



UNIVERSITI PUTRA MALAYSIA

***COMPARATIVE STUDY OF ROOF TRUSS CONSTRUCTION
METHODS IN MALAYSIA***

MOHD SYAHRUL HISYAM BIN MOHD SANI

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**DEPARTMENT OF CIVIL ENGINEERING
FACULTY OF ENGINEERING
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SERDANG, SELANGOR
2004**

**COMPARATIVE STUDY OF ROOF TRUSS CONSTRUCTION
METHODS IN MALAYSIA**

**BY
MOHD SYAHRUL HISYAM BIN MOHD SANI**

**A Project Report Submitted In Partial Fulfillment of the Requirements for
the Degree of Master of Science in the Faculty Of Engineering,
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**DEPARTMENT OF CIVIL ENGINEERING
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PROJECT APPROVAL FORM

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Project Title : Comparative Study Of Roof Truss Construction Methods In
Malaysia**

This project report attached hereby entitled:
**“COMPARATIVE STUDY OF ROOF TRUSS CONSTRUCTION METHODS IN
MALAYSIA”** is submitted by **Mohd Syahrul Hisyam bin Mohd Sani** in partial
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Alhamdulillah, I would like to take this opportunity to dedicate this report to my dearest parents, Mohd Sani bin Samsudin and Norbishah bt Abdul Wahab for their support during the preparation of this study. I would also like to express my sincere gratitude to my project supervisor, Professor Abang Abdullah Abang Ali, for his priceless guidance, suggestions, supportive advice and constructive criticisms all the way through this study project.

