EFFECTIVENESS OF CRUSHED COCONUT SHELL AND EGGSHELL POWDER TO ACT AS SUBGRADE STABILIZER

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Bachelor of Engineering (Hons) Civil (Infrastructure)
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This report is submitted as a
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DECLARATION BY THE CANDIDATE

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.

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ABSTRACT

The effectiveness of stabilization for subgrade layer will determine the performance of pavement design. Weak subgrade layer will create critical problems to the upper layer such as dissertation and soil settlement. Some method can be used to increase soil bearing capacity either use imported soil, chemical stabilization, geosynthetic stabilization or waste stabilization. Commonly, soil stabilization was using chemical stabilization for instance lime, cement and fly-ash but this study was focused on using agricultural waste such as crushed coconut shell and eggshell powder to improve the engineering properties of laterite soil. Coconut shell and egg shell can reduce construction cost because these two materials were typical domestic waste and most importantly it could reduce waste dumping on landfill. The purpose of this study is to investigate the effectiveness mixture of eggshell powder (ESP) and Crushed Coconut Shell (CCS) on soil performance for subgrade layer in term of soil bearing capacity. Soil sample that was using is laterite soil that classified under Silty SAND with specific gravity value 2.56 Mg/m^3. In order to evaluate soil bearing capacity after mixing with CCS and ESP, various percentages of CCS which is 2%, 4%, 6% and 8% with constant 3% ESP were conducted using California Bearing Ratio (CBR) whereby each of the percentage will undergo soaked and unsoaked condition. The finding shows that the maximum CBR value achieved at 4% of CCS for both condition (soaked and unsoaked). Overall it can be concluded that CCS and ESP can be considered as a good soil improvement technique with economic cost and environmental friendly.