

PAVEMENT TECHNOLOGY INCORPORATED

Over the years, various testing techniques have been developed to help with the production of asphalt paving mixtures which would perform well in the field. Under the Strategic Highway Research Program (SHRP), for example, the federal government spent more than \$50 million in an effort to develop equipment that could predict field performance.

The new pavement-design system called *SuperPave* had specs for the binder which took into consideration the temperature range over which the pavement was to be exposed. These new SuperPave mix designs also incorporated a new compaction procedure utilizing a gyratory-type compactor for Level One mix designs. The designs called for more sophisticated equipment for higher traffic loadings (Levels Two and Three).

Asphalt-pavement engineers were predictably uneasy about making such a major change in mix designs until they could get some practical experience with the new mixes. It became increasingly apparent that the industry needed some type of laboratory proof tester that would allow engineers to expose asphalt-mix samples to both rutting and fatigue.

Approximately five years ago, Ronald Collins, the Georgia DOT's research engineer, began working with Dr. Jim Lei of Georgia Tech to address this problem. The two men began to experiment with a loaded rolling wheel they theorized could accurately simulate actual field conditions. Through a series of adaptations and adjustments, this simple device became what the industry knew as the *Georgia*



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Loaded Wheel Tester. Three mix samples could be placed in this device in such a way that they could be simultaneously loaded and tested in a controlled laboratory environment.

The Georgia DOT was then able to correlate the test results from these devices with actual performance figures from the field, thereby proving that the device could predict how the mix would perform under actual field conditions.

While these early machines gave good indications of performance, their mechanical reliability was somewhat lacking. About two years ago, Collins discussed the need for an improved version of the equipment with Dr. J. Don Brock, chairman and CEO of Astec Industries. They agreed that Astec would build a prototype machine that would be more robust and more reliable.

When the Astec engineers began

to design the new machine, the need for additional features quickly became apparent:

- ❑ The new machine should have the ability to run samples both dry and under water;
- ❑ It should have the ability to lower the air temperature within the test chamber to 40° F (4° C);
- ❑ When running wet, the machine should be able to maintain control of the water temperature;
- ❑ The machine should be able to run fatigue tests at specified lower temperatures;
- ❑ It should be able to make test beams and cylinders in the same way they are produced in the field, i.e., by utilizing a vibratory compaction device.

The first prototype of the new testing device as it was developed by Astec's engineers was not a big success, primarily because it was given too many jobs to do. The engineers tried again—but this time they split the work to be done and built two separate machines: a vibratory compactor and an asphalt-pavement analyzer. This time they were successful.

The original intention of those involved in the research project was to build just a prototype machine. The manufacturing of the subsequent units had not been discussed. But as highway engineers saw the equipment, they began to request information about it. It quickly became apparent that this equipment needed to be manufactured in a focused facility. In addition, the project team recognized that other products were needed for the proper designing of asphalt mixes.

From these theoretical thoughts and considerations grew the con-

cept of a new company that was to become known as *Pavement Technology, Inc.* The new company was formed in the second quarter of 1996. Upon his retirement from the Georgia DOT, in October of 1996, Ronald Collins became the president of the new company.

According to Brock, the testing equipment currently in use across the industry does not really test the mix qualities most engineers believe should be tested. "There is no way," said Brock, "That the old equipment can take a sample, test it, and provide a dependable idea of whether it will fatigue or rut or both. The industry is in serious need of more comprehensive test methods.

"With Pavement Technology's new generation of testing devices," Brock continued, "mix designers and producers will be able to check exactly what kind of performance can be expected from a mix design before large amounts of money are spent placing it on the highway."

Pavement Technology's Asphalt Pavement Analyzer

This unit is actually an enhanced version of an experimental device called the *Georgia Loaded Wheel Tester*. The Asphalt Pavement Analyzer was developed by Astec engineers who worked closely with the Georgia DOT and Federal Highway Administration (FHWA). The device can effectively test samples for pavement deformation or rutting, moisture susceptibility, and fatigue cracking. These qualities make the Asphalt Pavement Analyzer the most universal testing device available in the industry.

Pavement Technology's Asphalt Vibratory Compactor

The Asphalt Vibratory Compactor is a machine that produces the special test specimens used in the Asphalt Pavement Analyzer. The unit is quite flexible in that it can produce either cylindrical samples or beam samples. Its vibration mode simulates the dynamic compaction used in the placement of asphalt mixes on

the roadway. Because of its simplicity, ease of use, consistency, and productivity, the Asphalt Vibratory Compactor is quickly becoming a popular tool in the industry. Test samples can be produced quicker and easier with the Asphalt Vibratory Compactor than with any other device that is currently available on the market.



The Asphalt Pavement Analyzer is a multi-functional loaded-wheel tester that has been successfully used for evaluating rutting, fatigue cracking, and moisture susceptibility of both hot and cold asphalt mixes.

Pavement Technology's Mobile Design Laboratory Hot-mix producers and designers are learning to live with new requirements for the SHRP SuperPave mix designs. To help them deal effectively with those new requirements, Pavement Technology offers a fully equipped mobile laboratory that simplifies

the design and testing of SHRP SuperPave mixes. The lab equipment includes all of the following items: an Asphalt Pavement Analyzer; an Asphalt Vibratory Compactor; a mini double-batch pugmill; a Laboratory Information Management System (LIMS); and all necessary office equipment, including a computer, scanner,

Pavement Technology's Mobile QC/QA Laboratory

A similarly equipped but smaller laboratory is offered for those producers or contractors who are called upon by their state agencies to provide approved testing and acceptance of asphalt pavements. This Quality Control and Quality Assurance (QC/QA) Lab will be delivered fully equipped and fully calibrated, ready to go to work for the producer or contractor. The unit measures 12 ft. (3.7 m) wide by 50 ft. (15.2 m) long.

An on-going process of research and development

These products—and others that are currently in the design and development stage—represent an innovative approach to some of the problems facing producers and contractors today. According to Collins, the high-performance mixes are here to stay because they meet today's demand for increased quality, performance, and lower life-cycle costs.

"At Pavement Technology," said Collins, "our product line has been designed to help the asphalt industry in general—and the producer in particular—as we adopt the new high-performance asphalt pavements. I personally believe Pavement Technology's biggest contribution will be to help in the transfer of technology that has been derived from what we have learned over the last 20 years.

"Our ultimate goal," Collins said, "is to make this new technology for asphalt-pavement testing readily available to producers and users nationwide." ▼▲▼

FOR MORE INFORMATION

about
Pavement Technology's
new line of testing devices
for improving quality
on paved surfaces,
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