

Stabilization of Lateritic Soil Sample from Ijoko with Cement Kiln Dust and Lime

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Abstract : When building roads and paved surfaces, a strong foundation is always essential. A durable material that can withstand years of traffic while staying trustworthy must be used to build the foundation. A frequent problem in the construction of roads and pavements is the lack of high-quality, long-lasting materials for the pavement structure (base, subbase, and subgrade). Hence, this study examined the stabilization of lateritic soil samples from Ijoko with cement kiln dust and lime. The study adopted the experimental design. Laboratory tests were conducted on classification, swelling potential, compaction, California bearing ratio (CBR), and unconfined compressive tests, among others, were conducted on the laterite sample treated with cement kiln dust (CKD) and lime in incremental order of 2% up to 10% of dry weight soft soil sample. The results of the test showed that the studied soil could be classified as an A-7-6 and CL soil using the American Association of State Highway and transport officials (AASHTO) and the unified soil classification system (USCS), respectively. The plasticity (PI) of the studied soil reduced from 30.5% to 29.9% at the application of CKD. The maximum dry density on the application of CKD reduced from 1.9.7 mg/m³ to 1.86mg/m³, and lime application yielded a reduction from 1.97mg/m³ to 1.88.mg/m³. The swell potential on CKD application was reduced from 0.05 to 0.039%. The study concluded that soil stabilizations are effective and economic way of improving road pavement for engineering benefit. The degree of effectiveness of stabilization in pavement construction was found to depend on the type of soil to be stabilized. The study therefore recommended that stabilized soil mixtures should be used to subbase material for flexible pavement since is a suitable.

Keywords : lateritic soils, sand, cement, stabilization, road pavement

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