



SOMETHING REALLY STRANGE was going on in the main manufacturing facility at Astec, Inc. in Chattanooga. A 40 x 60-ft. (12.2 x 18.3-m) section of the shop had been totally walled off, as if to ensure secrecy. A group of Astec craftsmen sequestered themselves behind the walls of what onlookers began to call “The Possum Pit”. People around the shop started to talk. Some said it was a super-secret project: The Possum Project. Others said they were just building toys.

Then, months after the fabricators disappeared into The Possum Pit, they brought out something that made everyone in the shop stop their wild speculations. Instead, everyone started smiling with a sense of awe and understanding. With one look at what The Possum Project had produced, it became clear that these guys weren’t just building toys; they were demonstrating the depth of the skill and craftsmanship that exists among those who work in the Astec manufacturing facility.

A new approach to tradeshow techniques

Eye-catching tradeshow exhibits have become a tradition for Astec Inc.—one that grows a little more each time the company visits ConExpo-Con/Agg in Las Vegas. In 2002, the centerpiece of all the outdoor exhibits was unquestionably the towering display of five Astec storage silos, painted with stars and stripes to resemble the American flag. Topping this display at the 2005 exposition was going to require something even more impressive or spectacular.

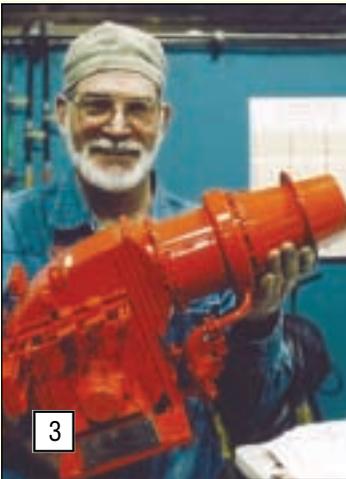
So it came as a surprise to many when the advertising department at Astec, headed by Paul Shelton, actually approached the 2005 exhibit by thinking small.

Literally, small—as in reduced size.

In October 2003, a select group from the Astec manufacturing team moved into the walled-off area to begin their work on The Possum Project. Their mission, as they understood it, was to build miniature versions of two complete



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These miniature versions of Astec's hot-mix asphalt plants were built to one-eighth the size of the actual plants.

Astec hot-mix asphalt production facilities—one portable plant and one relocatable plant. With only a somewhat vague description of the project in mind, many people shook their heads, interpreting that to mean The Possum Project was all about building “toys”. The craftsmen who were working on the project, however, had something very different in mind.

“Everyone was thinking, ‘Come on, we don’t want to take toys up to ConExpo,’” recalled Wayne Pressnell, who served as one of the fabricators on The Possum Project. “But nobody knew that we would put our heads together and decide to make this thing big enough to inspire people to walk up to it and just say ‘Wow!’ This wasn’t going to be anything like the toys they thought it would be.”

Embarking on a journey into the creative process

In order to make a big impression, the mini-versions of the facilities that the team aimed to build were models built at one-eighth the size of the actual plants. The team

worked directly from CAD drawings of the plant components, created specifically for this project. They used the same steel that goes into the life-sized Astec plants.

And, as time went on, members of the team realized that so much skill and effort was going into making these things, that they couldn’t be considered “toys” or “models.”

“About halfway through the project, I said out loud, ‘These are not models. These are exact replicas!’ In models, so many details get left out,” said Pressnell. “Our goal was to not leave out any details at all. To me, there’s a big difference between a simple model and an exact replica. The difference is in how much detail is involved.”

To help them achieve those details, the thousands of tiny components were pieced together, just as a full-sized plant would be assembled. Working with the dimensions from the CAD drawings, many of the pieces of steel were fabricated using a laser cutting machine.

“The laser saved us a lot of time,” said Charlie Mooney, one of the fabricators for The Possum Project. “We would draw up a duplicate of the big parts, size them down, and then have the cutting machine programmed so they could burn it out with the laser. After that, we carefully put the pieces together.”

The team quickly realized, however, that not all of the parts in an Astec hot-mix asphalt plant were repre-

sented in the scaled-down CAD drawings. In that case, the team members took extra time and care to make sure that the replicas they were producing were as close as possible to real life.

“There were a lot of parts that we had to go out to the big plant and measure by hand,” said Mooney. “For instance, we didn’t have a CAD drawing that showed every measurement on the motors. So we had to go out and measure them and get the length and the width, and take a picture of them.”

Once the fabricators had the measurements and the photos in hand, it required a steady hand and an artistic mind to translate the numbers and images into something realistic made from the steel.

