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نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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بالرسالة صفحات لم ترد بالأصل

TOWARDS A SIMPLIFIED AND ECONOMIC APPROACH OF BLAST-RESISTANT DESIGN OF FAÇADE COLUMNS WITH LIMITED STANDOFF DISTANCE

By

Fatma Attia Bakr Attia

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY
in
STRUCTURAL ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Professor of Structural Engineering
Structural Engineering Department
Faculty of Engineering, Cairo University

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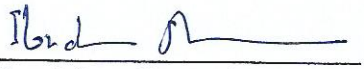
Approved by the
Examining Committee

Prof. Dr. Hamed M. Salem, **Thesis Main Advisor**
Professor , Structural Engineering Department
Faculty of Engineering, Cairo University

Prof. Dr. Mohamed Talat Mostafa, **Internal Examiner**
Professor, Structural Engineering Department
Faculty of Engineering, Cairo University



Prof. Dr. Ibrahim Galal Shaaban, **External Examiner**
Professor, Structural Engineering Department
University of West London

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2020

Engineer's Name: Fatma Attia Bakr Attia
Date of Birth: 09/02/1987
Nationality: Egyptian
E-mail: fatma.attia@hotmail.com
Phone: 01116410405
Address: 28 El Sayes st, Hadayek Helwan, Cairo, Egypt

Registration Date: 01/10/2015
Awarding Date: …./…./2020
Degree: Doctor of Philosophy
Department: Structural Engineering

Supervisors:

Prof. Dr. Hamed M. Salem

Examiners:

Porf. Hamed M. Salem (Thesis main advisor)
Prof. Mohamed Talat Mostafa (Internal examiner)
Prof. Ibrahim Galal Shaaban, (External examiner)
Professor of Structural Engineering, University of west London

Title of Thesis:

Towards a Simplified and Economic Approach of Blast-Resistant Design of Façade Columns with Limited Standoff Distance

Key Words:
blast loading; column design; Unified Facilities Criteria UFC 3-340-02; Dynamic increase factors DIF; progressive collapse

Summary:

Exterior columns are highly susceptible to structural damage in cases of blast attacks and its failure may lead to a progressive collapse of the entire structure. In this study, a three dimensional nonlinear dynamic analysis was carried out on a ten-story reinforced concrete office building designed according to ACI 318, where its exterior columns subjected to blast loading threat. The studied column is subjected to a different weights of (TNT) detonation charges with respect to different standoff distances, the behavior of the columns are evaluated according to UFC 3-340-02 and PDC-TR 06-08. Analysis trials are carried out to estimate a safe and economic column design that can withstand a predefined charge weight and standoff distance. A simplified rational design method based on the numerical results is eventually proposed.

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: Fatma Attia Bakr Attia Date: / /

Signature:

Dedication

I dedicate this work to
My parents *and all of* ***my family*** *who had the tolerance, wisdom, kindness, decency and enough guidance to put me on the right path and urged me to stand up against obstacles with confidence and never give up; for they have always been my backbone, my motivation and my inspiration.*
May God bless them.

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