



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



HANAA ALY



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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جامعة عين شمس التوثيق الإلكتروني والميكروفيلم

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HANAA ALY



**LABORATORY TESTING AND NUMERICAL
MODELLING OF FRAME CORNER CONNECTIONS
FABRICATED FROM STEEL COLD-FORMED
SECTIONS**

By

Ahmed Mohamed Massoud

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:

LABORATORY TESTING AND NUMERICAL MODELLING OF FRAME
CORNER CONNECTIONS FABRICATED FROM STEEL COLD-FORMED
SECTIONS

Key Words:

Cold-formed sections – Corner connection – Experimental testing – Finite element modelling – Self drilling screw connection.

Summary:

In this study, the behavior of beam to column cold formed section connection subjected to major axis bending moments has been investigated. For this purpose, experimental and analytical models have been developed. Two types of connections have been studied. For the first type, the beam is connected to the column via bracket plate attached to the web of the beam and column sections using self-drilling screw bolts of diameter 6mm, whereas. For the second type, ordinary bolts of grade 4.4 and diameter 12mm are used instead of the screws. Lipped channel sections of height, flange width, lip and thickness of 200,60, 20, and 2 mm respectively are studied. Seven specimens were fabricated to investigate the behavior of the connection. The main parameters were the thickness of the gusset plate and the connecting element (self-drilling screws vs ordinary bolts). The same models were simulated numerically using a finite element program. The cold-formed sections were modeled using shell elements while the connecting fasteners were modeled using wire elements.

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.

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Acknowledgments

Throughout the writing of this dissertation, I got a great lot of help and support.

I want to thank my supervisor, **Prof. Dr. Sherif Mourad**, whose advice was essential in developing the study topics and methods. When I got into trouble or had a query regarding my research or writing, the office was always open. His insightful feedback encouraged me to improve my thoughts and elevate my work.

I would also like to thank my advisor, **Prof. Dr. Maged Tawfik**, for his continuous support and assistance throughout this project's experimental study. As a result of his assistance and valuable advice, many obstacles in the laboratory have been conquered, and many difficulties have been addressed.

I would also like to thank **Dr. Hazem Al-Anwar**, my advisor, for his invaluable advice during my studies. He gave me the guidance to pick the appropriate path for my literature review and results analysis.

My **parents** and **sister** deserve my heartfelt thanks for their unwavering support and encouragement during my years of study and the research and writing of this thesis. This accomplishment would not have been possible without their help. Thank you.

Furthermore, I would like to express my profound thanks to **EMCON** for their excellent assistance in the fabrication and installation of the specimens, and **HBRC**, where all the experimental studies were carried out. In addition, I would like to thank my colleagues, specifically **Eng. Yasser Nasr**, for his excellent contribution and efforts in the field of numerical modeling. I would want to thank my colleague **Eng. Mohamed Hosny Zaki** for his patience and all the chances he's provided me to further my research.

Ahmed Mohamed Massoud

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