Specification Review:
Asphalt Pavements, Part V

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2016 Louisiana Standard Specifications for Roads and Bridges

• 501 – Thin Lifts
• 502 - Asphalt Mixtures
• 503 - Asphalctic Concrete Equipment and Processes
• 504 – Tack Coat
• 505/6 – Prime coat and curing membrane
• 507 – Surface Treatment
• 509/10 - Cold Planing, Patching and Widening
Why?

- Compliance with FHWA
  - Reduced personnel
- Improve durability of asphalt mixtures
  - Maintain rutting resistance
502 Mixture Design Specification

- New Mixture Design Requirements
- Production Inspection
- Laboratory Evaluation
502 Asphalt Mixtures – General Changes

• Added SMA (Old 508) , and Asphalt Treated Base
• Added binder substitutions; Allow:
  – PG82-22rm, latex modified, hydrated lime mixture,
  – PG 70 for PG 76 if LWT is passing, when ADT allows
• Require Contractor QC data entry into data system
• Pay on Roadway Density of ton received on project.
• Measure smoothness of “project” instead of lot
• Changed Localized Roughness
Brief Summary of 502 Design Changes

• Two levels of design (1 and 2)
  – Gyrations
  – VMA
  – VFA
  – LWT
  – SCB
  – Rap $G_{sb}$ to replace $G_{se}$

• Note lift thickness limits of mix on JMF
• $G_{mm}$ from validation replaces design $G_{mm}$
• All laboratories must be accredited by AMRL or CMEC.
New Mix Design is Required

• No existing mix design will be accepted.
• Lab Tech to design new mix and all submittal will be done through LaPave
• District Lab Engineer will approve mix for the validation process.
  – Note: closely monitor effective specific gravity of the aggregate ($G_{se}$) and Percent binder absorption ($P_{ba}$)
502 - Asphalt Mix Design Changes

- Lowered Gyrations (Level 1 and Level 2)
  - L1: 65 Gyrations $N_d$
  - L2: 75 Gyrations $N_d$

- VTM Remains (Air Voids)
  - 3.5%

- Raised design VFA
  - 72%

- Raised VMA
  - 0.5% Increase for each NMAS
502 - Asphalt Mix Design Changes

• RAP Aggregate – Bulk Specific Gravity ($G_{sb, RAP}$)
  – Replace $G_{se}$ for composite mixture $G_{sb}$
  – Determine $G_{mm}$ of RAP mixture – Rice
  – Determine Asphalt Content – Ignition
  – Compute $G_{se}$
  – Back-calculate RAP Aggregate $G_{sb}$ – QA Manual
    • Assume asphalt absorption ($P_{ba}$) = 1%
  – Use back-calculated RAP $G_{sb}$ to compute composite $G_{sb}$ on JMF
502 - Asphalt Mix Design Changes

- LWT required for all mixtures – verified by DL
  - L1: 10mm @20K passes (maximum)
  - L2: 6mm @ 20K passes (maximum)
- SCB required for all mixtures – verified by LTRC – Pilot Projects
  - L1: PG 70-22m, 0.5 kJ/m² (minimum)
  - L2: PG 76-22m, 0.6 kJ/m² (minimum)
- Allow for 5% increase in RAP if “fractionated” -split on the 1”. (still must meet LWT and SCB)

Table 502 - 7
502 Production Changes

• Plant Inspector is being removed from the Hot Mix Plant on a daily basis.

• LADOTD is instituting the roving Asphalt District Inspector (ADI).
  – This inspector can inspect HMA on the roadway, at the plant, and at testing laboratories.

• The roadway inspector will inspect the roadway project as always.
502 JMF Validation

• Validation Lot is 2000 tons.
• ADI and Lab Tech will work together to produce the best mix in the middle of the spec.
• All mix information will be reported into LA Pave daily (cob)
• 5 roadway cores will be evaluated by PWL for mix design CONDITIONAL validation approval.
• 10 gyratory specimens for laboratory verification
  – LWT, SCB
502 JMF Validation

- Laboratory Verification
  - LWT (4 specimen: 60mm height, 7 ± 1% air voids) - DL
  - SCB (6 specimen: 60mm height, 7 ± 1% air voids) - LTRC
- LWT must pass for FINAL Validation Approval
- SCB verification for Information Purposes
  - Specimens evaluated by LTRC for Pilot Projects
• NO PAY PARAMETERs for the plant.
  – It is assumed that the mix produced is within JMF, contractor QC
• No daily Inspector present, he is roving.
• Contractor Lab Tech is running daily QC
  – reporting results: LA Pave excel spreadsheet emailed to Lab Engineer daily.
• JMF is reported as a P-Lot.
  – P-Lots are associated with JMF and are not job specific and have NO PAY parameters.
• JMF’s are revalidated every two years but never expire.
502 Asphalt Materials - New Terms

• Minor mix,
  – pay with mainline or paid per mainline methods if paved >7’.

