بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / هناء محمد علي

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: ....

Ain Shams University
Faculty of Engineering
Department of Structural Engineering

Recycled Vitrified Clay (RVC) for Eco-Environmental Concrete (EEC)

A THESIS
Submitted in Partial Fulfillment of the Requirements of the Degree of
MASTER OF SCIENCE IN CIVIL ENGINEERING (STRUCTURAL)

Submitted by

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Name : Ali Alaa Eldin Negm
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Degree : Master of Science in Civil Engineering (Structural)

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Statement

This dissertation is submitted to Ain Shams University for the degree of Master of Science in Civil Engineering (Structural Engineering). The work included in this thesis was carried out by the author in the Department of Structural Engineering, Faculty of Engineering, Ain Shams University, Cairo, Egypt. No part of this thesis has been submitted for a degree or qualification at any other university or institution.

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Abstract

The production of environmentally friendly products, recycling waste, and keeping our environment clean have been in consideration for years. This could be achieved through recycling and decreasing the usage of fossil fuel products. Cement is one of the most consumed products on earth and the production of carbon dioxide emissions is one of the negative impacts of this industry. From this point, the usage of cement replacement materials can save the environment by the reduction of these emissions. Vitrified clay has been used for more than 1000 years and this industry produces landfilling waste. Vitrified clay contains metakaolin which is a pozzolanic material and can be used as a cement replacement. This study investigates the effect of using recycled vitrified clay (RVC) as a cement replacement material. This study is composed of two phases. Phase one focused on examining the RVC, fine, and coarse aggregate. The RVC was examined through X-ray Fluorescence (XRF), Laser scattering particle size distribution, and specific gravity. The fine and coarse aggregate were examined by conducting sieve analysis, specific gravity, and volumetric gravity. Phase two included tests on the concrete itself, whether fresh properties through slump test or hardened properties through compressive, flexural, abrasion, Scanning electron microscope, and X-ray diffraction (XRD) tests. The conclusions of this study were a guide for the effective usage of RVC as a cement replacement in the production of concrete and the optimum dosage for RVC depending on the usage required.

Keywords: Recycled Vitrified Clay, Metakaolin, Compressive Strength.