

Flexible Pavement Committee Meeting

Minutes

December 19, 2005

Below are the Minutes for the Flexible Pavement Committee meeting held at the Turnpike Office at the Turkey Lake Service Plaza in Orlando, FL. The meeting started at 9:30 a.m. and concluded about 2:30pm.

1. FDOT Research update. A Power Point presentation was given by Greg Sholar. The presentation is attached to these minutes.

- a. NCAT Test Track. Round 2 complete. 20 million ESALs. FDOT Sections: fine mix rutted half as much as coarse (3mm vs. 6 mm). PG 76-22 mixes rutted less than 67-22. Other track observations: fine as good as coarse. Binder grade most important for rutting. SMA no better than Superpave for rutting – maybe better at cracking. Lab air voids mildly correlated to rutting for PG 67-22 – did not correlate well with 76-22. APA worked best with cores – not lab specimens.
- b. HVS. Next project: construction variability study. Vary air voids by changing P-200 and binder content to determine affect on performance. Hot box to be used to prematurely age pavements and see if they get top down cracking.
- c. Segregation study. Will look at performance vs. density, permeability, air voids, etc. Ultimate intent is to develop a performance based segregation specification.
- d. RAP Study: Looking at higher RAP mixes.
- e. Cross-walks: Occasional friction problems. Looking at texture measurements. British Pendulum Tester, Dynamic friction tester, circular texture meter.
- f. Porous Friction Course: I-295 test section. ¼” rutting. Marginal performance at this time. Not sure where we’re going next.
- g. No track tack coat: Looking at Blackledge & Mariani products. Mixed success to date. FDOT is still looking for a few more projects.
- h. Rotary Asphalt Wheel Tester. Developed by Pine – being looked at in lab.
- i. Hot In-Place Recycling. SR-471 Sumter County – some rutting. Forensic investigation completed – no assignable cause.
- j. Hybrid Binder. See below.

The application of research activities has resulted in the implementation of polymer modified asphalts PG 76-22 on Interstate projects and allowing either coarse or fine mixes for high traffic levels. FDOT is concerned about rutting on some I-10 Superpave projects and has established an I-10 Rut Task Group to review. Musselman to chair and 4 meetings are scheduled through Feb 2006.

2. Status of PG 76-22 Asphalt Index. Discussion by asphalt binder suppliers that the cost of polymer has increased more than the price of neat asphalt and recommendation by FPC to keep things simple by having a separate price index for modified asphalt (PG 76-22). Musselman to check with SCO and Final Estimates to find out what is happening since this was discussed at the last FPC meeting.

3. Update on 916 addressing comments received. Comments from Industry were received during the spec review process related to the time from sampling to supplier having test results. Wording clarified and time extended for both Specification Compliance and Quality Control testing since many suppliers are using remote secondary labs due to hurricane damage. Clarified wording on when initial Specification Compliance test is required. Added wording to reference AASHTO T40 for sampling. Added wording incorporating Construction Directive on Positive Spot.

4. Alternative tack coats (Blacklidge "trackless", CRS1h, ?). The Blacklidge material is polymer modified anionic material. Mariani CRS1h is a cationic "hard" asphalt. Both the FDOT and Industry are interested in reducing the "tracking" tack while achieving bond between layers. Some difficulty in finding projects to evaluate these materials. Projects where contract time is an issue may not be good candidates. Still working with suppliers on a materials spec that is reasonable and can be routinely met by the supplier. SMO will evaluate projects using these materials. To date, there has not been enough data to incorporate these materials into Specs. Some Districts are interested in evaluating AC as tack similar to what the Georgia DOT uses. Discussion by contractors that straight AC as tack is a big safety issue. Experience of District use of RA500 as tack for night work shared. Stay tuned.

5. Hybrid binder research project will be funded. Just received word from FDOT Research Center that the Hybrid Binder Evaluation project will be funded by FDOT. Discussion on the history and background for the project: Can binders using GTR/polymer combination have same performance as current PG 76-22 polymer modified binders? Project will be a lab study to evaluate 3-4 of these binders. First step will be for UF researchers and FDOT to choose the binders for evaluation. Stay tuned.