• Other Minor mix, pay per tons received, 100%;
  – If voids at plant are out of spec; adjusted pay 5%.
Quality Manual

- Design Requirements, submittal forms, detail of mix design data required by DOTD, etc.
- QC/QA; Requirements of Contractor and minimum requirements of DOTD ADI.
- Example 1000 Ton “P Lots” ,
- Outline of Quality level analysis procedures, PWL etc.
- Example roadway lot and pay calculations
Independent Assurance Team

• Will be available on all large pilot projects in Contractors lab and District lab to review and assist quality team as needed. And will provide resolution testing.
• Team established to provide system analysis of contractors plant lab and DOTD district labs
• Provide performance review for every technician.
• Provide and analyze proficiency samples for all asphalt lab certified technicians
Certification

- Roadway Equipment is not certified, it is “verified” on the roadway by DOTD roadway inspector check list.
- Plant Certification every other year
- Technician Certification - 5 year cycle
  - Must have successfully demonstrated all performances.
  - All Proficiency samples to be distributed to each technician a minimum of once per year
- Accreditation
  - AMRL or CMEC
502 Acceptance, Verification, and Resolution – JMF By Lot

• Method 1:
  – 15 Acceptance – DOTD District Laboratory
  – 5 Verification – Contractor
  – 5 Resolution – Independent Certified Laboratory

• Method 2: (if contactor and DOTD sufficiently agree)
  – 15 Acceptance – Contractor
  – 5 Verification – DOTD District Laboratory
  – 5 Resolution – Independent Certified Laboratory
Roadway Lot (RL) Size

• Mainline RL = 37,500 linear feet divided in to 5 sublots = 7,500 linear feet.
• Mainline RL < 37,500 linear feet will be subdivided in to sublots, defined in the Quality Assurance Manual.
• Minor Mix (shoulder etc) = 1000 tons lots.
Table 502.11.1.1 Sampling

<table>
<thead>
<tr>
<th># of Mainline Roadway cores: Per 7500 ft. rdwy</th>
<th>Acceptance</th>
<th>Verification</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1 per 2500ft</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Method One, Tested by:
- District Lab
- Contractor
- Independent Lab

Minor.Mix Roadway cores:
- 1 per 1000 tons delivered to roadway sampled by roadway inspector and tested by District Lab for acceptance
  - When Approved by the district lab engineer.

<table>
<thead>
<tr>
<th># of Mainline Roadway cores: Per 7500 ft. rdwy</th>
</tr>
</thead>
</table>

1 Method Two, Tested by:
- Contractor
- District Lab
- Independent Lab
Sampling and Testing

- Acceptance Cores
- Verification Cores
- Dispute Resolution Cores
Statistical Analysis
PWL, F and t test

Minimum Density Spec. 92.0%

pdf for
$\geq 90\text{PWL} \Rightarrow 100\% \text{ PAY}$

$\mu = 93.9$
$1.282(1.492) \times 92.0 = 93.9$

$\mu = 93.5$
$1.282(1.166) \times 92.0 = 93.5$

Roadway Density (%)
Smoothness

• Measure IRI of entire project upon completion.
  – 65 IRI required for Interstate, 45 IRI =2% bonus

• Include localized roughness measure, 25 ft sliding baseline per Proval smoothness measure program available from FHWA.

• Exclusion of areas is allowed (manholes in urban areas, bridge tie-ins etc)
## IRI Table

<table>
<thead>
<tr>
<th>Percent Pay</th>
<th>102%</th>
<th>100%</th>
<th>95%</th>
<th>80%</th>
<th>50% Remove</th>
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</thead>
<tbody>
<tr>
<td>Category A</td>
<td>&lt;45</td>
<td>&lt;65</td>
<td>65-85</td>
<td>86-149</td>
<td>150</td>
</tr>
<tr>
<td>Interstate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Or 4 Treatments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cat-B 3 Treatments</td>
<td>&lt;55</td>
<td>&lt;75</td>
<td>76-95</td>
<td>96-149</td>
<td>150</td>
</tr>
<tr>
<td>Cat-C 2 Treatments</td>
<td>&lt;55</td>
<td>&lt;85</td>
<td>86-110</td>
<td>110-149</td>
<td>150</td>
</tr>
<tr>
<td>Cat-D 1 Single Lift</td>
<td>NA</td>
<td>20% Improvement</td>
<td>0-19% Improvement</td>
<td>&lt; Existing</td>
<td></td>
</tr>
</tbody>
</table>
Bump locations identified using ProVal

A Bump is defined as \( \frac{1}{4} \)" in 10 ft.

The use of the profilograph will be used to identify bumps using butterworth filter (TR644).

All identified bumps to be ground and checked with a 10 ft straight edge.
503 Equipment

• MTV required
• Lightweight MTV’s allowed
  – require temperature measuring device on paver
• Tack coat equipment improvements
503 Equipment Notes

- Require annual ASTM calibration for distributor.
- Allow lightweight mtv with Pave IR
- WMA foaming devices included
- Contractor blending of latex/rubber added
504 Tack Coat

• Added “trackless tack” emulsion
• Removed SS-1L and replaced with SS-1H.
• Pay separately for tack coat, by the gallon. ($2.50 - $3.00 per gallon)
• Increase the Design Rate of Tack rate. Ex. .03 min. to 0.06 gallon per square yard min. on new surfaces; (raised minimum tack rate on any surface to 0.04 gallon per sq yd.)
Questions?