

Trenchless TECHNOLOGY

CIPP Used on 54-In. Sewer Pipes in San Antonio

Giant Sinkhole Attributed to Pipe Collapse



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San Antonio, Texas, is a city firmly rooted in the past, with an eye on the future and a healthy respect for its heritage.

There are a number of famous missions in San Antonio, one of which is Mission Concepcion. Like many parts of San Antonio, the infrastructure around Mission Concepcion is under increasing pressure, with population growth and a thriving economy. Sometimes, that infrastructure cannot handle the stress, as was the case on Sunday, Feb. 7, 2010—better known as Super Bowl Sunday. That day, the San Antonio Water System (SAWS) got a report that there was a giant sinkhole developing on Benita Street, close to Mission Concepcion.

San Antonio Water System serves approximately 1 million people in the urbanized part of Bexar County, including approximately 325,900 water customers and 354,800 wastewater customers. SAWS' service area includes

most of the City of San Antonio, several suburban municipalities and adjacent parts of Bexar County. In addition to serving its own retail customers, SAWS also provides wholesale water supplies to several smaller utility systems within this area boundary.

The Challenge

The SAWS Operations team quickly responded, barricading the area and preparing the site for investigation. The team excavated the collapse on Monday, Feb. 8, and then called in Sandra Gomez from SAWS Replacements & Improvements group. On Wednesday, Feb. 10, SAWS provided its contractor LNV Engineering with authorization to proceed and help discover and design a solution.

Unfortunately, sinkholes are appearing with greater frequency around the United States. As neighborhoods and business districts age in municipalities across the country, so do the water and wastewater pipes and industrial pipe infrastructure that support them, making pipe collapses more common. What made this situation unique was the combination of factors, from the place of the sinkhole, the sensitive histori-

cal areas close by, difficulty in gaining access to the infrastructure and the unique collaborative solutions developed and deployed by RePipe, LNV Engineering and SAWS.

The situation on Benita Street provided many challenges, with the first one being the ability to accurately understand the situation. A sinkhole developed in front of a resident's house, which necessitated excavating the site to determine the source of the collapse and determine possible solutions. SAWS excavated the site, and, with LNV Engineering, determined the source of the sinkhole was two pipes of 54 in. in diameter collapsing, along with a deteriorating junction box.

Other challenges included the site itself, with the collapse under a residence and potential access points impossible given the new street close by and other houses situated directly atop the pipelines.

The Solution

SAWS and LNV Engineering originally thought sliplining might be the best remedy for the situation, given constraints such as time, inability to tear up pavement and budget. They quickly developed an emergency plan and

requested bids from three companies. After review, the team chose RePipe, an IPR company, due to its trenchless expertise, solution-oriented approach and competitive pricing. With RePipe's ability to employ a comprehensive portfolio of trenchless pipeline rehabilitation services in the United States, along with LNV Engineering's ability to thoroughly assess all options, they would ensure San Antonio Water System would have the best solution for the situation.

RePipe general manager Mike Vellano said, "We knew there were a lot of unknowns with the site, but felt we could work with LNV and SAWS in a collaborative manner to put the best solution in place, and meet all challenges appropriately."

Instead of sliplining, Vellano consulted with LNV and SAWS, and the group determined that given the state of the host pipe, some bends that would come into it and some other complicating factors, the best solution was likely a unique application of cured-in-place-pipe (CIPP) and a clean out and extension of the junction box.

The team determined that a customized CIPP solution would be the best fit, given the field conditions and the pipeline network in the general vicinity, but internal cutouts would be necessary, which is highly uncommon. RePipe came up with a plan with Peabody Construction to physically extend the junction box, divert flow, clean out the existing junction box, remediate the collapsed pipe, restore structural integrity and create a lasting solution to the wastewater pipes at the Benita Street project site.

In the area, the two 54-in. lines extended 900 ft to the next structure, but with this CIPP solution they would only need to rehabilitate 150 ft, saving time and

money. Given that the solution would not be open-cut, they further saved on time, materials and disruption to the area. To do true open-cut, the City would have needed to buy some area properties, demolish the houses and then dig-and-replace the existing pipe. Due to the sensitivity of the surrounding environment, CIPP lining was deemed to be the most sensible renovation over other trenchless solutions like sliplining and traditional open-cut replacement, which was deemed not feasible.

Two key participants in the project were Gerald Hoffpauir and Jorge Martinez from RePipe, who spearheaded innovative solutions to every challenge faced at the project. From securing bypass capability, creating internal cutout options to designing the inversion "shoot", their creativity and resilience were invaluable.

Tie-offs on the bag were done to prevent it from unfurling fully, essentially stopping the CIPP line where RePipe wanted. Then, once cured, the structure was deemed safe and an internal cutout was performed.

LNV and RePipe felt the cured pipe was the safest structure to enable the cutout. The alternatives would have been to dig an excavation pit or another insertion pit and open up the pipe and perform a cutout, but then that would have required another point repair, as well as more area disruption. The internal cutout allowed RePipe to eliminate the need for an excavation pit, exposing the pipe and perform a point repair. This saves time, money and produces a better end result. Additionally, any excavation might have disrupted the existing structure, increasing the possibility of further area pipe collapses. After the cutout was performed from the interior of the CIPP lines,

all the excess was removed by hand. Examinations were done thoroughly to ensure the rehabilitation of the lines was done satisfactorily and structural confidence was restored. This created a seamless solution that would meet the needs of SAWS and the neighborhood.

The Results

For Sandra Gomez, the project proved the value of a partnership between SAWS, its consultants and contractors to deliver true value for its community. "Municipalities like SAWS are always under constraints, from time to budget to options—there are never enough. It's good to work with LNV and RePipe, where they understand our constraints and work creatively to alleviate them," she said.

The collaborative solution created by RePipe, LNV, Peabody and SAWS held numerous benefits for the City of San Antonio and the neighborhood:

- Saved time—project done faster
- The right solution, developed and implemented safely
- Saved considerable amounts of money vs. open-cut
- Less intrusive than traditional methods
- Reduced cleanup time
- Cost-effectively extended the life of infrastructure
- Less material and energy
- Surface disruption minimized in sensitive Mission Concepcion area
- Fast turnaround enabled a planned project in the area to start as planned

About IPR

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