

EFFECT OF CURING TIME ON UNCONFINED COMPRESSIVE STRENGTH OF LATERITIC SOIL STABILIZED WITH TYRE ASH

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ABSTRACT

This study was to assess the effect of tyre ash on the geotechnical characteristics of compacted lateritic soils derived from migmatite gneiss in order to discover a conventional and cheaper stabilizer for pavement construction. Method employed included field sampling operation during which lateritic soil samples labeled A, B and C were collected. The basic index and engineering properties of soil were determined following the procedures stipulated by British Standard 1337 of 1992. The samples were compacted at modified American Association of State Highway and Transportation Official (AASTHO) level. The soil samples were subsequently stabilized with 2%, 4%, 6%, and 8% tyre ash in order to determine the influence of the stabilizer on the engineering properties of the soils.

Samples were cured for 7, 14 and 28 days in case of unconfined compression test. Samples for the determination of unsoaked CBR were cured for six days while samples for soaked CBR were also cured for the same number of days and soaked in water for 24 hours before tests were conducted. Specific gravity (2.74-2.78) revealed the soils were inorganic lateritic soil while the grain size analysis indicated that the percentages passing No. 200 BS sieve were 74.4%, 74.61% and 77.78% for samples A, B and C respectively. The soils were well graded and belong to group A-7-6 of the AASTHO classification system. The lateritic soils were of high plasticity and compressibility.

Stabilization of the lateritic soil derived from migmatite gneiss with tyre ash was quite effective. Significant increase in the values of Optimum Moisture Content, Unconfined Compressive Strength and California Bearing Ratio were obtained upon stabilization with 2-8% of the stabilizer. However there was reduction in the Maximum Dry Density of all the soil samples. Increasing the curing time decreased the UCS of the stabilized lateritic soils. Although the geotechnical properties of the stabilized lateritic soils were significantly improved, none of them met the requirements for road construction.

KEYWORDS: Curing Time, Tyre Ash, Engineering Properties, Lateritic Soils, Stabilization