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Effect of reinforcement corrosion on flexural behaviour of concrete beams

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Abstract:

Properly designed and constructed steel reinforced cement concrete structures are normally expected to provide relatively maintenance free service for at least 40years. This expectation is based on a consideration that steel is passivated and hence not subjected to corrosion, in highly alkaline (PH12.5-13.5) environment which is produced due to formation of $\text{Ca}(\text{OH})_2$ and other alkaline products during the hydration of cement.

The steel concrete losses passivation due to effect of chloride iron on passivating film and reaction between atmospheric carbon dioxide and alkali in concrete and is subjected to corrosion by normal electro chemical corrosion process. Once started, corrosion continues by self-generating mechanism.

The present paper deals with the corrosion mechanism of steel reinforcement and its influence on structural behaviour of concrete beams. Reinforced concrete beam will be designed as per standard specification using M_{20} grade of concrete and will be subjected to corrosion using chemical as well as electro chemical techniques. The condition of rebar will be periodically accessed through potential measurement. At the end of the test period structural behaviour of beams will be studied. The investigation is expected to throw more light on the process of reinforcement corrosion and its effect on the flexural behaviour of concrete beams.

Keywords:

electro chemical techniques, Reinforced concrete beam, M_{20} grade of concrete, RCC structures, rust stains, concrete spalling