

Effect of waterproofing coatings on steel reinforcement corrosion and physical properties of concrete

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Abstract: This paper reports the results of a study conducted to evaluate steel reinforcement corrosion and some physical properties of concrete specimens coated with two polymer-based, a cement-based polymer-modified, and a cement-based waterproofing coatings. The coated and uncoated concrete specimens were subjected to accelerated corrosion to determine the time-to-corrosion initiation. The physical properties were also evaluated by subjecting the concrete specimens to wetting/drying cycles and heating/cooling cycles for five months. The physical properties evaluated were water absorption, water permeability, chloride permeability, and adhesion. The accelerated corrosion test results clearly showed that the specimens coated with the polyurethane elastomer-based waterproofing material performed better than concrete specimens coated with other waterproofing materials. This was followed by the specimens coated with cement-based polymer modified, epoxy-based, and cement-based coatings in descending order. The two polymer-based coatings showed better performance than the cement-based polymer-modified and cement-based coatings in terms of the evaluated physical properties.