



NRC-CNRC

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Research in
Construction

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Non-Destructive Evaluation of Concrete Pipes

Objectives

To develop a non-destructive testing (NDT) method for condition assessment of concrete pipes

Background

Concrete pipes, such as Prestressed Concrete Cylinder Pipes (PCCP), are widely used in North American cities. Interaction of aggressive soils with PCCP induces cracking and damage in the mortar coating. This allows groundwater to reach the steel cylinder and the prestressed steel wires inside the pipe, which leads to their corrosion. Under high internal water pressure corroded wires can break, causing distress in the concrete cylinder that may result in a catastrophic failure of the pipe. Electromagnetic inspection methods used to assess the conditions of PCCP may overestimate the number of broken wires, and do not provide any information on the concrete conditions. Available sonic/ultrasonic methods provide only local characterization of the concrete, the results are not always reliable and the survey speed is slow. All these methods can be deployed only in dewatered pipes. This project aims to develop a more effective NDT method that can detect signs of distress in PCCP associated with wire breaks, and can be deployed without taking the pipe out of service.

Statement of Work

The research consists of the following tasks:

- Conduct an experimental program to investigate the applicability and accuracy of existing NDT methods
- Develop promising approaches and adapt them to PCCP
- Extend the developed method to water-filled PCCP
- Automate the process and validate the method in the field.

Expected Outcomes

The project will provide NDT tools and guidance to help PCCP owners and operators to inspect their pipes and assess their condition. As well, the results will help asset managers in prioritizing repair work, and in adopting better management approaches for PCCP networks.

Partners

Irrigation Development Branch (Saskatchewan Agriculture, Food and Rural Revitalization) and City of Regina

Start/Expected Completion Dates

This project began in January 2007 and will be completed in 2010.

Project Manager

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For more information, see http://irc.nrc-cnrc.gc.ca/csir/projects/nde_e.html

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