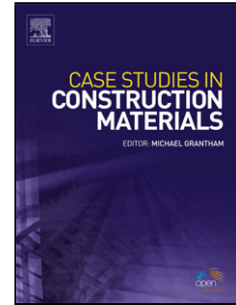


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Ameliorating Effect of Milled Eggshell on Cement Stabilized Lateritic Soil for Highway Construction

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ABSTRACT. This case study outlined the outcomes from the laboratory assessment of a lateritic soil stabilized with milled eggshell, cement and mixture of both in ratio 1:1 for potential use as a highway construction material. The stabilizing binders were added to the soil at varying percentages of 0, 2, 4, 6, and 8% by weight of the soil and afterwards subjected to various laboratory tests to determine its ameliorating effect. The test results showed that both unsoaked and soaked California bearing ratio (CBR) values increased with higher stabilizing binder content. The unconfined compressive strength (UCS) values just like the CBR values also increased with higher stabilizing binder content. The 8% milled eggshell and cement stabilized samples recorded peak UCS value of 760.7 kN/m², unsoaked CBR value of 87% and soaked CBR value of 45%. This peak UCS value met the condition by Nigerian General Specifications for highways of 750–1500 kN/m² for use as subbase material for light trafficked highways. The microstructural analysis gave a possible explanation for an increase in the strength and decrease in Atterberg limit of stabilized samples. The durability of some stabilized soil samples was satisfactory, the percentage resistance to loss in strength was not below the recommended maximum of 80%. An 8% by soil weight of milled eggshell and cement mixture in ratio 1:1 stabilized lateritic soil could be used as a potential subbase material for highway construction.

KEYWORDS: California bearing ratio; Lateritic soil; Durability; Milled eggshell; Stabilization.

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