



## **SUPERPAVE VOLUMETRIC MIX DESIGN WORKSHOP 2005-2006**

This workshop is intended for technicians and engineers who understand and are experienced with the basic principles and procedures of asphalt concrete mixture design, testing, and voids analysis calculations. Applicants must be PENNDOT Certified Level 1 Plant Technicians to attend or equivalent for out of state participants. This workshop fulfills the volumetric mix design requirements for PENNDOT Level 2 Plant Technician certification. Classroom segments are included to familiarize participants with the Superpave system, along with 1-1/2 days of hands-on laboratory testing to evaluate a proposed Superpave mixture design. The Superpave Workshop session consists of two 1/2 - day blocks bracketing 2 full days. This workshop has been updated to reflect the latest changes in test procedures, specifications, and implementation information. Time required for the various sections may vary as needed.

The participants should accomplish the following towards successful completion of the course based on the 70 percent passing grade:

- Conduct laboratory tests as required by the course in a proper manner (25 percent of the grade)
- Prepare a simple report on the prepared Superpave mix design (25 percent of the grade) – See participant's reporting document below.
- Pass a written exam (50 percent of the grade)

The report must be submitted on the last day of the course and should include the following.

1. The Results of the Volumetric Calculations
2. Bulk and Apparent Specific Gravities of the Combined Aggregate
3. Effective Specific Gravity of the Aggregate
4. Maximum Theoretical Specific Gravity of the Mix
5. Bulk Specific Gravity of the Compacted Mix
6. Percent Air Voids for the Compacted Mix
7. Voids in the Mineral Aggregate (VMA)
8. Voids Filled with Asphalt (VFA)
9. Percent Density at  $N_{ini}$
10. Dust/AC Ratio
11. The Estimated Binder Content (i.e. the binder content giving design air voids content)
12. Volumetrics at the Estimated Binder content
13. Compaction Chart (percent density versus gyrations) for the Compacted Mix
14. Gradation Chart for the Aggregates Used

The formulas for calculation of volumetrics will be provided during the course.

The forms required for data recording and plotting compaction charts will be provided.

# SUPERPAVE VOLUMETRIC MIX DESIGN WORKSHOP COURSE AGENDA

## DAY 1, Tuesday

### SCHEDULE FOR LECTURE MODULE 1, PTI

Time	Topic
<b>1:00 – 1:45 p.m.</b>	Introduction to Superpave & Superpave Implementation
<b>1:45 – 2:15 p.m.</b>	Performance Grading for Asphalt Binders
<b>2:15 – 3:00 p.m.</b>	Materials Selection
<b>3:00 – 3:15 p.m.</b>	<b>Break</b>
<b>3:15 – 4:15 p.m.</b>	Materials Selection
<b>4:15 – 5:00 p.m.</b>	Gyratory Compaction

## DAY 2, Wednesday

### SCHEDULE FOR LABORATORY MODULE 1 and LECTURE MODULE 2, PTI

Time	Activity – All Groups
<b>7:30 – 8:00 a.m.</b>	Morning refreshments in B107
<b>8:00 – 10:00 a.m.</b>	Superpave Mixture Design: Step by Step Procedure & Design Example
<b>10:00 – 10:10 a.m.</b>	<b>Break</b>
<b>10:10 – Noon</b>	Weigh & batch aggregates for gyratory compaction of specimens or mixture design & AASHTO T283 (Room A1)
<b>Noon – 1:00 p.m.</b>	<b>Lunch</b>

