



NICARAGUA BRIDGE

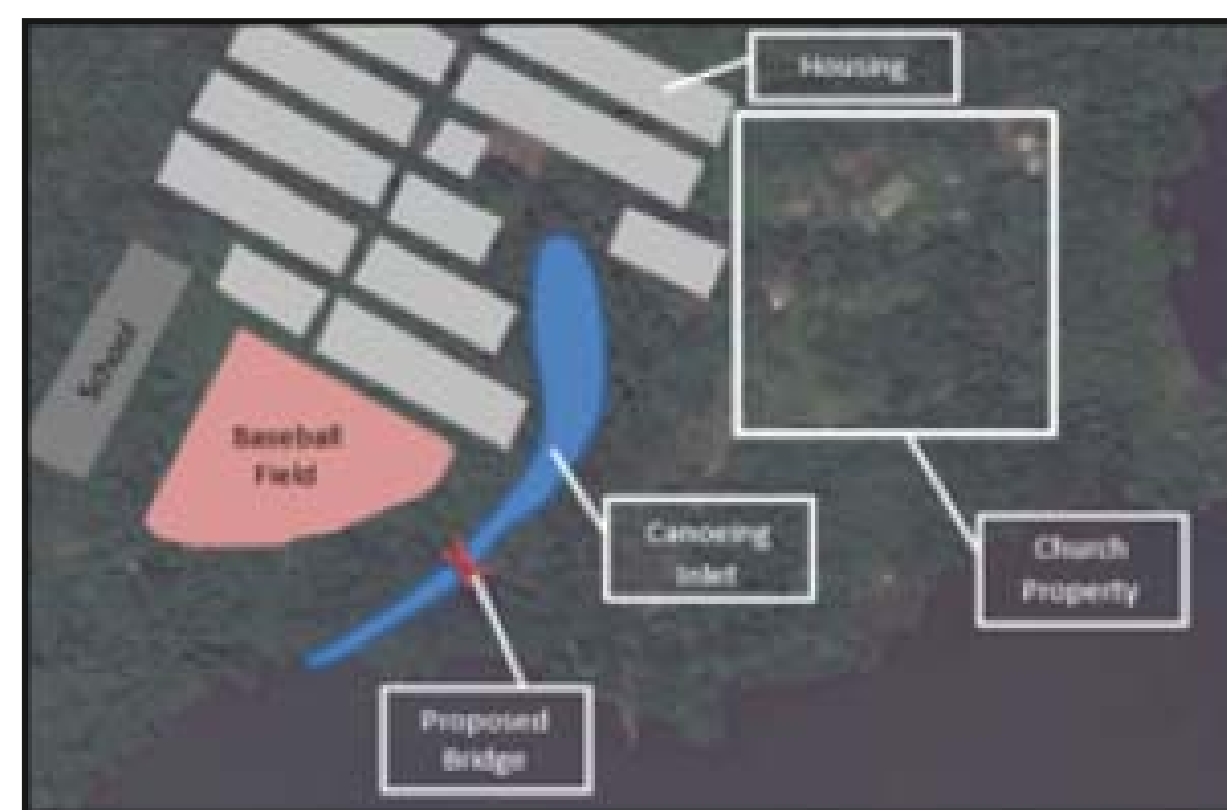
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Project Overview

The Rama people are an indigenous people group living on an overpopulated island off the coast of South-east Nicaragua.



Friends in Action has partnered with the Rama to build up a mainland community for part of the Rama population to relocate to. A swampy inlet currently splits the mainland community in half, cutting off the baseball field from where the church and clinic will be. The Nicaragua Bridge Project is designing a box culvert with a 20 ft span to connect the mainland community. Ultimately, the swamp will be dredged out to form a bay for the mainland community to store their canoes.



Alternative Selection Process

Initially, the span requirement was thought to be about 80 ft. With this requirement in mind, 6 design alternatives were explored in depth. These alternatives were costly and had a complex design and construction process. The idea of backfilling the site to reduce the span length to 20' offered 3 more design alternatives that seemed more economical and feasible. The box culvert was selected as the best alternative. This alternative was selected on the basis of:

