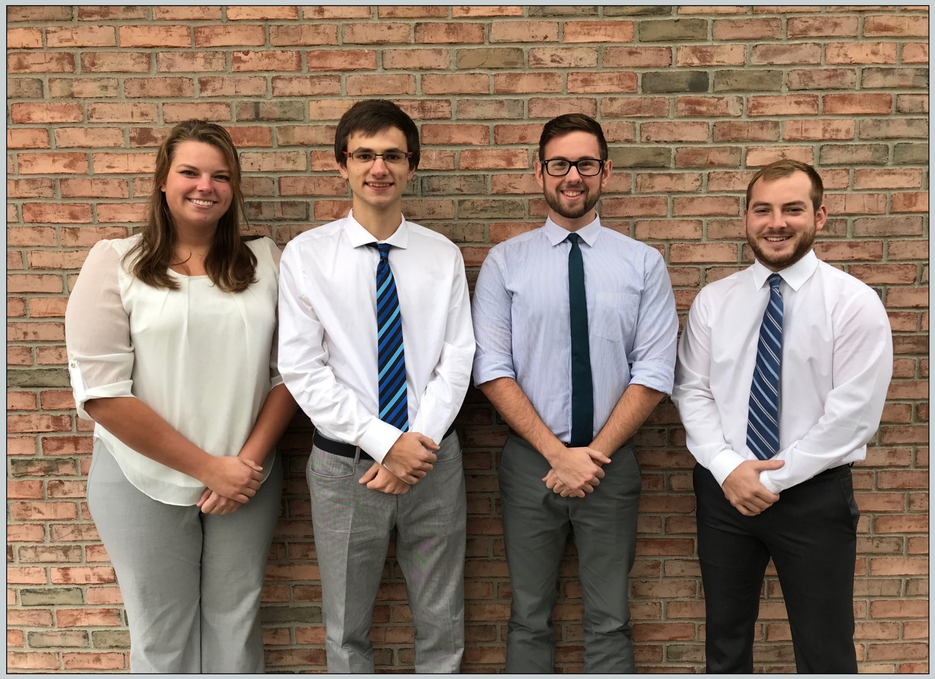
Par-fect Stream

Team 1, Calvin College, Grand Rapids, Michigan

Team 01



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Project Overview

The Indian Creek Watershed – a sub watershed to Plaster Creek – exhibits large flows into Indian Creek during storm events. This is due to the large urbanized drainage area. These large flows peak during storm events causing flooding of Indian Trails Golf Course. Additionally, these large flows cause erosion of the stream banks, which in turn moves sediment downstream altering the channel causing more flooding problems. The Plaster Creek Stewards aims to remove storm water runoff and pollutants from the greater Plaster Creek watershed through a variety of small projects, due to a lack of space in this fully developed watershed. This project acts as a small piece of the puzzle to solve the larger problem.

Goal

Team 01 aims to reduce flooding at Indian Trails Golf Course by creating a series of three rain gardens on the site. These rain gardens will help reduce peak flows and runoff. Additionally, Team 01 will design a plan for stream restoration on the north end of the stream. This stream restoration will help to slow flows in the stream and protect the stream banks against further erosion. The goal is to hold all runoff from the golf course for a 2-year 24-hour storm.

