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نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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HANAA ALY

STRENGTHENING OF RC FLAT SLABS WITH CUTOUT OPENINGS

By

ESLAM HATEM MAHMOUD EL-MAWSLY

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

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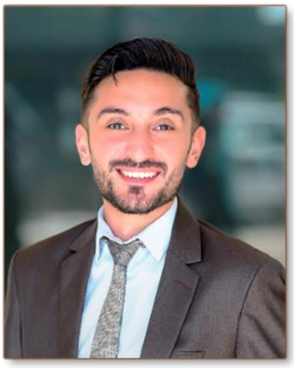

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Title of Thesis:

"STRENGTHENING OF RC FLAT SLABS WITH CUTOUT OPENINGS"

Key Words:

RC slab strengthening, central cutout, steel strips, CFRP, ECC.

Summary:

Cutouts in existing concrete slabs significantly decrease their capacity. Therefore, strengthening the cutouts is a necessity. In this research, four methods of strengthening flat slabs with central cutout openings are studied. These methods include near-surface mounted (NSM) reinforcing bars, anchored steel strips, epoxy bonded Carbon Fiber Reinforced Polymer (CFRP) strips, and an overlay of Engineered Cementitious Composite (ECC) material reinforced with a welded wire mesh. The dimensions of all slab specimens are 1100×1100×100 mm, and those of central cutout openings are 300×300 mm. In addition, a numerical analysis using finite element method (FEM) is carried out to validate the experimental results. The results show that the methods of strengthening used in this research lead to significant increase in the slab load-carrying capacity. The strengthening technique using ECC is the most effective approach.

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 reference section.

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Eslam El-Mawsly

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