

بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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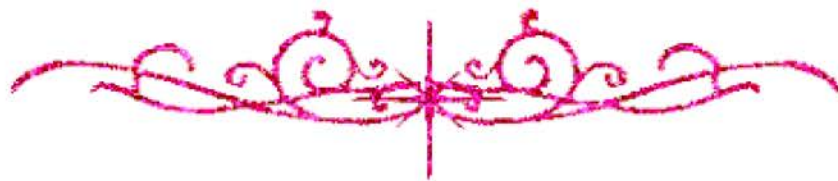


بعض الوثائق الأصلية تالفة





بالرسالة صفحات
لم ترد بالأصل





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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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 ($H = 4 \text{ m to } 16 \text{ m}$), retaining wall-length ($L = 8 \text{ m to } 40 \text{ m}$), spacing between struts ($S = 2 \text{ m to } 4 \text{ m}$), axial loads on pile ($N = 0 \text{ kN to } 1000 \text{ kN}$), and the horizontal distance between the existing pile and the retaining wall ($x = 1.5 \text{ m to } 40 \text{ m}$). 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.

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Date: / / 2021

Signature:

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