



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





شبكة المعلومات الجامعية



شبكة المعلومات الجامعية

التوثيق الالكتروني والميكرو فيلم

جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %



شبكة المعلومات الجامعية



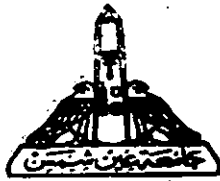
بعض الوثائق الأصلية تالفة



شبكة المعلومات الجامعية



بالرسالة صفحات
لم ترد بالأصل



THE SEISMIC BEHAVIOR OF INFILLED LIGHTLY REINFORCED CONCRETE STRUCTURES

Using reduced-Scale Model

by:

AHMED IBRAHIM ABDEL-MOUTI

B.Sc. Civil Engineering (Structures)
Ain Shams University, 1989

M.Sc. Structural Engineering
Ain Shams University, 1993

Thesis Submitted to the Faculty of Engineering, Ain Shams University
in Partial Fulfillment of the Requirements for the Degree

of
DOCTOR OF PHILOSOPHY

in
STRUCTURAL ENGINEERING

Under the Supervision of

Prof. Dr. S. A. Al-Behairy
Prof. of Reinforced Concrete Structures
Civil Engineering Department
Ain Shams University
Cairo, Egypt

Prof. Dr. R.N. White
President of The American Concrete Institute
James A. Friend Family Prof. of Engineering,
School of Civil and Environmental Engineering
Cornell University, Ithaca, NY, USA

Dr. G. I. Khalil
Assistant Professor of Structural Engineering
Civil Engineering Department
Benha Higher Institute of Technology
Benha, Egypt

Examiners Committee

4 - **Prof. Dr. R.N. White**

President of The American Concrete Institute
James A. Friend Family Prof. of Engineering,
School of Civil and Environmental Engineering
Cornell University, Ithaca, NY, USA

Richard N. White
.....

1 - **Prof. Dr. Ali Abdel-Rahman**

Vice dean and professor of
reinforced concrete structures,
Faculty of Engineering
Cairo University,
Cairo, Egypt

A. Rahman
.....

2 - **Prof. Dr. Abdel-Wahab Abou Alaneen**

Professor of reinforced concrete structures,
Faculty of Engineering
Ain Shams University,
Cairo, Egypt

Abdel-Wahab Abou Alaneen
.....

3 - **Prof. Dr. Shaker Al-Behairy**

Professor of reinforced concrete structures,
Faculty of Engineering
Ain Shams University,
Cairo, Egypt

Shaker Al-Behairy

10. 11.

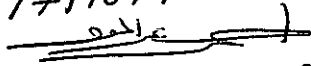
11. 12.

12. 13.

13. 14.

Statement

The dissertation is submitted to Ain Shams University for the degree of Doctor of philosophy in Civil Engineering. The work included in this thesis was carried out by the author in the department of Civil Engineering, Ain Shams University. No part of this thesis has been submitted for a degree or a qualification at any other University or Institution.

Date : 17/10/97
Signature : 
Name : Ahmed Abdel Mouti

— 11 —

1-2

1022.

•

203

2371

2021

28.

1. *Chlorophyll a* and *Chlorophyll b* contents were determined by spectrophotometry using the method of Lichtenthaler and Whistler (1987).

52.

1

33.

•

1

SECRET AND NOT BE DISCLOSED TO THE PUBLIC UNLESS SO ORDERED BY THE SECRETARY OF DEFENSE

...and the other two are the same as the first two.

Acknowledgments

The author would like to express his deep appreciation to Professor Shaker Al-Behairy Professor of reinforced concrete structures, Ain Shams University, Cairo, Egypt, for his support, guidance and encouragement throughout his work.

The author wishes to express his sincere thanks and deep gratitude to Professor Richard N. White, President of the American Concrete Institute , James A. Friend Family Professor of Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, NY, USA, for his kind supervision, constant guidance, and most constructive criticism to the achievement of the research work.

The author is specially grateful to Dr. Gamal Khalil, Assistant Professor of Structural Engineering, Civil Engineering Department Benha Higher Institute of Technology Benha, Egypt, for his sincere help, valuable suggestions and continuous moral support throughout the research work.

The experimental work of this study was conducted in George Winter Structural Laboratory at Cornell University. For this I am most grateful to Mr. Timothy Bond, the laboratory manager for his continuous help, which provided a unique environment for the experimental research. I am also in debt to David Farmer for being always willing to help.

Special thanks to very special friend, Abdelkader Tayabi whose contribution not only in this work but in my whole life as well was significant.

Finally the author would like to express his gratitude and appreciation to his parents and sisters for their continuous support and encouragement.

1917

1918

1919

1920

1921

1922

1923

1924

1925

1926

1927

1928

1929

1930

1931

1932

1933

1934

1935

1936

1937

1938

THE SEISMIC BEHAVIOR OF INFILLED LIGHTLY REINFORCED CONCRETE STRUCTURES USING REDUCED SCALE MODEL

by:

* Ahmed I. Abdel-Mouti

ABSTRACT

Unreinforced masonry infill walls have significant influence on the seismic performance of a lightly reinforced concrete frames (LRCF). LRCF could be defined as structures designed without consideration of lateral forces due to earthquakes or wind. In this research the interaction between masonry infill walls and LRCF under seismic excitation is investigated. A two story, two bay by one bay, 1/4 scale lightly reinforced concrete infilled structure is used in this research. The infill is an unreinforced masonry concrete blocks not connected to the building frame. A single degree of freedom earthquake simulator "shaking table" is used to apply earthquake loading to the structure under consideration. An enhanced off-line compensation technique for shaking table calibration is achieved in order to minimize the expected distortion of the shaking table output. The model structure was subjected to a series of tests to evaluate its performance before, during and after earthquake. Three types of tests were conducted to determine the dynamic properties and to study the general behavior of the test structure. The first two tests which are free vibration and static load tests were carried out before and after each seismic test to evaluate the change in structural properties from the seismic test. The third test consisted of applying the time scaled Taft S69E 1952 earthquake component to the model structure at different amplitudes until significant damage was observed. The test results showed that the existence of

* Ph.D. Student, Civil Engineering Department, Ain Shams University, Lecturer Assistant, Banha Higher Institute of Technology.

unreinforced masonry infill walls significantly changed the dynamic properties as well as the seismic performance of the structure. The test results also helped on quantifying the contribution of infill walls to the seismic response of reinforced concrete structure in the elastic and inelastic ranges .

Keywords: *Infill, Infilled Frame, lightly reinforced concrete structures, shake table, modeling*