بسم اللّه الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

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

بعض الوثائق

الأصلية تالفة

شبكة المعلومات الجامعية

بالرسالة صفحات لم ترد بالأصل

Cairo University

NUMERICAL STUDY OF THE INTERACTION BETWEEN STRUTTED EXCAVATIONS AND ADJACENT PILES

By

Sara Abd El Hakem Ahmed Ahmed

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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Approved by the Examining Committee

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Title of Thesis:

Numerical Study of the Interaction between Strutted Excavations and Adjacent Existing Piles.

Key Words:

Strutted excavation, piles, soft clay, numerical study, PLAXIS 2D

Summary:

This research comprises the use of 2D numerical modeling to evaluate the performance of strutted excavations and their effect on adjacent existing piles. PLAXIS 2D was adopted, as a modeling tool, in this research. A verification model was used to validate the simulation of a documented case study. The simulated case study included the construction of a cut-and-cover tunnel as part of a new Mass Rapid Transit line in Singapore. The results of the numerical study were compared to the full-scale field measurements. Afterward, the analysis was extended to investigate the interaction between the retaining system and existing piles located behind the retaining wall. A parametric study was conducted to examine the effect of different parameters, including excavation depth (H = 4 m to 16 m), retaining wall-length (L = 8 m to 40 m), spacing between struts (S = 2 m to 4 m), axial loads on pile (N = 0 kN to 1000 kN), and the horizontal distance between the existing pile and the retaining wall (x = 1.5 m to 40 m). The structural performance of the retaining wall and adjacent piles are reported in terms of horizontal displacements and bending moments.

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 university or institute.
I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Sara Abd El Hakem Ahmed Ahmed Date: / / 2021

Signature:

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