بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

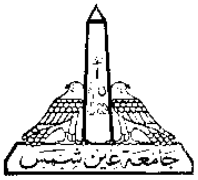
قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MONA MAGHRABY



AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING

SHEAR PERFORMNCE OF CONCRETE BEAMS CONTAINING ENGINEERED CEMENTITIOUS COMPOSITES

A Thesis
Submitted in Partial Fulfilment of the Requirements of The Degree of
Master of Science in Civil Engineering

By

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Bachelor of Science in Building & construction
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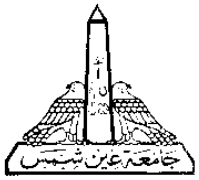
Cairo 2021



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Structural Engineering

Examiners' Committee

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Date: … / ... / 2021

Statement

This thesis is submitted as a partial fulfilment of Master of science in structural Engineering, Faculty of Engineering, Ain shams University.

The author carried out the work included in this thesis, and no part of it has been submitted for a degree or a qualification at any other scientific entity.

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Thesis Summary

The current study aims to assess the shear behavior of reinforced mortar beams including Polyvinyl Alcohol Fiber (PVA)ranges from 0 to 2.25%, fly ash (55%) and silica fume (15%). Fourteen beams were experimentally tested under two concentrated loads. In addition, a finite element model was developed to predict the crack pattern, load–deflection, energy absorption, and shear strength results of the test beams. The studied variables were different percentages of PVA fibres, shear span to depth ratio (a/d), and transverse reinforcement (stirrups) ratio. The fly ash and silica fume were kept Constantin all the studied mixes to achieve a compressive strength above 55 MPa at the time of testing (90 days) and to improve PVA-mortar properties. It was found that the inclusion of PVA improves the shear behavior of the tested beams in terms of pattern and ductility. It was observed also that reducing a/d led to enhancing the shear capacity without changing the mode of failure. In addition, PVA played the same role as the stirrups and their effect on the ultimate shear capacity was increased with reducing the volume of stirrups. Moreover, the PVA fibres were more effective in lower shear span to depth ratio (a/d = 1.5) giving an enhancement of shear resistance of 221%. The non-linear finite element model showed excellent agreement with the experimental results and the ratio of the predicted to experimental ultimate strength ranged between 0.91 and 1.09. The authors recommend a combination of fly ash, silica fume and at least 1.5% PVA in the presence of minimum stirrups reinforcement (5U6/m) or adding 2.25% PVA without stirrups to achieve adequate shear behavior and to improve the ductility of PVA-mortar beams

Keywords

PVA Mortar Shear of beams Fly ash Silica fume Non-linear finite element modeling

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Prof. Dr. Mohamed Said Mohamed Abd Elghaffar

Assoc. Prof. Dr. Wael Mohamed Montaser

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Date: … / ... / 2021