



Introduction: Malawi



- 1 in 3 people in Malawi do not have access to clean drinking water.*
- 3,100 children under 5 die annually from waterborne illnesses.*
- Lilongwe, the capital of Malawi, is comprised of several rural villages including one called Zamkutu.
- Over 2500 people live in Zamkutu.
- There is only 1 continuous protected water source in Zamkutu.
- Those that must resort to shallow hand-dug wells get sick often.

<https://www.wateraid.org/mw/facts-and-statistics>

Scoping Trip

Two projects were evaluated in Malawi during a 2-week scoping trip in January 2020.

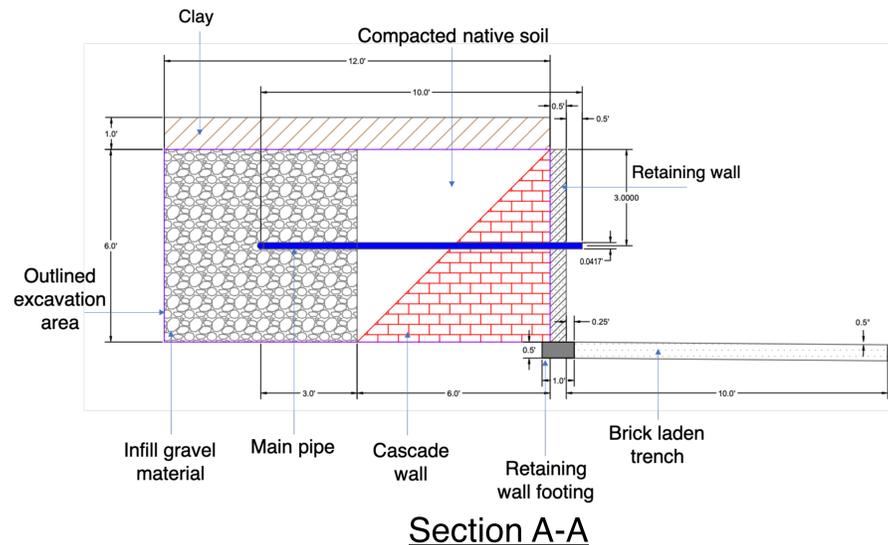
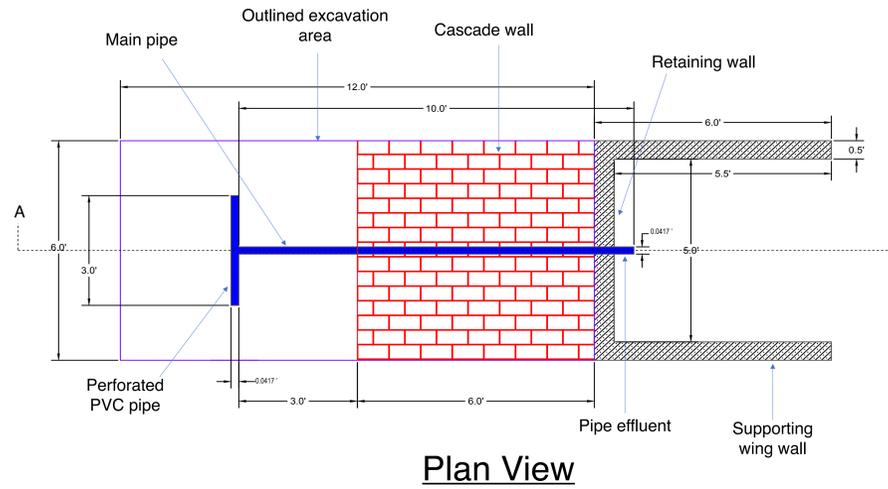
- The first was at a secondary school in Mangochi. It was not considered feasible after technical evaluation and regulatory concerns.
- The second was at Zamkutu village in Lilongwe. While in Lilongwe, the team:
 - Met the chiefs of Zamkutu
 - Walked around the village to meet families
 - Assessed the feasibility of several spring seeps that stay viable throughout the dry season

Design Considerations

- Spring seep selection and design criteria
 - Location
 - Hydraulic Conductivity
 - Water quality
- The spring selected is in the central subcommunity of Kaole within Zamkutu with a population of 450.

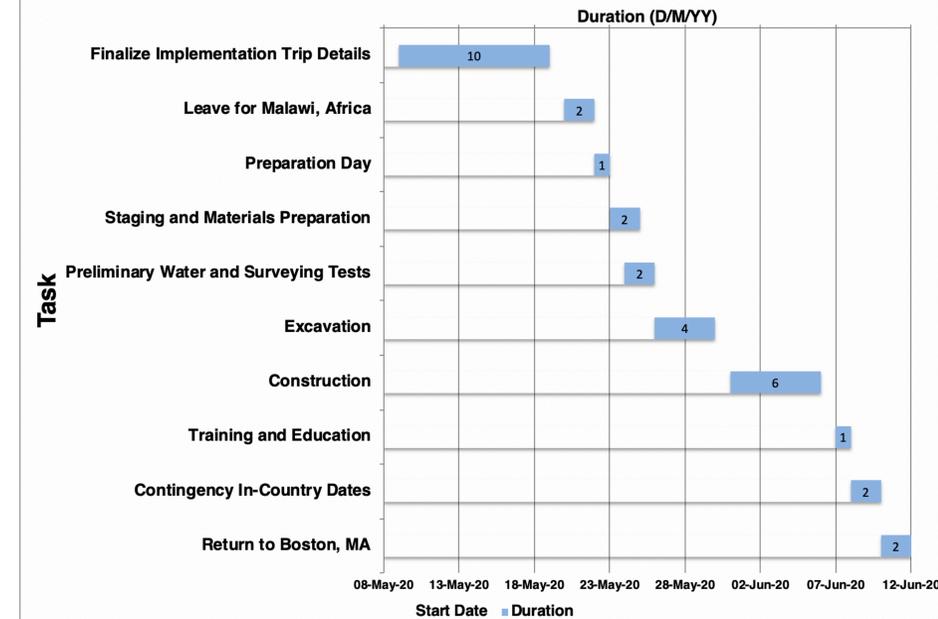


Final Design



Implementation Plans and Budget

Theoretical Implementation Schedule



Expenses	Price
Airfare	\$7,500.00
Housing Accommodations	\$1,500.00
Meals	\$650.00
Gas	\$175.00
Immunizations	\$400.00
International Insurance	\$70.00
Malawi Visa	\$375.00
Materials and Equipment to Build Spring Box	\$4,700.00
Labor	\$600.00
Sub-Total	\$15,970.00
Contingency (20%)	\$3,195.00
Total	\$19,165.00

Future Recommendations

- Communicate with Malawi contacts to solidify future implementation efforts with professional engineers and student volunteers
- Collect soil and water samples from selected spring for further analysis
- Create a standard operating procedure manual (SOP) for the Zamkutu leaders to keep in case issues arise

Acknowledgements

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Materials Needed

Construction Materials	
1" Stone	Clay
2.5" End Caps	Coupling
2.5" Galvanized Steel Pipe	Duct Tape
2.5" Perforated PVC	Elbow Coupling
Cement Mix	Geotextile Fabric
Plumbers Glue	HDPE Plastic Liner
Teflon Tape	Unscented Bleach
Steel Wire Mesh	

Construction Tools
100 Ft Measuring Tape
5-Gallon Buckets
Clip-On Level
Coping Saw
Hoe
Marking Tape
Pickaxe
Prybar
Scissors
Sharpies
Shovel
Tee
Trowel
Wheelbarrow
Wood Stakes
Work Gloves