



BRIDGING THE GAP

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MARCH 2024

RETAINING WALL AT WINDERMERE POINT STABILIZED AFTER ATMOSPHERIC RIVER DAMAGE

How would you save a coastal highway from being washed out by heavy winter rain? Caltrans Division of Engineering Services' Geotechnical Services team in conjunction with Bridge Design, Maintenance, and Structures Construction worked to do just that by stabilizing the retaining wall at Windermere Point in Fort Ross along Highway 1.

In January 2023 the soldier pile and ground anchor wall began showing signs of distress, cracking along its waler, and displacing enough to cause the failure of several ground anchors. As atmospheric rivers continued to drench much of California, the wall displacement increased, reaching nearly 4.5 inches between January and February.

The retaining wall, initially constructed in 2014 to handle what appeared to be a shallow slope failure, was constructed with an approximately 125-foot section with no ground anchors. Because of this, sections without the extra ground anchor support became displaced as the previous slope failure was reactivated.

Based on slope inclinometer data, the slope was failing at a depth of 30 to 40 feet, far greater than was previously predicted when the retaining wall was constructed. A large rock knob located directly in front of the retaining wall further exacerbated the problem, pulling the slope outward along with it.

Retaining wall repair work to restore the stabil-

ity of the embankment slope began in March 2023. This was done by installing 9-5/8" Pipe Piles, a secondary concrete waler, and additional 45-foot anchors along the damaged section. In addition, inclined 4" diameter holes were drilled in front of the wall, spaced 2 feet apart to perforate the sliding rock knob and promote separation of the rock mass from the newly stabilized roadway.

Repairs were completed in September 2023, stabilizing the slope, and no additional distress or displacement has been noted. If you're looking to work on exciting projects like this, visit our [Working with DES](#) web page to learn how to join our team.

