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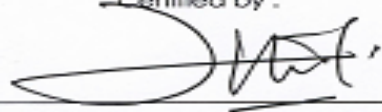
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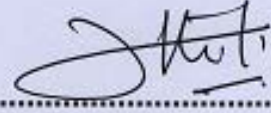
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CONSTRUCTION WASTE GENERATED IN CONVENTIONAL METHOD OF  
HOUSING CONSTRUCTION

ONG ENG GUAN

A project report submitted in partial fulfillment of the  
requirement for the award of the degree of  
Master of Science (Construction Management)

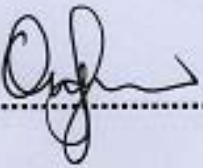
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Specially dedicated to my beloved wife, Chai Lee Chan, my dearest daughter,  
Joanne Ong Joo Yen and my cheering son, Ong Wei Qiao  
For everlasting love and care.....

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## ABSTRACT

Construction waste which is produced or generated during construction of structures consists of timber, wire, broken brick, glass, pipes, concrete, metal and plastics (if the metal or plastics are a part of the materials of construction or empty containers for such materials for paints), coatings, and solvents, asbestos, any liquid, compressed gases or semi-liquids. The type of material waste are also include drywall, masonry, roofing; structural metal, wire, insulation, Styrofoam, other packaging materials and building material such as sand, rocks, and dirt. Garbage however is not construction waste and the disposal of such materials must be in accordance with the regulations of the Municipal Authority. In no event shall construction waste include dangerous or extremely hazardous waste or any kind of garbage, sewerage waste, animal carcasses, or asbestos. It is important to identify the types and quantities of construction waste in a project in order to plan a good construction waste management system on which, the disposal will be minimize with reduce, reuse and recycle are implemented. The study found that in the conventional method of construction, the total construction waste generated in a luxury landed building construction will be around 2.75kg/sqft of as built area. If reuse and recycle are being practice, the dispose waste can be reduced by 40% to 50% of the generated waste. In this study, it also concluded that the extras cost need to be provided in the material wastages at around 8% of the actual calculated material cost. It can be generally conclude that approximately RM0.25/sqf is needed for the disposal cost of the waste for the construction of high-end housing project by using conventional method.

## ABSTRAK

Bahan-bahan buangan pembinaan merupakan sisa-sisa pepejal yang terjana semasa kerja-kerja pembinaan. Bahan-bahan buangan ini adalah terdiri daripada kayu, gentian atap, jubin, dawai, batu-bata, kaca, paip, konkrit, besi, plastik dan lain-lain. Bertambahnya kesedaran orang ramai terhadap impak bahan-bahan buangan pembinaan terhadap persekitaran dan kos pembuangannya telah menjadikan pengurusan bahan buangan pembinaan sebagai salah satu aspek penting dalam pengurusan projek.. Objektif kajian ini adalah untuk mengenal pasti jenis bahan buangan yang terjana dari kerja-kerja pembinaan, mengenalpasti masalah-masalah yang dihadapi dalam pengurusan bahan buangan dan mencadangkan atau memperbaiki amalan pengurusan bahan buangan pada masa ini. Adalah mustahak untuk mengetahui jenis-jenis dan kuantiti sisa pepejal yang akan dijanakan di suatu projek supaya satu sistem pengurusan bahan buangan boleh dirancang. Kuantiti bahan buangan ini boleh di kurangkan jika kegunaan dan kitar semula dipraktikkan. Dalam kajian yang dijalankan, didapati kuantiti bahan-bahan buangan pembinaan yang dijanakan adalah 2.75kg/kakipersegi luas binaan. Dengan proses kegunaan dan kitar semula dipraktikkan jumlah ini telah dikurangkan sebanyak 40% hingga 50% daripada keseluruhan bahan buangan yang dijanakan. Dalam kajian ini juga disimpulkan bahawa kos tambahan yang diperlukan untuk pembelian bahan binaan adalah 8% daripada jumlah kos bahan binaan yang diperlukan. Kos untuk pembuangan bahan-bahan buangan pembinaan rumah kos mewah ini juga dirumuskan sebanyak RM0.25/kaki persegi luas binaan.



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## **CHAPTER I**

### **INTRODUCTION**

#### **1.1 Overview**

The construction industry in Malaysia falls into four broad sectors such as office, retail, residential and infrastructure development. The Malaysian construction sector has recovered and is going through a phase of stabilization following a period of regional recession. The construction sector grew 4.6% in 2007 compared with 0.5% in 2006. It contracted by 1.6% in 2005 and 1.9% in 2004 (The Star, Friday July 4, 2008).

According to the mid-term review report of the Ninth Malaysia Plan (9MP: 2006 – 2010), the construction sector is expected to grow at 5.8% per annum, underpinned by activities within the civil engineering, residential and commercial property sub-sectors. The Ninth Malaysian Plan focuses on infrastructure development of the country, and the government has outlined plans to spend RM220billion on development over the next five years. The government's also plans to construct 43,800 units of low-cost housing and 29,000 units of low and medium cost housing, along with housing quarters for teachers and expected to act as a catalyst for construction industry growth in the Ninth Malaysian Plan. Major infrastructure projects in Malaysia include the Ipoh - Padang

Besar electrified double-track rail project, the bullet train project between Kuala Lumpur and Singapore, Bakun hydroelectric dam project and the West Coast Expressway project. All this does not include the contribution by the private sectors on the booming of construction industry in Malaysia.

