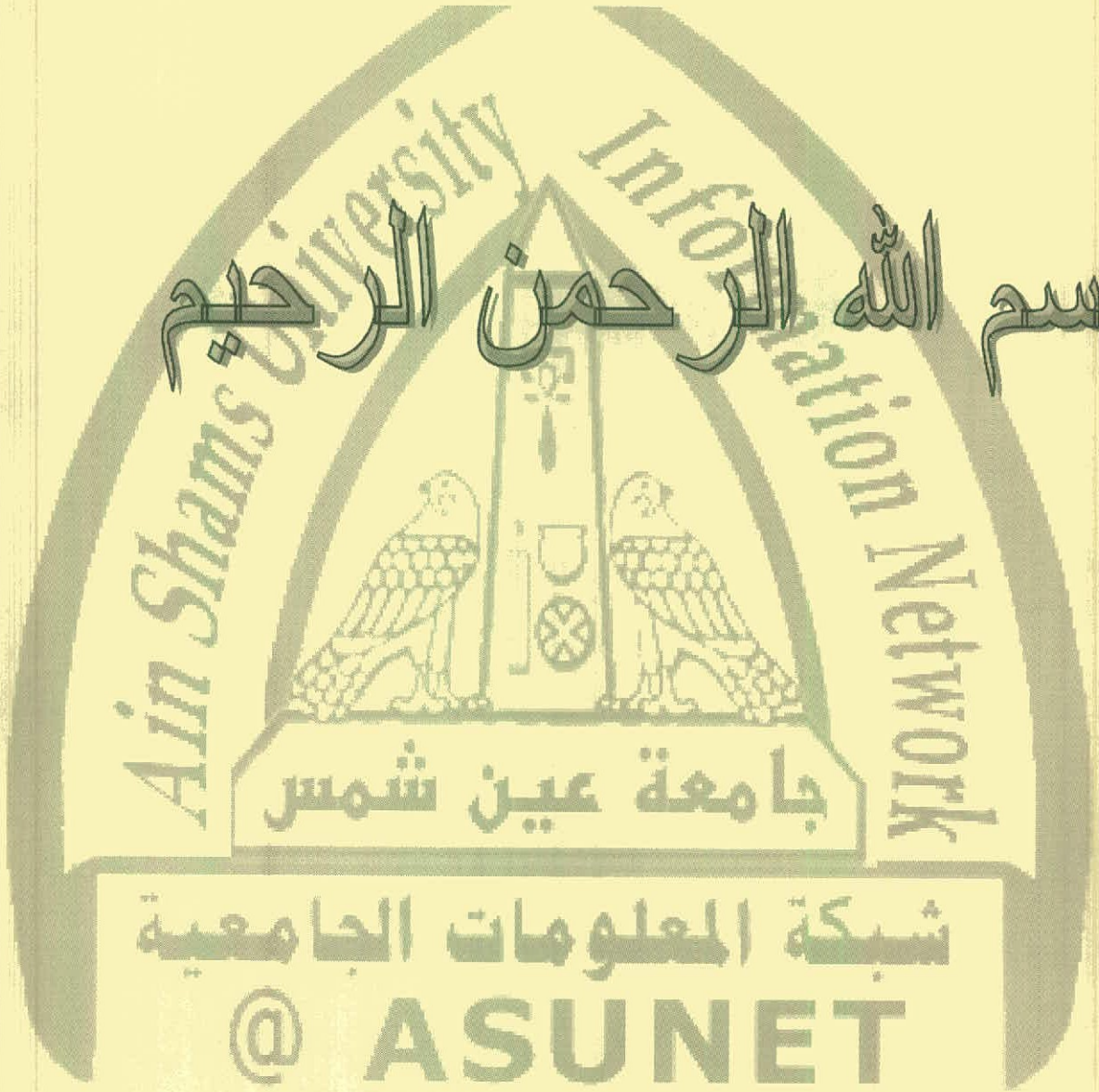
شبكة المعلومات الجامعية



بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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

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في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

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

بعض الوثائـــــــق الاصليـــــة تالفـــة

بالرسالة صفحات لم ترد بالاصل

EFFECT OF EXPANSIVE SOIL ON STRESSES IN STRUCTURES

THESIS
SUBMITTED FOR THE PH. D. DEGREE
IN CIVIL ENGINEERING

BY

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STATEMENT

This Dissertation is submitted to Ain Shams University, Faculty of Engineering, Structural Engineering Department, for the degree of Doctor in Civil Engineering.

The work included in this thesis was carried out in the department of Structural Engineering, Faculty of Engineering, Ain Shams University, from April 1989 to January 1996.

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

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ABSTRACT

Hoda Abd El-Hady Ibrahim. Effect of Expansive Soil on Stresses in Structures. Structural Engineering Department, Faculty of Engineering, Ain Shams University 1996.

Engineers are well aware of the severe distress, that lightly loaded structures can suffer when placed on a swelling soil subjected to environmental changes. Changes in the environment result in changes in the soil-water phase , thereby producing volume changes in the soil.

The main aim of this thesis is to investigate the effect of the type and rigidity of structures on the behaviour of expansive soil beneath it. Footing heave and interfacial normal stresses generated due to flow of water were investigated experimentally. An expansive sandy clay soil obtained from Golf area in Nasr City east of CAIRO were used in this investigation.

The structural variables considered are: a) springs with different stiffnesses, b) fixed beams with different stiffnesses (inertias) and subjected to different imposed stresses, c) square footing subjected to different imposed pressures, d) plane frames with tie beam having different inertias and e) plane frame rested on sand cushion.

The experimental results are shown as a relationship in the form of heave-time for footing. The soil water content profile at the end of each test are determined. A mathematical method is proposed to predict the heave for surface footing, fixed beam and frame based on expansive soil. A mathematical method is validated using the experimental results.

Keywords : expansive soil - heave - structure - imposed stress - stiffness - inertia -footing - mathematical method.

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CHAPTER 5. PREDICTED HEAVE OF STRUCTURES BASED ON EXPANSIVE SOIL