

# Building Freedom

## Concrete Cutter Helps Prepare for World Trade Center Memorial Site

**T**he horrifying events that took place on September 11th, 2001 will forever be etched in the memories of the people of New York City, the people of America, and those around the globe who witnessed the tragedy. Now the city moves forward with hope as Ground Zero is transformed into a memorial site, including the construction of *Freedom Tower*.

Since 2007, CSDA member company J. P. Hogan Coring & Sawing Corporation have been involved in the demolition of the World Trade Center slurry wall, that will make room for the new transportation hub, *Reflecting Absence* memorial, visitor orientation and education center and *Freedom Tower*. The memorial will also include the 'footprints' of the former twin towers as recessed pools, and will be surrounded by plant life and quiet public spaces at street level. The design for the memorial was chosen as a result of an international competition for architects, with New York's own Michael Arad the winner.



J. P. Hogan cored over a thousand picking holes on the slurry wall.



An artist's impression of how the tower will look against the New York skyline.

Regular readers of *Concrete Openings* may remember the March 2002 issue that covered another CSDA member's work at Ground Zero. Engineered Concrete Removal (ECR) was also involved with the slurry wall, creating exact openings for tiebacks. The J. P. Hogan team has also been there since the beginning. When the towers fell, their light towers helped illuminate the way for rescue teams and during the cleanup stage they drilled tieback holes that held back the river.

J. P. Hogan were approached by the general contractor, Phoenix Constructors (a joint venture between Fluor, Skanska, Bovis and Granite Construction), to cut and remove the damaged 1,000-foot-long, 50-foot-high, 5-foot-thick slurry wall. The decision was made to remove the slurry wall to make way for the new construction because of the heavy damage sustained on September 11th, and its proximity to the 1 and 9 Subway and Port Authority Trans-Hudson (PATH) trains. The slurry wall is located on Veasey Street, between Church and West Street in New York's World Financial Center. After consideration was given to various cutting and demolition methods, wire sawing was chosen in order to maintain the structural integrity of the slurry wall during the demolition process, as Gene Kelley of Granite Construction explains, "The bathtub slurry wall has some unique aspects with limited access for conventional demolition methods, so it made good sense to use diamond wire sawing to remove the required sections."



Demolition of the slurry wall will make way for the new construction.



Diamond wire sawing was used to perform the cuts.

Given the history of the site, a great deal of preparation was performed to identify actual and potential hazards that would complicate the job. A PATH station resides on the other side of the slurry wall, therefore J. P. Hogan had to take extreme care to stop slurry from spraying onto the live high-voltage tracks. In addition, a portion of the wall was heavily damaged by the fall of the twin towers so much care had to be taken to avoid the wall from breaking up during the demolition. Also, the team had to wait for the area to be excavated by Bobcat skid steers as each phase was completed. Blasting at nearby sites and other potential seismic events complicated the removal process.

"We hope for the best, but prepare for the worst," says John Hogan. "We have a comprehensive safety plan in place and all of J. P. Hogan Coring & Sawing Corporation's operators are required to complete multiple safety classes." These classes include a ten-hour OSHA course, confined space safety training and regular toolbox meetings, among others. However, when working on such a busy and highly-visible job site, extra precautions have to be taken. The Port Authority of New York and New Jersey safety courses included many topics including electrical hazards, proper use of Personal Protective Equipment (PPE), but also covered subjects such as how to react if a suspicious package was discovered, and evacuation procedures in the event of another terrorist attack.

It was imperative throughout the course of the work that equal attention was paid to both these dangers, and those faced every day by concrete cutters. For example, the Diamond Products remote-controlled wire saws used on the project were powered with 120-horsepower, V-6 gasoline engines, and the wire traveled at an average speed of 88 feet



3,200 picking holes were drilled for removal by crane.

per second (60 mph). J. P. Hogan cordoned off a 150-foot zone around the work area with red danger tape to minimize any potential risks, and notified other workers to avoid the area. Whenever possible, operators were stationed behind pilings, a safe distance away and at a 45 degree angle from the direction the wire was traveling. In the few instances when this was not possible, a plywood sheet was employed to shield operators from any debris. But possibly the smartest move by J. P. Hogan was to employ an engineer to create a stabilization plan, which would ensure the highest level of safety for the site workers and the passengers of the adjacent subway and PATH lines. By doing this, the team was well prepared for the possibility of a potential wall collapse due to seismic events caused by nearby blasting or from small earthquakes that regularly hit the city.

