

**MECHANICAL PROPERTIES OF LIGHT-WEIGHT SELF COMPACTING
CONCRETE USING POFA AS PARTIAL REPLACEMENT FOR CEMENT**

BY

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**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF CIVIL
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OTA, OGUN STATE.**

**IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF
MASTERS OF ENGINEERING DEGREE (M.ENG) IN CIVIL ENGINEERING**

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DECLARATION

I solemnly declare that I carried out the work reported in this project in the Department of Civil Engineering, Covenant University, Ota, Nigeria under the supervision of Dr. (Mrs.) Olatokunbo Ofuyatan. I hereby declare to the best of my knowledge that no part of this report has been submitted here or elsewhere in a previous application for award of a degree. All sources of knowledge used have been duly acknowledged.

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Signature

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Date

CERTIFICATION

We certify that the materials recorded in this project resulted from original research work carried out by **Tumba Masi Lassa** of the Department of Civil Engineering Covenant University, Ota as a requirement for the award of M. Eng. Degree in Civil Engineering, Covenant University, Ota, Ogun State, Nigeria.

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Head, Department of Civil Engineering
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Prof. Obanishola M. Sadiq
External Examiner

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Date

DEDICATION

This project is dedicated to the Almighty God, the creator of heaven and earth.

ACKNOWLEDGEMENT

I wish to express my sincere gratitude to the Almighty God for his guidance, protection, sound health and the gift of life throughout my research period, indeed all honor, glory and adoration be ascribed to him.

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ABSTRACT

This project work presents the results of an investigation on the mechanical properties of light weight self-compacting concrete containing palm ash (LWSCC) containing mineral (MA). The use of light weight concrete is useful in terms of decreasing the dead load of structural members, while self-compacting concrete (SCC) removes voids and ease the flow of concrete in construction. The palm ash used reduced the amount of waste in dumping site that could be a threat to the environment. The super plasticizer dosage for the concrete was 2%, aggregate size 10mm. The slump flow, T50, L-box test and V-Funnel test were conducted to determine the workability of the fresh concrete. Compressive strength, splitting tensile strength and flexural strength on the hardened obtained. Varying percentages 10-50% of LWSCC with different ash content were prepared. The results indicated a decline in the strength of concrete with the addition of POFA, the loss of concrete compressive strength by adding 50% POFA is only about 30~40%. The addition of 20% and 10% POFA yields the acceptable strength of SCC. The decrease of compressive strength is insignificant in term of economic value by cement replacement a basis for a mix ratio suitable for renovation and repair works.

Keywords: Self compacting concrete, lightweight concrete, super plasticizer, palm ash, coarse aggregate, fine aggregate.