



***STRUCTURAL ENGINEERS ATTITUDE AND PREFERENCES FOR
TIMBER AS A BUILDING / CONSTRUCTION MATERIAL***

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**STRUCTURAL ENGINEERS ATTITUDE AND PREFERENCES FOR
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By

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**A Project Report Submitted in Partial Fulfillment of the Requirements for the
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DEDICATION

I dedicate this study to my family, my husband, my friends and those who give me support, advice and guidance from the beginning until finishing of this writing. A special feeling of gratitude to my loving parents, Abdul Razak bin Majid, Zurina Binti Zakaria and my siblings and my loving husband, Muhammad Syukrilillah Bin Anuar for their full support a faith that I can finish my degree.

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ABSTRACT

This study was carried out to determine the structural engineer's attitudes and preferences towards the use of timber as a building/construction material. The main objective of this study was to analyse the attitude and preferences of structural engineers towards the use of timber as a building/construction material. A total of 60 respondents participated in this research of which 34% were males and 26% were females, through to question from a structured questionnaire by online survey form's link via email. More than half of the respondents have a positive attitude towards timber, especially as a unique and interesting material. However, respondents were also concerned about the price of timber is more expensive than other building materials, prone to attack by pest and its application is limited. Even though the respondents had a positive attitude toward timber but they did not prefer to use timber as their building material. Most of the respondent prefer to use other building material such as brick, concrete, steel and IBS. This survey also shows that preferences of respondents to timber prices have a profound effect on the use of timber as construction materials, especially in decision-making processes, such as the selection of building materials.

ABSTRAK

Kajian ini dijalankan untuk menentukan sikap dan keutamaan jurutera struktur terhadap penggunaan kayu sebagai bahan binaan / pembinaan. Objektif utama kajian ini adalah untuk menganalisis sikap dan keutamaan jurutera struktur terhadap penggunaan kayu sebagai bahan binaan / pembinaan. Seramai 60 responden mengambil bahagian dalam kajian ini yang mana 34% adalah lelaki dan 26% adalah wanita, melalui pertanyaan dari soal selidik berstruktur melalui pautan borang kaji selidik dalam talian melalui e-mel. Lebih separuh daripada responden mempunyai sikap positif terhadap kayu, terutama sebagai bahan yang unik dan menarik. Walau bagaimanapun, responden juga prihatin mengenai harga kayu lebih mahal daripada bahan binaan lain, terdedah kepada serangan oleh perosak dan aplikasinya terhadap. Walaupun responden mempunyai sikap positif terhadap kayu tetapi mereka tidak suka menggunakan kayu sebagai bahan binaan mereka. Kebanyakan responden lebih suka menggunakan bahan binaan lain seperti bata, konkrit, keluli dan IBS. Kajian ini juga menunjukkan bahawa pilihan responden terhadap harga kayu mempunyai kesan mendalam terhadap penggunaan kayu sebagai bahan binaan, terutamanya dalam proses membuat keputusan, seperti pemilihan bahan binaan.

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APPROVAL SHEET

I certify that this research project report entitled “Structural Engineers Attitudes and Preferences for Timber as a Building / Construction Material.” by Ummu Afiqah Binti Abdul Razak has been examined and approved as a partial fulfillment of the requirements for the Degree of Bachelor of Wood Science and Technology in the Faculty of Forestry, Univeristi Putra Malaysia.

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CHAPTER 1

INTRODUCTION

1.0 General Background

The construction industry is one of the important and productive sectors in Malaysia. Construction industry is classified into four sectors namely, residential buildings, non-residential buildings, civil engineering and the special trade sectors. The residential sector involves the construction of houses and condominiums. The non-residential construction comprises of all building construction other than residential. These include the construction of commercial and industrial buildings. In construction, many types of material are used as building materials. A building material is any material which is used for construction purposes such a beam, column, inner wall, slab, and flooring. Many naturally occurring substances, such as clay, rocks, sand, and timber, even twigs and leaves, have been used to construct buildings. Others materials include concrete, steel, and glass.

The construction industry in Malaysia is not keen in using timber as a building material (Jumaat et. al., 2006). Even though Malaysia is a timber-rich country the use of timber products in the construction industry is still negligible (Wong, 2008). The use of timber in building schemes in Malaysia has dropped from 60% to almost 5% during the last four decades (Balasbaneh & Marsono, 2015) as the local construction industry prefers to use brick and concrete (Sahabuddin & Longo, 2015, Abdul Rashid ,2009). In 2008, for instance,

timber products constitute only 8% of the total materials used by the Malaysian construction industry, compared to 23% each for iron and steel, and cement and concrete (SEAFI,2008). The construction industry in Malaysia is now increasingly using other alternative materials in applications where timber products used to be the norm (Mohamed & Abdullah, 2014, Marsono & Balasbaneh, 2015).

It is unfortunate that the country does not fully utilize her rich resources in the field of engineering in general and as structural materials in particular, in contrast with well-developed countries. The interest in using timber as a structural member in construction is almost non-existence. The usage is limited to formworks and trusses and is facing fierce competition from other materials. Knowledge on timber properties and design are also lacking among the structural engineers (Jumaat et. al., 2006). This phenomenon is understandable as only a few universities are offering courses on timber design. In terms of timber researchers, a small number of research groups are committed to timber research and promotions (Jumaat et. al., 2008)

The limited growth of timber in construction may in part be linked to the attitude and preferences of professionals regarding wood. The professionals include the structural engineer who is the central technical professionals involved in design and material selection in building construction (Kozak & Cohen, 1999, Bengtson, 2003) where they are responsible for the static performance of the buildings. The influence of structural engineers on material selection is

moderated by other 'stakeholders', for example, the authorities, contractors, architects, and developers (O'Connor et. al.,2004, Nord, 2018).

1.1 Problem Statement

Malaysia is one of the main producers of the world's good quality timbers that are very highly demanded all over the world. However, the local construction industry is not using timber as the main material compared to other building materials such as concrete, brick, steel, and IBS. The amount of timber used as the building material has decreased by just focusing on simple structures such as roof trusses, window frame, and other wood-based panels.

Knowledge on timber is also lacking among the professionals in the construction industry because in the universities only a few courses on timber properties are taught and limited use of timber in the Malaysia construction industry (Jumaat et. al., 2008). For example, as civil engineers, they must have the knowledge about type, structural, design and strength timber as the building material. Knowledge about timber properties is very important, especially for the structural engineers in the construction industry.

1.2 Objectives

The objectives of this study are :-

- i. To analyse the attitude of structural engineers towards the use of timber as a building / construction material.
- ii. To identify the preferences of structural engineers towards the use of timber as a building / construction material.



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