

BERMINGHAM

FOUNDATION SOLUTIONS

SINCE 1897

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THE TILTING LEAD SYSTEM – AN INNOVATIVE FIRST IN BRIDGE CONSTRUCTION



"Berminghammer supplied complex project specific pile tipping equipment outfitted with B-6505HD hammers. Berminghammer's engineering and creative abilities are really shining through on every pile that is tipped and driven onsite today. Their 'As Much Commitment as it Takes' and 'Genuine Team Player' approach have been instrumental in getting our critical path piling work up and running in short order."

Mark Mallett
Project Manager
FLATIRON

One of Bermingham's proudest achievements and greatest successes to date is the tilting lead system, an engineering masterpiece that is changing the way bridges are built. This innovative pile driving system, and the associated beam launcher, is a brand new concept currently used on the \$200 million Washington Bypass, a highway and bridge construction project in Washington, North Carolina, a joint venture between Flatiron and United.

Flatiron/United's challenge was to build a 4.5 km. bridge over the Tar River and wetlands. They approached Bermingham about the possibility of combining pile driving with a beam launcher. This unique machine is the result of a synergy between Bermingham's diesel pile drivers and pile driving system and

a beam-launching girder built by Deal of Rizzani de Eccher, a construction company from Udine, Italy.

This bridge builder cantilevers over the river then loads, locates and drives the piles for each pier without disturbing the surrounding environment. "All the necessary functions are performed from the supporting trusses," explains Stefano Gabaldo, Bermingham's Director of European Sales and project manager. This is a radical shift from traditional bridge building that relies heavily on marine equipment. The wetland sections did not have enough water depth to allow water equipment to be utilized and a typical temporary access trestle would have impacted heavily on the environmentally sensitive area.

"Each completed pier is used as subsequent

support for the equipment to drive the piles required for the next pier and so on," says Stefano, mentioning that the 450 ft. long machines will drive approximately 1500 piles for this project.

The piles are loaded while the lead is horizontal – something that is usually not done. Two gantry cranes load the 30" x 30" x 128' long concrete pile that can weigh up to 44 metric tonnes on to the tilting lead. The pile is secured hydraulically to the hammer and the lead, then rotates to a vertical position.

The system is completely automated and controlled by only three people, each responsible for a different part of the equipment. All vital information is regulated from the control console. Safety is always a priority in construction and

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CEO'S MESSAGE

Firstly, I would like to thank all of our customers, suppliers and employees who have helped to make 2007, our 110th year, a record breaking one.

Bermingham is pleased to announce the completion of private equity financing with C.A. Bancorp. This equity financing will enable the company to expand both the construction and manufacturing divisions, as well as help to create a new equipment rental division. While Bancorp has a significant minority position, Bermingham's key employees and I have retained our controlling position. Our investors bring valuable financial expertise, which will help the company achieve its International and North American goals and objectives.

Peter Smith has now been promoted to the position of President of Bermingham Foundation Solutions to lead both the Construction and Manufacturing Divisions. Peter joined the company in 2003 and has been instrumental in helping to grow the company from \$25 M to over \$60 M in revenue. I will continue in my role as CEO and help to guide the company towards our present targets.

We are also announcing the appointment of Mark Yukich to Chief Financial Officer for the

firm. Mr. Yukich brings 24 years experience in the Construction and Engineering industries serving domestic and international, public and private clients in the Infrastructure, Industrial, Commercial, and Real Estate sectors. He has senior management experience in finance, reporting, acquisitions, and compliance activities. Mr. Yukich earned his CMA designation in 1985.

Patrick Bermingham
Patrick Bermingham, CEO

B-32 OUT-PERFORMS IN ITALY

Birmingham has made inroads into the European market with the new B-32 Hammer that is outperforming the competition. The 3.2 tonne ram hammer, which is being used to drive piles for a parking structure at the Bologna fair in Italy, arrived on site November 2007. The B-32 is a clean hammer that offers ecological solutions, is less noisy and can drive concrete piles up to 600 mm in diameter faster than other equipment. The technical innovations with this hammer include superb controllability and driveability that makes it capable of going into areas where conventional diesel hammers are not typically used.