6. Binder supply issues? This has been a concern of FDOT and Legislature. Recent Construction Directive on Use of Positive Spot Material, and reopening of terminal source in Pensacola (Halcorp) in the near future should help with supply issues related to hurricane damage on Gulf Coast. Contractors have ability to change terminal sources with Mix Design revision, which helps asphalt supply issues in Florida.

7. Warm mix demonstration and FDOT direction. There are four basic methods of "warm mix technology (lowering of mix temperature by 40°F): 1) 2 component asphalt foam, 2) "wax" additive, 3) Zeolite additive, 4) emulsion. FDOT will evaluate the zeolite material as proposed by Hubbard Construction (OPC) on an FC-5 project on the Turnpike. Advantages lower emissions, ease in obtaining density, may help laydown at low ambient temperature of FC-5. Musselman coordinating evaluation. Stay tuned.

8. Update on CTQP asphalt courses. New updated versions of Paving 2, Plant 2, and Mix Design are on line. Feedback from instructors and students is that the courses are improved. There were some issues of "course availability" during the transition this summer when administrative structure and providers changed. It was noted that providers can be contacted about doing a course for a group at any location with the exception of Plant 1 and Paving 1 that require proficiency exams. It was noted that the Asphalt Plant Worksheet (Excel spreadsheet) is now an official form on-line. This allows the upload of data directly into LIMS. Implementation followed extensive development and training by McReynolds and Whitaker at SMO. The form has links to instructions in both video and written format.

9. FDOT position on coaching of persons who want to "challenge" CTQP exam. FDOT to allow but not encourage the coaching of FDOT employees to challenge the exam. Coaches do not have to be approved instructors. Cannot teach the exam. Can use manuals but not PowerPoint instructor materials. No official FDOT position of Industry coaching.

10. Need for a refresher/exam for requalification? Proposed by Industry for Paving 2 and Plant 2 with a specific "refresher exam". SCO position is that there is not a need to have a specific "refresher exam". Applicants must take current Paving 2 or Plant 2 exam. Opinions voiced that if there is no specific "refresher exam" then the value of the refresher course is moot. SCO has since decided not to develop any refresher courses.

11. Status of "pilots" of not having VT full time at plant. Musselman reported on status of "pilots": District 2 first piloted the approach of not having a full time VT at the plant in 2004. District 4 is currently evaluating a similar approach in Dade County where one or two IV inspectors rotate through four or five plants that are in the same area. District 5 is limiting the time VT's are at the plant. All of these approaches are also using an increase in the IV sampling and testing frequency. Multiple options are being considered by FDOT. Discussion that IV failures increase because increased IV sampling and testing. Discussion by Industry that it might be better to have one approach statewide for consistency.

12. Aggregate supply issues? Ongoing problem of transportation - both rail and water - particularly for Central Florida. RR indicates that better service can be obtained with larger trains, and terminals working on trying to get more space to hold material from larger trains, which will take some time. Aggregate supply issues getting better, but still a problem in some instances. Another issue that was discussed was the use of RAP. Can we use more RAP without compromising quality?

13. Revisions to 330-12. Basically the straightedging specification is being cleaned up and is currently out for review. Surface Requirements includes texture, cross-slope, and smoothness. Reorganized, reworded. Does not include laser but is compatible to add laser spec when it is standardized (see #14). QC testing by contractor and FDOT verification/acceptance. Two ways to correct structural course deficiencies: surface milling or remove & replace. Friction course deficiencies require remove & replace only.

Discussion by contractors and FDOT to allow engineer and contractor to work out the length (full lane width) of area to be removed and replaced. Need to make sure get density in area replaced. Contractors encouraged to review spec and comment. Additional discussion about the straight-edging of ramps with "tight curvature". The "real" zero point is some amount "low". Consider providing this guidance in the CPAM. Musselman to have SCO review.

14. What are the on-going activities related to smoothness testing? Next Smoothness Committee scheduled in Feb. There are a number of versions of the laser spec out for trial. The "standard version" to be included in all contracts with 330-12.6, is included in Construction Memorandum 14-04. Issues to be discussed at the Feb meeting include; incentive/disincentive specification, review of using 0.01 mile LOT's versus 0.01 mile LOT's for evaluation of smoothness, and if FDOT should be in the bump finding business or should this be contractor QC.

