Universität Stuttgart
Institut für Werkstoffe im Bauwesen

Pfaffenwaldring 4G, 70569 Stuttgart

IWB

Masterarbeit
M.Sc. Thesis

Datum: 20.04.2020

Application of non-destructive tests for the assessment of corrosion condition in reinforced concrete structures

Corrosion of steel reinforcement in concrete is the most important cause of the deteriorating of RC structures. Every year in industrial countries, a considerable amount of economic resources is allocated to repair and retrofit the corrosion affected reinforced concrete (RC) structures such as bridges and tunnels. Deciding on the most effective method of repairment crucially depends on understanding the corrosion condition in the existing structures. Moreover, diagnosing the corrosion in the early stages leads to reduce the costs of repair significantly. Therefore, using non-destructive test methods would be so beneficial since they are relatively easy to implement without any damages to the structures.

The main objective of the thesis is to evaluate some of the RC structures at the University of Stuttgart. The outcomes of the study would be a suitable guideline for defining the proper strategies regarding the maintenance of RC structures.

Main focuses of the thesis:

- Literature review about corrosion process (Electrochemistry) in steel-reinforced concrete and the application of different non-destructive tests to assess corrosion condition in RC structures and survaying the relative codes such as ASTM C876 and RILEM TC-154
- Locating the corrosion affected RC structures and studying the related details and history
- Implementing electrochemical non-destructive tests such as half-cell potential and corrosion rate measurment considering different ambient conditions
- Suggesting proper repair and retrofitting techniques

The applicant should:

- have passed courses in the field of civil engineering such as materials I+II
- have the ability to work independently
- have a good knowledge of English

Start: June 2020
Language: English
Period: 6 months

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