RoadNews for new roads

The WIRTGEN GROUP User Magazine for North America // № 02

WIRTGEN VÖGELE HAMM KLEEMANN

WIRTGEN GROUP technologies prove themselves in the field:

Ready for action

25.6 feet,

Paving over large widths: A SUPER 2000-3i demonstrated its outstanding performance on State Route 50 in Illinois. The VÖGELE paver with a VF 600 Extending Screed produced seamless quality over a 25.6-ft. width. WIRTGEN W 220 and W 210i milling machines had already laid the basis for paving, and HAMM vibratory rollers took care of compaction.

Quality campaign in Illinois: South of Chicago, the paving team of Gallagher Asphalt Corp. delivered excellent results – supported by the leading technologies of the WIRTGEN GROUP.

0 seams

Monee (Will County) // Illinois

The problem of deteriorating longitudinal "cold" joints between parallel one-lane lifts of asphalt has long perplexed pavement owners. These joints between paved lanes quickly degrade and permit water to enter the pavement, leading to debonding, delamination, long joint patches, and potholes. Many fixes have been offered, including wedge joint designs and paver-mounted devices that are supposed to knit the edges of the lifts together. Paving in echelon using two pavers close together – placing lifts of hot mix asphalt next to each other so they are thermally bonded – is one solution. But the best solution is no longitudinal joint at all, as demonstrated in August 2017 on Illinois State Route 50 near Monee, just south of the Chicago metro area. »»

Job site details

Rehabilitation of the surface course on State Route 50 in Monee, Illinois

Length of section:	8 mi.

Working parameters

Milling width:	7 ft., 3 in. (W 210i) and 8 ft., 2 in. (W 220)
Milling depth:	2.25 in.
Paving width:	21 ft. 6 in.-25 ft. 6 in.
Paving depth	
Leveling course:	0.75 in
Friction course:	1.5 in.

Material

Backfill for potholes:	IL 19.0 mm N70 PG 58-28 Superpave mix
Leveling course:	IL 4.75 mm N50 PG 70-28 polymer modified Superpave mix
Friction course:	IL 9.5mm N70 PG 58-28 Superpave mix
Quantity of mix	
Backfill for potholes:	16,000 t
Leveling course:	9,500 t
Friction course:	19,000 t

Machinery

WIRTGEN W 210i cold milling machine
WIRTGEN W 220 cold milling machine
VÖGELE SUPER 2000-3i paver with VF 600 Extending Screed
HAMM HD+ 120i VV-HF tandem roller

Wide paving is something out of the ordinary, that takes us to the next level.

Terry Sullivan, Project Superintendent
Gallagher Asphalt Corp.

Paving over large widths boosts economic efficiency

In Monee, Gallagher Asphalt Corp. placed a Superpave HMA friction course two lanes wide using a new VÖGELE SUPER 2000-3i and a VF 600 Extending Screed with 25.6-ft. kit. The result is an attractive mat that will resist moisture infiltration and deterioration for years to come. Placing two lanes with one paver at the same time also is more productive for a contractor. "Paving wide eliminates the lane joint and provides a smoother ride," said Don Gallagher, Operations Engineer, Gallagher Asphalt Corp., Thornton, Illinois. "It also allows us to complete the job faster as we make one pass instead of two."

Win-win-win situation

"To both the contractor and government agency, wide paving enhances pavement durability by eliminating the longitudinal joint," said Laikram "Nars" Narsingh, Manager, Commercial Support and Development for VÖGELE. "That joint usually is the first place to fail in a pavement. Every time you can eliminate a joint, you eliminate the first point of failure." In addition to providing a more durable pavement, wide paving makes a job site safer.

Wide paving is the kind of thing our company always is looking to do, and that is something out of the ordinary, that takes us to the next level," said Terry Sullivan, Gallagher Project Superintendent. "We are putting down the best quality product we can, both in terms of material and laydown. Wide paving is important for longevity, and rideability as well." »»

