Materials

SPECIFICATION CHANGES

- ASPHALT – Section 500
- CONCRETE – Section 900
- MATERIALS – Section 1000

LUANNA CAMBAS
DOTD MATERIALS ENGINEER ADMINISTRATOR
http://www.dotd.louisiana.gov/

Publications/Manuals

Standard Specifications

2006 Standard Specifications for Roads and Bridges Manual

Part V – Asphaltic Pavements
“Control F”
(type in your search word)
ASPHALT
502 - Superpave Asphaltic Concrete Mixtures

- Reformatted Section 500
  - No Marshall – 501
  - 502, Superpave - General, Materials, JMF, Validation, Plant QC, QA, Roadway QC, QA, Quality Level Analysis, Lot Sizes, Pay
Asphalt

- 503, Plant – moved batch plant to end, put roadway equipment together.
- 510, Patching, Widening and Joint Repair – NEW. Was 724.
Superpave

- Allow any mix type to be used for shoulders.
- Should be on plans as “Superpave Asphaltic Concrete”.
- PG 64-22 for shoulders and leveling.
# Mix Types and Levels

<table>
<thead>
<tr>
<th>TABLE 502-5</th>
<th>SUPERPAVE GENERAL</th>
</tr>
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<td>Wearing</td>
<td>Binder</td>
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<td>2</td>
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</tr>
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<td>2.5+ 4.0+</td>
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</table>
DESIGN MEMO

- > 35,000 ADT  SMA
- ≤ 3 Million ESALS  LEVEL 1
  - > 7000 ADT  LEVEL 1F
- > 3 Million ESALS  LEVEL 2
  - > 7000 ADT  LEVEL 2F
Mix Types

- No Level 3 Mixes
- No footnote on Level 2 mixes
- All base is level 1.
Mix Materials

- Clarified % of sand to be % of new aggregates
- Clarified % of RAP to be % of mix
Mix Parameters

- Changed maximum % of $G_{mm} @ N$
  - Initial
    - Level A 92%
    - Level 1 91%
    - Level 2 90%

- TARGET VFA = 73%
Roadway Cores

- Take 3 cores per subplot
- If add’l mix uses, take 1 add’l core per unrepresented mix use.
- Contractor required to provide approved transport container at no direct pay.
Roadway

- Liquid asphalt must be reapplied if exposed to traffic for more than 1 calendar day (was 2 days)
Paving

- During a screed malfunction paving must be discontinued for binder and wearing, not just for wearing.
Roadway – Surface Tolerance

- Longitudinal Surface Tolerance Incentive Pay:
  - Cat A
  - No pay penalties for surface tolerance
  - IRI ≤ 45
  - No grinding – UNLESS GRINDING IS WITHIN 300 FEET OF A BRIDGE END.
Roadway – Surface Tolerance

- Clarified the “existing surfaces” includes reconstructed bases without grade control.

- Reduced requirements for binder
  - Cat A - from 105 to 130 in/mile
  - Cat B - from 110 to 150 in/mile
Roadway Surface Tolerance

- Contractor to give smoothness data via USB flash drive.
503 – Equipment and Processes

- Require rates of all materials displayed digitally with quantity totalized.
- Have DEQ permits available during certification.
Asphalt Plant

- “Land-based” phone
- Lab in close proximity to plant operations
Asphalt Plant

- Required lab equipment to be calibrated and verified by test procedures and frequency of AASHTO R18, except that traceable standards and accreditation are not required.
Asphalt Plant

- Cold Feed
  Calibrations at 3 production rates
Asphalt Plant

- NEW AC tanks must have paddle-type mixers
- All AC tanks must have strainers and screens between tank and drum
Asphalt Plant

- Added RAP specs and fiber specs, both with separate feeder system, proportioning
- Storage time for unheated surge bins depends on temperature of mix (was 2 hours)
Asphalt Scales

- Changed wording for weighing mix for pay.

- Weigh hopper to print “certified tare of the truck, each batch wt, and total wt of mix loaded into the truck.”

- Platform scales to print “tare wt & and total wt of unit and mix. The truck must be weighed empty to determine tare wt prior to mixture loading.”
Asphalt Plant & Equipment

- Sampling platform - 15 Square Feet and Rails
Equipment

- MTV must abide by posted weigh limits.
- MTV shall be discontinued by PE if it causes base failures.
507 - Asphal tic Surface Treatment, AST

- Limestone and interlayer aggregates for hot application will not require precoat.

- No gelled asphalts
Interlayers may be placed during any month of the year.

Potholes will be repaired by DOTD prior to AST work, not prior to work order.
Raised pavement markers may be left in place when specified in plans.

How to tell if the pavement is too moist – with a piece of plastic.
Application rates shall be recommended by contractor and approved by engineer.

