

**ANALYSIS OF ECO-EFFICIENCY
PERFORMANCE OF REINFORCED CONCRETE
SINGLE STOREY RESIDENTIAL HOUSE IN
PROMOTING SUSTAINABLE STRUCTURE**

By

OMAR OTHMAN BIN JASNI

This report is submitted as a
partial requirement for the degree of
Bachelor of Engineering (Hons) Civil (Infrastructure)

**UNIVERSITI TEKNOLOGI MARA
JANUARY 2019**

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DECLARATION OF THE CANDIDATE

I declare that the work in this thesis was carried out accordance with the regulation of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledge as referenced work. This topic 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 Regulation for Under Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Sustainable development is referring to the development that create based on the current requirement without affecting the future capability in order to fulfill the needs. This concept was classified into three criteria which are economical criteria, environmental criteria and social criteria. Environmental criteria were criteria that related with the production of natural resources. Economic criteria were criteria that consider the profit gained from the project as people's benefits while social criteria were criteria that consider human safety, health and comforts. According to an annual report of United State Green Building Council, construction building has contributed more than 40 percent carbon emission compared with the industrial and transportation sector. This prove that inefficient design of structure was affected the environmental condition besides cost of project. Apart of that, this study was proposed an eco-efficiency index analysis method that integrates the cost and equivalent carbon emission content in single storey houses. In this method, the structural design was proposed in different value of concrete characteristic strength which are 20, 25, 30, 35 and 40MPa. This study was focused on structural element analysis of carbon emission for foundation, slab, beam and column. By using environmental score and economical score approach, it was found that blast furnace slag concrete produce higher eco-efficiency index value where it gave better performance in environmental and economical impact compare to normal concrete. Therefore, an eco-efficiency index method can be used for selecting the best structural design in promoting sustainable design. Based on the result, Case 5 have produce the optimum value of eco-efficiency index it show an optimum combination of concrete grade.

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