

Reinforcement corrosion in concrete structures, its monitoring and service life prediction - A review

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Abstract:

Reinforcement corrosion has been widely reported in the literature over the last two to three decades. It is one of the major durability problems, mainly when the rebar in the concrete is exposed to the chlorides either contributed from the concrete ingredients or penetrated from the surrounding chloride-bearing environment. Carbonation of concrete or penetration of acidic gases into the concrete, are the other causes of reinforcement corrosion. Besides these there are few more factors, some related to the concrete quality, such as w/c ratio, cement content, impurities in the concrete ingredients, presence of surface cracks, etc. and others related to the external environment, such as moisture, oxygen, humidity, temperature, bacterial attack, stray currents, etc., which affect reinforcement corrosion. The assessment of the causes and extent of corrosion is carried out using various electrochemical techniques. Prediction of the remaining service life of a corroding RC structure is done with the help of empirical models and experimental methods. In this paper a review is presented on the mechanism of reinforcement corrosion, techniques utilized to monitor reinforcement corrosion and methodologies that are utilized for the prediction of remaining service life of structures.