

ABSTRACT

Study of the Characteristics of Normal Concrete Using Artificial Coarse Aggregate as a Replacement for Alami Coarse Aggregate

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This research discusses the compressive strength of normal concrete that uses artificial coarse aggregate as a substitute for alami coarse aggregate. The study aims to analyze the effect of the artificial coarse aggregate mixture on normal concrete in terms of slump test, concrete density, and concrete compressive strength. The method used involves concrete with a strength of 15 MPa and the creation of 36 cylindrical test specimens with dimensions of 10 x 20 cm. The specimens were immersed in water baths according to the concrete age of 7 days, 14 days, and 28 days. This research reveals that the use of artificial coarse aggregate as a substitute for alami coarse aggregate achieves optimal results at a composition of 50% at 28 days of concrete age. At this point, the concrete shows a compressive strength of 16.8 MPa, with a slump value of 8 cm and a density of 2203.8 kg/m³. The study finds that the compressive strength of concrete with 100% artificial coarse aggregate almost matches the strength of concrete without any artificial aggregate. One of the key findings of this research is the minimal impact of artificial coarse aggregate on the workability of concrete. The slump test shows consistent results at 8 cm for variations of 0%, 75%, and 100% artificial coarse aggregate. In fact, at a 50% composition, there is a slight increase in workability with a slump value reaching 9 cm. The implications of these findings are significant. Artificial coarse aggregate can replace alami aggregate up to 100% without sacrificing the workability of concrete. In some cases, the use of artificial aggregate can even slightly improve the workability of the mix.

Keywords: Normal Concrete, Artificial Coarse Aggregate, Concrete Quality, Slump Test, Density, Compressive Strength.