

UNIVERSITI TEKNOLOGI MARA

**CONSTRUCTION WASTE ESTIMATING
MODEL FOR RESIDENTIAL HOUSING
PROJECTS IN SELANGOR AND KUALA
LUMPUR**

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of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own works, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Construction waste issues have become a major concern in most countries but in Malaysia, awareness on the documentation of construction waste generated is still lacking although such record may offer a better management system. Various models in quantifying the construction waste materials have been developed in many countries to improve the management of construction waste. Therefore, this thesis intends to provide models to predict the waste's amount of timber, steel, concrete and bricks generated from a housing project. Variables contributed to the construction waste generation were identified from literature review and were arranged in a structured questionnaire survey. This survey was distributed among Grade seven local contractors in Selangor and Kuala Lumpur area. Besides, archival data comprised of taking off, delivery order and as built drawing of the residential projects within the last three years of duration were collected from contractors in these areas. The findings of the survey resulted that planning of materials was found to be the most significant factor affecting the generation of waste while total cost of the project is opposed. The models developed for timber, concrete, steel and bricks shown the adjusted R-square value of 0.851, 0.535, 0.833 and 0.418 respectively. The performances of the models were evaluated by using the mean absolute percentage error (MAPE) where good model shown value less than 20% (15.478% of timber) and common for range 20%-50% for steel, concrete and brick model with percentage 23.856%, 32.71% and 35.256% respectively. The models developed are believed can assist the practitioners and contractors in estimating the waste will be generated and hence preparing the proper waste management.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

The construction industry is one of the most profitable industries with booming activities around the world, especially in developing countries where construction activities are considered as a continuous developed activity. These activities are not only good for the economy, but it is also responsible for a substantial amount of utilization of global resources and waste emissions.

Malaysia is one of the developing countries is experiencing a rapid-growth of industries which contributes to the Malaysian economy. The Star (2009, November 13th) reported in the article 'construction industry to see 3.5% growth' that the Malaysian construction industry registered the growth of 1.1% in the first quarter of 2009 and improved to 2.8% in the second quarter.

Construction industry in Malaysia is governed by the regulation under several parties which are Malaysian Construction Industry Development Board (CIDB), the National Institute of Occupational Safety and Health (NIOSH) Malaysia, and the local authorities (Lee & Zalina, 2006).

The Malaysian construction industry generally can be separated into two areas. The first area is general construction, which comprises of residential construction, non-residential construction and civil engineering construction. The second area is special trade works, which include activities of metal works, electrical works, plumbing, sewerage and sanitary works, refrigeration and air-conditioning works, painting works, carpentry, tiling and flooring works and glass works (Market Watch Malaysia 2010: Construction Industry, 2010)

It has been estimated about 709,400 units of residential buildings have been constructed based on the Ninth Malaysian Plan. Selangor, announced as a developed state in 2005 embraced the highest percentage of this number, by 19.2%, followed by Johor (12.9%), Sarawak (9.4%) and 8.2% at Perak (KLPos.com, 2007).

In 2005, the Ministry of Housing and Local Government Malaysia have provided an incentive to build low and medium cost housing for the lower-income