



Hoisting a nearly 9,000 lb. cooling tower to the rooftop of one of the tallest buildings between Detroit and Chicago is all in a day's work for Allingham Corporation, Southfield. In business since 1939, Allingham Corporation has operated the "big rigs" responsible for piecing together much of Metro Detroit's skyline, including Midfield Terminal, Ford Field and both the original Tiger Stadium in 1959 and Comerica Park in 1999. Today, Allingham cranes dot southeastern Michigan and beyond, ranging from jobsites at Severstal Steel to the Marathon expansion.

A snowy, fog-bound morning in early December 2011 found Allingham Corporation in Ann Arbor's tight grid of streets, assembling a jib extension for a Grove 350-ton capacity crane. Coupling the jib to the crane's 197-foot-long main hydraulic boom created the long "arm" of latticed steel needed to reach the very top of the Tower Plaza, a 26-story building, plus mechanical penthouse, soaring into the city's skyline along East William Street. "It was 253 feet just to clear the edge of the roof," said Alan D. Livernois, Allingham vice president. "The entire lift was about 270 feet in the air, because we also had to get up and over a 16-foot-high screen wall."

The rooftop of this concrete-framed building (actually the tallest building between Detroit and Chicago at the time of its construction in 1969) offers an eagle's eye view of Ann Arbor, complete with a sightline to the scoreboard of the Big House – the home of the University of Michigan's fabled maize and blue football team. On a clear day, GM World Headquarters in Detroit and the twin stacks of Fermi II in Monroe are faintly visible on the far horizon. Of course, the construction team wasn't on the rooftop to admire the view. During the hoist, the team's attention was focused on guiding the building's new cooling tower into precise position for attachment to a newly built structural steel support platform.

"This massive box had to land on just four, tiny little bolts for attachment," said Betsy Baird, AIA, LEED Green Associate, VP Quality and project manager for O'Neal Construction, Inc., the Ann Arbor-based construction manager for the Tower Plaza's 2011 infrastructure improvement project. The project was performed by Kramer-Triad Management, LLC, the building's property managers, and the Ann Arbor Tower Plaza Condominium Association, the steering committee for this 298-unit residential facility with some private offices. This well-coordinated hoist was the result of the teamwork between O'Neal Construction, John Darr Mechanical, Inc., Ann Arbor, as mechanical subcontractor, and Allingham Corp., one of the largest crane rental companies in the Detroit area.

Making it to the Top with the Allingham Corporation

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Darr Mechanical brought Allingham on board and coordinated the intricate switch of two old cooling towers, original to the circa 1969 building, for a new, energy-efficient unit. "Darr Mechanical provided coordination for that day for the labor and the equipment on site," said Livernois. "O'Neal also coordinated with Darr and with Allingham to put it all together as a team."

COUNTDOWN TO THE BIG HOIST

Preparation for the big lift was an exercise in logistics. Two seasons – cooling season and football season – steered the project toward a target date of early December. "We were going to try to do it as soon as cooling season was over," said Baird. However, the end of cooling season marks the beginning of football fever. Any potential interference with traffic flow during a football weekend at this Big 10 town was unthinkable – and not even allowed. "The City wouldn't allow us to close a street on a football weekend," said Jason Fletcher, O'Neal superintendent.

Ultimately, Friday, Dec. 2, 2011 was selected with Saturday as an alternate date in the event of inclement weather. O'Neal also opted to conduct the hoist in a single day, beginning at 5 am and ending at 8 pm. Allingham selected the Grove 350 hydraulic, all terrain crane from its fleet of close to 100 cranes, to meet the demands of a one-day schedule. "If we brought in a crawler crane, it would have taken two days to assemble it," said Livernois. "With a mobile hydraulic crane, we can set it up in three hours. It is also rubber-tired, so it can be driven to the jobsite."

