

TECH NEWS

TECHNOLOGY NEWS

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On the (concrete) road again

You might see one of ISU's newest laboratories rolling down a highway in Iowa — or in Texas, New York, or North Dakota.

Taking the lab to the field

Protocols for field testing concrete pavement materials and mixes lag behind improvements in laboratory testing. To bridge this gap, the Portland Cement Concrete Pavement Technology Center (the PCC Center) recently launched a new lab on wheels.

Housed in a 44-foot by 8.5-foot Featherlite trailer, the mobile lab makes it possible to conduct tests and collect data from many concrete pavement construction sites with relative ease and accuracy.

The mobile lab is equipped to take 25 different measurements. Many of the field tests have been modified from standard laboratory methods, and all are being evaluated by PCC Center staff. At the same time, contractor personnel and inspectors are getting hands-on experience conducting field tests and interpreting results.

Jim Grove, PCC research engineer, says, "These tests can produce quick, real-time answers to specific issues, allowing for real-time adjustments."

A national project

The mobile concrete lab supports the conduct of a multi-state, FHWA pooled-fund research project. Iowa is the lead state. The goal is to provide practical methods of integrating best materials and construction practices and controlling the quality of concrete pavement during construction.

As part of this project, PCC Center staff are taking the mobile lab to construction sites in each of the participating states.

A testing breakthrough

Researchers are particularly excited about the onboard air void analyzer (AVA). The AVA provides immediate information about the air system of plastic concrete; an adequate air system is critical for concrete roads subject to freeze-thaw cycles.

Previously, field application of the AVA has been almost impossible because the equipment is sensitive to vibrations.

To solve this problem, Bob Steffes, research engineer with the PCC Center, designed a trapdoor in the floor of the mobile lab. When the trailer is parked, an AVA-mounted tripod is lowered through the trapdoor and placed solidly on the ground.

This custom design has been successful. Test results have not been affected by movements including wind or people walking in the lab.

What does the future hold?

Grove, Steffes, and others are finetuning the field tests. A recommended "best practices" manual will be ready by fall 2005.

For more information

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Details about the research project and mobile lab, with more photos and information about the public-private partnership that funded the lab, are online, www.pcccenter.iastate.edu/mco/.
