Ain Shams University
Faculty of Engineering
Department of Structural Engineering

Evaluation of Response modification factor (R) for estimating the strength of core wall multistory buildings under seismic loads

A Thesis Submitted in partial fulfillment for the requirements of
The degree of
Master of Since in Civil Engineering

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2017

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ACKNOWLEDGMENT

I wish to express my deep gratitude to **Dr. Gamal Hussein,** Professor of theory of structures, Faculty of Engineering, Ain Shams University, for his constant supervision, planning, generous support, helpful advice and constructive criticism throughout this wok.

I am deeply indebted to **Dr. Nasr Eid,** Assistant Professor of theory of structures, Faculty of Engineering, Ain Shams University, for his skillful kind supervision, support, guidance, help, encouragement and useful suggestions since the start of the wok.

I wish to extend my thanks to my **colleagues and all the staff** of Structural Engineering Department, Ain Shams University, for their help and encouragement. Also, my best thanks to all those who, in one way or another, helped in making this work possible, especially **Dr. Nasr Eid**.

Finally, especial appreciation and deep gratitude to **all my family**, for their support and encouragement.

Eng. Hesham Samy Al Sweify

STATEMENT

This dissertation is submitted to Ain Shams University for the degree of Master of Since in Civil Engineering (Structural).

The work included in this thesis was carried out by the author in the Department of structural engineering, Faculty of engineer, Ain Shams University.

No part of this thesis has been submitted for a degree or qualification at other university or institution.

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Abstract of M.SC. Thesis submitted by:

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Title of thesis

"Evaluation of Response modification factor (R) for estimating the strength of core wall multistory buildings under seismic loads"

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ABSTRACT

The objective of this research work is to study the response modification factor for concrete shear walls under seismic loads. The behavior of shear walls was analyzed using nonlinear static analysis by nonlinear finite element analysis. A parametric study was performed to assess the effect of shear wall dimensions, height, location, amount of reinforcement, and the fundamental time of the structure on the value of the response modification factor.

Response modification factor component and calculation methods were studied according to various codes which use forced based design method, this factor was studied also by nonlinear static analysis, which uses displacement based design method to calculate the value of response

modification factor whose depends on element nonlinear behavior, ductility and enters the plasticity limit, where this factor plays an important role in seismic force reduction and dissipate earthquake energy into inelastic deformations.

Key words: response modification factor – pushover analysis – nonlinear static analysis – shear walls –time history analysis – capacity curve – ductility reduction factor – overstrength factor- base shear – displacement – ductility

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