بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MONA MAGHRABY

Cairo University

SEISMIC RESILIENCE QUANTIFICATION OF A HOSPITAL DESIGNED ACCORDING TO ECP-201

By

Heidi Yosri Mohammad Hosni Ibrahim

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
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....

Professor of Structural Analysis and Mechanics
Civil Engineering
Faculty of Engineering, Cairo University

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Approved by the
Examining Committee

____
Prof. Dr. Walid Abdel Latif Attia, Thesis Main Advisor

____
Prof. Dr. Sherif Ahmed Mourad, Internal Examiner

____
Prof. Dr. Hatem Hamdy Ghith, External Examiner
Professor at Housing and Building National Research Center.

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2021

Engineer: Heidi Yosri Mohammad Hosni.
Date of Birth: 09 / 10 / 1990.
Nationality: Egyptian
E-mail: haidyosry@gmail.com
Phone: +201278003919
Address: 19 Tarek Ibn Ziad St., Giza, Egypt.
Registration Date: 01 / 10 / 2015.
Awarding Date: …. /…. / 2021.
Degree: Master of Science.
Department: Structural Engineering.

Supervisors:

Prof. Dr. Walid Abdel Latif Attia.

Examiners:

Prof. Dr. Walid Abdel Latif Attia. (Thesis main advisor)
Prof. Dr. Sherif Ahmed Mourad. (Internal examiner)
Prof. Dr. Hatem Hamdy Ghith. (External examiner)
Professor at Housing and Building National Research Center.

Title of Thesis:

Seismic Resilience's Quantification of a Hospital Designed According to ECP-201.

Key Words:
Seismic, Resilience, Assessment, FEMA, PACT.

Summary:
This thesis presents seismic resilience quantification of a hospital designed according to the Egyptian code (ECP-201) in terms of repair cost, repair time and casualties. The prototype building is an existed typical 5-story reinforced concrete structure with shear walls and expansion joint, located in Suez. Building's safety against lateral loads was checked according to ECP-201 provisions. Static non-linear (Pushover) analysis was conducted. Collapse fragility functions of building's structural and non-structural components were established using incremental dynamic analysis (IDA). Building's seismic resilience was quantified using new-generation seismic performance assessment methodology proposed by Federal Emergency Management Agency (FEMA), FEMA P-58 along with its associated software, Performance Assessment Calculation Tool (PACT). The outcomes show that building's median repair time is 22 days, median repair cost is $20,850,000 which is 66.5% of the building's total replacement cost, and median number of casualities is 386 persons.

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

I dedicate this thesis to my parents, Fathia Soltan and Yosri Honsi for their unconditional love and support. I’m truly thankful and grateful for having you. Also, I dedicate this thesis to my brother, Rami Yosri, for being a constant source of encouragement and support.

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