Effects of Oil Palm Shell and Curing Time to the Load-Bearing Capacity of Clay Subgrade

Abstract

Road construction built over subgrade clay soil may experience lower shear strength of bearing capacity which may develop the failure of the structure. In order to meet the shear strength requirement, improvement of weaker subgrade is essential. This study investigates the potential of Oil Palm Shell (OPS) for subgrade improvement. The effects of Oil Palm Shell and its curing time in the mixture of the clay subgrade were examined by series of laboratory tests. The clay soils were mixed with OPS additives at 10%, 20% and 30% of total mix. Modified proctor compaction was performed to get the optimum moisture content and maximum dry density for the CBR sample preparation. Samples were then cured for 7 days, 10 days, 14 days, 20 days and 28 days prior California Bearing Ratio test to examine the improvement effect. The results reveal that Oil Palm Shell improves the load bearing capacity of the clay soil subgrade due to higher CBR value produced as compared to conventional mix. The highest CBR values obtained from 30% oil palm shell at 20 days curing period. Thus, it can be concluded that the addition of Oil Palm Shell to the clay soil can improve the load bearing capacity of subgrade in the pavement construction.