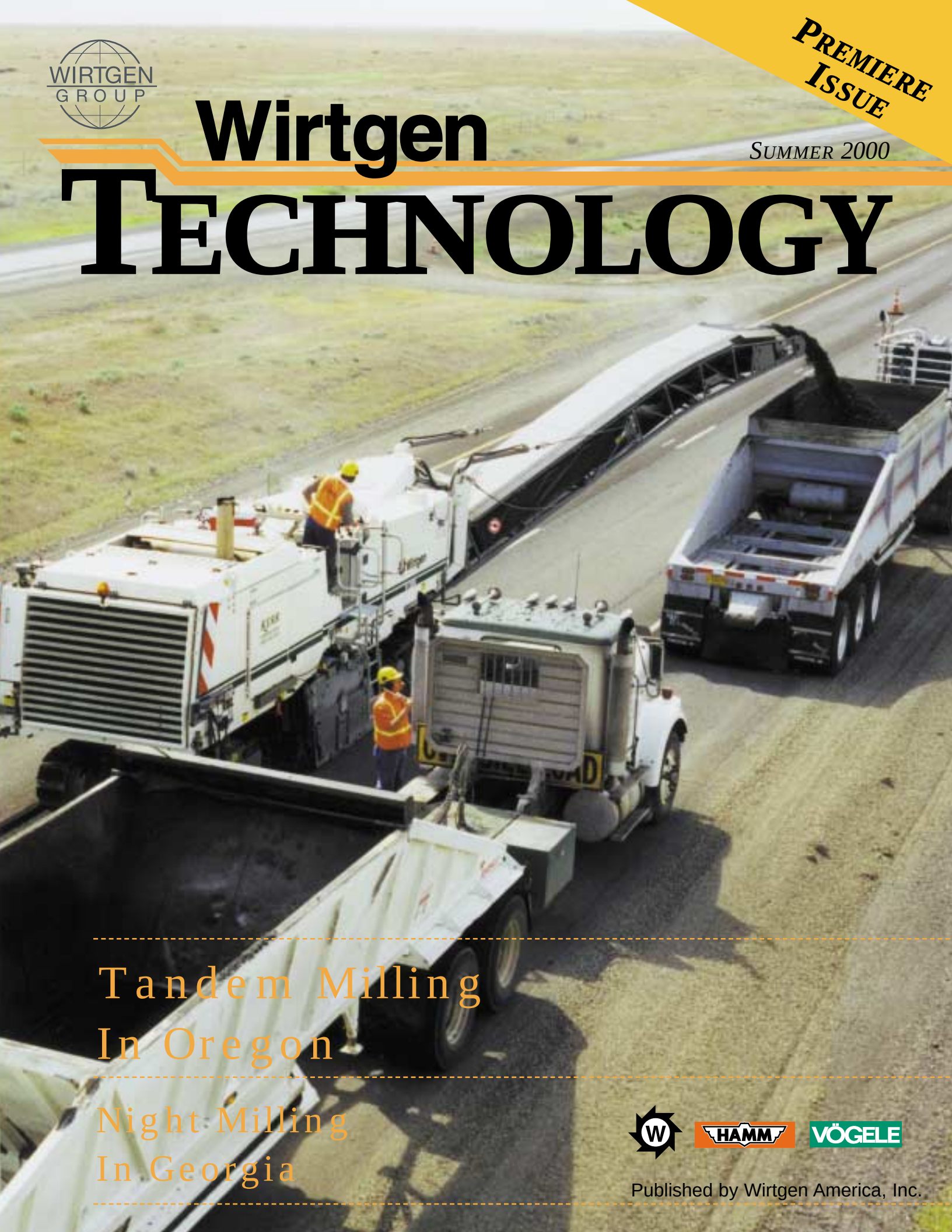

PREMIERE ISSUE

WIRTGEN GROUP

Wirtgen TECHNOLOGY

SUMMER 2000

Tandem Milling In Oregon

Night Milling In Georgia

HAMM VÖGELE

Published by Wirtgen America, Inc.

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SUMMER 2000

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Wirtgen Technology Magazine, Summer 2000, Vol. 1, No. 1. *Wirtgen Technology* is published in the United States of America by Wirtgen America Inc., a subsidiary of Wirtgen GmbH.

On the Cover: *Working in April, Wirtgen W 2200 milling machine of Kerr Contractors, Inc. removes aged asphalt on I-84 in central Oregon. Read more about the project beginning on Page 6.*

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As I see it...

RAP *'don't get no respect'*

To paraphrase Rodney Dangerfield, reclaimed asphalt pavement (RAP) "don't get no respect", if a new survey by the National Asphalt Pavement Association (NAPA) is accurate.

The Federal Highway Administration (FHWA) reports that 80 percent of RAP that's removed each year during widening and resurfacing projects is recycled and reused in various manners.

That 80 percent is significantly higher than the U.S. Environmental Protection Agency's recycling rates of 60 percent for aluminum cans, 56 percent for newsprint, 37 percent for plastic soft drink bottles, 31 percent for glass beverage bottles and 23 percent for magazines, NAPA reports.

But in an Earth Day-inspired, NAPA-commissioned survey of U.S. residents earlier this year, NAPA found that public awareness of RAP reuse is barely existent. In the survey of 1,000 adults, Americans ranked asphalt pavement as being recycled the least among nine products.

When asked which of the nine is recycled the most, 35 percent of Americans said paper, followed by 31 percent for aluminum and 21 percent for plastic. When asked which is recycled the least, 29 percent said asphalt pavement, followed by 18 percent for rubber and 16 percent for yard waste.

That the general public isn't aware of RAP reuse should not be surprising. The public — and the news media, for that matter — barely knows the difference between portland cement concrete and hot mix asphalt pavements.

But because asphalt pavement accounts for 92 percent of the nation's highways and roadways — and the fact that RAP can be used as part of new pavement, roadbeds, shoulders and embankments, and even used for trails and bike paths — the reuse of RAP offers a powerful opportunity to stress the environmental benefits of responsible road construction.

RAP is "buried treasure" for the roadbuilding community and its highway-using, taxpaying patrons. The aggregates in RAP have been pre-processed at considerable expense years earlier, so the diesel fuel, electricity and water used to mine, process and deliver the aggregates are saved, benefiting taxpayers and road users.

Also, because RAP's processed aggregates are reused, less stone is consumed from existing quarries and gravel pits, prolonging those reserves in a time of growing opposition to the opening of new aggregate resources at distances close to the urban areas where most of the product is needed.

In past years, most RAP was landfilled. Because RAP now can be reused in large amounts, pressure is taken off valuable landfill space, making more room for waste materials that are better suited for landfilling.

And because the residual asphalt contained in the RAP also can be reused, less petroleum is consumed for road construction, with attendant benefits in transport, refining and resource consumption.

For all these reasons, RAP deserves more exposure to the public and news media. It's one more way to "paint roads green" in an era where "greener than thou" positioning wins points in the political arena and popular press.

The NAPA survey is a point of departure for this promotion. So is the finely crafted new web site of the Asphalt Recycling & Reclaiming Association (http://www.arra.org/), which lists FAQs (frequently asked questions) about the disciplines and techniques of asphalt recycling.

Let's all think harder about the ways we can promote the positive environmental impact of reusing RAP in our pavements. It's one more weapon we can use to defend road construction against those who would stop it.

• • •

Welcome to the premiere issue of *Wirtgen Technology* Magazine, published by Wirtgen America Inc. for its customers and other stakeholders in the roadbuilding community.

We'll bring you case histories on how contractors and governments are using Wirtgen products to better serve their customers while enhancing their own business. We'll bring you technological developments and news about the roadbuilding industry. And yes, we'll bring you news about Wirtgen America and its people, who are here to serve you.

We welcome your comments about our new venture. If this is not your copy, please use the postage-paid reply card bound inside to get on our mailing list.

And again, welcome to *Wirtgen Technology*!

