شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم

MONA MAGHRABY

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# 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

Cairo University

# TORSIONAL BEHAVIOR OF REINFORCED CONCRETE BOX SECTION BEAMS

By

Mahmoud Yasser Mahmoud Khalaf

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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…………………………….

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**Title of Thesis:**

TORSIONAL BEHAVIOR OF REINFORCED CONCRETE BOX SECTION BEAMS

**Key Words:**
RC beams; Box Section; Torsion; Twisting angle, Normal Strength Concrete.

**Summary:**
A numerical study is conducted in order to study the behavior of the reinforced concrete hollow sections under pure torsion. Several parameters are studied. These parameters are divided into 6 different groups. Firstly, the effect of the concrete compressive strength in the beam behavior is studied in a group of 5 different models. Secondly, the effect of the yield stress of the reinforcement bars is studied in a group of 4 models. Thirdly, changing the transverse reinforcement ratio effect in the beam behavior is studied in a group of 5 models. Fourthly, A group of 5 models in order to study the change in beam behavior due to changing the cross-section wall thickness. Fifthly, the effect of adding upper flange to the beam cross section is studied in a group of 4 models. Finally, Changing the cross section from rectangle to square is the last parameter to study. This group contains 4 models.
After analyzing all of these models, the results are compared firstly with experimental results. In order to ensure the validity of the theoretical models for ANSYS. Secondly, the results are compared with the manual calculations according to some international codes equations as ACI-318-19, ECP2018, and EN1992-1-2004.

# Disclaimer

I hereby declare that this thesis is my 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: Mahmoud Yasser Mahmoud Date: / / 2021

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# Dedication

To my mother, my wife, my father, my sisters, My family, and all my friends

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I would like to show my gratitude for my supervisor **Prof. Dr. Hany Abdalla** for his guidance, advice, support and valuable discussions review during my Master, and his great efforts to achieve my objectives.

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