NUMERICAL EVALUATION OF RESPONSE MODIFICATION FACTOR FOR RC STRUCTURES UNDER THE EFFECT OF VERTICAL AND HORIZONTAL GROUND MOTIONS

By

Abdelrahman Mohammed Hussein Ahmed

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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Prof. Dr. Hamed M. Salem

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Professor of Reinforced Concrete Structures
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

_____
Prof. Dr. Mohamed Talaat Mostafa, Internal Examiner

_____
Prof. Dr. Ghada Diaa Abdelhamid, External Examiner
Professor of Structural Engineering, Housing and Buildings National Research Center

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2020

Engineer's Name: Abdelrahman Mohammed Hussein Ahmed
Date of Birth: 17/2/1993
Nationality: Egyptian
E-mail: cve.abdelrahman@cu.edu.eg
Phone: 002 0112 7844422
Address: Masjed Elshaheed St.- Haram - Giza

Registration Date: 01/10/2016
Awarding Date: / /2020
Degree: Master of Science
Department: Structural Engineering Department

Supervisors:

Prof. Dr. Hamed M. Salem

Examiners:

Prof. Dr. Ghada Diaa Abdelhamid (External Examiner)
Prof. Dr. Mohamed Talaat Mostafa (Internal Examiner)
Prof. Dr. Hamed M. Salem (Thesis Main Advisor)

Title of Thesis:

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Key Words:

Vertical Ground motion, Response modification factor, Ductility, Over-strength, Redundancy, AEM.

Summary:

This research aims to evaluate the response modification factor for reinforced concrete structure with ductile moment resisting frames system, which was designed according to the Egyptian Code of Practice (ECP) under the effect of vertical and horizontal ground motions. A non-linear dynamic analysis is performed using the Extreme Loading for Structures (ELS®) software which based on the Applied Element Method (AEM). The values of (R) factor were evaluated under the effect of the vertical ground acceleration, combined vertical and horizontal ground accelerations, concrete compressive strength and reinforcement grades defined by (ECP). The obtained values of (R) factor from the numerical analysis were compared to the values defined by (ECP), the Euro Code (EC8), the American Codes (ASCE) and (UBC97).

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: Abdelrahman Mohammed Date:

Signature:

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