

Improving properties of Concrete made with Concrete Recycled Aggregate from local resources, by adjusting W/C*

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Abstract

Aggregates are essential component of concrete products because it forms 75% of the total volume, therefore they have major effect on the properties of the concrete products specially the compression strength which mainly depends on the physical and mechanical properties of the resulted aggregates.

The scarce of the natural resources and adopting conceptions of sustainable resources in developing industry all led to bring up new alternatives to the natural aggregate (from quarries), through replacing them with recycled aggregate resulted from crushing and demolishing debris of Construction and Demolition Waste (C&D W) from several sources. These are used as coarse aggregate in concrete works to achieve principles of saving the environment and the resources.

Scientific researches proved that Recycled Concrete Aggregate (RCA) can be used as coarse aggregates to get a new concrete product and in producing Recycled Aggregate Concrete (RAC), characterized by decreased compression strength according to the replacement ratio.

In this research the possibility of improving the compression strength of the concrete made with recycled aggregates (from local resources) as coarse aggregate is studied, through defining the replacement ratio and modifying the water to cement ratio W/C used. Physical and mechanical properties of the new concrete product (RAC) are studied to achieve the technical and economic viability of using and recycling the demolition waste.

The purpose of this research is to expand the field of using Recycled Aggregate Concrete (RAC) which effects the improvement of landfills employing, disposal of construction and demolished wastes, protect the natural quarries, and achieving the principles of sustainable development.

The important view in this research is enhancing the use of debris and construction and demolition wastes as concrete recycled aggregates, to produce new concrete consistent with the required specifications in the engineering works and constructions.

Key words: Demolition wastes, Recycled aggregate concrete, W/C Ratio

* For the paper in Arabic see pages (129-137).

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