بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / سامية زكى يوسف

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد

EFFECT OF STAGES OF CONSTRUCTION ON THE BEHAVIOUR OF POST-TENSION SLABS IN HIGH-RISE BUILDINGS

By

Abdullah Magdi Ahmed Abdelhameed Mabrouk

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
STRUCTURAL ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

Prof. Dr. Adel Galal El-Attar
……
Professor of Concrete Structures
Department of Structural Engineering
Faculty of Engineering, Cairo University

Assoc. Prof. Ahmed Alaa Elansary
……
Associate Professor of Concrete Structures
Department of Structural Engineering
Faculty of Engineering, Cairo University

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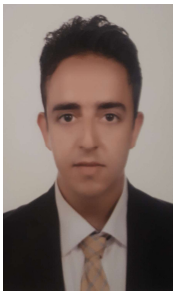
Approved by the
Examining Committee

Prof. Dr. Adel Galal El-Attar Professor of Concrete Structures, Cairo University.	Thesis Main Advisor
Assoc. Prof. Ahmed Alaa Elansary Associate Professor of Concrete Structures, Cairo University.	Thesis Advisor
Prof. Dr. Ayman Hussain Khalil Professor of Concrete Structures, Ain Shams University.	External Examiner
Prof. Dr. Amr Ali Abdelrahman Professor of Concrete Structures, Ain Shams University.	External Examiner

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2022

Engineer's Name:	Abdullah Magdi Ahmed Abdelhameed
Date of Birth:	05/10/1994
Nationality:	Egyptian
E-mail:	abdullah.mabrouk@yahoo.com
Phone:	01115501733
Address:	6th of October City, Giza, Egypt.
Registration Date:	01/03/2019
Awarding Date:	2022
Degree:	Master of Science
Department:	Department of Structural Engineering



Supervisors:

Prof. Dr. Adel Galal El-Attar
Assoc. Prof. Ahmed Alaa Elansary

Examiners:

Prof. Dr. Adel Galal El-Attar (Main advisor)

Assoc. Prof. Ahmed Alaa Elansary (Advisor)

Prof. Dr. Ayman Hussain Khalil (External Examiner)
(Professor of Concrete Structures, Ain Shams University)

Prof. Dr. Amr Ali Abdelrahman (External Examiner)
(Professor of Concrete Structures, Ain Shams University)

Title of Thesis:

Effect of Stages of Construction on The Behaviour of Post-Tension Slabs in High-Rise Buildings

Keywords:
Staged-construction analysis; High-rise building; Post-tension floors; Differential axial shortening; Time dependent effects.

Summary:

The current research investigates the impact of using staged-construction analysis (SCA) of HRB on the behaviour of PT slabs as a more realistic approach for HRB analysis. Comprehensive finite element models (FEM) are developed to conduct SCA of HRBs with PT slabs having various heights and layouts. The FEM accounts for both geometric and material nonlinearities while including prestressing loads. Hence, PT slab analysis is conducted using 3D modelling of a complete building rather than 2D modelling. A series of analysis comparisons is made between OSA, SCA, and SCA with time-dependent effects (SCAT). Then, comparisons between the three analyses are made to evaluate the design of PT slabs during service and ultimate stages due to the different analysis approaches.

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: *Abdullah Magdi Ahmed* Date: ...../...../2022

Signature: .....

Acknowledgments

I wish to express my sincere appreciation to **Prof. Dr. Adel Galal Alattar** for his valuable advice and encouragement throughout the research period.

I am also grateful for **Assoc. Prof. Ahmed Alaa Elansary** for his scientific advice, knowledge and insightful discussions and suggestions. He is my primary resource for receiving answers to my scientific questions.

I also have to thank **Assist. Prof. Mohammed Zawam** for his contribution in the revision of this thesis along with **Assoc. Prof. Ahmed Alaa Elansary** so that this work can come out in a professional, verifiable and ethical format.

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List of Symbols, Abbreviations and Nomenclature

a	Depth of the compression block from the top compression fiber.
A_c	Area of critical punching section.
ACI	American concrete institute.
A_{ps}	Area of prestressing steel.
ASCE	American Society of Civil Engineers.
ASTM	American Society for Testing and Materials.
B	Building.
BM	Bending moment.
CEB-FIP	International federation for structural concrete, Comité Européen du Béton- Fédération internationale du béton.
DAS	Differential axial shortening.
d_p	Distance from the top compression fiber till the center of the prestressing reinforcement.
DS	Design section.
Ec	Modulus of elasticity of concrete.
EPR	Effective precompression ratio.
fc'	Characteristic strength of concrete.
FEM	Finite element modelling.
f_{ps}	Nominal failure stress of prestressing steel.
f_{pu}	Ultimate strength of prestressing steel.
HRB	High-rise buildings.

J_c	Polar moment of inertia.
MR	Moment ratio.
MR_{SCA}	Moment ratio due to staged construction analysis.
MR_{SCAT}	Moment ratio due to staged construction analysis with time-dependent effects.
M_u	Ultimate moment capacity.
Non-PT	Non-prestressed.
OSA	One-step analysis.
PS	Punching shear stress.
PSR	Punching shear ratio.
PSR_{SCAT}	Punching shear ratio due to staged construction analysis.
PSR_{SCAT}	Punching shear ratio due to staged construction analysis with time-dependent effects.
PT	Post-tensioned.
RC	Reinforced concrete.
R_{cf}	Reinforcement correction factors.
S	Analysis section.
SCA	Staged-construction analysis.
SCAT	Staged-construction analysis including time dependent effects.
TDE	Time-dependent effects.
TS	Total stress at tension face of slab.
TSR	Total stress ratio at the tension face of the slab.