

Green Bridge Technology

Draws Worldwide Attention



“Green Again” was the theme of the 2010 ORBA Convention and Patrick Bermingham, CEO of Bermingham Construction, was on hand to share information on his company’s innovative green bridge technology.

In particular, Bermingham spoke about use of a new tilting pile driving mechanism and associated beam launcher, which has been used on a highway and bridge construction project in Washington, North Carolina. The machine used on the project combined Bermingham’s diesel pile driver system with a beam-launching girder built by Deal, a company from Italy.

A joint venture between Flatiron and United Contractors, the project involved constructing a 4.8-km bridge over the Tar River and wetlands.

“The construction was to take place over very sensitive wetlands and the Tar River,” said Bermingham, who made use of a slide presentation as illustrations during the convention session. “The technology enabled the bridge to be built without any temporary staging work. It cantilevers over the river, loads and drives piles

without disturbing the surrounding environment. It wasn’t all level construction and the 40 tonne, 40 metre piles were driven with an accuracy within 25 mm. Modelling and design began in September 2006. By February 2007 testing was underway. We did a lot of testing of the tilting pile system in Hamilton and started assembling the system in Washington in 2008.”

One of the challenges of the project involved crossing the highway with live traffic to drive piles on the far side, said Bermingham.

“A lot of people were stopping beside the highway to take pictures,” he noted. “We also had to cross over live rail tracks and water. We weren’t able to cross the river during the fish window so we had to wait a couple of months. It all worked smoothly in an almost robotic fashion. In fact, the workers and staff had to fight boredom. All equipment was electric so there was no noise. Operators followed a checklist. Rework was zero as everything was done and checked as constructed. All pile driving was done by a single station. Sensors throughout the system provided location and pressure feedback and the status of various equipment functions,

ensuring that everything happened in sequence.”

A hydraulic foot was designed to go into the ground to absorb unwanted vibrations and provide extra stability.

“The foot had to be removable if it got stuck,” noted Bermingham. “It was used when a pile deviated due to minor obstructions.”

The equipment proved to be twice as productive as expected, he said. The project was completed in September 2009.

“We were doing 40 metres of bridge every four days using only the constructed bridge as a construction site and without affecting the environment. The entire team that worked on the bridge project operating the equipment totalled 14 people and most were unskilled new immigrants to America.”

The new system has been attracting a lot of attention from the construction industry around the world, stated Bermingham, who noted that the company is currently looking into other projects where the tilting pile driving mechanisms could be used. ■

