

CEEn-2018 CPST-011

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Lovers Lane Hillside Stabilization

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Project Description

The South Jordan Canal in Northern Utah runs from Bluffdale to Kearns. A portion of this canal runs through the city of Riverton. The section that runs through Riverton is adjacent to a hillside and Lovers Lane. Due to multiple factors, the hill adjacent to the South Jordan Canal and Lovers Lane has become unstable. This hillside is also in the area of some existing residential homes, and prevents Riverton City from allowing future development in the area. This hill has an old horizontal drainage system existing within the hillside already. For this project, students were to analyze and recommend a solution to lower the amount of groundwater and stabilize the hillside next to Lovers Lane in Riverton. To make a final recommendation, students were to perform an analysis of several options for the hill. Then, make a final recommendation to the City based on a criteria of safety, cost, benefits, feasibility, and longevity of each option.

Analysis

Three major solutions were proposed and analyzed for the hillside. Each solution was required to reduce the amount of groundwater in the hill to increase stability. The final recommendation was to also provide maximum safety and return on investment, for the City.

The three solutions considered included:

1. Lining the Irrigation Canal with a barrier to prevent further seepage from the Canal into the hill.
2. Connecting the existing drainage system to a existing abandoned sewer pipe and route the ground water out of the area.
3. Installing a new drainage system in the hill which more effectively removes and routes the drainage of the groundwater out of the area.

For each option a cost-benefit analysis was performed and compared.

Conclusion

A major cause of the instability in the hillside is due the seepage that comes from the canal. Another major source of water is the aquifer in the area. To help eliminate the first major source of water in the hill, it is recommended that the City work with the canal company to line the canal in the area adjacent to Lovers Lane.

It is a recommend the City consider lining the canal with a geosynthetic composite, such as the Huesker Canal³ liner. This will greatly reduce the amount of water in the hill, increasing the stability of the hillside significantly. Furthermore, it is recommend to install 3 wireless piezometer measuring stations in the hillside to evaluate the effects of installing the liner to the hillside.

After at least a year of installing the liner, the hillside should be reinspected and additional mitigation may be considered, as necessary.

