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Rising to the Occasion

Concrete placing system pumps and places 120,000 cubic yards of concrete for 50-story building

STURTEVANT, WI (August 8, 2011) – Rising 850 feet (259m) above downtown Oklahoma City, Oklahoma, is the Devon World Headquarters Tower, which is expected to be the tallest building in the state once complete. An impressive lineup of Putzmeister America, Inc. equipment pumped and placed an estimated 120,000 cubic yards (91,747m³) of concrete for the 1.7 million square foot structure.

Part of the city's "Core to Shore" downtown redevelopment project, which aims to redevelop 750 acres of underutilized land between the core of downtown to the shore of the Oklahoma River, the building will be the new headquarters for Devon World Headquarters, LLC, a subsidiary of Devon Energy Corporation and the largest U.S.-based independent oil and natural gas producer.

The building will comprise a 130-foot (40m) tall metal and glass rotunda, a five-story podium building and a 10-story above- and below-grade parking garage.

Multiple Challenges

An aggressive pour schedule, a unique mix design and extreme weather conditions (hot, cold and windy) spurred Miami-based C&C Concrete Pumping, Inc. (C&C), the concrete pump and placement sub-contractor on the project, to enlist their trusted Putzmeister equipment to get the job done on time and on budget.

"24 floors of the building needed to be occupied by the end of 2011 and the remaining 26 floors by summer 2012," explains Laszlo Fazekas, National Marketing Director of C&C. "Consequently, a high-early concrete mix was specified to meet this demanding pumping schedule and to also combat the freezing weather conditions and reduce finishers overtime. Due to these circumstances it meant we needed to supply the most efficient and dependable concrete pumping and placing equipment.

"From our experience of completing 100-story plus high-rise buildings with our Putzmeister equipment, we knew it would pump the concrete mix design under extreme pressures in the most efficient manner possible," says Fazekas.

Setup

Arriving on site in April 2010 C&C enlisted one MX 34/38Z placing boom with lattice tower, two BSA 14000 HP-D 8" trailer pumps and one Thom-Katt® TK 50 high pressure shotcrete/concrete pump.

"The two trailer pumps were set up side by side," explains Pepi Cancio President of C&C. "One was utilized for pumping on site while the other was on stand by in the event extra support was needed."

For most of the floor pours, the pedestal was bolted directly to a cross-base which was mounted to the structure's climbing core wall forming system. Once the climbing core wall forming system was removed, a 40-foot tower was mounted to the cross-base, except this time the cross-base was bolted to a newly poured concrete deck in the roof as per the guidance of Putzmeister engineers. This method allowed one placing boom mounting system to be used as both a climbing and static mounting system.



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C&C Concrete Pumping, Inc. enlisted two of their BSA 14000 HP-D 8



C&C enlisted one MX 34/38Z placing boom with lattice tower for the project.



"The placing boom and pedestal, with a combined total weight of 18,600-pound (8,437kg), was flown to and from the tower with ease," explains Cancio. "Positioning the boom on the pedestal also proved to be a simple process."

While the trailer pump and placing boom were used for the horizontal flatwork and vertical elements, the TK 50 was used for miscellaneous concrete placement needs including stairs, pour backs and pop-ups.

24/7

According to Fazekas, a 24-hour pour schedule to place the 120,000 cubic yards (91,747m³) of concrete was implemented from the time the equipment was initially set up until the top off of the structure.

"The horizontal element pours were done at night while the vertical elements were done during the day," says Fazekas.

"There were three slab pours per typical floor," adds Cancio.

High pressure, low output pumping was a necessity on this project due to the heights that had to be attained with a challenging concrete mix design. The BSA averaged outputs from 50 to 90 cubic yards per hour (38-69m³/hr).

"The output varied due to the density of the mix design and on the weather," explains Cancio. "The mix included superplasticizers to meet pumpability and workability requirements needed for concrete finishing purposes, and dense aggregate to meet the strength demands of the project. In the winter this mix was more challenging to pump because the aggregates could not be maintained at Saturated Surface Dry (SSD) condition due to freezing temperatures when aggregates absorb lots of free water, leaving us with a somewhat sticky paste.

"Luckily, we were able to depend on our powerful pumps and great concrete finishers to pump out the harsh, high strength mixes."

With the BSA's simple and reliable closed loop free flow hydraulics, C&C was able to provide a smoother and more controllable pumping method in the varying weather conditions on the site.

"As part of the free flow hydraulics design, the pump has a fully adjustable volume control to allow for very slow pumping while retaining full concrete pressure of 3,190 psi (220 bar), making the BSA ideal for this type of job," adds Jovanny Cabral, General Manager for the C&C Dallas, Texas branch.

