

ABSTRACT

The main objective of this project was to study the mechanical and durability properties of normal strength concrete with and without Recycled Coarse Aggregate (RCA) using recycled coarse of 30% only. The mix containing 0% of recycled coarse aggregate was served as control mix. In both sets of mixes of concrete, same cement: fine aggregate: coarse aggregate (1:1.25:2.61) was used, which was measured by weight of the concrete. Also, a water cement ratio of 0.4 was used in all mixes. The mechanical properties of NAC and RAC were investigated on 7, 14 and 28 days. The mechanical tests were performed using standard procedures, which were Compressive Test (ASTM C 39), Indirect Tensile Splitting Test (ASTM C 496) and Flexure Test (ASTM C 78). The durability of recycled aggregate concrete was investigated on 30, 90, 180, days. The durability tests were performed using standard procedures, which were Rapid Chloride Penetration Test (ASTM C 1202), Absorption and Sorptivity (ASTM C 1585), Salt Spray (ASTM B 117), Half-Cell potential (ASTM C 876), Hydraulic Permeability (DIN 1048), and Carbonation (BS 1881).

The results showed that the mechanical properties decreases with the replacement of natural aggregates with recycled aggregates and durability properties like absorption and permeability deteriorate with the increase in proportion of recycled aggregates in the concrete while on the other hand the depth of carbonation, chloride penetration and corrosion tends to increase when recycled aggregates replace natural aggregates.