Lots**

<table>
<thead>
<tr>
<th>Mixture</th>
<th>NMAS</th>
<th>Density Limits for 100% Pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>All RPS 9.5, 19, 25 mm, wearing /binder courses</td>
<td></td>
<td>≥ 92 and ≤97</td>
</tr>
<tr>
<td>All standard 9.5, 12.5, 19, 25 mm, wearing/binder courses</td>
<td></td>
<td>≥ 90 and ≤97</td>
</tr>
<tr>
<td>All 25 mm and 37.5 Base Courses</td>
<td></td>
<td>≥ 90 and ≤100</td>
</tr>
</tbody>
</table>
Spec 408/2011-Section 409
Change No. 7

• Eliminate loose box samples for acceptance of quantities less than 500 tons:

  – **Old Language:** For JMF’s placed in quantities of 500 tons or less in a critical condition, the tonnage will be considered a lot. The lot will be divided into three equal sublots.

  **New Language:** For JMF’s placed in quantities of 500 tons or less, the tonnage may be considered a lot if density acceptance is by pavement cores, however mixture acceptance will be by certification. The lot will be divided into three equal sublots.
Spec 408/2011- Section 496
Change No. 8 (April 2015)

• HIGHLIGHTS
  – 60-Month Warranty Specification on Superpave, SMA
  – Warranty Bond (50% of the contract amount)
  – End-Result
  – Requires Warranty Performance Criteria
  – SP Design- by Level-2 Certified Technician
  – SP Design - Submit 7 days before use
  – Submit QC Plan & QC test results– for information only
Spec 408/2011- Section 496

• CONSTRUCTION – Thickness Verification
  – Within 24 hours, drill one 4-inch core or larger for each 2,000 linear feet.
  – PTM 1 for Core Locations, PTM #1
  – Core Depth Determination: Use PTM 737
  – If thickness deficient more than 1/4 inch, and not possible to correct satisfactorily, then it is defective work.
  – If thickness deficient more than 1/8 inch for 3 consecutive cores, then deficient.
Spec 408/2011- Section 496

CONSTRUCTION – Quality Control/Assurance

- Department reserves the right to request loose samples or cores at random locations- for information purpose only.
- If directed, one loose sample behind the paver, boxed and delivered to inspector.
- If directed, one 6-inch core for every 1000 tons of material. If core defective, a new core within 12 inches of the original location.
PERFORMANCE MEASUREMENT

- Survey by Department or a designee
- Annual survey analysis
- Notify contractor 14 days before survey
- Automated survey system
- Follow Pub 336 for both automated and manual surveys
- Flushing and pothole survey done manually
- Results reported for each segment
Spec 408/2011- Section 496

• PERFORMANCE CRITERIA
  – Provide survey results to contractor within 14 days
  – Compare with Table A of Spec 496 for action
  – If year 5 survey shows 30% of segment with two or more distresses of low severity, then remedial action by an approved surface treatment technique.
Spec 408/2011- Section 496

• Performance Criteria of Table A of Spec 496,
  – Fatigue Cracking
  – Transvers Cracking
  – Raveling
  – Rutting
  – Flushing
  – Longitudinal Joint Deterioration
  – Edge Deterioration

• For Each, there is Threshold Level and Remedial Action
Performance Evaluation by the Contractor

- Contractor may monitor or test warranted pavement courses using nondestructive methods at any time during the warranty period.
- Notify District Executive at least 7 days in advance of such testing
- Obtain written authorization from Department before such testing
- No remedial work before written authorization from Department
Spec 408/2011- Section 496

• REMEDIATION WORK

  — Remediation work must be satisfactory to Secretary, at contractor’s cost
  — If remedial action needed, contractor notified within 5 days from the date of determination
  — No work by Department on the warranted pavement during the warranty period
• **REMEDIATION WORK**
  – Contractor may propose a method of testing, measurement, or remedial action different from Table A. Then, must submit a plan of approach.
  – Department will review and approve or disapprove the plan.
  – Complete within 60 days
Spec 408/2011- Section 496