15. Why not sample behind the paver or at the paving site? This was brought up by SCO. Page provided response to SCO on history of pros and cons of acceptance sampling at paving site (representative of what is in road vs. safety to get sample, compaction of lab samples). Issue is being brought up because of FDOT's desire to reduce VT personnel at plant to reduce cost. Contractors also brought up reduced smoothness when sampling behind paver, and the effect on density due to delays in getting rollers on the mat. FDOT indicated advantages of obtaining IV samples at paving site if this can be done safely.

16. Small jobs and small areas. Small amount of FC-5 on projects. Is it possible to allow some flexibility in time (up to 3-4 months) to allow paving of these areas when paving FC-5 on another project? Lots of waste just to get a small amount of FC-5. Dietrich to contact Maintenance and Construction and see if guidance can be provided in CPAM. Contractors indicated there are inexperienced CEI field people who need reasonable guidance written down.

17. FC-5 in curb and gutter sections - rethink FC-5 usage notes. Contractors gave examples where plans require OGFC at or below gutter. Standard index shows OGFC no greater than 1/4in above gutter (because of ADA). Even with suburban situations, should not routinely have curb and gutter in high speed areas using OGFC. Dietrich will check out specific projects as requested. Discussion of OGFC in crossovers: District policy.

18. FC-5 working temperature recommendations, FC-5 with polymer modified PG 76-22 will be required for all traffic level D and E projects. Florida seems to be experiencing problems of drain-down, bleeding, fat spots, and texture that is not happening in Georgia with essentially the same mix. A/C: running mix at 330°F and recommend using Material Transfer Device (MTD). Pickup of small limestone aggregate particles a problem. Getting a representative sample of FC-5 for binder content a problem which is being worked on by SMO and Districts. OPC: I-4 used MTD and got better ride and texture than without. OPC is convinced the MTD is the way to go. Ajax

& Lane: Both have experienced problems with drain-down. Mariani: at 330°F modified PG 76-22 has viscosity similar to “neat” PG 67-22. MTD with remixing helps. Discussion by Musselman of OGFC empirical mix design procedure and lab tests for drain-down. SMO to look at a “rule of thumb” of setting polymer modified binder content the same as “neat”.

19. Reminder about laying FC-5 in nominal weather conditions and weather days/weeks. Same comments by contractors that CEI (particularly consultants) are reluctant to give weather time for not placing FC-5 in marginal ambient temperature. Comments by contractors that MTD helps in marginal ambient temperature conditions.

20. Material Transfer Device requirement on FC-5 with PG 76-22. FDOT: In general, the Department prefers to focus on end result versus method spec. However, in the case of FC-5 with polymer is it time to start requiring an MTD? It’s difficult to handle the problem with just an using incentive/disincentive spec for smoothness. Contractor comments: Some Contractors felt that the MTD should be required - at least for polymer modified FC-5. MTD will improve ride. But it is expensive, and has maintenance problems.

21. Discussion on ACAF proposed specification. ACAF got group together to review current 334 and had many recommendations to simplify. Recommendations included: simplify traffic levels, reduce VMA, reduce target AV at design, allow option of verification using plant produced mix, use of continuous RAP stockpiles (since most process RAP anyway), need both time and mix temperature for reheating for VT and IV samples, one time field initial production requirement for a mix, eliminate shut-down for IV gradation failure, IV sample resolution procedure, additional defective material options, binding EAR’s, allow contractor voluntary LOT termination, expand small production. FDOT asked Industry to consider a pass/fail system for lower traffic level (and small production). FDOT to review ACAF’s recommendations and ACAF to consider FDOT two tier acceptance: pass/fail and PWL bonus.

22. Cross slope: appropriate use/clarification of where slope checks apply. A situation where the cross-slope requirement on plan was waived because of curb and gutter etc, but contractor was still required to check and report the cross slope. This issue will be forwarded to the SCO for their input.

23. Current Status of Hot In Place Recycling. FDOT has a Hot In-Place Recycling (HIPR) Task Group which is evaluating different techniques, developing specs and policy. A new HIPR job was recently bid as an alternate to milling and resurfacing on SR-471 in Polk County.

24. Other: D-5. District 5 has looked at jobs which recently became deficient (as identified by the Pavement Condition Survey) and the average age was approximately 6.5 years. The data may be correct but will include situations where OGFC surface has deteriorated and just the surface needs rehab not the whole pavement structure.

