The first hot-mix plant built by Astec
Ordered in the Fall of 1972
and installed during the Winter of 1972-1973
The Astec Turbo Double Barrel® Drum-Mixer is the
Here’s a quick four-page

The Astec Turbo Double Barrel drum-mixer has a proven track record of being able to produce more mix at a lower cost-per-ton than any other drum-mixer on the market. There are two reasons for this remarkable achievement: (1) Astec’s unique design uses the entire length of the
BARREL

most popular production equipment on the market. overview of how it works:

1. Virgin aggregate enters the inside drum.
2. Aggregate moves through the inside drum.
3. Virgin aggregate exits the inside drum.
4. Virgin aggregate, rap, fines and liquid AC are mixed in the outside drum.
5. Finished mixture exits the outside drum.

Details on the next page.
Lower production cost, lower operating cost, That’s what you can expect from the

The design of the Astec Turbo Double Barrel drum-mixer is vastly different than anything else on the market. But that is because the process of mixing is totally different. This unique design combines the functions of a dryer and a continuous-process mixer in one compact and efficient system (see diagrams on opposite page). The results for the producer are substantial. It provides a clean operation, with minimal oxidation and emissions. The system permits remarkably high levels of control —so the quality of the finished mix can be precisely what the producer desires. Perhaps most important is the efficiency of the Astec Turbo Double Barrel drum-mixer and its ability to lower the producer’s cost per ton on a day-to-day basis.

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**OPERATIONAL EFFICIENCY STATISTICS**

**Virgin Mixes**
- Compared with a counter-flow drum mixer: The Turbo Double Barrel makes 9% more mix per hour—but it actually burns 3% less fuel.
- Compared with a parallel-flow drum mixer: The Turbo Double Barrel makes 15% more mix per hour than a parallel-flow drum mixer—but burns 5% less fuel.

**50% RAP Mixes**
- Compared with a counter-flow drum mixer: The Turbo Double Barrel makes 14% more mix per hour—but it actually burns 12% less fuel.
- Compared with a parallel-flow drum mixer: The Turbo Double Barrel makes 24% more mix per hour than a parallel-flow drum mixer—but burns 19% less fuel.
lower maintenance cost, higher trade-in value:
Astec Turbo Double Barrel® Drum-Mixer

Cool, damp virgin aggregate enters the high end of the drum and moves through the drying chamber by virtue of three different types of flights that are attached to the interior wall of the drum. The conditioning flights (A) break up any clumps or sticky material in the aggregate. The showering flights (B) help to veil the material evenly through the hot gas stream. And the combustion flights (C) keep the aggregate from interfering with the flame, while spreading the material to maximize the radiant heat transfer.

When the hot, dry virgin aggregate leaves the inside of the inner drum, it is held within the confines of the outer drum for the sequential mixing process. The desired ingredients are added to the aggregate in an order that allows better temperature equalization and a more even distribution of all particles throughout the mix. First, the RAP is added, then the fines and additives, and finally the liquid AC.

The Astec Double Barrel drum-mixer was designed to have a long mixing chamber that would provide extraordinarily long mixing times. When combined with the sequential mixing process, these long mixing times ensure uniform and consistent incorporation of all aggregates, materials, and additives. Even if you are dealing with high raw-material variance or heavily modified or sticky mixes, the Astec design helps you produce homogenous, strong mixes.
sometimes, all the pieces seem to come together to form a whole that is much more than merely satisfactory. In many cases, it is so good that it generates a lot of attention from the people who matter.

Putting together all the right pieces is something the people at Sherbrooke Asphalt, Inc. pride themselves in. And last year, that practice paid off in the form of a high honor for performance excellence from the Minnesota Department of Transportation.

Sherbrooke Asphalt is a relatively new name in the construction industry. The company, which maintains its headquarters in Detroit Lakes, Minnesota (about 45 miles east of Fargo, North Dakota), got its start 12 years ago when Bruce Sherbrooke and his father decided to start a full-service paving company in the northwestern region of Minnesota. Today, the operation at Detroit Lakes is entirely self-sufficient, with its own gravel pit, crushing equipment, a 400-tph (363 tonnes per hour) hot-mix asphalt plant, and a full line of road-construction equipment. They say with confidence that they are willing to take on any kind of paving job. “We do anything from highways to driveways,” said Bruce Sherbrooke, owner and general superintendent. “Plus, we can do custom crushing, Superpave crushing, aggregate wash… We go by the old saying: ‘No job is too small or too big!’”

During the summer of 2001, Sherbrooke Asphalt took on a $3.3-million Superpave contract to resurface a section of four-lane Trunk Highway (TH) 10, stretching 15.6 miles (25.1 km) from Frazee, Minnesota to Perham, Minnesota. In preparation for the project, they gathered together the right people, the right tools, and the right techniques—and they were able to complete the job in only about two months.

Sherbrooke Asphalt did not only do the job quickly, however. They also produced solid results that earned the company an award from the Minnesota Department of Transportation (Mn/DOT). Sherbrooke Asphalt was presented the Mn/DOT Merit Award for Construction Excellence in recognition of their resurfacing work on TH 10. The award said their work was “...deemed the best of its class completed in Minnesota during 2001.”

According to Sherbrooke, this award-winning project would not have been possible without putting together the right pieces. Here are some of the key tools that he said helped Sherbrooke Asphalt get the job done.

quality aggregate: base of any good paving job
One way that Sherbrooke Asphalt assures the highest quality hot-mix asphalt (HMA) is by crushing their own aggregate. This gives them a key advantage when they decide to take on sophisticated Superpave-specified projects, where the exact size and shape of the aggregate is important.
"We have our own gravel pit here on the same property as our hot-mix plant," said Sherbrooke. "We don't have any quarries in this area. A lot of people around here have to go into quarries and haul their aggregate long distances, but we are able to produce our Superpave aggregates right here."

Sherbrooke Asphalt's aggregate-handling equipment includes a portable plant manufactured by Telsmith, Inc. Material is fed onto a 48-in. x 20-ft. (122-cm x 6.1-m) vibrating grizzly feeder. Oversized material goes directly into the primary Telsmith 2250 jaw crusher, while undersized and crushed material is combined and fed onto a JCI 6-ft. x 20-ft. (1.8-m x 6.1-m) triple-deck screen. Oversized material off of the top deck is then circulated to a Telsmith 44S Gyrasphere cone crusher. The conveyors for this crushing operation were manufactured by Superior Industries, Inc. and Kolberg-Pioneer, Inc.

**Advanced technology: A necessity for Superpave**

Sherbrooke said it is absolutely vital to have modern equipment in order to compete for Superpave-specified contracts. According to Sherbrooke, your HMA plant must have the capability to easily handle different combinations of aggregate materials, a large percentage of RAP (without producing blue smoke)—and it must be able to produce the high volume of material that most highway construction projects demand.

To meet those needs, Sherbrooke Asphalt chose to use plants manufactured by Astec, Inc. They quickly outgrew the first Astec plant that they acquired in 1994, which was a 7-ft. (2.1-m) Double Barrel® facility rated at 300 tph (272 tonnes per hour). So in the spring of 2001, they traded it in for an Astec Turbo Six Pack®, with a production rate of 400 tph (363 tonnes per hour).

"The Astec Turbo Six Pack works very well," said Sherbrooke, "especially when we are running Superpave mixes."

The Sherbrooke Asphalt plant has a five-compartment cold-feed bin that allows the easy exchange of mix formulas on the fly. Two Astec storage silos and a portable self-erect bin increase the operation's flexibility by allowing the separate storage of different kinds of mix intended for different jobs. The silos can also provide a jump-start for the next day's paving.

**Perfect paving: An award-winning project**

After the right materials have been brought together into a Superpave mix, the mix is delivered to the roadway so it can be compacted into a smooth, even mat.

For the TH 10 resurfacing project, Sherbrooke Asphalt was required to replace 2 in. (5 cm) of milled roadway, plus an additional 1.5 in. (3.8 cm) of surface course. In all, the TH 10 project required about 100,000 tons (90,717 tonnes) of HMA.

At the center of the project was a Roadtec RP 185-10R rubber-track driven paver, which Sherbrooke Asphalt has operated since 1999. The rubber track of the RP 185-10R allows maximum tractive effort, as well as more even distribution of the unit's weight.

One feature Sherbrooke said he appreciates on the RP 185-10R is the electric-heated screed. "I love it," he said. "We have much less warping and easier control of the temperature. It has an automatic on and off, so it does not overheat or get too cold."

In addition to those benefits, the overall performance of the firm's Roadtec paver—both in its paving speed and in its paving quality—seem to be the features that impress Sherbrooke the most.

"We have Roadtec, Caterpillar, Blaw-Knox, and Cedarapids pavers," he said, expressing his direct and open opinion. "I don't care what anybody else says: Our Roadtec paver produces the smoothest mat that we have ever seen. We have made more money on incentives for smooth rides than ever before. There is just no comparison."
Asphalt Pavement Analyzer
A designer’s “crystal ball” that can help tell the future of mix designs

A COMPANY’S GUARANTEE
that its product will function as intended has always been the cornerstone of good relationships between the producer and consumer. It has been only recently, however, that the owners of the transportation infrastructure have begun to move that relationship a notch or two higher. In many cases today, they not only expect a performance guarantee from hot-mix asphalt (HMA) producers and paving contractors—they also require it.

