

**STUDY ON CONCRETE PERFORMANCE USING  
TREATED POFA AS A PARTIAL REPLACEMENT  
OF CEMENT**

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**Bachelor of Engineering (Hons) Civil  
(Infrastructure)  
UNIVERSITI TEKNOLOGI MARA  
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By  
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This report is submitted as a  
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## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledgement as referenced work. This topic has not been submitted to any other academic or non-academic institution for any degree or qualification.

I hereby, acknowledgement that I have been supplied with the Academic Rule and Regulation for Under Graduates, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## ABSTRACT

Palm Oil is used to produce cooking oil and its waste called Palm Oil Fuel Ash (POFA). POFA is one of the wastes that have the same chemical properties as cement, which is silica, calcium oxide, and etc. Due to the development, the demands in cement used in concrete were high to fulfil their desire. The cement currently used is not suitable for a sustainable environment where the cement industry is the primary producer of carbon dioxide ( $\text{CO}_2$ ). This would make the natural resources decrease and cannot be used for other purposes. The objective of this study is to study the effect of optimum molarity of treated POFA towards the compressive strength with 10% replacement of cement and to investigate water absorption on various molarity of treated POFA in 10% of replacement of cement in concrete. POFA were collected at industry landfill to treat at the environment laboratory by using various molarity of sulphuric acid,  $\text{H}_2\text{SO}_4$ . Then the treated materials were used on concrete mix of 50 mm x 50 mm x 50 mm mould. 54 cubes sample were being produced to test on compressive strength and water absorption by following the standard BS1881 to check the effect of the treatment of the POFA. From the result obtained, the concrete with partially cement replacement by using POFA treated with 5mol of sulphuric acid is the optimum value that gets from the compressive strength test and also achieved the design strength which is C25/30. The compression strength for the concrete with 5 mol treated POFA and OPC were compared as the result was 44.77  $\text{N/mm}^2$  and 47.26  $\text{N/mm}^2$  respectively. The higher the molarity of the sulphuric acid after 5mol shows that the compressive strength were been decrease.

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