“It’s easy to build a silo or a drag or a set of feeder bins. But the hard part is when you have to go take a picture of a reducer or a motor or a bearing, and you have to build from that picture,” said Pressnell. “It was such a challenge to make every little part look exactly like it



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[1] Paul Shelton, Astec’s advertising director, peeks around from behind an Astec storage silo to give an idea of the size of the 1/8-scale replicas.

[2] Using a hoist, Eddie Carson gently moves a self-erecting bin.

[3] Charlie Mooney, chief fabricator of The Possum Pit, checks for detail.

[4] Mike Nix drills tiny holes in the railing of an Astec lime silo.

[5] Some of The Possum Pit crew spent long hours behind welding masks—which is what Wayne Pressnell is doing here.

[6] Eddie Carson prepares another component for assembly.

[7] A long shot of The Possum Pit, showing a baghouse near completion.

[8] Group photo of The Possum Pit crew. Back row, left to right: Eddie Carson, Terry Abercrombie, Grady Reel, Tony Gilliam, Charlie Mooney, and Roy Clayton. Front row, left to right: Rick Meadows, Randy Kennemore, Wayne Pressnell, and Jim Gilliam. Not pictured: Mike Nix.



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was supposed to look. You have to have imagination and take an artistic approach.”

As the models began to take shape, team member Jim Gilliam readied himself to begin painting them. What he wasn't ready for was the detail and craftsmanship that went into shaping each piece.

“I didn't know that it would be so detailed when they first started,” said Gilliam. “When I saw the detail that the guys in The Possum Pit put in, I had to rethink my entire process. The details really set it off. If we had just painted it brown and ivory and let it go at that, it would not have made such an impact.”

Months into the project, the results of the team's labor began to emerge from The Possum Pit. The pride that the team members already felt toward the work that they were doing began to spread to other workers at the Astec manufacturing facility.

“When the rest of the shop saw the first silo system, their percep-

There's a big difference between a model and an exact replica. The difference is in how much detail is involved.

tions of The Possum Pit changed,” said team advisor Roy Clayton. “And as the finished relocatable model was set up, the rest of the plant division got a chance to see what we were doing, and their level of acceptance grew. They finally realized this project wasn't a joke.”

Even the people who were deeply involved with The Possum Project on a day-to-day basis were very much impressed. Clayton added that he was even astonished when he saw the first complete replica of the relocatable hot-mix asphalt plant. “The model exceeded anything I had expected,” Clayton said. “I was extremely impressed by the quality of workmanship and the amount of detail that these replicas attained.”

Results: Two complete HMA facilities... indoors

If the quick change in perception among others working in the Astec manufacturing facility was a good indication of the impact of The Possum Project, it should not have been terribly surprising when the replicas became a show-stopper at the 2005 ConExpo-Con/Agg show.

“The final products turned out a lot better than I first expected,” said Gilliam. “Like everyone else, I had some reservations about sending models to the show in Las Vegas. But when everything came together, I knew it would be really special.

“That still didn't prepare me for the reactions that we got in Las

Vegas, though,” he continued. “I couldn't believe all the pictures the press and contractors took. It made me feel like I had accomplished something worthwhile.”

Looking back on the experience, Possum Project member Mike Nix said that a cooperative attitude and a common goal tied the team members together. “We were like brothers out there,” he recalled. “I don't remember one time when we had an argument. We knew what we had to do, and we had a good time doing it.”

Mooney added that the results they achieved with the one-eighth scale replicas reflects directly on the talent that lies within the Astec manufacturing facility.

“Everyone involved in the project used his own expertise,” Mooney said. “We all made some small mistakes, but the farther we went with the project, the better we got.

“We demonstrated that you need to put pride and quality into anything you build.” ▼▲▼



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[1] This is the finished Astec display at the 2005 ConExpo-Con/Agg show. You can see the two 1/8-scale replicas: a relocatable plant near the center of the photo; a portable plant to the right.

[2] Prior to the show, the crew had to assemble each of the units.

[3] During show, the replicas drew an unprecedented amount of attention.

[4] In this photo, a future roadbuilder becomes acquainted with quality.

[5] Visitors to the Astec display were intrigued with the chance to see an entire hot-mix asphalt plant in such a compact area. Astec, Heatec, and CEI sales representatives stayed busy answering their questions.

[6] Visitors were fascinated with the craftsmanship and degree of detail.

[7] In most cases—as in this replica of a CEI heater—The Possum Pit crew used authentic materials.

[8] The closer you get to the replicas, the better you can judge for yourself the craftsmanship that went into these fascinating replicas.

[9] The attention to detail is obvious in this close-up photo of a Heatec heater and distribution system.



