سامية محمد مصطفى

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

سامية محمد مصطفى

شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

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سامية محمد مصطفى

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

سامية محمد مصطفى

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بعض الوثائق الأصلية تالفة

سامية محمد مصطفى

شبكة المعلومات الجامعية

بالرسالة صفحات لم ترد بالأصل

Ain Shams University

Faculty Of Engineering

BEHAVIOR OF R.C. DEEP BEAMS UNDER TORSION LOADS

By

AHMED HASSAN GHALLAB

B.Sc. (Honors) 1991, Structural Division

Civil Engineering Department

Ain Shams University

A Thesis

Submitted In Partial Fulfillment

For The Requirements Of The Degree Of

Master Of Science In Civil Engineering (Structural)

Supervised By

Prof. Dr.

ABD EL-HADY H. HOSNY

Professor Of R.C. Structures,
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ALI SHERIF ABD EL FAIAD

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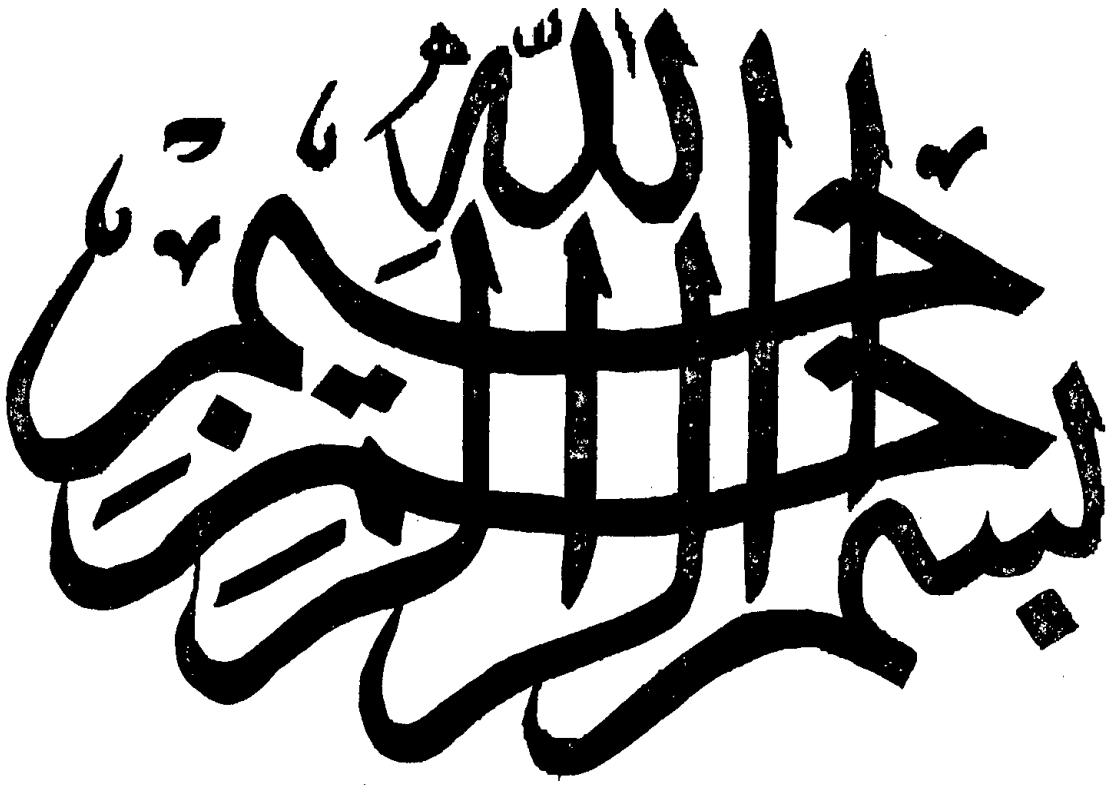

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Date: 17 / 9 / 1995

STATEMENT

This dissertation is submitted to Ain Shams University for the degree of MASTER OF SCIENCE in structural engineering.

The work included in this thesis was carried out by the author in the department of Civil Engineering (Structural Division), Ain Shams University, from November 1992 to May 1995.

No part of this thesis has been submitted for a degree or a qualification at any other University or Institution.

Date: 17/ 9/ 1995

Signature: Ahmed Ghallab

Name: **Ahmed Hassan Ghallab**

TO MY PARENTS, WHOM I COULD NOT APPRECIATE THEIR RIGHTS, WHATEVER I DO.

TO MY BROTHERS.

TO MY WIFE

Ain Shams University.

Faculty of Engineering.

Department of Civil Engineering (Structural).

Abstract of the M.Sc.Thesis submitted by : **Eng. Ahmed Hassan Ghallab**

Title of the Thesis: **BEHAVIOR OF R.C. DEEP BEAMS UNDER TORSION LOADS**

Supervisors: **Prof. Dr. Abd Al Hady Hussein Hosny**

Dr. Ali Sherif Abd El Faiad

Registration date: / / Examination date: / /

ABSTRACT

Deep beams exist in many reinforced concrete structures as tanks,dewellings and office building...etc. Most codes study deep beams under flexural and shear loads only but do not say anything about deep beams under , torsion load,however behavior of deep beams differ than that of shallow beams.

The thesis deals with the study of the general deformational behavior of R.C. deep beams with different ratio of vertical stirrups , longitudinal steel , and concrete strength, under torsion load , from zero up to failure load.

The experimental phase , contains the results of the tests conducted on six scaled direct models of R.C. deep beams under pure torsion load. All beams have the same dimensions . The difference among the six specimens were the ratio of, vertical stirrups, longitudinal steel and, concrete strength.

In the theoretical phase ,these six R.C. deep beams were analyzed using the finite elements method , taking into consideration the nonlinear stress-strain curve of concrete and steel ,as well as, bond slippage between steel and concrete.

The results of the experimental work and theoretical analysis showed that, the concrete strength has a significant effect on both cracking and ultimate torques, but the value of longitudinal steel and vertical stirrups have a slight effect on cracking torque, and have a significant effect on ultimate torque. Moreover the effect of the vertical stirrups is more than the effect of longitudinal steel on the ultimate torque.

Key Words : Deep beams. Vertical stirrups. Longitudinal steel. Concrete strength. Torsion load. Finite element. Material nonlinearity. Bond slippage.