بسم الله الرحمن الرحيم

MONA MAGHRABY

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

STUDYING OPTIMIZATION OF NONLINEAR FE MODELLING PARAMETERS FOR RC BEAMS WITH CASE STUDY APPLICATION OF LEDGED RC L-SHAPED BEAMS

By

Samuel Hanna Kamel Yaakop

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
GIZA, EGYPT
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Under the Supervision of

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Title of Thesis:

STUDYING OPTIMIZATION OF NONLINEAR FE MODELLING PARAMETERS FOR RC BEAMS WITH CASE STUDY APPLICATION OF LEDGED RC L-SHAPED BEAMS.

Key Words: Nonlinear Analysis; Optimization; Mesh Size; Verification; Ledge Beam.

Summary:

In this research a simple reinforced concrete beam was modelled in form of 2D and 3D models in nonlinear FE analysis using a commercial nonlinear software package (ATENA) focusing on the following three parameters: the effect of mesh size, element type and reinforcement form/modelling (smeared or discrete). After establishing the most suitable of these parameters to use in simulation in the nonlinear analysis of RC structures, a verification was made using published results of nine RC simply supported beams which their results of load deflection curves or moment–deflection curves were found in the literature from tests. The results of the studied beams gave good agreement with the published results based on the findings from the parameters and assumptions that are considered in the thesis.
After this verification of the previous parameters, a case study application on L-shaped RC (ledged) beams was conducted with a view to enhance the shear ledge capacity by investigating reinforcement details without changing the ledge beam geometry.

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: Date:

Signature:

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Foremost, I would first like to thank my thesis main advisor Professor Dr. Mourad M. Bakhoum, Faculty of Engineering, Cairo University for his continuous support in my study and research ,creative vision, timely advice, his patience, motivation, enthusiasm, immense knowledge, precise and valuable comments, the highly cost of the program used in my research, patience during the supervision of this thesis and the enormous effort he made to revise this document, His guidance helped me in all the time of research and writing of this thesis. I could not have imagined having a better advisor and mentor for my M.A study.

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Eng. Samuel Hanna

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