Stu Murray
President
Wirtgen America Inc.

Tandem Milling Machines Make Short Work Of Long Interstate

This spring a Wirtgen W 2200 and a W 2000 cold milling machine teamed up to make short work of a long interstate highway project in central Oregon.

Along the scenic Columbia River in the Columbia River Basin of central Oregon, milling subcontractor Kerr Contractors Incorporated, Tualatin, Ore., used its new big Wirtgen models — in tandem, one ahead of the other — to mill the driving lane of I-84 directly ahead of an asphalt paving train. Prime and paving contractor was J.C. Compton Contractors, Inc., McMinnville, Ore.

The project involved 22 miles of main line milling each direction on I-84 between Arlington and Boardman, Ore. The project began on March 28, with three days of 300-mm (11.8-in.) deep cutting and excavation for the approaches to a bridge deck, said Bill Moody, milling manager for Kerr. Main line milling began on April 3, with the subcontract completed on Tuesday, April 18.

The project was bid in metric by the owner, the Oregon Department of Transportation office at The Dalles. In April, Kerr was milling a 75-mm (2.95-in.) depth of aged asphalt, for a total of 292,078 square meters (3.14 million square feet) of reclaimed asphalt pavement (RAP), approximately 21,905 cubic meters (28,650 cubic yards) in volume.

The value of the milling contract was $126,000, part of the $7.6 million total repaving project. “The job spans across several previous paving projects, so there are different types of mix within the same project,” Moody said. “Some of the pavement is quite broken-up and crumbling, while some is more substantial.”

Big machine in front

“The 2200 is out in front,” Moody said. “The big machine with the most power is leading, followed by the smaller 2000.”

“We’re making a 4.2-meter-wide cut,” said John Mengler, Kerr assistant milling manager. The 2200 comes from the manufacturer with a 7-foot-2 cutting width, and the W 2000 standard is 6-foot-7. But we ordered it with an optional, wider mandrel, at 7-foot-2, because in Oregon the standard inlay is 4.2 meters, or 14-foot width. We wanted to be able to achieve the 14-foot cut with two machines.” Competitive machines lack this two-pass cutting width capability.

Milling preceded asphalt laydown

The Wirtgen machines were only part of a team effort. “The methodology is to have the W 2200 in the lead, followed by a side-cast sweeper, which kicks material into the path of the W 2000,” Mengler said. “The W 2000 comes along and picks up the bulk of the W 2200’s cut in addition to the roadway section that’s being milled. A pickup sweeper follows the W 2000 and a second kick broom takes care of the dust.”

The Wirtgen machines were loading RAP into Compton’s trucks. “Once we’ve done the grinding and cleanup, Compton follows, paving about 1,000 meters behind us, inlaying the cut section with hot mix asphalt concrete with 30 percent RAP,” Mengler said. Compton was paving using live bottom trailers dumping asphalt into a windrow, with a windrow elevator feeding a Blaw-Knox PF-220 asphalt paver.

The job was specified to preclude driver exposure to vertical edges, and no night work was required. “Going into the job, the methodology was for us to cut the hole, and for Compton to fill it and be complete at the end of each shift,” Mengler said.

W 2000 follows W 2200 in I-84 project

New to cold milling

Kerr Contractors has been in business for 12 years, but only recently has entered the competitive asphalt milling business. The W 2200 and W 2000 comprise Kerr's milling fleet at this time. "Kerr primarily is a sitework/utility contractor," Moody said, "and has been milling only since August 1999."

That's when Moody and Mengler joined Kerr. The milling business is an extension of Kerr's existing demolition materials recycling operations. "The W 2000 was acquired last fall, and the W 2200 this spring," Moody said. Both units were new.

Kerr's dealer is Construction Machinery Inc. of Portland, Ore., a $180 million, Anchorage-based firm with 320 employees and 15 dealer locations in Alaska, Washington, Oregon and California. The dealer's website is located at http://www.cmi-online.net/.

"These machines ultimately will be lower in cost to operate, and are user-friendly from an operations standpoint," Moody said. "The production capabilities of these machines are as good, or greater, than competing machines, perhaps 15 to 20 percent more productive than directly competing models."

"It's not very often that you have an opportunity to put a machine into a situation of pure-production mode," Mengler said. "This job has given us that opportunity. And although it's very early, what we've seen so far is better production than we were anticipating, and lower operational and maintenance costs."

Productive design features

Many Wirtgen design elements have caught their attention. "There are design features that are causing the higher production," Mengler said. "The mandrel [cutter drum] design is a superior product. Material can be pulled out of the cutter housing faster with the wider conveyor belts. I'm not a mechanical engineer, but the power transfer from engine to drum seems more efficient.

Tandem milling

"We're able to keep the machine in the cut longer with its more efficient use of water, tool wear is better, and the mandrel is well balanced and near perfect," Mengler said. "And because tool life is longer we don't have to get out of the cut so often to change teeth."

Kerr was able to purchase the new machines with a high level of confidence. "Everything we thought would happen, has happened," Moody said. "We have gotten extra time in the cut, and better production rates. When we first started we had strong brand loyalties to other makers. But the Wirtgen machines have proven themselves and validated our assumptions."

About the Wirtgen W 2200

The W 2200 — new for the Year 2000 — is designed for big, continuous cold milling projects in which a pavement must be removed mile after mile.

The high-horsepower, high-production W 2200 lets contractors or government agencies mill large projects in surprisingly short periods of time. Its maximum milling depth of 13.7 inches (350 mm) means that entire pavements can be removed at a single pass.

Wirtgen's design engineers have produced a machine with a cutting width of 86.6 inches (2200 mm), four large D-5 crawler tracks, a milling drum with a high-efficiency mechanical belt drive, and a highly efficient front-loading system on a unit that is both compact and easy to operate. The W 2200's Caterpillar Model 3412E, 12 cylinder, 875 hp diesel engine is specified for the machine's maximum cutting depth, with an immense feed rate and high level of performance that keep operators and owners happy.

The front-loading conveyor system is sized to handle extremely large volumes of material, by means of its 43.3-inch (1100 mm) belts with a carrying capacity of over 1,100 tons (1000 metric tonnes) per hour.

About the Wirtgen W 2000

The W 2000 is a high-performance, powerful, compact large-volume milling machine with broad cutting width for removing deteriorated asphalt pavements, or complete roadway structures down to 13 inches in a single pass.

The W 2000 boasts a 565 hp engine and front loading of RAP for ease of operation. The W 2000 has a 79-inch cutting width as standard, and an 87-in cutter width as an option.

Tight Quarters In Historic District Can't Stop Alpha

Wirtgen America regional manager Marty Burks delivers new W 2000 to Alpha Milling president Larry J. Ware

"That year I bought the W 2000 off the lot at Conexpo/ ConAgg, and just purchased another W 2000 this year. It's a very competitive market, but if you have good machines and good people you have the world on a string."

In April, asphalt milling contractor Alpha Milling Co., Inc., used one of its versatile W 1900 DC cold milling machines to remove aged asphalt in the downtown historic district of Golden, Colo., as part of a street reconstruction project.

With the Front Range of the Rocky Mountains to the west, the famous Coors Brewery to the east, and hemmed in by the massive North and South Table Mountains, Golden lies in a spot of scenic beauty.

Golden was an early gold mining town and trading depot. While ultimately surpassed by sprawling Denver to the west, Golden has retained its period architecture and visitors now enjoy a selection of saloons, shops, tourist attractions and restored historic structures.

Against this backdrop, and with precision, milling foreman Jeff Palumbo and groundman John Parks negotiated the W 1900 DC — with its 6-foot, 7-inch wide cutter drum — down major streets, up narrow alleys, and to-and-fro across parking lots.

"They are milling 4 to 7 inches deep, full-width, as part of a street reconstruction project," said Paul Valdez, Alpha's operator/foreman. Alpha served as subcontractor to Asphalt Paving Company of Golden, for its client City of Golden.