Provided guidance for application rates.
Interlayers shall be Type E and may be placed on

- raw or stabilized base
- milled surface
- between lifts of asphalt
- over Portland cement concrete pavement that will be overlaid with asphalt
AST

- Aggregate size and application rate are no longer to be specified on the plans.

- Measure and pay for Aggregate and Asphalt separately.
STONE MATRIX ASPHALT

TIED TO SECTION 502
508 - Stone Matrix Asphalt

- Shoulders can be SMA or any mix in 502.
- Fiber spec in 1002. No longer pre-approved.
- Minimum fiber rate of 0.1% by wt of mix.
Validation samples 1 in each third of 1000 tons.

Average of test results must meet specs.

No small quantity pay for SMA.
SMA

- Voids 3.5%, not 4%
- 3 cores per sublot, not 5.
- Use average density to determine deviation.
SMA

- Remove existing pavement markings before placing SMA.
Contractor shall place smooth transitions, a minimum of 1 foot/ ¼” of cold planed depth, at transverse joints prior to restoring traffic by milling or placing mix. RAP shall not be used.
MILLING

- Drainage of planed areas, when needed, shall be cut through the shoulder to the ditch the same day that the adjacent cold planing is performed.

- At no additional pay.
For single lift overlays requiring shoulder stabilization, 15 calendar days will be allowed between cold planing and paving, which may be extended further by the engineer. (was 30)
MILLING

- No additional measurement or payment will be made for multiple passes.
510 - Patching, Widening and Joint Repair

- No ½” NMS mixes for patching, widening.
- Level A mix req’d for Joint Repair
- Overwidths will be accepted at no additional pay.
Patching, Widening and Joint Repair

- Underwidth shall be corrected by furnishing and placing additional asphaltic concrete to a minimum width of 1 foot (0.3 m) and plan thickness at no direct pay.
901 - PORTLAND CEMENT CONCRETE
Concrete

- If plant breaks down, finish the pour from another plant, meeting 901.01.

- Certified Concrete Technician
  - Submits mix design
  - Is responsible for pour, but may utilize an Authorized Concrete Field Tester at site.
Concrete

- PE may authorize an increase in slump by use of water reducers for walls and diaphragms < 8” thick.
Concrete

- Class P, Class P(M) and Class P(X) concrete cylinders for compressive strength tests shall be cured by the same methods used in curing the members they represent.
Proportioning for volume of coarse aggregates in concrete mixes, (excluding concrete pipe, Types B and D pavement, and minor structure concrete) shall be in accordance with Table 901-1.
For Max Aggregate Size, Fineness Modulus, get Volume of Dry-Rodded Coarse Aggregate Per Unit Volume of Concrete.

For 3/4” aggregate, FM of 2.60, VCA = 0.64.
<table>
<thead>
<tr>
<th>Maximum Size of Aggregate, Inches (mm)</th>
<th>Volume of Dry-Rodded Coarse Aggregate Per Unit Volume of Concrete for Different Fineness Moduli of Fine Aggregate[^1]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.20</td>
</tr>
<tr>
<td>3/8 (9.50)</td>
<td>0.52</td>
</tr>
<tr>
<td>1/2 (12.5)</td>
<td>0.61</td>
</tr>
<tr>
<td>3/4 (19.0)</td>
<td>0.68</td>
</tr>
<tr>
<td>1 (25.0)</td>
<td>0.73</td>
</tr>
<tr>
<td>1 1/2 (37.5)</td>
<td>0.77</td>
</tr>
<tr>
<td>2 (50.0)</td>
<td>0.80</td>
</tr>
<tr>
<td>3 (75.0)</td>
<td>0.84</td>
</tr>
</tbody>
</table>
Trial Mixes

(1) Fly Ash
(2) Ground Granulated Blast Furnace Slag
(3) Microsilica
(4) Heavyweight Concrete
(5) Flexural Strength (when required)
(6) Unusual Materials and Applications
   not for SuperP
Concrete – Mix Adjustments

- May adjust the fine to coarse aggregate ratio no more than 5%.

- Type C is deleted.
Concrete Substitutions

- May use Pavement Type B for Type D, D for B.
- Small irregular areas may be substituted with Class A concrete.
Concrete

- Cement Type 1(B) and (1C) are not allowed.
- Mass Concrete $\geq 48''$ or on plans.
Cement

- In lieu of fly ash, the contractor may use grade 100 or grade 120 ground granulated blast-furnace slag up to 50% (was 45%) percent by weight (mass) of cement.
- Does not have to be at the plant.
Concrete

- Can use set-accelerator and a set-retarder together when needed.
- Final slump of mix with SuperP shall be appropriate to the application.
- Can be added to partial load.
Concrete

- Contractor to record amount of each material put into the mix.
- Only full standard bags of cement.
- Only Authorized Batcher or Certified Tech can add moisture content of aggregates to printed ticket.
Concrete

