



Bridging the Gap

Your Connection to Engineering Services

August 2024

Scaling California's Mountain Ranges

What does it take to join the climbing team that keeps California's highways safe from rockfall?

California has one of the country's most diverse geologic terrain. Due to this, the Golden State's hills and mountain ranges have the potential for rockfall. With many of our highways being along this landscape, it's important to ensure the safety of the roadway and motoring public against the natural process in which rocks or boulders break away from a slope or cliff face and fall to the ground below. Various factors can cause rockfall including weathering, erosion, seismic activity, and human activity.

In the 1980s, the Caltrans Division of Engineering Services recognized Geotechnical Design needed a program to deal with rocks and slope design within the State. During this same time, San Luis Obispo's Maintenance team developed a maintenance scaling program along the Big Sur Coast. The Caltrans Rock Climbing and Scaling program was formed with the collaboration of these two departments. This program is a handpicked, volunteer program, that follows the guidelines of the Rock Scaling Code of Safe Operating Practices. Every office within Caltrans is represented in this program, including Maintenance workers, Geotechnical Design, Construction and Maintenance Engineers, and Engineering Geologists.

To be a climber, each candidate needs to pass:

- Rock Climbing and Scaling (Basic) course. This course teaches the basics of Caltrans' Climbing, including how to use climbing gear, rope, and knots.
- Rock Climbing and Scaling (Refresher) course. This course adds aerial rescue techniques to the curriculum.

Climbers' responsibilities include scaling rocks, conducting geotechnical investigations, inspecting culverts, blasting to prevent avalanches, and stabilizing slopes. Not to mention installing and inspecting rockfall prevention systems, as well.

A project that Geotechnical Design recently completed was a slope on San Bernardino State Route 18 that had very active rockfall.



The climbing team planned a job to blast the brow of the slope, eliminating an overhang, and then scale the remaining loose rock. The amount of rock removed during this job was approximately 15,000 yards.

Another project at "Perched Rock" on Ventura State Route 33 involved one of the biggest boulders brought down in Los Angeles. Maintenance Drone pilots identified this boulder sitting at least 200 feet above the highway. Maintenance and Geotechnical Design crews hiked above the boulder and rappelled down to it, then placed airbags to encourage the boulder to roll downhill. On larger rocks, rubberized or Kevlar airbags are placed between rock joints or cracks and inflated with compressed air to dislodge unstable rocks. The crew was successful in getting it down to the highway. Believe it or not, the 20-foot-long by 12-foot-wide by nine-foot-high boulder landed in the travel lane and stayed intact! After this, Maintenance Blasters reduced the boulder via a power tool, Boulder Buster, and were able to remove it from the highway. Do you think you have what it takes to join our rock-climbing team? Visit [Working with the Division of Engineering Services](#) for more information.

