
# BEARING CAPACITY OF SHALLOW FOUNDATIONS ABOVE REINFORCED SOIL AND MSE WALLS

By

**Omar Mohamed Sherif Bahaa El Din**

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:**

Bearing Capacity of Shallow Foundations above Reinforced Soil And MSE Walls


**Key Words**:

Bearing capacity, Numerical modeling, MSE Walls, Reinforced Soil.



**Summary:**

Mechanically stabilized earth walls is an efficient solution to overcome the problem the society faces due to the overpopulation. Constructing a building above a MSE Walls is very risky for designers, since damage of the soil reinforcement is predictable in this case. In this research, Two dimensional Finite Element analysis model of a MSE Wall was constructed using different constitutive models for simulating the backfill. A comparison between the numerically predicted model and full-scale test was conducted is presented to assess the adequacy of the numerical model adopted. The parametric study included changing properties of the contents of the MSE Walls and studying its effect on the overall stability. The results indicated that bearing resistance of a strip footing above a MSE Wall recommended by FHWA is higher than minimum bearing capacity concluded from the analysis.

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Finally, I am greatly indebted to my family for their prayers and standing by my side.

# Dedication

I dedicate the following thesis to my family and to my beloved grandfathers. Gedo Abd El Aziz a glorious man who passed away 9 months ago whom I promised to be the first person to read my thesis, however, god preferred to send him to paradise before I terminate my thesis. My second grandfather Youssef who he was the catalyst that always urged me to achieve my Master's Degree. He used to boost my morals and motivate me to enhance my technical and ethical abilities. I hope they are in a safe place.

To my dear father and mother, without being by my side, I could not ever face my future smiling. Thanks for being everything to me. To my wife Basma, the gift that Allah sent me few months ago, I dedicate you the entire thesis.

Furthermore, I dedicate my study to every student trying to add to the science and have better life for humanity. They should note that science is not what humans reached on the spot, new theories will be revealed and proposed on daily basis. Finally, never to stop searching for more information till the last day in my life.

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