



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



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التوثيق الإلكتروني والميكرو فيلم



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MONA MAGHRABY



Cairo University

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
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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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