

Effect of Rice Husk Ash on Strength and Durability of High Strength High Performance Concrete

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Abstract : This paper reports the strength and durability properties of high strength high performance concrete incorporating rice husk ash (RHA) having high silica, low carbon content and appropriate fineness. In this study concrete containing 10%, 15% and 20% RHA as cement replacement and water to binder ratio of 0.25 were investigated. The results show that increasing amount of RHA increases the dosage of superplasticizer to maintain similar workability. Partial replacement of cement with RHA did not increase the early age compressive strength of concrete. However, concrete containing RHA showed higher compressive strength at later ages. The results showed that compressive strength of concrete in the 90-115 MPa range can be obtained at 28 curing days and the durability properties of RHA concrete performed better than that of control concrete. The water absorption of concrete incorporating 15% RHA exhibited the lowest value. The porosity of concrete is consistent with water absorption whereby higher replacement of RHA decreased the porosity of concrete. There is a positive correlation between reducing porosity and increasing compressive strength of high strength high performance concrete. The results also indicate that up to 20% of RHA incorporation could be advantageously blended with cement without adversely affecting the strength and durability properties of concrete.

Keywords : compressive strength, durability, high performance concrete, rice husk ash

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