

Experimental Study of Geotextile Effect on Improving Soil Bearing Capacity in Aggregate Surfaced Roads

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Abstract : Geosynthetics utilization plays an important role in the construction of highways with no additive layers, such as asphalt concrete or cement concrete, or in a subgrade layer which affects the bearing capacity of unbounded layers. This laboratory experimental study was carried out to evaluate changes in the load bearing capacity of reinforced soil with these materials in highway roadbed with regard to geotextile properties. California Bearing Ratio (CBR) test samples were prepared with two types of soil: Clayey and sandy containing non-reinforced and reinforced soil. The samples comprised three types of geotextiles with different characteristics (150, 200, 300 g/m²) and depths (H= 5, 10, 20, 30, 50, 100 mm), and were grouped into two forms, one-layered and two-layered, based on the sample materials in order to perform defined tests. The results showed that the soil bearing characteristics increased when one layer of geotextile was used in clayey and sandy samples reinforced by geotextile. However, the bearing capacity of the soil, in the presence of a geotextile layer material with depth of more than 30 mm, had no remarkable effect. Furthermore, when the two-layered geotextile was applied in material samples, although it increased the soil resistance, it also showed that through the addition of a number or weights of geotextile into samples, the natural composition of the soil changed and the results are unreliable.

Keywords : reinforced soil, geosynthetics, geotextile, transportation capacity, CBR experiments

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