

Performance of Air Cured Concrete Treated with Waterproofing Admixtures or Surface Treatments

Authors : Sirwan Kamal, Hsein Kew, Hamid Jahromi

Abstract : This paper reports results of a study conducted to investigate strength, sorptivity, and permeability under pressure of concrete specimens, cured using a water-based curing compound. The specimens are treated with waterproofing admixtures or surface treatments to enhance performance while exposed to water. Four types of concrete specimens were prepared in the laboratory, Portland cement (CEM I), Portland-fly ash (CEM II/A-V), Blast-furnace cement (CEM III) and Portland-silica fume (CEM II/A-D). Concrete cubes were de-molded three hours after casting, and sprayed with a curing compound. Admixtures were added to the mix during batching, whereas surface treatments were applied on concrete after 28 days. Compressive strength test was carried out to assess the efficiency of curing compound to develop required strength. In addition, sorptivity and permeability tests were conducted to evaluate the performance of treated specimens with respect to water ingress. Results show that strength development in specimens cured with curing compound achieved up to 96% and 90% at 7 and 28 days respectively, compared to cubes cured in water. Moreover, specimens treated with waterproofing admixtures or surface treatments materials characterized by hydrophobic impregnation considerably reduced water penetration compared to untreated control cubes. On the other hand, cubes treated with admixtures or surface treatments materials characterized by crystalline effect were ineffective in reducing water penetration.

Keywords : admixtures, concrete, curing compound, surface treatments

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