Heavy Vehicle Simulator (HVS)
HVS Track
Located in Gainesville, FL
HVS Loading

- 9 kip Load
- One direction
- 8 mph
- Super single tire
- Up to 14,000 passes a day
All asphalt rutting sections are tested at 50° C
HVS Instrumentation

- Strain gages
- Thermocouples
- Pressure cells
**Round #3**
- Testing completed last fall.
- 12.5 mm coarse mix vs. fine mix (both are traffic level D mixes).
- Georgia granite and local sand.
- PG 67-22.
HVS Round #3 Results

- Twelve sections tested.
  - 6 fine graded & 6 coarse graded.
  - 90,000 passes for each section.
  - Coarse section rut average = 15.1 mm.
  - Fine section rut average = 12.7 mm.
HVS Accelerated Pavement Aging System

- 85 degrees C.
- Should accelerate binder hardening in the pavement.
- Goal is to use the HVS to crack the asphalt.
- Current UF Research Project.
Round #2:

- FDOT left two sections from round #1 in place for another 10 million ESALs of traffic (2-years).
- 12.5 coarse vs. fine (unmodified binder, PG 67-22).
- 20 million ESALs applied.
  - Fine-graded mix rut depth = 3.1 mm.
  - Coarse-graded mix rut depth = 3.4 mm.
Fine-graded Mix

Section S6
NCAT Test Track Round # 2 (cont.)

- Constructed two new sections of 12.5 mm fine graded mix; PG 67-22 & PG 76-22 to match Gainesville HVS test sections (round #1).

- 10 million ESALs applied.
  - Unmodified mix rut depth = 6.5 mm.
  - Modified mix rut depth = 2.9 mm.
Sections E2 & E3

Fine mix with PG 67-22 & PG 76-22
NCAT Test Track
Round #3 Plan

- **Construct two new mixtures**
  - One with a high energy ratio (good cracking resistance).
  - One with a low energy ratio (poor cracking resistance).

- **Use Florida limerock base.**
  - Base material will be trucked to NCAT for construction.
Asphalt Pavement Analyzer

- Predominant laboratory rutting performance test in the U.S.
- Currently used by FDOT for:
  - Research.
  - Mix design verification of traffic level D & E fine graded mixtures.
  - Production testing (trial basis).
    - I-295 in Jacksonville.
Rotary Asphalt Wheel Tester

- Developed by Pine Instruments.
- Evaluating it in the Research Lab.
- Tests a SGC pill under water.
- Ruts the curved surface of the specimen.
Inside Views
Rotary Asphalt Wheel Testing

- Water temperature can be set up to 60 degrees C.
- Test can be extreme.
- Still evaluating testing parameters.
- Potential as a rutting and/or possibly a stripping test.
RAP Study

- Evaluate the effect of increased RAP on mixture performance in the lab.
- Varying percentages of RAP
- Laboratory Tests
  - APA
  - UF IDT (cracking)
  - Rotary wheel testing
  - Binder tests
- Fractionated RAP
Fractionated RAP
Segregation Study

- Comparing lab performance of segregated areas to uniform sections.
  - APA and UF IDT cracking test.

- Performance is controlled by the amount of coarse aggregate present not the level of segregation.
Core Dryer

- Able to adequately dry cores in about 15 minutes without damaging them.
- Can decrease density testing time.
- Density cores currently have to be dried for a minimum of four hours and preferably overnight.
Friction Test Sections

- **FC-12.5 (dense graded friction course)**
  - SR 121
  - SR 16

- **FC-5 (OGFC)**
  - SR 24
  - US 27
Hot-in-place Recycling
No Track Tack Coats

- Two new products.
- Results are mostly good.
  - Several good field jobs, one bad job
  - Trouble meeting lab specs
- Working on generic specification.
University and Contract Research

- New techniques for determining the adequacy of an asphalt mixture gradation.
- Simple IDT machine for cracking test.
- Evaluation of thick and bonded OGFC.
- OGFC’s contribution to cracking resistance in asphalt mixtures.
- Implementation and calibration of mechanistic-empirical design guide.
- Development of a construction quality index.
FDOT Research Reports

- Available on the internet.

http://www.dot.state.fl.us/statematerialsoffice/
Safety Research
Thank You!
Questions or Comments?

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