

CHPP-Composite Helical Pipe Pile ***Reagan Ranch Visitor's Center***

The historic Neal Hotel was identified as an ideal location for the Ronald Reagan Ranch Visitor's Center and Gallery in Santa Barbara's downtown waterfront. The historic building will be used as an educational and public museum commemorating Ronald Reagan's Western White House-Rancho Del Sol. The existing building is on the National Register of Historic Structures.

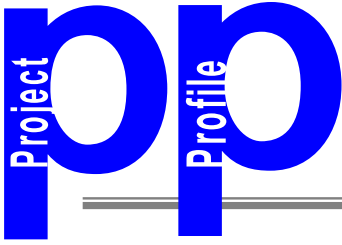
A new 4-story building was to be constructed inside the confined older existing shell including a new stairway and elevator along with a 4th floor/roof top structure. The new foundation design would need to support the existing concrete exterior shell, as well as the new 4-story concrete structure and must also resist seismic earth tremors.



Soil boring at the site indicated several lenses of compressible clays and a high water table. A deep foundation system was required. There were physical constraints for construction inside the confined building perimeter including areas with low overhead clearance and a desire to avoid spoils. It was also important to protect the façade during construction. The required ultimate load capacity was 110 KIPs.

A number of tests were conducted with slender RCS and 3-1/2 in. pipe helical piles. Although the 3-1/2 in. diameter helical piles could be used, the total of 325 piles required made this a costly option. The Composite helical Pile (CHPP) with a lead and 8-inch nominal shaft provided both bearing and friction capacity using fewer piles and providing the project with a cost effective solution. The CHPP tested to 130 KIP ultimate load.





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A total of 104 piles were installed to a depth of 30 ft. A conventional backhoe fitted with a hydraulic torque motor was used to install the helical piles to 20,000 ft-lbs. There was minimal mobilization cost and the maneuverability of the equipment simplified the installations.



A 20,000 ft-lb. Capacity hydraulic torque motor was attached to standard multi-purpose construction equipment





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The CHPP helical pile extensions are connected with square formed male/female ends and bolted together. The squared ends provided an efficient and easy to use interface to apply up to the 20,000 ft-lbs of torque required in this project. The inside of the helical pile provides an unobstructed view from top to the bottom of the lead section transition. The piles were filled with 4,000 psi of concrete for added strength rather than the more costly method of using grout. The vibration free installation protected the façade from damage during the installation of the CHPP helical piles.



Lightweight and maneuverable equipment was used to install the helical piles.

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The formed square connection ends transfers installing torque through the pipe pile and not through the bolts

4 bolts secure each extension

The CHPP helical piles are open in the interior permitting visual inspection after installation and adding an exact volume of concrete when required.

