

***A STUDY ON THE REINFORCEMENT LAYERS EFFECT ON
SQUARE FOOTING EMBEDDED IN FLYASH REINFORCED
WITH GEOGRID UNDER CYCLIC LOADING***

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Abstract: In pavement and foundation engineering, the geosynthetic technique to improve the properties of soil is using extensively over the last few decades. The reinforced soil concept is based on the strength, friction, and adhesive properties of the reinforcement. Experiments are carried out on the square footing resting on flyash beds with and without geogrid subjected to cyclic loads. The experiments are carried out on different loading magnitude of 250kN/m^2 , 350kN/m^2 , and 450kN/m^2 . The experimental results demonstrate that the square footing resting on flyash bed, reinforced with geogrid perform better than its counterpart resting on flyash bed without reinforcement. In reinforced flyash bed, the square footing resting on a three-layer reinforced flyash bed performs better than the two and four layers of reinforcement.

Keywords: flyash, geogrid, load cycles, settlement, cyclic resistance ratio(CRR), Settlement ratio(SR).

1 Introduction

In pavement and foundation engineering, the geosynthetic technique to improve the properties of soil is using extensively over the last few decades. The reinforced soil concept is based on the strength, friction, and adhesive properties of the reinforcement.

The use of geosynthetics in earth structure to improve the bearing capacity and settlement performance has been proved to be cost-effective. The flexibility of reinforcing material varies from stiff to flexible. The types of geosynthetics are geotextiles, geogrids, geomembranes, geonets, etc.

According to the study of the dynamic behavior of geogrid reinforced sand, the maximum permanent settlement of the foundation is reduced because of the geogrid reinforcement and found that the critical depth of reinforcement and critical width of reinforcement layer is 1.33 times of the width of foundation and 4 times the width of foundation respectively(Shin and Das). The bearing capacity increased by almost three times in the soft clay zone where the footing was reinforced by four layers (Nagy et al.). Geogrid reinforcement also increases the performance of footing embedded in a flyash bed (Gangadara et al).