

DESIGN, FABRICATION AND EVALUATION OF HYDRAULIC DIAPHRAGM PUMP

A PROJECT REPORT

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ABSTRACT

The study was conducted to design, fabricate and evaluate the performance of the hydraulic diaphragm pump for irrigating water. The fabrication was done in Molo, Iloilo City and the performance testing and evaluation were conducted at the Jalaur Dam located in Brgy. Moroboro, Dingle, Iloilo. The set-up consisted of the site of the source of water (dam), drive pipe, impulse valve, diaphragm body and pump end. The diaphragm body was composed of rubber diaphragm, spring, rod and gasket cup. The pump end was composed of suction valve, suction pipe, delivery valve and delivery pipe. The operation of the hydraulic diaphragm pump started when the water flowed to the drive pipe creating a water hammer effect causing the impulse valve to open or close. When the impulse valve closes, pressure is directed to the diaphragm which caused the plunger to force water to the delivery pipe. Results revealed that for a maximum vertical lift of 6 m, an average discharge flow rate of 0.054 lps (194.4 li/hr) was recorded giving the pump a power generation of 3.167 watts. The investment cost is PHP25,000.00 for the fixed and variable costs of PHP45.89/day and PHP200.00/day, respectively, giving a total cost of PHP245.89/day. Furthermore, computations revealed that the hydraulic diaphragm pump may incur an operating cost of PHP0.16/li.