• REMEDIAL EMERGENCY WORK
  – Contractor will be notified of any needed emergency repair work immediately.
  – Contractor will let Department know within 24 hours whether they will repair.
  – Must begin repair work with 48 hours from original notification by the Department.
  – If Department does the repair, the cost will be the responsibility of the contractor.
Spec 408/2011- Section 496

- **DISPUTE**
  - Contractor may dispute Department’s performance results
  - Contractor may use a third party performance survey results as the base for dispute
  - Notify Department within 30 days from the date of Department’s notification.
  - If not resolved within 14 days, then submit to the Conflict Resolution Team
Spec 408/2011- Section 496

**CONFLICT RESOLUTION TEAM**

- Two Reps selected by the Contractor
- Two Reps selected by the Department (District and BOPD)
- One person mutually agreed (cost shared equally)
- Team will meet within 30 days from the date of submission
- Decision of majority will be final.
FACTORS BEYOND CONTROL

If Distresses because of Factors beyond Contractor’s Control, then Contractor not responsible.

The area of such distress calculated by the max. width times max. length times 1.5, but extending no more than 10 feet on either side of the distress area.

Department may repair these distresses at no cost to the contractor.
Spec 408/2011- Section 496

- FACTORS BEYOND CONTROL

  - Base Condition causing fatigue cracks or other distresses
    - 6-inch cores
    - Measure thickness, void content, gradation, binder content
    - If within limits, contractor not responsible

  - Traffic Loading
    - If ESALs exceed 100% of the estimated 20-year design life ESALs
    - If ESAL’s increase cause change in number of gyrations, then contractor not responsible

  - Department Routine Maintenance
Spec 408/2011- Section 496

• FACTORS BEYOND CONTROL
  – Destructive Procedures by the Department
    • Distresses caused by coring, milling, etc.
  – Uncontrolled Forces of Nature
    • Floods, earthquakes, tornados, fires, landslides, sinkholes, …
  – Traffic Accidents
    • Fuel or chemical spills, vehicle fire, gouging or goring of pavement surface
Spec 408/2011- Section 409
Change No. 9 (October 2015)

• Use of Material Transfer Vehicle is Required for RPS Bituminous Pavements.

• Added Language in Spec 409:
  “Utilize a Material Transfer Vehicle (MTV) as specified in Section 108.05(c)5 for RPS pavements unless otherwise approved by the Representative.”
Specification 2016

Initial Version and Changes 1 through 6

April 2016 – April 2019
Spec 408/2016- Section 420
Pervious Bituminous Pavement System
Change No. 1 (October 2016)

• Use of Pervious Pavements on Department Projects.
• Allows water to percolate and infiltrate through the pavement and underlying layers.
• Minimizes runoff
• It is a System! Includes different layers, different materials, and drainage outlets
Spec 408/2016- Section 420
Pervious Bituminous Pavement System
Change No. 1 (October 2016)

- Porous Surface
- Filter Layer (Choker Course)
- Reservoir Layer (Detention Basin)
- Filter Fabric
- Subgrade Soil
Spec 408/2016- Section 420
Pervious Bituminous Pavement System
Change No. 1 (October 2016)

• Materials
  – Type A Aggregate (for use in Asphalt Concrete)
  – AASHTO No. 3 for primary detention coarse aggregate, topped with AASHTO No. 57 as a choker and leveling coarse
  – Type A, Class 4, Geotextile
  – Edge Restraint to resist lateral roller forces
Spec 408/2016- Section 420
Pervious Bituminous Pavement System
Change No. 1 (October 2016)

• Bituminous Materials
  – Pervious 9.5 mm wearing course, PG 70-22 or PG 76-22
  – Pervious 19.0 mm Binder course, PG 64-22
  – RAP limited to 10% of the mixture
Ultra-thin bonded wearing course of HMA (UTWC) over polymer-modified emulsified asphalt membrane.

