BEHAVIOUR OF PRE-CRACKED REINFORCED CONCRETE FRAME L-CONNECTION REPAIRED BY USING DIFFERENT TECHNIQUES

By

MAYSOUN MAGDY MOHAMMED ISMAIEL

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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Title of the theses: Behavior of pre-cracked reinforced concrete frame L-Connection repaired by using different techniques

Key words: Repair; CFRP; Frame Joints; corner joints

Summary:

This research is an experimental study of an exterior corner frame joint (L-shaped). The main objective of this research is intended to focus on repairing pre-cracked connections using traditional and modern techniques. Ten specimens were fabricated; half of them were subjected to opening bending moment while the rest were subjected to closing bending moment. The studied specimens were repaired using CFRP sheets with different application methods (fully wrapped by one layer or two layers and other applied on the sides and two specimens were repaired using steel plates). A comparison between the test results using different techniques showed that using CFRP sheets increases the confinement and capacity of the specimens by about 20% as well as ductility up to 40%, while steel plates increases the capacity by 10%.Also test results showed that the orientation of the CFRP sheets has a great effect on confinement and capacity .At last the test results showed that the using of CFRP layers is more effective than steel plates.

DEDICATIONS

I would like to dedicate this thesis as an expression for my deepest appreciation and gratitude to my father Eng. Magdy Mohammed Ismaiel for his encouragements throughout my life, and continues support without which completion of this study would have not been possible. Also, hot gratitude must go to my mother and sister for their constant love which sustained me through my life.

To all my professors in Cairo University Faculty of Engineering, for their help and support through my educational development. This thesis is also dedicated to my honest friend Mohammed samy youssif for his continuous support.

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