



Encinal High School Stadium Renovations

Alameda Island, California, USA

Keller collaborated with the geotechnical engineer to design a ground improvement solution that addressed seismicity concerns, as required by the California Geological Survey (CGS).



The project

As part of a larger effort to modernize their campuses, the Alameda Unified School District undertook renovations to the athletic fields and the grandstand areas at Encinal High School. After the first round of submittal plan review, the California Geological Survey required the owner to address lateral spreading and liquefaction settlements in areas that may be occupied during a seismic event. The geotechnical engineer consulted with Keller to determine an approach that would minimize impact on the established project schedule and budget.

Located on the shoreline of the San Francisco Bay, the ground conditions consisted primarily of relatively clean sands and intermixed clays. Groundwater was encountered at 5 ft below grade, and liquefiable layers were observed at depths of 20 ft below ground surface elevation or shallower.

Based on ground conditions and schedule restrictions, Keller recommended a mass soil mixing (MSM) buttress wall solution to provide vertical seismic settlement mitigation at the grandstands and lateral spreading mitigation along the shoreline.

The buttress and spreading mitigation consisted of a system of soil-cement panel grids. The panels were created by blending the in situ soil with a cement slurry using specialized tooling mounted to excavators. Keller installed MSM cells along the shoreline south of the sports fields to create a buttress wall and below the proposed grandstands to create a lattice grid. The 143 individual MSM panels were installed to depths of 20 ft below grade without incident and ahead of schedule. This allowed the school to open the baseball field in time for the start of the season.

Project facts

Owner(s)

Alameda Unified School District

Keller business unit(s)

Keller

Main contractor(s)

Robert A Bothman Construction

Engineer(s)

Miller Pacific Engineering Group

Solutions

Ground improvement
Liquefaction mitigation

Markets

Education

Techniques

Mass soil mixing

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