

Kinematic Behavior of Geogrid Reinforcements during Earthquakes

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Abstract : Reinforced earth structures are generally subjected to cyclic loading generated from earthquakes. This paper presents a summary of the results and analyses of a testing program carried out in a large-scale multi-function geosynthetic testing apparatus that accommodates soil samples up to 1.0 m³. This apparatus performs different shear and pullout tests under both static and cyclic loading. The testing program was carried out to investigate the controlling factors affecting soil/geogrid interaction under cyclic loading. The extensibility of the geogrids, the applied normal stresses, the characteristics of the cyclic loading (frequency, and amplitude), and initial static load within the geogrid sheet were considered in the testing program. Based on the findings of the testing program, the effect of these parameters on the pullout resistance of geogrids, as well as the displacement mobility under cyclic loading were evaluated. Conclusions and recommendations for the design of reinforced earth walls under cyclic loading are presented.

Keywords : geogrid, soil, interface, cyclic loading, pullout, large scale testing

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