

# 2019 FALL PROJECT PROFILE

Foley CAT Emergency Outfall Replacement

Kansas City, MO

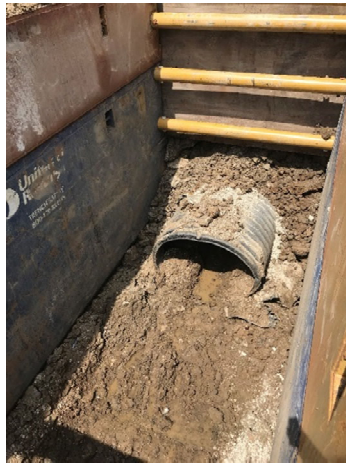
HDPE Pipe Replacement

Completed with Forterra Reinforced Concrete Pipe installed by Leath & Sons Contracting

A simple repaving project proved to be much more of a hassle than it should have been. In early 2019, the owners of Foley CAT Equipment Sales in Kansas City, MO were hoping to improve their site and repave their parking lot. During some of the preliminary site inspections it was discovered that a long stretch of 60-inch, city-owned HDPE storm sewer pipe running underneath their lot was severely over deflected and in risk of total collapse. Plans for a simple repave ultimately came to a halt.

The failed line was originally installed in 2007 by the site developer. A few years later, it was extended and turned over to the city with an easement through the private site. The city expects that the failure occurred shortly after or during the original installation and that, the deflection had been increasing over time. Unfortunately, this was not checked when the outfall changed hands and the city was left with the responsibility.

The project initially called for a short stretch of the line to be replaced, but after digging up the section in question, it became apparent that the upstream and downstream segments of the line were also failed and in need of replacement. A large cavity was discovered roughly 6' below the parking lot caused by soil washing away as it entered through holes and cracks in the top of the pipe. Fortunately the line was inspected when it was, prior to what could have been a catastrophic cave-in. By the time the failure was discovered, the pipe had deflected between 30-40% for nearly all of the 184 ft of outfall – directly underneath the parking lot. The cause of the failure was a simple overloading of the pipe due to earth loads. With a maximum fill approximately 19' over the top of



the line, it was more than apparent that the HDPE line was not set up for success from the outset. Designers can avoid these situations by completing a structural assessment of the underground utilities and selecting appropriate materials for the application.

Ultimately, the City decided to replace the line with a Class 4 Reinforced Concrete Pipe. Since most of the structure of RCP is built-in to the pipe at the plant in a controlled environment, the city could be confident that the pre-cast concrete product was up to the task of the above-average fill-heights. Even with conservative design assumptions, a Class 4 pipe of this size is guaranteed for up to 20' of fill.



Construction was completed by Leath & Sons Contracting in the Fall of 2019. Forterra was selected to supply the pipe which was produced and shipped out of our Plattsmouth, NE plant. The City gave high compliments to the contractor for their ability to complete the work efficiently and providing great communication throughout construction. The total cost of the replacement came to \$275,000. As the city of Kansas City, MO moves forward from this learning opportunity they will look to re-evaluate the limits set on HDPE usage to ensure that situations like this don't arise in the future.

