

STRENGTH CHARACTERISTICS OF LATERITIC SOIL STABILIZED WITH TERRASIL AND ZYCOBOND NANNO CHEMICALS

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ABSTRACT

Laterite is a major material in road construction. However, Stabilization of weak laterite with cement or lime is expensive and well reported. There is a paucity of information on stabilization of weak laterite with Nano chemicals. This study investigates the Geotechnical properties of weak laterites Stabilized with Nano chemicals (Terrasil and Zycobond).

Lateritic soil samples were collected from two different burrow pits (Sample A, latitude: 8^o08'N longitude: 4^o15' E and (Sample B, Latitude: 8^o25' N, Longitude: 4^o.3' E, Altitude: 306). Terrasils and Zycobonds were measured in weight to stabilize the laterites at 5, 10, 15, 20%, respectively. Geotechnical testing, which includes: Particle Size Analysis, Liquid Limit (LL), Plastic Limit (PL), Maximum Dry Density (MDD), Optimum Moisture Content (OMC) and California Bearing Ratio (CBR) were carried out on stabilized and unstabilized samples.

Particle size distribution analysis showed that the percentage passing sieve No 200 for Sample A and B were 76.6% and 66.5%, respectively. Using the AASHTO classification system, the soils falls into A-5 - A-7 soils. The LL, PI, MDD and OMC for Terrasil stabilized samples A ranges from (36 -52)%, (8 -32)%, (1.73 - 2.34)g/cm³, (7.20 - 10.8)% Sample B values range from (36 - 58)%, (15-34)%, (1.8 - 2.63)g/cm³, (10.5 - 14.0)%. Zycobond Stabilized samples A varies from (45 - 50)%, (14 -30)%, (2.21 - 1.92)g/cm³, (11.5 - 24.0)%. Sample B values vary from (37 - 56)%, (11-38)%, (1.79 - 2.09)g/cm³, (9.6 - 12.4)%. The average CBR (soaked and unsoaked) for Terrasil stabilized samples ranges from (5 - 6)%, (13-17)% and (4 - 6)%, (20 - 25)%. The CBR for Zycobond samples ranges from (5 -7)%, (20-29)% and (3-14)%, (22-55)% for samples A and B, respectively.

This Study showed that the Optimum percentage of Nano Chemicals that gave the highest Compressive Strength was 15%. Nano Chemicals (Terrasil and Zycobond) enhanced the Geotechnical properties of weak lateritic soil.

KEYWORDS: *Laterite, Nano Chemicals, Geotechnical Properties, Terrasil and Zycobond*

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