Teknologi Bahan Konstruksi

Non-destructive Test (NDT)

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Why use testing?

- Make best use of limited budgets
- Repair vs. replace
- Increase load limits
- Preserve our infrastructure
- Economics
- Historic structures
- Make sound judgments to repair or replace
- Increase level of confidence / decrease uncertainty
- Increase overall safety

Destructive testing vs Non-destructive testing

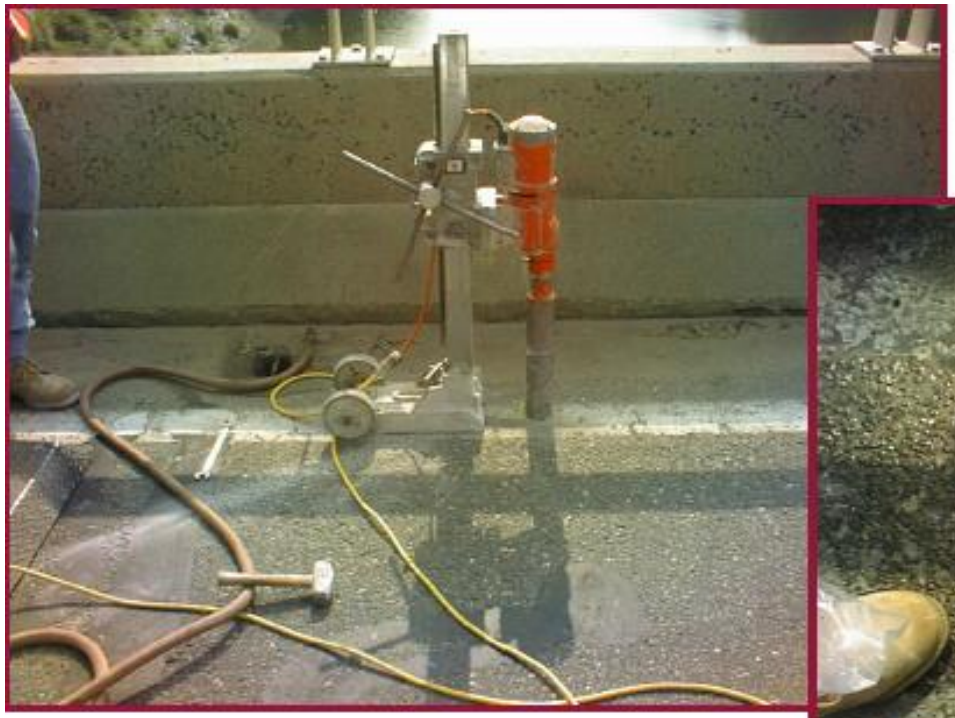
- Destructive testing is carried out until the specimen's failure. These tests are generally much easier to carry out, yield more information and are easier to interpret than non-destructive testing
- Non-destructive testing is the type of testing that does not destroy the test object. It is vital when the material in question is still in service.

Destructive Testing

- Involves removing or uncovering a piece of the structure
- Used mostly to determine material properties

- Determine a load rating
- Increase load capacity

Used mostly to determine material properties



Determine extent of contamination or damage

Types of Destructive Testing

- Concrete sampling
- Freeze-thaw damage
- Alkali-silica reaction

Types of Non-Destructive Testing

- Rebound Hammer Test
- Pull-out Test
- Windsor Probe Test
- Maturity Test

Homework

1) List four nondestructive test methods for the evaluation of concrete quality. Which one can be used as a direct substitute for determining the compressive strength of concrete?
2) What are the principles behind the following test procedures: Schmidt hammer test, Windsor probe test, pullout test, maturity test? Explain which you would recommend for deciding the formwork removal time.
3) Your company has been hired to perform the assessment of the damage of a building that had been exposed to a fire for 1 hour. Write a memo describing the protocol of the site investigation including what non-destructive tests should be used to determine the best repair strategy for the reinforced concrete structure.