CONCORD ADEX CITY PLACE

Birmingham is continuing to provide support for Concord ADEX's City Place Development in Toronto.

Foundations ranging from 0.9m to 2.5m in diameter were specified for the Block 26E Building. Birmingham booked equipment availability several months in advance so

that work could commence on August 15th in the peak of the summer construction period. Two additional drilling rigs were added to accelerate the completion of the contract in November. Birmingham will begin construction of the next two building towers in March 2008.



DRIVING PILES FOR SUNCOR'S VOYAGEUR PROJECT

Project Voyageur in Fort McMurray, Alberta is the nucleus of Suncor's growth strategy to produce 550-million barrels of oil per year. In mid-2007, Birmingham Construction Ltd. was retained as a sub-contractor to North American

Construction of Edmonton to drive approximately 1,100, 30-in. diameter, 1-in. wall pipe piles up to 90-ft. long for the Voyageur project. A total of 17,000 piles are planned with potentially as many as 30,000 by the time the project is finished.

Originally, Birmingham was to supply hammers and leads to NAC for the test pile program, but given NAC's volume of work and the size and schedule of the Voyageur Project, they contracted Birmingham to drive the largest production piles, starting with the 30-in. pipe. The test pile program, supervised by AMEC of Edmonton, took place in January and February using four different model hammers, including the B-21, B-5505, B-6005, and the B-6505HD. Both open-ended and closed-ended pipe piles – 12-in., 18-in., 24-in. and 30-in. in size – were investigated.

Birmingham crews are currently operating two, 165-ton Terex cranes using



NEW PIER AT BURLINGTON'S WATERFRONT

In the spring of 2008, the Brant Street Pier at Spencer Smith Park will be open to the public. The project is the final phase of the \$17.4 million initiative to transform Burlington's waterfront into an exciting destination for residents and visitors.

Birmingham has been involved with the s-shaped pier's construction since early 2007 when they designed and built a temporary trestle extending into Lake Ontario from which the in-water pier foundations could be constructed. A 100-ton crane was used for 14 structural support caissons (each 1.2 metres in diameter) that were socketed six metres into the bedrock just below the lake bottom. According to Brent Porteous, Project Superintendent, weather was the major challenge of the project. "We had to stand on a barge to drive the piles and the water was pretty rough when the March cold winds were blowing."

Harm Schilthuis and Sons was the General contractor on the project. The new Brant Street Pier new pier stretches 132 m (436 ft)

out over the water and includes day docking for recreational and tour boats, a lookout point above the deck, and is crowned with a wind generator.



"We had to stand on a barge to drive the piles and the water was pretty rough when the March cold winds were blowing."
Brent Porteous, Project Superintendent

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AN INNOVATIVE FIRST IN BRIDGE CONSTRUCTION

this system includes many technical innovations designed and manufactured in-house at Birmingham. Sensors, located throughout the system, allow operators to monitor exactly what is happening at all times, and a feedback mechanism immediately stops the hammer should a problem occur. A hydraulic foot was designed to go into the ground to absorb unwanted vibrations and give extra stability. "There are numerous complexities to the system," says Stefano adding that every division within the company was involved with building the prototype. "It is the pinnacle of our achievements to-date. Everyone is extremely proud."

Engineering modeling and design began in September 2006 and by February 2007 initial testing was under way. "We had a full length concrete pile, weighing 44-tonne, shipped from the United States to test on site in Hamilton Harbour. We built our own structure to support the machine and the test passed with flying colours, tilting the mechanism up and down 100 times."

Two machines were sent on site to North Carolina in late summer 2007. They are being used simultaneously from the north and south to build the bridge.

At present, they can drive the nine piles required for a bent in one and a half days and complete a full span of the bridge in seven days. With this rate of production, the project

could be completed a year ahead of schedule.

This tilting lead system was combined with Berminghammer B6505HD after the client cracked several concrete piles while using a competitor's product. The B-6505HD allowed them to have the controllability necessary to drive the piles without overstressing them and, after a successful test program, three of these pile drivers were purchased. The clean combustion and low emissions of this hammer was also a great bonus considering the environmental concerns of the area.

