

Detailed Engineering Design (DED) for PLTMH Development in the Ngluweng River, Plaosan District, Magetan Regency

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ABSTRACT

Micro hydro power plant (PLTMH) is a system that can convert the potential energy and kinetic energy of water into small-scale (micro) electrical energy. In a PLTMH, some of the water from the river is channeled into the carrier channel and then channeled through the penstock (rapid pipe) to the turbine. The purpose of this study was to determine the magnitude of the river discharge in Ngluweng, Plaosan District, Magetan Regency, to determine the potential for electrical power that could be generated by a PLTMH on the Ngluweng river, to determine the most suitable type of turbine to be used in the Micro Hydro Power Plant (PLTMH) on the Ngluweng river, District Plaosan, Magetan Regency, and know the Detail Engineering Design (DED) for the construction of a PLTMH on the Ngluweng River, Plaosan District, Magetan Regency. In this study primary data collection was carried out using direct observation and measurement methods. Observations were made based on data on flow velocity, cross-sectional area of the flow and height difference from the river flow to past the waterfall. The data obtained is used to determine the power generated and then sold to PLN and the village receives funds to build the village or if the people of Magetan want to switch to renewable energy to reduce costs which are quite expensive. The results of the study found that in the Ngluweng river the water discharge was 0.225 m³/s. The resulting power potential is 16.31 kW. The appropriate type of turbine is the Cross Flow Manual Generator turbine. The *Engineering Design Details (DED)* for the construction of the PLTMH on the Ngluweng River software Autocad, Plaosan District, Magetan Regency are appropriate, including the weir and intake design, the channel design, the design of the calm tank, and the design of the power house.

Keywords: *Detailed Engineering Design (DED)*, PLTMH