

Effect of Concrete Waste Quality on the Compressive Strength of Recycled Concrete

Authors : Kebaili Bachir

Abstract : The reuse of concrete waste as a secondary aggregate could be an efficient solution for sustainable development and long-term environmental protection. The variable nature of waste concrete, with various compressive strengths, can have a negative effect on the final compressive strength of recycled concrete. Accordingly, an experimental test programme was developed to evaluate the effect of parent concrete qualities on the performance of recycled concrete. Three grades with different compressive strengths 10MPa, 20MPa, and 30MPa were considered in the study; moreover, an unknown compressive strength was introduced as well. The trial mixes used 40% secondary aggregates (both coarse and fine) and 60% of natural aggregates. The compressive strength of the test concrete decrease between 15 and 25% compared to normal concrete with no secondary aggregates. This work proves that the strength properties of the parent concrete have a limited effect on the compressive strength of recycled concrete. Low compressive strength parent concrete when crushed generate a high percentage of recycled coarse aggregates with the less attached mortar and give the same compressive strength as an excellent parent concrete. However, the decrease in compressive strength can be mitigated by increasing the cement content 4% by weight of recycled aggregates used.

Keywords : compressive, concrete, quality, recycled, strength

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