Dietrich indicated that new pavement selection requires a minimum of 10 yr for asphalt and 50 yr for PCC. Dietrich to check to see if the D-5 calculations were done correctly and if there needs to be some standard method of determining the average pavement life to avoid any misinterpretation of data since it appears each district will be making this determination for pavements in their district.



Pavement Research Update

*Flexible Pavement Committee
December 2005*

NCAT Test Track



NCAT Test Track

- Round 2 complete.
- FL sections:
 - ◆ Fine-graded mix rutted half as much as coarse mix (3 vs. 6 mm).
 - ◆ PG 67 mix rutted 33% more than PG 76 mix (8 vs. 6 mm).
- Debate exists on measurement technique.

NCAT Test Track Other "Observations"

- Fine graded as good as coarse graded with respect to rutting. Fine less permeable, easier to compact and quieter.
- Binder grade most important for rutting.
 - ◆ PG 76 half the rutting of PG 67.
- SMA no better than Superpave for rutting. May be better at cracking.
- Lab air voids mildly correlated to rutting for PG 67 mixtures. Little to no correlation for PG 76 mixtures.
- Good QC \equiv Good performance.

NCAT Test Track

- Structural experiment sections cracked due to classic fatigue cracking.
- Four non-structural sections showed minor top-down cracking (not FL).
- APA had good correlation for roadway cores. Poor correlation for lab samples.
- Noise study:
 - ◆ Similar to FL results.
 - ◆ Fine mixtures quieter than coarse mixtures & OGFC.
 - ◆ Two layer or very thick (>2") single layer OGFC is quietest.

Heavy Vehicle Simulator (HVS)



Next HVS Experiment

- Construction Variability Study
 - ◆ Same mix.
 - ◆ Different laboratory air void contents (AC, -200).
 - ◆ Different levels of density.



HVS Hot Box



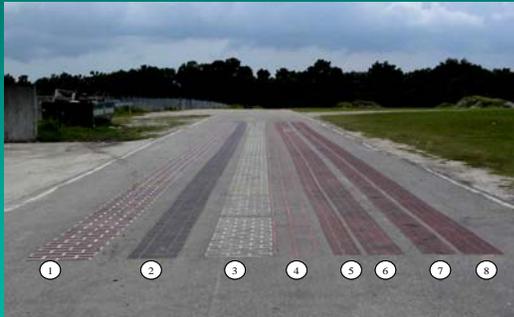
Segregation Study

- Examining segregated pavement sections.
 - ◆ Performance tests.
 - ◆ Non-nuclear density gauge.
 - ◆ AC and gradation.

RAP Study

- Examining effects of high percentages of RAP on performance.
 - ◆ Volumetrics.
 - ◆ Cracking test (IDT).
 - ◆ Rutting tests.

Crosswalks



Texture Measurement



Locked Wheel Tester



British Pendulum Tester



Dynamic Friction Tester



Circular Texture Meter

Porous Friction Course

- Coarser FC-5 (1/2, 3/8, #4 sieves).
- 1 1/4" thick.
- PG76-22 binder.



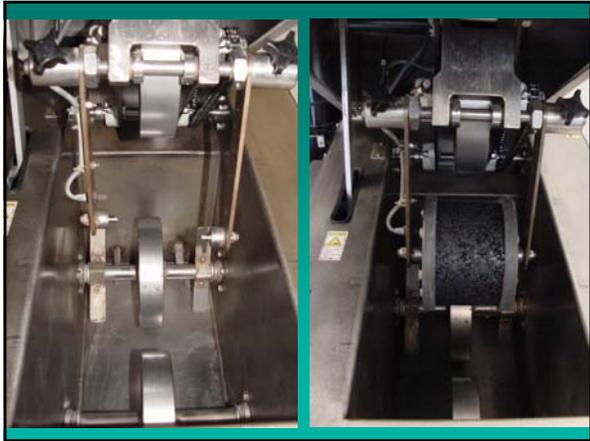
No Track Tack Coat

- Contains polymer, which minimizes tack tracking.
- Blacklidge and Mariani.
- Looking for a few more projects.

Rotary Asphalt Wheel Tester

- Developed by Pine Instruments.
- Tests a SGC pill under water.
- Ruts the cylindrical surface.









University Research

- Hybrid binder.

Thank You!

Comments / Questions?