The methods utilized on the project included core drilling 3,200 “picking” holes for subsequent removal by crane. After the picking and wire-access holes were cored, operators started each phase with a horizontal cut, bracing the wall with 3-foot-long by 3-inch-wide by 3/8-inch-thick steel I-beams and 5/8-inch by 10-inch carbon steel wedge anchors. The team then made the vertical cuts and braced each 5-foot by 5-foot piece with more I-beams. During the removal process the plates were removed incrementally by a mobile crane and stacked onto a waiting flatbed truck.

Most wire saw transitions are built for 40-horsepower saws (maximum), so beefing up the construction on all those pieces was one of J. P. Hogan’s first modifications. Even with the additional reinforcement, the operators still needed to inspect the transitions regularly. The company purchased three remote-controlled, high-production CC-TWS-V6R track

wire saws manufactured by Diamond Products to complete the wire sawing portion of the job.

J. P. Hogan had to manufacture many of the transitions needed for the project. However, Tom Gainey, Ron Rapper, and engineers from fellow CSDA member Husqvarna Construction Products worked closely with the team to obtain the proper specifications for the diamond wire, and provided many of the solutions including Pellegrini wire saw pulleys. The R2221 core drills were manufactured by Shibuya, and purchased from Diteq Diamond Tools and Equipment. Additional heavy-duty, high-speed pulleys and custom transitions were manufactured by J. P. Hogan employees.

The work consisted of 8,000 linear feet of horizontal cutting and 8,400 linear feet of vertical cutting. To date, J. P. Hogan has core drilled 3,362 holes, measuring 4 inches in diameter and 60 inches deep, and the team has removed approximately 11,300 metric tons of concrete since their work began in November 2007. The team is progressing extremely well, and are projected to finish one month ahead of schedule.

Due to the continued success of their work, J. P. Hogan have been presented with additional work opportunities at the site, and is now undertaking inverted core drilling consisting of an additional 1,681 core holes. John Hogan is pleased with his team’s performance and the overall outcome. “It was a profitable and challenging job—and a meaningful one,” he said. “Everyone at J. P. Hogan was proud to have been a part of the building of the *Freedom Tower* and the *Reflecting Absence* memorial.”

## DID YOU KNOW?



The cutting team have removed over 11,300 metric tons so far.



### SLURRY WALLS

Slurry wall construction was used to construct the bathtub that surrounded most of the World Trade Center site. A slurry wall is a reinforced-concrete diaphragm wall used to build tunnels, open cuts and lay foundations in areas of soft earth close to open water, or with a high ground water table.

Slurry walls are typically constructed with a set of guide walls, typically 3.3 feet deep and 1.6 feet thick, constructed on the ground surface. A special clamshell-shaped digger is used to excavate the slurry trench guided by the guide walls. The trench is kept filled with slurry, a mixture of bentonite and water, at all times to prevent collapse. Once the first trench is completed to design depth, or bedrock, an adjacent trench is dug in the same manner. Eventually, once a particular length is reached, a reinforcing cage is lowered into the slurry-filled pit and the pit is filled with concrete from the bottom up using tremie pipes. The concrete displaces the bentonite slurry, which is pumped out and recycled. To prevent the concrete wall from collapsing into the newly-open area, temporary supports such as tiebacks are installed. When completed, the structure built within a walled-off area prevents the wall from collapsing, so that tiebacks or other temporary bracing may be removed.

In order to construct the World Trade Center, it was necessary to build the bathtub, with the slurry wall along the West Street side of the site, to keep out water from the Hudson River. This method was used in place of conventional de-watering. The slurry method was devised by Port Authority chief engineer John M. Kyle, Jr., and towards the end of 1966 work began on building the slurry wall. The construction was led by Montreal-based Icanda, a subsidiary of an Italian engineering firm, Impresa Costruzioni Opere Specializzate. It took fourteen months for the slurry wall to be completed, which was necessary before excavation of material from the interior of the site could begin.

#### COMPANY PROFILE

J. P. Hogan Coring & Sawing Corporation has been a CSDA member since 2006 and has been in business for over 14 years. The company is based in Staten Island, New York, and has 55 employees at their two locations.

#### RESOURCES

##### General Contractor:

Phoenix Constructors

##### Sawing and Drilling Contractor:

J. P. Hogan Coring & Sawing Corporation  
Staten Island, New York

Phone: 718-761-7014

Fax: 718-370-2826

email: [Jhogan@888jphogan.com](mailto:Jhogan@888jphogan.com)

Website: [www.888jphogan.com](http://www.888jphogan.com)

Methods Used: Core Drilling, Wire Sawing

REVIEW AND COMMENT ON THIS ARTICLE AT [WWW.CSDA.ORG/FORUM.CFM](http://WWW.CSDA.ORG/FORUM.CFM)