In the planning phase, O'Neal also added "a couple of supports in the interstitial spaces as an extra precaution," said Baird. Actually getting the project off the ground also entailed minimizing disruption to tenants by notifying residents on the upper floors and creating a detour to steer all tenants clear of potential danger. Despite the detour and placement of security fencing around the perimeter, one foolhardy pedestrian exited a nearby dry cleaning business, actually climbed the security fencing with his laundry slung over his back, and calmly walked through the construction zone, recalled Baird.

Clearly, the core logistical demand was working in the sheer congestion of Ann Arbor streets, plus being directly next door to the University of Michigan's Central Campus buzzing with students and other pedestrians, as well as a fair number of construction projects. "We were right in the heart of downtown, and we were really crunched for space," said Jeremy Finn, Darr project manager.

Congested streets and massive equipment make for tight quarters. In fact, the crane, arriving in the early evening the day before the



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hoist, consumed the width of the entire street, said Livernois. O'Neal even had to remove the barricades of a fellow O'Neal project located directly across the street to make room for the Grove 350's outriggers. "They had to make space for us to be able to fit the crane in that location, because the crane couldn't sit just anywhere on the street," said Livernois. "It had to be placed in a certain spot in order to make the lift."

The crane had to be staged in a location offering the optimal center of rotation, along with the proper angle and distance, for the machine to access the cooling towers in the southwest quadrant of the rooftop. "We couldn't boom up high enough if we were too close to the building," added Livernois. Ultimately, the crane was staged west of the Tower Plaza, and at a distance bordering on the very edge of the crosswalk at East William and Thompson streets.

INFINITE CONTROL

The project team arrived in the pre-dawn darkness of early winter. Beginning the day with a brew of fog, snow and wind, Allingham proceeded with the first part of the mission: assembling the jib extension and the crane's massive 220,000 lbs. of counter weight, both

delivered to the site on tractor trailers the previous day. The crane was prepped for 9,000 lbs., but the cooling tower probably weighed in the 8,700 lb. range.

Using a National 1400 H boom truck with a 33-ton capacity, Allingham built the 141-foot-long jib extension, pinning together four latticed sections to assemble the entire piece. While the crane and counter weight occupied the entire width of the street at the west end, the jib extension stretched to the east the full length of the block. Even with the main boom retracted, the completed jib extension stopped just short of the opposite cross walk at East William and Maynard Streets.

After the 3.5-hour assembly of jib and counter weight, the weather cleared as if on cue, creating perfect conditions for the required series of lifts. "It turned out to be a crystal clear day with no wind – either at street level or up at the rooftop," said Livernois. "We have an anemometer at the tip of the jib that measures how many meters per second the wind is blowing."

The poor weather lifted quickly, but rigging consumed the next two hours. Rigging and centering a heavy load with an assortment of cables must be performed with care and at a deliberate pace. Maneuvering the boom over and down to the load is also a studied action. "When the operator goes over the top of a heavy piece to pick it, he finds the center of gravity and keeps the center of gravity underneath it," said Livernois, who has been in the crane business since 1973 and who has done more than his fair share of swinging steel and hoisting heavy objects skyward. "While the operator hoists the load up at a fair rate of speed, he slows when he gets close to clearing the roof of the building. He is moving so slowly at that point, he has infinite control." At the Tower Plaza project, the actual vertical hoist from the rooftop, either up or down, took only about six or seven minutes, recalled Fletcher.

AN UPLIFTING EXPERIENCE

The first actual pick was removal of the two existing cooling towers, both 43-year-old mechanical units in poor condition. The panels of both cooling towers had been previously removed as part of an asbestos abatement, said Fletcher. With the cooling towers essentially stripped down to their structural frames, Darr and Allingham decided to remove the fans from both units as a safety measure. "The old towers were in rough shape," said Finn. "We didn't want the weight of the fans bearing on top of the towers and causing any problems going down." Fan and tower removal was conducted in two phases: the first pick began at 11:15 and brought the fan to the street below; the first cooling tower came down at high noon, said Fletcher.