



Pulling pipe on the Olympic Avenue Watermain Renewal Project.

Innovation in the renewal of watermains

By Ian Bateman, Director, Interflow

With water authorities increasingly using Trenchless Technology to rehabilitate water infrastructure, Ian Bateman from contractor Interflow outlines one solution for reducing supply interruption during the renovation.

A SIGNIFICANT CHALLENGE and opportunity for the Trenchless Technology industry is to provide asset owners with cost effective and non-disruptive solutions for watermain renewals. The number of kilometres of water pipelines in Australasia is similar to the number of kilometres of sewer lines. Both types of pipe have a finite life and degrade over time. However, the

rate of trenchless water pipe renewals is far below that of sewer pipe renewals. Water pipe renewals are commonly undertaken with the traditional excavate and replace method. This is similar to where the sewer pipe renewal market was 20 years ago.

The majority of trenchless watermain renewals in Australasia are conducted using pipe bursting or sliplining techniques.

These techniques have many positive aspects, such as replacing a deteriorated watermain with a new polyethylene pipe — the very same pipe that would typically be used today when a new pipeline is laid. In the case of pipe bursting there is no loss of cross sectional area and it can actually provide the client with an increased diameter when needed. →



Figure 1. An example of how shutting off water supply can affect residents.



Figure 2. Infracstop can drastically reduce the residents affected by watermain renewals.

However, one of the major issues faced by the industry and the water authorities is impact on the water supply to the residents. In order to renew or replace a watermain there are strict limitations on the allowable time residents can be without water (typically no longer than

four hours and in many markets no longer than one hour). Furthermore, any such shutdowns are scheduled to occur at times that provide the least disruption to residents (such as weekends and nights) further increasing the costs of the renewal.

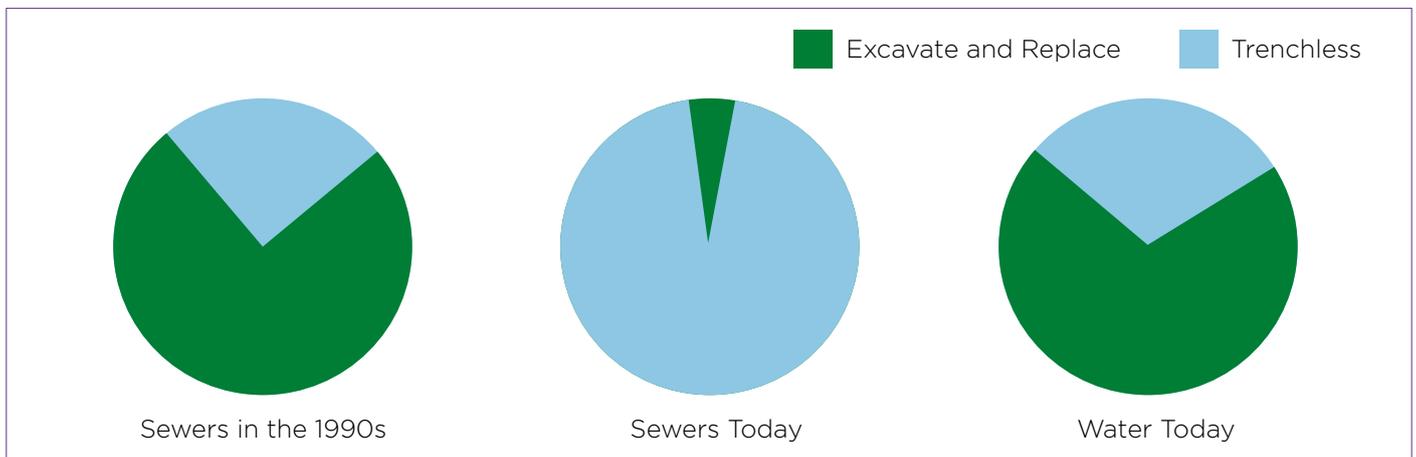
Infractec recognised this issue and set about developing the technology that enabled the watermain to be renewed with no interruption of water supply to residents. The technology revolves around an innovative on-line shut-off valve called Infracstop®.

