

Thesis Title	Effect of Rice Husk-Bark Ash and Palm Oil Fuel Ash on Water Permeability of Concrete
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Abstract

The objective of this research is to study the effects of rice husk-bark ash (RHBA) and palm oil fuel ash (POFA) on water permeability of concrete. Rice husk-bark ash and palm oil fuel ash, by-products from biomass power plant, were ground until the particles retained on a sieve No. 325 of 15-20 (medium fineness) and less than 5% (high fineness) by weight. Three different finenesses of RBHA and POFA (including RBHA and POFA as directly received from the power plant) were used to replace Portland cement type I at 10, 20, 30 and 40 percent by weight of binder to cast concrete. Compressive strengths of concretes were determined at the ages of 7, 28 and 90 days and water permeabilities of concretes were determined at the ages of 28 and 90 days.

The results revealed that the unground rice husk-bark ash and palm oil fuel ash were not suitable for using as a cement replacement in concrete because the concrete produced exhibited low compressive strength and high water permeability as compared to that of the control concrete. Additionally, with 10% and 20% replacement of Portland cement type I by medium fineness and high fineness of rice husk-bark ash, respectively, the compressive strengths of concrete were as high as that of the control concrete and the values of water permeability were lower than that of the control concrete at 90 days. When high fineness of palm oil fuel ash was used to replace Portland cement at 20 percent by weight binder, it produced higher compressive strength and lower water permeability of concrete as compared to the control concrete at 90 days. In addition, concrete containing RHBA or POFA with higher compressive strength tended to have lower water permeability of concrete than the one with

lower compressive strength. Finally, it was found that the water permeability of concrete containing RBHA and POFA could be predicted by using the compressive strength of the concrete.

Keywords : Water Permeability / Compressive Strength / Rice Husk-Bark Ash / Palm Oil Fuel Ash