Roll before temperature drops below 185°F

Minimum of 2 passes with a steel double-drum roller

Minimum weight of roller: 8 tons

Compact in static mode except at joints.

Pneumatic-tire roller may be needed to prevent the “bridging” effect of the steel drum roller.
# Spec 408/2016- Section 489

Ultra-Thin Bonded Wearing Course

Change No. 1 (October 2016)

<table>
<thead>
<tr>
<th>Type</th>
<th>NMAS</th>
<th>Placement Rates (pounds per square yard)</th>
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<tbody>
<tr>
<td>A</td>
<td>6.3 mm (1/4 inch)</td>
<td>45 to 65</td>
</tr>
<tr>
<td>B</td>
<td>9.5 mm (3/8 inch)</td>
<td>55 to 80</td>
</tr>
<tr>
<td>C</td>
<td>12.5 mm (1/2 inch)</td>
<td>60 to 85</td>
</tr>
</tbody>
</table>
Using Anti-Strip Additives with WMA
Incorporate a liquid anti-strip additive at the same dosage rate as the dosage rate for the HMA JMF.

If the WMA Technology includes an anti-strip additive additional liquid anti-strip additive is not required in mixtures where the moisture sensitivity analysis cannot be performed as specified in Section 411.2(e)1.

If the WMA Technology includes an anti-strip additive as part of its WMA Technology and moisture sensitivity analysis can be performed according to Section 411.2(e)1 add additional anti-strip additive or make other adjustments to the JMF and meet the specified moisture sensitivity requirements.
### Spec 408/2016- Section 409

**Superpave Mixes**

**Change No. 3 (October 2017)**

<table>
<thead>
<tr>
<th>Nominal Max Agg. Size (mm)</th>
<th>Each Specimen</th>
<th>Multiple Specimens</th>
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</thead>
<tbody>
<tr>
<td>Air Voids at $N_{des} (V_a)$</td>
<td>±2%</td>
<td>±1.5%</td>
</tr>
<tr>
<td><strong>Min. VMA% for 4.75 mm mixes</strong></td>
<td>16.0</td>
<td>-</td>
</tr>
<tr>
<td><strong>Min. VMA% for 9.5 mm mixes</strong></td>
<td>15.0</td>
<td>-</td>
</tr>
<tr>
<td><strong>Min. VMA% for 12.5 mm mixes</strong></td>
<td>14.0</td>
<td>-</td>
</tr>
<tr>
<td><strong>Min. VMA% for 19.0 mm mixes</strong></td>
<td>13.0</td>
<td>-</td>
</tr>
<tr>
<td><strong>Min. VMA% for 25.0 mm mixes</strong></td>
<td>12.0</td>
<td>-</td>
</tr>
<tr>
<td><strong>Min. VMA% for 37.0 mm mixes</strong></td>
<td>11.0</td>
<td>-</td>
</tr>
</tbody>
</table>
Spec 408/2016- Section 419
WMA in SMA
Change No. 3 (October 2017)

WMA can be used with SMA
### Spec 408/2016- REMOVALS

Change No. 3 (October 2017)

<table>
<thead>
<tr>
<th></th>
<th>Bituminous Wearing Courses FJ-1 ad FJ-1C (Removed)</th>
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<tbody>
<tr>
<td>422</td>
<td>Bituminous Wearing Course FB-2 (Removed)</td>
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<tr>
<td>430</td>
<td>Bituminous Binder Course FB-2 (Removed)</td>
</tr>
<tr>
<td>431</td>
<td>Bituminous Wearing Course FB-1 (Removed)</td>
</tr>
<tr>
<td>439</td>
<td>Bituminous Binder Course FB-1 (Removed)</td>
</tr>
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<td>440</td>
<td>Bituminous Binder Course FB-1 (Removed)</td>
</tr>
</tbody>
</table>

