شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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HANAA ALY

A PROPOSED TECHNIQUE TO ESTIMATE AN ADEQUATE SEISMIC GAP IN MID-RISE BUILDINGS

By
Abdallah Magdy Shawky Muhammad

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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Title of Thesis:

A PROPOSED TECHNIQUE TO ESTIMATE AN ADEQUATE SEISMIC GAP IN MID-RISE BUILDINGS

Key Words:
Adjacent Buildings; Impact Elements; Time History Analysis; Seismic Joint; Seismic Pounding

Summary:

Overpopulation is a real problem so governments seek saving construction area. As such, several buildings are built adjacent to each other without a sufficient gap. During earthquakes, structures vibrate laterally and collide. This is known as seismic pounding. Pounding causes massive force, which is not taken into consideration. As a result, structures may experience failures and collapse. Recently, various researches are concerned with pounding and mitigating its effects. International provisions and standards recommend a minimum gap between adjacent buildings. This separation distance becomes excessive and uneconomic in several cases. This research aims to study and evaluate several methodologies used by international standards to calculate the gap distance between buildings. A group of low to mid-rise reinforced concrete structures are designed and proposed to be used during the analyses. A number of four earthquake records are utilized to analyze all structures and generate the time history of response using time history analysis technique which results in a total number of more than one hundred cases of pounding. The analysis is performed according to some assumptions. It is assumed that considering the foundation system is isolated footing, therefore all columns shall be hinged-base constraints. Two earthquake records are used during the analyses of these forty-two cases. The analyses show that the asymmetric pounding phenomenon has no significant effect on the safety of reinforced concrete structures under the effect of low peak ground accelerations.

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 : Abdallah Magdy Shawky Muhammad Date: 30/08/2021

Signature :

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Dedication

I dedicate this research to my parents, for their caring, guidance, support, patience and help. I do believe that, I couldn't success in all my life steps without their continuous support. God bless them.

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