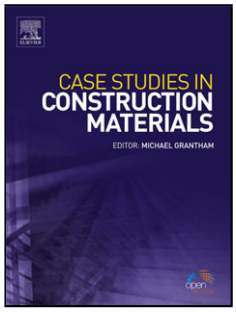

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Rice husk ash as a partial replacement of cement in high strength concrete containing micro silica: Evaluating durability and mechanical properties

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Abstract

The preliminary and inevitable interest in the use of partial replacements or by - products as complementary pozzolanic materials was mostly induced by enforcement of air pollution control resulted from cement production industry. Rise husk is by- product taken from rice mill process, with approximately the ratio of 200 kg per one ton of rice, even in high temperature it reduces to 40 kg. This paper presents benefits resulted from various ratios of rice husk ash(RHA) on concrete indicators through 5 mixture plans with proportions of 5, 10, 15, 20 and 25% RHA by weight of cement in addition to 10% micro- silica (MS) to be compared with a reference mixture with 100% Portland cement. Tests results indicated the positive relationship between 15% replacement of RHA with increase in compressive strengths by about 20%. The optimum level of strength and durability properties generally gain with addition up to 20%, beyond that is associated with slight decrease in strength parameters by about 4.5%. The same results obtained for water absorption ratios likely to be unfavourable. Chloride ions penetration increased with increase in cement replacement by about 25% relative to the initial values (about less than one fifth).