

SC SOLUTIONS

Wharf & Embankment Strengthening Program

Seismic Design & Analysis

Location: Oakland, California

Owner: Port of Oakland

SC Solutions' responsibilities on this project included evaluation of the seismic performance of the existing Port of Oakland Berths 60, 61, 62, and 63. An important effect in the analysis of these facilities is to properly capture the soil structure interaction actions in three-dimensional space. A thorough analytical effort involved considering these important effects, so that the whole system could be designed for the desired performance level under various seismic events.



As part of this project several studies were conducted:

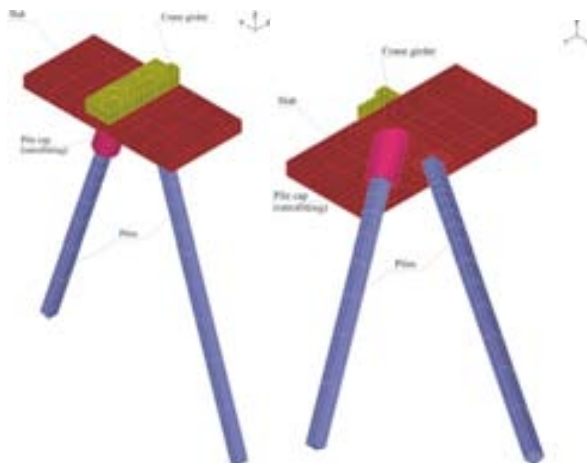
Evaluation of the superstructure to batter pile connection.

Evaluation of the pile group behavior and development of the optimal pile spacing.

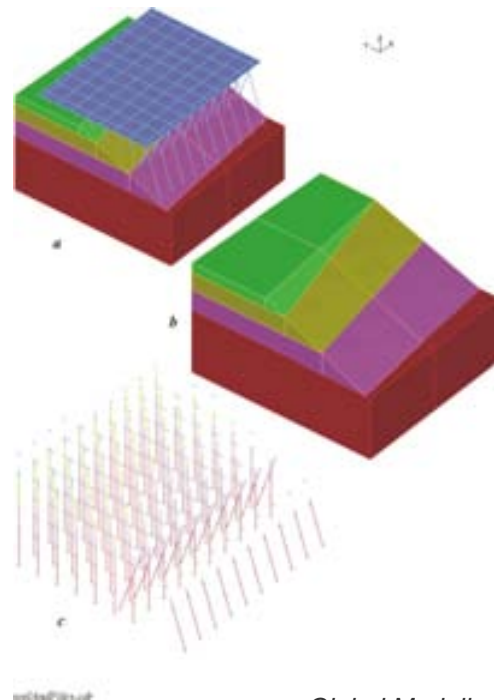
Study of various analysis methodologies and their effects on the construction costs.

Study of the pile lengths and soil property influences on the wharf behavior under seismic loads.

Upon completion of the vulnerability studies several strengthening concepts were developed and analyzed. Cost and performance comparisons were developed to establish the best possible course of action to be undertaken by the Port of Oakland.



Batter Pile to Superstructure Connection Model



Global Modeling Detail