Pulling teeth a joy

As an operator, Valdez pays special attention to features that optimize productivity. And to him, the ease of replacing tooth holders stands out.

"Wirtgen's drum system and tooth holders are 100 percent better than any other machine," he said. "The Type III holders are so much easier to work with. If you happen to 'burn' a holder, you unscrew a bolt, remove the holder, clean it out, put another one back in and you're done. There's no welding or high maintenance in the drum area." While Wirtgen's system can take 5 minutes from start to finish, welded systems take up to one hour to repair.

While Valdez considers the Wirtgen models to be fundamentally operator-friendly, Wirtgen's liberal use of international symbols on the controls took a little getting used to. "When we demo'ed the first 1900, the symbols and many controls were intimidating," he said. "But once you start doing the work the symbols are less and less important. Right away you know where everything's at."

Carving a niche in milling

In the space of only three years, Alpha has been able to carve out its niche in the heated competition of the cold milling arena. Alpha specializes in smaller county and municipal jobs within 75 miles of Denver, bypassing the big interstate and state highway work.

"We expanded really fast," said Alpha president and owner Larry J. Ware. "I purchased one Wirtgen and in a month's time I had to purchase another. In our first year we did $1.2 million of work, so we had a pretty decent year."

W 1900 DC works in constrained quarters of parking lot in historic downtown Golden

Alpha milling foreman Jeff Palumbo at the helm

And the second year was just as rewarding. "We did $2.2 million in 1999," Ware said. "That year I bought the W 2000 off the lot at Conexpo/ConAgg, and just purchased another W 2000 this year. It's a very competitive market, but if you have good machines and good people you have the world on a string."

Going into the summer season, Alpha had about 16 employees. Each year, from March through December, each machine is seeing about 1,300 hours' worth of work, Ware said.

But Alpha was able to find work outside the standard season in February 1999. "One interesting job completed in early 1999 was work at Colorado University's football field, milling off the artificial turf asphalt base prior to their putting in natural grass," Ware said.

Relying on Wirtgen

Since its founding in 1998, Alpha has based its fleet — and in a way, its future — on Wirtgen products. The firm has two W 1900s, two W 2000s, and a 1000 VC, and in spring, had a W 500 utility mill on order.

Ware first encountered Wirtgen machines at a previous cold milling firm with which he was associated. "I had the 1000 VC at the prior company and had hardly any problems with it," Ware said. "I was totally impressed. Alpha tried, and dropped, a competing model after the first year, as I realized that Wirtgen machines are the machines of the future."

Ware's machines' front-loading capabilities are winning friends among Ware's prime contractor clients in terms of traffic control and production, Ware said. "With the front-load, trucks can go with the flow of traffic and don't have to back up to the milling machine," he said. "The continuous flow — with trucks not having to turn out and back around in — means so much to contractors."

Palumbo and groundman Jeff Parks transit to another milling site in Golden historic district; Coors brewery is at end of street

And even with a front-loading conveyor — instead of the conveyor blocking the operator's view — operator visibility actually is enhanced, because he or she doesn't have to keep turning around to see where the conveyor is aiming, Ware said.

Down-sized model on order

In April, Alpha had ordered a much smaller Wirtgen machine — the W 500 — to replace the skid-steer-mounted 18-in. cutters it was using for small milling jobs like manholes and curbs.

"We're really pleased with the Wirtgens, and think it will be a lot more cost-effective to go with the dedicated model instead of the skid-steer loaders," Valdez said. "They're more productive, a lot quicker and a lot cleaner. And from operating the other machines, I know they are a lot more operator-friendly.

"Wirtgen is a lot-better machine," Valdez said. "To me it's the best machine out there."

About the 1900 DC

The Wirtgen Model 1900 DC cold milling machine features a broad cutting width and a productive, powerful, compact large-volume milling machine for removing deteriorated asphalt pavements, or complete roadway structures down to 12 inches in a single pass.

The 1900 DC boasts a 400 hp engine and front loading of RAP for ease of operation. This model has a 79-inch cutting width, with 86-inch cutter width available as an option. Wirtgen's popular 2-3-4-foot Combo Cutter options also is available for the 1900 DC, making it a highly effective shoulder excavator as well.

Night Work Speeds Georgia Shoulder Milling

Independent suspension of 2100 DC works well with Combo Cutter

Cold milling of soil-cement shoulders at night was setting the stage this spring for accelerated work on the reconstruction and widening of I-475 west of Macon, Ga.

The improvement of the heavily traveled bypass in Bibb and Monroe counties in Middle Georgia encompasses 15 miles of widening and reconstruction on I-475 north of Macon to I-75 to the south.

Night work is an important feature of this $69 million, 840-day project, due to the project's location as the "Macon Bypass", a heavily trafficked route from the central United States to Florida. Average vehicle per day count was 47,700, with 26 percent trucks. This is projected to increase to 85,900 vpd by 2022.

"The traffic volume during the daytime is very heavy," said Lamar M. Pruitt Jr., Georgia DOT District 3 Construction Engineer in Thomaston, Ga.. "You can hardly close a lane without backing up traffic so far that it becomes impossible."

Day/night work is dictated by traffic loads. Pruitt said the contractor may work during the day, but can't do any work during the day that would prohibit the contractor from getting out of the road immediately if the traffic volume rose. Daytime closures are allowed from 11 a.m. to 8 p.m. if traffic is not visibly disrupted.

The project is the first incentive/disincentive contract awarded by the Georgia Department of Transportation, Pruitt said. The incentive bonus for early completion is $10,000 per day, up to a maximum of $2 million.

Prime contractor is Douglas Asphalt Company, of Douglas, Ga., which received notice to proceed June 29 of last year. In April the contractor was at least 10 percent ahead of schedule, said Steve Vaughn, Macon Area Engineer for Georgia DOT.

Deep shoulder milling

In mid-March Douglas was removing anywhere from 4 to 16 inches of shoulder and subbase in one pass, prior to placement of a road base to enable shifting of driving lanes while the existing interstate is widened. As part of its fleet Douglas was using a Wirtgen Model 2100 DC cold milling machine equipped with Wirtgen's new Variable Width Super Combo Cutter.

"We're taking out five-and-a-half-feet of soil-cement shoulder 12 inches deep," said Chris Thompson, milling foreman for Douglas. "We're going to shift the main line to the left, so we're trenching on this side so we can run traffic temporarily where the shoulder was. We'll come back and fill it with graded aggregate base and asphalt."

After placement of temporary lanes, Thompson will bring the 2100 DC back to mill 8-inch-deep, 4-foot wide safety shoulders in the right of way.

The Combo Cutter on the 2100 DC easily cuts varying widths, said Sal D'Amato, regional manager, Wirtgen America, Inc. "It has the capability of cutting 6-foot, 8-inches wide, but also can cut 2-, 3-, 4- and 5-foot widths by easily removing cutter drum sections.

"This one is set up specially to cut 5-foot, 6-inches due to the job requirements," D'Amato said. "The contractor bought this machine for this contract last year; we make the only machine that can do it. It can cut 16 inches in one pass."

"We can't cut the shoulder 6-foot-6, because then we'd be cutting out too much, and leaving extra work for backfill," Thompson said. "The drum being 5.5 feet gives us a perfect trench, and all we have to do is dump our graded-aggregate base (GAB), roll it and pack it. When they come back to pave in a couple of days, we'll come back, cut it to grade and we're over and done with.

"The Combo Cutter keeps us busy year-around," Thompson said. "After I get through here I'll go back to regular milling full-width, then in winter break it down to 2- or 4-

Heavy daytime traffic on I-475 necessitates night work

About the 2100 DC

The 2100 DC is a high-performance profiler. The reclaimed asphalt pavement (RAP) is loaded via a two-stage front-loading conveyor system. It boasts a cutting width of 79 inches and cutting depth of 12 inches. At an operating weight of 88,000 lbs., the machine can produce as much as 700 tons per hour of RAP. The engine, a Mercedes OM444LA, supplies a continuous 601 hp. It is supplied with a tracked suspension.

foot widening jobs. The machine won't be parked long."