RTQC IS REAL-TIME

The National Center for Asphalt Technology (NCAT) and Alabama DOT are just beginning a formal scientific study of the RTQC concept using an Accu-Swipe™ belt sweeper and an Automatic Gradation Unit (AGU)



UNDoubtedly, producers of hot-mix asphalt (HMA) will be interested to learn about the benefits that can be derived from real-time quality control (RTQC)—the automated process of sampling and testing HMA mixes during production, without stopping the plant. Many departments of transportation throughout the United States have approved the use of RTQC equipment that was designed and manufactured by Astec Controls. Some felt that a formal study should be done to test the validity of this technology, as well as its end-user benefits.

The National Center for Asphalt Technology (NCAT) at Auburn University in Alabama—at the request of the Alabama DOT—is moving forward with a comprehensive study of RTQC.

The automated action of the sampling system takes place on the cold-feed conveyor belt as the material is being passed to the drum-mixer. First, the Accu-Swipe belt sampler captures a sample [1] of the material. The sample is dropped into an electrically heated dryer where it is dried and weighed. It is then dropped into the Automatic Gradation Unit [2] where it undergoes immediate analysis. The results are transmitted back to the control house where the Total Control 2000 lets the plant operator to make any changes that might be necessary.

FOR INFORMATION

about Astec's Real-Time Quality Control System, call Diane Hunt at Astec:

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QUALITY CONTROL

“There is a lot of interest in the industry to find better ways of doing quality control,” said Randy West, assistant director at NCAT. “The traditional techniques that have been used in the past were fairly labor-intensive. Sometimes, there’s just some uncertainty about the data using the traditional techniques. Overall, there is a lot of interest in finding a better way for controlling the production of hot-mix asphalt.”

Astec’s RTQC technology

For years, Astec has worked to provide technology that would allow producers to maintain the quality of their HMA as it is being produced. Traditional methods of quality control involve a fairly simple procedure: The operator stops the plant in the middle of production, one person walks out with a shovel and a bucket to retrieve a sample, and then the sample is hand-delivered to the on-site lab. This traditional method is obviously inefficient—and it is also very costly due to resulting downtime.

To replace this procedure, Astec provides to the HMA industry the Accu-Swipe™ belt sampler, an automatic device that collects a cross-section sample of aggregate from the moving feeder conveyor in approximately half a second. The Accu-Swipe belt sampler takes the sample without interrupting production.

Once the sample is collected by the Accu-Swipe, it is dried, weighed, and dropped into the Automatic Gradation Unit (AGU)—a device mounted below the Accu-Swipe and the plant’s inclined conveyor. (see photo).

The AGU weighs and screens the aggregate sample, separating the material by size and measuring its quantity. The actions of the AGU allow producers and state regulators to verify the aggregate mixture before the liquid asphalt cement is added.

The final tool in Astec’s line of RTQC technological advances is the Total Control 2000, Astec’s computer-based control system

for HMA facilities. This system allows controllers to operate the entire plant from one computer system located in the plant’s control room. When it is used in conjunction with the Accu-Swipe and AGU, the Total Control 2000 collects quality data and saves it in a convenient format that is compatible with a wide variety of computer applications.

Testing the technology

In order to begin testing the RTQC technology, NCAT first obtained funding from the Alabama DOT, and then worked with Astec to set up the Accu-Swipe automatic belt sweeper, AGU, and Total Control 2000 at East Alabama Paving Company’s HMA facility. This setup is currently used as the test facility for the study.

According to Randy West, the project is still in the beginning stages since the system was installed last fall, just before the paving season came to an end. “This is the first attempt to test the idea as a complete system,”

West explained. “There’s still some equipment tweaking that needs to be done. And we are trying to work out some of the details for the procedures. For example, on the drying unit: How many times do you take measurements? And what is a constant weight to determine the moisture content? We have to find answers to some of those things.”

Despite the learning curve, West said that the project is an exciting one to be working on.

“We think this will result in a big step forward. Certainly, we don’t have all of the pieces of the puzzle put together at this point. This is the first step. Some of the equipment has been in existence for a while—such as the belt sweeps and the viscometers. But this is a first attempt to put a lot of those pieces together. Even now, there are still some pieces missing. But we have to start somewhere,” West said.

“We’re on the cutting edge.” ▼▼



The RTQC (Real-Time Quality Control) concept that is being studied by NCAT is actually working on a hot-mix plant owned by East Alabama Paving Company of Opelika, Alabama. The RTQC system installed here consists of the Accu-Swipe

automatic belt sampler and the Automatic Gradation Unit (AGU). When material has been sampled and analyzed, the resulting data is transmitted to the plant’s Astec Total Control 2000 system so necessary adjustments can be made.