



AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
STRUCTURAL ENGINEERING DEPARTMENT

HYBRID STRENGTHENING BETWEEN OLD AND NEW REINFORCED CONCRETE SLABS

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THESIS

Submitted in Partial Fulfillment for the Requirements of the
Degree of Master of Science in Structural Engineering

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DEDICATION

**THIS DISSERTATION IS DEDICATED TO THE
SOURCE OF LOVE AND SUPPORT,
MY BELOVED AND WONDERFUL
MOTHER (Dr. SALA ALAALNABY ABOLKHER),
FATHER (Mr. MOHAMED HAMZA)
AND HUSBAND (ENG. OSAMA RADWAN)
WHO
DEDICATED THEIR ENTIRE LIFE FOR MY SUCCESS
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

Eng. / Marwa Mohammed Ibrahim Hassanin

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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