

Angeles National Forest

Washouts and Roads

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Acknowledgements

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I would like to thank Ricardo Lopez, Vivian "Andy" Ramsey, and Mony Sea for their help on this immediate project, without their help I would not have been able to finish this project in time. Thank you to everyone in the Engineering Department for their guidance and support throughout this internship that made it memorable.

Executive Summary

This project of analyzing roads and watersheds was brought on to me through the Angeles National Forest due to the heavy rain season that happened in 2017 and this past winter season in 2018. Very secluded roads were heavily damaged due to washouts and are needed to be taken care of due urgently.

The road I was working on in particular had been washed out in 2017 and had become worse over the new rain season in 2018. A contract was sent out to contractors before reassessing damage done in 2018, now the work looks more extensive and expensive.

In my project, I intended to resurvey the topography of the damage and create new estimates of cost and fill for the bidding contractors. Aside from this I was also looking for

potential damaged watersheds nearby the roadside damage in case the road needed to be treated with more urgency and try to resuscitate the habitat that had been left damaged for two years.

My end result is a more accurate estimate of the changes that had happened in the road between the two years since the first topography graph.

Project Objectives

There are at least 600 miles of road in the Angeles National Forest. Naturally, the roads are exposed to the elements and are at risk during extreme weather events. In Lake Hughes, CA the forest service road 7N23 has been impacted by the weather and has severe damage that needs to be repaired as soon as possible.

The washout I looked at was not the only one on that road and it definitely was not the biggest. The original intentions of this project was to create topography maps of each washout on the road and create estimates incase funding came in to rebuild the road.

Due to time and funding efforts, the rest of the road will go left uncontracted and be fixed as best as possible by the ANF Roads Crew. I was only able to work on the road that was being put out for bidding because the new topography map would give a better cost estimate to the ANF Engineer.

As a Civil Engineer on the National Forest there is plenty variety to keep on, I enjoyed this the most about the Forest Service. Being on the Angeles National Forest was especially exciting because there are 3 million people in the county of Los Angeles who look to the Angeles Forest for recreation purposes and is hardly ever without something new and exciting.

Project Approach

Fortunately, I was able to see many different road washouts while working on the Angeles to notice how they impacted their surrounding areas. My only project change was how in depth I would be able to go looking into the road 7N23 and taking topography points for washouts that were not priority.

In order to complete this project with some success I needed to become familiar with the machines I would be using. I was able to use a Trimble S7 along with a Trimble TSC3 to collect data points for my topography map on AutoCAD Civil 3D.

Project Outcomes

The topography for 7N23 was completed but it not the most accurate topography. My partner and I were having trouble taking points that would register to the Trimble due to the size of the washout. The deepest part of the washout was around 11 feet and was unreadable from two different angles we made our control points from. Aside from this, getting points along the side of the washout and getting near to it became dangerous after sliding frequently and unexpectedly due to the soft material, lack of water, and compromised area.

If anything could be done differently, I would have made an effort to get more points in the lower part of the washout and moved a control point to the bottom of the washout to see if we could possibly get a reading from the lowest point. I would have also tried to move more brush or a least cut some down to get clear reading without compromising our safety or the soil.

Throughout this internship I learned that if you do not know the history of sites before they are being worked on, you are at a severe disadvantage.

Conclusions

I enjoyed learning about washouts in the Angeles National Forest. I would recommend that future students would look into how the washouts affect, if it does, watersheds. These locations are remote and usually do not affect any immediate bodies of water but it would be interesting to look into any habitat change.

This internship with the Forest Service excited me about the federal system for a career. I enjoyed seeing a part of engineering that is generally unique to the area of Los Angeles. I hope to come back to the Angeles as a Civil Engineer later in life or see another forest in California.

Appendices



My partner for the day, Mony, holding the prism for readings.





