

CONDITION ASSESSMENT OF WATER PIPES IN HONG KONG

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ABSTRACT

In order to develop a cost-effective strategy for the rehabilitation of a pipe network, it is first necessary to identify those sections of the network that require renovation or replacement. One commonly adopted approach to this is to identify those sections of the network where there has been the greatest number of bursts and leaks. Whilst this is an effective approach for identifying which sections are in most urgent need of repair or replacement, a pro-active strategy which prevents leaks and bursts from occurring is preferred. Furthermore, in the case of critical mains, it may not be desirable for the pipeline to develop a failure history. A pro-active strategy, however, requires a sound understanding of the condition of the pipe.

This paper will provide an overview of the various direct and indirect methods for evaluating water pipe condition, including near field and remote field electromagnetic techniques, acoustic emission, ultrasonic techniques, stray current monitoring, coating defect surveys, hardness testing, visual inspection, deflection and deformation measurements, and soil surveys.

A case study of the condition assessment of the Dongjiang Water Mains (DJWM) in Hong Kong will be included to demonstrate the application of most of these techniques, and the results and output from the assessment. The DJWM consists of a number of buried and exposed trunk mains bringing water to Hong Kong from across the border in Guangzhou and as such are crucial to maintaining a secure supply of water to Hong Kong. The pipes have been added to over the years and consist of a variety of pipes of different ages, diameters, and materials, ranging from buried 1.2 metre diameter steel pipes installed in the 1960s to 2.4 metre diameter exposed GRP pipes installed during the 1980s. The case study will highlight particular problems found with the pipelines and will also demonstrate how the results have been used to develop a cost-effective maintenance and rehabilitation programme for the pipelines.

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