



UC Berkeley Geosystems Engineering Wednesday Lecture Series

Wednesday, 12 March 2025

1:10-2:00 PM

Lecture Room: 406 Davis

YouTube Headquarters - San Bruno, CA

Pedro Espinosa

ENGEO

1450 Bayhill Drive is the location of one of YouTube's (Google's) planned office structures, also known as "Building 3". The Building 3 structure is located behind YouTube's existing headquarters and is up to four above-grade stories in height with below-grade parking facilities extending 70 feet below grade. The building footprint is approximately 550 feet long and 125 feet wide. Just to the east of the building footprint is the San Francisco Public Utility Commission (SFPUC) easement within which the two water transmission lines that serve San Mateo County and the City of San Francisco. These water lines are 60- and 66-inches in diameter and as close as 30 feet to the building footprint. Immediately to the west of the building footprint, and rising above the excavation, is a Caltrans embankment supporting the I-280/I-380 interchange. Due to proximity to existing improvements, the parking garage required a large temporary shoring system. An internally braced system was originally contemplated due to the SFPUC and Caltrans constraints.

The selected shoring system was a combination of soil nails with upper cantilever along the east and south sides of the excavation and tiebacks and soldier piles along the west and north sides. During the excavation, ENGEO observed and tested up to 5 rows of tie-backs and 12 rows of soil nails. ENGEO also developed and oversaw a robust and near-real-time monitoring program in conjunction with 2D finite-element modeling (FEM) and calibration to predict future movements of the structure and SFPUC pipelines. Construction of the final basement required erection of two tower cranes between the east shoring wall and the SFPUC pipelines. ENGEO performed additional FEM analysis to understand loading and deformation of the shoring wall and SFPUC pipes based on a micropile foundation solution, provided construction and final design recommendations, created a logistics plan, and observed construction and testing of the micropiles.

Ultimately, Google saved \$1.5M by moving from an internally braced system to a tieback and soil-nail system. The Caltrans embankment and the SFPUC pipelines remained fully operational throughout construction. Construction is now complete.

