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Objective:

The ultimate goal of this project was to develop a sustainable source of water for the villages of Lamarre and Terre Sallee which are located in the Centre state of Haiti. The two villages currently lack the adequate resources required to provide water for people, animals, and crop irrigation and a long term solution was required to address the domestic and agricultural needs of the two villages.

Problem

- A year round supply of water is needed to effectively irrigate the village's agricultural plots
- During the dry season little to no rain occurs and water is scarce throughout the region
- Wells are currently maintained to provide drinking water but they do not have the capacity to handle irrigation

Background

- Lamarre & Terre Sallee have begun cultivating plots for year round vegetable production
- 2 wells provide water for domestic use for 545 people
- Villagers expressed a great interest in the construction of a lake as a possible solution

Solution Evaluations

- Drilling of more wells
- Use of water conservation techniques like keyhole gardens, mulching, and rain barrels
- Construction of one large lake or several smaller lakes
- Final Choice – Construction of one large lake

Design Constraints

- Must provide 18,700 cubic meters of water for crops and villager's needs
- Location must be suitable for lake construction (soil type, topography, rainfall, etc.)
- Cost of construction should be affordable to villagers (\$150,000)

Global & Societal Impacts

- Will provide enough water to allow for multiple growing seasons for crops
- Will allow the villagers to sell excess crops in local markets as a source of income
- Will provide a source for fishing, laundry, recreation, and livestock



