

NON-DESTRUCTIVE TESTING OF CONCRETE STRUCTURES

I. INTRODUCTION

Importance and need of non-destructive testing, Basic methods for NDT of concrete structures, Tools and equipment for visual inspection , General procedure of visual inspection, Partial destructive tests-Pullout test, Pull off test, Core test, Moisture measurements in concrete, Comparison of NDT methods.

II. REBOUND HAMMER TEST

Fundamental principle, Equipment for Schmidt/rebound hammer test, General procedure for Schmidt rebound hammer test, Applications of Schmidt rebound hammer test, Range and limitations of Schmidt rebound hammer test.

III. ULTRASONIC TESTING

Pulse velocity test , Fundamental principle , Equipment for pulse velocity test , Applications, Determination of pulse velocity, Factors influencing pulse velocity measurements , Detection of defects and Developments in ultrasonic tomography. Combined Ultrasonic Pulse Velocity and rebound hammer Techniques.

IV. METHODS TO EVALUATE CORROSION OF REINFORCEMENT

CARBONATION DEPTH MEASUREMENT TEST- Fundamental principle , Equipment for carbonation depth measurement test, General procedure for carbonation depth measurement test, Range and limitations of carbonation depth measurement test.

HALF-CELL ELECTRICAL POTENTIAL METHOD- Fundamental principle , Equipment for half-cell electrical potential method , General procedure for half-cell electrical potential method , Applications of half-cell electrical potential testing method , Range and limitations of half-cell electrical potential inspection method.

V. PERMEABILITY TEST

Fundamental principle , General procedure for permeability test, Equipment for permeability test, Initial surface absorption test, Modified Figg permeability test , In situ rapid chloride ion permeability test , Applications of permeability test , Range and limitations of permeability test.

REFERENCES:

1. Guidebook on non-destructive testing of concrete structures, IAEA, vienna, 2002.
2. Handbook on Nondestructive Testing of Concrete Second Edition V.M. Malhotra, Nicholas J. Carino.
3. IS 13311-1 (1992): Non-destructive testing of concrete methods of test, part 1- Ultrasonic pulse velocity.
4. IS 13311-2 (1992): Non-destructive testing of concrete methods of test, part 2- Rebound hammer test.