



Managing Stormwater Quality

Kyle Jenkins, Duncan Szpara, Daniel Zirtzman
Civil Engineering Department
The University of Iowa
December 2021



Site Location and Proposed Features

Our group was tasked by Camp Courageous to design devices that would lower soil erosion, improve the water quality, increase habitat growth, and serve as a showcase for land and water stewardship. Our designs for Camp Courageous are to be implemented with minimal impact to the area.

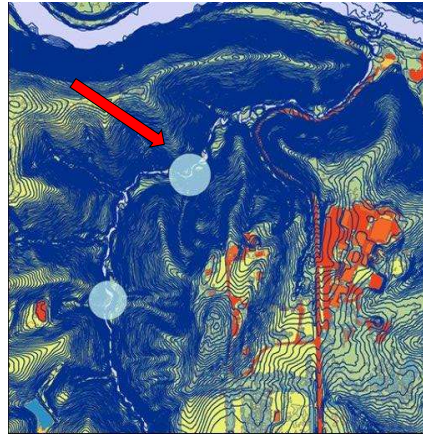


Fig. 1: Proposed Storm Water Quality Locations

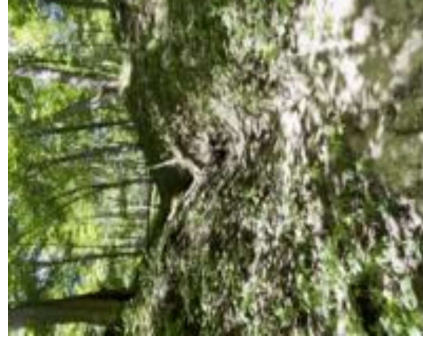


Fig. 2: On-Site Erosion

Dam

A dam was one of the solutions that we designed for the site. This erosion control device will collect water behind the weir and let it flow slowly downstream. Wildlife habitat will be created upstream from the dam, while downstream will benefit from lower velocities and improved water quality. Additionally, we will have temporary storage pools located behind the weir that will allow sediments to settle out when peak flow conditions are not occurring. To compliment the weir, a prefab bridge will be placed on the dam to allow visitors and campers to view storm water features and the riparian habitats up close. This bridge creates a trail link that allows for the trail project team to cross over the creek.

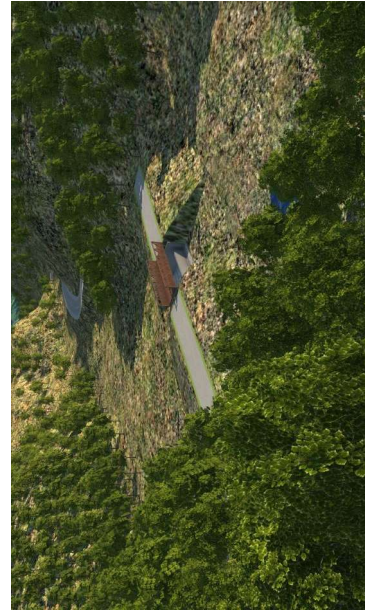


Figure 3: Dam with Prefab Bridge



Figure 4: Dam with Prefab Bridge

Sock Sleeve Slope Stabilizers and Check Dams

To ensure that gully erosion is managed on the property, we designed options for check dams that can slow storm water velocities, reduce slope erosion, and be installed relatively easily with volunteers or with smaller machinery. One check dam design is made of rock while the other is made of wood. In addition to this, we have also provided plans for a sock sleeve slope stabilizer: a device that slows down water and is so easy to implement that volunteers could install them.

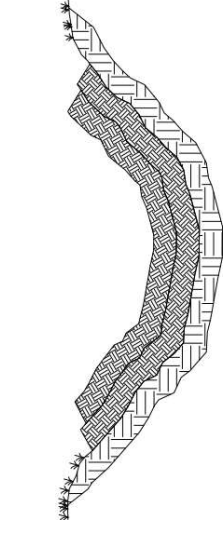


Fig. 5: Sock Sleeves

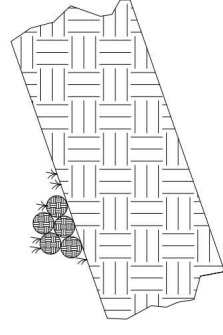


Fig. 6: Sock Sleeves Side Profile

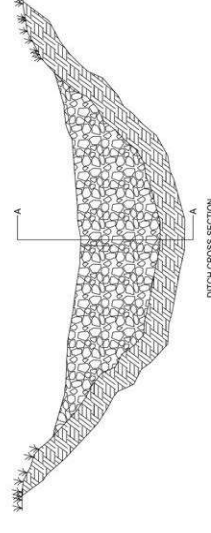


Fig. 7: Rock Check Dam

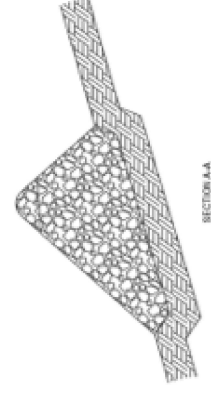


Fig. 8: Rock Check Dam Side Profile

Conclusion

We believe these erosion control features can be implemented throughout the site and will be the best solution for Camp Courageous. The dam will control most of the flow on the main channel. Sediment traps will help settle out pollutants, and the slope stabilizers and check dams will help to limit gully erosion in the small tributaries