



Cairo University

CHARACTERIZATION OF GEOGRID PULLOUT MECHANISM FOR CALCAREOUS SAND BACKFILL

By

Ahmad Mahdi Abdelmawla

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
in
CIVIL ENGINEERING – PUBLIC WORKS

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Title of Thesis:

Characterization of geogrid pullout mechanism for calcareous sand backfill

Key Words:

Pullout; Geosynthetics; Calcareous sand; uniaxial geogrid; Reinforced Soil

Summary:

There are two primary failure mechanisms associated with MSE walls using geogrids including rupture and pullout. The failure mechanism with relevance to this thesis is the pullout failure. This type of failure mechanism depends on the interaction between the backfill soil and reinforcement. In order to properly select a type of backfill soil or reinforcement that will provide sufficient interaction strength, the soil reinforcement interaction should be tested and characterized using pullout tests. Siliceous sands have been widely used as a backfill soil in MSE walls. Also, most published researches address the geogrid pullout resistance embedded in siliceous sands. Geogrid pullout design empirical equations and parameters in design codes such as AASHTO are based on using siliceous sands as a backfill material. In this thesis, the aim is to evaluate the interaction between calcareous sand as a backfill soil and two types of geogrids including HDPE and polyester, performing and analyzing laboratory pullout test results.

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Dedication

This thesis is dedicated to the most valuable and precious people in my life, my Parents. Those who without them I would have never reached anywhere in this life.

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