World Academy of Science, Engineering and Technology
International Journal of Architectural and Environmental Engineering
Vol:8, No:12, 2014

Recycling of Aggregates from Construction Demolition Wastes in Concrete: Study of Physical and Mechanical Properties

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Abstract : This work is focused on the study of valuation of recycled concrete aggregates, by measuring certain properties of concrete in the fresh and hardened state. In this study, rheological tests and physic-mechanical characterization on concretes and mortars were conducted with recycled concrete whose geometric properties were identified aggregates. Mortars were elaborated with recycled fine aggregate (0/5mm) and concretes were manufactured using recycled coarse aggregates (5/12.5 mm and 12.5/20 mm). First, a study of the mortars was conducted to determine the effectiveness of adjuvant polycarboxylate superplasticizer on the workability of these and their action deflocculating of the fine recycled sand. The rheological behavior of mortars based on fine aggregate recycled was characterized. The results confirm that the mortars composed of different fractions of recycled sand (0/5) have a better mechanical properties (compressive and flexural strength) compared to normal mortar. Also, the mechanical strengths of concretes made with recycled aggregates (5/12.5 mm and 12.5/20 mm), are comparable to those of conventional concrete with conventional aggregates, provided that the implementation can be improved by the addition of a superplasticizer.

Keywords : demolition wastes, recycled coarse aggregate, concrete, workability, mechanical strength, porosity/water absorption
Conference Title : ICBS 2014 : International Conference on Building Science
Conference Location : Paris, France
Conference Dates : December 30-31, 2014

Open Science Index, Architectural and Environmental Engineering Vol:8, No:12, 2014 publications.waset.org/abstracts/14876/pdf