



Century Village at Cabrillo, Phase V

Long Beach, California

Over 1,300 Geopier Impact® elements were installed in 29 days to mitigate potential liquefaction settlement

Description: This phase of the project included the construction of a four-story apartment complex and parking structure to provide homeless veterans and non-veterans with transitional housing. The new structures are supported on a mat foundation with an applied bearing pressure of 750 psf. Large predicted liquefaction settlements due to the design earthquake are the primary geotechnical design concern.

Subsurface Conditions: Soil conditions consisted of 10 feet of loose silty sand and medium stiff sandy silt over discontinuous, interbedded layers of loose silty sand, medium stiff sandy silt, and soft to medium stiff lean to fat clay to depths of about 30 feet, underlain by older marine sand and silt deposits. The historic high groundwater level was established at 7 feet below grade.

Geopier Solution: The design team was concerned about liquefaction of the silty sand and sandy silt in the upper 30 feet during a magnitude 7.2 design earthquake with a peak ground acceleration of 0.64g. The Geopier Impact® Rammed Aggregate Pier® system was selected to mitigate liquefaction total settlements to less than 3 inches and differential settlements to 2 inches over 30 feet.



More than 1,300 Impact elements were installed to depths of 30 feet in only 29 days. An added benefit of the liquefaction mitigation program was reinforcing the soft clay layers and creating a 30-foot thick crust of reinforced soil to provide support for the mat foundation static loads.

PROJECT TEAM

Owner:

Century Villages at Cabrillo

Geotechnical Engineer:

Geotechnologies, Inc.

Structural Engineer:

Castillo Engineers

General Contractor:

Walton Construction

Geopier Installer:

Foundation Services Corp.

Geopier Designer:

Western Ground Improvement