شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

:حفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من 15-25 مئوية ورطوبة نسبية من 20-40%

To be Kept away from Dust in Dry Cool place of
15-25- c and relative humidity 20-40%

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING

SOIL EFFECT ON THE DYNAMIC BEHAVIOR OF FRAMED STRUCTURES

BY

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A THESIS

SUBMITTED IN FULFILLMENT
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IN
CIVIL ENGINEERING (STRUCTURAL)

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CAIRO - 1999

بسم الله الرحمن الرحيم

دَعْوَىٰهُمْ فِيهَا سُبْحَانَكَ اللَّهُمَّ وَتَحِيَّتُهُمْ فِيهَا سَلَامٌ ۚ
وَءَاخِرُ دَعْوَىٰهُمْ أَنِ الْحَمْدُ لِلَّهِ رَبِّ الْعَالَمِينَ

صدق الله العظيم

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STATEMENT

This dissertation is submitted to Ain Shams University for the degree of Doctor of Philosophy in Civil Engineering (Structural).

The work included in this thesis was carried out by the author in the Department of Structural Engineering, Ain Shams University, from 1996 to 1999.

No part of this thesis has been submitted for a degree or qualification at any other University or Institution.

Date : 17 / 6 / 1999

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Title of thesis :

SOIL EFFECT ON THE DYNAMIC BEHAVIOR OF FRAMED STRUCTURES

ABSTRACT

This thesis studies the effect of soil (site conditions) on the dynamic behavior of structures. Full interaction between bedrock motion, subsurface soil, substructure and superstructure are represented as a dynamic soil-structure interaction problem using the finite element method. Nonlinear behavior of soil stiffness and damping ratios as a function of shear strain amplitude, confining pressure and plasticity index are taken into account. An advanced technique for earthquake simulation analysis is presented. Improvements have been made to raise its accuracy. Different simulated earthquakes for bedrock motion have been used to predict the effects of various site conditions on the dynamic characteristics of surface ground motion. Extensive studies have been carried out, including wide range of soil and site condition, to develop enhanced design response spectra curves. These enhanced design curves have been normalized to be used for structural design purposes. Comparison between these enhanced curves and recent international building codes is illustrated. Moreover, the effects of site conditions, foundation types, location of tie beams and their inertias on the dynamic response of an example framed structure have been examined.

Key Notes : Dynamic Soil Structure Interaction (DSSI) - Finite Element - Viscous Boundary - Transmitting Boundary - Earthquake Simulation - Response spectra - Tie Beam.