

**STUDY ON THE CONSTRUCTION WASTES  
GENERATION AT KUALA TERENGGANU**

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## **SUPERVISOR'S DECLARATION**

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Bachelor Degree in Civil Engineering.

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## **STUDENT'S DECLARATION**

I hereby declare that the work in this thesis 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 Universiti Malaysia Pahang or any other institutions.

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STUDY ON THE CONSTRUCTION WASTES GENERATIONS AT KUALA  
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## ABSTRAK

Nowadays, the increasing quantity of municipal solid waste has causes serious environmental problem which requires a better solution in handling the wastes that generate. Construction waste is considered as part of the municipal solid waste. Construction wastes that produce in the construction process contributes a large amount to municipal solid waste. For that reason, a proper way of handling construction wastes is significance in reducing the negative impacts towards the environment, social, and economy.

This first objective of the study is to estimate the quantity of waste generation at selected construction sites near Kuala Terengganu. Other than that, this study also to investigate the current practices or C&D waste management on sites. Lastly the objective of this research is to identify the strategies taken by the companies in minimizing waste at construction sites. Quantitative method is used as a data collections for this study. This is related with taken a sampling from a certain population. For this study, questionnaire had been given to the 32 person from 32 sites.

The responded to questionnaire about total estimated waste generated, method of disposing and the method how the managed the waste. Survey information was obtained through the respond from reviewer and all responses remained confidential. Descriptive statistics were used to analyse the data..

From the survey, there a few types of waste found during the all phase of construction. The most commons five of type of waste generated at selected 32 constructions sites are wood (26%), followed by steel 23%, brick 22%, concrete 18% and lastly plastic (11%). Besides, the respondents believed that there are a few factors which contribute to the waste generation. However, the respondents agreed that design changes during the construction phase contribute the highest factor of waste generation. Most of the sites managed to disposed the waste by sending the waste to the disposal centre which are lefal in Malaysia. The legal landfill in Kuala Terengganu is located at Kampung Sungai Ikan, Terengganu and Sungai Kerak, Marang A few action has been taken in order in minimizing waste. the respondents believed that the worker should cut the material like steel reinforcements, timber or pipes properly to reduce the waste.

Lastly, it is essential for the contractors to follow Site Waste Management Plans (SWMPs) in order to manage the construction waste more effectively.

## ABSTRACT

Sisa pembinaan yang dihasilkan dianggap sebagai sebahagian daripada sisa pepejal perbandaran. Sisa-sisa pembinaan yang dihasilkan dalam proses pembinaan menyumbang kepada sejumlah besar kepada sisa pepejal perbandaran. Kini, peningkatan jumlah sisa pepejal menyebabkan masalah alam sekitar yang serius yang memerlukan penyelesaian yang lebih baik dalam menangani sisa-sisa yang menghasilkan. Atas sebab itu, cara yang betul untuk mengendalikan sisa pembinaan adalah penting dalam mengurangkan kesan negatif terhadap alam sekitar, sosial dan ekonomi.

Objektif kajian ini adalah untuk menganggarkan kuantiti penjanaan sisa di tapak pembinaan terpilih berhampiran Kuala Terengganu. Selain itu, kajian ini juga untuk mengkaji strategi yang diambil oleh syarikat dalam meminimumkan sisa pembinaan. Akhir sekali objektif kajian ini adalah untuk mengkaji amalan C & D semasa dan pengurusan pembinaan sisa. Kaedah kuantitatif digunakan sebagai koleksi data untuk kajian ini. Ini berkaitan dengan mengambil sampel dari penduduk tertentu. Untuk kajian ini, soal selidik telah diberikan kepada 32 orang dari 32 tapak.

Maklumat tinjauan telah diperolehi melalui respons daripada pengulas dan semua jawapan masih sulit. Statistik deskriptif digunakan untuk menganalisis data. Daripada tinjauan, terdapat beberapa jenis sisa yang terdapat semasa fasa pembinaan berjalan. Kebanyakan lima jenis sisa yang dijana di 32 tapak pembinaan ialah kayu (26%), diikuti oleh keluli 23%, bata 22%, konkrit 18% dan terakhir plastik (11%). Selain itu, responden berpendapat bahawa terdapat beberapa faktor yang menyumbang kepada penjanaan sisa. Walau bagaimanapun, responden bersetuju bahawa perubahan reka bentuk semasa fasa pembinaan menyumbang faktor penjanaan sisa tertinggi. Kebanyakan tapak pembinaan ini berjaya melupuskan sisa itu dengan menghantar sisa ke pusat pelupusan yang lefal di Malaysia. Tapak pelupusan di Kuala Terengganu terletak di Sungai Ikan, Terengganu dan Sungai Kerak, Marang Beberapa tindakan telah diambil untuk meminimumkan sisa dan para responden percaya bahawa pekerja harus memotong bahan seperti besi bar, kayu atau paip dengan baik untuk mengurangi sisa di tapak pembinaan.

