Non-Destructive Evaluation of Reinforced Concrete Structures

Description:

Volume 1: Deterioration processes and standard test methods reviews the processes of deterioration and classical and standard test methods.

Part one discusses deterioration of reinforced concrete and testing problems with chapters on topics such as key issues in the non-destructive testing of concrete structures, when to use non-destructive testing of reinforced concrete structures, deterioration processes in reinforced concrete, modelling ageing and corrosion processes in reinforced concrete structures, components in concrete and their impact on quality, and predicting the service life of reinforced concrete structures. Part two reviews classical and standard testing methods including microscopic examination of deteriorated concrete, the analysis of solid components and their ratios in reinforced concrete structures, the determination of chlorides in concrete structures, and investigating the original water content of reinforced concrete structures.

Volume 2: Non-destructive testing methods reviews the latest non-destructive testing techniques for reinforced concrete structures and how they are used.

Part one discusses planning and implementing non-destructive testing of reinforced concrete structures with chapters on non-destructive testing methods for building diagnosis, development of automated NDE systems, structural health monitoring systems and data fusion. Part two reviews individual non-destructive testing techniques including wireless monitoring, electromagnetic and acoustic-elastic waves, laser-induced breakdown spectroscopy, acoustic emission evaluation, magnetic flux leakage, electrical resistivity, capacimetry, measuring the corrosion rate (polarization resistance) and the corrosion potential of reinforced concrete structures, ground penetrating radar, radar tomography, active thermography, nuclear magnetic resonance imaging, stress wave propagation, impact-echo, surface and guided wave techniques and ultrasonics. Part three covers case studies including inspection of concrete retaining walls using ground penetrating radar, acoustic emission and impact echo techniques and using ground penetrating radar to assess an eight-span post-tensioned viaduct.

- Provides a comprehensive discussion from examination of the components in concrete and their affect on quality through to the role of and tools required for lifetime management
- Experts in the field identify the testing problems associated with infrastructure considering design, build and maintenance stages
- Reviews the latest non-destructive testing (NDT) techniques and how they are used in practice

Contents:

Part 1 Deterioration of reinforced concrete and testing problems: Introduction: Key issues in the non-destructive testing of concrete structures
When to use non-destructive testing of reinforced concrete structures: An overview
Deterioration processes in reinforced concrete: An overview
Modelling of ageing and corrosion processes in reinforced concrete structures
Components in concrete and their impact on quality: An overview
The role and tools of lifetime management of civil structures. Part 2 Conventional/standard testing methods:
Conventional/standard testing methods for concrete: An overview
Microscopic examination of deteriorated concrete
The analysis of solid components and their ratios in reinforced concrete structures
The determination of chlorides in concrete structures
Investigating the original water content of concrete.

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