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Assessment of Concrete Compressive Strength with the Incorporation of Recycled Coarse Aggregates Across Varied Curing Periods

Aves, Federico A Jr.
Department of Civil Engineering, Surigao del Norte State University, Surigao City, Philippines
faves@ssct.edu.ph

Abstract: *One of the most crucial factors in optimizing the compressive strength of concrete is the assessment of aggregate supply quality. However, due to scarcity and local regulations limiting quarrying, making the most of available supply becomes essential. In this study, the compressive strengths of concrete were compared using recycled aggregates from three different sources and cured for 60 days. Various tests, including specific gravity and absorption, sieve analysis, abrasion test, workability test, and compressive strength test, were conducted to evaluate the suitability of these recycled aggregates for concrete applications. The study's specific findings revealed that with an increasing number of curing days, using the ponding method up to 28 days and the moist method beyond 28 days, the compressive strengths of the five different concrete mixtures also increased. Moreover, employing the three sources of recycled aggregates showed a comparable rise in concrete's compressive strength. Remarkably, the compressive strength achieved in one concrete mixture at the 28-day curing period could be attained by another mixture at specific curing periods. Adequate curing of concrete specimens through ponding at the required temperature demonstrated a significant enhancement in the compressive strength of concrete. Overall, the study concluded that the compressive strengths of the five different concrete mixtures varied and could be properly addressed through correct proportioning, handling, and proper mixing. Utilizing recycled aggregates from three different sources and varying the water-cement ratio for each mixture yielded positive outcomes. Furthermore, the research revealed that all selected recycled aggregate sources were suitable for concrete construction in the area and could be blended to maximize usage volume without significantly affecting quality.*

Keywords: Concrete, Coarse Aggregates, Curing Periods, Compressive Strength, Recycled Aggregates

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