

Deterioration Estimation of Reinforced Concrete Building Structures Using Material Testing Data Base

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Abstract

This study aims to investigate the material factors that affect the degree of deterioration of reinforced concrete structures and develop an integrating evaluation model. Also, the durability indices were generated using the analytic hierarchy process for the overall durability assessment of structures, which corresponded to the durability grades referred as the maintenance, reinforcement, or demolition. The status of concrete includes compressive strength, resistance coefficient, concrete cracks, honeycomb and spalling. And the reinforcement status includes corrosion potential, corrosion current, chloride ion content, neutralization depth and protective layer thickness. Durability indicators were determined through the findings on the structural inspection process of reinforced concrete structures and the evaluation methods related to materials testing and industry standards. Case studies were also presented to illustrate the methodology of the assessment system. The durability methodology can be summarized as the comprehensive evaluation methods considering the earthquake potential factors, structural factors, environmental factors, and material deterioration factors.

Keywords: durability, analytic hierarchy process, material deterioration

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