

Improving durability of R.C. members through optimum selection of the levels of corrosion cracking factors

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Abstract:

In the present paper, a procedure has been suggested to select the optimum levels of corrosion cracking factors, namely cement content, w/c ratio, cover thickness and diameter of the reinforcing bars corresponding to a designed service life of R.C. members with various chloride contents. For demonstrating the utility of the procedure, an empirical model for corrosion rate in terms of chloride content, cement content, and w/c ratio has been considered. Corrosion rates for the various possible combinations of these factors have been calculated using the model, and optimum levels of the cement content and w/c ratio are selected corresponding to the minimum corrosion rate at various levels of the chloride content. Then by substituting the values of minimum corrosion rates, and various combinations of cover thickness and diameter of reinforcing bars, in a life prediction model, the maximum service lives have been obtained for various levels of chloride in the R.C. members.