The 2100 DC is powered by a 600-hp continuous, 690-hp intermittent Mercedes V12 diesel engine. It's one of 11 cold milling machines of varying manufacture owned by Douglas Asphalt.

"It's one thing to cut the pavement, and another to get the reclaimed asphalt pavement out of the cutter housing, onto the belt and into the truck," D'Amato said. Conveying capacity on the 2100 DC is enhanced by the machine's 40-inch-wide belts with taller chevrons.

"I've been on this project for seven months," Thompson said. On the previous 14-mile southbound shoulder, two machines were used to remove soil cement, with the 2100 DC cutting the final grade in the hole. "Now we're doing it all in one lick, and knocking off the extra machine costs," he said.

Where years ago this work might have been done by a subcontractor, scheduling considerations are prompting prime contractors to acquire large cold milling machines on their own. "A lot of times contractors will have corrections to do under deadline, and to get a milling subcontractor to come in and work only two to three hours is not cost effective," D'Amato said.

Superpave and OGFCs

To accommodate increasing traffic volume, reconstruction involves widening from two to three lanes each way, restoration of the existing portland cement concrete (PCC) pavement, and on it placement of a stone matrix asphalt (SMA) base course, topped by a Superpave-design driving surface, from Tobesofkee Creek to the south, to Georgia 19/U.S. 41 to the north, a distance of 14.8 miles.

Slab repair and replacement, and joint sealing is being undertaken on the deteriorated PCC pavement. Prior to overlay paving fabric will be placed over each joint to forestall reflective cracking.

There will be an average of 8.5 inches of overlay on the existing PCC pavement, and the inside added lanes will be graded aggregate base topped by full-depth asphalt. The final configuration will be three 12-foot lanes with 12-foot inside and outside shoulders of full-depth asphalt. A concrete median barrier will be placed.

A typical cross section of the new, inside lanes is 400 mm of graded aggregate base, topped with three 50 mm lifts of 19 mm top size Superpave mix, and a 69 mm lift and another 50 mm lift of the same mix. Over this will be placed a 40 mm, 12.5 mm top-size SMA course, topped by a 50 kg/square meter spread rate of 12.5 mm open graded friction course.

For the existing section overlays, two 50 mm lifts of the 19 mm Superpave base course will be topped by a zero to 35 mm leveling course of Superpave mix to increase the cross-slope, Vaughn said. This will be topped by another 50 mm Superpave mix, and the SMA and OGFC.

Georgia DOT specified the typical sections, and the contractor will design and submit for approval the actual job mix formula.

In addition to the driving lanes work, four double bridges will be widened and repainted, and seven overpasses will be raised, rehabbed and painted. Concrete repair and bridge widenings are being undertaken by Douglas' subcontractor Gilbert Southern Corp. of College Park, Ga.

Douglas Asphalt's milling foreman Chris Thompson checks cut depth

There's Just One Machine For One-Man Operation

Utility cold milling contractor Vulcan Asphalt thinks so much of its new W 1200 F/T that firm's promotional literature displays it as a boon for the customers.

Vulcan took possession of the W 1200 F/T in January 2000, sold by the big California distributor Nixon-Egli Equipment Co. (see related story). "The machine is ideal for dig-outs, conforms, wedge cuts, trenching and profiling," said Jim Fingland, president, Vulcan Asphalt Process Co., Isleton, Calif.

Fingland is the owner-operator, and his wife Portia is ground-person. As a married couple they have attained a good synergy in the contracting business. "Portia drives, and I conduct most of my business seated next to her with a laptop on my knees," Fingland said.

Using machine to promote

Since January, Fingland has used the machine to promote his service and the benefits both he and the machine offer to clients. Instead of the hackneyed "a cut above", Fingland's slogan is "A Cut Below the Rest".

Both Fingland's business card and sales brochure feature color photographs of the W 1200 F/T, and the brochure stresses the machine offers added value for the customer. "Significant savings of $1,000 per day may be achieved by utilizing a 4-foot machine in lieu of the larger, less-maneuverable 6-foot," the brochure states.

Fingland's brochure explicitly states that the all-track design of the W 1200 F/T is another plus for customers. "Gone are the days of getting stuck in non-cohesive soils and sub-base," the brochure says. "With all tracks, this machine will cut it."

That benefit became clear enough to Fingland on jobs in 1999. "Last year we spent 200 days working, and I got stuck in soft soils a dozen times," Fingland said. "I lost a lot of time getting out of the muck. Now that we have this all-track machine, I can't imagine any circumstance where it would get stuck. We've already encountered a job in Merced this year where we definitely would have gotten stuck."

Tracks replace tires

The 1200 F/T replaced a Wirtgen W 1000, a 40-inch machine with rubber tires. "It was a good machine," Fingland said, "but it was unstable in areas where the base was soft, and too often we'd get stuck. It also was a back-loading machine, so the trucks would have to back into it.

"The 1200 F/T is a front-loading machine, with a lot larger swing so we can load trucks a lot easier and faster," he said. "And the right rear track swings in hydraulically now, where we used to have to do it manually. "That's important when you mill close to walls and curbs."

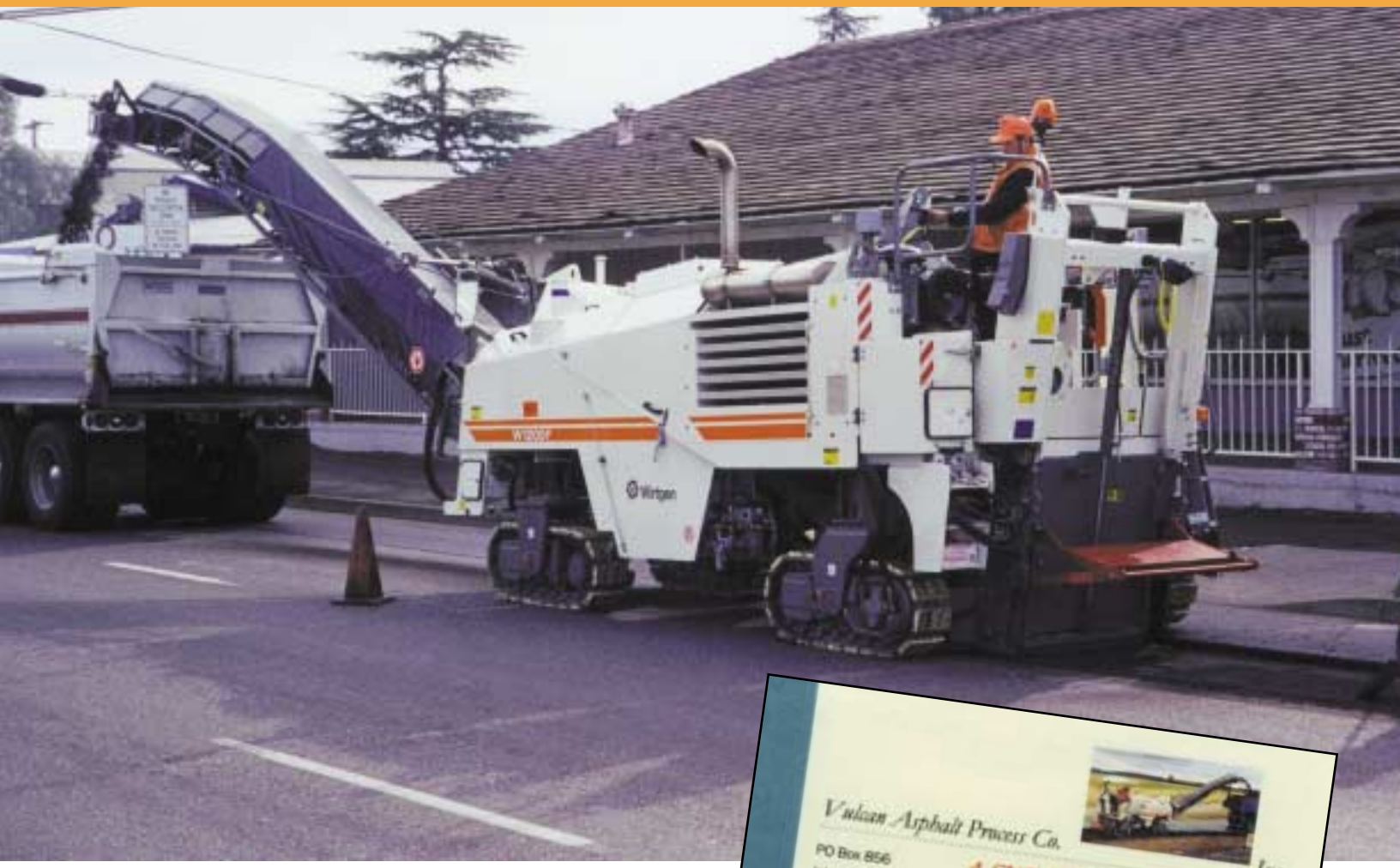
For the operator, visibility is improved, Fingland said. "You're not looking back and forth to load and cut," he said. "Everything's always in front of you. And on the platform, the ease of operation is so much better. I like the control panel and the electronic sensors. It's a very accurate machine."

