

Post Office Expansion Supported on Helical Torque Anchor™ Piles

Denver, Colorado

Pile Installation



Gray Construction was awarded the contract to construct the 162,000 square foot U.S. Post Office expansion project in Denver. Park Range Construction was selected as the certified installer of helical screw piles supplied by Earth Contact Products. The helical piles were arranged in clusters of three or four piles at each of the 91 concrete pile caps. The column loads on the pile caps ranged from 130,000 pounds to 174,000 pounds. Park Range Construction used three teams to install the helical piles to the plans and specifications. The job proved to be challenging due to difficulty drilling through the dense soil conditions near the surface to reach the claystone bedrock at 45 to 50 feet.

Project Summary	
Project:	U.S. Post Office Expansion, Denver, Colorado
Pile Design Engineer:	CTL Thompson, Inc. Denver, CO
Geotechnical Engineer:	Ground Engineering, Inc. Denver, CO
Installing Contractor:	Park Range Construction, Inc. 2755 South Raritan St, Englewood, Colorado (www.parkrangeconstruction.com)
Products Installed:	1-3/4" Sq. Bar with 8" & 10" Diameter Helical Plates 1-3/4" Sq. Bar with 10" & 12" Diameter Helical Plates
Number of Placements:	285
Depth to Bearing:	45 to 50 ft
Ultimate Capacity:	87,000 lb
Average Working Load:	43,500 lb
Factor of Safety:	2.0 : 1 Ultimate To Working Load

The ECP Model TAF-175 Torque Anchor™ solid square shaft helical pile was installed at each placement to a required minimum depth of 45 feet below grade. The pile configurations varied due to soil borings encountering very dense soils at 10 to 15 feet deep on a portion of the site.

Load Testing



Pile Cap Construction



At these placement locations, a smaller plate configuration was used to allow the pile to reach the target depth before experiencing excessive shaft torsion. The installation shaft torsion 8,700 foot-pounds was needed to provide a service load of 43,500 pounds with a factor of safety of 2.0.

As part of the verification process, two static load tests were performed prior to installing the piles and two load tests were made during production. These tests were directed and supervised by CTL Thompson Engineering and monitored by the USPS inspector. The test procedure was conducted in close conformance with ASTM D-1143. All of the load tests were successful.

This challenging project was completed in six weeks despite the difficulty in drilling through the very dense soil that was encountered from 10 to 15 feet below grade. The project ran smoothly and was completed on time and within budget.

Construction of the Post Office Addition



ECP Torque Anchors™
Earth Contact Products, LLC.

"Designed and Engineered to Perform"