Over the last few years, more and more states have been writing warranties into their design-build contracts—requiring the road-construction contractor to assume responsibility for the pavement’s durability and longevity. Most warranty contracts only cover the pavement’s life for 20 years or more. The increase in popularity of these pavement warranties is causing some HMA contractors to place a stronger emphasis on design testing, quality control, and quality assurance.

Other contractors, however, have always placed an emphasis on assuring long-lasting pavement designs—with or without the pressures of warranty contracts. The Shelly Company (part of the Oldcastle Materials group), was already looking for innovative ways to minimize defects in their asphalt pavements when Ohio—the state in which they are head-quartered—passed legislation to mandate warranty specifications in some projects. At that point, said Larry Shively, vice president of quality control for Oldcastle Materials, the company absolutely needed to get a tool to help them design longer-lasting pavements.

“Even before the warranty issue came up, we were looking at ways to minimize rutting in asphalt pavements,” said Shively. “Then, when warranties came about, it became a definite need to guarantee that we did not have rutting in our pavements.”

To help them make that guarantee, the Shelly Materials Quality Control Laboratory acquired an Asphalt Pavement Analyzer (APA) from Pavement Technology, Inc. (PTI). The APA is a multifunctional loaded-wheel tester that helps evaluate permanent deformation (rutting), fatigue cracking, and moisture susceptibility of both hot and cold mixes. In only a matter of hours, the APA can simulate literally years of wear on either cylindrical test specimens or rectangular test specimens.

Shively said the laboratory technicians dedicate about one week to each mix design. “It takes us a couple days to do a mix design. We proportion the mix and let it set. Then we compact the sample. And then it goes into the APA,” he said. “It usually takes two hours to do a pavement analyzer test.”

Once the asphalt sample is in the APA, the technicians can move on to working with another mix design because the APA is fully automated. A computer generates a report that contains measurements of the resulting deformation in the mix.

“Basically, the APA is a torture test to see if the mix is prone to rutting. If it does not rut within certain specifications, then we feel that the mix design is accurate, the materials are suitable... and we can proceed with the production of that material.”

—— Larry Shively
Vice President of Quality Control
Oldcastle Materials

FOR MORE INFORMATION
about the Asphalt Pavement Analyzer, call Wade Collins at PTI:
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E-mail: wadec@pavementtechnology.com

The accuracy of the APA makes the quality-control technicians much more confident when they are presenting their mix designs to their customers as durable and long lasting. That makes bidding on warranty-specified projects a little easier, of course. But it also helps them serve their private customers better. The key reason in acquiring the APA, Shively said, was simply to help the company turn out a quality product, week in and week out.

“I think it is important to note that we do not just use the APA on state mixes,” he said. “We use this on any mix design, including private mixes. We are using the APA to test pavements that go into large private parking lots, truck-stop parking lots, and FAA-regulated airports. We use it on a wide variety of applications.”

When asked whether he would recommend the APA to other contractors, Shively laughed.

“If they are our competitors, I hope they’re not using it,” he said. “That really sums it up, doesn’t it? I think the APA does give us an advantage.”
MOST PEOPLE EXPECT that a crushing plant in a hot-mix asphalt (HMA) facility will spend most of its time crushing reclaimed asphalt pavement (RAP). After all, RAP material is being used in increasingly higher percentages in today's HMA mix designs. But at the crushing plant that Warren Paving, Inc. bought a few years ago, only about 25 percent of the material that passes through its grizzly is RAP. The other 75 percent of the material the crusher handles is, interestingly, reclaimed concrete.

Warren Paving operates two HMA-production facilities in the state of Mississippi. One of the facilities is in the Hattiesburg area and that one has been in business for 45 years. The other one is about 70 miles (112 km) south in the Gulfport area and it has been in operation for about five years. Warren Paving’s main activities include road construction and paving, although they do handle some minor earthwork and utility work, such as waterline and sewer-line installation.

For years, Warren Paving had been crushing RAP at its Hattiesburg facility. But several years ago, the management at Warren Paving decided to focus the company’s attention on two areas: (1) they wanted to begin crushing operations at the Gulfport plant; and (2) they wanted to begin crushing salvaged concrete as well as RAP at both facilities.

The second area of their focus—crushing salvaged concrete—was part of a larger, more innovative picture. According to B. J. Sellers, manager of Warren Paving’s Gulf Coast Division, the company had discovered the usefulness—and the beneficial economic factors—of utilizing crushed salvaged concrete in some of their conventional road-construction projects.

“We’re using salvaged concrete for granular or aggregate base...and free...
material," said Sellers. "Most people around here use crushed limestone for base—but we’re using crushed concrete, instead."

Sellers added that concrete is much easier to find—and less expensive—than limestone. "We just put out the word that we will take it—and people are happy to find a place where they can get rid of it without having to pay a tipping fee," he said.

Keeping in mind their desire to crush concrete and to start up crushing operations at their Gulfport facility, Warren Paving purchased a portable crushing configuration that would help serve both purposes. The new set-up included a Telsmith 3055 jaw crushe, a Telsmith 5252 horizontal-shaft impactor, and a Telsmith 5 x 16-ft. (1.5 x 4.9-m) double-deck Specmaker screen.

According to Sellers, the simple portability of the plant was one factor that prompted Warren Paving to choose the Telsmith setup. Not only would the company get a plant that could handle large amounts of concrete and RAP in a timely manner, they would also get a plant that could be used at their Gulfport location, their Hattiesburg location—or just about anywhere else crushing needed to be done.

And Warren Paving was quick to take advantage of their new crushing system’s portability.

"We set up the plant here in Gulfport on August 31 of 2000 after it was delivered to us from the factory," Sellers explained. "And we started our crushing operations with it right away. Since that time, we’ve had it working fairly steadily."

In the first seven months after acquiring the plant, Warren Paving moved the plant to three different locations. Sellers said the ease of moving the plant makes it much more feasible to take the plant to the concrete instead of the other way around.

"It’s pretty easy to move," he said. "On the move from Gulfport to Hattiesburg—which is about 70 miles (112 km) away—we made the whole move in a total of four days. That includes tearing it down, moving it down the road, and putting it back up again. Four days, total. And there were no permit problems involved in the move, of course."

Sellers said they generally consider the amount of crushing that needs to be done before deciding to move the plant, though.

"Somewhere around 20,000 tons (18,143 tonnes) is the breaking point for moving or not moving the plant," said Sellers. "Any less than 20,000 tons and it usually costs about the same or less to hire trucks to haul the material to the crushing plant."

As for production rates, Sellers said the plant can process about 120 tons (108 tonnes) of material each hour.

"When we’re running the concrete base material, we are able to run the plant a little bit faster," said Sellers. "That’s because we are including the fines in with the mix and so we don’t have to cycle back through the plant as many times. The only thing that tends to limit us a little bit is our ability to load the crusher. But overall, we are very pleased with the production rates we have been getting."

When asked how the Telsmith crusher had changed Warren Paving’s operations over the last year and a half, Sellers said it has indirectly brought about a new understanding of the potential uses for salvaged concrete to the Mississippi area.

"We have increased the awareness of the use of crushed concrete for base material in the surrounding area," said Sellers. "We expect to be seeing more and more usage of the material." ▼▲▼

FOR MORE INFORMATION about this application, contact Bob Meyers at Telsmith:

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"Most people around here use crushed limestone for base," said B. J. Sellers, the manager of the Gulf Coast Division for Warren Paving, Inc. "But we’re using crushed concrete, instead." The portable equipment that the Mississippi-based company is using to crush both RAP and salvaged concrete is shown in these photos. There is the Telsmith 5252 HSI crusher (top); the Telsmith 3055 jaw crushe (middle); and the Telsmith double-deck Specmaker screen (bottom) that measures 5 x 16 ft. (1.5 x 4.9 m). According to Sellers, the equipment is remarkably easy to move. One of the company’s moves of 70 miles (113 km) was done in just four days, including tear-down, transport, and set-up at the new location.
Southern Nevada Paving has been doing business in Las Vegas since 1962, long before the current building and development boom. This Astec Turbo 500 Double Barrel® drum-mixer plant will help them meet their production demands.

“We bought a new Astec 8-ft. (2.4-m) drum in 1990. Then we bought a new Astec 7.5-ft. (2.3-m) Turbo Double Barrel drum in 1995,” said Meldrum. “And most recently, we purchased this Astec Turbo 500 Double Barrel plant.” Each of the company’s plants is in a different area of metropolitan Las Vegas. As anyone knows who has been to Las Vegas in recent years, the city is growing at an incredible pace, with new roads, hotels, and housing being built all the time. For an asphalt producer and contractor, Las Vegas is definitely a good and challenging place to be. Southern Nevada Paving has been there—helping the city along—throughout most of its growth cycles, including this period of booming growth.

