St. Louis Saves Time and Money With Flexible Connectors

Repairing and maintaining manholes used to be a real pain for the Metropolitan St. Louis Sewer District in Missouri.

Repairs took anywhere from one day to two weeks to complete, depending on the number of emergencies or poor weather conditions that interfered with the work. Leaking pipe connectors constructed with brick and mortar were costing the district between $1,000 and $6,000 in materials and labor to repair while also causing subsidence and dangerous road conditions.

Repair in progress

"The pavement would sink six inches around the manholes, causing serious problems for vehicles and pedestrians," says Ronald Moore, materials engineer for the Metropolitan St. Louis Sewer District (MSD). "The only solution was to take the time and spend the money to fix them, or risk further problems down the road."

Ten years ago, MSD found a much better solution in flexible rubber connectors. Already using them in its sanitary system, MSD began using them for its storm projects in hopes of reducing the uncontrolled inflow of water into its storm systems.

"With inflow, soil comes into the system, and that causes cave-ins," says Moore. "Without a watertight connection, the integrity of the structures are compromised and collapse occurs. To solve the problem, we opted to incorporate the flexible connectors into our storm systems."

It was a good choice, according to Moore. MSD currently installs the connectors in all new storm systems, and is gradually replacing the brick-and-mortar connections in all of its existing storm systems with flexible connectors.

"Flexible connectors save our District time, money and the hassle of inspections while also preventing soil migration and subsidence, vehicle damage and pedestrian hazards," says Moore. "Watertight systems also prevent erosion and subsidence around structures, and eliminate the high cost of repairing streets and sidewalks caused by leaks."

Such savings are significant for MSD, a public agency whose responsibilities include the collection and treatment of wastewater and stormwater management. MSD serves a population of approximately 1.4 million in a 524-square-mile region that encompasses the city of St. Louis and about 80 percent of St. Louis County for a total of 92 municipalities.

Within that area, MSD operates 10 treatment facilities that treat an average flow of 360 million gallons of sewage per day. It operates and maintains 8,585 miles of sewers, including 2,382 miles of stormwater sewers, 4,422 miles of sanitary sewers and 1,781 miles of combined sewers that handle both wastewater and stormwater flows.

Watertight rubber connector

To remove and replace manholes MSD spends $750,000 annually, including crew costs of $250 an hour. Every year, MSD adds 548 storm manholes, 1,167 inlets and nine junction chambers to the system, for which it averages 2.5 flexible gaskets per structure.

Because MSD takes over maintenance of its sewer and storm systems after installation – and because it doesn't pay for the initial installation or materials – the switch to flexible connectors has been particularly fruitful. "We're responsible for repairing any voids or cave-ins," says Moore. "Once we started using the flexible gaskets, we had a significant reduction in our maintenance costs in those areas."

Plus, says Moore, the less stormwater that gets into the sanitary system, the less time that must be spent treating that stormwater. An overloaded system requires additional sewer lines to handle the overflow. The best way to eliminate that need, says Moore, is by installing a flexible connector in every manhole in the District's sewer system.

MSD's cost savings associated with flexible connectors have been significant, and these savings are returned to the district's general revenue fund for use on other projects. According to Moore, it costs $1,000 to $6,000 to dig up the street, disrupt traffic and repair each structure.

According to Moore, the switch to flexible connectors was fairly seamless for MSD. At first, concerns were raised over the cost of the connectors, but those issues were resolved once the project developers realized the costs would equalize," says Moore. "Considering the labor intensive practice of using brick and mortar to make joint connections."

MSD has achieved another goal as a result of using flexible connectors in its sanitary systems: compliance with the new EPA regulations requiring that systems be watertight and airtight. "The gasket makes the whole system watertight, which means air testing is much easier," Moore explains, adding that MSD specifies that its watertight flexible joints be able to withstand an air test.

"When the inspector sees that flexible connector in place, he's 99.9 percent confident that there's a solid seal in place," says Moore, adding that over the last 10 years flexible connectors have "become part of the standard routine" for MSD. "Everyone expects the manufacturers to know how to use them, so everyone is on the same sheet of music when it comes to installation and performance."■