- In salty or corrosive environments, mix concrete for 2 minutes and carefully control water content.
- Water added at site should not bust the slump.
- Time limit is 90 minutes or 300 revs – whichever comes first. (PE can reduce time allowed.)
When the U.S. Weather Service forecasts temps < 35° in 24 hours after pour – need written approval.
<table>
<thead>
<tr>
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<th>Min. Cement, lb/yd³</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>2000 Specs</td>
</tr>
<tr>
<td>Class AA</td>
<td>611</td>
</tr>
<tr>
<td>Class A</td>
<td>564</td>
</tr>
<tr>
<td>Grade B</td>
<td>545</td>
</tr>
</tbody>
</table>
Concrete

- The **minimum cement factors** may be waived in writing by the District Laboratory Engineer provided the contractor's mix design meets the average compressive strengths in Table 901-3 plus the over-design compressive strengths in Table 901-4.
Concrete

- **Class A** 4400 psi in 28 days

- **20-29 Tests, with**
- Standard Deviation of 500 psi
- Need 760 psi additional
  - $4400 + 760 = 5160$ psi.
Concrete

- Pay based on 28-31 days
- Pay adjustments based on $350/CY (was $250/CY)
MATERIALS

- Section 10
Materials

- QPL -- is not blanket approval for its use
- may require
  - certificates of delivery, compliance, analysis
  - acceptance testing
  - verification testing
- Materials Sampling Manual
Materials – HYDRAULIC CEMENT

- Deleted Types I(B) and I(C) cement.
- Portland cement per AASHTO M 85
- Portland-pozzolan cement per AASHTO M 240 for Type IP cement
- Fly Ash per AASHTO M 295
Materials – Asphalt Materials and Additives

- Payment adjustment applies to quantity represented by the sample

- if no specific pay adjustments exist, the invoice price of the material shall be used

- Cleaned up footnotes
Materials – Asphalritic Materials and Additives

- Added Fiber spec
- Eliminated the pay penalty for viscosity
  SS-1  SS1h  CRS-2  CMS-2  CSS-1
  CSS-1h  CRS-2P  SS-1P  SS-1L
- Retained payment penalty for
  MC Cutback  EPR-1  AEP
Aggregates

- Deleted shell, sand-shell, and sand-gravel
- Polish value per AASHTO T 279
- The soundness test may be waived for Recycled PCCP
Aggregates

- Fine Aggregate
- Angularity will now be determined in accordance with DOTD TR 121, with weighted averages based on the aggregate portions passing the No. 4 sieve.
Materials – Joints

- Clarified min pressure for preformed elastomeric compression joint seals
- Deleted Reinforced Elastomeric Joint Seals
Zinc Paint Systems for New Structural Steel and 100 Percent Bare Existing Structural Steel - will be the preferred paint system for 801 structures

Topcoat of ends of weathering steel members shall match the color of the weathering steel
Deleted ASTM Type I and Type II reflective sheeting. Replaced DOTD Type VII (Fluorescent Orange) sheeting with ASTM Type X (Fluorescent Orange) sheeting.

Raised pavement markers shall comply with the compressive strength requirements per ASTM
Materials - Traffic

- Added field performance testing requirements for standard thermoplastic marking.
- Guarantee and corrective measures
- New requirements for water borne traffic paint.
Traffic

- Added moisture resistance flow characteristics for glass beads
Drainage Units

- Precast reinforced concrete drainage units and box culverts shall be listed on QPL 77.

- Compressive strengths for precast units and box culverts shall comply with ASTM C 76.
Epoxy Systems

- Changed the minimum epoxy equivalent weight value from 160 g/g mole to 155 For Types I, II, and III epoxy resin systems
Materials - Misc.

- Fertilizer - Added the requirements for fertilizer tablets.

- Seed Requirements - Added annual Rye
Materials - Misc.

- **Fiber Mulch Products** - Required fiber mulch products to consist of organic fiber mulches, not recycled

- **Water Management Gel** - Water management gel shall consist of acrylamide copolymer gel
Mycorrhizal Inoculant - In addition to live spores, Mycorrhizal inoculant may also consist of root fragments. Each Endomycorrhizal inoculant shall carry a supplier’s guarantee for the material. Also, the project engineer will verify the expiration date and shelf life of each container of material.
Compressive strength for the core for wall drains corrected from 308 kPa to 380 kPa.
“The covers of this book are too far apart.”

Ambrose Bierce (1842 - 1914)
“Hell, there are no rules here... we’re trying to accomplish something.”

Thomas Edison (1847 - 1931)
“Outside of a dog, a book is man’s best friend.”

“Inside of a dog it’s too dark to read.”

Groucho Marx (1890 - 1977)
Questions?

…“Control F”