Meldrum and his wife, Geraldine, started the company 40 years ago in 1962. “We got started doing some smaller paving jobs,” he said, “and as the years went by, we diversified and got some grading equipment.

“One of our first big jobs was in 1967 when we got a job as a subcontractor to help lengthen and widen the runway at Area 51 at the Nevada test site. We had a 15-day window to do the runway, and we had to work whatever hours we had to—7 days a week and 24 hours a day if necessary—to get that runway paved and back open for them.”

Since those modest beginnings, Southern Nevada Paving has gotten involved with numerous construction projects, including some along the famous Las Vegas Strip, as well as other projects related to the city’s growth.

“We’ve been involved with the grading, paving, and excavation for most of the major hotels along the Strip,” said Meldrum.

The continued demand for work in the Las Vegas area prompted Southern Nevada Paving to buy a hot-mix plant that could handle high levels of production. And the close proximity to the Las Vegas area prompted them to choose a plant that would easily meet strict Environmental Protection Agency (EPA) regulations.

“Basically, we picked Astec because we wanted to avoid the potential emissions problems faced by everyone in the industry,” said Meldrum. “We believed that Astec had the latest technology—and we wanted to get the best that we could buy. When it comes to emissions, we are convinced that the Astec plant is the best plant available on the market.”

After operating the company’s new plant at the Sloan location for

(Continued to Page 20)
several months, plant supervisor Anthony Freeman said he agrees with Meldrum’s initial assessment of the Astec plant.

“Definitely, as far as meeting the EPA’s emissions standards is concerned,” said Freeman, “I am convinced that Astec plants are the Cadillac of hot-mix plants.

Inspections are not that big of a deal anymore—because there are no emissions coming out of the stack at all. It’s just a night-and-day comparison between the Astec Turbo Double Barrel plant and other plants on the market. Astec definitely dominates the market for keeping blue smoke and paraticulates out of the stack at all. It’s just a night-and-day comparison between the Astec Turbo Double Barrel plant and other plants on the market.

In addition to the superior reduction of emissions that is provided by Astec’s double-barrel design, Freeman said the Astec plant has a number of special features that prove it was designed with a plant operator’s needs in mind.

“Overall, the whole plant is really, really well thought-out,” Freeman said. “Take the cold-feed bins, for example. They have new stainless-steel skid plates mounted under the conveyor belt instead of rollers. I see much fewer problems with this system than I have seen with other systems in the past.”

The Astec Turbo Double Barrel drum-mixer plant Southern Nevada Paving purchased also has an automatic sampling chute that is mounted at the inlet to the drum. This optional feature makes it possible for the operator to collect an aggregate sample—in a matter of seconds—simply by pushing a button in the control house.

“My new aggregate sampler in the Astec Turbo Double Barrel is too—and we wanted to get the best that we could buy.”

“Basically, we picked Astec because we wanted to avoid the potential emissions problems faced by everyone in the industry. We believed that Astec had the latest technology—and we wanted to get the best that we could buy.”

Desert Plant Oasis
(Continued from Page 19)

Freeman added that having an automatic sampler is more than a convenience for Southern Nevada Paving: As far as he is concerned, it is a necessity.

“When we do paving jobs for the California DOT, they keep a very close eye on the aggregate we’re putting in the mix,” said Freeman. “We have to be ready to sample it at any given time, whenever the officials want it. So, if you’ve been running the plant at 400 tph (363 tonnes per hour) and you have to stop the plant to send somebody out and take a sample of the material—and if it takes you 30 minutes to get your production back up speed... Well, it’s easy to see that you just lost quite a bit of production.”

In addition to being able to run continuously—without stopping for periodic aggregate samples—Freeman said the Astec plant promises to meet its rated output of 500-tph (454-tonnes-per-hour) without any problems.
“We haven’t had the opportunity to run our new Astec plant at full production yet,” said Freeman in an interview that took place in September. “So far, I’ve had it up to 475 tph (431 tonnes per hour)—and even then, I was running out of silo storage or truck capacity. But I’m sure it will run at 500 tph with no problem.”

From a maintenance and troubleshooting viewpoint, Freeman said the design of Astec’s relocatable plant is helpful. There are features in the relocatable design that he much prefers over portable and stationary HMA plants.

“As opposed to portable plants, the relocatable plant is raised up off the ground,” said Freeman. “For that reason, you can easily clean under almost everything, almost every plant component. Plus, you can see when there is a spill so you can get it cleaned up before it adversely affects your day’s production.”

“Maintenance and repair are easier with a relocatable plant, too—and that’s because everything is right at eye level. So you don’t end up rolling around on the ground trying to work on the augers for your baghouse, for example.”

The basic, logical design of Astec hot-mix plants is something that makes them continually attractive to Southern Nevada Paving, in the opinion of supervisor Bob Hover. He helped set up the new plant at Sloan, adding yet another chapter to his relatively long history of experience with Astec plants.

“This is the third Astec plant I have set up,” said Hover. “We didn’t have much trouble at all when we were erecting it. But, then, after doing a couple of them, you learn what needs to be done—as well as the order in which it all needs to be done.”

After getting to know several Astec plants well, Hover said the manufacturer and its products are simply a pleasure to work with. “I think we have a pretty satisfactory rapport with Astec,” he said. “The equipment design is good. The engineering is good. And the parts-support is good.”

In spite of all the positive things that different individuals within the company had to say about their new Astec Turbo Double Barrel drum-mixer plant, the key factor is something intangible. According to Freeman, Southern Nevada Paving’s satisfaction with Astec equipment all comes down to one thing: the low emissions.

“We haven’t had the opportunity to run our new Astec plant at full production yet.
So far, I’ve had it up to 475 tph—and even then I was running out of silo storage or truck capacity. But I’m sure it will run at 500 tph with no problem.”

Southern Nevada Paving handled most of the installation and erection of the new plant with its own personnel, although Astec was available to provide whatever technical assistance that was necessary. To the first-time visitor, the plant site is unusual, mainly because the quarry operation is located on mountain above the plant (photo on right). In the photo, you can see the white spill of material that has cascaded down from the quarry.
The concept of “Perpetual Pavement” was recently used on a segment of Interstate 35 near Laredo, Texas. According to all those involved, the project should serve as a model for new road construction in the future.
resist rutting and also provide a high-quality riding surface for the foreseeable future.”

Although the kind of Perpetual Pavement design chosen for the I-35 project has only recently begun to gain the attention of some state DOT engineers, it is a concept that has been around for decades. One of the key elements of the I-35 Perpetual Pavement design is an SMA layer—a stone-on-stone structure that is very resistant to rutting. With a combination of special designs, such as an SMA surface course, deep-strength pavement, and the Superpave design system, Perpetual Pavements can last for decades with only minor maintenance to the surface course.

“Based upon what we have seen—combined with experience that we get from Europe, Maryland, and Georgia, where these mixtures have been used—these SMA mixes last a very long time,” said Fitts. “We haven’t seen a real need to replace any of these pavements when they are designed and constructed properly.”

Since most contractors have never had the opportunity to work with true Perpetual Pavement designs, the Texas Asphalt Institute and the Asphalt Alliance offered a primer course to the contractor who was awarded the paving project—Gilbert Texas Construction, L.P.—as well as TxDOT’s inspection personnel. This helped both parties develop an understanding for the properties unique to this pavement design and the equipment needed to handle it properly.

According to Scott Roe, the I-35 project superintendent for Gilbert Texas, the contractor overcame several challenges throughout the project. First, of course, was the challenge of learning to work with a completely new kind of hot-mix asphalt (HMA) formula, both in the lab and during paving. To produce the HMA necessary for the I-35 reconstruction, Gilbert Texas used an Astec Dual Drum Mixing System. This type of plant is specifically designed for producers who handle a large amount of extremely abrasive aggregates in their mixes. The Astec Dual Drum Mixing System features two drum components that work independently of each other, one used to dry the aggregate and the other used to add the liquid asphalt cement to the aggregate and mix it to the desired consistency.

The Astec Dual Drum Mixing System used by Gilbert Texas features a 9-ft. (2.7-m) portable aggregate dryer and an 8-ft. (2.4-m) portable mixing drum. According to Fitts, Gilbert Texas sought out some of the toughest aggregate available in their area—aggregate so tough that it created an application that the Astec Dual Drum Mixing System was designed for.

“The materials they used were among what are considered some of the hardest, most durable aggregates that we have available in the state of Texas,” said Fitts. “Knippa traprock, a basalt source quarried by Vulcan Materials, Inc. about 70 miles (113 km) west of San Antonio, was the principle coarse aggregate used for each of the mixtures.”

In addition to the toughness of the aggregate used in the project, Gilbert Texas’ lab technicians discovered a challenge while running their quality-control tests. “In the 1-in. (25.4 mm) nominal-sized base mix, they encountered some problems with variability in some of the test results they were getting,” said Fitts. “The specific gravity of the traprock is over 3.0, which is considerably heavier than most materials. Consequently, if you only take a small sample, all it takes is one big rock to throw the test results off—to create a lot more variation than you might normally expect with a normal-weight aggregate.

