New Condo Project at the Water's Edge Supported by 190 *ECP Torque Anchor™* Piles

Boston Area, Massachuttes

This project took several years of extensive permitting with local and state conservation commissions and planning to get all of the approvals.

The owner investigated driven piles for foundation support in the very weak, soft soil at the site. The potential environmental impact of bringing a pile driver on the site would cause more permitting problems with some regulatory agencies.

In order to move the project forward, the owner needed an environmentally safe foundation support alternative that would be accepted by all regulatory agencies.

Helical screw piles were the answer that the owner was seeking. Atlas Systems of New England was able to provide engineering expertise and extensive helical screw pile foundation installation experience in sensitive environments like this one.

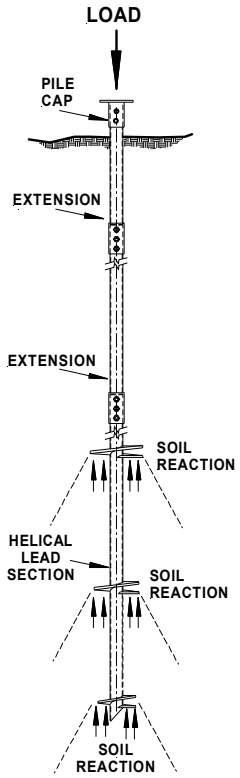
Several major challenges had to be addressed including working during the local tidal changes and with a high water table on the site. The weak soil also generated concern that the piles might have trouble achieving the required shaft torsion to adequately support the design loads. There were no deep soil borings available to verify the underlying soil stratums below target depth were as strong as, or stronger than the soil at the target embedment depth.

It is well known that in some locations in the Massachusetts area that if a target stratum does not provide sufficient load capacity, the next stratum of suitable bearing soil could be over 100 feet deep. This unknown about the soil being able to achieve the required pile capacity within the target depth range, along with the possibility of much weaker clay soil below the target depth created concern for the owner about increased construction costs.

New FEMA regulations governing coastal building mandate that foundation piers must provide compression capacity and must resist tension forces from tidal surges.

The local building code stated that first floor elevation must be a minimum eight feet above the mean high tide mark.

The engineering design for the helical screw pile that would support the design load is an ECP TAF-350-84 12-12-14 Torque Anchor. This configuration consists of a 3-1/2 inch diameter structural steel tubular pile shaft with two 12 inch diameter helical flights and one 14 inch diameter helical flight attached to the shaft.



This drawing shows the tubular pile configuration for the 190 ***ECP Torque Anchor***™ helical screw pile that were installed.

Products used:
Lead:
TAF-350-120 12-12-14
Extensions:
TAE-350-84/120
Pile Cap:
TAB-350T 8-8

Earth Contact Products, LLC

ECP Helical Torque Anchors™

"Designed and Engineered to Perform"

During the installation of the helical piles, some placements did not achieve the required installation shaft torsion to meet the design capacity. An installation log was made at each placement. These logs were reviewed by the structural engineer of record. Each of the deficient placement locations was carefully checked against the specific calculated design load at the particular location.

Most of the placements with lower than expected terminal shaft torque provided sufficient capacity plus a suitable factor of safety to be accepted by the engineer. After the complete engineering review of the installation logs, only a few locations needed a supplemental pile for additional support.

The project was completed on time and all 190 helical screw pile placements were approved by the engineer and the regulatory agencies.

The photo above shows *ECP Torque Anchor*™ product on the job site. Above one can see the lead sections with the 12"-12"-14" diameter plates at the center of the photo. Extension sections are at the bottom of the photo. Extensions are used to achieve the specified depth requirement.

Similarly, the lead sections are seen at the left center and extensions at the bottom of the photo.

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