## **1.2 Problem Statement**

The Construction industry is the key indicator and driver of economic activity and wealth creation. Although this industry accounts less than 5% of the country gross domestic product (GDP), the Malaysian government is extremely protective of the industry and is taking initiative to improve the industry (The Star, Friday July 4, 2008).

The construction of residential buildings remains active and new housing schemes continue to be developed. The construction of low and medium-cost houses continues to be supported through the Malaysian Government's housing program. Luxurious and high-end landed residential properties, such as semi-detached and bungalows are still in demand, however, on a selective basis depending on its price, location and accessibility.

With the increase of properties, the needs of building material are also increase in ratio which the material cost is around 60% to 75% of the total construction cost of each trade. As a result the construction waste will also increase significantly especially those projects that are using conventional method of construction. This construction waste consists mainly but not limited to timbers, concrete's, metals, bricks, drywall or dry board, roof tiles, tiles, marble, material packaging, plastics, papers, cardboard, glazing and etc. Construction waste is becoming a serious problem in Malaysia. The



construction industry generates lots of construction waste, which caused significant impacts not only on the environment but also aroused growing public concern. Thus, the needs and the importance to know the types and quantities of construction waste that will be generate in a project.

### **1.3 Research Objectives**

The aim of this study is to investigate the construction waste generated in a housing project using the conventional method of construction. In order to achieve the aim of the study, several objectives has been established as follows:

- a) To identify the types of site construction waste generated in conventional method of luxury housing construction.
- b) To determine quantity of site construction wastes generated compared to the total built-up area of building.
- c) To investigate the construction waste management system and construction waste disposal option that practices on site.
- d) To obtain the material wastages cost and construction waste disposal cost.

### **1.4 Scope Of Study**

The scope of study can be outlined as follow:

- a) To collect data on the construction waste generated in the construction of

6 units double storey semi-detached houses, approximately 3,000ft<sup>2</sup> in build-up area for each unit.

The project for the double storey semi-detached houses in this case study is the construction and completion of 48 units of double storey semi-detached houses situated at Damansara Idaman, Petaling Jaya, Selangor Darul Ehsan

- b) To collect data on the construction waste generated in the construction of 12 units double storeys terrace houses, approximately 2,173ft<sup>2</sup> in build-up area for each unit.

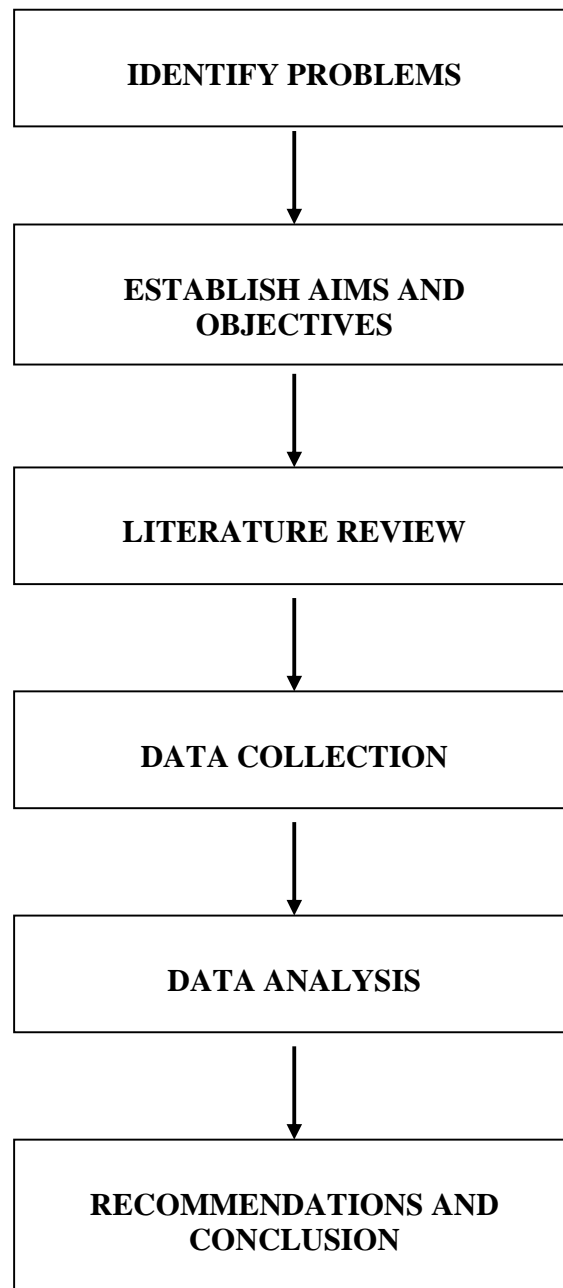
The project for the double storey terrace houses in this case study is the construction and completion of 179 units of double storey terrace houses situated at 7th mile Jalan Gombak, Selangor Darul Ehsan.

## **1.5 Research Methodology**

The study was focused on the construction waste generated in the construction of luxury residential building using conventional method of construction. The scope of study are only emphasised on the double storeys semi-detached and double storeys terrace houses. Literature review process is important and are essential in helping to establish the aims and objectives of this study. The sources of these literature reviews was obtained from reports and publications.

Data on the construction waste are then obtain from the indentified site by observing, segretions and measurement. Quantities of construction material are also obtain from the contract document and ordered quantity. All the data obtain will then be analysed before a recomendation and conclusion will be discuss. The method and detail

on this data collection, location, and analysis will be explain in more detail in chapter 3 and 4 respectively. The reseach methodology flowchart is shown in Figure 1.1



**Figure 1.1 Research Methodology Flowchart**