



Sea Cave Support, Clotfelter Residence Santa Cruz, California

Civil and Structural Engineering



Client Reference:

Kurt Clotfelter, Owner
849 Almar Avenue, Suite C-174
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Budget: \$300,000

From start to finish this project was unconventional in nature. Mesiti-Miller Engineering was asked to devise a way of supporting the ceiling of a buried sea cave directly below a prime ocean front home. The owners of the home were concerned about future stability of the sea cave affecting the safety of their home.

The home is at the edge of a sandstone bluff and overlooks Seabright State Beach. The sea cave was a remnant from historic times when the ocean had scoured the base of the bluff. Access to the inside of the cave for visual observation was made impossible by beach sand deposits and rip-rap revetments.

With the help of vintage photographs, the project geologist mapped out the extents of the sea cave. Based on this information, we developed the structural design for a system of reinforced concrete columns and beams to support the dead weight of the thousands of tons of soil above and buttress the face of the failing sandstone bluff.

Alternative solutions by other engineers had been proposed, including filling the sea cave with concrete; however these brute force approaches had proved too expensive. Our elegant design approach was instrumental in keeping construction costs to a minimum and providing an aesthetically pleasing façade satisfactory to the regulatory agencies.