“That was one problem that they had to work through, but they were able to conquer it.”

When the HMA arrived at the paving site, Roe said the paving (Continued on Page 24)
crews encountered another challenge related to the unusually tough aggregates in the mix. “The Perpetual Pavement design worked really well on this project, but it was definitely challenging in the beginning,” said Roe. “It is a little bit of a different animal to handle—but once we got it under control, we were very happy with how it worked out.”

One factor that initially complicated construction was compaction. It was a problem that was a direct result of the pavement’s heavy-duty nature.

“One interesting thing that Gilbert Texas ran into was that the mixtures were very resistant to rutting—but as such, they were very resistant to compaction as well,” said Fitts. “The contractor was able to successfully achieve compaction in the field, but they had to fight with it. Consequently, we never expect this mix to rut. We don’t think it’s going to move out there at all.”

Another difficult aspect of the project, according to Roe, was that the paving crews were working in a trench 13-in. (33-cm) deep. The first phase of the project involved milling 13 in. of the existing surface and base, leaving the shoulders in place. As a result, the paving crews were faced with a unique situation where trucks had limited access to the pavers. Luckily, said Roe, Gilbert Texas paving crews had the benefit of being equipped with a Roadtec Shuttle Buggy® material-transfer vehicle, or MTV for short.

“Paving in a trench was a little different,” said Roe. “It presented a challenge as far as access for trucks. But the Shuttle Buggy MTV really helped that situation, because we were able to keep the MTV out of the trench and still feed the hopper on the paver while it worked down inside the trench.”

The delivery of the asphalt to the paver was possible because of the Shuttle Buggy MTV’s ability to rotate its conveyor 55 degrees to either side of center. The Shuttle Buggy MTV would follow the paver from the shoulder of the road, moving the hot-mix asphalt from the end-dump trucks to its own hopper and then to the paver’s hopper. While transferring the material to the paver’s hopper, the Shuttle Buggy MTV also remixes the HMA. This reduces—and in fact, almost eliminates—temperature segregation, one of the main causes of premature pavement failure.

“We have been using Roadtec Shuttle Buggy MTVs for about four years now. In that situation with the trench, it really worked out well for us,” said Roe. “Plus, we didn’t experience any segregation—there were not any temperature differentials at all.”

Despite the learning curve typical of working with any new kind of paving design, the project was completed smoothly and quickly. In fact, the company finished the job with about ten weeks to spare, according to Scott Dysthe, the project sponsor for Gilbert Texas.

“They gave us 19 months, and we did it in nine,” said Dysthe. “We like to get in on a job and get out. We don’t let things drag. Some of our best people were working on that job—and that’s what made it happen.”

While the job was completed in a short time-span, Fitts said it can be expected that this pavement will last far beyond the time it took to complete it.

“This project was designed with the Perpetual Pavement concept. Because of the way we designed the pavement’s structure, we do not expect cracking to begin at the bottom,” said Fitts. “Instead, we expect any type of problems to occur from the top down. But, by using an SMA wearing course, we don’t expect any of those types of problems to occur for a very long time.”

The success of the I-35 project—both in its execution by Gilbert Texas and the apparently durable design—has paved the way for similar projects in the near future in the state of Texas.

“The conduct of this project led the Laredo District of TxDOT to let another similar project on I-35’s northbound lanes, immediately north of where this one ended,” said Fitts. “And hopefully, we’ll see this spread throughout the state to areas that have, in the past, only considered Portland Cement Concrete.”

He added that experience from this project has sparked several ideas for handling this kind of Perpetual Pavement project in the future.

“Personally, I would recommend to any department of transportation that is interested in this kind of project to have a pre-bid conference where they can introduce the peculiarities of the project and the mixture-design requirements to the mix producers and the paving contractors,” said Fitts. “These mixes are different from anything most Texas contractors have ever dealt with. A pre-bid conference will tend to give them a chance to fully understand what they will be dealing with before they go to bid on the project.

Fitts also suggested followup meetings and interaction between participating teams as a way to ensure quality work.

“Immediately before starting the project,” said Fitts, “it is useful to review the mixture designs, HMA production, placement, and compaction with the contractor’s field personnel and the agency’s inspectors. The more specific this can be for the materials and conditions on the project, the better. These aren’t your run-of-the-mill overlay projects—and we must do what we can to assure that they perform as they are designed to perform.” ▼▼▼
HERE ARE SOME OF THE SPECIFICATIONS FOR A TYPICAL HEATEC SUPPLIED LIQUID-AC TERMINAL:

**Two API 650 Liquid-AC Storage Tanks**
- Dimensions: 134 ft. (40.8 m) diameter x 40 ft. (12.2 m) high
- Capacity of each tank: 100,000 barrels
- 4-in. (10.2 cm) fiberglass insulation on walls of the tanks
- 4-in. (10.2 cm) mineral wool insulation on the roofs of the tanks

**Two Model HCT-800 Helical Coil Hot-Oil Heater Systems**
- Each hot-oil heater system includes:
  - A two-pass helical coil heat exchanger with an output of 8,000,000 Btu per hour
  - A single-pump hot-oil circulation system
  - A burner capable of using either No. 2 fuel oil or natural gas
  - A NEMA 12 control panel and all necessary system controls
  - A 1,000-gal. (3,785-L) remotely mounted hot-oil expansion tank

**One No. 2 Fuel Oil Storage Tank**
- A stationary vertical tank with a storage capacity of 25,000 gal. (94,634-L)
- Dimensions: 41.6 x 12.1 ft. (12.7 x 3.7 m)

**Truck Loading Station**
- The truck loading station includes the following:
  - Loading rack is equipped with loading positions for two tank trucks
  - Three 6-in. (15.2-cm) liquid-AC pumps
    (one for loading the storage tank; two for loading tankers through the loading rack)
  - Heat exchanger designed to boost liquid-AC temperature on the way to the rack
  - Piping for liquid-AC from unloading pump to the liquid-AC tanks
  - Two (2) fully electronic 80 x 10-ft. (24.4 x 3-m) low-profile truck scales
  - Fully computerized truck loadout management system
  - Station also includes pipe bridge, loading arms, and operator shelter
AN AC TERMINAL

Heatec recently announced that the company is available to provide turnkey installation of complete liquid-AC terminals. Heatec will provide total service to those interested from drawing the plans to manufacturing the components to supervising the final installation of a state-of-the-art terminal that can serve a producer’s own plants or the general public.

The number-one question on the minds of almost all hot-mix asphalt (HMA) producers these days is quite simple:

How can I save money?
And the question that follows that one is even more simple:

How can I make more money?

An excellent answer to both of those questions involves something that most producers have never even considered: You can build your own liquid asphalt cement (liquid-AC) terminal.

The key benefit to owning and operating your own terminal is that you gain more control over the price you pay for liquid AC. In short, a liquid-AC terminal gives you a central location where you can store large amounts of liquid AC over long periods of time. This allows you to purchase liquid AC during off-peak periods—during the winter months, for example—and then store it until your production needs call for it.

In addition to the money-saving benefits, you will be able to have complete control over when the liquid AC is moved from your terminal to smaller storage tanks at your HMA-production facility. If you are managing a number of production facilities, this freedom is especially useful.

Finally, a liquid-AC terminal can also provide you with a source for additional income, as well as save you money. Some HMA producers might recognize a need for a liquid-AC terminal in their local market—not only for themselves, but also for other producers in the area. And because you control when and at what price level the terminal is filled, you can offer other producers the same cost benefits that your own operation will enjoy.

How to get started in the liquid-AC terminal business:

For many years, Heatec—a member of the Astec Industries family of companies—has been a familiar presence in the HMA industry and in other industries relating to liquid AC. The company began supplying heating components in 1977. Over the years, Heatec has marketed a broad line of liquid-AC heating and storage equipment, including helical coil heaters, heaters for liquid-AC terminals, shipping containers for liquid AC, and the advanced mixing systems that are needed for handling both ground tire rubber and polymer additive systems.

Today, Heatec plays a major role in the development of large liquid-AC terminals by supplying the necessary heating and pumping equipment, as well as polymer-handling equipment.

Recently, Heatec announced that the company is available to provide turnkey installation to those interested in acquiring their own liquid-AC terminals. Heatec will provide service on the entire project, beginning with drawing the plans, then manufacturing the equipment, and supervising the final installation of the terminal.

According to Tom Wilkey, vice president of sales for Heatec, it is really a very logical step for the company to move from supplying certain key components for a liquid-AC terminal to supplying all of the facility’s components.

“We have been involved in this market for some time now, supplying partial equipment to contractors who build the terminals,” said Wilkey. “Historically, we would supply the big hot-oil heater and other handling equipment and the customer would subcontract with a storage-tank manufacturer to build the big, field-erected tanks. Now, we will provide a single source for the purchase and installation of all the facility’s components.”

Working with just one company throughout the entire design and installation of a terminal has several advantages. First, you know that the people who design the layout of the terminal are the same people who will see it all the way through to installation. Also, you know that all of the components for the terminal were designed to work together for the highest possible degree of efficiency and economy.

