بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية 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 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

THE SEISMIC BEHAVIOR OF INFILLED LIGHTLY REINFORCED CONCRETE STRUCTURES

Using reduced-Scale Model

by

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B.Sc. Civil Engineering (Structures)
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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.

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

by:

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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

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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