Getting used to new model

The high technology built into the W 1200 F/T can be startling to a new operator, and it took some getting used to, Fingland said. "I wasn't used to it," he said. "On the first day I was a little shaky because there were so many controls that I didn't have on the previous machine. But after three days in Merced, it was a breeze."

At Merced, Vulcan worked as sub to Garcia Paving, milling 40,000 square feet of short dig-outs all over Merced streets. The dig-outs were undertaken to fix failed areas for reconstruction prior to complete pavement overlay.

"The longest one was 8 feet," Fingland said. "This really puts a lot of strain on the operator, namely me, because you just barely put it in the ground when you have to come out of it. I was a busy man, but it did the job very accurately." Garcia Paving followed immediately behind Fingland, filling in the cuts prior to overlay.



Owner-operator Jim Fingland cuts trench in San Jose in January with new W 1200 F/T

Fingland's business card proclaims "A Cut Below the Rest" and features the W 1200 F/T

A family business

Vulcan Asphalt Process Co. Inc. is descended from a family business, Asphalt Surfacing Corp., that was started by Fingland's father, Jack. Jim subsequently struck out on his own in 1977, and for a short time was in competition with his father, before his father retired.

Fingland remembers the first asphalt milling machine being sold in the late 1970s. "A fellow came to our office, selling a mining drum attached to a motor grader, and he wanted $100,000 for it," he said. "We turned him down, and didn't get into milling until several years afterward."

"The machine is ideal for dig-outs, conforms, wedge cuts, trenching and profiling."

About the Wirtgen W 1200 F/T

The W 1200 F/T is the tracked version of the rubber-tired W 1200 F. It's a road milling machine with mechanically driven milling drum of up to 48 inches wide. It features a two-part front-end conveyor system. The machine is driven by a water-cooled, six-cylinder turbo-diesel KHD Deutz engine rated at 250 hp. An integrated heavy-duty cooling fan ensures trouble free operation, even at high ambient temperatures.

Specialization In Paving Market Keeps Nixon-Egli Volume Leader

Nixon-Egli is Wirtgen America's No. 1 dealer in the United States

"If we couldn't provide added value for our customers, then we would be no better than any other guy down the road."

Customer service and market intelligence keep Wirtgen America Inc.'s largest-volume dealer — Nixon-Egli Equipment Co., of Santa Fe Springs, Calif. — on the front lines in one of the nation's biggest equipment markets, California.

Nixon-Egli's unparalleled performance last year earned it recognition by Wirtgen as being No. 1 in dealer sales, and No. 1 in government sales, for 1999. The awards were presented to John Skaff, vice president, construction equipment division, and Carl Bahnsen, vice president, during the annual meeting of the Associated Equipment Distributors in Chicago earlier this year.

"We've been their No. 1 dealer for the last four years," Skaff said. "We have great market penetration and market share for Wirtgen."

Customer hot buttons

Early in the 21st century, Skaff has pinpointed product segments where Wirtgen products are especially in demand.

"There are three areas with a lot of activity," Skaff said. "We have a lot of customers putting in fiberoptic cable, so there's suddenly a lot of interest in smaller-type machines, such as the 20- and 24-inch machines, the W 500s and W 600s. Contractors are doing the work in San Diego, Los Angeles, Sacramento, everywhere. We're seeing miles and miles under contract.

"We also have a lot of interest in curb reveal and cut-outs for the state of California, utilizing the 48-inch machines, the W 1200 Fs and F/Ts," Skaff said. "And the new models with increased horsepower are getting interest. We have had good market penetration with the 1900 DC. That machine broke the market open for us. Now the new W 2000 with Cat power, heavier-duty tracks and better production is further penetrating that market, and we're starting to see trade-ins of 1900s on W 2000s."

And Nixon-Egli is getting its feet wet in base recycling with foamed asphalt, as well. "We have a signed order on a foamed oil machine that came in last week," Skaff said. "Right now all cylinders are firing. We're getting interest in every product area."

Narrow market focus key

One key to Nixon-Egli's success is product specialization and a narrow market focus. "Instead of trying to be a jack of all trades and master of none, we try to be a jack of very few trades and master of all," Skaff said. "We strictly serve the asphalt paving industry. If it

has to be paved, compacted, ground-up, swept or maintained in any way, we are involved in that. That way our efforts are focused in one sector and we can maximize our profits and market share."

Privately owned Nixon-Egli operates out of two locations, serving southern and northern California. Its headquarters are located in Santa Fe Springs in the L.A. area, and its northern territory is served from Hayward, north of San Jose in the San Francisco/East Bay region.

The firm's sales are divided approximately 60 percent contractor to 40 percent governmental, Skaff said, adding it sells as many as 100 street sweepers per year. These public sector sales, while rewarding, require a longer time frame than private sector dealings, he said.

"Government sales can be drawn out much longer than contractor sales," Skaff said. "Contractors are quick sales, with much more intense negotiations. A government sale, on the other hand, will involve writing of specifications, demonstrations, and capital allocations. The process can take as long as six months to two years. But with the contractor, it's in the neighborhood of three months."

At Nixon-Egli yard in Hayward, Calif., big W 2000 awaits shipment

Support essential to repeat sales

After-sales support is key to retaining customers, Skaff said. "We probably have $2 million to $3 million worth of parts for all the pieces of equipment we provide," he said. "If we sell a part three times in one year, we stock it. We also maintain four service trucks in northern California, and six service trucks in southern California."

He added Nixon-Egli has 16 mechanics in the south, and eight in the north, who are on call for 24/7 customer service via radio telephone. "Wherever they live is a satellite location," Skaff said.

Customer training is an essential part of the sale, Skaff said. "We always provide training on demos and startups," he said. "We try to do it in conjunction with the factories whenever possible." His maintenance personnel also undergo continuous education. "I would like to say our maintenance people are extremely well-trained, but we always try to have a factory person out in the field so we learn something new, as well as our customers."

All of this added support helps Nixon-Egli sustain public sector sales as well as its private clientele. "One of the reasons we get the majority of the bids is that those entities are very comfortable with our service and parts, as well as our sales personnel. All three of those units added together constitute added value for Nixon-Egli customers. If we couldn't provide added value for our customers, then we would be no better than any other guy down the road."

Nixon-Egli's customers think so highly of Nixon-Egli that when they feel underserved by existing dealers of a particular product line, they suggest to manufacturers that they switch dealers to Nixon-Egli.

Skaff, though, credits much of his firm's success to support provided by Wirtgen America staff. "Our market penetration for Wirtgen is much better today than it was when we first started with Wirtgen," Skaff said.

