INNOVATIVE APPROACHES TO HANDLE ISSUES IN PERFORMANCE-BASED SEISMIC BEHAVIOUR OF MULTISTORY RC BUILDINGS

By

AMER ABDULWAHHAB HAMMADI AL-NUAIMI

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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Under the Supervision of

MOHAMED EZZAT SOBAIH
Professor Emeritus of Structures
Structural Engineering Dept.
Faculty of Engineering
Cairo University

ADEL YEHIA AKL
Professor Emeritus of Structures
Structural Engineering Dept.
Faculty of Engineering
Cairo University

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Approved by the Examining Committee

Prof. Dr. Mohamed Ezzat Sobaih, Thesis Main Advisor
Professor Emeritus of Structures, Cairo University, Faculty of Engineering, Structural Engineering Department

---

Prof. Dr. Adel Yehia Akl, **Thesis Advisor**
Professor Emeritus of Structures, Cairo University, Faculty of Engineering, Structural Engineering Department

---

Prof. Dr. Abd-Alrahman Bazaraa, **Internal Examiner**
Professor Emeritus of Structures, Cairo University, Faculty of Engineering, Structural Engineering Department

---

Prof. Dr. Omar El-Nawawy, External Examiner
Professor Emeritus of RC Structures, Ain Shams University, Faculty of Engineering, Structural Engineering Department

---

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2016

Engineer: Amer Abdulwahhab Hammadi Al-Nuaimi

Date of Birth: 20 / 3 / 1957

Nationality: Iraqi

E-mail: alnuaimi.amer@gmail.com

Phone: +201117799871

Address: Baghdad Iraq- Baghdad University -Civil Engineering Department

Registration Date: 1 / 10 / 2012

Awarding Date: / / 2016

Degree: Doctor of Philosophy

Department: Structural Engineering Department

Supervisors: **1-Prof. Dr.** Mohamed Ezzat Sobaih
2-Prof. Dr. Adel Yehia Akl

Examiners: **1-Prof. Dr.** Mohamed Ezzat Sobaih
2-Prof. Dr. Adel Yehia Akl
3-Prof. Dr. Abd-Alrahman Sadek Bazaraa
4-Prof. Dr. Omar Ali Mousa El-Nawawy
(Ain Shams University)

Title of Thesis:

Innovative Approaches to Handle Issues in Performance-Based Seismic Behaviour of Multistory RC Buildings

Key Words: Pushover, PBSD, Capacity Spectrum Method, Multistory buildings, Iraq.

Summary:

The first aim of this study is to assess the performance objectives engaged in the Iraqi Seismic Code (ISC 1997) in order to make a realistic evaluation related to performance-based seismic design (PBSD) of multi-story reinforced concrete buildings and also to evaluate and compare the structural response demands obtained from nonlinear static analysis (NSA) procedures according to two versions of the capacity spectrum method (CSM) which are recommended in ATC 40 and ATC 55. The second aim is to present a simplified approach to handle the performance issues easily, by deriving the required factors to condensate the frame into an equivalent frame with a single bay model. This modeling will be called “The Condensed Frame Approach (CFA)”.

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Dedication

Dedicated to Humanity, to those adoring Tolerance, Impartiality, and Perseverance.

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