



Cachuma Resource Conservation District

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Introduction

On Monday, July 6, 2009, I toured your Franklin Ranch Road property along with your engineer, Mike Simmons.

The purpose of my visit was to review the circumstances leading to a series of systematic failures of the drainage and erosion control system during the storm events of late January, 2008. I reviewed the photos, which showed two problem areas:

Problem being addressed

Problem 1: A blockage of drain inlet (I-3C) which caused an erosion channel down slope and to the east, undercutting the east property rock lined channel.

Problem 2: Sediment deposition in the north and east property line bio basins, along with sediment and rock from upslope properties flowing down the access road to the east.

Cause

First it is recognized that the subject rain events were very significant storms. As recorded in automated rain gauges at the Goleta Fire Station (less than 4 miles from your property), 4.73 inches of rain fell during the late evening hours of January 23 and early morning hours of January 24. This is roughly equivalent to a 10-year storm. Then four days later, the late evening hours of January 27 and early morning hours of January 28, brought another 2.85 inches to a saturated watershed. This is roughly equivalent to a 2-year storm. While it is true that these storms were well within the design range of the system under construction, the timing of the storms was unfortunate.

The temporary ditch that was installed in place of P-1 was not large enough to handle the amount of water generated by these storms. The excess runoff was directed to the Problem 1 area in a legitimate attempt to prevent erosion damage.

Subsequently, the lack of vegetative cover above the Salentine property (to the west) along with the high runoff volume, overpowered the temporary ditch along the access road and deposited sediment and rock in the Problem 2 area.

The lack of healthy vegetative cover on the north facing slope, simply exacerbated the situation by reducing the ability of the soil to absorb the rain and to resist erosion.

During the haste of activity while attempting to prepare as much as possible for these storms, the protective cover (remnant of chain link fence) was left over the pipe inlet at I-3C. The drain inlet became blocked and

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was quickly overtopped, resulting in the concentrated water flow down slope and to the east, cutting an erosion channel.

Lastly, the east rock-lined channel along this slope was slightly above grade, resulting in the undercutting of this rock-lined channel, instead of the capturing of the water flow.

Corrective Action to Date:

The course of action initiated by you and Mike Simmons are good first steps to proactively rectify the problem. These actions include:

- The removal of the chain link trash gates. As Mike noted these are fine for protecting the drains during summer construction but have been removed during the winter rain months.
- The vegetation has greatly improved since the 2008-2009 rain season.
- The erosion damage has been repaired.
- A larger temporary drainage ditch in lieu of P-1 has been constructed for the 2009 winter rains and the access road has been graded above Problem area 1 to insure that up property run-off will follow the P-1 path and not affect Problem area 1.
- The east slope rock-lined channel has been reconstructed and the area has been graded to insure that it is below grade.

Analysis of the design/construction

All of the newly constructed improvements down slope of P-1 have been constructed with care and professionalism. Specifically, the erosion control blankets that were installed performed very well and greatly reduced sheet erosion.

It is clear that the rock work has been done with pride. Even though the rock-lined channel along the easterly property boundary had an extra 3 acres of drainage because P-1 had not yet been installed, it would have operated properly and without problems if the water had been able to get into it. *In its current state, the rock channel will provide for adequate passive drainage flow should a similar drain inlet failure, however unlikely, occur in the future.*

I understand the sequence of installing P-1 was hindered by the on-going hillside stability project and grading. Unfortunately, down slope improvements were built first, so that the runoff that should be diverted by P-1, instead passed right by the perimeter location of P-1 to the lower diversions, channels and pipes. This is a challenge when trying to capture and divert water from its natural drainage path.

The area below P-1 was not designed to take the full 5.5 acre watershed. Instead they were designed to take a much smaller volume of runoff from the much smaller incremental drainages (seven smaller drainage areas, all 0.75 acres or smaller).

When construction is complete, I am confident that it will perform trouble-free for years, with minimal maintenance.

Recommendations

Complete the design by implementation of P-1 prior to the 2009/2010 rain season. If this can not be done, improvements should be made to the temporary ditch constructed to replace P-1. If this is the case, we will provide recommendations for the improvements to the temporary drainage ditch.

Trash racks should be built and installed as specified. If not complete before the rains, simply drive pieces of ½ inch steel pipe into the ground at 6-inch spacing across the width of the flowline, at a distance of 5-feet upstream of each inlet. These pipes should be firmly planted and extend 6-inches above grade. If a pipe inlet collects flow from 2 directions, this arrangement should be completed in each direction of flow.

The newly constructed rock-lined channel along the route of P-4 was not included in the plan and is not considered necessary because the slope is quite flat and the drainage area is very small. A rock-lined channel with this slope will not maintain adequate velocity to keep sediment in suspension, resulting in the channel having problems collecting sediment. It is likely that this will be an on-going maintenance problem, depending somewhat on the quality and density of groundcover on the slope above. If the groundcover is exceptionally dense, as in sod, there will be very minimal volume of sediment generated, even with heavy rain. In any case, the channel was full of sediment on the day of my visit and needs to be cleaned out to be functional.

All rock-lined channels need to be walked and carefully inspected to ensure that top of rock at the top of the side slope is installed flush with grade. This will ensure that sheet runoff flows into the ditch as intended.

Water Bars should be installed to direct runoff into the rock-lined channels along steep sections of field roads and access roads.

Some areas will need a second seeding of erosion control grasses to ensure a healthy, vigorous groundcover as the rainy season progresses. Irrigation water managed closely to prevent runoff would be very helpful in improving this groundcover.

Conclusion

In spite of the problems encountered, I have a very high degree of confidence in the drainage and erosion control plan provided to you in July 2007 by the CRCDC and Mike Simmons. I have reviewed the design and stand by it as sound in concept and presentation. Further, I have revisited the hydrology study, and the design hydraulics to ensure compliance with the current standard hydraulic engineering principles and practices. It is my considered opinion that the design meets or exceeds these principles and practices.

The objective of the plan is to achieve reliable and predictable performance of the drainage and erosion control system so that you and neighbors will be able to relax with confidence in the event of pounding rain. You are well on the way to achieving this level of protection. Please do not hesitate to call if you have any construction questions or if I may be of further assistance in any way.

Sincerely,


DALE A. GROPP, CPESC 2155
Civil Engineering Technician