



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



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التوثيق الإلكتروني والميكروفيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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Cairo University

DERIVATION OF NATIONAL EXPRESSIONS FOR DAMPING MODIFICATION FACTOR FOR THE DESIGN OF BASE-ISOLATED BUILDINGS

By

Mohamed Hesham Mohamed Mohamed Mansour

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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Title of Thesis:

Derivation of National Expressions for Damping Modification Factor for the Design of Base-Isolated Buildings

Key Words:

Damping Modification Factor; Base-Isolation; Egyptian Seismic Code; Natural and Artificial Ground Motions; Time History Analysis

Summary:

Damping modification factor is used in international seismic codes for the design of structures with damping levels higher than 5% such as seismically isolated buildings. This study included deriving expressions for that factor using the data of local earthquakes in Egypt. The ground motions used in this study included 26 natural accelerograms and 150 artificial accelerograms. By comparing the derived expressions in this study with the values in two international codes and in previous studies, it was concluded that the natural earthquakes expressions are more recommended for addition to the Egyptian seismic provisions. The natural earthquakes expressions were used to design hypothetical base-isolated buildings lying in seismic zone (5) in Egypt. A seismic performance assessment was done for the designed base-isolated buildings using time history analyses and their responses were compared to their fixed-base counterparts showing an efficient performance for the studied base-isolated buildings.

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: Mohamed Hesham Mohamed Mohamed Mansour Date: / /

Signature:

Dedication

***TO
MY PARENTS,
AND ALL MY FAMILY***

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