

The Influence of the Geogrid Layers on the Bearing Capacity of Layered Soils

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Abstract : Many classical bearing capacity theories assume that the natural soil's layers are homogenous for determining the bearing capacity of the soil. But, in many practical projects, we encounter multi-layer soils. Geosynthetic as reinforcement materials have been extensively used in the construction of various structures. In this paper, numerical analysis of the Plate Load Test (PLT) using of ABAQUS software in double-layered soils with different thicknesses of sandy and gravelly layers reinforced with geogrid was considered. The PLT is one of the common field methods to calculate parameters such as soil bearing capacity, the evaluation of the compressibility and the determination of the Subgrade Reaction module. In fact, the influence of the geogrid layers on the bearing capacity of the layered soils is investigated. Finally, the most appropriate mode for the distance and number of reinforcement layers is determined. Results show that using three layers of geogrid with a distance of 0.3 times the width of the loading plate has the highest efficiency in bearing capacity of double-layer (sand and gravel) soils. Also, the significant increase in bearing capacity between unreinforced and reinforced soil with three layers of geogrid is caused by the condition that the upper layer (gravel) thickness is equal to the loading plate width.

Keywords : bearing capacity, reinforcement, geogrid, plate load test, layered soils

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