شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم


HANAA ALY

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# جامعة عين شمس

# التوثيق الإلكتروني والميكروفيلم

# قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

# يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

Cairo University

# INTERFERENCE EFFECTS BETWEEN TWO CLOSELY SPACED FOOTINGS ON UNREINFORCED AND REINFORCED SAND

By

**Montaser Ibrahim Hussanin Tony**

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**

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

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**Title of Thesis:**

Interference Effects between Two Closely Spaced Footings on Unreinforced and Reinforced Sand

**Key Words:**
Interference; Bearing Capacity; Settlement; Tilt; Reinforced Sand; Shallow Foundation.

**Summary:**

Typically, shallow foundations are the first choice to safely transfer the loads to the ground because they are more economical and faster to construct compared to deep foundations. In some cases, the footings may be closely placed due to project requirements. The proximity of two closely spaced footings affects the failure pattern compared to the same footings constructed sufficiently apart from each other. Numerical analysis using the finite element program PLAXIS 3D version 12 was adopted to investigate the effect of interference of two closely spaced footings resting on unreinforced and reinforced sand. A series of numerical runs were performed to examine the main parameters that affect the load displacement response of two closely spaced rectangular and square footings. These parameters include sand relative density, the spacing between footings and soil reinforced. The effects of these parameters on the load-displacement response of the footings including the ultimate bearing capacity, expected settlements and tilt, are summarized and compared with published data. The results help in properly defining the allowable bearing stress to ensure both the safety and economy of the adopted foundation system.

# Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other universities or institute. I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Montaser Ibrahim Hussanin Date: / / 2022

# Signature

# Dedication

This thesis is dedicated to the most valuable and precious people in my life, my Parents. Those who support me very much and without them I would have never reached anywhere in this life and my lovely wife Nermeen Ali.

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