



“Investigator+” enables non-disruptive watermain leak detection

JD7 Investigator+ can be launched through fire hydrants, pressure fittings, air valves and gate valves while the mains remain in service

BY DAVID GOSSELIN AND DONNY WONG

As part of a pilot project with the City of Vancouver, B.C., a quadrant delimited by Prince Edward Street, between 34th and 36th Street, was selected in order to perform an internal pressurized inspection using the JD7 Investigator+ unit.

JD7 Investigator+

The JD7 Investigator+ watermain condition assessment tool for in-service distribution systems is a next generation device for asset management. Pairing a high definition camera system with hydrophone technology, as well as a high powered sonde, the Investigator+ allows for the inspection of assets ranging from 100 to 300 mm all while maintaining the lines in full service. Utilizing various pre-existing entry points such as fire hydrants and pressure fittings, minimal preparation is required for an intervention.

The system is extremely robust, allowing reliable results to be achieved within harsh environments. The system uses an electronic or manual drive

mechanism to feed and retract the sensor head within the water main. This ensures a consistent feed rate and increases control of the position of the sensor. The mechanism also allows water integrity within pressurised water mains.

Project details

For the purpose of this project, nine access points were selected in the Vancouver area. The launch system utilized with the equipment was adapted in order to provide access into a vast majority of fire hydrant models from the major manufacturing companies (Mueller, American, Clow, etc.) including both slide-gate and compression style hydrants. The particularity of the Vancouver region is not only the fact that slide-gate hydrants are still very much present in the network, but also that the vast majority of the hydrants in the region are manufactured by Terminal City Iron Works Ltd. and are only readily found in B.C.

Having never worked with such a model of hydrant before, it did not surprise us when we

realized modifications would have to be made to our current launch apparatus to accommodate the variances in design. Since slide-gate hydrants are considered to be antiquated in water distribution systems, it was also surprising to see so many in good working order. It was concluded that, in order for our rig to work properly, we would have to devise a way to simultaneously seal the single drain plug in the shoe as well as isolate the barrel, essentially transforming the barrel into that of a wet-barrel hydrant. A solution was quickly developed and, with the modifications completed on the launching device, only a rapid adjustment was then required between hydrant mobilizations to accommodate for the varying burial depths. Our approach for proper completion of the project began with completing the direct tapping insertion as well as all the slide-gate hydrants and finished with the more conventional compression style hydrants.

Throughout the inspection process of



Working through fire hydrants, the JD7 Investigator+ provides high-definition images of the insides of pipelines while simultaneously detecting leaks in the line.

the various watermains, we were able to identify sectors which had been rehabilitated with cement mortar lining as well as others which hadn't been examined yet. The cast iron lines which had been lined showed no signs of tuberculation throughout the pipe other than at the tees and various bends or valves. The cast iron lines which were approximately of the same pe-

riod, without having undergone rehabilitation, were now showing signs of anywhere between 5 to 20 percent reduction due to tuberculation. Despite encountering some areas with heavy tuberculation, no acoustic points of reference or anything that may have been perceived as a leak were detected. The nine access points which were utilized allowed us to cover over 300 metres of watermain in the area.

Having identified zones where tuberculation was becoming an issue, the City now possessed the documentation validating the actual condition of the watermains in that area. As a result of the work performed, the unlined mains have been identified as rehabilitation candidates in the near future.

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