

Asbestos cement pressure pipe manual

By **Adam Wheeldon**, Principal Environmental Engineer and Principal Author,
Opus International Consultants, Christchurch.

The new, and extensively updated, asbestos cement pressure pipe manual is now available online at www.waternz.org.nz/ACManual.

The new manual (second edition) now includes wastewater pressure pipes, in diameters from DN 50 to DN 600, and is made up of two volumes.

Volume one comprises the User Guide, and Volume two is Technical/Supporting Data. The lifetime prediction model (a user-friendly spreadsheet called “Deterioration modelling for pressure pipelines”) is also included.

Volume one outlines the processes and procedures to guide asset managers with a consistent and repeatable approach to asbestos cement (AC) pressure pipe condition assessment.

Volume two of the document contains technical and supporting information including:

- Asbestos cement pipe deterioration
- Asbestos cement pipe condition assessment
- Lifetime prediction modelling and charts
- Condition grading and charts
- Glossary of terms and abbreviations
- Reference tables.

AC watermain pipe samples assessed since 2003

The original (first edition, August 2001) AC pipe manual was based on 240 condition assessments of AC watermain pipes. Since then, analysis of 790 pipe samples has shown that the average deterioration rate is around three percent greater than that of the 240 pipe samples assessed up to 2001.

AC wastewater pressure pipe samples assessed since 2003

Some 89 AC wastewater pressure pipes have been assessed for condition, and these form the basis of the deterioration rates used in the model.

Note: To the best of our knowledge, no stormwater pressure pipe samples have been assessed, and the new manual recommends using the results from the watermain pipe samples.

Guidance on pipe sampling

Detailed guidance related to pipe sampling for condition assessment is given, including what to look for and what to record. Condition assessment of pipes in-situ including core sampling is also covered.

Health and safety

Volume one includes a comprehensive user guide to working with asbestos from a water and wastewater pipeline perspective. This section has been developed to assist and enable asset owners, contractors, pipe condition assessors and other professionals (the users) to better understand the potential risks when working on or near AC pipes.

This section has been developed in conjunction with WorkSafe and provides a detailed example of a working practice check list. It also contains various other aspects of health and safety to consider, including:

- Why asbestos is a hazard
- Health and safety, and asbestos management planning
- Regulations and legislation
- Controlled equipment.

The need for appropriate training and personal protective equipment for personnel who will be working with AC pipes is highlighted.

Condition assessment techniques

The various condition assessment techniques are described, and the two principal methods of measuring deterioration depths are: phenolphthalein testing and computed tomography (CT) scanning (see images).



Phenolphthalein testing



CT scanning

Lifetime prediction model and charts

The lifetime prediction model has been updated, and three fields are auto-populated, based on the pipe data imputed.

A predicted lifetime range is now provided for water and wastewater pressure pipes from DN 50 to DN 600 (inclusive). The new charts are specific to pipe application (use), diameter, and pressure class.

Condition grading and charts

The condition grading system provides for five grades as per the New Zealand Infrastructure Asset Grading Guidelines. The grading is related to the probable remaining life of the pipeline, so that there is no need for a qualitative judgement regarding the pipe condition. [WZN](http://www.waternz.org.nz)