AIN SHAMS UNIVERSITY

FACULTY OF ENGINEERING

STRUCTURAL ENGINEERING DEPARTMENT

HYBRID STRENGTHENING BETWEEN OLD AND NEW REINFORCED CONCRETE SLABS

BY

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THESIS

Submitted in Partial Fulfillment for the Requirements of the

Degree of Master of Science in Structural Engineering

Supervised by

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Professor of Reinforced Concrete Structures

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Professor of Reinforced Concrete Structures

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DEDICATION

THIS DISSERTATION IS DEDICATED TO THE

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MY BELOVED AND WONDERFUL

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AND ALWAYS ENCOURAGES ME TO PURSUE ALL

MY DREAMS AND BELIEVE WITHOUT A DOUBT

THAT I WILL FULFILL THEM.

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Abstract of the M.Sc. Thesis Submitted

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Title of The Thesis:

HYBRID STRENGTHENING BETWEEN OLD AND NEW REINFORCED CONCRETE SLABS

ABSTRACT

Studies have shown that there are several factors that affect the strength of the connections between old and new reinforced concrete slabs that must be taken into consideration including: (concrete strength– roughening of the surface of old concrete - the impact of the bonding material - the presence of shear connectors .... etc.).

This research aims to study experimentally and numerically the effect of roughening of the surface of old concrete, the bonding materials and the importance of the presence of shear connectors at the link between the old and new reinforced concrete slabs on both tension and compression side of the old slab.

The experimental program was includes testing (10) samples of concrete slabs. First group consists of two reference samples with total depth (12 cm), other (8) samples were prepared as sandwich sample, the two layers

(6cm + 6cm) and the work of linking those two classes was by using different materials.

A numerical analysis applying the finite element method by using Ansys 14 was done as a theoretical study that supports the results of the experimental program in this research.

A comparison was made between the results of the experimental program with the results of the numerical analysis and it was found that there is a good agreement between them.

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