

***Design and Build Undershot Waterwheel Prototype
Alternative Energy Source***

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ABSTRACT

Hydroelectric power plant or PLTA is a power plant whose main source comes from water energy which utilizes water flow to be converted into electrical energy. By utilizing the flow of water to drive a waterwheel that will produce mechanical energy. Water energy is an energy source that is very abundant and environmentally friendly. The prototype design of the waterwheel is used on a small scale by utilizing water as the main driving force. The prototype of the *undershot* waterwheel that has been designed and functions normally without any problems. This waterwheel prototype can be used as a learning media and practicum for engineering students. The test results show that the prototype of the waterwheel without a load with a large valve variation produces the highest value at water discharge of 0.000891 m³/s, waterwheel rotation with a value of 315,8 Rpm, generator rotation of 1180 Rpm, and voltage with a value of 201V. While the waterwheel prototype with a load produces a waterwheel rotation of 89,8 Rpm, a generator rotation of 381,425 Rpm, a voltage with a value of 183 V, a current value of 0.1 A, a frequency of 53 Hz, and a power of 18,3 W.

Key words : Prototype, Design, Undershot Waterwheel.