A first of its kind in the world, the new tilting pile driving mechanism is attracting a lot of attention from the foundation and construction industry. "It brings pile driving to a totally different level," emphasizes Stefano, commenting that research is ongoing to apply the technology to other applications.



Outstanding Features:

- 140 ft. long leader system
- Capable of handling up to 44-tonne piles
- Drives piles from cantilevered section of beam launcher
- System causes minimal environmental disturbance
- No temporary access required
- No expensive marine equipment required
- Fully automated hydraulic control systems
- Incorporated safety features

STATNAMIC - MOBILIZING PRODUCTION PILES AND ENSURING SAFE TRANSPORTATION INFRASTRUCTURE

The results shown here are a great example of the power of Statnamic; not only in its ability to fully mobilize the capacity of bored-piles, but more importantly to identify a serious problem with the foundation design of a major transportation infrastructure project in Canada.

The following graph (Caisson D-1), was intended as a routine proof-test on a production pile. The anticipated (and required) ultimate capacity of the pile was supposed to be 10,000-kN. The grey-line indicates the measured Statnamic data from the load cell and displacement transducer. The black-line represents the 'derived-static' load-displacement response calculated using the 'unloading-point-method'. As the data shows the pile experienced a 70-mm net settlement, with an initial plunging failure occurring at 6,000-kN and a residual capacity of approximately 4,000-kN. This was a 22-m long, 1.2-m diameter bored-pile.

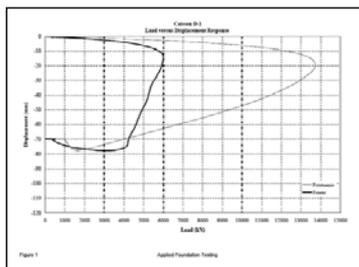


Figure 1

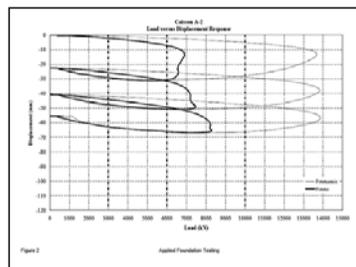


Figure 2

After the testing of Caisson D-1, it was decided that additional testing was required. The results of the Statnamic testing on Caisson A-2 are shown below. Three cycles of loading were performed in an effort to use Statnamic to 'improve' the capacity of the pile. This strategy met with some success (cycle 1 – 6,500-kN, cycle 3 – 8,200-kN), but the final result was still less than the required capacity of 10,000-kN.

16-MN Statnamic device with mechanical catching mechanism



The third pile that was tested showed results similar to that of the first pile. A similar attempt to improve the pile capacity through cyclic loading (4-cycles, see below) showed no improvement in the pile capacity. This testing proved without a doubt that the bearing layer (a dense sand) was not capable of supporting the required ultimate capacity of 10,000-kN. Additional "remedial" foundations were required to supplement these foundations -- proof that load testing is a good idea!

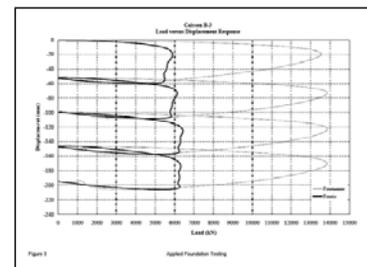


Figure 3

The above testing was performed by Applied Foundation Testing, Inc. of Green Cove Springs, Florida, on a project in Canada.



KUWAITI SOLUTION

Birmingham custom packaged eight foundation rigs to the construction arm of First Kuwaiti Trading for a project to expand two main power stations in Kuwait City in October 2007. Birmingham supplied two B-5505 and three B-4505 diesel hammers, along with five 90-ft vertical travel lead systems.

The piling systems were rigged on five Terex cranes, two 110-ton and three 80-ton, and the pile driving hydraulics were customized by Birmingham staff in-house and then installed at Dozier Crane headquarters in Savannah, Georgia. Birmingham also supplied three Bauer drilling rigs on the project.

