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FEBRUARY 2011 EQUIPMENT ■ OPERATIONS ■ SOLUTIONS

Mass Media

A Kentucky producer
sees stockpiles rise after
an upgrade to advanced
screening technology
using new screen media
pg 18



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Mass Media

A producer's advanced screening technology upgrade increased production by more than 25 percent.

EDITED BY DARREN CONSTANTINO

Hinkle Contracting Co., a subsidiary of Summit Materials, is one of Kentucky's largest aggregate producers and asphalt paving contractors. Hinkle puts a strong emphasis on achieving perfect spec material in its aggregate production operations. In its quest for quality control excellence over the years, the company often experienced severe blinding on many of its limestone operations' screens. Some of its sites were shutting down daily to clean screen media, costing the company thousands in spec-material production. Out-of-spec material was also impacting the company's bottom line, so it started experimenting with more advanced screen-media technology to achieve maximum production of in-spec product across multiple operations.

Because of Hinkle's emphasis on spec asphalt paving projects, "everything we do is designed to meet and exceed state specifications," says Kenny Massengale, aggregate quality control technician for Hinkle's Cumberland Division. "We have a goal and strive to meet our customers' expectations, regardless if the customer is the Kentucky Transportation Cabinet, a commercial developer or a homeowner whose driveway we are paving. People expect a quality project and it is our goal to provide our customers just that – a quality project that requires no corrective work or removal and replacement of asphalt pavement," he says.

Greg Bryant, a Cumberland Division quality control technician, says, "With our #57s, #8s and #11s, if the material does not meet state spec – if it is too dirty, with too many fines in the finished product – it creates problems for our asphalt plants and our asphalt

HINKLE'S 16 LIMESTONE AGGREGATE OPERATIONS SERVICE ITS OWN ASPHALT, CONCRETE BLOCK AND PORTABLE READY-MIX CONCRETE PLANTS, AND ALSO AREA ASPHALT AND CONCRETE CUSTOMERS.

lay-down crews, and it makes it much more difficult for us to provide the customer with the quality job they expect and deserve," he says.

"There were days we either scrapped our #11s (to sell as an inferior product) or had to wash them to meet spec," Massengale adds. This lost opportunity or added expense was costly and negatively impacted the bottom line. Hinkle realized there was an opportunity to significantly cut costs, improve profits and offer a higher quality product to its customers.

No small feat

Improvements in technology or process at one operation often have a positive ripple effect across multiple operations. As one of Kentucky's most multi-faceted contractors, Hinkle Contracting Co. specializes in asphalt and concrete paving and construction, including road construction; design/build projects; railway construction; and airport runway, apron and taxiway construction. The Paris, Ky.-based company also offers grading and site preparation, landfill construction and environmental work. The company has 17 asphalt plants and three concrete-block manufacturing facilities. Hinkle's 16 limestone aggregate operations service not only its own asphalt, concrete block and portable ready-mix concrete plants, but also area asphalt and concrete customers.

Donnie Spencer, manager of Hinkle's Central Division for aggregates,



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Somerset Stone's finish screen uses Major Wire's Flex-Mat 3 Tensioned on all three decks to make #11s (5/16-in.), or Class I sand and lime.

had facilities that accrued downtime as they stopped to clean the screen media daily to keep products in spec.

"At one point, we were stopping every two hours to clean our screen media, which could take up to 30 minutes to clean and start up again," he says. Referring to Natural Bridge Stone quarry near Stanton, Ky., as an example, Spencer says the site was only realizing 74 percent uptime owing to blinded screens – dropping the 585-tph operation to an average of 433 tph, for a loss of more than 1,500 tons of production, or \$12,000 at spec material prices, in a 10-hour day.

"We initially had woven wire screen media," Spencer says. "But we modified the decks and tried synthetic screen media because that was supposed to take care of our blinding problem. The material at Natural Bridge is especially tough to screen. There is clay embedded in the limestone

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that makes it sticky and moist as it's processed. Our main product there is concrete spec #57s, and we weren't getting the tight gradation we needed because of the blinding. In all, we tried rubber and polyurethane from different manufacturers, and then modified part of the screen decks again and put in [non-blinding woven] wire at the dis-

charge end. The wire helped somewhat, but nothing really solved the blinding."

In 2007, Spencer and Hinkle Contracting's Cumberland Division Manager Roy Sutton saw a brochure from Candiac, Quebec-based Major Wire Industries Ltd., describing its new technology that combines the efficiency and performance of the company's Flex-

Mat 3 self-cleaning screen media with the easy installation of modular panels. This technology, available for flat-surface and tensioned screen decks, allows producers to increase screen open area, create more screening action with the vibrating wires and eliminate blinding and pegging problems to achieve more throughput of spec material. Its distinctive lime-green polyurethane strips bond individual wires, and allow them to vibrate independently at different frequencies. With more screening action, more properly sized material falls through instead of sticking to the wire, according to the manufacturer.



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As a modular screen media, the 1-ft. x 1-ft. panels have their own individual "crown" in the middle of each panel, running parallel to the flow, which provides the tension needed to allow the wires to vibrate effectively. The panels install easily on most common flat-surface screen decks, similar to traditional polyurethane and rubber panels.

The division managers decided to see if the new Flex-Mat 3 Modular screen media could solve their blinding problems. "I could immediately see that it increased the open area over the synthetic screen media, same as if we were using wire," Spencer says, adding he hoped the cleaning properties of the media also would help. Spencer and Sutton contacted their local Major Wire dealer, Dave Cash from Process Machinery Inc., to get his input. Hinkle Contracting initially installed some test panels of the new modular screen cloth onto a finish screen at its Lake Cumberland Stone quarry.