Now in Pub 447: Approved Products for Lower Volume Local Roads

NECEPT
Spec 408/2016- Section 460
Tack Coat
Change No. 3 (October 2017)

• New Tack with half of the water of AET (faster curing)
• Inclusion of non-tracking tack coat
• Revision of application rates based on surface texture
Spec 408/2016- Section 483
Microsurfacing
Change No. 5 (October 2018)

Class of Bituminous Materials Changed

Used to be CSS-1hPM (E-8CPM)

Now it is CQS-1hPM
Spec 408/2016- Section 409
SP Mixes
Change No. 6 (April 2019)

Added

parking lot mixes to acceptance by certification
Spec 408/2016 - Section 409
Change No. 6 (April 2019)

Major Change to
the section on

Weather and Seasonal Limitations
Spec 408/2016 - Section 409
Compare with Current Spec

Weather and Seasonal Limitations (Current)

No mix placed from November 1 to March 31
Unless extension granted.

Paving Season Extension: No placement of mix between November 20 to March 20
Spec 408/2016 - Section 409
Compare with Current Spec

Weather and Seasonal Limitations (Current)

No wearing course placed between

October 1 to March 31

Or between

October 16 to March 31

(District/County Dependent)

For the following mixes

• for all PG 76-22 wearing courses,
• ≥10 million ESALs wearing courses,
Weather and Seasonal Limitations

Place between April 1 to October 15 for
- all PG 76-22 wearing courses,
- >10 million ESALs wearing courses,
- 4.75 mm wearing courses,
- wearing courses placed less than 1.5 inches (compacted)

Place between April 1 to October 31 for other mixes
Spec 408/2016 - Section 409
Change No. 6 (April 2019)

Paving in extended season

• Submit requests in writing at least 14 days prior work

• Group 1:  **April 1 to November 15**

• Group 2: **March 1 to December 15**

• Density acceptance will be by pavement cores,
  • Utilize a Material Transfer Vehicle (MTV) on any day when the paving length will exceed 1,500 linear feet
Paving work completed during the fall portion of the Extended-Season will be subject to a spring evaluation and manual survey by the Department to be conducted by May 1.

Manual surveys will be conducted in accordance with Publication 336.
<table>
<thead>
<tr>
<th>Performance Criterion</th>
<th>Threshold Level</th>
<th>Remedial Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue Cracking</td>
<td>All low, medium, high severity</td>
<td>R/R, as Section 496, Table A</td>
</tr>
<tr>
<td>Transverse/Miscellaneous Cracking</td>
<td>All low, medium severity</td>
<td>Crack seal as specified in Section 469</td>
</tr>
<tr>
<td></td>
<td>All high severity</td>
<td>R/R, as Section 496, Table A</td>
</tr>
<tr>
<td>Raveling/Weathering</td>
<td>All medium or greater severity</td>
<td>R/R, as Section 496, Table A</td>
</tr>
<tr>
<td>Rutting</td>
<td>&gt; ¼ inch</td>
<td>R/R, as Section 496, Table A</td>
</tr>
<tr>
<td>Flushing</td>
<td>All</td>
<td>R/R, as Section 496, Table A</td>
</tr>
<tr>
<td>Pothole, Loss of Bond, Delamination</td>
<td>All</td>
<td>R/R, as Section 496, Table A</td>
</tr>
<tr>
<td>Longitudinal/edge joint deterioration</td>
<td>All low severity</td>
<td>Crack seal as specified in Section 469</td>
</tr>
<tr>
<td></td>
<td>All medium or greater severity</td>
<td>R/R distressed layer full lane on both sides transversely of distressed area and a minimum of 24 inches beyond the distressed area in all longitudinal directions</td>
</tr>
</tbody>
</table>
Do not place bituminous paving mixtures when surfaces are wet or when the air or surface temperature is 40°F or lower.
Highlights from Section 409

