SAW-CUTTING TO DRAIN ASPHALT PAVEMENTS

2006 Southeastern Pavement Management and Design Conference

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Only a measure of last resort

First saw-cut in May 2001

Not widespread activity
  - <10 projects to date
  - Only 1 in queue
WHERE’S THE WATER?

- Sags
- Crests
- Everywhere in between
In all cases to date, *not* groundwater
- Relatively impermeable aggregate base
- No alligator cracking or other base-subgrade failure distresses
- In subsurface drillings, have not seen it yet

Likely, trapped rainwater
- Average Statewide Precipitation: 50.78 inches (1895 to 2001)
WHAT DOES A DRAINAGE PROBLEM LOOK LIKE?
GA 400 Northbound
12.5mm Superpave
- Average Air Voids = 6.08%
- Standard Deviation Air Voids = 1.935
- 8.5% of mix placed (2013 tons) > 7.8% air voids

12.5mm SMA
- Average Air Voids = 6.34%
- Standard Deviation Air Voids = 1.511
- 9.6% of mix placed (2267 tons) > 7.8% air voids
12.5mm Superpave
- Average Air Voids = 6.85%
- Standard Deviation Air Voids = 0.942

12.5mm SMA
- Average Air Voids = 5.95%
- Standard Deviation Air Voids = 1.595

19mm Superpave
- Average Air Voids = 6.59%
- Standard Deviation Air Voids = 1.399

25mm Superpave
- Average Air Voids = 6.01%
- Standard Deviation Air Voids = 1.248
CONTRIBUTING FACTORS

- Construction joints
  - Lined up on top of each other
- Air voids
- Mix Gradation Bands
REPAIR DETAILS
NOTES:

1. LONGITUDINAL SAWCUT SHOULD RUN PARALLEL TO LOW END OF SUPERELEVATION.
2. DIAGONAL SAWCUTS SHOULD TIE INTO LONGITUDINAL SAWCUT.
3. SAWCUTS AT LOW END OF ROAD SECTION SHOULD TIE INTO DRAINAGE STRUCTURE, WHERE POSSIBLE, OR OTHER METHOD SHOULD BE PROVIDED FOR TRAPPED WATER TO EXIT PAVEMENT.
4. SAWCUTS SHOULD BE 1/4 -INCH WIDE.
5. SAWCUT SHOULD BE MADE TO BOTTOM OF ASPHALT LAYER WHERE WATER TRAPPED.
6. SAWCUTS SHOULD BE SEALED AT SURFACE.

APPLIES TO

<table>
<thead>
<tr>
<th>STATION TO STATION</th>
<th>LOCATION</th>
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<tr>
<td>118+50 ± TO 1127+00 ±</td>
<td>LT., RT., Q</td>
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<tr>
<td>RAMP 'AA'</td>
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SAW CUTTING DETAIL

NO SCALE
NOTES:

1. Repairs to southbound will be similar except cuts will drain into median.
2. Longitudinal sawcuts should run parallel to low end of superelevation.
3. Diagonal sawcuts should tie into longitudinal sawcut.
4. Sawcuts at low end of road section should tie into drainage structure, where possible, or other method should be provided for trapped water to exit pavement.
5. Sawcuts should be $\frac{1}{4}$-inch wide.
6. Sawcut should be made to bottom of asphalt layer where water is trapped.
7. Sawcuts should be sealed at surface.

REPAIR DETAIL

NO SCALE
DOES SAW-CUTTING WORK???
US 341 – Wayne County
GA 400 Southbound
GA 400 Northbound
(the week after a rain)
GA 400 Northbound – outside of saw-cut area
(the week after the same rain)
I-20 Westbound
I-20 Westbound
SR 124 – DeKalb County
SR 124 – DeKalb County
TWEAKING THE CUTS

- Try wider cut
  - Next time: ½ inch wide
  - May consider up to 1 inch wide

- Be more aggressive intercepting water
  - More cuts, where few places to drain
AN OUNCE OF PREVENTION...
Section 400
- Hot Mix Asphaltic Concrete Construction

Section 828
- Hot Mix Asphaltic Concrete Mixtures
SOME MAJOR CHANGES

- Gradation bands are finer
  - on #8 and/or
  - on #200
- Tightened air void requirements
- More realistic compaction targets
- Added permeability testing
NEW MIX SPECIFICATIONS

- Air voids
  - Target = 5%
  - Maximum = 7%

- Permeability ≤ 3.60 ft/day
9.5mm Superpave – Type 1
- Air voids = 5.8%
- Permeability = 0.0 ft/day

9.5mm Superpave – Type 2
- Air voids = 6.1%
- Permeability = 0.23 ft/day
IN-PLACE MIX PROPERTIES

- **12.5mm Superpave**
  - Air voids = 5.6%
  - Permeability = 1.35 ft/day

- **19mm Superpave**
  - Air voids = 6.1%
  - Permeability = 0.78 ft/day
IN-PLACE MIX PROPERTIES

- 25mm Superpave
  - Air voids = 5.1 %
  - Permeability = 0.0 ft/day
… and the engineers designed happily ever after…

THE END