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At Natural Bridge Stone, Hinkle installed the modular panels on the bottom decks of the scalping and finish screens. The scalping screen uses 1/4-in. Flex-Mat 3 Modular screen media to help pull out the minus 1/4-in. material after the primary crusher for use as washed Class I sand for company-owned asphalt plants. Natural Bridge uses the modular screen media on the bottom deck of its finish screen, with a combination of 1/4-in. and 3/16-in. openings to exert tight control over gradations. The media also helps clean the quarry's 1/4-in.-plus asphalt chips for use in its onsite asphalt plant. Spencer says the quarry is a big help in mixing gradations for asphalt prior to the asphalt plant because the plant doesn't have all of the bins on hand that it needs to create certain mix varieties.

"The flexible modular panels work because they open up the screening area. The 'crown' in the center creates

Take note

With its new equipment, the Somerset plant has been able to almost double its production from 400 tph to up to 800 tph.

the tension needed to give the panel firmer movement," Spencer says. "It's the difference between a gallop and a trot," he adds, explaining that a horse's trot is bouncy, with an up-down movement. "A gallop is firmer, and it rolls."

Natural Bridge now operates at 96 percent uptime. And Spencer says a goal of 99 percent uptime is on track for 2011.

Embracing the technology

As a result of Hinkle's success with Flex-Mat 3 Modular, the company began to add the media to many of its aggregate operations' screens. Over the past three years, the company has increased its use

of Flex-Mat 3 screen media to a point that three-fourths of Hinkle's aggregate facilities now utilize the technology in either modular or tensioned configuration. In fact, one of these operations, Somerset Stone, recently moved and upgraded its entire plant. As part of the upgrade, Sutton chose to add Flex-Mat 3 Tensioned screen media to the middle decks of its twin secondary screens and on all three decks of its finish screen.

Somerset's processing plant had been located at the top of the quarry from its inception in the mid-1970s until mid-2009. "As we mined, we had to haul the material farther and farther for processing," Bryant says. "The 2009 upgrade replaced the entire plant, and we located it down in the pit."

According to Somerset Quarry Superintendent Harley Coffey, the operation's old processing plant had used synthetic screen media to combat blinding, but they eventually tried

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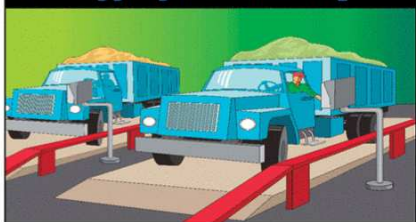
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→ COVER STORY

Flex-Mat 3 Modular panels on the bottom deck of its finishing screen. Coffey says that like Natural Bridge, Somerset had been stopping production daily to clean its screens. And, the operation was getting a lot of fines in its #8 and #57 products. "We couldn't keep them clean. But the flexible wire worked out really well for us," he says.

Sutton explains that the modular screen media had solved the blinding problem in his division's quarries so well that he chose to install screens with crowned decks in Somerset's new plant so that he could use tensioned media. "It fixes a problem on flat-deck screens, but the Flex-Mat 3 Tensioned is less costly. So, if we could configure our screens for it from the start at Somerset, that's the way I wanted to go," he says.

Somerset's 8-ft. x 24-ft. twin secondary screens follow the

FINE SAND IS NOW CONSISTENT ENOUGH THAT IT CAN BE USED FOR CONCRETE BLOCK, READY-MIX CONCRETE AND ASPHALT WITHOUT MAKING SCREEN-MEDIA CHANGES, WHICH SAVES A HALF-DAY OF PRODUCTION THAT HAD PREVIOUSLY BEEN LOST.

secondary HSI crusher and have woven wire on their top decks. The decks each have three 8-ft. sections installed with openings in 1-in., 3/4-in. and 1/2-in., respectively, to spread the gradation. The middle decks with Flex-Mat 3 use 1/2-in. openings and screen for the quarry's #8 products. The bottom deck uses 5/16-in. wire to pull out #11s, Class I sand and lime products.

Overs from the secondary screens go to twin tertiary cone crushers, and then recirculate to the screens. The bottom decks from the secondary screens send #11s, sand and lime to the 8-ft. x 20-ft. finish screen. This screen has Flex-Mat 3 in openings of 1/4-in. and 3/16-in. split on the top and middle decks. The bottom deck has a split of 3/32-in. and 5/64-in. openings.

Bryant explains that with Somerset's old processing plant, Hinkle had enclosed the screens to keep out moisture that exacerbated blinding. "Now we don't have to enclose the screens, and unless we're having a downpour, we can still process in the rain. Flex-Mat 3 was part of that decision to not enclose the screens. Without it, we'd be right back to enclosed buildings to try and keep out the weather," he adds.

In addition, the quarry is able to make coarse sand without having to wash it. At this point, only the fine lime sand is washed. Massengale says the fine sand is now consistent enough that it can be used for concrete block, ready-mix concrete and asphalt without making screen-media changes, which saves a half-day of production that had previously been lost.

With new equipment, less downtime and less recirculation to try and clean the product for spec material, the Somerset plant has been able to almost double its production from 400 tph with the old plant to 750-800 tph, depending on market needs.



Flex-Mat 3 Modular panels have an individual "crown" in the middle, running parallel to the flow, providing the necessary tension so the wires vibrate effectively.

Common-sense solution

"Flex-Mat 3 Modular provided a common-sense solution for us because our synthetic media was blinding over. It opens up the screening area, opens the throughput, eliminates our blinding problem and cleans the material better," Spencer says. He adds that over the past three years, five Hinkle quarries have installed this modular screen media, and three have begun to use Flex-Mat 3 for tensioned screens – all in the quest to improve gradations and production.

"If we don't meet state specs, we might as well just give the material away," Bryant adds. "We're now meeting state specs with everything. That's money in the bank." PQ



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