UNIVERSITI TEKNOLOGI MARA

CAWANGAN TERENGGANU

MEC299

STRUCTURAL DESIGN AND ANALYSIS

AMPHIBIOUS BOAT

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Alhamdulilah.

ABSTRACT

This projects' objectives are to design and analyse the frame of structure of the Amphibious Boat. Amphibious boat is a type of boat that have 2 functions, which is to be use on water surface and on land. In this project, the material that will be use are GRP(Glass Reinforced Plastic). The basis analysis of this project is the mechanical properties of the material used such as yield strength, ultimate strength, compressive strength, elongation characteristics and plastic deformation, fracture, and fatigue characteristics. Since Amphibious boat will be use on water and on land, so there were a several problems which is to create the frame structure of the boat based on selected hull design based on the ABS Rule and classification as requirement for safeguard and safety.

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CHAPTER 1
INTRODUCTION

1.1 Background of Study

This project using application of marine structure, floating, submerged, or fixed, structural layout and geometrical properties, each structural element, every element being interconnected with other element. The basis analysis of this project is the mechanical properties of the material used such as yield strength, ultimate strength, compressive strength, elongation characteristics and plastic deformation, fracture, and fatigue characteristics. Since it is amphibious boat, it also involves Physics and Dynamic on land surface. This project will be used as a research instrument for the student at any school and university.

The equipment that will be used for this project are Ansys and Polycad. Ansys will be used for analysis for the project meanwhile Polycad will be used for designing the amphibious boat. All the process of designing and analysing will be done by UiTM laboratory and Student's own equipment since this project only on digital not physically. The progress of this project will be done under the supervision of the UiTM lecturer to avoid unnecessary

Back in the 1770s, the 1st person who came up with the design of amphibious thing is Raimondi di Sangro who's a nobleman of Italian. In 1805, American inventor and engineer, Oliver Evans design the first known self-propelled amphibious vehicle. Although it is disputed to have successfully travelled over land and water under its own steam.

The material being used in this project is GRP, Glass Reinforced Plastic is a plastic-based material consisting of glass fibres bonded together with resin. It has been widely used in boat building in the last 20 years because it is durable material. The most important reason why fibre-glass boat building has increased in recent years, and we see many fibre-glass boats sailing in vast seas is the fact that fibre-glass is a material resistant to both climate and weather conditions and it is lightweight.