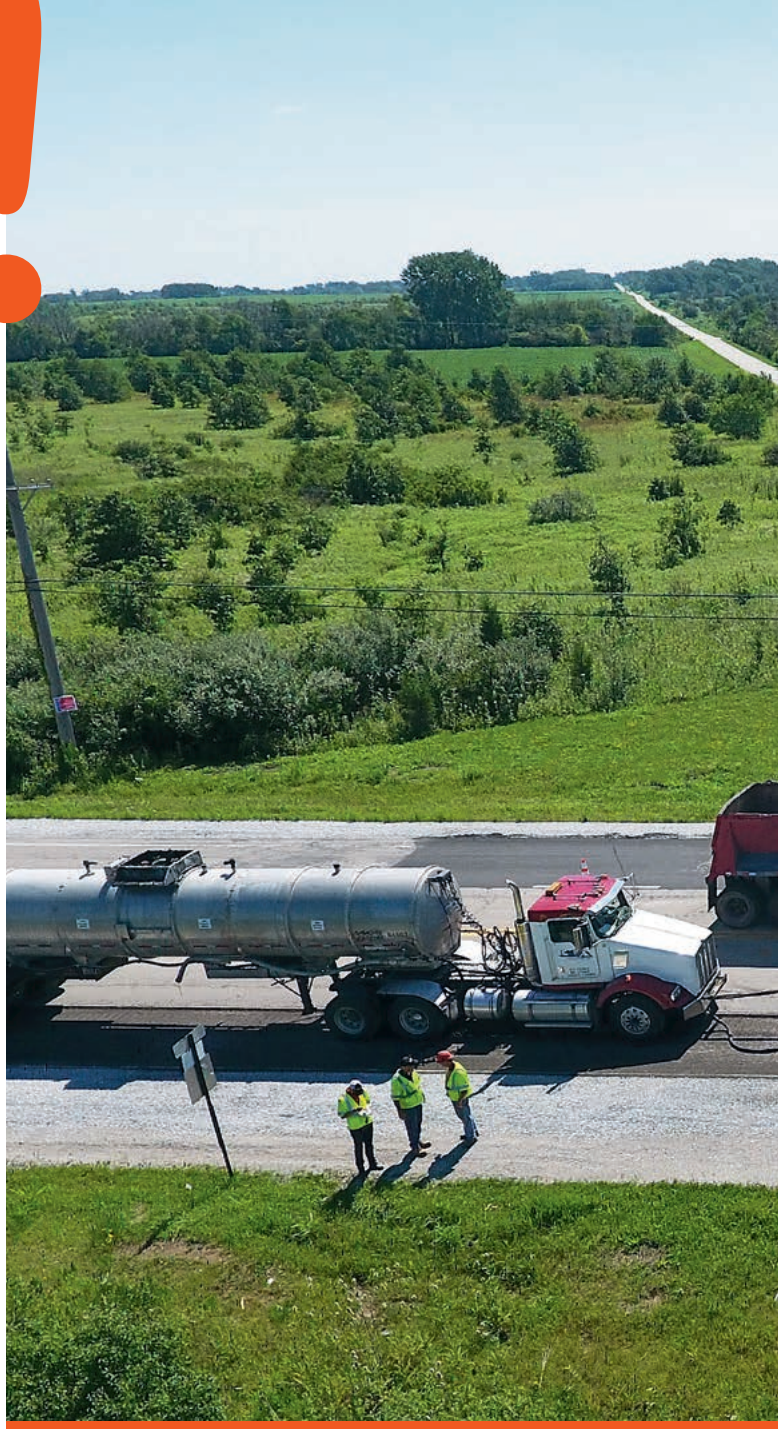
Patching, then milling

The entire project was eight miles long by four lanes and began with extensive patching of the pavement, much of it full-depth into a crumbling underlying concrete pavement which was reflecting through the asphalt overlays. “We had a significant amount of patching that needed to be done,” said Jim Trost, Vice President of Operations, Gallagher Asphalt. “There was concrete under some sections, asphalt under others. We had to go down full-depth to repair the sections, and patched them with an IL 19.0 mm N70 (70 gyration) Superpave mix.” These included extensive failed concrete expansion joints which had to be cut with saws. Because of the substantial amount of patching required – at 15 in. deep – approximately 16,000 t of IL 9.5 mm N70 PG 58-28 Superpave mix was required.

Powerful performance by 2 WIRTGEN large milling machines

Echelon milling followed the patching work, in which Gallagher’s W 210i and new W 220 removed 2.25 in. on average from the pavement. The W 220 was purchased with a 7 ft., 3 in. drum, but because it incorporated WIRTGEN’s Flexible Cutter System, Gallagher used a 8 ft., 2 in. drum for this project. The W 210i also was not equipped with its standard 6 ft., 7 in. drum but with a 7 ft., 3 in. drum which is available for this machine optionally as well as the 4 ft., 11 in. drum.

