

Islington Avenue Watermain: Not Just Another Lining Project

In 2014, the Regional Municipality of York embarked on a journey to renew 3 km of ductile iron watermain in the City of Vaughan, Ontario. Constructed in 1977, the 450 mm and 600 mm watermain supplies water from the City of Toronto to the West Woodbridge Elevated Tank. At the outset, the renewal method had not yet been determined and during preliminary design an assessment was carried out to determine the optimal renewal method. All options were considered including: slip-lining, Cured-In-Place Pipe (CIPP), and full pipe replacement by a combination of open cut and tunnel methods. Based on cost, minimized pedestrian and vehicular impact, constructability and the ability to meet the desired project objectives, CIPP was selected as the preferred renewal method. This presentation will cover the project highlights and the innovations developed to successfully complete this project.

PROJECT HIGHLIGHTS:

- Installation of approximately 3,000 metres of CIPP liner within a 450mm / 600mm ductile iron watermain
- Rehabilitation of all existing valve chambers with new valves, stainless steel piping and appurtenances including replacing the access chimneys with new pre-cast chamber riser sections to improve access
- Installation of new valve chambers to improve isolation capabilities
- Installation of new connections to the local distribution system for constructability purposes
- Construction of a new flow control valve chamber with electric actuator
- Comprehensive coordination between the owner (the Region), water supply (Toronto Water), and local distribution (City of Vaughan).
- The project was successfully completed on-time and the watermain is back in service.

INNOVATIONS:

- Access pits were strategically at existing chamber locations to provide access to the watermain for lining. Existing chamber walls were salvaged, roof slab removed, and new precast risers added to raise roof elevation. This minimized the extent of excavation and dewatering required. Chambers experiencing infiltration were repaired by injection grouting.
- Due to high demand on the system during summer months the watermain could not be shut down between Victoria Day and Labour Day. The work was successfully phased over two separate winter periods (2017/2018, and 2018/2019). The isolation plan carefully considered alternative supply locations and in one case required additional flow through a pressure district boundary. To achieve this, a new pressure-reducing valve was installed to supplement flow through the boundary.
- Prior to discharging the CIPP curing water to the natural environment the water was treated through a carbon filtration system
- Working with an existing system required careful consideration and development of the isolation plan. In one location where isolation could not be achieved using existing valves, a temporary live-tap inline valve was implemented to safely work on the pipeline.
- To prevent potential contamination of the local distribution system with super-chlorinated water during the watermain disinfection process, continuous monitoring of chlorine levels on the live-side of the watermain was implemented.