

ABSTRACT

Lateritic gravel is a marginal material that is locally available in most parts of Kenya, but they rarely meet the specifications to be used as a pavement material due to GAB grading and higher plasticity. This study analyzed the process involved in the stabilization of lateritic gravel to be used as a flexible pavement material through stabilization by a combination of molasses and bagasse ash. In an attempt to reduce overreliance on the use of traditional stabilizers like cement, lime, and others that have a negative impact on the environment, the research employed the use of molasses and bagasse ash since they are locally available, cheap, and eco- friendly. Both molasses and bagasse ash were used as alternatives since they contain compounds known to improve and change the characteristics of lateritic gravel. The soil samples were taken from Maruirui in Ruiru.

The effect of molasses and bagasse ash on lateritic gravel was determined at various percentages (2%,4%,6%) both by weight. Compaction properties, Atterberg limits, and strength characteristics were determined for both stabilized and unstabilized laterite gravel.

From the research, it was evident that the 2% of (Molasses+ Bagasse ash) combination was the optimum for the effective stabilization of lateritic gravel. At 2% the results for mechanical stabilization showed that there was an increase in Maximum

Dry Density higher than that of the neat sample. At optimum percentage, UCS values improved as compared to the UCS values of the neat sample. The study also established that neat lateritic gravel gave lower CBR values as compared to the one mixed with molasses and bagasse ash at 2%. The increase in CBR values higher than that of the neat sample was an indication that a combination of molasses and bagasse ash caused the soil of strength to increase and therefore it stabilized the lateritic gravel. Molasses was observed to have Calcium Oxide as the main compound while Bagasse ash had Silica Oxide, which are the main elements that contributed to the increase in strength values. Both sugarcane molasses and bagasse ah improved the engineering qualities of lateritic gravel i.e., California Bearing Ratio, Unconfined Compressive Strength and Maximum Dry Density.