Birmingham's foundation solution package is the largest equipment purchase the company has made to date.

The marrying of equipment and cranes happened in Kuwait City where Niels Christensen spent a month training Kuwaitis on the equipment assembly, maintenance and operating procedures. "Everything went together quite smoothly," says Niels adding, "It never ceases to amaze me as to how similar the construction industry is. The only difference is the language and the landscape."



BERMINGHAM SUPPLIES TWO PILE DRIVING RIGS TO GUINEA

Introductions at an Amsterdam conference led to Birmingham joining forces with Leduc, a French company, on a pile driving test program for a bauxite processing plant project in Guinea. Profound b.v., a Dutch company, performed drivability studies for Leduc and subsequently the B-5505 was selected for the test pile program. One of the project's main requirements was for equip-

ment that would monitor and record the hammer performance during pile driving – something Birmingham's Pile Driving Monitor was able to deliver. "This sort of monitoring can only be found on expensive high-end hydraulic hammers," emphasizes Stefano Gabaldo, Director European Sales. A rental B-5505 was used for the testing program, but Leduc subsequently purchased two B-5505

hammers, a B32, two complete piling rigs consisting of 108-ft. VTL lead systems and crawler cranes. Birmingham's ability to ship the first system within six weeks after the confirmed order was crucial to the sale. A Birmingham technician will aid in the commissioning of the systems at the job site in March 2008.



PEOPLE ARE OUR DRIVING FORCE



STEFANO GABALDO, DIRECTOR EUROPEAN SALES

As Director European Sales, Stefano plays a major role in introducing Birmingham's innovative technology and practical solutions to new customers throughout the world and has been influential in the company's steady sales increases into Europe in 2007. "It can be challenging breaking into new markets, but it's also rewarding," says Stefano, who is closely associated with the engineering development and manufacture of state-of-the-art equipment. "When you're involved

with all the engineering aspects and believe in what the equipment can do, it's easy to be convincing on the sales side," he says mentioning he enjoys his job diversity. "It's fun because we're always inventing new things."

Stefano, a graduate of Ryerson Polytechnical Institute, where he earned a bachelor degree in structural engineering technology, began his association with Birmingham in the early 90s as a consultant preparing drawings and

developing parts for equipment. He gained in-depth product knowledge while creating manuals for the various equipment. He joined the company full-time in 1998 and was instrumental in establishing the engineering design team the following year.

Stefano is an avid cyclist, biking to and from work every day. He and his wife Liz have two children Alexander 17, and Max 13.



GREG STOKKERMANS, SUPERINTENDENT/PROJECT MANAGER

Greg joined the Birmingham team in May 2006 upon graduation from the University of Western Ontario with a degree in civil/structural engineering. "Although I had other offers, the Niagara tunnel project piqued my interest in joining Birmingham. I enjoyed a lot of great experiences as field engineer with that project." Since September 2007 Greg has been assigned to the Suncor's Project Voyageur in Fort McMurray, Alberta, part of a growth strategy to increase oil sands

production. It is another major project for Birmingham who has been contracted to install large piling for a new processing plant. "I'm responsible for all aspects of the project -- from planning the work and managing the manpower, including the safety program, to project invoicing and administration."

The native of Grand Bend, Ontario is looking forward to a long career with Birmingham. "I enjoy the opportunities that Birmingham

gives me and the responsibilities that they entrust to me. I'm ready to tackle any new endeavor, especially the things we haven't done before. I'm excited by the challenges that lie ahead."

In his spare time, Greg enjoys skiing and traveling.

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HOW TO CONTACT US
1-905-528-7924 / 1-800-668-9432
Fax: 1-905-528-6187 or visit
www.birminghamhammer.com

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Patrick Birmingham - CEO
Peter Smith - President
Louis Fritz - Sales Engineer
Michael Justason - Product Manager
Stefano Gabaldo - European Sales
Warren Waite, U.S. Sales
Karl Christensen - Operations Manager
Milan Brestovacki - Technical Sales Coordinator
Dave Potosky - Senior Estimator
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