

Durability Performance of Concrete Containing Laterite Aggregates

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ABSTRACT

In Malaysia, concerns about the depletion of granite aggregates in the future and the availability of laterite aggregates locally have incentivized researchers to integrate laterite aggregate into the production of concrete. Studies found that the use of 20 to 30% of laterite aggregates, as partial replacement for coarse aggregates, results in concrete with the targeted strength. However, the effect of laterite aggregate content on the durability performance of this concrete is unknown. As such, the acid resistance and water absorption of concrete consisting of various percentages of laterite aggregates, integrated as partial replacement of coarse aggregates, are presented and discussed. Mixes consisting of varying amounts (0-50%) of laterite aggregates were prepared in the form of cubes (150 × 150 × 150 mm). After water curing for 28 days, the specimens were tested for the determination of compressive strength and durability against acid attack and water absorption. It was found that concrete with low water absorption can be produced through the integration of 50% of laterite aggregates. Similarly, the integration of laterite aggregates of up to 20% produces concrete that exhibits good durability against acid attack, chloride ion penetration, and water absorption.

KEYWORDS: laterite aggregates, concrete, durability, acid resistance, chloride

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