

CITY OF SYRACUSE SAVES TIME, MONEY AND DISRUPTION WITH SPRAY-IN-PLACE PIPE REHABILITATION

By: Audrey Leamy, Roger Linder, SUEZ

The Syracuse (New York) Water Department provides retail water service to the entire city, the fifth largest in the state with a 2020 population of 148,620 and a metropolitan area population totaling more than 662,000. Through wholesale and other service agreements, the Syracuse Water Department also supplies water to portions of the towns of Dewitt, Onondaga, Geddes, Camillus, Salina, and the villages of Skaneateles, and Jordan and Elbridge. For 124 years, the primary water supply for the City of Syracuse has been Skaneateles Lake, a body of water approximately 15 miles long and one mile wide.

The Syracuse water system is made up of over 500 miles of pipelines to deliver water from Skaneateles Lake to the City and to distribute the water throughout the City. The city's extensive water infrastructure also encompasses over 50 miles of transmission conduits, 5,500 hydrants, 7,500 valves, nine pumping stations, 19 gates houses, and two Ultraviolet Light treatment and Chlorination facilities. The water supply system also consists of water storage in Woodland and Westcott Reservoirs on the west side of the city, and water is also stored in two standpipes and in the three tanks that comprise Morningside Reservoir. Combined, the five water storage facilities accommodate a total of approximately 205 million gallons.

SOLUTIONS TO ADDRESS AGING INFRASTRUCTURE

As with many cities across the USA, the city's water infrastructure is aging. Much of it is 75 to 125 years old. In the heart of the city, the water system averages 350 main breaks a year as a result. However, city personnel have taken this issue very seriously and have begun implementing a plan to update the distribution system.

After evaluating various trenchless technologies, the project team selected SUEZ's Spray-in-Place Pipe Rehabilitation (SIPP) as the preferred solution for certain stretches of the water system. One area runs directly in front of City Hall, one of the city's busiest locations, so the solution had to provide minimal disruption both below and above ground to minimize risk. With many other utilities located in the same area, the risk of crossings and conflicts were high.

"It's an old system and very difficult to update in a dense urban setting," said Joseph Awald, Commissioner of Water, City of Syracuse.

After learning about SIPP at a lunch and learn session presented



SIPP far less disruptive compared to traditional techniques

by SUEZ, the Syracuse Water Department opted to try SIPP for one stretch of pipe. It turned out to be an attractive and viable solution. With SIPP, service connections do not need to be drilled, and excavation is typically limited to a very small insertion and receiving pit making SIPP far less disruptive compared to traditional techniques.

ABOUT SIPP

SUEZ' SIPP is an efficient and long-lasting pipe rehabilitation solution that scrubs underground pipes clean and then uses a state-of-the-art, computer-controlled robotic spray rig to apply an internal epoxy pipe coating. The epoxy coating applied by SUEZ is NSF-approved for use in potable water systems across North America. Once it has cured, the epoxy lining seals the pipe, preventing leaks and water contamination, and extending the pipes' service life. This solution also minimizes future maintenance costs and increases the flow capacity for greater system efficiency and importantly, for firefighting.

As noted, SIPP eliminates the need for major road or sidewalk tear-ups, requiring only a series of small access pits along the

“WATER QUALITY IMPROVED, AND PUMPING COSTS DECREASED DUE TO THE IMPROVED FLOW OF WATER THROUGH THE RENOVATED PIPING SYSTEM.”



Compact access pit



CCTV to inspect cleaning

pipeline to be rehabilitated. It can be used to rehab pipes made of different materials including cast iron, with diameters ranging from 4 inches to 36 inches.

The SUEZ SIPP rehabilitation process consists of a few key steps:

- The first step is to agree with the utility on the access point locations to be used for the SIPP process. A small access pit is excavated two feet below the host pipe. A three-foot section of the host pipe is removed to allow access to safely launch the lining equipment inside the host pipe. A CCTV inspection is performed to analyze and confirm the section of pipe to be restored.
- Next, the pipe interior is prepared for restoration by drag scraping and/or hydro-jetting to create a clean, smooth dry surface. The cleaning process is then inspected by a CCTV inspection.
- The epoxy coating is applied using computer-controlled robotic spray application rigs to ensure a more uniform coating and the desired thickness application. Once cured, this coating creates an internal seal that prevents leaks and helps protect against future corrosion and biological buildup. The two-component, 100% solid epoxy system used to coat water distribution systems exceeds ANSI/NSF 61 standards. The epoxy coating is a Zero VOC material with certified zero fish kill.
- A final CCTV inspection is performed to make sure the lining is correct. The sections of pipe that were removed at the access points can then be reinstated. The utility proceeds with the chlorination/disinfection before system restoration.



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Pre Rehab Tuberculated Pipe



SIPP Pipe Relined

BENEFITS OF SIPP

SIPP can yield considerable cost savings when compared to direct replacement, where it is necessary to dig and replace the entire length of the pipe that needs attention. SIPP also saves time over traditional pipe replacement.

An important advantage of SIPP is that it minimizes inconvenience to consumers by relining water pipes instead of digging them up and replacing them. While a SIPP project does require a minimal amount of excavation limited to a very small insertion and access pit, it represents only about 3 percent of the excavation needed with traditional dig-and-replace projects. The significant cutback of excavation and backfill shortens the traditional construction schedules for this type of work and makes the work safer. Another benefit is that the epoxy lining seals the pipe, leaving no annular space for water to leak. The lining prevents corrosion, improving water quality.

SYRACUSE SIPP IN ACTION

Through its general contractor, the city signed a subcontractor agreement with SUEZ for the rehabilitation of its cast-iron water

main involving 1,200 ft. of 24-inch pipe, 200 ft. of 16-inch pipe, and 500 ft. of 6-inch pipe. Due to the layout of the existing system, the project was divided into seven sections. The product applied to the existing host pipe was the Warren 301-01 coating.

As a result of this project, water capacity increased due to the removal of tuberculation. Water quality improved, and pumping costs decreased due to the improved flow of water through the renovated piping system.

The project was completed in May 2021, within both the proposed budget and timeframe. “The project was shortened by almost 30 days, and we saw approximately a 10-15 percent cost savings compared with the traditional approach,” Awald said.

“Benefits included the lack of roadway disturbance and minimized disruption to traffic flow. We were able to re-open roadways quickly. We were pleasantly surprised by the quickness of the SIPP process, and we plan to use it for rehabbing other stretches of pipe in our distribution system. It’s cost-effective and less invasive – a good solution to high density, high utility conflict in urban areas,” he added. †

ABOUT THE AUTHORS:



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