



ABSTRACT

A pump is a fluid machine used to increase energy of a liquid in the way that it gives energy in the form of work to the liquid so it can be delivered from one place to another place.

A pump is not only used to deliver liquid from a lower place to a higher place, but also used to transport solid-material. When pumps used as a material handling device, the system is called *hydrotransportation*. As its name, this system uses pumps as its main device. Pumps play a role as a *carrier*, transporting solid material mixed with liquid such as water. *Hydrotransportation* is chosen as a material transportation system for few considerations, such as heavy work field, continuous operation and long distance of material delivery.

The idea of this thesis is designing pumps that are used as hydraulic material handling device. The transported material is sand with amount is 750,448 *TPH* that is used to reclaimate a seashore with area 10 ha. The system has two pumps with same specification. The pump is a centrifugal pump with capacity of 496,032 cubic metres per hour and total head of 22 metres. The pump will be driven by an electric motor with four poles, at speed of 1470 rpm and power of 51,5 kiloWatt.

The design of this pump includes the design of pump-impeller, in this case, a semi-open impeller with two blades is used, volute, pump-shaft, bearings, coupling and other supporting components.