شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

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

بالرسالة صفحات لم ترد بالأصل

ANISOTROPIC MECHANICAL BEHAVIOR OF RESEDIMENTED NILE SILTY CLAY

BY

Kareem Mohamed Salaheldin Mohamed

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
GIZA, EGYPT
2016

ANISOTROPIC MECHANICAL BEHAVIOR OF RESEDIMENTED NILE SILTY CLAY

By
Kareem Mohamed Salaheldin Mohamed

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

Under the Supervision of

Dr. Hany Abdellatef Lotfy
Prof. of Soil Mechanics and Foundation
Faculty of Engineering,
Cairo university

Dr. Sherif Adel Akl
Lecturer of Soil Mechanics and Foundation
Faculty of Engineering,
Cairo university

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2016

ANISOTROPIC MECHANICAL BEHAVIOR OF RESEDIMENTED NILE SILTY CLAY

By

Kareem Mohamed Salaheldin Mohamed

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

Approved by the
Examining Committee

Prof. Dr. Hany Abdellatef Lotfy, Thesis Advisor

Dr. Sherif Adel Akl, Member

Prof. Dr. Mostafa Elsayed Mosaad, Internal Examiner

Prof. Dr. Khaled Mohamed Elzahaby, External Examiner (President of HBRC, Egypt)

Azza Saied

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2016

Engineer: Kareem Mohamed Salah El-Din
Date of Birth : 1/ 6 / 1985
Nationality : Egyptian
E-mail : eng.kareem.civil@gmail.com
Phone. : 01028607044
Address :

Registration Date : 1 / 10 / 2010
Awarding Date : / /
Degree: Master of science
Department: Civil Engineering-Public works

Supervisors: Prof. Dr. Hany Abdellatef Lotfy
Dr. Sherif Adel Akl

Examiners: Prof. Dr. Khalid Mohmed Elzahaby (External examiner)
Prof. Dr. Mostafa Elsayed Mosaad (Internal examiner)
Prof. Dr. Hany Abdellatef Lotfy (Thesis advisor)

Title of Thesis:
Anisotropic Mechanical Behavior of the Resedimented Nile Silty Clay

Key Words:
Anisotropic; Resedimented; Yield surface; Mechanical behavior; Geotechnical characteristics; Consolidation characteristics.

Summary:
This research investigates the engineering behavior of Resedimented Nile Silty Clay (RNSC) in Egypt. The study involves tests for index properties, consolidation, undrained shear strength, and mechanical anisotropy. According to the USCS the Nile sediments are classified as high plasticity inorganic clay (CH). However, the grain size distribution of these sediments shows percentages of 70 silt and 30 clay on average. The thesis presents a standardized framework for resedimenting the Nile Silty Clay to provide testing specimens with minimum sample to sample variation. The process has given insights into the consolidation behavior of the sediments. A series of consolidated undrained triaxial tests at different preconsolidation pressures are performed to study the material shear strength, in order to calibrate the Modified Cam Clay model to the behavior of the sediments. Another series of triaxial tests are performed to study the mechanical anisotropy of the RNSC. The experiments involve drained compression and extension tests using different stress path directions on overconsolidated twin samples. The analysis of the test results determines the yield points and the shape of the yield surface in the stress space. The analysis shows the inherent anisotropy resulting from the resedimentation process. The asymmetry of the yield surface is tied to the anisotropy of the material fabric according to Oda (1993) and Akl and Louis (2013).

ACKNOWLEDGMENTS

I am immensely thankful to God for being an imperceptible driving force throughout my life. I would like to express my deep appreciation and gratitude to my professors Prof. Dr. Hani A.Lotfi and Dr. Sherif A.Akl to believe in me, leadership, motivation, and the enormous and insightful comments and knowledge helped me throughout the master's degree.

Special thanks to my friends Ali Hilal and Nermeen Salama, who supported me in the true sense of the word, listen to me and guide me. We will always cherish the good moments we had together. I would like to thank all my friends in the Mamdouh Hamza associates Geotechnical Laboratory huge help to make a friendly work environment. I also benefited greatly through the help of Dr. Abdullah El Galaa from Housing Research Center and construction.

We will be forever indebted to my mother for everything that cannot be put into words. I cannot end without mentioning my brother Ibrahim Aldemeiry, to encourage, help and humor. Finally, I am grateful for all in soil mechanics and management of the institution who has made a successful research unforgettable.