Small System Offers Big POTENTIAL

Berminghammer Foundation Equipment's EML 45 gets into small spaces

By Jim Timlick

Ask any contractor about the biggest challenges they must deal with in the course of their work and there's a pretty good chance working on or near a large body of water will come up in the conversation.

You won't get an argument on that count from Patrick Chicoine, project director for Quebec-based Construction Polaris CMM, Inc. Polaris is the lead contractor for a new, two-lane bridge being built near the town of Papineauville in the southern region of la belle province.

As part of the project, Polaris built a temporary bridge beside the existing bridge that spanned the Petite-Nation River near Highway 50. The old bridge was then demolished and is being replaced by a new steel crossing that will feature a concrete deck with two lanes of traffic and two shoulder lanes. Work is scheduled to finish this summer.

"It's not unusual for us to do that kind of job, but it's always a challenge when you have a lot of water to control like that," Chicoine said. "You can't always see what you're doing with that kind of work. You've also got to keep your guys safe."

What makes this project particularly challenging is the limited amount of space where the bridge abutments needed to be built and where the equipment to construct them can be mobilized.

That's why Polaris approached Hamilton, Ont.-based Berminghammer Foundation Equipment for help. Polaris needed to drive a total of 48 16-inch pipe piles between 80 and 120 feet deep as part of the bridge's foundation, but knew that a crane-mounted piling system simply wasn't feasible. Getting a crane to where it was required would have been extremely difficult and the mobilization costs would have been prohibitive for the number of piles required for the project.

The solution? The EML 45, an excavator-mounted piling system introduced by Berminghammer in 2019.

One of the primary attractions of the EML 45 is its portability – it can be carried in a single truckload – and the reduced mobilization costs that come along with that.

It's the latest offering in the company's line of excavator mounted leads (EML) and was a perfect fit for the Cat 349 hydraulic excavator Polaris already had on hand.

Chicoine says the EML 45 was the perfect solution because it dramatically reduced the mobilization costs compared to using a crane-mounted system. It also allowed the excavator to be used for other tasks on the jobsite once all the piling work was completed earlier this spring.

"We are not a specialty contractor in foundations. We are a general contractor. Pile driving is something we don't do all the time. We might do it two, three or four times a year. That means we need to find equipment that can do something else (besides driving piles)," he said.

The beauty of the EML 45 is that once the piles have been driven, the lead can be easily removed and the excavator can then be used for other jobs rather than sitting idle as is sometimes the case with many crane-mounted piling systems.

"For us that was a big advantage," Chicoine said.

Adding to the degree of difficulty for the bridge project was the fact that it required batter-style piles to provide added resistance to any horizontal forces. That meant those piles had to be located at just the right spot and at a precise angle.

"We need to be precise and efficient. We don't have any room for error," he said.

To build the bridge's foundation, Polaris had to first construct a cofferdam, which is essentially a large box made of sheet piling that is built within a body of water and then the water is pumped out. It controls the flow of water around a work area while keeping workers safe and dry. It takes up far less space than a rock dam and allows water to flow far more freely and easily.

Chicoine says his company was extremely pleased with how the EML 45 performed as part of the bridge project. Although it's not quite as fast as a hydraulic or diesel hammer, it was easy to operate, he says, thanks to its simple winch and cable design.

CONTINUED ON PAGE 60

David Zanchetta, P.Eng., a sales and field services representative for Berminghammer, says the EML 45 has earned rave reviews since it was introduced to the Canadian market two years ago. There are currently four units in use in Canada, including in northwestern and southern Ontario, Quebec and Nova Scotia, and the company expects to add units in Saskatchewan and Alberta in the not-too-distant future.

One of the primary attractions of the EML 45 is its portability – it can be carried in a single truckload – and the reduced mobilization costs that come along with that.

Another feature that has sold clients on the unit, says Zanchetta, is its high pile proving capacity. Its 10,000-pound drop hammer is large enough to prove 2,000 kilonewton (kN) capacity piles for bridges, which is the equivalent of 4,000 kN of geotechnical resistance.

"It's really taken off this year. Everyone loves the capacity that you can get out of it and the fact you can get into these remote and difficult to access areas," he said.

"It's been on jobs in the middle of Toronto and Mississauga that are really tight between lanes of a highway where you would never be able to get a crane in. It can replace the capacity of a lead-and-crane system in a much smaller package. There isn't anything else out there that can do it on a 45-ton excavator."

The EML 45 is the latest iteration of Berminghammer's excavator-mounted piling system which also comes in a 30-ton version. It's ideal for projects that require a small number of piles such as bridge and pier abutments, and jobs where there is limited space to mobilize equipment.

The system is relatively simple in its design. It features a hydraulic cylinder between two sheave blocks on the back of the unit's lead. As it extends, it lifts the hammer. When it retracts quickly, the hammer drops. The key is the speed with which the cylinder retracts.

Another advantage of the EML 45, Zanchetta says, is that the operator is in full control of the hammer at all times compared to diesel hammers "where you basically have to shut off the fuel system and by the time it shuts off, you might get a couple more blows as the hammer keeps coming down."

Construction Polaris CMM was so satisfied with the performance of the EML 45 in Papineauville that the unit is already being used for a similar bridge project in eastern Quebec that is nearly twice the size.

Zanchetta expects the number of EML 45s sold in Canada to continue to rise steadily as more and more construction and deep foundation companies learn about the unit's capabilities.

"This is a system that is really picking up steam right now," he said.

PHOTOS COURTESY OF CONSTRUCTION POLARIS CMM, INC.