

**EVALUATION ON THE USE OF TILES
WASTE IN STABILIZATION OF
SUBGRADE LAYER WITH RICE HUSK
ASH AS AN ACTIVATOR AGENT**

NUR SABREENA BINTI MARHAMI

**Bachelor of Engineering (Hons) Civil
(Infrastructure)
UNIVERSITI TEKNOLOGI MARA
JULY 2019**

**EVALUATION ON THE USE OF TILES WASTE
IN STABILIZATION OF SUBGRADE LAYER
WITH RICE HUSK ASH AS AN ACTIVATOR
AGENT**

By
NUR SABREENA BINTI MARHAMI

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

**UNIVERSITI TEKNOLOGI MARA
JULY 2019**

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 work, unless otherwise indicated or acknowledged 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 Regulations for Under Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Author : Nur Sabreena binti Marhami
Author I.D. No. : 2016209962
Programme : Bachelor of Engineering (Hons) Civil (Infrastructure)
Faculty : Civil Engineering
Thesis Title : Evaluation on the Use of Tiles Waste in Stabilization of Subgrade Layer with Rice Husk Ash as an Activator Agent

Signature of Author :

Date : JULY 2019

ABSTRACT

Good design of highway gives a crucial contribution to economic growth and social benefit by providing access to employment, health and education services. In the process of designing the highway, the importance of having natural soil as subgrade layer is crucial to ensure the quality of road itself. One of the main and foremost processes in the construction of highway is subgrade soil stabilization. However, this process can be very costly. An alternative should be done in order to justify this problem. Therefore, in Malaysia, waste generation is increasing year by year due to the large amount of waste produced. As the world is now facing a serious problem on handling disposal materials, stabilizing agent for the soil can be used to solve this problem. Previous researches shown that tile waste is a potential source of construction material and soil stabilizer. Besides, many studies have been conducted with the aim of reducing the cost for soil stabilization; one option is by using waste materials such as tiles waste (TW) and rice husk ash (RHA) (Sumayya, et al., 2016). This type of wastes can improve the strength of the problematic soil thus make it to be environmentally friendly. The study is concerned with the role of TW content in stabilized problematic soil physical characteristics. The main aim of this research is to determine the optimum percentage of TW content for stabilization of problematic soil from Batu Kawan, Pulau Pinang. The soil was stabilized with five proportions of TW (15%, 20%, 25%, 30% and 35%) and constant RHA of 10% was used as an activator agent. The specimens were then cured for 0, 7 and 14 days before being subjected to the unconfined compression test (UCT). It was found that the optimum percentage of TW is at 30% added with RHA of 10% in soil. The highest value of UCT test for the sample was found to be 250kN/m². Therefore, the test results showed that the RHA-TW admixture could effectively improve the strength of problematic soil.

Keywords: Soil Stabilization, Rice Husk Ash, Tiles waste, Unconfined Compression Test

ACKNOWLEDGEMENT

Assalamualaikum w.b.t.

I would like to express my deepest appreciation to all those who involved in completing this report. A special gratitude to my final year project supervisor and co-supervisor, Mr. Fairus Azwan Azizan and Mrs. Zanariah Abd Rahman, who has contributed suggestions and encouragement, and gave a lot of helps for me in coordinating my project. A lot of knowledge and information were given to me to complete this project perfectly.

A special thanks to my partner, who had helped me a lot in completing this final year project. The cooperation given makes our project ran smoothly. Furthermore, I would like to acknowledge with much appreciation the vital role of the assistant engineer, Mr. Azrul Aswad and Mrs. Suzana Haji Ahmad, who helps me in most of the laboratory conducted.

Finally, big thanks to my family members and friends who dedicated me with their supports and prayers and willing to contribute their ideas during completing this final year project.