

## COMPOSITE EFFECTS OF POZZOLANS IN PRODUCING HIGH STRENGTH RECYCLED AGGREGATE CONCRETE

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Over the years, the unceasing growth and development in the construction industry has resulted in both positives and negatives. The extensive use and disposal of many of the materials used in construction have resulted in the depletion of natural resources, together with piling up of large amounts of construction and demolition waste in landfills, causing adverse effects on the environment, the economy as well as society. The most extensively consumed material in the construction industry can be identified as concrete. Procurement and transportation of raw materials for cement and aggregates which are the two major constituents used in concrete production add significant disturbances to the ecological system. Thousands of research studies have shown the feasibility of using recycled aggregates to produce both normal and high strength concrete with comparable properties to conventional concrete. However, it requires a more all-inclusive approach in producing an environmentally friendly solution. This paper discusses the procedure followed in producing cost effective and economical high strength concrete through the composite use of pozzolans namely fly ash, silica fume and rice husk ash (RHA), in both stages of aggregate treatment and concrete production. Results from aggregate testing showed a 26% and 59% reduction in aggregate water absorption and porosity, respectively. Further, enhancements in terms of aggregate specific gravity and crushing value were obtained. Concrete which contained RHA in both stages, attained a compressive strength of 55.4 MPa, which was even higher than the control mix containing natural aggregates. The same mix of concrete showed a 12% increase in its surface resistivity. This indicates the possibility of achieving high strengths, even with the use of RA derived from parent concretes of lower grades, and not many studies have focussed on this aspect of high strength recycled aggregate concrete production (HS-RAC).

**Keywords:** recycled concrete aggregate; surface treatment; dual pozzolans; Rice Husk Ash; high strength concrete

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