

Effect of Waste Foundry Slag and Alccofine on Durability Properties of High Strength Concrete

Authors : Devinder Sharma, Sanjay Sharma, Ajay Goyal, Ashish Kapoor

Abstract : The present research paper discussed the durability properties of high strength concrete (HSC) using Foundry Slag(FD) as partial substitute for fine aggregates (FA) and Alccofine (AF) in addition to portland pozzolana (PPC) cement. Specimens of Concrete M100 grade with water/binder ratio 0.239, with Foundry Slag (FD) varying from 0 to 50% and with optimum quantity of AF(15%) were casted and tested for durability properties such as Water absorption, water permeability, resistance to sulphate attack, alkali attack and nitrate attack of HSC at the age of 7, 14, 28, 56 and 90 days. Substitution of fine aggregates (FA) with up to 45% of foundry slag(FD) content and cement with 15% substitution and addition of alccofine showed an excellent resistance against durability properties at all ages but showed a decrease in these properties with 50% of FD contents. Loss of weight in concrete samples due to sulphate attack, alkali attack and nitrate attack of HSC at the age of 365 days was compared with loss in compressive strength. Correlation between loss in weight and loss in compressive strength in all the tests was found to be excellent.

Keywords : alccofine, alkali attack, foundry slag, high strength concrete, nitrate attack, water absorption, water permeability

Conference Title : ICCEE 2017 : International Conference on Civil and Environmental Engineering

Conference Location : Miami, United States

Conference Dates : March 09-10, 2017