Capable of pumping up to 133 cubic yards per hour (102m³/hr), the BSA trailer pump is powered by a 500 hp (368kW) Caterpillar® engine.

In addition, the TK 50, featuring a powerful 96 hp (72kW) Deutz TCD2012L04m engine, averaged outputs up to 10 cubic yards per hour (7m³/hr) of the harsh mix throughout the project.

"Able to pump up to 54 cubic yards per hour (41m³/hr) at 1,150 psi (79 bar), the TK 50 features a gradual reduction from hard-chromed material cylinders to the outlet, providing an even flow of material, and ultimately providing us longer life of the pump," says Cabral. "As an added bonus, the pump's angled hopper is easy to fill, clean and maintain, which helped us stay on track with the job's aggressive pour schedule."

Not only did the pumps' performance on this project exceed our expectations, but C&C's four-arm Multi-Z placing boom did too: according to Cancio, it placed the concrete precisely with no delay.

"The maneuverability and precision of the placing boom is incredible," says Papito Saavedra, the head



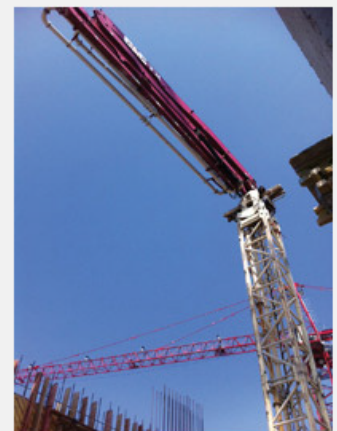
On the roof of the building, C&C installed a 40-foot (12m) lattice tower and cross-base by clamping it directly to the concrete floor it sat on.



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of placing boom operations for C&C for this project. "Capable of reaching up to 108 feet, seven inches horizontally (33.10m) and 116 feet, four inches vertically (35.47m), we never had to worry that it wouldn't be able to reach the exact point of placement."

On the roof of the building, C&C installed a 40-foot (12m) lattice tower and cross-base by clamping it directly to the concrete floor it sat on.

All in a Day's Work

"We knew our equipment and experience would stand up to the grueling demands of this job," notes Cancio. "We have used the same equipment to do the tallest buildings in Miami and Austin as well. Having a great combination of people to work with from the owner and developer and general contractor, to the ready mix concrete company in addition to the right equipment on every project we do, makes the job even more successful and rewarding for everyone involved.

"The right personnel and our reliable equipment is what has allowed us as a company to participate on jobs where we do not have permanent offices like Oklahoma, the Carolinas, Alabama, and New Orleans, which offers our customers more flexibility."

C&C topped off the structure in summer 2011.

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A division of one of the world's most well-recognized and respected heavy equipment manufacturers, Putzmeister Concrete Pumps GmbH, Putzmeister America, Inc. manufactures a complete line of truck-mounted concrete boom pumps, separate placing booms, truck-mounted telescopic belt conveyors, and trailer-mounted concrete pumps as well as mortar, grout, shotcrete, plaster and fireproofing pumps and mixers, industrial pumps, tunneling machinery and pipeline systems. Some of the industry's best known brands such as Allentown Shotcrete Technology, Esser Pipe Technology, Thom-Katt® and Telebelt® are part of the Putzmeister America family. The company's workforce is dedicated to hands-on customer support and advancing the industry in design and technical innovation.

TECHNOLOGY THAT PUTS YOU FIRST

SPECS:

Owner/Developer: Devon Energy Corporation - Oklahoma City, Oklahoma

General Contractor: Joint Venture of Holder Construction (primary partner) - Atlanta, Georgia and Flintco, LLC (minority partner) - Tulsa, Oklahoma

Concrete Pump and finisher Sub-contractor: C&C Concrete Pumping, Inc. - Medley, Florida (Corporate offices); C&C Tx Concrete Pumping with branches in Dallas and Austin, Texas, Miami and Orlando, Florida and Sao Paulo, Brazil

Concrete Mix Supplier: Dolese Concrete - Oklahoma City, Oklahoma

Equipment: One Putzmeister MX 34/38Z placing boom, One Putzmeister lattice tower, two Putzmeister BSA 14000 HP-D 8" trailer pumps and one Thom-Katt® TK 50 high pressure shotcrete/concrete pump.

Putzmeister America, Inc.
1733 90th Street,
Sturtevant, WI 53177 USA
Phone: (262) 886-3200
Toll-free: (800) 884-7210
Fax: (262) 884-6338

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