

Properties of mortar with fine eggshell powder as partial cement replacement

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ABSTRACT

Solid waste management is one the leading problems faced by developing nations. In Malaysia, the average per capita generation of municipal waste is about 0.85kg per person per day, and this number is only expected to raise as the population grows and nation becomes more industrialized. One of the wastes is eggshell waste, as Malaysians have among the largest egg consumption in the world. This paper presents the properties of cement mortar with fine eggshell powder as partial replacement of cement. Type-N mortar was prepared with cement: sand: water ratio of 1: 2.75: 0.60 and the percentages of cement replacement tested are 2.5%, 5%, 7.5% and 10% by weight of cement. Flow table test was conducted to access the fresh properties of mortar, while compressive test and flexural test were carried out to determine the mechanical properties. Water absorption and acid resistance eggshell mortar were also studied. From the result, eggshell mortar has similar flow consistency with the control. 5% eggshell produces mortar with optimal compressive and flexural strength and the water absorption of eggshell mortar is lower compared to control. However, eggshell mortar loses more weight when subjected to acid attack. © 2020 Elsevier Ltd. All rights reserved.

KEYWORDS

Absorption; Acid; Eggshell; Mechanical; Mortar

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