



Begin driving sidewalk pile, S sidewalk, E end of pool.



# Lincoln Memorial Reflecting Pool Grounds Rehabilitation

*Lincoln Memorial gets a facelift: Mid-size construction company tackles huge historic job*

By Heather Hudson

**Y**ou can forgive the crew members of the Lincoln Memorial Reflecting Pool Grounds Rehabilitation Project if they sometimes get the feeling they're being watched.

Aside from the millions of tourists who flock to the hallowed ground they're restoring in Washington, DC, they've also been under the watchful eyes of the infamous 19-foot marble sculpture of Abraham Lincoln himself.

When the \$30.7 million facelift is complete in April 2012, after 18 months of exhaustive work, it promises to rise up to meet the American legend it was built to honor back in 1922.

Corman Construction, one of the mid-Atlantic region's largest heavy construction contractors, has taken on the massive job. Despite working on projects like the 2,300-foot Woodrow Wilson Bridge in Virginia and an 11-bridge I-95/I-694 interchange, even they have never taken on a project of this magnitude.

With just under 600 employees, Corman Construction survived the recession of the last several years by teaming up

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– Corman Construction Project Engineer Tom Mulcahy

with other contractors. Project Engineer Tom Mulcahy says they're now getting back into smaller jobs and more utility and pipe work. The reflecting pool restoration was considered a good opportunity to strike out on their own in a more meaningful way while sub-contracting some of the components.

Photos courtesy of Corman Construction



From left: Conditions in 2W, looking W; Crane Mat in 1E with Pile Cut-off Stabilizer; PM-16 driving in 1E.

### How it all began

One can imagine the grandeur that architects had in mind when installing the almost 2,500-foot long reflecting pool that mirrors both the Washington Monument and the Lincoln Memorial. Lined by walking paths and giant elm trees on both sides, it plays host to more than 24 million visitors each year.

But time has not been kind to the pool or its surroundings. The asphaltic roofing material originally used to line the pool and cover the soft soil underneath made for a leaky and uneven bottom. The concrete slab poured on top to remedy the problem in the 1970s has settled, cracked and leaks.

“They were putting an excess of 200 million gallons of water into the pool every year just to keep water in it,” said Corman Construction Project Engineer Tom Mulcahy.

“Water was seeping into the ground and concrete slabs around it... the pool was pulling away from its edge and there were large gaps in places where water was leaking into the ground.”

The National Park Service has also asked for a small water treatment building to be erected nearby, which will put ozone into the water to treat and allow recirculation. Other parts of the restoration include adding new security bollards and changing some of the sidewalks by the Lincoln Memorial to offer a larger secured area and create more capacity for crowds.

**“On good days, we were able to get 80 to 90 piles driven in an eight-hour shift with one of those rigs and we used them for a total of 35 days across three months.”**

– Corman Construction Project Engineer Tom Mulcahy

### Getting to work

Mulcahy says the project has required a complicated choreography of crews working on different facets of the enormous job. At its peak, there were roughly 60 workers on site each day from Corman Construction alone, plus other subcontractors completing other tasks.

By far one of the biggest and most challenging aspects of the job has been driving the more than 2,300 piles into a soft ground.

“We used southern pine timber piles because it’s a marine-like environment considering the brackish soil with salt water coming in from the tidal basin,” said Mulcahy.

