

MEMORANDUM



TO: JEFFREY HERCZEG, DIRECTOR OF PUBLIC WORKS
FROM: BEN CROY, CITY ENGINEER
SUBJECT: 2024 PCCP WATER MAIN INSPECTION
DATE: DECEMBER 5, 2024

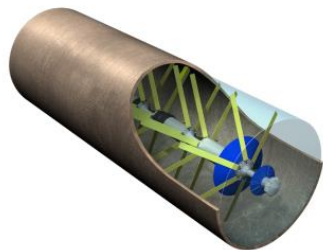
Mayor and Council –

FYI, only

- Victor

The City of Novi's water distribution system has approximately 4.5 Miles of large diameter (24" and larger) Prestressed Concrete Cylinder Pipe (PCCP), a common pipe material for large diameter water mains. However, PCCP pipe can develop defects resulting in catastrophic failures and water main breaks. A break of this nature occurred in the GLWA distribution system in October 2017 on 14 Mile, east of Novi, impacting service of seven communities and taking five days to repair.

Following the 2017 water main break, the Great Lakes Water Authority recognized the need to inspect the remainder of the PCCP in their water system. This inspection method involves the use of specialized insertion equipment that can identify specific defects within the pipe. This inspection is a proprietary method conducted by Xylem (Pure Technologies) which sends two pieces of equipment (Smart Ball for leaks, and Pipe Diver for structural integrity) through the live water main. In 2019 (see attached presentation) staff initiated the same inspection process on Novi assets to identify specific areas of concern and estimate the criticality of any defects.



Pipe Diver Cross Section

The inspection of the PCCP pipe was completed in two events. During the initial inspection in 2020, the Smart Ball completed the southern 2.2 miles of PCCP pipe (the northern section insertion point was problematic), and the Pipe Diver inspection was only completed on 1.8 miles of pipe. The Pipe Diver equipment was impeded by a damaged valve and Xylem had to perform an emergency extraction of the Pipe Diver. The remainder of the Pipe Diver/Smart Ball inspection was completed in 2024 following assessment/repair of valves in the inspection path, along with the installation of a new structure for the insertion of the Pipe Diver.

The inspections resulted in two major findings; the Smart Ball did not identify any detectable leaks, and the Pipe Diver identified four segments of pipe exhibiting distress to the extent repair was recommended. The repairs of the four pipe segments (Novi Road and 13 Mile Road) were completed in March of this year. The City's contractor, LGC Global, hired

Structural Technologies to perform an internal repair method called Carbon Fiber Reinforced Polymer (applied by hand inside the pipe) to strengthen the pipe segment. The same repair method was used on GLWA's water mains on 14 Mile Road.

Following the completion of all inspections and repairs, Xylem provided a summary report, including analysis and recommendations for future rehabilitation to proactively manage the PCCP pipe. No further repairs are required; however, additional inspection in 7-10 years is recommended. The attached Condition Assessment Report shows Novi's PCCP water main exhibits a distress rate of approximately 0.7 percent, which is well below the average of four (4) percent observed by Pure Technologies in similar inspections.

The attached map shows the PCCP water main inspected along Novi Road and the location of the repairs. It should be noted that approximately 1,483 feet of pipe north of the Novi Rd/Old Novi Rd intersection could not be inspected due to the pressure reducing valve which regulates pressures between districts. Staff will continue to monitor and inspect Novi's PCCP assets as needed.