



1.054/1.541 Mechanics and Design of Concrete Structures (3-0-9)

Outline 13

Non-destructive Testing for Concrete Structures

Demand for the development of non-destructive testing (NDT) techniques for concrete structures has increased with the growing concern about the deteriorating condition of the World's infrastructure. Efficient and accurate imaging techniques are needed for a reliable evaluation of safety and serviceability of concrete structures. Although, presently, imaging is routinely used in various fields, implementation of these technologies in NDT of civil engineering systems, especially of concrete structures, offers many challenges and requires additional development due to the composite nature of the concrete material and the complexities of reinforced or prestressed concrete systems.

This lecture introduces the basic principles of various imaging techniques associated with several NDT methods applicable to concrete structures. The techniques considered are radiography, radioactive computerized tomography, infrared thermography, radar imaging and acoustic imaging. Special considerations regarding the applicability and accuracy of these techniques for the condition assessment of concrete structures are discussed, and examples of imaging applications are given.