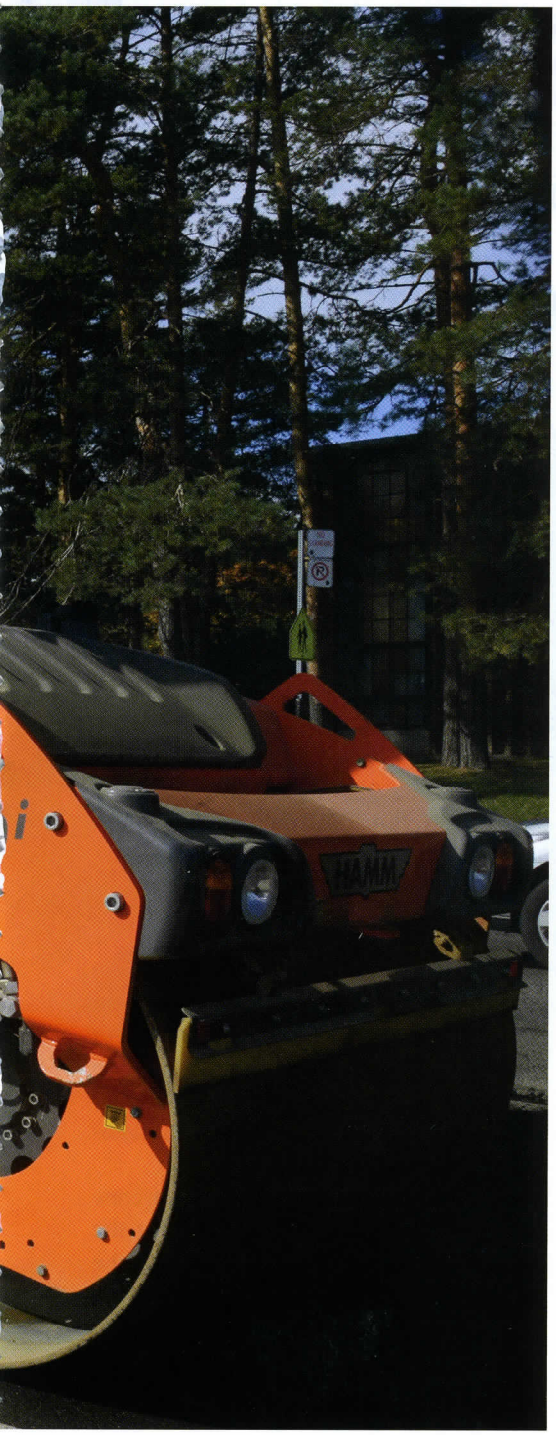
CANADIAN PAVING GROWTH

New asphalt paver, compactors and cold mills from Wirtgen Group are the centerpieces of the expansion for Pave-Tar Construction Ltd., Etobicoke, Ontario, into pavement reconstruction. For over four decades, Pave-Tar and a predecessor firm have provided services such as grading, curb and sidewalk construction, sewer and water construction, snow removal, and asphalt milling, paving and maintenance. The purchase of a suite of new machines positions the firm for growth for years to come. The small-to-midsize equipment is ideal for Pave-Tar's target market, which is municipalities.



LEFT: Hamm HD+ 80i VV-S features split drum compaction. ABOVE: The Pave-Tar crew uses the Super 1300-31 to place an asphalt overlay in Scarborough, Ontario. BELOW: The small HD 12 VT roller features pneumatic and smooth drum compaction.

"The majority of our work is for municipalities, such as Toronto, Mississauga and Brampton," said Jason Amaral, estimator and project manager. "In the summer months we employ up to 120 people, and up to 250 in the winter."

Pave-Tar has owned a W 50 DC to supplement milling work that was subbed out. "We started off small, and the W 50 DC fit our needs at that time," Amaral said. "But this year we decided to do more of that milling ourselves. We acquired the 1.2-meter W 120 Fi, and after that it made sense to find a paver and rollers.

"It made sense for us to buy the four different types of rollers, because each one serves a purpose. We use the bigger models on municipal roads and parking lots, and the smaller rollers are useful on paths where we don't need the large roller and that degree of compaction."

From user-friendly controls to right-sized operations, Pave-Tar is poised for growth in the Ontario market. AP

–FROM WIRTGEN GROUP

HAMM OPERATORS SEE THEIR PROGRESS

Intelligent compaction—as it applies to asphalt and soil compaction—describes compaction of road materials using modern vibratory rollers equipped with an integrated measurement system, an onboard computer reporting system, global positioning system (GPS) based mapping, and optional feedback control, according to Federal Highway Administration consultant The Transtec Group, Austin.