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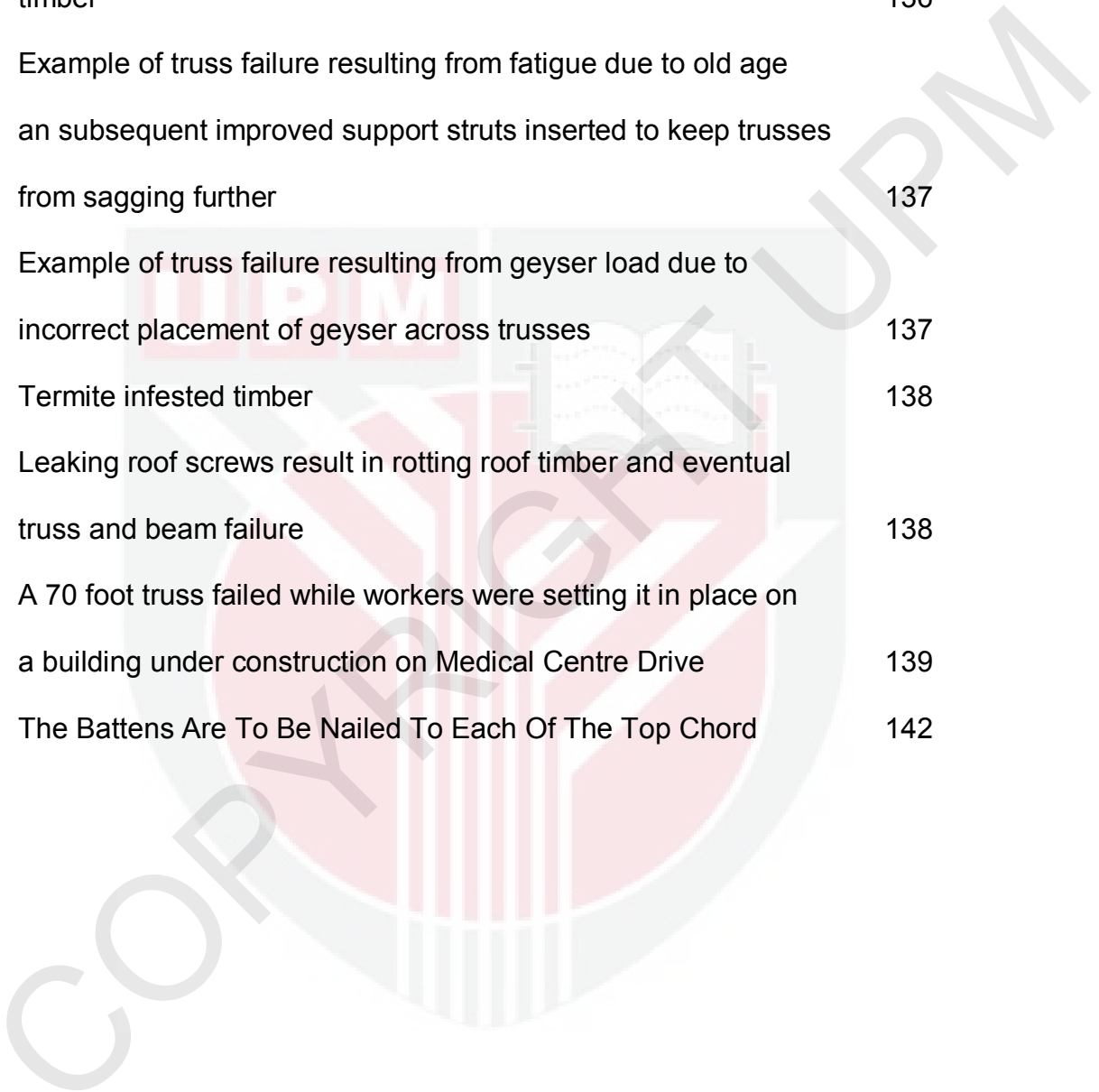
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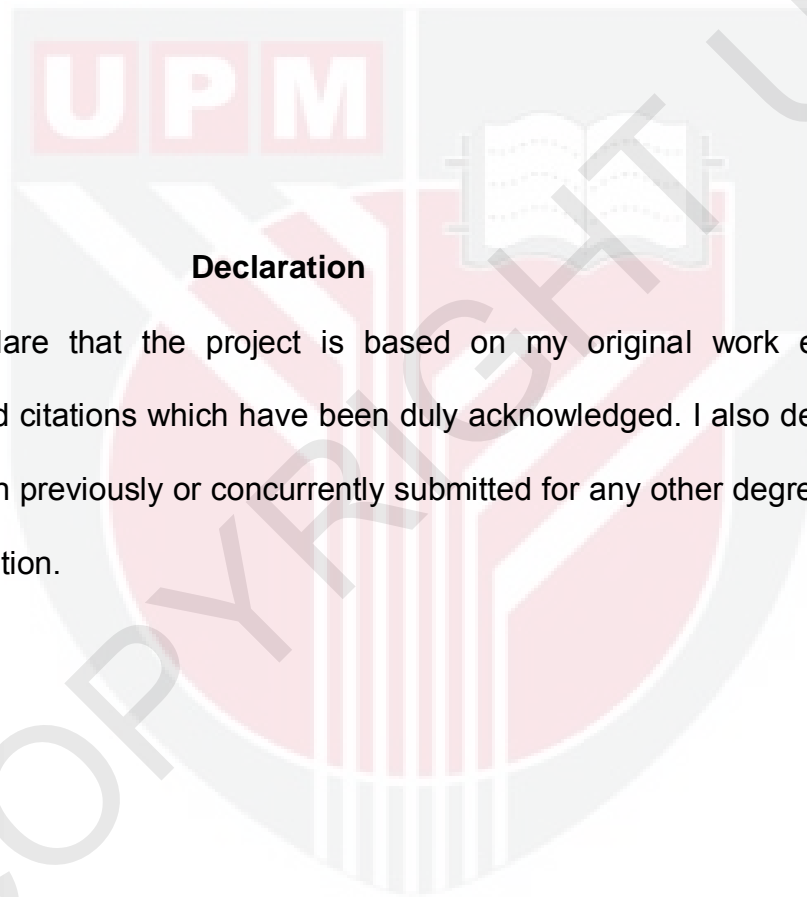
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Declaration

I hereby declare that the project is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institution.



