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Experimental Investigation of Waste Paper with Termite Mound as Partial Replacement of Portland Cement for HCB

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Abstract

This study developed the evaluation of waste paper with termite mounds as a partial replacement of Portland cement for HCB. This study aimed to evaluate the termite mound with waste paper as SCM for HCB production. For this termite clay with west paper powder replacement level of the weight of ordinary Portland cement was carried out to determine setting time, compressive strength, and absorption rate. The chemical analysis of unclaimed termite clay soil obtained from Adwa, Enda Yohanes sub-location, Tigray in Ethiopia was found to be chemically suitable as pozzolanic material. Secondly, material was collected from the site and experimental work at the Messebo cement factory and Adigrat University construction material laboratory was carried out. Then after ingredient testing and mix proportioning using 5% intervals cement will be replaced up to 25% by TMC+ WP for HCB. Results revealed that calcined termite hill clay with the waste paper was found pozzolanic and can partially replace cement. It has shown that up to 20% replacement of the ordinary Portland cement by TMC with WP, the compressive achieved a target mean compressive strength of hollow concrete block on the 28th day. Hence, it is concluded that TMC and WP were suitable to replace cement partially with 20% replacement of cement by calcined termite hill clay and waste paper as the optimal percentage of the production of HCB. The total chemical composition of blended material oxides was 71.22%. This result exceeds the minimum percentage value of 70% for natural pozzolana.

Keywords: Calcined termite clay, Compressive strength, HCB partial replacement, Waste paper