Acceptance by certification is appropriate for **What mixtures?**

- Scratch courses
- Leveling courses less than 2 inch depth
- Mixtures used by Department maintenance forces
- Mixtures for local or municipal governments
- Mixtures placed in quantities not exceeding **500** tons in a continuous placement operation
- Mixtures used for parking lots
- All **4.75** mm asphalt mixture applications
Which mix parameters must be used to certify mixtures based on QC tests

- Asphalt Content
- Percent Passing the **2.36 mm (No. 8)** sieve (excluding 4.75mm mix)
- Percent Passing the **0.075 mm (No. 200)** sieve
Highlights from Section 409

Current Language in 409 on RAS

- 5% RAS
- Only manufactured waste
- Post-Consumer shingles not allowed
- Keep fiberglass felt and Paper/organic felt separate
- 100% passing 12.5 mm
Review of Tables in Section 409
## Section 409.2: MATERIALS

### TABLE A

**JMF – COMPOSITION TOLERANCE REQUIREMENTS**

<table>
<thead>
<tr>
<th>Gradation</th>
<th>Single Sample (n=1)</th>
<th>Multiple Sample (n≥3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passing 12.5 mm (1/2 inch) and Larger</td>
<td>± 8.0 %</td>
<td>± 6.0 %</td>
</tr>
<tr>
<td>Passing 9.5 mm (3/8 inch) to 150 µm (No 100) Sieves (Inclusive)</td>
<td>± 6.0%</td>
<td>± 4.0 %</td>
</tr>
<tr>
<td>Passing 75 µm (No. 200) Sieve</td>
<td>± 3.0%</td>
<td>± 2.0%</td>
</tr>
<tr>
<td>Asphalt Content</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.0 mm HMA mixtures and smaller</td>
<td>± 0.7%</td>
<td>± 0.4%</td>
</tr>
<tr>
<td>25.0 mm HMA mixtures and larger</td>
<td>± 0.8%</td>
<td>± 0.5%</td>
</tr>
</tbody>
</table>
## Section 409.2: MATERIALS

### TABLE A (Cont’d)

**JMF – TEMPERATURE OF MIXTURE, °F**

<table>
<thead>
<tr>
<th>Class of Material</th>
<th>Type of Material</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG 58-28</td>
<td>Asphalt Cement</td>
<td>260</td>
<td>310</td>
</tr>
<tr>
<td>PG 64-22</td>
<td>Asphalt Cement</td>
<td>265</td>
<td>320</td>
</tr>
<tr>
<td>PG 76-22</td>
<td>Asphalt Cement</td>
<td>285</td>
<td>330</td>
</tr>
<tr>
<td>All other PG</td>
<td>Asphalt Cement</td>
<td>As specified in Bulletin 25 (Specifications for Bit. Materials)</td>
<td></td>
</tr>
</tbody>
</table>
### Section 409.2: Materials

**TABLE B**

**JMF - VOLUMETRIC TOLERANCE REQUIREMENTS**

<table>
<thead>
<tr>
<th>Nominal Max Agg. Size (mm)</th>
<th>Each Specimen</th>
<th>Multiple Specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Voids at $N_{des} (V_a)$</td>
<td>±2%</td>
<td>±1.5%</td>
</tr>
<tr>
<td>Min. VMA% for 4.75 mm mixes</td>
<td>16.0</td>
<td>-</td>
</tr>
<tr>
<td>Min. VMA% for 9.5 mm mixes</td>
<td>15.0</td>
<td>-</td>
</tr>
<tr>
<td>Min. VMA% for 12.5 mm mixes</td>
<td>14.0</td>
<td>-</td>
</tr>
<tr>
<td>Min. VMA% for 19.0 mm mixes</td>
<td>13.0</td>
<td>-</td>
</tr>
<tr>
<td>Min. VMA% for 25.0 mm mixes</td>
<td>12.0</td>
<td>-</td>
</tr>
<tr>
<td>Min. VMA% for 37.0 mm mixes</td>
<td>11.0</td>
<td>-</td>
</tr>
</tbody>
</table>
Section 409.2(f).1: Materials