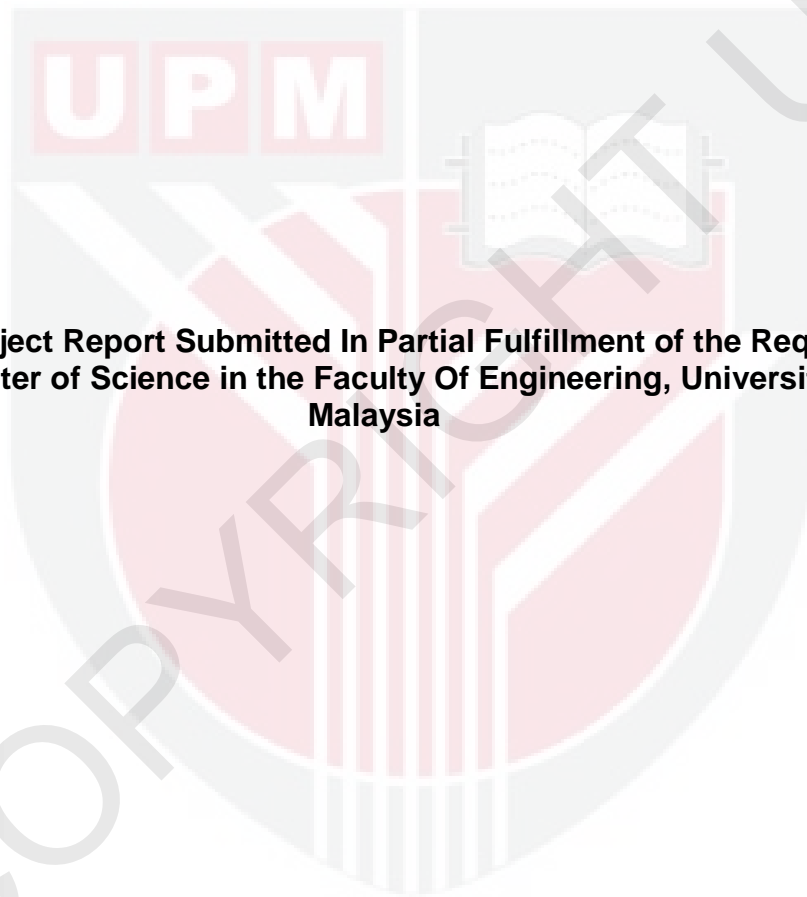
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Mohd Syahrul Hisyam b. Mohd Sani

Date:

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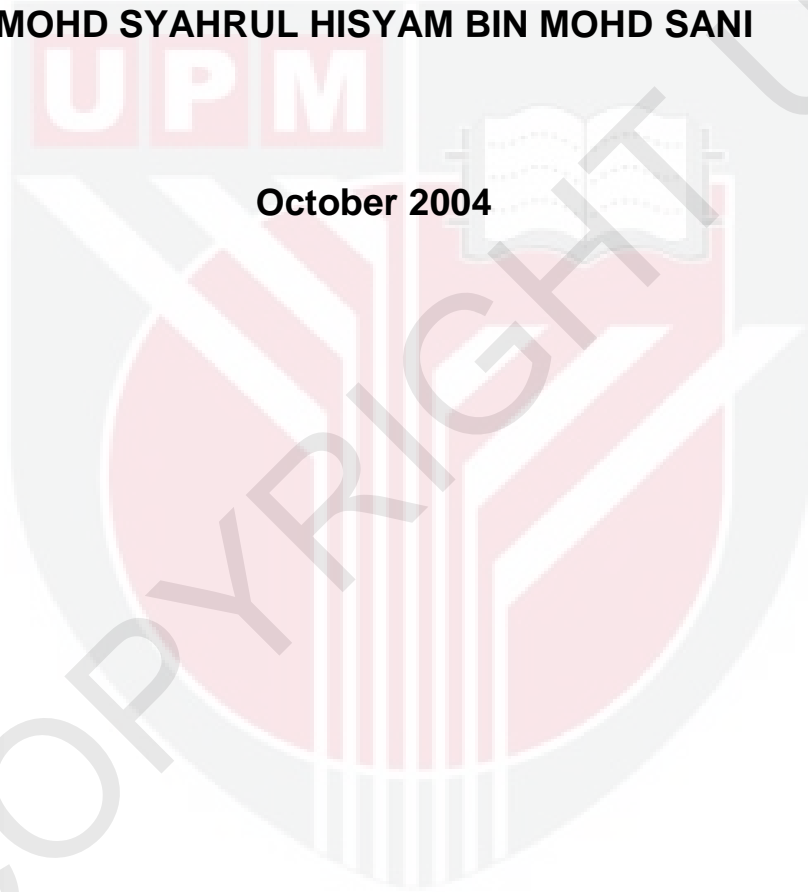


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October 2004



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ABSTRACT

The first light frame trusses were built on site using nailed plywood gusset plates. These trusses offered acceptable spans but demanded considerable time to build. In the 1950's the metal connector plate transformed the truss industry by allowing efficient prefabrication of short and long span trusses. With the growing demand for affordable housing, increasing construction costs and heightened concern for energy-efficiency, contractors and builders across Malaysia have recently begun to re-examine their options for the delivery of housing. Roof trusses come in all shapes and sizes to suit almost every single design of roof. This trend has resulted in a growing interest in prefabricated building system including roof truss systems.