Akhir sekali, Sangat penting bagi kontraktor untuk mengikuti Rancangan Pengurusan Sisa (SWMPs) untuk menguruskan sisa pembinaan dengan lebih berkesan

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## LIST OF ABBREVIATIONS

ASD	Architectural Services Department
CIDB	Construction Industry Director Board
C&D	Constructions & Demolition
ICI	Industrila, commercial & institutional
M&R	Maintenance & Renovations
NEA	Suspended Solids
PE	Ployethylene
PS	Polystrene
PWD	Public Work Department
PVC	Poliviny Chloride
WMP	Waste Management Plan
WRF	Waste Reduction Framework Plan

## CHAPTER 1

### INTRODUCTION

#### 1.1 Background of Study

Managing waste can be challenging for industrial, commercial and institutional (ICI) sectors. Organizations must deal with a wide variety of materials, large volume of waste and behaviours of many customers, visitors and others from within and outside of the province. There is no action can meets the needs of all ICI sector organizations. However, a strategic solid waste management planning approach will help to define solid solutions. The management of constructions wastes is a global environmental issues faced by the some countries around the worlds.

Construction waste generation has been identified as one of the major issues in the constructions industry. In fact, this uptake of building activities results in about 30% of the total annual waste generation worldwide (Jun et al., 2011; DEFRA, 2015; EC, 2015). This thus puts immense pressure on the depleting landfill sites and affects the environment adversely. To ensure the conservation of natural resources and to reduce the cost and impacts of waste disposal, effective waste management practices must be put in place. This will ensure the flow of construction material in a closed loop to minimise waste generation, preserve natural resources and reduce demand for landfills. To achieve this, effective management strategies such as waste reduction, component reuse and material recycling are needed to divert Construction and Demolition Waste (CDW) from landfills (Scotia, 2013)

According to Fishbein (1998), construction and demolition (C&D) debris frequently comprises 10%-30% of the waste received at many landfill sites around the world. In United Kingdom, the rates of wastages that related to its construction industry



may be assumed as high as 10% -15% compared to waste generated in Australia, United States of America and Canada respectively. (McGarth et. Al., 2000). Over the decades, building construction activities have generated the largest volume of waste across the globe (Osmani, 2013). This waste could be attributed to the constant uptake of construction, demolition and renovation activities during which villages are built into towns, towns into cities and cities into mega cities (Jaillon and Poon, 2014).

Other than that, during the last two decades, extensive building and infrastructure developments are the factors led to an increase in construction waste generation in Malaysia. A study showed that 28.34% of waste comes from industrial and construction waste in the Central and Southern regions of Malaysia (Mohd Nasir et. Al, 1998). This is because when the construction is widen from one time to time, it generated more construction waste in Malaysia. Finally, it will gives more bad impacts to our environment and surroundings too.

Integrated waste resource management planning will allow the companies to perform a comprehensive strategy that can be stay effective if there is changing economic, social, material and environmental conditions. In some cases, the best method and efficient cost to manage waste is through waste minimizing as a primary focus for most integrated waste management plans. Lastly, together with that, specific missions and targets wil be the defined in a plan

## 1.2 Problem Statement

Nowadays, the biggest environmental problems in Malaysia is arise when the generation of solid waste rose up from day to day. The increasing number of population has led to the increasing of C&D waste and it has become a big issue to be solved. According to Zia & Devada in year 2007, the waste generated are from sources like domestic, industrial and commercial and at the same time it showed as an increasing trends throughout the world. On the other hand, construction waste is one of the factor the waste generated and it is categorized under solid waste. Besides, construction and demolition (C&D) waste consists of materials which are normally produced to construction, demolition and renovation projects. It can be identifid as source of waste for all organizations in the ICI sector. C&D waste are included soil, asphalt, brick, mortar, drywall, plaster, cellulose, fibreglass fibres, lumber, wood, asphalt and manymore (Nova Scotia Solid Waste-Resource Management Regulations., 1996). On top of that, the solid waste management plays an important role in maintaining a sustainable environment.

From the sustainability aspects, waste management is not a small issue and it is only becoming worst. Nowadays there are many current discussions focus on creating sustainability for the construction design, the industry waste practices also have a big impact on constructions long term sustainability. With the built environment sector demanding 40% of the world extracted materials and constructions waste making the largest contribution to waste streams in many countries, the fact is that it is simply unsustainable for construction to continue its linear approach to waste which are “make, use, and dispose”. One of the big reason being that is the construction industry are running out of places to manage the waste.

Besides, inadequate waste management practices can be a serious drain on project profit margins. As a general rule, the more waste produced by a certain project, the less profitable it will be. The cost of buying of unused and wasted materials, labour cost associated with waste handling, cost of waste storage transportation and handling, annual increases in landfill tax are the factors that will cut the project profitability.

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