“Both machines working in echelon took out a full lane and a half with each pass,” Trost said. “We ran our LEVEL PRO systems on both machines to ensure consistency and as smooth a pavement as possible to form a base for the new pavement layers. We used a sonic ski sensor for the LEVEL PRO system on the milling machines, and later, Big-MultiPlex-Skis for the Niveltronic Plus System for Automated Grade and Slope Control for our SUPER 2000-3i paver. We utilized a material transfer vehicle, and even paved long days to eliminate the number of transverse joints in the pavement. We did all this to deliver a top quality finished product that would be as smooth as possible.” »»



FCS Light: Maximum range of applications

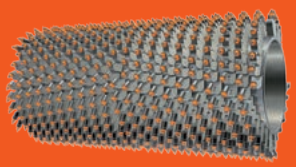
Cutting technology is a core competence of WIRTGEN. With the Flexible Cutter System Light, or FCS Light for short, WIRTGEN offers the optimum solution for high capacity utilization of the machine: Milling drums with different tool spacings can be exchanged in a short amount of time. That makes it possible to perform a range of milling operations with one and the same machine. As a result, the WIRTGEN

ECO Cutter
Milling width: 2,000 mm
Milling depth: 0–330 mm
Tool spacing: 25 mm

cold milling machines are extremely versatile to use, covering everything from standard applications through fine milling for the creation of new, level road surfaces to the use of what are known as ECO cutters for a particularly high area performance. This increases the capacity utilization of the large milling machine, boosting its economic efficiency in the process.

All milling drums are equipped with the HT22 quick-change toolholder system for point-attack cutting tools whose robust upper part can be quickly and easily replaced directly on the job site. The system minimizes downtimes and increases the service life of the milling drum. The HT22 combines maximum milling output with efficient operating costs.

Standard milling drum
Milling width: 2,000 mm
Milling depth: 0–330 mm
Tool spacing: 18 mm



Micro-fine milling drum
Milling width: 2,000 mm
Milling depth: 0–330 mm
Tool spacing: 6 x 2 mm

Paving two-lanes wide offers exceptional pavement durability and smoothness.

Paving a 0.75 in.-thick leveling course

After milling, because the drop-off between lanes was too high for drivers to negotiate safely, Gallagher followed with the paver placing the required IL 4.75 mm N50 (50 gyration) PG 70-28 polymer-modified leveling course. "Illinois allows no more than 1.5 in. of drop-off in the pavement to ensure motorist safety," Trost said. "Because we cut 2.25 in. of pavement, we chose to pave the 0.75-in. leveling course right behind the milling operation." About 9,500 t of leveling course was placed on the project.

Paving the surface course over a width of 21 ft. 6 in.

Following patching and laydown of the leveling course, Gallagher set up its SUPER 2000-3i to pave a 21. ft, 6 in.-wide surface with a 1.5-in. compacted lift thickness, placing two lanes of surface course with each pass of the paving operation. Initial set-up advice and support for wide paving was provided by VÖGELE's Regional Product Support Manager James Boucher and Narsingh. "VÖGELE provided technical personnel to get us set up," said Tim Murphy, Director of Construction for Gallagher. "We selected a day before the test strip was to be paved and they helped our mechanics put on the auger and screed extensions, get everything configured and checked out, and get the long skis set up. Our people were really happy with how smoothly things went with the wide paving."

Highlights of the VÖGELE SUPER 2000-3i

- 10-foot tracked Highway Class paver with a large range of applications and paving widths up to 28 ft. 3 in.
- Powerful Cummins engine complying with US EPA standard Tier 4f
- Advanced design for precise material handling
- Innovative and reliable drive concept for accurate tracking
- ErgoPlus 3 with a number of additional ergonomic and functional advantages
- Daily maintenance-free paver with auto-lubrication and more
- The right screed for every application: The paver can be combined with the VF 600, VR 600 or AB 600 Extending Screeds

Quality impresses the Illinois Department of Transportation

While not unknown in North America, paving two or more lanes wide is not common here. One reason is the reluctance of government agencies to try new processes, and with good reason: They are stewards of the public's resources, and if a new process is tried and fails, the money is wasted. It makes sense to stick with the tried-and-true basics. Therefore, much depended on the success of placement of the test strip. "The test strip was exciting," Don Gallagher said. "We had a lot of executives who came out, and everybody was impressed by the job and the quality of the test strip. I believe IDOT was very happy with the test strip and because of that they allowed us to continue with wide paving for the entire project." The surface material was another Superpave mix, an IL 9.5 mm N70 (70 gyration) PG 58-28 formula. Approximately 19,000 t of surface mix was placed, manufactured by Gallagher's own plant.