Both prefabricated roof truss systems and onsite roof truss construction are used currently. From this two system, many macroeconomic factors and regulatory factors like speed of construction and use advanced technology have been cited as reasons for this, little attention has been paid to the nature of the homebuilding industry, its operational structures and the ability of the product itself to accommodate the contractor's needs and preferences.

From these two methods, the site observation, interview and questionnaire data are been analysed from the characteristic factors that involve in roof truss construction. All the parties that involve in construction industry like roof truss

manufacturers, contractors and consultants are being interviewed and asked about the roof truss system. Finally the result that been generated is show that the prefabricated system is the most popular system and give many advantages to Malaysian construction industry.



CHAPTER 1

INTRODUCTION

1.1) GENERAL

The purpose of a roof truss is to support the roof which keeps the elements such as rain, snow and wind out and to support the loads from ducts, piping and ceiling. While performing these functions, they must also support the roofs and their own weight. There are two basic terminology used for trusses in residential construction which are pitched (triangular) truss and parallel chord (flat) truss. Lightweight trusses are manufactured to suit virtually any roof profile. Pitched or flat, they are only limited to the load arrangements and the support locations. Flat trusses also known as parallel chord trusses are an alternative to conventional floor joist systems and are a competitive option to open web joint systems. Parallel chord floor trusses may be designed with varying chord and web arrangements and bearing support details. The different truss systems and methods will be considered in this study to know where the suitable method and give benefit to Malaysian construction industry. All advantages and disadvantages will be showed to recognize the better solution that can make profit and benefit to client and contractor.

The goal of this study was to determine if innovative building systems and materials have the potential to lead to better productivity and give benefit in the Malaysian construction activity. Furthermore, it is to establish the premise that builders who use prefabrication and built onsite methods will perform more productively than those contractors or builders who don't. These ideas were pursued by first reviewing the history of home building to determine trends and patterns in innovation. The practical phase of the study was accomplished by interviewing local and regional contractors and manufacturers about their actual systems of construction used for residential homes construction. These systems were then analyzed to determine the contribution of these systems to the builder's productivity.

Prefabricated roof truss systems have replaced conventional or onsite construction roof trusses systems for 75% of single and multi-family construction. This is no surprise, due to the many advantages of using prefabrication trusses system. This engineering eliminates guesswork, provides a more uniform roof appearance and speeds the construction process. Using trusses will cut down on time and labor costs on the job site. Houses and buildings can be enclosed more quickly and thus avoid weather related problems. So that from here can make analysis and determine the good one for construction on site either using prefabrication system or using onsite construction system. Otherwise to know how this both system can give more economic to our economy status.

1.2) OBJECTIVE OF STUDY

The objective of this research project is to study and compare the different roof trusses used in Malaysia. From here we can determine the most suitable systems and relevant system in the residential houses that suite to the Malaysian construction industry. This will be know by making analysis between this both system in many aspect like cost, quality, environment, time taken, high buildability score and etc. Then, from the study we can determine all the advantages and disadvantages occur for prefabrication roof trusses system in Malaysia construction scope. After that, we also to determine all advantages and disadvantages of onsite roof trusses system. Beside that, to study the stages of prefabrication roof trusses system from prepare material until delivery the roof trusses to construction site. Finally from questionnaire information, site observation and result we can select the good and productivity system in Malaysia achieve the new area of construction technologies. Better in time, better in construction and make the profit.

1.3) SCOPE OF STUDY

Firstly, make the questionnaire to get all information about prefabrication roof trusses system with onsite roof trusses system. The questionnaire will be pass for all parties that involve in construction and also involve in roof trusses. So

the questionnaire will split into three categories that as describe below:

Category
Manufacturer
Contractor
Consultancy

Besides that, these studies have to make some interview and site observation with the trusses manufacturing and contractor.

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