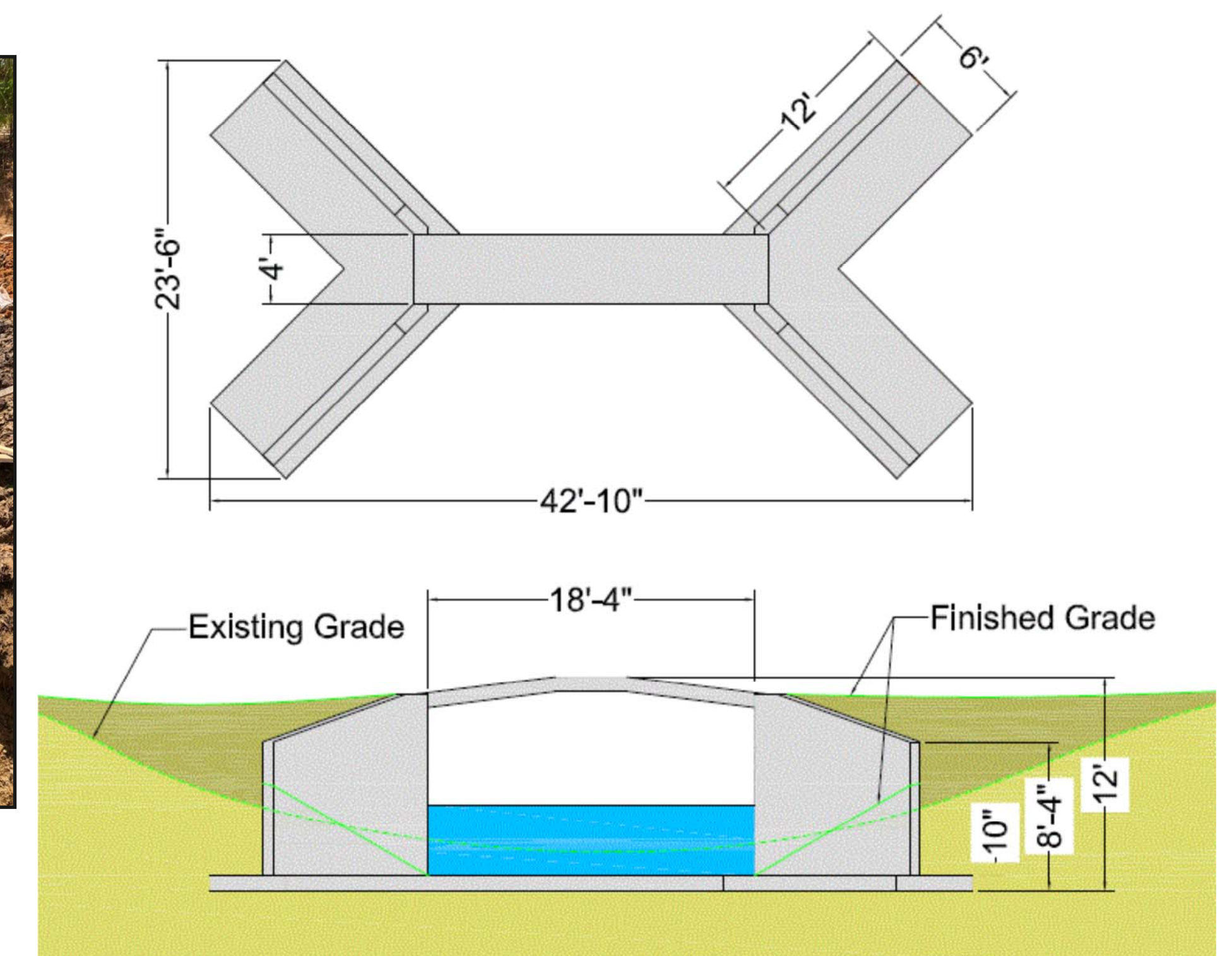
- Constructability
- Cost
- Life Cycle
- Ease of Design

Construction

Two teams from West Shore Evangelical Free Church travelled to the Nicaragua Site to begin construction, successfully completing the footer. The final design and construction sequence will be refined in the upcoming weeks for the team that will be in Nicaragua from May 22-June 2 to continue to make progress on the culvert. Team members will stay the following week and partner with the AROMA team to complete the construction by June 8.

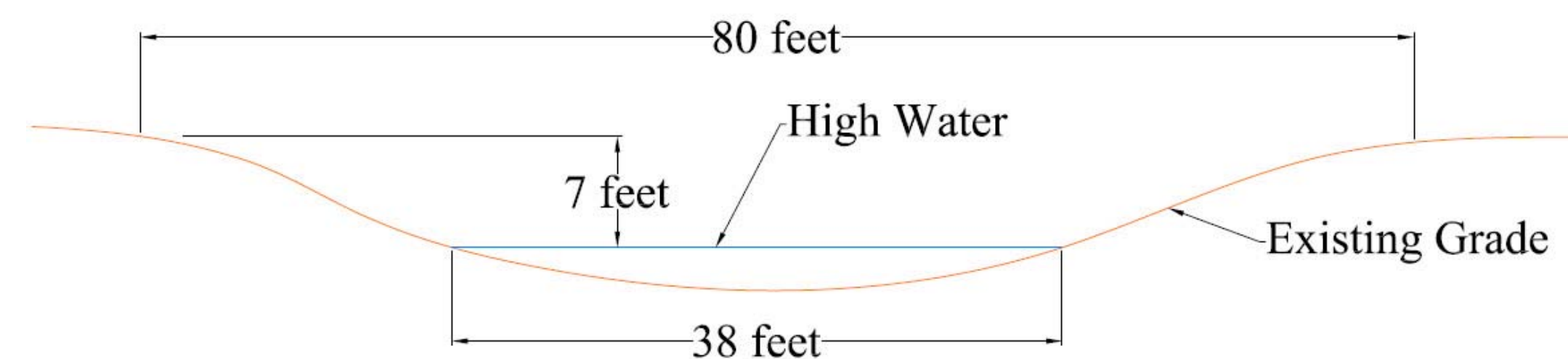
Design Specifications

- 20' span length to allow for efficient flow of canoe traffic
- 12' high box culvert with arched profile
- Bottom slab poured at 4'10" depth to achieve minimum 5' freeboard and a minimum required depth of 3'
- Wing walls for global stability and reduced soil



Site Overview

- Salt Water
- Heavy rainfall and termites
- Minimal tidal effects
- Minimal flow from inlet
- Soil classified: elastic silt
- Rock and aggregate are difficult and expensive to obtain



Acknowledgements

Team Members

- Caleb Comeaux (SPM)
 Jake Holderman Alissa Haley
 Dan Mewha Sam Gobeille
 Mark Simpkins Seth Brewster
 Eric Weaver Justin Blest
 JJ Robinson

Advisors

- Faculty Project Manager — Dr. Brian Swartz
 Project Advisor — Doug Stump



Construction Team

West Shore Evangelical Free Church

Project Partner

Friends in Action International

