

ABSTRACT

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*“ANALYSIS OF THE EFFECT OF POLYCARBOXYLATE ETHER (PCE) ON
THE COMPRESSIVE STRENGTH OF CONCRETE WITH RECYCLED
CONCRETE AGGREGATE (RCA)”*

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This research addresses the issue of increasing concrete waste, which continues to accumulate due to extensive construction activities and testing practices in civil engineering laboratories. Waste concrete generated from building demolition and unused test specimens is often discarded without proper utilization, causing negative impacts on the environment. This study aims to recycle waste concrete into Recycled Concrete Aggregate (RCA) as a substitute for natural coarse aggregate and to analyze the effect of adding Polycarboxylate Ether (PCE) as a superplasticizer admixture to improve the compressive strength of concrete. Test specimens were cast in cylindrical molds with a diameter of 15 cm and a height of 30 cm using 100% RCA and varying PCE dosages of 1%, 2%, and 3% by cement weight. Compressive strength tests were conducted at 7 days of curing. The test results showed that a 2% PCE dosage produced the highest compressive strength of 24.5 MPa, while 1% resulted in 22.1 MPa. In contrast, an excessive dosage of 3% decreased the compressive strength to 16.5 MPa due to an imbalance in the concrete mix caused by overdosing the PCE. The findings confirm that using an optimal PCE dosage can significantly enhance the quality of RCA concrete, making it feasible for sustainable construction projects. This research is expected to serve as a reference for managing concrete waste effectively, promoting cost savings in raw materials, and supporting environmentally friendly construction practices in the future.

Keywords: Compressive Strength, Concrete Waste, Polycarboxylate Ether, Recycled Concrete Aggregate, Superplasticizer.