

Combined Effect of High Curing Temperature and Crack Width on Chloride Migration in Reinforced Concrete Beams

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Abstract : Deterioration of reinforced concrete structures is a serious concern in the construction engineering, largely due to chloride induced corrosion of reinforcement. Chloride penetration is markedly influenced by one or several major factors at the same time such as curing in combination with different crack widths which have spectacular effect on reinforced concrete structures. This research presents the results of an experimental investigation involving reinforced concrete beams with three different crack widths ranging from 0 to 0.2mm, curing temperatures of 20°C or 40°C and water-to-cement of 0.5. Chloride content profiles were determined under non-steady state diffusion at 20°C. Based on the obtained results, higher chloride content was obtained under condition of high curing temperature in combination with large crack more than 0.1mm and there are no significant differences between narrow crack width (less than 0.1 mm) and beams without crack (0mm).

Keywords : crack width, high curing temperature, rapid chloride migration, reinforced concrete beam

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