## DAY 2, Wednesday

### LABORATORY MODULE 2: HANDS ON LABORATORY TESTING, PTI

Time	Activity – Groups 1 & 2	Activity – Groups 3 & 4
<b>1:00 – 2:00 p.m.</b>	Fine aggregate angularity; coarse aggregate angularity, fine & coarse aggregate specific gravity (Room C102)	Gyratory compaction of mixture design specimens (Room C101)
<b>2:00 – 2:50 p.m.</b>	Sand equivalent demonstration; flat & elongated particles (Room C111)	Gyratory compaction of mixture design specimens (Room C101)
<b>2:50 – 3:05 p.m.</b>	<b>Break</b>	
<b>3:05 – 4:05 p.m.</b>	Gyratory compaction of mixture design specimens (Room C101)	Fine aggregate angularity; coarse aggregate angularity, fine & coarse aggregate specific gravity (Room C102)
<b>4:05 – 5:00 p.m.</b>	Gyratory compaction of mixture design specimens (Room C101)	Sand Equivalent demonstration; flat & elongated particles (Room C111)
	<b>Dismissal</b>	

# SUPERPAVE VOLUMETRIC MIX DESIGN WORKSHOP COURSE AGENDA

## DAY 3, Thursday

### SCHEDULE FOR LABORATORY MODULE 3: HANDS ON LABORATORY TESTING, PTI

Time	Activity – Groups 1 & 2	Activity – Groups 3 & 4
8:00 – 8:30 a.m.	Introduction to AASHTO T283 Specimen Fabrication (C102) <b>with Morning Refreshments</b>	
8:30 – 9:00 a.m.	Gyratory compaction of T283 specimens (Room C101)	Measure bulk density of compacted specimens & Gmm (Room C102)
9:00 – 10:10 a.m.	Gyratory compaction of T283 specimens (Room C101)	Calculate & Analyze the Results
10:10 – 10:25 a.m.	<b>Break</b>	
10:25 – 10:55 a.m.	Measure bulk density of compacted specimens & Gmm (Room C102)	Gyratory compaction of T283 specimens (Room C101)
10:55 a.m.- Noon	Calculate & Analyze the Results	Gyratory compaction of T283 specimens (Room C101)
Noon – 1:00 p.m.	<b>Lunch</b>	

## DAY 3, Thursday

### SCHEDULE FOR LABORATORY MODULE 4: HANDS ON LABORATORY TESTING, PTI

Time	Activity – All Groups
1:00 – 1:45 p.m.	Bulk specific gravity of gyratory compacted T283 specimens (Room C102)
1:45 – 2:30 p.m.	Saturate T283 specimens, perform sample calculations, & discuss completion of test & evaluation of results.
2:30 – 2:45 p.m.	Review of the Rotational Viscometer, Superpave Shear Tester, and Indirect Tensile Tester
2:45 – 3:00 p.m.	<b>Break</b>
3:00 – 5:00 p.m.	Conduct Calculations and Prepare Report
	<b>Dismissal</b>

## DAY 4, Friday

### SCHEDULE FOR LECTURE MODULE 3, PTI

Time	Topic
8:00 – 8:30 a.m.	QC/QA for HMA and Construction Guidelines
8:30 – 9:30 a.m.	Report Submission and data analysis
9:30 – 9:45 a.m.	<b>Break</b>
9:45 – 11:00 a.m.	Course Quiz
11:00 – 11:45 a.m.	Quiz review, question & answer period, course evaluation by participants
	<b>Dismissal</b>

#### NOTES:

- Times shown for all activities are approximate & may be varied as needed.
- Lunch will be provided for all course participants during the 2 full day sessions as indicated on this schedule. Refreshments will be provided each morning.
- Parking passes for privately owned vehicles are available upon request to prevent ticketing by University police – these are for specific lots located only at PTI.
- You will need a calculator & pen/pencil to use in the laboratory and for the quiz.
- Long pants and closed toe shoes are required for testing activities in the laboratory – please dress appropriately for working with mechanical equipment and hot materials. Safety glasses and gloves will be provided.
- Participants are responsible for their own hotel accommodations. A list of local hotels including telephone numbers is available upon request. It is not always possible for NECEPT to arrange for discounted room rates for workshop attendees, but be sure to ask if such rates are available when making your hotel arrangements.