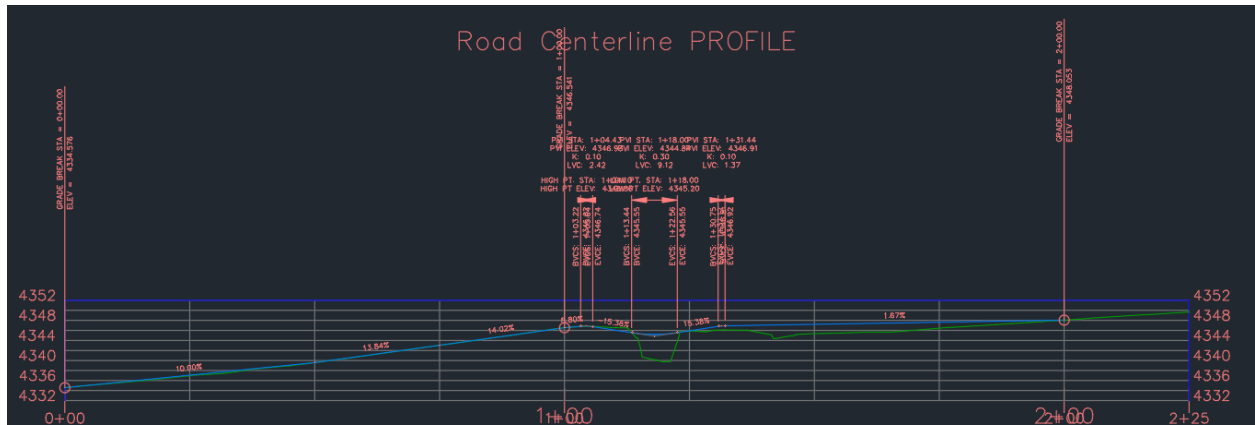
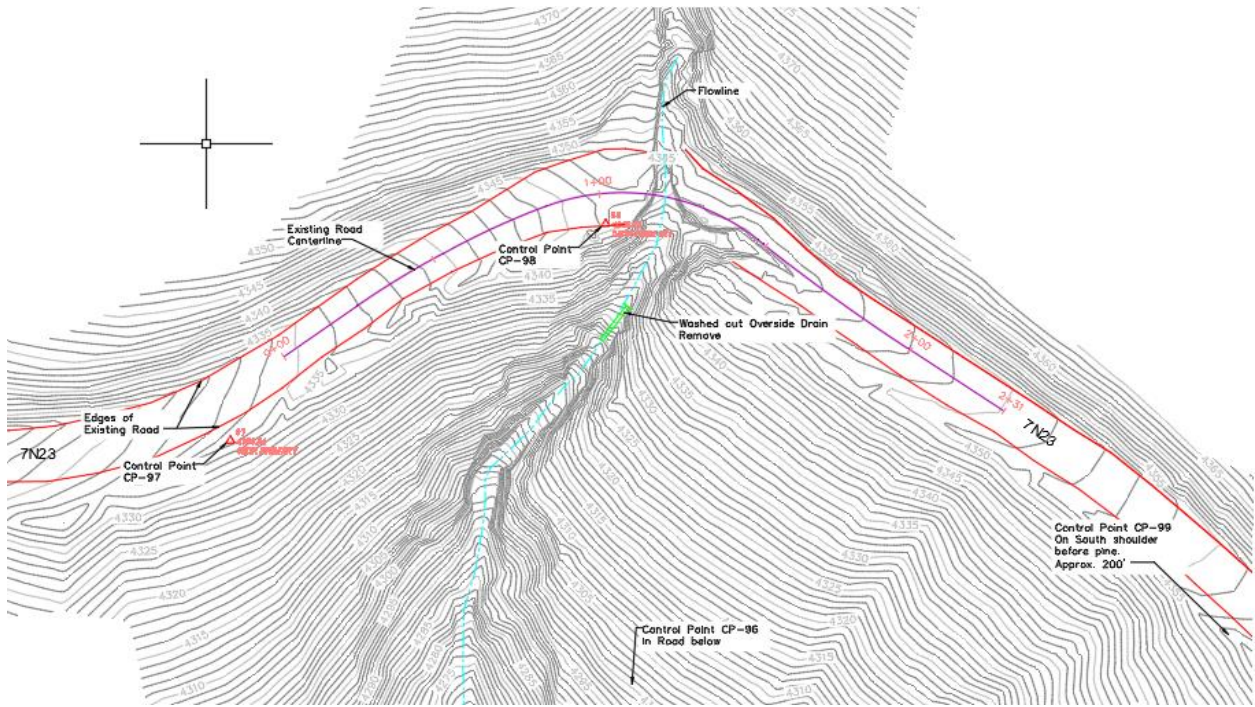
Washout damage as of July 2019.