**TABLE C**
MIXTURE ACCEPTANCE

<table>
<thead>
<tr>
<th>Acceptance Level</th>
<th>Acceptance Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification Acceptance</td>
<td>Producer Certification of Mixture Section 409.2 (f) 2</td>
</tr>
<tr>
<td>Lot Acceptance</td>
<td>Mixture Acceptance Sample Testing Section 409.3(h) 2</td>
</tr>
</tbody>
</table>
Section 409.3: Construction

- **TABLE D.** - Re-adjustment of Lot Size and Associated Number of Sublots

- **TABLE E.** - Density Limits for Partially Completed Lots

- **TABLE F.** - Density Acceptable Levels & Criteria

- **TABLE G.** - Minimum Mixture Compacted Depths
## Section 409.4: Measurement & Payment

### TABLE H - Mixture Acceptance by Certification

#### Asphalt Content

<table>
<thead>
<tr>
<th>NMAS</th>
<th>Criteria</th>
<th>Value</th>
<th>PF, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>All sizes</td>
<td>Printed Tickets</td>
<td><strong>All least 90% is ± 0.2 of JMF</strong></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Less than 90% is ± 0.2 of JMF</strong></td>
<td>85</td>
</tr>
<tr>
<td>19 mm and smaller</td>
<td>QC Sample Testing</td>
<td>Single, n=1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>±0.7%</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>±0.8% to 1.0%</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; ±1.0%</td>
<td>RR or 50%</td>
</tr>
<tr>
<td>25 mm and larger</td>
<td>QC Sample Testing</td>
<td>±0.8%</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>±0.9% to 1.2%</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; ±1.2%</td>
<td>RR or 50%</td>
</tr>
</tbody>
</table>
**Section 409.4: Measurement & Payment**

- **TABLE H - Mixture Acceptance by Certification**
- **Gradation**

<table>
<thead>
<tr>
<th>NMAS</th>
<th>Criteria</th>
<th>Value</th>
<th>PF, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>All sizes</td>
<td>QC Sample Testing for % Passing #200 Sieve</td>
<td>n=1, ±3.0%</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n≥ 2, ±2.1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>±3.1% to ±4.0%, ±2.2% to ±2.7%</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; ±4.0%, ≥ ±2.8%</td>
<td>RR or 50%</td>
</tr>
<tr>
<td>All sizes</td>
<td>QC Sample Testing for % Passing #8 Sieve</td>
<td>±6%</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>±4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>±7% to ±8%, ±5%</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; ±8%, ≥ ±6%</td>
<td>RR or 50%</td>
</tr>
</tbody>
</table>
Section 409.4: Measurement & Payment

• Mixture Acceptance by Lots

**TABLE I**

– Asphalt Content
  • Single and Multiple Samples as per Table A \( PF = 100 \)
  • If any Single out or Lot Average out for Multiple Samples then Table K

– Gradation (No. 200)
  • Single and Multiple Samples as per Table A \( PF = 100 \)
  • If any Single out or Lot Average out for Multiple Samples then Table K
Section 409.4: Measurement & Payment

• Mixture Acceptance by Lots

TABLE I

– Density
– Non-Movement or Optimum Rolling Pattern  PF = 100
– RPS Wearing and Binder Courses
  • See Table I
– Standard Wearing and Binder Courses
  • See Table I
– 25 mm and 37.5 mm Base Courses
  • See Table I
Section 409.4: Measurement & Payment

• **TABLE J**
  – Upper & Lower Limits for Calculating PWL

• **TABLE K**
  – Payment Factor Based on PWL
Thank You!