In addition to the convenience of a single-source purchase and installation, said Wilkey, Heatec has the knowledge and expertise to create the best equipment for handling liquid AC.

“Heatec has been building fuel-efficient storage tanks and liquid-AC heaters for many years,” said Wilkey. “We understand exactly what is needed to transfer, handle, and store liquid AC. And we are ready to take that special understanding and experience to the next level by building these liquid-AC terminals.”

For more information about Heatec’s liquid-AC terminals, call Tom Wilkey at Heatec: 800-235-5200
Fax: 423-825-3488
E-mail: twilkey@heatec.com
THE MIX OF THE FUTURE, with trouble-free performance on the roadway, might be the result of a better design and testing procedure. Astec Industries’ corporate research and development lab, the RocDoc Lab, has been working on developing a performance-based asphalt mix-design procedure. If this concept proves to be feasible to all concerned, it may mean that asphalt mixes in the future can be designed and controlled based on actual performance instead of strictly volumetric properties.

Hot-mix asphalt (HMA) design methods have improved over the years. At one time, the design methodology involved simplistic procedures that attempted to visually determine the optimum asphalt content of a mix. Today, mix designers are using much more complex procedures. These current design methods, however, are time consuming, trial-and-error procedures in which various asphalt contents are carefully tested until an optimum asphalt content can be estimated. This estimated optimum asphalt content is typically based on volumetric properties such as voids in mineral aggregate and voids filled with asphalt, which are assumed to relate to pavement performance. Furthermore, the most prevalent design methods used today do not include a performance-based test that can verify the conclusion that the estimated optimum asphalt content will actually result in the desired pavement properties.

Often, HMA job mix formulas that are created according to currently accepted design methods can meet required design criteria in the laboratory, only to experience a variety of problems during and after construction. Examples of these problems include bleeding, rutting, tenderness, and fatigue cracking. All of these phenomena are problems that can supposedly be avoided through volumetric mix design, but nonetheless are still quite prevalent in today’s asphalt mixes.

Problems also occur in basing mix design and field control strictly on volumetric criteria. It is not at all uncommon for designers to spend weeks testing multiple variations of mix designs, attempting to achieve a mix that meets all of the required volumetric criteria. Similar problems occur during field production of some mixes. Quality-control technicians often require large amounts of time while they constantly monitor and alter a mix to assure that the required volumetric properties of the mix are maintained.

The volumetric properties that the mix designers are looking for are specific properties such as voids in mineral aggregate (VMA) and voids filled with asphalt (VFA). These volumetric properties—which can change drastically with small changes in asphalt content, gradation, and air voids—are assumed to relate to the performance of the HMA. Unfortunately, with volumetric designing, there is usually no test performed that would verify the validity of these properties with respect to actual mix performance.

Performance testing of asphalt mixes is widely accepted by many asphalt producers and researchers as a means for testing and proving asphalt mixes prior to construction. The Asphalt Pavement Analyzer (APA) is a multi-function wheel-tracking device that was designed for performance testing of HMA. The APA (see photo above, left) is capable of testing HMA specimens

With the availability of performance-testing equipment like the Asphalt Pavement Analyzer, it may be more advisable to design mixes based on performance as well as volumetrics.
If this concept proves to be feasible, it may mean that asphalt mixes can be designed and controlled based on actual performance instead of strictly by their volumetric properties.

The Asphalt Pavement Analyzer (above) from Pavement Technology, Inc. is capable of conducting a range of performance tests, including the rut test on three material samples that is shown in this photograph. An example of one of the APA's tests is shown in the graph (below) that illustrates the relationship between binder content and APA rut depth for mix-design purposes.

FOR MORE INFORMATION about the Asphalt Pavement Analyzer, call Wade Collins at PTI: 888-553-2341
Fax: 770-388-0149
E-mail: wadec@pavementtechnology.com

The ability of the APA to determine an HMA mix's susceptibility to various pavement problems makes it an invaluable tool in validating HMA mixes prior to construction. With the availability of performance testing equipment such as the APA, it may be more advisable to design mixes based on performance as well as volumetric properties.

The RocDoc Lab has successfully completed several projects that investigated ways of utilizing a performance testing procedure in the mix design process. Here is a summary of these projects:

**Study 1**—The purpose of this particular study was to investigate several asphalt mixes that had experienced bleeding and flushing. The contractor who had placed the mixes felt that a lower asphalt content would have stopped the bleeding, but he was forced to produce the mixes at the asphalt content determined by the Superpave mix design. Rut and fatigue testing of these mixtures in the APA indicated that an asphalt content 0.2% to 0.3% lower than the specified optimum would have been sufficient for a good-performing pavement. This study indicated that performance testing with the APA during mix design may help in adjusting the optimum asphalt content to give the best-performing mix.

**Study 2**—To further investigate performance-based mix design, this study looked at determining a mix's optimum asphalt content based solely on the mix's performance data. Several 12.5-mm and 9.5-mm blends were utilized in this study. An estimated optimum asphalt content was chosen based on theoretical volumetric calculations. Beam specimens were then fabricated at this asphalt content, as well as 0.5% above and 0.5% below the estimated optimum asphalt content. These beams were then tested for rut resistance and fatigue resistance in the APA. Graphs for rut depth versus asphalt content and fatigue cycles versus asphalt content were then plotted. The optimum asphalt content was chosen by identifying the asphalt content that resulted in the desired rut and fatigue resistance.

**Study 3**—This special study of performance-related mix design investigated the use of the APA as a supplement to the existing Superpave mix design system. Several 12.5-mm Superpave mixes were designed according to conventional Superpave criteria. The specimens fabricated during the mix design were tested for their volumetric properties and then subjected to the resistance-to-rutting test in the APA. A graph for rut depth versus asphalt content was then plotted which could be used to help in identifying the optimum asphalt content (see the graph in the center of this page).

All of these studies indicate that performance testing during mix design can help the designer pinpoint an optimum asphalt content that will result in a desired level of performance. This information can help designers avoid mixes that may be too "rich" in asphalt or too "dry" and difficult to compact in the field. Perhaps most important, valuable information on the performance of the mix can be obtained. If a mix is found to be inferior based on performance testing in the APA, it can be redesigned before it is placed in the field. This can result in huge savings by avoiding costly rework.

Many asphalt experts across the nation agree that a performance test for the Superpave mix design method is desperately needed. The APA may be the solution to this problem. Its usefulness in the design process was verified in a recent report published by the National Center for Asphalt Technology (NCAT Report 01-05A), where it was ranked as the top choice for testing equipment.

The RocDoc Lab is continuing its research into this area. If a viable performance-related mix design process can be identified, it will mean improved asphalt mix design and pavement performance for years to come. ▲▲▼
As the president of the Asphalt Institute, Peter T. Grass is helping the organization serve all areas of the liquid-asphalt industry, from petroleum-asphalt producers to hot-mix asphalt (HMA) producers. Prior to receiving this appointment, Grass held various senior leadership and management positions with the Army Corps of Engineers both in the United States and in Europe. Grass was commander and district engineer of the San Francisco District where he was responsible for major projects such as the deepening of the Humboldt Bay and Harbor federal channel; establishing new levels of cooperative stakeholder participation in the regulatory process; and leading the Army Corps of Engineers’ analysis in the deepening of the Port of Oakland’s federal channel from 42 to 50 ft. (12.8 to 15.2 m).

Grass earned a Bachelor of Science in Civil Engineering degree from the University of New Hampshire and a Master of Science degree in Civil Engineering from the Georgia Institute of Technology. Hot-Mix Magazine recently spoke with Grass to learn more about the Asphalt Institute’s involvement with the HMA industry.

For more information about the Asphalt Institute, see the overview article entitled “The Asphalt Institute” that ran in Hot-Mix Magazine, Vol. 7, No. 2, Page 38.

HOT-MIX: In what ways is the Asphalt Institute helping the road-construction industry?

PETER GRASS: Generally speaking, the Asphalt Institute tries to promote “technology transfer.” It is very important for those in the industry to realize that we are not working with the same old asphalt that we grew up with. There is a new asphalt out there, one that is new both in terms of mix design and mix type. The educated engineer should be very well aware of these new designs and should understand when to use the right mix for the right application at the right time.

HOT-MIX: At one time, people seemed to think there was only one way to build a road. Is the Asphalt Institute working to change that perception out there in the marketplace?

PETER GRASS: Absolutely. There is a lot going on with HMA technology. And it is important to stay abreast of these things. If you don’t, then there is a good chance that your agency will, indeed, fall behind the market.

HOT-MIX: What are some of the problems with getting a smooth “technology transfer” started between different agencies?

PETER GRASS: One of the problems we fight all the time is the mindset of “If it wasn’t invented in my state, then it’s no good.” We really need to get over that in our industry.

HOT-MIX: And where do you think that kind of negative mindset come from?

PETER GRASS: I think a lot of it has to do with risk. The way the departments of transportation (DOTs) are structured now, they assume the risk by using a new technology because they are the owners. There is reluctance to move out of the comfort box that is made of a technology that has worked in the past.

