Ain Shams University
Faculty of Engineering
Department of Civil Engineering

TOWARDS PRODUCING HIGH STRENGTH MASONRY CONCRETE HOLLOW BLOCKS USING LOCALLY AVAILABLE MATERIALS AND FACILITIES

By

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B.Sc. Civil Engineering

A Thesis Submitted in Partial Fulfillment for Requirements
of the Degree of Master of Science in Structural Engineering

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To my parents, my wife

and my daughters

STATEMENT

This thesis is submitted to Ain Shams University, Cairo, Egypt, in the partial fulfillment of the requirements for the degree of Master of Science in Civil Engineering.

The work included in this thesis was carried out by the author at the Properties and Testing of Materials Lab of the faculty of Engineering, Ain Shams University.

No part of this Thesis has been submitted for a degree or a qualification at any other university or institute.

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Abstract of M.SC. thesis submitted by:

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ABSTRACT

There is an increasing demand to produce high strength concrete hollow blocks masonry to fulfill the need to build multistory masonry buildings using thin walls with limited amount of grout. In spite of the availability of high performance block making machines, the current local production of the concrete masonry blocks lacks the availability of high strength masonry concrete blocks. This may be due to the shortage of experience in specifying the right mix proportions and types of concrete materials and admixtures to be used.

One of the challenges in the proposed research is the need to use real block making machine in all trials since the degree of compaction provided by such machines cannot be reproduced in the laboratory. Therefore, the current research has been initiated with a

focus on producing high strength masonry concrete hollow blocks using real block making machine.

The main objective of the current research is to produce high strength concrete masonry hollow blocks and to establish the relationship between the masonry compressive strength and unit compressive strength.

The results of this study showed that high strength concrete hollow block can be achieved using the available local materials and ordinary curing methods.

Keywords: Load-bearing masonry, high strength, concrete hollow blocks, concrete block prism, compressive strength, tensile strength, modulus of elasticity, mortar, grout, density, absorption, aggregate, superplasticizer, silica fume.

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