HOW INFRASTOP WORKS

Prior to commencing the renewal of a given length of watermain, it must be isolated (taken out of service). The traditional way to achieve this would have been to shut off supply at the nearest shut off valve, thus interrupting supply to all residents downstream of the valve. Figure 1 shows an example of how shutting off supply can affect residents. The red line indicates the location of the watermain to be renewed. The shaded region illustrates the number of residents that would be affected by shutting off supply at the valve.

Clearly the extent of resident disruption is vast and it is not feasible to take this number of residents offline for the duration of the watermain renewal. As such it was common to install shut-off valves immediately upstream of the renewal activity. However, installing such valves could only be done with the water supply shut off, so the residents in the shaded region would still be without water for at least the length of time it took to install the shut off valves - typically approximately four hours.

In the early 2000s Infractec developed a unique valve called an Infracstop. This patented shut-off valve can be installed immediately upstream (and downstream if needed) of the job with the watermain still in service, hence causing zero interruption to residents. In conjunction with installation of Infracstops, a localised temporary water supply system is installed and connected to each water meter of each residence. When the Infracstop valve is shut, the water supply is diverted to the temporary water supply system and the residents are then



Water pipe renewals are commonly undertaken with traditional open-cut excavations - similar to usage levels in the sewer pipe renewal market 20 years ago.

assured of water for the entire duration of the renewal.

Infrastop has proven to be fail safe. In over ten years, there have been no instances of equipment malfunction that have required an emergency supply interruption. It can be installed in 90 minutes and without the lead-time necessary to arrange notifications. It requires nothing more than a minor trench opening to install it.

The number of residents now affected is shown in Figure 2. As can be seen, by installing Infrastops at the location of the renewal work, the number of residents in the shaded area is very small. Furthermore, none of the residents have any loss of water supply.

RESULTS ACHIEVED

Since the release of Infrastop to the market, Infratec has installed approximately 10,000 units in Victoria. Before Infrastop, in an average year there were between 500 and 600 planned four hour shutdowns required to perform the renewal work. Now there are less than five required per year.

We are now able to confidently enable water authorities to:

- Complete the vast majority of all renewal works without any supply interruption
- Significantly reduce water off hours – an important KPI for all authorities

- Eliminate many of the costly and severely disruptive interruptions involving businesses and key customers where work would have otherwise needed to occur on weekends or after hours
- Significantly reduce the number of customer complaints relating to interruption of water supply – this includes avoiding resident notification, damage to hot water services and several other issues that put a load on Emergency Communications Centres. Innovations such as Infrastop will continue to drive down trenchless renewal

costs and allow the water authorities to offer greater service to its customers. As these innovations enter the market and clients become more confident and aware of what is available, the market for trenchless watermain renewals will continue to grow. Interflow aims to play a key role in advancing the trenchless watermain renewal market as it has done in the sewer renewal sector since 1991.

For more information about Interflow's sewer, stormwater and water pipe renewal capabilities, and to find out more about the full range of pipeline services Interflow can provide, visit www.interflow.com.au 

BURSTING THROUGH SUPPLY INTERRUPTION

The Infratec team has been utilising the Infrastop while working on the Olympic Avenue Watermain Renewal Project that is taking place in south-eastern suburbs of Melbourne. Crews are rehabilitating 632 m of existing AC pipe by bursting the pipe and pulling through PE100 PN16 pipe of 125 mm diameter. Project proponent South East Water selected pipe bursting for the project because it would allow minimal disruption to the highly built-up areas where the works are taking place. In suburbs with several primary schools and areas with young families, the minimal excavation technique provided a safer alternative to open-cut trenching. By utilising the Infrastop and an alternative supply system, works were able to take place without disrupting the supply to residents in the area.