

# ICES 2024

**TITLE OF PROJECT:**

**Effect of gradation on the compressive strength of concrete using different types of aggregates**

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**ABSTRACT (150-300 words):**

This research investigates the influential role of aggregate gradation in optimizing concrete compressive strength while preserving workability with different combination of gradations ranging 60-40, 55-45, 50-50, 45-55, 40-60 for aggregates. The selection of aggregate gradation profoundly impacts concrete performance, making it a critical consideration for engineers and producers in meeting project-specific requirements.

The study encompasses comprehensive experimentation with various aggregate gradations in concrete mixes, focusing on testing their compressive strengths and analyzing outcomes. The primary objectives include determining the most optimized aggregate gradation for maximizing compressive strength, comparing different aggregate gradations' impact on concrete strength, and assessing their interplay with workability.

The experimental investigation involves two parts. Initially, material properties of cement, coarse aggregates, fine aggregates, slag sand, and M sand are analyzed for their physical and mechanical characteristics. Subsequently, utilizing the M-25 grade as per IS10262-2019 standards, mix designs are implemented.

The results indicate promising findings, notably achieving an average compressive strength of 41 MPa for M25 grade concrete using a blend of 50% Slag sand and 50% M sand and 50:50 gradation for 20&10mm coarse aggregate. These results signify a substantial enhancement in strength, providing valuable insights into an optimized aggregate gradation mix that meets the grade requirements.

This research contributes significant insights for construction projects, offering guidance in selecting tailored aggregate gradations to attain superior compressive strengths without compromising workability. These findings hold potential in influencing concrete mix design practices toward enhanced performance in construction applications.

**KEYWORDS:** M-Sand ,Slag Sand, River Sand ,6mm Aggregate, Gradation.

**CATEGORY:** Concrete Technology Building Construction