

Sensitivity Analysis of Interference of Localised Corrosion on Bending Capacity of a Corroded RC Beam

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Abstract : In this paper, using the response surface method (RSM), tornado diagram method and non-linear finite element analysis, the effect of four parameters on residual bending capacity of a corroded RC beam was investigated. The parameters considered are amount of localised cross section reduction, ratio of pit distance on adjacent bars to rebar distance, concrete compressive strength, and rebar tensile strength. The focus is on the influence on the bending ultimate limit state. Based on the obtained results, the effects of the ratio of pit distance to rebar distance (L_p/L_r) and the ratio of the localised cross section reduction to the original area of the rebar (A_{pit}/A_0) were found significant. The interference of localised corrosion on adjacent reinforcement bars reduces the bending capacity of under-reinforced concrete beam. Using the sensitivity analysis could lead to recognize uncertainty parameters, which have the most influences on the performance of the structure.

Keywords : localised corrosion, concrete beam, sensitivity analyses, ultimate capacity

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