

DESIGN TOOL

for quality-minded contractors

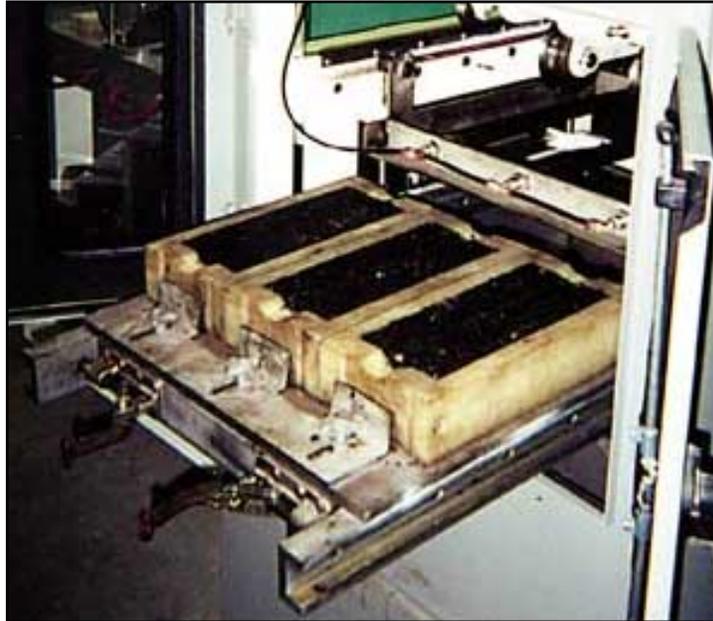
ONE SIMPLE, BASIC TRUTH prevails over the production of hot-mix asphalt (HMA) in the field: The quality of a mix design ultimately determines the performance of the pavement. Increasingly, the responsibility for helping to design the mixes—and therefore, the responsibility for ensuring a pavement's long life—rests on the shoulders of the producer. But a pavement's strength and life span cannot be reliably determined without the proper testing tools and procedures.

Today, more and more producers are discovering the advantages of two HMA-testing tools that are manufactured by Pavement Technology, Inc. (PTI): the Asphalt Pavement Analyzer (APA) and the Asphalt Vibratory Compactor (AVC). These machines put the power of performance-testing in the hands of the producer, and ensure that a mix is ready to perform up to any standard—whether those standards are Superpave, state department of transportation (DOT), or a private customer's specifications.

John Sullivan, asphalt-laboratory technician for Warren Paving, Inc. in Hattiesburg, Mississippi, said his company has used the PTI equipment for some time now, and that the APA and AVC have been valuable additions to their lab.

"The APA is a good mix-design tool," Sullivan said. "When we are designing mixes, this equipment gives us a good idea of how the mix will perform in the field. We have used it on on-going jobs as a quality-control tool, as well."

The APA is becoming an even more important quality-development and quality-assurance tool as growing numbers of state DOTs come to expect HMA producers



The Asphalt Pavement Analyzer puts the power of performance testing firmly in the hands of the hot-mix asphalt producer.

and contractors to participate in warranty programs on their work.

Trent Baldwin, quality-control director for Kokosing Materials, Inc. (a subsidiary of Kokosing Construction Company, Inc.) in Fredericktown, Ohio, explained the increase in warranty work his company has experienced.

"In our state, the trend is more and more toward warranty work," Baldwin said. "We are even seeing warranty projects on two-lane resurface projects. Those are three-year warranty projects. New construction carries a seven-year warranty. And rehabilitation or

'rehab' jobs usually carry a five-year warranty.

"Our ultimate goal," continued Baldwin, "is to provide a long-lasting, quality pavement that will meet or exceed our customers' expectations. We don't just try to achieve the seven-year warranty. We'd like to see the pavement last 15 or 20 years."

To meet this goal, producers like Kokosing Materials have chosen to invest in their own on-site laboratories, which include testing equipment like the APA and AVC. Each of these devices can be an extremely valuable tool for a pro-

ducer who is trying to predict the performance of a mix.

First, the AVC replicates the action of a vibratory compactor in the field, producing rectangular or cylindrical specimens of asphalt pavement. Both kinds of specimens can then be tested in the APA.

The APA is used to evaluate the mix for permanent deformation, fatigue cracking, and moisture susceptibility of both hot and cold asphalt mixes. This testing machine uses a multi-functional loaded-wheel tester that replicates years of highway wear in just a few hours. Producers say these tests are essential during the design process.