HOT-MIX: So what exactly would you tell someone who is reluctant to specify a mix design that would be new to their area?

PETER GRASS: I would tell them that there is better technology available today. The technology of pavement design has experienced a quantum leap in the last five to ten years. People need to embrace that quantum leap if we are going to improve the level of quality in our business. After all, the benefits of improving pavements are clear: It’s cost effective. The new technology is not appreciably more expensive than previous methods. And it delivers a better product that will last much longer.

HOT-MIX: What are some of the ways the Asphalt Institute works to promote this “technology transfer” to the industry?

PETER GRASS: One way we do it is through our involvement with the Asphalt Pavement Alliance (APA). We are one of the founding partners in the Alliance, along with the National Asphalt Pavement Association (NAPA) and the state Asphalt Pavement Associations. We feel the APA has been very successful because it approaches promotion at a national level and execution at a local level.

HOT-MIX: How does the Asphalt Institute participate with the APA’s local strategy?

PETER GRASS: We have eleven field engineers spread out across North America who work at the local level. Their duties include teaching seminars, serving as liaisons between the industry and local governments, and working as independent problem-solvers for our members and the DOTs. They are seen as an impartial body of people you can go to if you have problems. Our field-engineer program is a great asset to both the APA and the industry as a whole.

TECHNOLOGY TRANSFER ON THE ROAD TO QUALITY

An Exclusive Hot-Mix Magazine Interview

PETER T. GRASS
President
Asphalt Institute

“The technology of pavement design has experienced a quantum leap in the last five to ten years. People need to embrace that quantum leap if we are going to improve the level of quality in our business.”
HOT-MIX: Why is it so important that the APA promotes the industry at the local level?

PETER GRASS: The local level is where the decisions are ultimately made for pavement choice. We need to influence those local decision makers by letting them know about the many alternatives that are available with the new asphalt technology.

HOT-MIX: How successful do you think the Asphalt Institute and the APA have been with promoting the industry?

PETER GRASS: I think the APA has been very successful in looking ahead. I think it is important to realize that the APA is not just about having some CDs or slick brochures to hand out. It is about having a message that is based on sound technology and research from projects that have been completed out in the field in states around the country.

HOT-MIX: What is another way the Asphalt Institute helps the road-construction industry?

PETER GRASS: First, let me tell you about a program we started in the last couple of years: the Asphalt Academy. Here, we bring in students—to our headquarters in Lexington, Kentucky most of the time—and we focus a course of study on mix design. The students might be from a state DOT, they might be from a contractor, or they might be from a consultant component of the industry. We help them get up to speed on the latest in mix design. This kind of program is essential if we are going to have quality pavements out there.

HOT-MIX: What kind of attendance do the courses at the Asphalt Academy draw?

PETER GRASS: I am very pleased with the response we have gotten from the Asphalt Academy. Last year, we ran three courses over three different months here in Lexington. And we were fortunate enough to draw capacity crowds for each course.

HOT-MIX: How many students are usually in each of the classes?

PETER GRASS: We restrict each course to about 20 students. That gives the students lots of time for hands-on work and for posing questions. Small class sizes facilitate learning and make sure the course is not a cookie-cutter process. If people are taking the time to come to these courses, we want to make sure that they really get the information out of it that they need.

HOT-MIX: What kind of hands-on work do the students do?

PETER GRASS: Because we have the courses here at our headquarters, we can use our own lab, which is right across the hallway from the classroom. We take the students into the lab to show them what it takes to do a mix design. With the lab as part of the training vehicle, it really sinks home what they have learned. It is very difficult to do that in an exclusively classroom-based environment.

HOT-MIX: What other educational programs does the Asphalt Institute organize?

PETER GRASS: We hold training seminars all over the United States, Canada, and occasionally South America. These seminars last anywhere from part of a day to a whole week and cover topics such as construction issues and pavement preservation. Plus, this year we are doing a series in partnership with the FAA—a series of airport-pavement workshops.

HOT-MIX: Is Superpave design a part of your seminar program?

PETER GRASS: We still hold Superpave workshops for the next level of specifiers: the local governments. Some of the state DOTs have embraced the concept of Superpave—although not all have—and the next step is getting that knowledge down to the county level and below.

HOT-MIX: Are there any other ways the Asphalt Institute works to educate those involved with the road-construction industry?

PETER GRASS: Well, another way we educate people is through our technical publications. We have a wide variety of technical publications that have been developed over the years. These fill the need of education simply by providing ready, current references on everything from mix design to pavement type. Our technical publications are a major component of educating a lot of people through a wide grouping of products.

HOT-MIX: Does the Asphalt Institute offer any other services to the industry?

PETER GRASS: I think dealing with environmental issues is a major part of what we do.

HOT-MIX: What does the Asphalt Institute do to help in that area?

PETER GRASS: We like to take the approach of being concerned about “over the horizon” environmental issues. We deal with those issues that are not yet a regulatory standard, but ones that could be some day. What we want to do is influence the research and design as it goes forward. Research is being done all over the world: In universities, private research laboratories, and within various governments. They are trying to investigate the environmental and health effects of certain materials—and asphalt is one of those materials being investigated.

HOT-MIX: How does your organization try to get directly involved in that research?

PETER GRASS: Our strength comes from leveraging our members’ resources to a common goal. We want to make sure that the research being conducted is prudent, that it is science based, well thought out, and that it has a peer-review component. This ensures that the research is absolutely unbiased and is done as best as it can be—and that the conclusions that are drawn from that research are based on true outcomes.

HOT-MIX: What other challenges besides environmental issues face the industry today?

PETER GRASS: I think our industry has a few issues within itself that it must face. As a part of the Asphalt Institute, I am able to travel all over the country and see what people are doing and what challenges they are facing. It all really comes down to a few pervasive issues that we need to continue to work to address.

HOT-MIX: And what, in your opinion, is the most important issue the industry must tackle?

PETER GRASS: From my viewpoint, the most critical issue is quality. And I’m not talking about one specific issue of quality, but quality concerns across the whole spectrum. It starts with producing a quality binder. Then you need to ensure a sound mix design based on current technology. Then that design must be effectively translated into the plant process. And, ultimately, quality must be assured in the placement of the final product. There is a lot of room along that spectrum for each of our responsibilities to fall short of expectations. That is something that we must constantly guard against. We can work every day to promote the industry, but one bad job can reverse much of our progress in that area. A bad job is what people tend to remember—so a bad job is really the worst thing that can happen to us…We must deliver a high-quality product.”
THE RESPONSIBILITY of hot-mix-asphalt (HMA) design, testing, and quality control was once a concern only for the department of transportation technicians—but now it is often assigned to the producer. This growing trend has forced many producers to seek the assistance of independent laboratories, hire experienced personnel, or train their own employees to handle these highly technical tasks.

Kevin Vaughan, the laboratory director for the RocDoc Lab that is maintained by Pavement Technology, Inc. (PTI) recently said that educating technicians is one of the biggest challenges producers can face.

“Training new technicians and providing continuing education for experienced technicians is more important than ever,” said Vaughan. “But there is not always time to do this training in-house. Plus, the producers might not have the resources to teach their technicians everything they really need to know.”

The PTI RocDoc Lab serves as the research and development arm of Astec Industries. In addition, it aids HMA producers in the development of better mixes. When PTI recognized the need for training within the asphalt industry, the RocDoc Lab began offering training courses to help educate technicians and asphalt mix designers.

The RocDoc Lab is currently offering two training courses for beginning technicians and two courses that serve as continuing education for more experienced technicians. Vaughan explained that each course can be tailored to fit the needs of the producer.

- Introduction to asphalt and basic asphalt mix design: This course is intended for the new employee who knows very little about asphalt materials, mixes, and testing. The course will give a basic understanding of HMA components, testing of these components, HMA properties, and HMA testing. This course can cover testing of either Marshall mixes or Superpave mixes, depending on your needs.

- Introduction to HMA design: This course explains the principles behind either the Marshall method of mix design or the Superpave mix design. It is recommended that participants have some asphalt-testing experience prior to taking this course, but this is not mandatory.

- Advanced HMA testing: This course covers some basic topics to serve as a review and refresher for experienced technicians. It also includes discussion of asphalt-mix diagnostics and methods for correcting mix deficiencies. Performance testing of asphalt mixes will also be covered.

- Advanced HMA design: This course includes a basic review of the mix design procedures. It will also cover topics such as performance testing for asphalt mix design, as well as the use of fractionated RAP in mix designs to reduce costs.

Each course includes lecture sessions as well as hands-on testing and design in the lab.

“All of these courses can be modified to meet the producer’s needs,” said Vaughan. “The technicians at the RocDoc Lab will gladly sit down with the producer and design a course that addresses the most important issues and methods his employees need to understand.”

The courses are offered at the PTI RocDoc Lab in Covington, Georgia. These facilities are brand new, featuring state-of-the-art laboratory testing equipment.

