

Excerpt from

"Beat the Clock"

By Greg Northcutt

Recreating Natural Vegetation in a Hurry

Some emergency erosion control problems provide more time than others to craft solutions. Still, the speed of responding to an emergency is a relative matter. That was the case for an emergency repair involving the California Department of Parks and Recreation and CALTRANS early last year near Newport Beach in the southern part of the state.

In January 1995 unusually heavy rains, runoff from upstream development and slopes burned bare by earlier wildfires, plus poor stream maintenance combined to create the emergency. The swollen Los Trancos Creek had cut into a fill slope, creating an escarpment about 45 m (150 ft.) long and 23 m (75 ft.) tall. This threatened stability of the Pacific Coast Highway and prompted closure of one of the highway's six traffic lanes. The problem

called for a prompt solution.

At this site the creek flows across Crystal Caves State Park and an area designated as a State Historic District because of the architecture of some three dozen beach cottages dating back to the 1920s. Any method to control streambank erosion had to blend in with the site's history. Consequently, rock rip-rap and standard concrete retaining walls were ruled out.

One alternative involved the use of soil "burritos"-soil enclosed in a wrapping of geotextile fabric-with individual burritos, laid horizontally and stacked vertically, alternating with brush layers. This was rejected because of structural concerns. CALTRANS engineers lacked enough material for brush layers due to wildfires the previous fall.

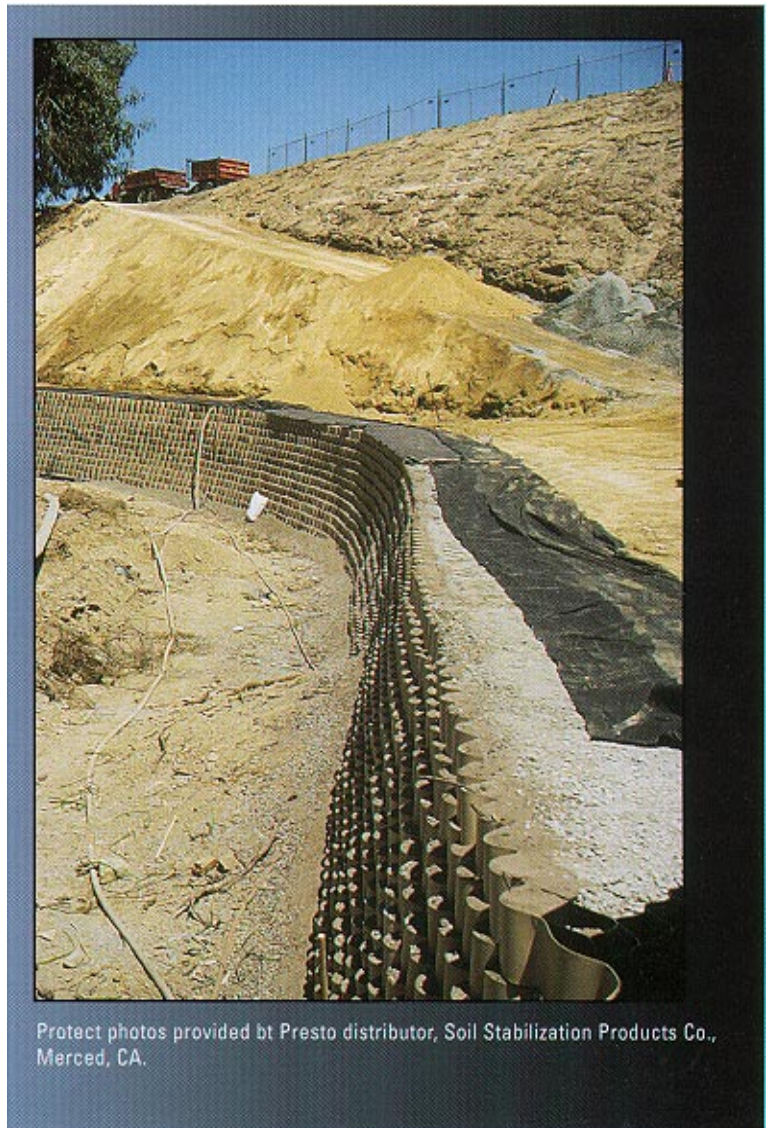


A cellular confinement system stabilizes the lower portion of the slope with straw blankets protecting the upper 1.5:1 slopes.

The solution adopted included a 2.4 m- (8 ft.-) high, vegetated gravity retaining wall constructed with a cellular confinement system. "It allowed us to recreate natural vegetation, keeping with the historical look of the slope, and it provided the needed structural strength," says Steven Musillami of Dangermond and Associates in Sacramento, CA. At the time Musillami was a landscape architect with the California Department of Parks and Recreation.

The retaining wall was built with Presto Products' Geoweb, a honeycomb-like cellular structure, 20 cm (8 in.) tall. The cells of a cellular confinement system can be filled with various granular materials to produce a uniform structural mass that resists lateral pressures and maintains structural integrity through high frictional forces between layers. One layer of the cellular system is laid atop another to form either a vertical or stepped face. In this case the width of each layer, front to back, varied from about 1.2 to 3 m (4 to 10 ft.). All cells except for the outer row were filled with drainage rock. The outer row of each tan-colored layer of cells was left exposed, filled with soil, and seeded with a native mixture.

From the top of the wall to the highway, straw wattles were placed horizontally, on the contour, about 5.5 m (18 ft.) apart on the 1.5:1 (H:V) slope to slow runoff and minimize any erosion. The slope was then seeded by hand with a native coastal sagebrush-scrub mix, the same used with the retaining wall. After seeding, the slopes and the straw wattles were protected with straw erosion control blankets. "The design and project construction wasn't that difficult," says Musillami. "The hard part was coordinating work with all the government agencies involved." The construction project was completed in August about seven months after the slope washed away "For this type of project that was a very, very short time frame," Musillami says. EC



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