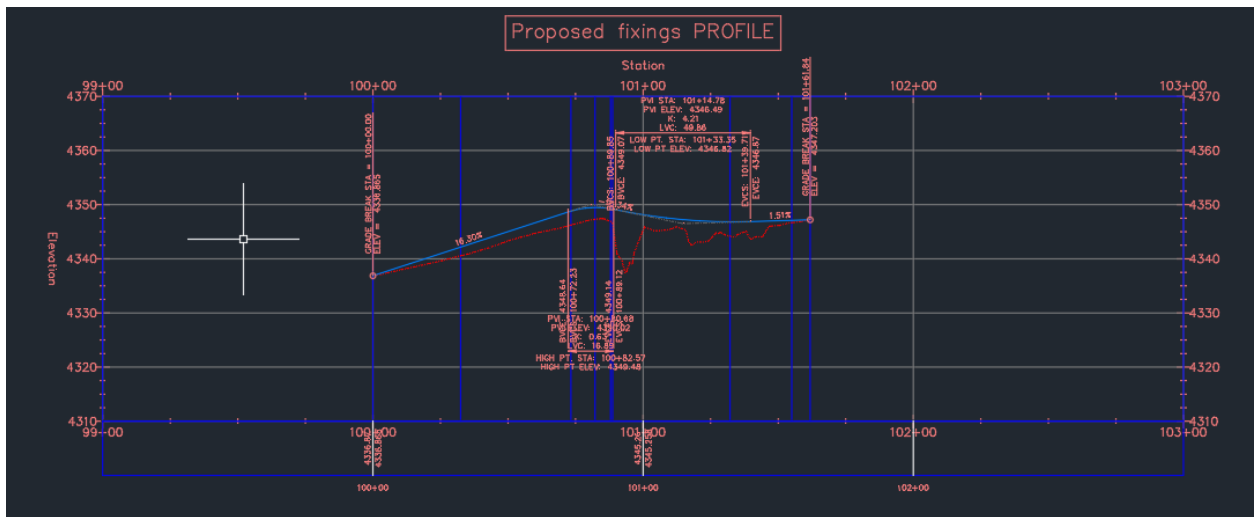
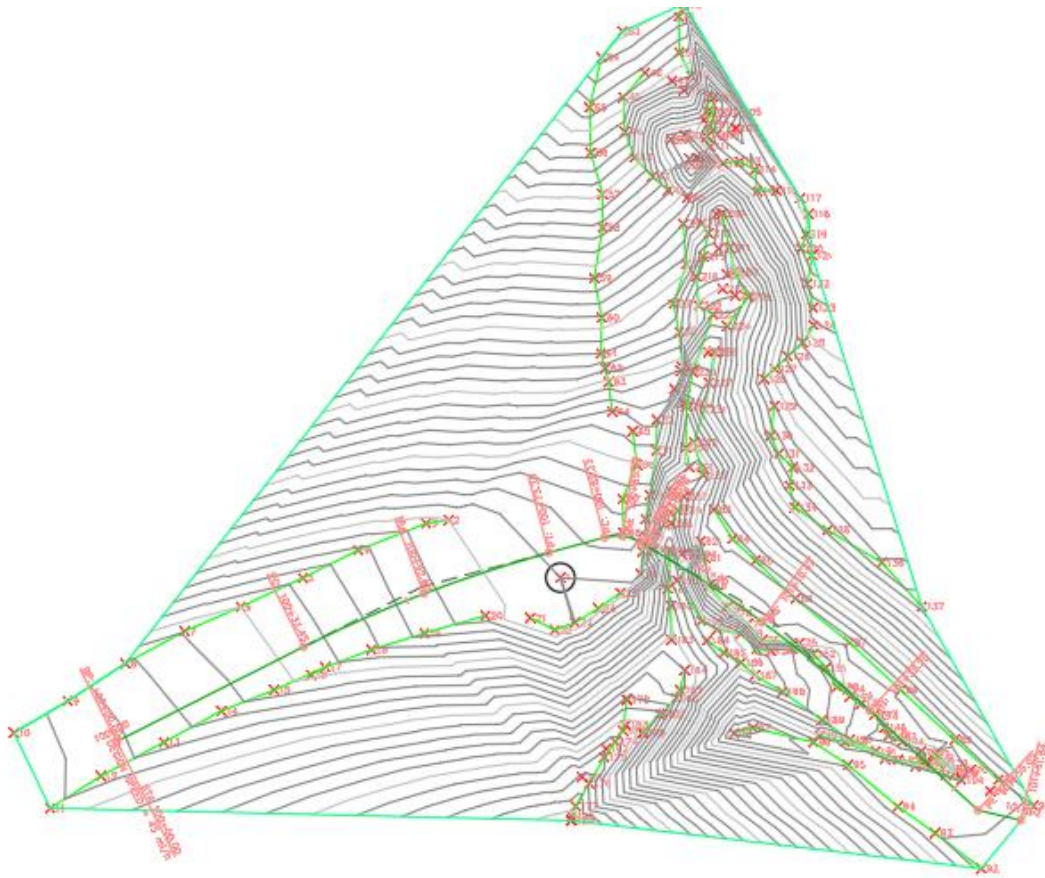
7N23 April 2017

7N23 April 2018

Photo Credits: Google Earth Pro



Original Topography and Road Centerline Profile



My Topography and Road Centerline Profile.