"We run trial batches when we work on mix designs," Sullivan said. "If we come up with a mix that we feel good about, we go ahead and run it through the rut tester to see how it performs. If it doesn't do what we would like it to do, we'll make some gradation changes to the mix and run a few more trials to try to get it stiffened up a bit so it will stand up better under the loads."

Larry Shively, vice president of quality control for the Thornville, Ohio-based Shelly Company, said his company had been testing mix designs for some time before purchasing the APA—but they had never had this kind of performance from a piece of laboratory testing equipment.

"We originally had a Georgia-style loaded-wheel tester, which was basically a manual measurement operation," said Shively. "We decided to go with the APA for several reasons: First, it was self-contained. Second, it was more automated. And third, it had some

other important features that were not available on the Georgia loaded-wheel tester.”

Once the APA had been installed in The Shelly Company laboratory and became fully operational, Shively said they began to discover even more advantages to the equipment.

“We are able to run more loaded-wheel tests in a more timely manner,” Shively said. “We can do that with the combination of the compactor (AVC) and this device (APA) because it is automated.”

“Also, we have been using the APA quite a bit for DOT mixes, especially for warranty projects where we have to guarantee against rutting. That was our primary focus from an application standpoint. But we really did find a lot of use for the APA with mixes for our private hot-mix customers, as well.”

Overall, the APA is able to take the guesswork out of designing mixes of all kinds. Sullivan said the APA has also proven to be a time-saver—and a tool that tends to benefit the reputation of the company.

“The Mississippi DOT requires samples of surface mixtures,” said Sullivan. “For that, they require that we submit to them two 75-mm (3-in.) cylinders for them to run through their own APA before they will approve the mix. But, having our own testing equipment here, it allows us to design a better mix.”

Exceeding customers’ expectations was a big factor in his company’s decision to purchase the APA from PTI, said Baldwin.

“The main reason we purchased it was to ensure that the product we were supplying to our warranty projects would exceed the threshold limits that were outlined in the plan,” said Baldwin. “We felt that with the large warranty projects we have, it was time to get on board and purchase one of these machines to help us predict pavement performance.”

Baldwin said that in the short time that his company has been running the APA, the technicians



Pavement Technology's Asphalt Pavement Analyzer or APA (top photo) is able to replicate years of wear on a sample of HMA in a matter of hours. The machine can evaluate with a high degree of precision key performance data, including permanent deformation, fatigue cracking, and moisture-induced damage. The samples used in the APA are formed in Pavement Technology's Asphalt Vibratory Compactor or AVC (bottom photo). This equipment is able to replicate the action of a vibratory compactor in the field to produce both cylindrical and beam specimens—which are then used in APA fatigue tests (as shown in the photo on the facing page).

in the lab have already made some interesting discoveries regarding the flexibility and versatility of the APA.

“One thing we have done—and we were fairly well pleased with the results—was to run both lab-produced and plant-produced mixes through the APA,” said Baldwin. “The results are, believe it or not, pretty close. I thought that the plant-produced mix would perform much better. But we’re seeing a close correlation between the lab-produced and plant-produced mixes.”

Shively said the APA has proven itself to be a very “versatile piece of equipment” in the time that they have been using it.

“We’re putting a lot of faith in the APA because we have to warrant a lot of our pavements against rutting,” Shively said. “We have to have some sort of dependable tool to predict its performance, rather than just the ultimate tool that everyone has been using—which is to wait three to seven years, as it sits on the highway, to find out that it actually ruts.”

“I think this tool is on the cutting edge of technology for our industry. It is the kind of tool that does you no good if you don’t use it. When you first look at it, you might think that maybe it’s just a fancy toy. But when you actually use it, you will discover that it is definitely a valuable tool!”

Much like APA users everywhere, Baldwin said his laboratory plans to keep the APA very busy evaluating their mixes in the future.

“I have about 150 mixes that I want the lab technicians to run through the APA,” said Baldwin. “I’ve got them running both fatigue- and rut-testing. And, once we get all those tests done, we are going to start doing some underwater testing to see what effect—if any—we get.”

“It’s true that PTI’s Asphalt Pavement Analyzer is a very expensive piece of equipment. But we think, in the long run, that it will pay for itself in the quality, long-lasting mixes our company will be able to produce.” ▼▲▼

FOR INFORMATION

about the Asphalt Pavement Analyzer, call Wade Collins at

888-553-2341

fax: 770-388-0149

e-mail: wadec@pavementtechnology.com