

## **Stabilization of Spent Engine Oil Contaminated Lateritic Soil Admixed with Cement Kiln Dust for Use as Road Construction Materials**

**Authors :** Johnson Rotimi Oluremi, A. Adedayo Adegbola, A. Samson Adediran, O. Solomon Oladapo

**Abstract :** Spent engine oil contains heavy metals and polycyclic aromatic hydrocarbons which contribute to chronic health hazards, poor soil aeration, immobilisation of nutrients and lowering of pH in soil. It affects geotechnical properties of lateritic soil thereby constituting geotechnical and foundation problems. This study is therefore based on the stabilization of spent engine oil (SEO) contaminated lateritic soil using cement kiln dust (CKD) as a mean of restoring it to its pristine state. Geotechnical tests which include sieve analysis, atterberg limit, compaction, California bearing ratio and unconfined compressive strength tests were carried out on the natural, SEO contaminated and CKD stabilized SEO contaminated lateritic soil samples. The natural soil classified as A-2-7 (2) by AASHTO classification and GC according to the Unified Soil Classification System changed to A-4 non-plastic soil due to SEO contaminated even under the influence of CKD it remained unchanged. However, the maximum dry density (MDD) of the SEO contaminated soil increased while the optimum moisture content (OMC) behaved vice versa with the increase in the percentages of CKD. Similarly, the bearing strength of the stabilized SEO contaminated soil measured by California Bearing Ratio (CBR) increased with percentage increment in CKD. In conclusion, spent engine oil has a detrimental effect on the geotechnical properties of the lateritic soil sample but which can be remediated using 10% CKD as a stand alone admixture in stabilizing spent engine oil contaminated soil.

**Keywords :** spent engine oil, lateritic soil, cement kiln dust, stabilization, compaction, unconfined compressive strength

**Conference Title :** ICEGG 2018 : International Conference on Engineering, Geology and Geotechnics

**Conference Location :** Dublin, Ireland

**Conference Dates :** January 30-31, 2018