

# Compressive Strength of Concrete Containing Roof Tile Waste as Partial Fine Aggregate Replacement

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## ABSTRACT

Roof tile waste is one of the wastes which usually generated during construction and demolition activity. It is then disposed at landfill and causes environmental pollution. Rising concrete production pushes for larger quantity of sand to be harvested from river. Excessive sand mining harms the environment and affect the water quality. The approach of using roof tile waste as fine aggregate replacement in concrete would lead to a cleaner environment and more sustainable river ecosystem. This study investigates the influence of crushed roof tile waste on the workability, compressive strength, and water absorption of concrete. A total of five concrete mixes containing various proportion of crushed roof tile waste as partial fine aggregate replacement were prepared. The percentage of crushed roof tile waste used as partial fine aggregate replacement is 0, 5, 10, 15 and 20 by weight of sand. The concrete mixes were subjected to slump test, compressive strength test and water absorption test. The workability of concrete reduced when a larger amount of waste roof tiles was substituted as fine aggregate. The use of 40% roof tile waste as partial fine aggregate replacement increases the concrete strength. Concrete mix that contains roof tile waste exhibits lower water absorption than control concrete specimens and it can be classified as good quality concrete. Conclusively, the integration of roof tile waste would reduce burden at landfill and also lower down the dependency of concrete industry on river sand supply.

## KEYWORDS

Construction waste; roof tile waste; partial fine aggregate replacement; green concrete; compressive strength

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