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Corrosion initiation and propagation of RC beams cracked by loading under chloride environment

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Abstract:

This paper deals with corrosion initiation and propagation in pre-cracked reinforced concrete beams exposed to a chloride environment under sustained loading. The cracking maps, corrosion maps, chloride profiles, cross-section loss and corrosion rate of one group of two beams cast in 2010 were examined. Experimental results show that, after rapid initiation of corrosion at the crack tip, the corrosion process almost stops and the time elapsing before corrosion re-start depends on the exposure conditions and also on the cover depth. The case of horizontal tensioned (and cracked) surface exposed to chloride appears to be very detrimental condition leading to fast propagation stage of corrosion and high corrosion rate.

Key words: corrosion initiation; corrosion propagation, chloride; cracks, reinforcement