Use of disposed waste ash from landfills to replace Portland cement

Sumrerng Rukzon

Rajamangala University of Technology Phra Nakhon, Bangkok 10300, Thailand,
rerng197@rmutp.ac.th

Prinya Chindaprasirt

Department of Civil Engineering, Faculty of Engineering, Khon Kaen University, Khon Kaen, 40002, Thailand

In this study, waste ash was utilized as a pozzolanic material in blended Portland cement in order to reduce negative environmental effects and landfill volume required to dispose of waste ash. The influence of waste ash, namely palm oil fuel ash, rice husk ash and fly ash on compressive strength and sulfate resistance in mortar were studied and evaluated by some accelerated short–term techniques in sodium sulfate solutions. Ordinary Portland cement (OPC) was partially replaced with ground palm oil fuel ash (POA), ground rice husk ash (RHA) and classified fly ash (FA). Single pozzolan and a blend of equal weight portions of POA, RHA and FA were also used. The resistance to sulfate attack of mortar improves substantially with partial replacement of OPC with POA, RHA and FA. The use of a blend of equal weight portions of FA and POA or RHA produced mixes with good strength and resistance to sulfate attack. POA, RHA and FA have a high potential to be used as a pozzolanic material.

Key Words: Fly ash • landfill • palm oil fuel ash • rice husk ash • waste ash utilization • Portland cement replacement

This version was published on September 1, 2009

Waste Management & Research, Vol. 27, No. 6, 588-594 (2009)
DOI: 10.1177/0734242X09103189