



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

**NEW MASONRY UNIT AND INTERLOCKING
MORTARLESS BUILDING SYSTEM
FOR LOAD-BEARING WALLS**

A Thesis Submitted

In partial Fulfillment of the Requirements

For The degree of Master of Science

In

Civil Engineering (Structural Engineering)

by

Eng. Tarek Mohamed Cherif Elkhoraibi

**Cairo University
Faculty of Engineering**

July 2002

B

1-2-2

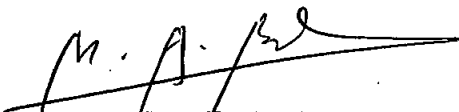
**NEW MASONRY UNIT AND INTERLOCKING
MORTARLESS BUILDING SYSTEM
FOR LOAD-BEARING WALLS**

**A Thesis Submitted
In partial Fulfillment of the Requirements
For The degree of Master of Science
In
Civil Engineering (Structural Engineering)**

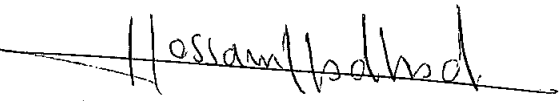
by

Eng. Tarek Mohamed Cherif Elkhoraibi

Under the Supervision of


Prof. Dr. Mahmoud A. Reda Youssef

Head, Structural Engineering Department
and Professor of Strength of Materials
Faculty of Engineering, Cairo University


Dr. Hossam Abdel Ghafour Hodhod

Associate Professor
Structural Engineering Department
Faculty of Engineering, Cairo University

**Cairo University
Faculty of Engineering**

July 2002

NEW MASONRY UNIT AND INTERLOCKING MORTARLESS BUILDING SYSTEM FOR LOAD-BEARING WALLS

**A Thesis Submitted
In partial Fulfillment of the Requirements
For The degree of Master of Science
In
Civil Engineering (Structural Engineering)**

by

Eng. Tarek Mohamed Cherif Elkhoraibi

Approved by the Examining Committee

Prof. Dr. Mahmoud A. Reda Youssef, Thesis Main Advisor

Dr. Hossam A. Hodhod, Advisor

Prof. Dr. Farouk El-Hakim, Member

Prof. Dr. Hassan Saad, Member

**Cairo University
Faculty of Engineering**

July 2002

ACKNOWLEDGEMENT

The author wishes to express his deepest gratitude to Prof. Dr. Mahmoud Aly Reda Youssef for his unfailing guidance and help, and for putting his knowledge and experience so generously at his student's disposal.

The author is also deeply indebted to Dr. Hossam Abd El-Ghafour Hodhod whose sound advice and support have guided him in every step and through all the stages of this study and whose endless creativity had a direct impact on the final development of the invented system.

ABSTRACT

In this study, a new mortarless masonry system is developed. The developed system is composed of masonry units, each with two cylindrical cells, and the interlocking between successive stretches is achieved by two pins per unit.

A detailed survey of the previous research work in this domain is carried out. The author attempts to benefit from the advantages of mortarless masonry construction to yield a new masonry system suitable for domestic use. The system is designed to serve for load-bearing walls, retaining walls, and fences. It is ungrouted and unreinforced. Openings are built without supporting frames or lintels. The units and pins do not contain any complicated configurations, and are to be manufactured according to the standard tolerances used in conventional masonry units built with mortar.

One-third scale model units and pins are manufactured using plaster. An experimental testing program is conducted on the developed masonry system to evaluate its performance under expected applied loads. The testing program is carried out on one-third model masonry units and masonry assemblages built using the developed interlocking system. One-third scale models are constructed using a conventional system built with mortar and tested for comparative purposes. The results are analyzed and correlated. The performance of the new mortarless system is evaluated, and an understanding of its behavior under applied loads is reached.

The new system shows considerable resistance to axial compression, and lateral in-plane and out-of-plane loads. Moreover, possible modifications, meant to improve the capacity and performance of the system, are specified, and recommendations for future research work are suggested.