“Technology is not going to slow down and wait for producers,” said Vaughan. “The RocDoc Lab is here to help you and your employees deal with the fast changes in HMA design and testing methods.”
I F SOME MAN ON THE STREET came up to you and told you that it is possible to cut your annual aggregate-production cost-per-ton by 25 percent, you might be inclined to ignore him. After all, you know your business and you certainly don’t allow any unnecessary expenses to work their way into your budget, right?

Well, it might be worth your time to hear what that man on the street has to say. Even the most careful aggregate producer might overlook some important hidden costs—costs that can be avoided if you know where to look for them and how to erase them from your production picture.

While they might be one of the most unassuming parts of your production process, the aggregate stockpiles can be a source of unnecessary expenditures if they are not structured correctly and maintained properly.

The main factor that causes stockpiles to become money-grubbing mounds of rock is segregation. Segregation occurs during typical stockpile-building methods when larger particles roll to the outside of the conical pile while smaller particles remain at the inside of the pile. When segregation in the stockpile occurs, the aggregate supply becomes out of spec. And if the situation is not corrected, segregated material can cost the producer substantial amounts of money in fines, restoration, and other miscellaneous expenses.

Probably the most widely accepted method for eliminating the problem of stockpile segregation is the use of a telescoping conveyor during the building of stockpiles. A telescoping conveyor is able to build a stockpile in layers of small windrows. Segregation still occurs within these "miniature" conical piles, but because this pattern is repeated many times within a single stockpile, a higher gradation resolution occurs.

In short, when the stockpiles are built with a telescoping conveyor, the overall supply of material remains within specification.

Today, one of the most popular choices in telescoping conveyors is the TeleStacker™ conveyor that is manufactured by Superior Industries. This conveyor, which is available in lengths from 110 to 150 ft. (32.5 to 45.7 m), can be equipped to fully automate the movement of the stinger, incline, and radial travel according to the limits and increments set by the operator. The result is a fully desegregated stockpile—and that leads to serious money savings for the producer.

Here are five ways in which the use of a telescoping conveyor can save money in your aggregate-production operation:

- Eliminate haul-truck costs. When a producer uses traditional haul trucks in the building of his stockpiles, the added expenses can be obvious. Many of these are labor-related expenses. For example: First, a driver must be hired or a company must be subcontracted to provide the drivers and the trucks. The producer must provide workers’ compensation for each driver. Also, Mine Safety Health Administration (MSHA) regulations require eight hours of training for each driver. Today, one of the most popular choices in telescoping conveyors is the TeleStacker™ conveyor that is manufactured by Superior Industries. This conveyor, which is available in lengths from 110 to 150 ft. (32.5 to 45.7 m), can be equipped to fully automate the movement of the stinger, incline, and radial travel according to the limits and increments set by the operator. The result is a fully desegregated stockpile—and that leads to serious money savings for the producer.

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There are additional equipment-related expenses: The producer is responsible for liability on hired trucks used on the project. If the producer owns his own vehicles, he must take into consideration a ten-year depreciation schedule on
engines of approximately $15,000 per unit.

Other miscellaneous expenses might be easily overlooked, such as MSHA fines for improper berming of stockpile perimeters and added emissions fees for each diesel engine used in the operation.

When a telescoping conveyor is used to build the stockpile, the need for haul trucks is eliminated—and so are the associated costs.

Avoid out-of-spec fines. Although the primary concern for aggregate producers is providing the best possible product for their customers, there are added incentives today for them to produce high-quality products: the monetary fines that are levied by regulating agencies such as the departments of transportation (DOTs). As a result of these fines, if a producer’s aggregate is segregated, it hurts both his reputation and his pocketbook.

Deductions or fines for out-of-spec material range from $1 to $3 per ton. And if a producer has a consistent problem with segregation, he may be forced to shut down his operation.

Once a producer’s material has become segregated, the only choice he has (beside facing the penalties) is to restore the gradation of the material. The expenses associated with the necessary rehandling equipment include labor, fuel, and wear-and-tear on equipment. According to one industry expert, it can cost as much as 30 to 60 cents per yard to handle material twice.

Prevent compaction. Compaction becomes a problem when front-end loaders or other heavy machinery are driven onto the stockpile for loading, unloading, or restoration. The heavy equipment not only compacts the material, but it also crushes it further, causing degradation.

Aside from containing a large amount of degraded material, a compacted stockpile is at risk of becoming, essentially, a pile of concrete if it is exposed to heavy rain. When a stockpile becomes hard and compacted, one of the only options is to blast the material to loosen the lifts—yet another expense and another way for the material to lose quality.

Prevent additional handling. Every time material is handled, it costs the producer money and it puts the aggregate at an increased risk for segregation. The use of a telescoping conveyor eliminates the need to handle material. It goes straight from the crusher into a desegregated stockpile—with no need for additional handling until it is time for loadout.

Maximize your loadout. When a stockpile is built using trucks and front-end loaders, the material tends to become dense and compacted. The use of a telescoping conveyor eliminates this densification. This “soft” stockpile makes it simple for even a light front-end loader to quickly move material from the stockpile to the trucks. Load-out goes much faster, saving time and money.

When you take these factors into consideration—the five factors that result from the use of a telescoping conveyor—you might find that the benefits you enjoy could exceed the 25-percent savings mentioned by that man on the street in the first paragraph. In addition, the use of an automated telescoping conveyor can also provide you with a certain peace of mind by assuring you that your stockpiles are quickly able to recognize the savings and benefits that result from this advanced technology. For example, Allan Cowan, crushing superintendent for Odessa, Texas-based Jones Bros. Dirt and Paving Contractors, Inc., said the savings piled up when the company began using the TeleStacker conveyor.

“I save approximately 30 cents per ton by not stockpiling with haul trucks,” said Cowan during a recent interview. “If I had to ballpark all the hidden savings, I’d estimate another 75 cents per ton, minimum. All in all, I could see a savings of up to 25 percent of my annual cost per ton.”

In addition to the money-saving factors, users of the TeleStacker conveyor say they find it extremely easy to use. John Martin, plant manager for United Materials in Great Falls, Montana, said the automation of the TeleStacker conveyor was not intimidating at all. In fact, it proved to be easy to program.

“It is very operator-friendly,” said Martin. “You need to measure off the footage that you’re going to have it cycle in. Completing the measurements takes longer than programming the conveyor.”

Martin added that the portability of the TeleStacker conveyor has also made it a very valuable investment.

“It’s so easy to move,” he said. “We just pull the stinger in, pick the wheels up, back a truck in, and we’re off and running.”

The TeleStacker conveyor from Superior Industries can significantly reduce the occurrence of segregation in aggregate stockpiles. The TeleStacker conveyor can build almost any size or shape of stockpile. Plus, Superior manufactures the TeleStacker in three versatile sizes: 110 ft. (33.5 m), 130 ft. (39.6 m), and 150 ft. (45.7 m).

Producers who have used the TeleStacker™ say it has other benefits, including cost savings and ease of use. Here are some convincing comments from a few of those producers:

Producers who have tried the Superior Industries TeleStacker telescoping conveyor are quickly able to recognize the savings and benefits that result from this advanced technology. For example, Allan Cowan, crushing superintendent for Odessa, Texas-based Jones Bros. Dirt and Paving Contractors, Inc., said the savings piled up when the company began using the TeleStacker conveyor.

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Shull assigned to new position for aggregate-handling manufacturer

Production Engineered Products (PEP) recently announced that Mike Shull has been appointed parts and service manager. Shull has been a part of the PEP team for more than four years, first working as a saw operator. In June 2000, he was promoted to the position of inventory, shipping, and quality-control manager. There, he was responsible for all final quality inspections of PEP's manufactured equipment. He was also in charge of the entire inventory and the shipping of parts and equipment. A PEP representative said they expect Shull will continue to contribute significantly to the quality of PEP products.

CEI adds two personnel to their equipment-sales team to better serve you

CEI recently announced two new changes within their sales team. Gary Kamplain recently took on the responsibilities of sales manager for CEI. In this role, he will oversee operations in the sales department, as well as promoting sales in CEI’s northwest territory, including areas in Canada and the northwestern United States. Brian Garvin has joined CEI as the company’s regional sales manager. He will be serving customers in Oklahoma, Texas, Colorado, New Mexico, Kansas, Nebraska, and Utah.

New Heatec portable calibration tank offers efficient solution to multiple-plant owners

Those who manage multiple hot-mix asphalt (HMA) plants will want to know about the portable calibration tank from Heatec. This tank is mounted on a trailer, allowing it to be pulled to virtually any location. It can be used to calibrate multiple systems without investing in multiple tanks. Plus, it gets the job done faster than a distributor truck: the Heatec portable calibration tank lets a plant run three cycles in less time than it takes for one cycle with a distributor truck. For information, contact Jerry Vantrease at Heatec: 800-235-5200. Or fax: 423-821-7673. Or send an e-mail: jvantrease@heatec.com.

