

A PRELIMINARY DESIGN OF FISH HOUSE FOR RENEWABLE  
ENERGY RESEARCH

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**A PRELIMINARY DESIGN OF FISH HOUSE FOR RENEWABLE ENERGY  
RESEARCH**

**By  
MUHAMAD NURISWIN BIN ROSLEE**

**A thesis submitted in partial fulfilment of  
the requirement for the award of the degree of  
Bachelor of Applied Science (Maritime Technology)**

**DEPARTMENT OF MARITIME TECHNOLOGY  
FACULTY OF MARITIME STUDIES AND SCIENCE MARINE  
UNIVERSITI MALAYSIA TERENGGANU**

**2012**



DEPARTMENT OF MARITIME TECHNOLOGY  
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE

**DECLARATION AND VERIFICATION REPORT**  
**FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled:  
**A PRELIMINARY DESIGN OF FISH HOUSE FOR RENEWABLE ENERGY RESEARCH** By **MUHAMAD NURISWIN BIN ROSLEE** Matric No. **UK 17788** have been examined and all errors identified have been corrected. This report is submitted to the Department of Maritime Technology as partial fulfillment towards obtaining the **Bachelor Degree of Applied Science (Maritime Technology)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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## DECLARATION

I hereby declare that this thesis entitled **A PRELIMINARY DESIGN OF FISH HOUSE FOR RENEWABLE ENERGY RESEARCH** is the result of my own research except as cited in the references.

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# **A PRELIMINARY DESIGN OF FISH HOUSE FOR RENEWABLE ENERGY RESEARCH**

## **ABSTRACT**

Design can be defined as a plan or drawing produced to show the look and function or workings of a building, garment, or other object before it is built or made. Prototype is a first or preliminary model of a product; e.g. a machine, from which other forms are developed or copied. A final design should start as a prototype so that it can be tested whether the product complies with the sets of requirements needed. In this research, a preliminary design prototype of fish house for renewable energy research was studied. Nowadays, fish farming activities are known as one of the sources of protein which is important for human beings. However, such activity is costly especially in terms of operating costs which include electricity cost. The objective of this research has led to the development of three preliminary designs, in which the characteristics of the prototype were determined. All the designs were virtually drawn into autographic drawing in AutoCAD and 3D drawing in Google Sketch-Up. The characteristics of the best and suitable design were determined using pairwise comparison chart (PCC) method and morphological chart method. The actual prototype was built after the best and suitable design was determined. Hollow steel bars and metal inert gas (MIG) welding were used in building and completion of the prototype. Finally, the strength of the structure was determined virtually using Pro Engineer software. The research shows that the design, prototype and the strength analysis were preliminary at best, in which detail/validation were not conducted within the time frame, however opens up new frontiers to expand the current research.



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### **ABSTRAK**

Reka bentuk boleh ditakrifkan sebagai pelan atau lukisan yang dihasilkan untuk menunjukkan rupa dan fungsi atau jalan kerja sebuah bangunan, pakaian, atau objek lain sebelum ia dibina atau dibuat. Walau bagaimanapun, prototaip model pertama atau awalan produk; contohnya mesin, dari mana bentuk lain dibuat atau disalin. Satu reka bentuk akhir harus bermula dengan sebuah prototaip supaya ia boleh diuji sama ada produk itu mematuhi set keperluan yang diperlukan/ditetapkan. Dalam kajian ini, prototaip rumah ikan dihasilkan untuk penyelidikan tenaga boleh diperbaharui telah dikaji. Pada masa kini, aktiviti penternakan ikan dikenali kerana ikan merupakan salah satu sumber protein yang penting bagi manusia. Walau bagaimanapun, aktiviti ini adalah mahal terutama dari segi kos operasi termasuk kos elektrik. Objektif kajian ini telah membawa kepada pembangunan tiga reka bentuk permulaan, di mana ciri-ciri prototaip telah ditentukan. Semua reka bentuk dilukis menggunakan lukisan unjuran autografik dan menggunakan perisian AutoCAD dan 3D dalam Google Sketch-Up. Ciri-ciri reka bentuk yang terbaik dan sesuai telah ditentukan dengan menggunakan kaedah Pairwise Comparison Chart (PCC) dan kaedah carta morfologi. Prototaip sebenar dibina selepas reka bentuk yang terbaik dan sesuai telah ditentukan. Bar keluli berongga dan kimpalan logam gas lengai (MIG) telah digunakan dalam menyiapkan dan membina prototaip. Akhirnya, kekuatan struktur ditentukan menggunakan perisian Pro-Engineer. Kajian ini menunjukkan bahawa reka bentuk, prototaip dan analisis kekuatan awal pada terbaik, di mana detail / pengesahan tidak dijalankan dalam jangka masa yang ada, walaubagaimanapun ia membuka sempadan baru untuk meneruskan penyelidikan semasa.