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Effect Different Moisture States of Surface-treated Recycled Concrete Aggregate on Properties of Fresh and Hardened Concrete

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Abstract : This study examined the properties of fresh and hardened concretes as influenced by the moisture state of the coarse recycled concrete aggregates (RCA) after surface treatment. Surface treatment was performed by immersing the coarse RCA in a calcium metasilicate (CM) solution. The treated coarse RCA was maintained in three controlled moisture states, namely, air-dried, oven-dried, and saturated surface-dried (SSD), prior to its use in a concrete mix. The physical properties of coarse RCA were evaluated after surface treatment during the first phase of the experiment to determine the density and the water absorption characteristics of the RCA. The second phase involved the evaluation of the slump, slump loss, density, and compressive strength of the concretes that were prepared with different proportions of natural and treated coarse RCA. Controlling the moisture state of the coarse RCA after surface treatment was found to significantly influence the properties of the fresh and hardened concretes.

Keywords : moisture state, recycled concrete aggregate, surface treatment
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