

Landslide In San Rafael Endangered Homes

The Challenge

A large slide was endangering several homes on a steep slope in San Rafael. The slide plane ran at a depth of up to 30 ft. below the surface and the scarp measured over 200 ft. wide x 300 ft. in length.



Working our way up the hill, excavating a bench into competent material

Action: The repair called for removal of the slide material, benching into competent bedrock and re-installation of the slide material in compacted lifts.



Excavating out unstable soils



Spreading out slide material in 8" lifts

A series of sub-surface drains were placed at the back of the benches.



Wrapping a sub-drain at the back of a bench, in filter fabric

Surface improvements were also installed, including concrete V-ditches and drop inlets to channel rain-water away from the slope. Finally, re-vegetation with perennial rye-grass was installed along with surface erosion protection using jute netting, allowing the grasses to take hold.



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Drain pipe and sub-drain installation,
with sheep-foot compactor in foreground



Endangered structure at top of landslide.



Compacting slide material with sheep-foot roller.
Top of sub-drain gravel showing.



Sitting on compacted bench



Finished slide repair. Hillside re-seeded
and erosion protection matting installed.



Results: This neighborhood is now safe, with the full value of the properties restored. The slide repair has been through many heavy winters with no sign of any further movement or distress.