بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

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

MONA MAGHRABY

LOAD DISPLACEMENT RESPONSE OF PILES UNDER DIFFERENT LOADING CONDITIONS

By

Ahmed Mahmoud El-Saied Nasr

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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Prof. Dr. Mohamed Ibrahim Amer

………………………………..

Professor of Soil Mechanics and Foundations
Public Works Department
Faculty of Engineering, Cairo University

Dr. Amr Farouk Elhakim

………………………………..

Associate Professor of Soil Mechanics and Foundations
Public Works Department
Faculty of Engineering, Cairo University

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Approved by the
Examining Committee

____
Prof. Dr. Mohamed Ibrahim Amer, Thesis Main Advisor

____
Dr. Amr Farouk Elhakim, Advisor

____
Prof. Dr. Hussein Hamed Elmamlouk, Internal Examiner

____
Prof. Dr. Sayed Mohamed Elsayed, External Examiner
Ain Shams University

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2021

Engineer's Name: Ahmed Mahmoud El-Saied Nasr
Date of Birth: 01/9/1992
Nationality: Egyptian
E-mail: ahmed.shehab9292@gmail.com
Phone: 002-01008637324
Address: Hadayek Al-Ahram, Giza

Registration Date: 01/10/2014
Awarding Date: …./…./2021
Degree: Master of Science
Department: Civil Engineering - Public Works

Supervisors:
Prof. Mohamed Ibrahim Amer
Assoc. Prof. Amr Farouk Elhakim

Examiners:
Prof. Dr. Sayed Mohamed Elsayed (External examiner)
(Faculty of Engineering, Ain Shams University)
Prof. Dr. Hussein Elmamlouk (Internal examiner)
Prof. Dr. Mohamed Ibrahim Amer(Thesis main advisor)
Assoc. Prof. Dr. Amr Farouk Elhakim (Advisor)

Title of Thesis:

LOAD DISPLACEMENT RESPONSE OF PILES UNDER DIFFERENT LOADING CONDITIONS

Key Words:
Deep Foundation; Numerical Modelling; Undrained Shear Strength; Burrulus; Small Strain Soil Modulus

Summary:
Deep foundations are commonly used in large civil engineering structures. Deep foundations transfer the loads from the superstructure to more stable ground layers taking into consideration the allowable displacement and ultimate capacity. A good characterization of soil parameters plays an essential role in pile design. Thus, new site-specific correlations are developed between the clay strength obtained from tests performed on high-quality Shelby tube specimens and in-situ test results. In the current research, the load-displacement results from full-scale pile load tests performed in Al-Burrulus are analyzed. The ultimate pile capacities are back-calculated from the load tests under the different loading conditions (compression, tension, and lateral) and compared with capacities obtained from the analytical method. Moreover, the field load-displacement curves of axially loaded piles in compression are compared with the theoretical load-displacement response provided by (ECP 202). Additionally, the current study presents the back analysis of field pile load tests using the finite element method program "Plaxis 3D" using the Mohr-Coulomb model. The analysis aims to back-calculate operational soil stiffness through using the small strain shear modulus G_{max} as the initial value for soil modulus. New modulus degradation curves are developed for bored piles under compression, tension, and lateral loading. Finally, the relations between the back-calculated soil modulus and depth ratio are presented.

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: Ahmed Mahmoud El-Saied Nasr Date: .../..../2021

Signature:

Dedication

This work is dedicated to my small and big families: my father, mother, wife, daughter, brothers, and uncles.

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First and foremost, I would like to thank **Allah** for giving me the opportunity to expand my knowledge and complete my master's degree.

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I am sure I have forgotten to mention many people so I would like to extend my thanks to all of them.

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