CEI’s new Nomad 5.5 hot-mix asphalt plant was made for remote, rugged locations

Producers who work in remote and rugged territory have heard about the Nomad series of HMA plants from CEI. Now, there’s a new model—the Nomad 5.5—that was recently introduced by CEI. This plant is rated at 80 tph (72.6 tonnes per hour) at 5-percent moisture content. It is available in three general arrangements, each designed to fit the producer’s HMA-production needs. For more information about the new Nomad 5.5—or the 130 tph (118 tonnes per hour) Nomad 6.5—call Gary Kamplain at CEI: 800-545-4034. Or send a fax: 423-265-7521. Or send an e-mail to sales@roadtec.com.

New Roadtec brochure features benefits of the RP 185-10R paver

Roadtec recently released a new color brochure for its RP 185-10R rubber-track paver. To request a free copy of this informative piece of literature, call Carmen Mercer at Roadtec: 800-272-7100. Or fax: 423-265-7521. Or send an e-mail to sales@roadtec.com.

Learn all there is to know about Astec’s brand-new high-efficiency burner

Astec’s new Whisper Jet™ burner is the featured topic of this detailed spec sheet. To ask for this literature, call Diane Hunt at 423-867-4210. Or send a fax: 423-867-3570. Or download it at www.astecinc.com. (Click on the literature link.)
Roadtec service offers the maintenance needed for paving equipment

After years of wear and tear, your older brand-name paver might be begging for a little refurbishing. The Roadtec Rebuild Service Center specializes in giving new life to older paving equipment. The Center offers a broad range of services, ranging from routine equipment overhaul to the rebuilding of brand-name pavers with OEM or A/S Brand factory-direct paver parts. The Roadtec Rebuild Service Center also offers component exchange for C-1 and C-3 conveyors on Roadtec Shuttle Buggy® material-transfer vehicles. The Roadtec Rebuild Service Center employs two shifts of experienced technicians to ensure fast service. For more information, call toll-free: 877-266-8882. Or send a fax: 423-622-9072. Or check out the information on their website at www.roadtecparts.com.

Ben Brock, CEI general manager, will move to the Astec sales department in December

Astec, Inc. recently announced that Ben Brock, the general manager of CEI (a member of the Astec Industries family of companies located in Albuquerque, New Mexico) will move to the Astec headquarters in Chattanooga, Tennessee in preparation for assuming responsibilities as vice president of sales for Astec. Brock began his career working in various positions in the Astec and Roadtec factories. Following his graduation from Clemson University with a BS in economics, Brock worked in sales for Astec for four years. In 1997, he moved to Albuquerque to take on the duties of general manager of CEI. As of the end of the last fiscal year, Brock had helped the company grow from 54 to 76 employees, with the sales volume increasing by 56 percent. Brock will transfer to Astec in January 2003, where he will work in all phases of sales. It is expected that he will take on the position of vice president of sales on July 1, 2003. His predecessor in that position, Gail Mize, will assume the duties of national accounts sales manager, where he will continue to serve longtime Astec customers.

NAPA releases guide to hot-mix technology—all on a single interactive CD

Imagine a single source of hot-mix asphalt information—including articles, photos, and movie clips—that is easy to access. The National Asphalt Pavement Association (NAPA) has created that source with a new interactive CD: A Guide for Hot Mix Asphalt Pavement. To see how you can get a copy of this instructional tool, call NAPA at 888-468-6499. Or send an e-mail: publications@hotmix.org.

Ben Brock

Redesigned control panel offers advantages for horizontal directional-drill operators

Operating a horizontal directional drill (HDD) has become a little easier with the recent release of a redesigned operator control panel. American Augers, a manufacturer of HDD equipment, tooling, and accessories, has updated the control panel for their mid-range and maxirig directional drills by designing it with a lower profile—to provide better visibility of the drill stem as it is being put in the ground—as well as enlarged gauges. For information, contact Scott Smalley at the Astec Underground Group: 419-869-7107. Or send him a fax: 419-869-7727. Or an e-mail: ssmalley@americanaugers.com.

New operator’s manual available for Heatec HMA plant helical-coil heaters

Heatec offers key upgrades on older heaters with UE capillary assembly controllers

Operators of older Heatec heaters with UE capillary assembly controllers will be interested to learn that Heatec now offers an upgrade that makes them both easier and safer to operate. The upgrade—which is the UE Conversion Panel—can be mounted in virtually any location to provide improved convenience over the existing UE controllers. In addition, the panel’s digital controllers do not require calibration. For more information on the Heatec UE Conversion Panel, contact Jerry Vantrease at 800-235-5200. Or fax: 423-821-7673. Or e-mail your request to jvantrease@heatec.com.

New boring machine from American Augers sits at the top of its class with a 72-in. cut

As the trenchless market continues to grow, American Augers recently announced the release of its first true 72-in. (1.8 m) boring machine. The American Augers 72-1200S delivers 200,000 ft.-lb. (271,003 J) of torque and up to 1.2 million lb. (544,300 kg) of thrust. The machine has a triple-bladed spoil panel for quick removal of high volumes of material. With the extra power and speed, bores are completed effectively. For more information on this top-of-the-line boring machine, contact Denis Fox at American Augers: 419-869-7107. Or send a fax: 419-869-7425. Or visit their website at www.americanaugers.com.

Asphalt provides a smooth and even canvas for the creative efforts of more than 250 artists

To most people in the road-construction industry, a brand-new stretch of smooth, pitch-black asphalt is a work of art. But to more than 250 artists in Kansas City, Missouri, an expanse of fresh asphalt became a place to create a work of art. In October of this year, the fifth annual La Strada dell’ Arte festival took place in front of Kansas City’s Union Station. The festival involved amateur and professional artists “painting” the 60,000 sq. ft. (5,574 sq. m) of asphalt parking lot with colored chalk. In addition to being a newly established tradition for the Kansas City community, the event also provides a unique opportunity to highlight the beauty and benefits of asphalt. To learn more about the event—and perhaps to get ideas for sponsoring a similar event—you should check out the festival’s website: www.lastradakc.org.

New technical paper on longitudinal joints now available from Roadtec

This in-depth technical paper from Roadtec explains the latest ideas in the construction of longitudinal joints. To get a copy of Technical Paper T-130, call Carmen Mercer at 800-272-7100. Fax: 423-265-7521. E-mail: sales@roadtec.com.
Osborn Engineered Products tackles major expansion at South African colliery

Osborn Engineered Products SA (Pty.) Ltd., a member of the Astec Industries family of companies located in South Africa, was recently awarded a R50 million ($5.1 million USD) contract to expand the plant at Anglo Coal’s Kleinkopje Colliery. The project will increase the plant’s overall annual production from 7.5 million tons (6.8 million tonnes) per year to 8 million tons (7.3 million tonnes). The contract includes the installation of an apron feeder, two new grizzly screens, a rotary breaker, and a new jaw crusher. For more information on how Osborn can help improve a producer’s material-processing facility, contact Alan Forsyth at 011-27-11-820-7654.

Pavement cost analysis provides numbers that prove asphalt’s benefits

A recent study sponsored by the Asphalt Pavement Alliance (APA) proves that asphalt pavements cost less to build and maintain over a 40-year period than concrete pavements, based on the history of the Interstate highways in the rural portions of the State of Kansas. The study was conducted by Dr. Stephen A. Cross, associate professor, and Dr. Robert L. Parsons, assistant professor, when both were with the University of Kansas. The study was completed with the assistance of the Kansas Department of Transportation. To view the study, go to the APA’s website (www.asphaltalliance.com) and follow the links: Technical Data > Life Cycle Costs > “Evaluation of Expenditures on Rural Interstate Pavements in Kansas”. Or you can call toll free to ask for a copy of the study: 888-468-6499.

Roadtec personnel update: New and familiar names in the Roadtec sales department team

The Roadtec sales department has announced the following changes to its team. Here is a quick look at the new and familiar faces taking on new responsibilities in the Roadtec sales team: Mike Bezjian is regional sales manager for North Dakota, South Dakota, Nebraska, Iowa, Kansas, and Missouri. Tim Boucher is regional sales manager for Vermont, New Hampshire, New York, Maine, Connecticut, Rhode Island, Massachusetts, and New Jersey. Tommy Chastain is regional sales manager for Indiana, Ohio, Kentucky, Pennsylvania, West Virginia, Maryland, and Delaware. Daniel Cunningham is demo specialist for Roadtec cold-planer equipment. Richard Draheim is western sales manager. Andy Guth is regional sales manager for Texas and New Mexico, based in Austin, Texas. Mike Harris is regional sales manager for Alabama, Mississippi, and western Tennessee. Don Lamb is eastern sales manager. Hank Lawrence is regional sales manager for Washington, Oregon, Montana, and Idaho, plus Alberta and British Columbia in Canada. Terry Leber is products marketing manager. Ken Mayo is regional sales manager for Georgia and Florida. Jim Patterson is director of sales and marketing. Frank Reiland is regional sales manager for east Tennessee, North Carolina, South Carolina, and Virginia. Phil Slack is regional sales manager for Michigan and Ontario.

Free “E-Newsletter” from Heatec offers info on maintenance, operations

Among the many features offered by Heatec at its new website is a free E-Newsletter that can be easily downloaded and printed. To get your name on the distribution list, go to www.heatec.com—and then follow the links to Heatec News and enter your information.