

SUBJECT

Rehabilitation of Deteriorated Water Transmission Pipeline

Drinking Water Supply: *PipeArmor®150SW*

The City of Tacoma sought an improved methodology to offset the high cost and disruptive work required with large diameter pipeline replacement. The subject of concern was a deteriorated section of a 58” diameter transmission pipeline that is part of the main supply system from the McMillin Reservoir to the city’s distribution hub. The deteriorated section was located 6’ under road improvements and traversed a busy four-lane intersection.

Process Environment

Use	Drinking Water Supply
Process Temperature	Ambient (45° F – 60° F – seasonal ranges)
Operating Pressure	60 psi

Serviced Pipeline

- 2,300 linear feet (LF) of 58” carbon steel pipe installed in 1936 in Puyallup, (Tacoma) WA along urban roadway.

Challenges

- The deteriorated section of pipeline was located along a primary thoroughfare, with up to 18° grade changes over 600’ and traversed under the middle of a four lane intersection, restricting excavation to roadside access.

Solution and Process

- The deteriorated pipe section was abrasive blasted and water-jetted clean.
- A camera inspection was performed to assess the condition of the compromised pipe and location of perforations.
- The pipe system received a life extension lining with the robotic installation of PipeArmor® 150SW, (ANSI/NSF-61 compliant). The PipeArmor® liner was applied at from 375 mil (0.375”) thicknesses in a single pass to fill in the perforations, stop water loss, and stem further wall loss from abrasion and corrosion.

Findings / Results

- City engineers inspected the PipeArmor® lined pipe; then after chlorination treatment, reinstated it to service.
- The robotic delivery process minimized area traffic as well as local community disruptions.
- The world’s first large diameter water supply pipeline was rehabilitated with a robotically applied self standing polyurea liner.
- After a year of in service use, the pipeline was dewatered and inspected by the city on May 10, 2014, where the liner was found unremarkable.



Prepped pipe wall substrate.



Robots are designed for insertion and assembly through 24” man ways and vaults.



Completed liner at one year inspection.