"One of those reasons is the change in administration at Wirtgen America in the early 1990s," Skaff said. "Frankly, since [Wirtgen America president] Stu Murray took over, and placed good district representatives like [regional managers] Marty Burks and Jeff Wiley, they helped us double our market share. I can't say enough about them."

John Skaff, *left, receives award for being No. 1 in Dealer Sales for 1999, and* **Carl Bahnsen** *(right) receives award for being No. 1 in Government Sales for 1999, from Wirtgen America president* **Stu Murray** *(center) during Associated Equipment Distributors annual meeting in Chicago in January*

New Nashville Headquarters Will Serve Wirtgen America, Hamm

The days are numbered for Wirtgen America Inc.'s River Hills Drive Nashville headquarters. Hemmed-in and bursting at the seams, there's barely enough room for Wirtgen America current operations, much less future growth.

That's why Wirtgen America has broken ground for a $4 million, 74,000-square foot office, parts warehouse and service facility that will provide the state-of-the-art in employee and customer comfort, service and productivity. Both Wirtgen America and its new Hamm Compaction Division are expected to move in before the end of the year.

"Wirtgen America's needs have outgrown its existing facility," said David Bockian, head of preconstruction services for T.W. Frierson Contractor, Inc., Nashville, the single-source, design/build firm which has undertaken the project.

"Architecturally we're trying to satisfy Wirtgen America's growth needs while providing a corporate identity for the administrative, sales, warehouse and maintenance shop functions suitable for its North American headquarters," Bockian said. "It's going to be an exciting, versatile building."

The total office space — including administration and warehouse offices — will total nearly 16,000 square feet on two levels. The building will include 9,900 square feet of 60-foot clear-span shop, with an 19.5-foot clear hook height overhead crane running the length of the work area.

The parts warehouse will be 38,000 square feet with a 20-foot clear minimum height. Several mezzanines within the warehouse footprint will provide even more space to a total of some 50,000 square feet on two levels. Tall racks will accommodate parts and other equipment.

The building will be a concrete slab-on-grade structure with steel superstructure, Bockian said. The exterior perimeter walls will be of tilt-up concrete. "They will simplify construction while providing a versatile, durable wall system," he said. "Not that you would want to, you could run a forklift right into it without doing anything, compared to metal wall panels."

Nonetheless, the rear walls of the structure will be metal wall panels to ease future expansion. "But anything visible to the street will be painted tilt-up concrete, with accent bands to give flair and keep it from looking too much like a warehouse," Bockian said. "And office will be similar, but elaborated to a greater degree to differentiate it."

Abundant skylights and a light-colored interior paint scheme will enhance the ambience of the warehouse interior, while reducing lighting costs. The facility will be fully sprinkled. A wash bay in back of the building will facilitate washing of equipment. A loop road will encircle the building, which has plenty of room for expansion on the 8.5-acre site.

A two-story main entrance will greet workers, customers and visitors. A training room will accommodate up to 30 trainees. Conference rooms will adjoin the training room, and when all walls are opened, up to 60 persons will be accommodated as a group.

The roof is a Butler Manufacturing MR-24 standing-seam metal roof, "the best roof in the world," Bockian said. The whole facility is sited in an industrial section of The Crossings planned unit development, with adjacent residential and retail land, in its entirety developed in an ecological and aesthetic manner.

It's located within Nashville corporate limits, and to the delight of visitors, within 10 miles of Nashville International Airport, and a half-mile from I-24, much like Wirtgen America's existing facility.

Wirtgen GmbH Completes Buyout Of Hamm Compactors

In March Wirtgen America Inc. parent Wirtgen GmbH of Germany completed its acquisition of Hamm AG, a leading innovator in asphalt compaction equipment. The move consolidates Wirtgen Group's position as a world leader in mobile road construction equipment both internationally and in the United States.

The purchase of Hamm complements Wirtgen Group's existing lines of Wirtgen asphalt recycling, milling and road construction equipment, and Joseph Vogele AG asphalt pavers. Simultaneously, Wirtgen announced the sale of its Wibau Asphalttechnik asphalt mixing plant subsidiary to Amman IMA GmbH, a German company of the Swiss Amman Group.

In August 1999, Wirtgen first announced acquisition of 56 percent of Hamm. That stake was increased to 100 percent in March 2000.

And in Germany, the construction of a new $25 million state-of-the-art manufacturing facility for Hamm was started in December 1999, and will open in early 2001.

Hamm AG, of Tirschenreuth, Germany, and Wirtgen GmbH, of Windhagen, Germany, are two international companies that combine high-quality products and advanced technology in world road construction markets.

The Wirtgen Group's goal is to become one of the world's largest suppliers of road construction equipment. Internationally, Wirtgen Group's complete line now consists of compaction equipment, soil stabilizers, spreaders, reclaimers, asphalt pavers, milling machines, slipform pavers, and other equipment.

Much of the new Wirtgen Group product line was exhibited at the Intermat 2000 international construction equipment exposition outside Paris May 16-21.

In North America, Hamm markets single-drum vibratory soil compactors; articulated double-drum vibratory and tandem combination vibratory asphalt compactors; pneumatic-tired asphalt compactors; and static three-wheel asphalt compactors.

Hamm compactors deliver rock-solid compacting capabilities, helping customers control costs and stay on schedule. Hamm compactors are designed to meet U.S. Superpave requirements, as well as to help contractors earn quality assurance/quality control (QA/QC) bonuses.

Wirtgen America Inc. — headquartered in Nashville — is the North American subsidiary of Wirtgen GmbH, the world's largest manufacturer of pavement milling machines. Wirtgen's product line in North America primarily revolves around high performance, technologically advanced milling equipment, hot and cold recyclers, Rhino-brand parts and cutters, and surface mining equipment.

Now, Wirtgen America has purchased all the assets of Hamm America of Dallas, Tex. To better serve its North American market requirements, Hamm America will become the compaction division of Wirtgen America. The Hamm brand will be retained.

For more information, you're invited to visit these firms on the Internet at http://www.wirtgenamerica.com/, and http:www.hammcompactors.com/.

Newsmakers

In March, *Tonya Bennett* joined Wirtgen America Inc. as credit manager. She's lived in Middle Tennessee all of her life, and is rearing her two children here. In addition to past due accounts, Tonya loves to collect postcards from traveling friends and acquaintances.

• • •

***Heath O'Sheal* has followed the rainbow to Middle Tennessee from Greenville, S.C. In April he joined Wirtgen America as warehouse supervisor.**

• • •

Wirtgen America's newest parts salesman is *Gene White,* whose responsibility at Wirtgen complements his avocation as licensed auctioneer. We hope he'll put his selling skills to good use here in Tennessee, where he and his wife Gail have lived all their lives.

• • •

***James F. Griffith* has joined Wirtgen America Inc. as district representative for Pennsylvania, Delaware, West Virginia, Virginia, and southern New Jersey (south of I-95). Jim brings extensive sales experience with Black & Decker, Allegheny, High Lift, and most recently, Barton dealer Stephenson Equipment.**

Jim can be reached at :
579 Oaklynn Court, Apt. TA,
Pittsburgh, Pa., 15220,
voice/fax (412) 531-0472
mobile (412) 719-1533.

New FHWA Research Reaffirms Value Of Rumble Strips

Milled-in shoulder rumble strips are margin of safety for errant drivers

New research from the Federal Highway Administration (FHWA) reaffirms the cost-effectiveness and value of rumble strips on the shoulders of our nation's highways.

And although the research used data only from rolled-in rumble strips — that is, rumble strips formed during compaction of fresh hot mixed asphalt by a compactor with upraised ridges on its drum — many of the conclusions intuitively are applicable to milled-in strips as well, such as those formed by the Wirtgen W 500 or W 600 cold milling machines modified with a rumble strip attachment.

Released in December, *Safety Evaluation of Rolled-In Continuous Shoulder Rumble Strips Installed on Freeways* gives an advance look at findings of a longer paper by the same name to be released by the Transportation Research Board this year.

