

Modified AVT EZ Valve™ Provides Line Control Without Suspending Service

PIPE DETAIL

A 20-inch (500- mm) ductile iron pipe trunk line

SUMMARY

- Valve replacement was needed in several locations on a 20-inch (500- mm) trunk line Original repair plans failed to appropriately address the damage
- A 20-inch (500-mm) EZ Valve™ was modified to allow horizontal installation on the line
- Installation was carried out with a shallow excavation
- The line was repaired under pressure
- A team of 3 installers installed the valve in 6 hours

The Mishawaka, Indiana, water department had evaluated its lines and drawn up maintenance plans for a 20-inch (500- mm) trunk line. The decision was made to install a valve on the line, but some conditions complicated the project. The excavated area was very shallow, which presented an installation challenge, and the water department wanted to complete the project without interrupting service. Because the trunk line had multiple broken valves, it would be impossible to limit the scope of a service shutdown with a traditional repair.



A modification allowed the EZ Valve™ to be installed horizontally on the trunk line.

The water department needed an insertion valve system that could be installed while maintaining full pressure on the line and could be installed with a shallow excavation.

The installation criteria led the water department to look to AVT for a solution. The AVT EZ Valve™ provided all the features needed and could be customized affordably to meet the low vertical profile required for the shallow excavation.

For this installation, AVT adapted a standard valve for horizontal application by designing, machining, and welding a custom support track inside the valve bonnet. The track supports the wedge gate as it rides on its side inside the bonnet and enables smooth operation of the gate. Another modification to the design involved attaching a right-angle gearbox to the valve nut so the valve can be actuated at ground level in the same way as a traditional valve and with the same number of turns.

Because the AVT EZ Valve is relatively small, it could be installed using the smaller excavation, and because of the valve's unique design, service did not have to be interrupted while the project was under way. The valve maintains the pipe's structural integrity during installation, which precludes the need for restraint procedures like framing and concrete work that not only add cost but require additional manhours, extending the duration of the repair process.

The built-in isolation gate allows the valve to be installed under pressure without additional supplemental equipment. The system also uses a slot-access design that only taps the pipeline with a narrow, milled slot that normally is cut over the top 120 degrees of the single pipe length involved. In this horizontal application, the slot was milled on the side, centered 90 degrees off the vertical.

Before installing the valve, a team of 3 technicians cleaned and lubricated the pipe and placed the valve body castings. This process employs a gasket system with the flexibility to adapt to imprecise outside diameters and even irregular geometries while allowing the assembled body to rotate on the pipe length and maintain line pressure.

Next, the team attached an end milling machine to the cutting adaptor plate and rotated the valve body to cut an access slot for the wedge gate. This milling process makes a 3.5-inch (89-mm) slot over a 120-degree path and flushes the milled debris out of the system to prevent it from entering the line. In a normal installation, the slot for the bonnet is centered on the top of the pipe diameter. In this case, the milling process was adjusted to allow the slot to be made on the horizontal plane.

Finally, the installers attached the valve bonnet to the pipe and tested it to confirm proper functionality by cycling the valve on and off. After verifying that the valve was working correctly, they tightened the body bolts and restraint bolts to secure the valve body in position, creating a drip-tight seal.

The entire process was carried out without additional excavation and without interrupting service.

The AVT EZ Valve is the only 20-inch (500-mm) insertion valve available in North America. Each valve is factory pressure tested before delivery and includes UL listing and AWWA material specifications and is certified to NSF/ANSI 61.