Photo 1 – Proposed Dam Location

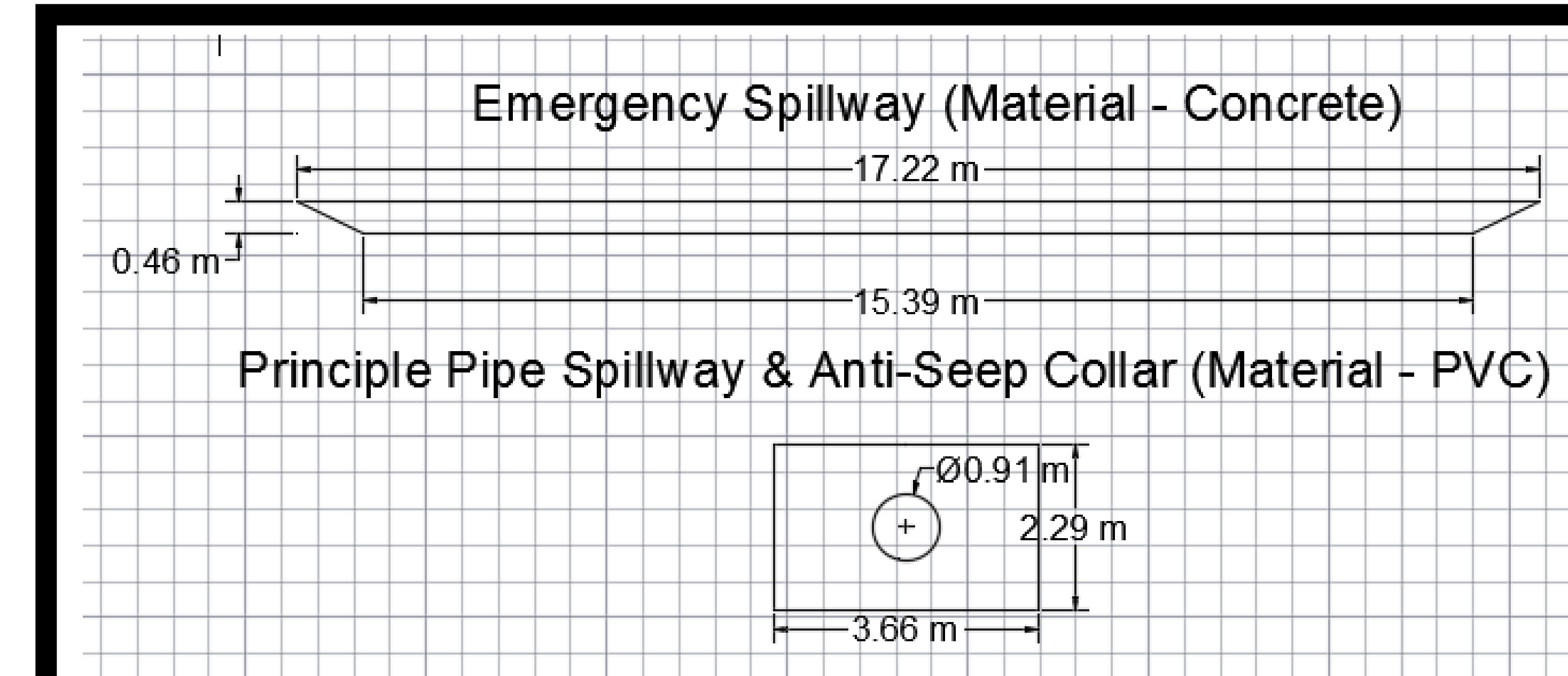


Figure 1 – Spillway Design

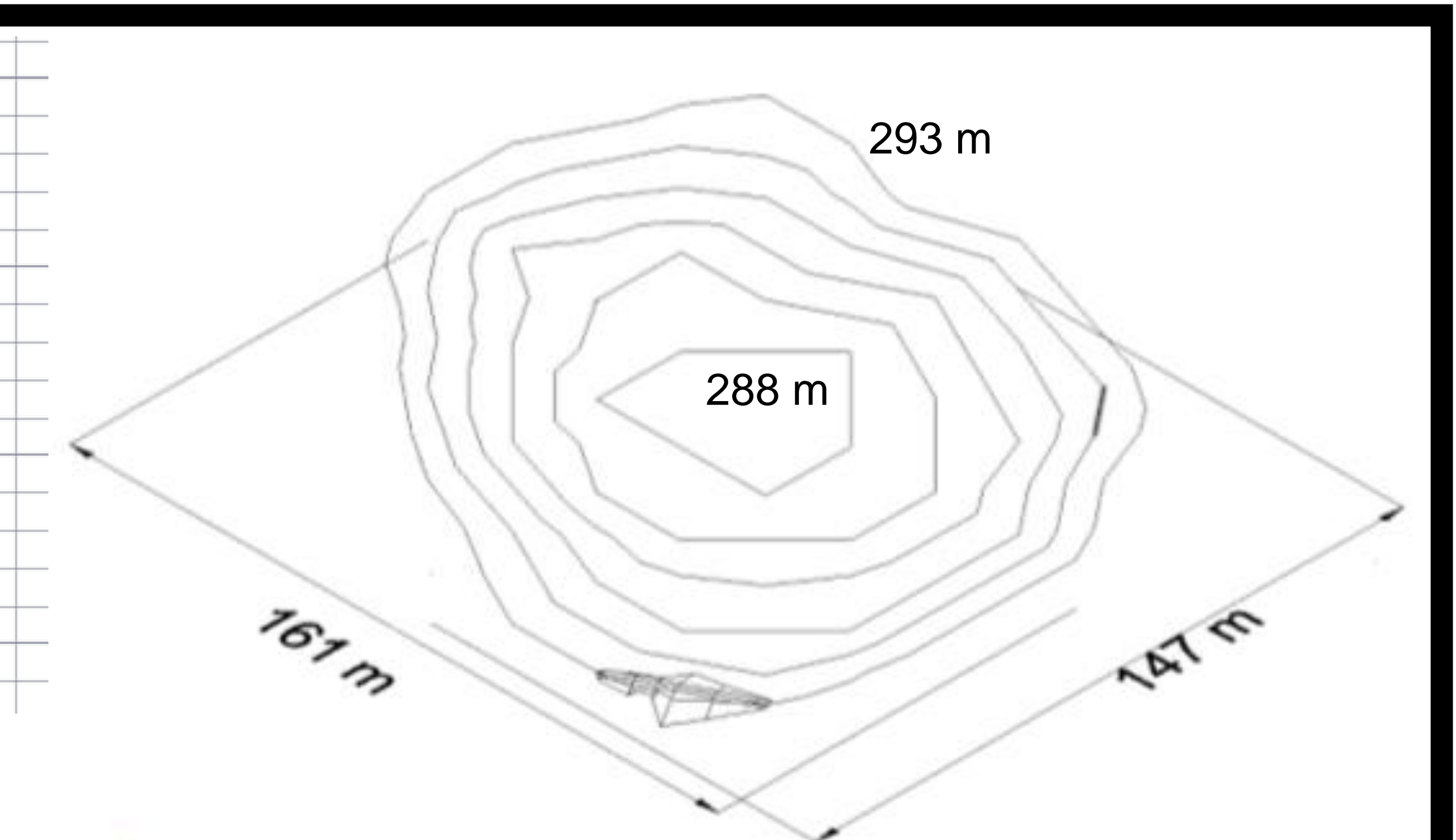


Figure 2 – Pond Contours

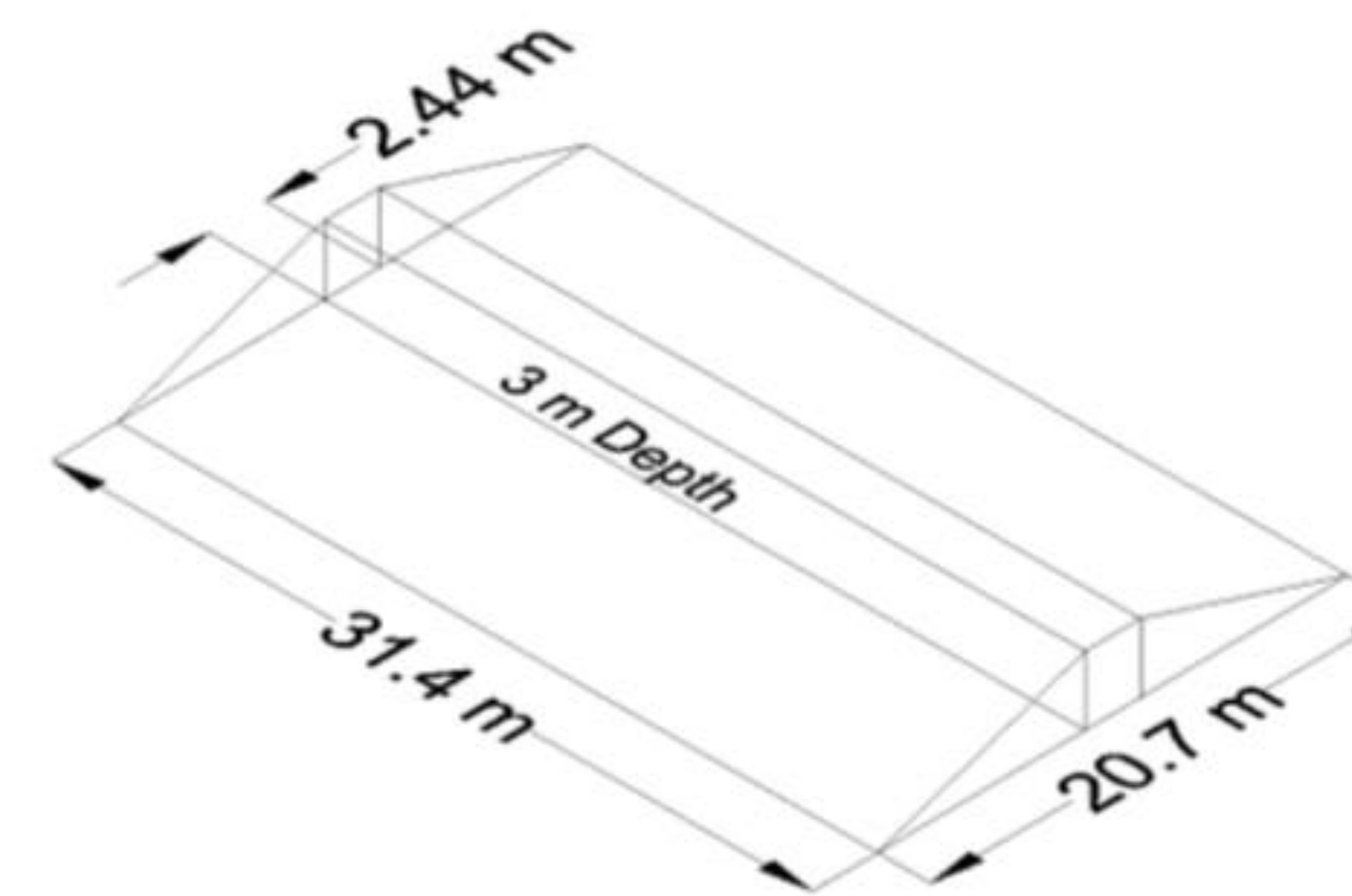


Figure 3 –Proposed Dam Design

