PRELIMINARY CONCEPTUAL DESIGN OF A WING IN GROUND EFFECT (WIGE) AIRCRAFT FOR 6 PASSENGERS

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

Signed :.....

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ABSTRACT

Wing in Ground Effect (WIGE) is the aircraft which is flying at low altitude under a ground effect condition and float on the water while inoperative. In this project consist of designing the external shape of WIGE aircraft by using CATIA software and conducting a preliminary aerodynamics analysis of the design by CFD software (STAR-CCM). The size of aircraft is design to suit for 4 passengers which is 10m length, 4m high and 8m wing span. The aircraft is design to driven by piston engine with dual propellers and a cruising velocity was set to be 40m/s. The operating temperature and density is 303K and 1.164kg/m^2 respectively. The aerodynamics analyses were covered on 1.5m and 2m altitudes with various angles of attack. Analyses started with meshed the aircraft with boundary condition applied and placed it in the free stream geometry to earn C_L, C_D and C_M by CFD software. The ability of the aircraft to fly under a ground effect was calculated accordance to forces coefficient obtained.

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