

# Bay Area UNDERPINNING

## Winery Renovation and Improvements Supported with Helical Torque Anchors

St. Helena, California

Renovation and improvements to the winery visitor center included construction of 12 foot tall basements at two locations within the existing winery building. The excavations for the basements were 18 feet below grade. One basement is now used for a new kitchen, dry storage, stairway and elevator. The other basement was constructed for a new vestibule, winery library, stairway and elevator.

There were three soil borings ranging from 12-1/2 to 50-1/2 feet below grade. The results of the soil investigation revealed artificial fill consisting of gravels, low plasticity



Project Summary	
Project:	California Winery Renovations
Engineer:	PJC & Associates, Inc, Rohnert Park, CA Engineers - Geologists
Installing Contractor:	Bay Area Underpinning, Inc. Fairfield, CA <a href="http://www.bayareaunderpinning.com">www.bayareaunderpinning.com</a>
Products Installed:	4-1/2" Dia. x 0.337" Wall Tubular Shaft Piles with 10' & 12" Diameter 1/2" Helical Plates
Number of Placements:	45
Depth to Bearing:	29 to 32 ft (Below Grade)
Pile Depth Below Basement:	11 to 14 ft
Design Ultimate Capacity:	84,000 lb
Average Working Load:	30,000 lb - uplift
Average Test Load:	75,000 lb - uplift
Factor of Safety:	2.5 : 1 Test to Working Load

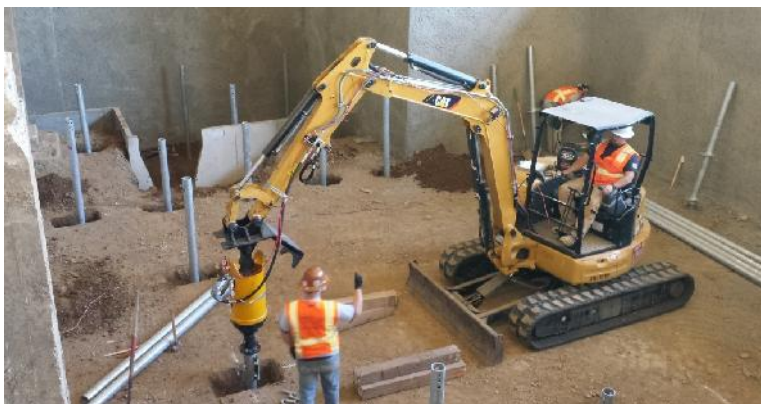
sandy clays and fine to coarse grained clayey sands with moderate compaction overlaying alluvial soil deposits that were from moist to saturated and loose to dense. Ground water was encountered in one borehole at 21 feet. Perched water is common in the area within a few feet of the ground surface.

The engineers had concern about uplift of the new basement floors due to soil heave from the fluctuating ground water. Helical piles offer a big advantage over other methods in that they support compression loads and they prevent uplifting due to soil expansion.

Bay Area Underpinning, Inc, a certified installer of Torque Anchor™ brand helical screw piles manufactured by Earth Contact Products, was selected to install the new foundation supports for this project.

recommendations. ECP anticipated terminating the piles into the medium dense to dense clayey sand encountered from 20 to 25 feet below grade.

The designers at ECP provided the helical pile design for the project following PJC & Associates, Inc.





The helical pile installation was accomplished using a Pro-Dig X20K hydraulic torque motor attached to a mini-excavator. Shaft torsion was used to estimate pile capacity during installation and later pile capacity was verified by load testing.

The lead pile section consisted of a seven foot long shaft that measured 4-1/2 inches diameter with a 10 inch and a 12 inch helical plate attached. Helical plate thickness was specified at one-half inch. The lead section was followed by an extension section to achieve the installation depth below basement grade plus sufficient shaft height to embed the pile caps into the new concrete beams.



There were two tension load tests performed, one in each basement. The tests were performed to ASTM D1143 standards along with procedures recommended by ECP. The entire testing process was supervised by a JPC Engineering inspector.

The test apparatus had to be accurately assembled and the instruments for measuring the force applied to the pile and the resulting deflection had to be calibrated and certified.

The results from the two tension load tests provided JPC engineering with proof that the ECP Torque Anchors™ performed better than anticipated. There was only slight movement of the piles when the final incremental load of 75,000 pounds was applied to the test pile.

The project was a huge success. Both the customer and engineer were pleased with Bay Area Underpinning's installation and with the performance of ECP Torque Anchor™ brand of helical piles.



*“Designed and Engineered to Perform”*