CONCEPTUAL DESIGN OF HUMAN POWERED HYDROFOIL

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"I declared that this thesis is the result of my own work except the ideas and summaries which I clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in the candidature of any degree."

Signed : .....

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ABSTRACT

A hydrofoil is a boat with wing-like foils mounted on struts below the hull. While, the human powered hydrofoil means the hydrofoil is moved by using human energy. The term "hydrofoil" is used to refer to the foil itself, especially when the airfoil profile has been specifically designed for use in water (such as for a propeller blade). Hydrofoils are now being applied in multiple marine applications. In this project, the student is design a human powered hydrofoil for the purpose of recreation activities. First, a research about the existing human powered hydrofoil was done. After that, a sketch of the hydrofoil was done by refer to the existing hydrofoil's design. Then, the most suitable material was selected and followed by strength analysis and lift analysis to find out the size of structure and foils. After the foil has been selected, it was simulated using CFD software. The simulation was done to prove the foil chosen is able to generate enough lift or not. The size of each structure of the human powered hydrofoil has been obtained for this project. NACA 2410 with 210 cm x 14 cm in dimension has been selected as wing design. A comparison between the theoretical and simulation result has been made to prove the analysis done is correct.

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