According to the paper, 1997 statistics from the *Fatality Analysis Reporting System* (FARS) show that 37,280 fatal crashes occurred, with 11,126 of these crashes being coded as single-vehicle run-off-the-road crashes. "This significant safety problem is being addressed with continuous shoulder rumble strips (CSRS) and other safety treatments by many highway agencies," writes author Michael S. Griffith at FHWA's Turner-Fairbank Highway Research Center.

"The average safety effect of CSRS [continuous shoulder rumble strips] is estimated to be a reduction of single-vehicle run-off-the-road accidents by 18.3 percent," the new research reports. For injury crash data (omitting non-injury run-off-the-road accidents), the average safety effect of CSRS installed on rural freeways was a 13 percent reduction in such single-vehicle accidents.

Thus the expense of installing CSRS — either milled or rolled — can mean big savings to the motoring public. In the case of this research involving rolled-in or formed rumble strips, the savings were estimated by the research (milled-in strips cost somewhat more but also are functionally louder).

"It was estimated that approximately one single-vehicle run-off-the-road accident (at an average cost of $62,200) could be prevented every three years based on an investment of $217 to install rolled-in CSRS for one 1 km [0.62 mile]," Griffith writes. "Clearly this is a substantial return for a safety treatment that suggests widespread implementation."

The complete advance report is available off the Internet at http://safety.fhwa.dot.gov/rumblestrips/.

Milled-in strips preferred

While the paper cited above did not study milled-in rumble strips, in actuality, milled-in strips are preferred because of their louder noise, despite their slightly higher cost.

"Milled rumble strips are the current favorite type of rumble strip among many states because they are easy to implement on new or existing asphalt and Portland cement concrete pavements and shoulders," the FHWA reports. "They have little or no effect on the integrity of the pavement structure; and

they produce greater noise and vibration than rolled or formed rumble strips."

Milled rumble strips are generally installed with a longitudinal width of 180 mm (7 in.) and a transverse width of 400 mm (15.6 in.) while offset from the travel lane, typically at 300 to 400 mm (11.7 to 15.6 in.), FHWA said.

"Tires passing over milled rumble strips drop roughly 1.3 mm [0.5 in.] into the groove, which causes tire noise and vehicle vibration," FHWA said. This compares to a tire drop in rolled rumble strips approximately 0.75 mm (0.3 in.).

"Field tests demonstrate that the noise and vibration from milled rumble strips are particularly effective in warning large trucks that leave the road," FHWA said. "One study determined the effect of the milled strip to be 12.6 times rougher and 3.4 times louder than that of the rolled rumble strip."

"Milled rumble strips are the preferred method for new or existing (retrofit) shoulders," reported FHWA's Wyoming Division Office in 1998. "Rolled rumble strips, while still in use, are not as effective as milled for new or existing shoulders."

Other data estimate that rumble strips can reduce the rate of run-off-road crashes between 20 and 50 percent. For example, New York State Thruway data show a 34 percent drop in run-off-road crashes after installing shoulder rumble strips, at a time when overall crash rates increased more than 11 percent. New York State Thruway data indicate benefit/cost ratios ranging from 66:1 to a high of 182:1.

The Nevada DOT analyzed several projects that included rumble strips and other safety enhancement features. With benefit/cost ratios between 30:1 to more than 60:1, rumble strips proved more cost-effective than other features, including guardrails, culvert-end treatments, and slope flattening.

A Maine DOT survey of 50 state departments of transportation identified a benefit/cost ratio of 50:1 for milled rumble strips on rural interstates nationwide.

A study by the Pennsylvania Turnpike Commission found that "drift-off-road" (DOR) accidents were the largest contributor to overall accidents on the turnpike system. The PTC developed a new safety feature, the Sonic Nap Alert Pattern (SNAP), consisting of a narrow, continuous rumble strip located in the right shoulder just outside the edge line of pavement.

Using test installations under live traffic, the Pennsylvania Turnpike Commission experienced a 70 percent reduction in DOR accidents by use of SNAP on five different projects over substantial time periods. The PTC was attempting to have its entire system utilize SNAP rumble strips by the end of 1999.

W 500 for milled-in strips

Wirtgen's W 500 cold milling machine — modified with a rumble strip attachment — is a perfect choice to retrofit existing shoulders, or groove rumble strips into new pavement shoulders. The Wirtgen W 600 also is used for this function.

In Oklahoma, a contractor used the Wirtgen W 500 rumble strip machine to install rumble strips on I-40 east of Oklahoma City. Oklahoma DOT specs called for 24-inch-wide cuts instead of the 16-inch cuts used by most other states, so the W 500 was modified for the 24-inch width.

The W 500 rumble strip machine is a simple adaptation to the standard W 500, NOT a job-specific, dedicated machine. Rumble strips are just one of a variety of jobs that the W 500 can accomplish.

In the Oklahoma application, the W 500 worked at a rate of 60 fpm, or one cut per second. Other recent applications of rumble strips using the W 500 include agencies such as the New York State, Texas, North Carolina, Florida, Louisiana, Tennessee, Idaho, Missouri, Washington State, Oregon, Indiana, Wisconsin and Montana departments of transportation. Also using the W 500 for rumble strip installation in Canada are the provinces of Quebec, Ontario, New Brunswick and British Columbia.

W 600 DC mills shoulder strips on interstate highway shoulder

Caltrans Personnel Hear Benefits Of Foamed Asphalt

Pavement maintenance personnel of the California Department of Transportation (Caltrans) got a hands-on look at the next era of road base stabilization using foamed asphalt, courtesy of Wirtgen.

In February, civil engineer and Wirtgen consultant Dave Collings, Pr. Eng., A.A. Loudon & Partners, conducted a two-hour workshop on foamed asphalt bases for Caltrans district pavement maintenance engineers.

The workshop — at Caltrans' research laboratory in Sacramento — was followed by a lab trailer demonstration of the foamed asphalt process in a parking area outside the lab facility.

Collings spoke at the invitation of Caltrans at its "Forum for the Future" pavement maintenance workshop in Sacramento Feb. 17. The workshop gathered district personnel from all around the Golden State to discuss pavement preservation and management issues over a two-day period.

"Believe me, it's black magic," Collings told the district engineers. "This has got to be the most user-friendly material you've ever seen."

What is foamed asphalt?

"Foamed" or "expanded" asphalt is a road base recycling process relatively new to the United States.

With foamed asphalt, a stabilized road base is created by carefully injecting a predetermined amount of cold water into hot penetration-grade asphalt in the mixing chamber of a pavement remixing unit. The process, popular in many other countries, offers a cost-effective alternate for road base stabilization to other techniques.

Hot liquid asphalt rapidly expands into millions of bubbles (foam) when it comes into contact with cold water, similar to the splattering which takes place when drops of water stray into hot cooking oil on a stove top. Precisely added water allows control of the rate and amount of asphalt foaming or expansion. The expanded asphalt has a resulting high surface area available for bonding with aggregate fines.

For road stabilization using foamed or expanded asphalt in Wirtgen's WR 2500, the foamed asphalt is directly injected into the recycler's mixing chamber, where it is dispersed among the reclaimed asphalt pavement particles without the use of costly asphalt emulsions or cutback solvents.

While expanded asphalt doesn't completely coat all aggregate surfaces, it does form a mortar or glue which bonds the particles together. The expanded asphalt has an affinity for finer particles, those of 75 microns or less. This effective coating of finer particles increases the available surface area of the expanded asphalt for bonding with the coarser particles of material.

