

# Sophistication in large diameter pipeline inspection



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Interflow, through its partnership with Drain Surgeons NZ and Cleanflow NZ, is now able to offer Australian water authorities a sophisticated large diameter pipeline inspection system that's capable of providing accurate, objective data on the condition of pipeline both above and below the water line.

**THE HD PROFILER** operates without person-entry and without the need for flow control by utilising CCTV, laser profiling and sonar. This advancement represents a major step forward for Interflow's clients who seek a safe, cost-effective and objective means of understanding the condition of their large diameter pipelines.

## BACKGROUND

Over the last 20 years, the inspection methodology for small diameter sewer pipes (less than 750 mm) has evolved from being rudimentary with subjective interpretation of the footage, to being a process that is now carried out in a consistent manner by hundreds of companies using well-established methods and equipment. There are now also standard reporting methods and several software companies that provide reports and assessments to water authorities.

The principle inspection tool used for small diameter pipes is a camera, which provides footage indicating the condition of the pipeline. In more recent times, there has also been interest in using laser profiling to obtain more accurate and objective information on the shape of the pipe. In small diameter pipelines it is typically possible to see the full 360 degree of the pipeline either due to low flows or from temporarily plugging the flow while running the camera through the pipe. Cameras will be inserted in one manhole and driven along the pipe to the

next manhole, transmitting footage via a cable to a screen and storage device above ground. Typically, lengths of several hundred metres are capable of being surveyed from one location. This is quite adequate for the vast majority of small diameter pipelines.

The situation in large diameter pipelines (> 900 mm) is quite different. Firstly, the flow rates and depths in these pipes are typically so high that it is not possible to view the condition in the invert and for a significant portion of the lower circumference. It is generally not possible to plug or divert the flow to completely empty the pipe because this encounters a significant cost. Additionally, the distance between entry points in large diameter pipe is often much greater.

As a consequence, the default method of inspection in large diameter pipeline has been to enter the pipe and manually inspect.

## INTRODUCING THE HD PROFILER

The HD Profiler represents a significant advancement in the field of large diameter pipeline inspection.

The HD Profiler allows sewer pipes in the size range 900 to 3,000 mm to be inspected without person-entry. The unit contains a camera, laser profiler and sonar. It is pulled through the sewer at speeds of up to 15 m per minute and can survey a pipeline from a single access point up to 3,000 m long.

The unit stores all information onboard. Upon retrieval the data is

downloaded and sent to Cleanflow NZ for analysis and preparation of the reports.

## INSPECTION DATA AND REPORTS

### 1. CCTV

The HD Profiler is equipped with a high resolution camera that provides a video file of the pipeline complete with digital zoom.

### 2. PROFILING

An accurate profile of the pipe is produced. This allows the actual shape of the pipe to be shown as well as the extent of deterioration/corrosion. This data is vital in the assessment of the pipeline's structural condition. The Flat Graph software is used to topographically map pipe radial variances from the reference shape and size from start to end of the pipe. Based on the reference shape and size, a flat graph is drawn with the pipe being split at the 6 o'clock position and flattened out. Colours represent how the data matches the reference shape by:

- Appearing white when the data lies close the reference shape
- Appearing on a yellow to red scale when there is deviation outside the reference shape (e.g. corrosion)
- Appearing on a blue scale where there is deviation inside the reference shape (e.g. debris). This can also be used in flexible pipes to show the extent of non-circularity.

### 3. SONAR

The sonar profiler is able to be used when the pipe is 25 to 75 per cent surcharged. The sonar images are recorded as a video, combined with the laser profilers and used to generate →

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