



National University of Science and Technology

Think in Other Terms



FACULTY OF INDUSTRIAL TECHNOLOGY

BEng (Hons) Degree in Civil and Water Engineering

FINAL YEAR PROJECT

BY

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Abstract

The design of the Takunda Basin Irrigation Scheme is as a result of the unpredictable climatic changes that have severely affected the food security of the community. The area to be irrigated is 5 hectares and the type of soil in that area is clay-loam. The water requirement for the scheme was calculated and found to be $0.05\text{m}^3/\text{sec}$. The water is going to be abstracted from an existing borehole which is 40m deep and is going to be conveyed through a buried 110mm PVC pipeline to a night storage tank with a design capacity of 600m^3 . The water is going to be pumped from the borehole at a calculated rate of $0.008\text{m}^3/\text{sec}$. Concrete lined canals with a bed slope of 1:1500 are going to be constructed and these are going to convey water from the tank to the field. Siphons will be used to take water from the canals into the field. The bottom width of the canal and the water depth were found to be 0.23m and 0.20m respectively using the Chezy formular. For practical purposes the minimum required canal bottom width should be 0.25m. This value was adopted for the designed canals. Longitudinal profiles were plotted showing the canal bed, the original ground level and the water level. Drop structures were introduced in order to minimize earthworks during construction of the canals. A 1 inch parshall flume is going to be constructed along the canal and this will be use to measure the discharge in the canals so as to compare it with the design discharge of the scheme. The proposed irrigation cycle for the scheme is 5 days which leaves 2 days for other works outside the scheme. The area to be irrigated per day is 1 hectare.