“We’re on very soft soil with bedrock 50 feet down. When

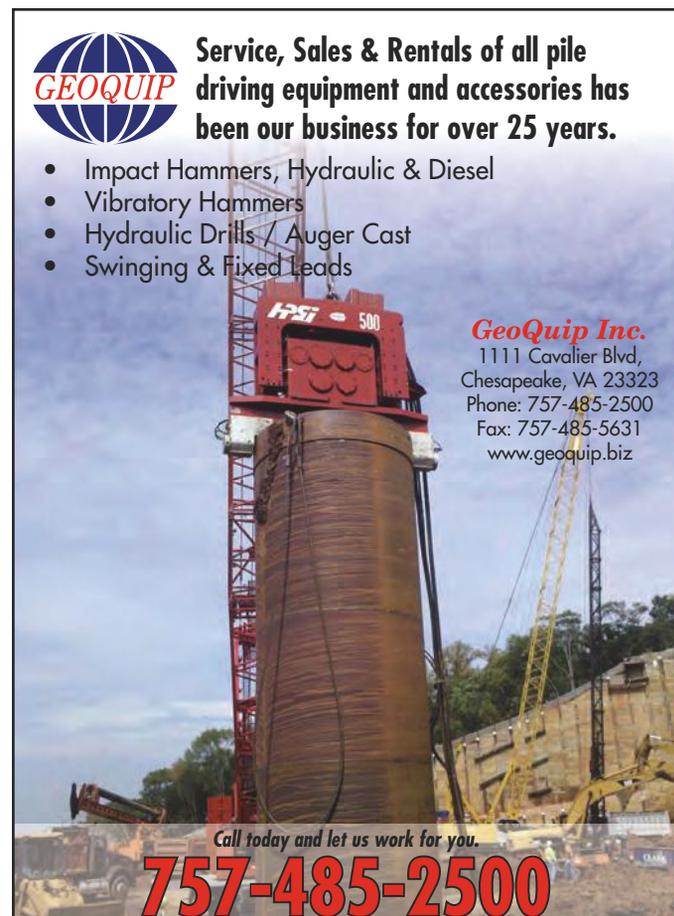


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From left: CAT 330 feeding Pm-20 Crane Mats; CAT 330 feeding Pm-20 Crane Mats; and pool conditions in 3W.

we would put a pile in the ground, the weight of the hammer would drive it down 20 or 25 feet because the soil is so soft. You had to be very careful because it's easy to drive these piles right to bedrock and you wouldn't know till you hit it and broke the pile."

Despite the care they took, about 5 percent of the piles were snapped off. Crews remedied the situation by driving one on either side of it.

Two Junttan PM 23LC pile driving rigs performed the bulk of the piles with a kind of efficiency Mulcahy hadn't seen before. "These rigs were almost like an excavator on tracks with pile driving attachments to them. They were all hydraulically operated with leads that were hooked onto them so

everything was all in one piece."

Using claws, the Junttan picked up the pile itself, lined it up and then used the attached hammer to drive the pile down.

"On good days, we were able to get 80 to 90 piles driven in an eight-hour shift with one of those rigs and we used them for a total of 35 days across three months."

Another feature that helped increase efficiency was the real-time data the rigs displayed every time a hammer hit a pile, offering a window into how much capacity an individual pile had.

Though driving the pile went swiftly, it was the prep work that had crews scrambling. "We had steel pile shoes to fit on the bottom end of the pile to protect it from cracking if the



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Pile in pool, W end looking E.

**“When you’re into this kind of capacity it’s a major job to get 100 piles ready every day and get ahead of these guys.”**

– Corman Construction Project Engineer Tom Mulcahy

pile hit rock on the way down, but we had to shave the pile down to get that boot on there. And the top end had to be shaved down to fit it into the driving cap on the pile driving rig. With 2,130 piles in the pool, that’s a lot of prep work.

“When you’re into this kind of capacity it’s a major job to get 100 piles ready every day and get ahead of these guys. It took pretty much a crew and a half just to do prep of piles every day – two or three with chainsaw and the rest marking the piles where they needed to be shaved down.”

Mulcahy is satisfied with the relatively smooth running of the project, but if there was one thing he’d do differently, it would be to order larger pile shoes that would eliminate the need to shave the piles and cut down on the prep work.

“The Junttan machines were perfect; we made the exact right decision to use them. It was just the little things like the pile shoes that we’ll tweak in the future.”

A mechanically-minded man himself, Lincoln would surely approve of the systematic approach to rehabilitating the place he calls home. ▼

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