Design

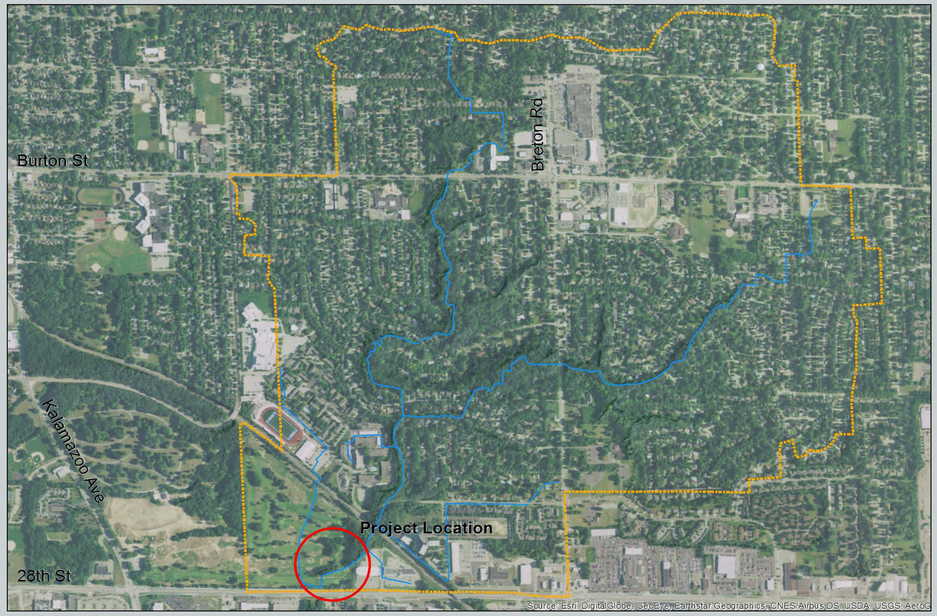
Team 01 has designed three rain gardens with the following sizes:

- North: 7000 CF
- Middle: 17000 CF
- South: 4500 CF

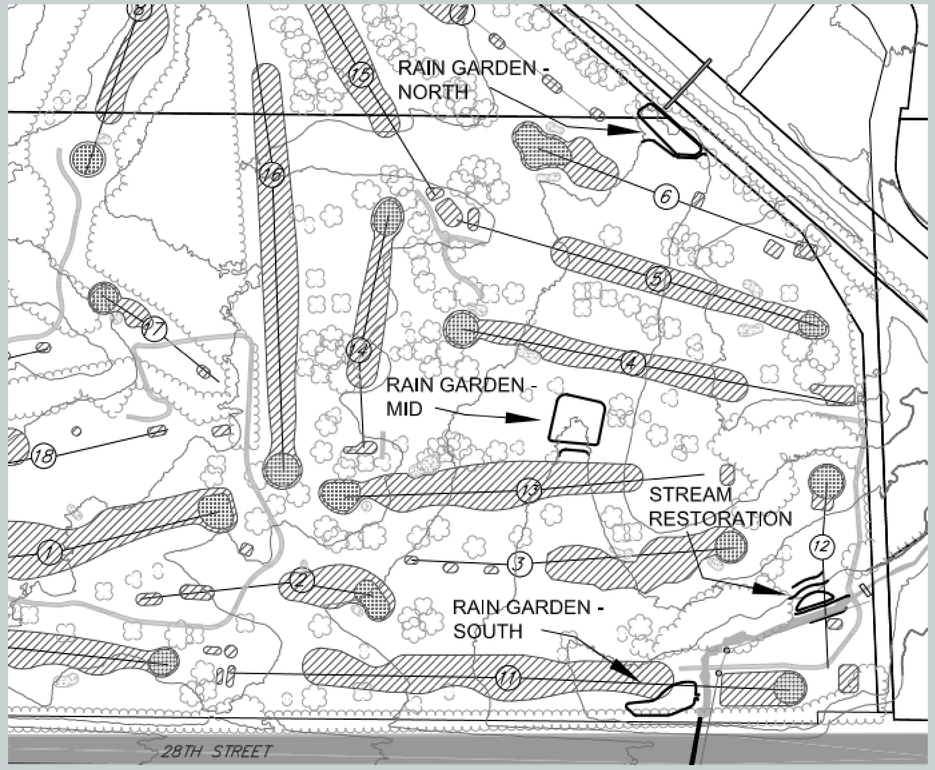
These rain gardens are accompanied by stream restoration which plans to:

- Expand the channel
- Implement a 2-stage Ditch
- Stabilize the channel banks

With these implementations, the team is able to meet the goal of maintaining all runoff from the golf course for a 2-year 24-hour storm event. These designs help reduce flood levels on site by 2.16 inches for this event.



Indian Creek Watershed – The contributing drainage area



Indian Trails Golf Course – Proposed Site Locations

Design Process

Research → Data Collection and Processing → Watershed Modeling ⇄ Stream and Flood Modeling → Plan Drafting

Acknowledgements

Julie Wildschut – Project Engineer – Plaster Creek Stewards