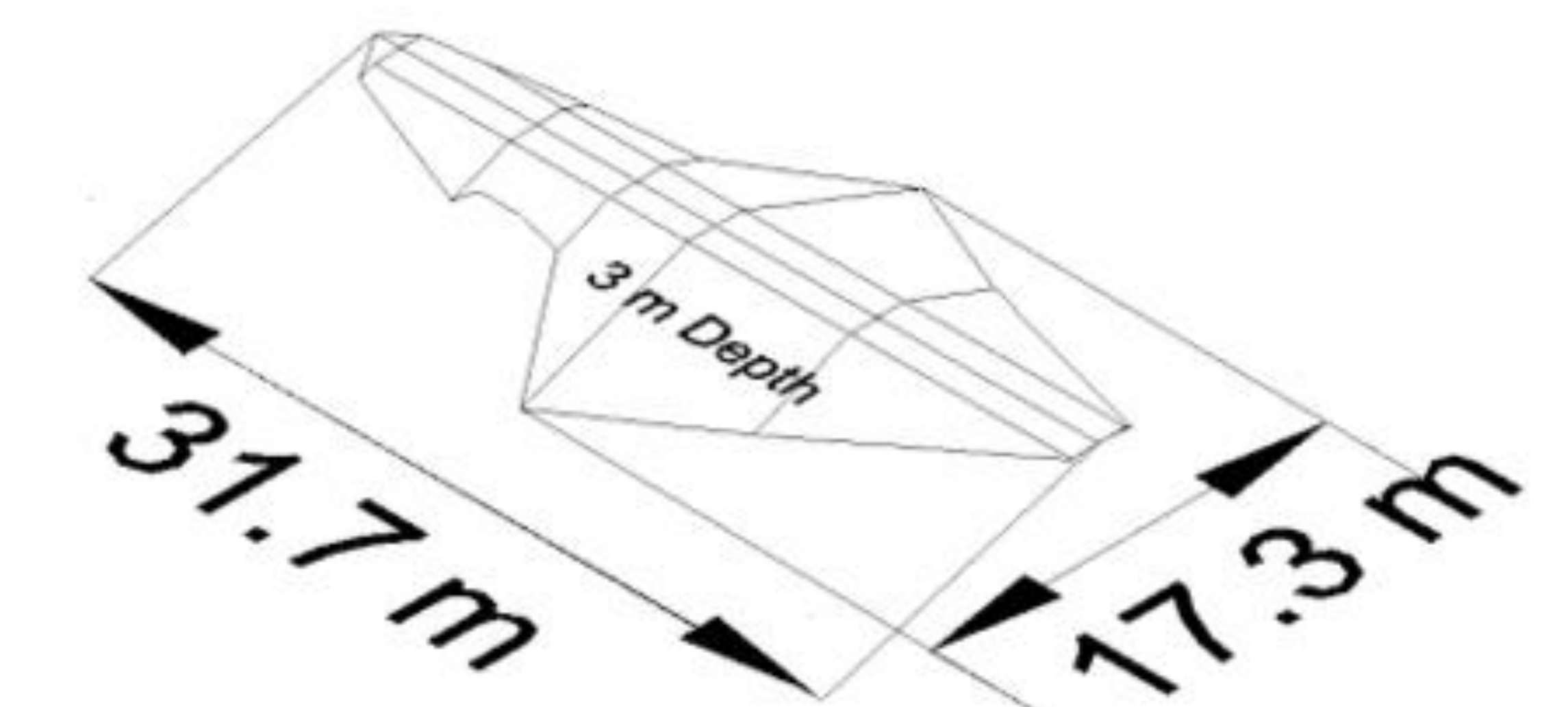


Figure 4 – Earth-fill Required

Final Design

- Lake Size – 36,400 square meters
- Maximum Lake Depth – 5 m
- Dam Height – 3 m
- Dam Top Width – 3.05 m
- Dam Side Slopes – 3:1 (H:V)
- Final Cost - \$148,000
- Materials – Earth-fill, pvc, concrete, vetiver, pump
- Cut-fill dam construction method with cutoff trench included

Photo 2 – Lamarre Agronomy Plot



Photo 3 – Nearby Lake (From Local Builder)



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