



# **INVESTIGATING THE EFFICIENCY OF AN INNOVATIVE GEOPOLYMER COMPOSITES AS REPAIRING MATERIAL FOR CONCRETE STRUCTURES**

By

**Salma Ahmed Saber Ahmed El Sayed**

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 Thesis:**

**Investigating The Efficiency Of An Innovative Geopolymer Composites  
As Repairing Material For Concrete Structures**

**Key Words:**

Geopolymer Composite; Repair; Bond; Pull out Test; Splitting Test

**Summary:**

In this research, for the first time in Egypt, geopolymer composite blend was used as repair material for concrete structures. Direct tensile test, splitting test, flexural test, pull out test and bond between concrete and steel test and were used to investigate the different composites efficiency compared with the available materials in the market. Very efficient blend was remarked gives a very comparable results compared with the available epoxy materials in the market.

# **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.

Name:

Date:

Signature:

## **Dedication**

**To My Mother & Father,**

**The reason of what I become today,**

**The source of my success,**

**Thank you for your love, Support and Care.**

**To My Sisters, My Brothers & My Cousins**

**Thank you for your love, Support and Care.**

**To My Family**

**All my love and respect to you for your care, love and support.**

**To My Great Professor**

**Mohamed I. Serag**

**All my deep respect to you for teaching me,**

**supporting me, inspiring me and for your deep**

**effect on my way of thinking and on my life.**

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