First-class performance pays off

The project fell under Illinois DOT's Pay for Performance (PFP) quality management program (QMP), in which bonuses or penalties are imposed according to two plant mix qualities which are based on the air voids in the HMA mixture and on voids in the mineral aggregate (VMA) in the paved mix. "We are getting paid based on test results from the mix, and each of these properties accounts for 30% of the overall pay factor," Trost said. "In-place density is the final pay factor and accounts for 40% of our overall pay factor. It's important to us to have good control over the mix, and making it in our own plant helps us achieve this." Ride quality is evaluated outside the PFP program. »»

Paving team processes more than 4,000 t mix per day

"On the first day of wide paving, using a material transfer vehicle, Gallagher Asphalt was able to place some 4,400 t of HMA, placing another 4,800 t on the second day," Don Gallagher said. "We paved the four-lane S.R. 50 highway two lanes at a time," Trost said. "Our schedule was to get all the paving done in four days, so after test strip approval, we did four miles a day for two days southbound," says Trost. "Then, the following week we turned around and did four miles a day for two days northbound." "Density target for the wide lift was 93%, but Gallagher was routinely hitting 94%," Sullivan said. "The VF 600 Extending Screed was providing initial compaction." »»

Highlights of the VF 600 Extending Screed

- Maximum paving width 25 ft. 6 in.
- Basic paving range 10 ft. to 19 ft. 6 in.
- Compacting system V (vibration)
- Smooth, robust telescoping system for precise operation at all widths
- Capable of many screed profiles with crown and sloping extensions
- Berm is available as an option
- Sloping extension up to 10%
- Innovative electric screed heating
- Easy-to-use ErgoPlus operating system
- Compact design allows for great visibility to all areas
- Ideal tool for multivariable width applications and mainline paving

The VF 600 Extending Screed with 25.6-ft. kit was configured easily in the field.

Highlights of the HAMM HD+ 120i VV-HF tandem roller

- Simple, intuitive and language-neutral operation
- Excellent view of the machine and the job site
- Seat-operating unit can be moved and rotated
- Track offset for comfortable starting, pulling off and compaction at curb edges
- 3-point articulation for even weight distribution and excellent straight travel

HAMM HD+ 120i VV-HF: one of four breakdown rollers following the paver in echelon.

Final compaction in 7 passes

Breakdown rolling for the wide paving was done by four tandem rollers, operating side-by-side behind the paver in seven-pass echelon. Included was a HAMM HD+ 120i VV-HF. "We have four vibratory rollers upfront, running side-by-side, each making about seven passes," Gallagher said. "They're followed by two finishing rollers to get out lines in the pavement. Final smoothness is the result of consistent material supply, the paver with wide screed moving at a consistent paving speed, the MTV eliminating mix segregation, truck bumping and stops in paving, and careful and consistent compaction."

Intelligent technology documents compaction

Having that many breakdown rollers is important because the Superpave wide lift must be compacted before it loses heat. Temperatures of mix coming out of screed varied from 290 to 310 °F. On this job, a thermal sensor system that sits on the paver and measures the the temperature of the mat as it emerges from under the screed. "I think it's very important going forward to know you are consistently laying down a nice temperature mat that will roll nicely, as temperature plays a big role in how well the pavement will be compacted," Gallagher said. "We also were running intelligent compaction on the rollers, logging temperature, roller speed and pass counts," he added. "Being able to pull the reports and see that we are consistently rolling the same number of passes lets us monitor the compaction process and diagnose problems if something comes up. This can show our consistency in compaction, which will point to something else having gone wrong if there is an issue." Because Gallagher was using a variety of roller makes, they were using a third-party IC system on the breakdown rollers.

Leading technology and outstanding service make the difference

"WIRTGEN is a reliable brand we've stuck with," he added. "They're responsive and good to work with. And if we need anything, WIRTGEN and our distributor Roland Machinery are fantastic to work with. If we ever have any issues, they jump on them right away." Gallagher also has a variety of HAMM rollers ranging from 48 in. to 66 in.-wide drums, as well as a fleet of HAMM HD CompactLine rollers. And it uses HAMM HD+ 110i VT and HD+ 70i VT combination smooth drum/pneumatic-tire rollers in their hot in-place recycling operations as well as conventional HMA paving. ///