Evaluation of Recycling Concrete

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Recycling is becoming essential to reduce the amount of solid waste, which is becoming a global environmental crisis, in addition to conserving the world recourses, which are becoming scarce, to the future generations.

Waste concrete may be collected and utilized in the production of new concrete. Properties of aggregates have a great impact on the durability and strength of the resulting concrete. As recycled aggregates contain concrete rebels and have been exposed to different environments for different durations, their properties are expected to differ compared to those of virgin new aggregates. Properties of aggregates affect the mix design and the proportions of the constituent materials. The suitability of the recycled aggregates for concrete production was assessed through standard aggregates tests. Properties were compared to of new aggregates.

As recycled aggregates are collected from different structures with different types of concrete with different types and durations of exposure, their properties are expected to differ between batches. Most of the properties were determined for three different batches of recycled concrete and a preliminary statistical evaluation was performed to investigate consistency.

One of the main goals of this study is to investigate the possibility of recycled aggregate utilization in concrete production. To achieve this goal, concrete specimens were produced using different mixes of concrete incorporating recycled aggregates. The mechanical properties of the resulting concrete were evaluated and compared to those of control concrete, produced using new virgin aggregates.

Durability of concrete produced using recycled aggregates is of major concern, as the utilized recycled aggregates are of lower quality compared to new ones and have been previously exposed to different types of environmental exposures. Durability of concrete produced using recycled aggregates was investigated through exposing concrete specimens to different types of exposures for different time durations before evaluating the changes in their properties.

In this paper the proportions of the utilized mixes, the specimens preparation, the testing procedures along with the results for both the mechanical properties and durability are explained and discussed