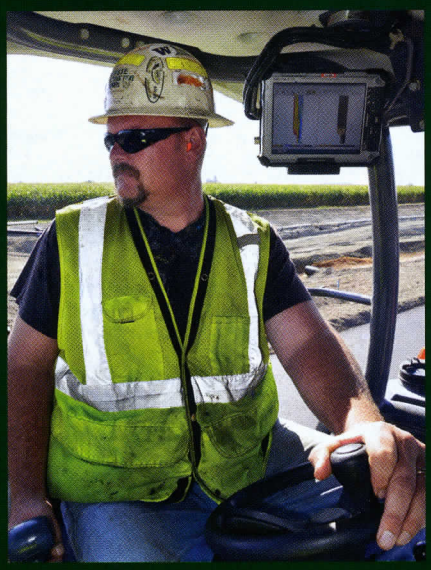
With the HCQ Navigator, Hamm was one of the first manufacturers to launch a compaction measurement and documentation system. The system links measurement data from various sensors on the rollers with the position information obtained via GNSS (global navigation satellite system) receivers. The HCQ Navigator uses these data to determine the progress of compaction for all rollers in a group in real time. A compaction map visualizes the status for the roller drivers and site management.

"HCQ Premium is the latest intelligent compaction system from Hamm," Tim Kowalski, Hamm applications support manager, said. "We have upgraded the system to provide pre-installation kits for any soil or HD+ Hamm roller, if not already factory-equipped. This...is a Hamm exclusive for our H i-series soil compactors and HD+ and HD+ i-series asphalt rollers."

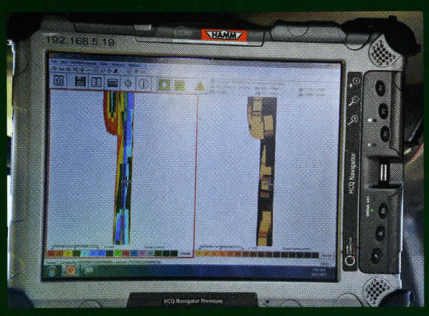
At the core of the application is a panel touch-screen PC with USB interface. This computer provides processing power as well as a monitor and data storage facilities. It is based on military standards, has a fully enclosed metal case, and is protected against water and vibrations.

The HCQ Indicator measures the stiffness of asphalt or soil beneath the drum, and consists of an accelerometer mounted on the drum framework inside the rubber buffers, a processor and a display. With the accelerometer mounted this way, users get the actual reaction of the drum against the material it is trying to compact. Based on these data, the processor calculates the HMV (Hamm measurement value)—indicating the degree of compaction as a stiffness measurement derived from the measured signals—and displays this value to the driver in the cab.

During the compaction process, the panel PC shows the operator how stiffness is progressing. Separate graphics depict, for example, the number of completed passes or the current asphalt temperature, and the operator has the ability to monitor two of these functions simultaneously on the split screen.



At the core of the Hamm IC system is the HCQ GPS Navigator, a touch-screen PC with USB interface, which provides processing power as well as a monitor and data storage facilities.



Rollers equipped with the Hamm Compaction Quality (HCQ) system maintain a continuous record of color-coded plots, allowing the user to view the precise location of the roller, the number of roller passes (on the left screen), and material stiffness measurements (HMV, on the right screen).

Also, two methods that may help bonding occur between the cold and hot edges of the joint are tack coat application on the joint and the use of infrared heaters to reheat the cold edge.

Minor increases in density are feasible and provide a cost-effective means of improving pavement service life. For increased density specs to have maximum benefit and effectiveness, agencies should consider the following:

- Appropriate project selection. When choosing projects for implementing higher in-place density requirements, evaluate the underlying base. If the base is weak, optimal compaction will be difficult to achieve.
- Lift thickness. Increased lift thickness can improve compaction effectiveness because the mat cools more slowly, allowing more time for compaction. Also, lift thickness should be sufficient to allow for the re-orientation of aggregate particles during compaction. Fine-graded mixes should have a minimum lift thickness of three times the nominal maximum aggregate size (NMAS). For coarse-graded mixes, minimum lift thickness should be four times the NMAS.
- Mix design. Appropriate binder content should be selected for the desired in-place air voids. Gradation, binder content, and volumetric properties such as air voids and voids in mineral aggregate (VMA) can influence compactability of a mix and should be carefully controlled during production to minimize variability.
- Criteria. Appropriate measures of field compaction should be used for acceptance requirements. Comparing in-place density with theoretical maximum density allows less potential for variability in field compaction than comparison with density of lab samples.
- Performance incentives. As shown in the LCCA example, in-place density has a significant economic impact on highway agencies. Thus, performance incentives should be established to encourage enhanced compaction and achieving higher in-place density.

The full literature review is available for download free of charge on the NCAT website as NCAT Report 16-02 at http://ncat.us/info-pubs/technical-reports. AP

– BY COURTNEY JONES AND NAM TRAN