Cutting out cut-backs

"When a carefully metered amount of cold water is introduced into hot asphalt, a foam is formed, increasing its volume and surface energy," Collings said. "This enables stiff road-grade asphalt to be mixed together with cold, moist aggregate without having to resort to the added cost of cutting back the binder with a solvent or emulsifying it." A benefit is that foaming reduces the viscosity of the binder, permitting easier dispersion through the aggregate. Other benefits, Collings said, include:

Sample of foamed asphalt is drawn from WR 2500, foams to many times its volume, and subsides within seconds; millions of bubbles act as carrier of liquid asphalt cement to road base fines in Wirtgen WR 2500 road recycler

California DOT hosted Wirtgen at annual maintenance workshop at Sacramento laboratory

- The recycled lift is more resistant to penetration of water.
- Foamed asphalt-stabilized bases are usually less expensive than a bituminous emulsion or a combination of emulsion and cement.
- Additional water is not added to the recycled material, as is necessary when emulsion is used.
- The rapid strength gain from use of foamed emulsion means that traffic may be introduced onto the recycled road as soon as compaction is complete.

Foamed asphalt in Wisconsin

For example, in 1999, Jefferson County, Wis., utilized foamed asphalt technology in an $800,000, 5.0-mile, Phase I reconstruction of County Highway N. "Foamed asphalt offers an option for road reconstruction," said Jeff Haas, Jefferson County Highway Commissioner. "It has long-term benefits, with an anticipated, average cost savings of 20 to 25 percent over standard methods, when used where appropriate."

There, a Wirtgen WR 2500 remixer equipped for foam asphalt was used in the application. To make a foamed asphalt-stabilized base, a high-surface-area asphalt froth is created by precisely injecting cold water into hot liquid asphalt as it enters the machine's mixing chamber. There, air bubbles in the expanded liquid asphalt froth act as the carrier of liquid asphalt to fines in a reclaimed asphalt pavement (RAP) aggregate mix.

In less than 15 seconds the froth subsides and the dispersion of asphalt is achieved, eliminating time waiting for the "break" required when expensive asphalt emulsions are used. The technology also sidesteps use of costly cutback solvents. The liquid asphalt cement is pure, with nothing added to it to change its properties. That makes it more economical to use than emulsions, which are a processed oil.

Jefferson County had been doing base recycling and stabilization since the mid-1990s, but considered foamed asphalt stabilization only in early 1998, when reconstruction of County Highway N became possible under a State of Wisconsin local roads improvement program.

"It was then that we looked at hot foamed asphalt injection as an option, instead of the straight pulverizing, followed by binder and surface mats," Haas said. That followed foamed asphalt demonstrations in Dodge County, to the immediate north.

"We saw four different methods of base recycling," Haas said. "The foamed process appears to provide a cost-effective method of reducing the amount of paving that has to be done, as well as reusing the existing pavement for the binder [base course] mat."

New option for governments

Previously, these governments only had the option of seal-coating roads, or patching them, and eventually the roads would wear out. But full-depth recycling is an economical, viable product that a small-budget government can employ to bring its roads up to acceptable conditions. If the job is designed right, a base-recycled and stabilized road can stay in use without a wearing surface for up to a year, or even have a double seal coat placed on it as a wearing surface.

"We were seeing alligator and reflective cracking from previous overlays," Haas said. "There was a lot of thermal cracking in general. We knew a simple overlay would work for a while, but that the cracks would reflect through again. By going with this process — which pulverized, recycled and stabilized the top four inches of the existing pavement — we created a binder-type mat in-place, thereby eliminating the need for paving a new binder mat with virgin materials."

Existing County Highway N was 21-foot wide, whose prebid cores showed 8.5 inches of asphaltic concrete over 4 to 5 inches of crushed aggregate base course. The road was pulverized to a depth of 9.5 inches. Following foam-asphalt base treatment, it received a 1-inch leveling course of hot mix asphalt (HMA) and a 1.5-inch finish or riding

Blister packs of raw and finished foamed asphalt samples are distributed

Collings demonstrates benefits of foamed asphalt to Caltrans personnel

course, on a 32-foot width which included 4-foot paved shoulders paved 2.5-inches deep.

Foamed asphalt is not appropriate for all roads, he said. "One case would be a road that not only has deteriorated pavement, but marginal soils in the subgrade that can't be stabilized by pulverizing alone," Haas said. "If there are any horizontal or vertical curve realignments, or minimal shoulders, or drainage problems that need to be addressed, more extensive reconstruction may be required."

Recycling, contractors and cash flow

If full-depth reclamation and recycling represents less asphalt produced, moved and placed on behalf of a contractor — thus less profit — a paving contractor who expands into milling and recycling has a chance to reclaim some of that cash flow.

For example, a foamed asphalt project such as Jefferson County's Highway N represents a loss of the binder or base course for the contractor, this despite the contractor's placement of a surface course over the foamed asphalt-recycled road.

But the ability to do the entire foamed asphalt project — in this application, by use of the WR 2500 — enables a contractor to recapture much of that income while providing a great value for the government agency customer due to the reuse of existing materials. This leveraging of construction funds through recycling may enable the customer to do even more road recycling work in a given season.

That's because with recycling, contractor and owner are using a material that's already been mined, processed, bought and paid for by the government agency. This is becoming critical because virgin aggregate sites are getting harder and harder to find and put into operation. Thus asphalt recycling will continue to play a larger role in the road building industry.

Also, the elimination of the need to truck in virgin aggregates and HMA is a big cost saver with recycling, as is the speed of completion and the ability to keep the road open for residents, school buses and public safety purposes.

WR 2500 Mobile Remixing Machine Beats Plant Mixing

Aggregate or asphalt road millings can be treated with foamed asphalt in a stationary plant. However, use of a suitably equipped mobile remixing machine like the Wirtgen WR 2500 offers firm benefits over plant mixing.

WR 2500 at work on Jefferson County, Wis., Highway N

"Inside the 2500 are 16 expansion chambers, where a very small amount of water is introduced to the hot asphalt liquid," said Stu Murray, president, Wirtgen America, Inc. "We can also introduce air if we're working with a harder penetration-grade asphalt cement. A froth is developed as we change the viscosity of the asphalt cement to that of shaving cream. The air bubbles serve as carriers to incorporate the asphalt to the fines in the mixer."

"The mix design methods when using foam is much different than some people are accustomed to," Murray said. "With emulsions, you're doing full-particle coatings of all materials in-situ. With foam, you're attaching the asphalt to fines in the roadway, material finer than sand. We like to see it under-200 sieve size, which is material so fine that if you tossed it in the air, it would blow in the wind. If the fines are not available we need to make adjustments for that in the mix."

That's why corings and analysis are needed to determine what's underneath the driving surface. Wirtgen's operations manual will guide contractors through the mix design process.

Asphalt/water emulsions work similarly, in which the water serves as carrier. But emulsions are expensive due to the manufacturing process and additives required. Foamed asphalt saves time, too, because the time waiting for the emulsion to "break" is eliminated. The actual period of foaming is less than 15 seconds.

"When the bubbles break, the mixture returns to its natural state," Murray said. "With emulsions you have to wait for the emulsion to break, at which point the asphalt cement is released from the emulsifiers and moisture and is able to attach itself to the aggregates or RAP."

Following mixing of base materials with the liquid asphalt froth, a large rubber-tired compactor performs breakdown rolling right behind the WR 2500, prior to initial grading of the road using a motor grader. The final compaction in the high 90s is achieved by a steel-wheeled roller following the grader.

The WR 2500 also can perform base recycling with emulsions where appropriate, base pulverizing only, or even volumetrically controlled soil or base stabilization using lime or cement in dry or slurry form.

"Every 2500 that comes equipped for foam also has the capability to inject emulsion, which is a great feature as well," Wirtgen's Murray said. "Foamed asphalt is just another tool for contractors, governments and engineers to use to make our roads better and use in-situ materials."

The WR 2500 asphalt injection system is environmentally compatible and is well-received by users. The system is designed so that at end of day, crews need only close the valves and disconnect the tanker. They don't have to flush the system with diesel oil or solvents to keep the bitumen soft overnight, nor does diesel oil have to be drained and stored in the approved holding canisters. As a result, minimal start-up time is required at the beginning of the work day.

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