

Investigation of the Mechanical Properties of Blended Sea-Sand Concrete

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In tandem with global urbanization and infrastructure development, the escalating demand for concrete has prompted a search for eco-friendly alternatives against the extraction of river sand for fine aggregate. This research explores the feasibility of using a combination of sea sand and manufactured sand (M-sand) as a reliable replacement for fine aggregate in concrete. Initially, the study assesses the workability and compressive strength of concrete using both types of sand individually. Subsequently, it investigates the blends of 25%, 50%, and 75% manufactured sand with sea sand on these characteristics. The findings indicate a decrease in the workability of sea sand and manufactured sand individually compared to river sand. However, an increment is evident in the sample that contains a blend of 50% manufactured sand with sea sand. It also satisfies the ASTM standards for the gradation under sieve analysis. Furthermore, concrete formulated with sea sand and manufactured sand, both individually and in combination, exhibits a reduction in compressive strength compared to river sand. However, the mix containing 50% sea sand and 50% manufactured sand demonstrates compressive strength that closely resembles that of river sand concrete. Therefore, the analysis of the mechanical properties of these combinations demonstrates that the 50% sea sand and manufactured sand sample would be suitable for use for industrial requirements.

Keywords: Sea sand, Manufactured sand, Compressive strength, Workability