

The Behavior of Self-Compacting Light Weight Concrete Produced by Magnetic Water

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Abstract : The aim of this article is to access the optimal mix design of self-compacting light weight concrete. The effects of magnetic water, superplasticizer based on polycarboxylic-ether, and silica fume on characteristics of this type of concrete are studied. The workability of fresh concrete and the compressive strength of hardened concrete are considered here. For this purpose, nine mix designs were studied. The percentages of superplasticizer were 0.5, 1, and 2% of the weight of cement, and the percentages of silica fume were 0, 6, and 10% of the weight of cement. The water to cementitious ratios were 0.28, 0.32, and 0.36. The workability of concrete samples was analyzed by the devices such as slump flow, V-funnel, L box, U box, and Urimet with J ring. Then, the compressive strengths of the mixes at the ages of 3, 7, 28, and 90 days were obtained. The results show that by using magnetic water, the compressive strengths are improved at all the ages. In the concrete samples with ordinary water, more superplasticizer dosages were needed. Moreover, the combination of superplasticizer and magnetic water had positive effects on the mixes containing silica fume and they could flow easily.

Keywords : magnetic water, self-compacting light weight concrete, silica fume, superplasticizer

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