

Trenchless Technology in Two Cities



Amarillo TX & Tulsa OK Expanding In-House Trenchless Technology Capability

TT Technologies Grundoburst 800G static pipe bursting system a powerful addition to the City of Tulsa trenchless toolkit

By: A2B Publishing Inc.

GROWING TREND

Amarillo, Texas and Tulsa, Oklahoma are two cities representing a growing trend across both states for municipalities to acquire equipment, train staff, and conduct their own in-house trenchless technology programs. As buried infrastructure ages, local governments are seeking viable repair and rehabilitation options which minimize disruption to residents, businesses, communities and surface traffic. There is a great need for cost effective and environmentally friendly solutions that allow municipalities to stay on top of rehab and repair of deteriorating buried assets.

A decade ago, only a handful of cities in Texas and Oklahoma had bought equipment and trained personnel for doing their own trenchless technology work. Today, as understanding and knowledge about the cost and social advantages of trenchless technology is more widespread, municipalities are increasingly using trenchless methods in-house as the best means to upgrade and repair their sewer and water systems while remaining socially, fiscally and environmentally responsible.

In-house trenchless technology programs enable municipalities to have full control over their rehab and repair efforts. Going in-house ensures a municipality can implement its desired trenchless method and allows optimal deployment of workforce and equipment, using resources in a more cost-effective, timely and efficient manner.

AMARILLO

Because there is no need for a lengthy bid/award process, in-house trenchless programs provide greater responsiveness and flexibility to quickly tackle emergency repairs and defects as they arise. According to Robert Hamrick, Assistant Wastewater Collection Superintendent, City of Amarillo Wastewater Collections, “The management felt it would save the City money and that we could get the lines replaced quickly if needed, instead of having to put out to a bidding process which can, at times, take several months.”

Since Amarillo brought the work of rehabbing its aging and deteriorating water and sewer lines in-house, using trenchless methods has resulted in a more systematic and cost-effective approach for managing and upgrading its buried infrastructure. Using its own directional boring machine, the Amarillo Water Department has installed 6274 LF of 6-inch water main to date, using interlocking pipe. Of that footage 4919 LF upsized the main from 2 inches to 6 inches diameter, and 1355 LF was installation of a new line for fire service. The Amarillo Wastewater Collection Department began its in-house pipe bursting program in 2017, and has so far replaced 1308 LF of 6-inch deteriorating concrete mains with new HDPE pipe.

*We can't open cut everything.
The future is in trenchless...*

– PHILIP HOWERY, UTILITY SYSTEMS OPERATIONS MANAGER
CITY OF TULSA WATER AND SEWER DEPARTMENT.

TULSA

Nearly 25 years ago, the City of Tulsa began looking for the best methods to cost effectively repair and rehabilitate its sanitary sewer system without creating major disruptions for nearby residents, businesses and surface traffic flow. As Philip Howery, Utility Systems Operations Manager, City of Tulsa Water and Sewer Department, remembers it, “Back then there weren’t as many contractors doing trenchless sanitary sewer rehab as there are now. The local contractors did mainly open cut point repairs and open cut manhole to manhole replacements. These were very disruptive to property owners and the driving public.”

The City of Tulsa has more than 1900 miles of sanitary sewer pipe. Diameters range from 6-inch to 66-inch mains. With most of this pipe installed before 1970, the majority of the sanitary sewer system is close to or beyond the 50 year design life. According to Howery, “We wanted flexibility to address emergency and high difficulty repairs without having to wait for a contract or access a high-cost emergency contract. Developing in-house capability was the answer.”

Equipment acquisition and staff training were the first considerations. Following discussions with vendors and other municipalities, and after attending several conferences and field demonstrations, Tulsa settled on three feasible methods that provided the greatest cost effectiveness and flexibility: CIPP point repair, HDPE slip-lining, and HDPE pipe bursting.

EQUIPMENT

The City of Tulsa first purchased a butt fusion machine from McElroy Manufacturing to do slip-lining. It was capable of fusing 6 – 18-inch HDPE pipe. Initially, the slip-lining was done using a sewer cleaning bucket machine (towable winch) to pull the HDPE pipe in. Five years ago a Hammerhead HydroGuide HG1200AT constant tension winch was brought in to replace the bucket machine for pulling slip-lines.

As Howery recalls, “The HydroGuide was a huge improvement in the capability and safety of the underground winch pulling process. It has a hydraulic system to lower the boom, bracing and cable into the manhole automatically. It is so powerful that it has never failed to pull a pipe into place even when the host pipe is in horrible shape and friction forces are extreme.”

Next, the city purchased a CIPP point repair liner system from LMK Technologies. The package included a large trailer, generator, wet out tables, freezer, vacuum and compressed air control systems. It contains all the tooling necessary to complete CIPP point repairs from 3 – 30 feet in length at diameters from 8-inch to 24-inch, and uses air/ambient cure resins.



City crews enjoy working with all of Tulsa's trenchless technology equipment

“That is some really good capability to make point repairs in areas you most definitely don’t want to dig up,” says Howery, “For example, next to swimming pools, under buildings, under retaining walls, under roads and highways, and high value landscaping.”

Pipe bursting was next added to Tulsa’s in-house toolkit with the acquisition of a TT Technologies Grundoburst 800G static pipe bursting system, which can burst 8- to 12-inch host pipe. This gave the City the ability to upsize pipe from 8-inch to 10-inch

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The City of Tulsa benefits greatly from the McElroy Manufacturing location in the city



Majority of Tulsa's slip-line work involves inserting 7.125-inch DR 19 HDPE pipe

or 12-inch; and from 10-inch to 12-inch. Observes Howery, "It is an amazing system. Very powerful and has never failed to bring the bursting head and poly pipe to the bursting pit in the most difficult conditions. It just keeps pulling until the job is done and overcomes huge forces!"

For service lateral reconnections and occasional main pipe coupling a GF Central Plastics MSA 340 electrofusion machine is used. In conjunction with the butt fusion machine, this equipment produces a 100% leak-free, joint-free piping system lasting up to 100 years! In 2008, Tulsa upgraded its butt fusion equipment to a McElroy TracStar 500, a self-propelled, self-contained unit, with on-board generator. "The crews love it" Howery emphasizes, "along with all our other trenchless equipment!"

None of this inventory of trenchless technology equipment comes cheaply, however these equipment acquisitions are excellent long term investments in cost savings, safety and overall effectiveness. Howery thinks it was necessary for the City of Tulsa to purchase, "the highest quality equipment because we know that failures during this type of work can be catastrophic to private property, and put our crews into extremely difficult excavations."

Hamrick at the City of Amarillo sums up, "We felt with the cost saving from using trenchless, the equipment would pay for itself over a rather short period of time."

TRAINING

For both Amarillo and Tulsa, equipment manufacturers provided initial on the job training when the equipment was purchased, and always step up with ongoing support as required. Tulsa now specifies training on new pipe bursting and slip lining equipment in its bid documents, and staff training on this equipment is done on site. This ongoing specialized training keeps the experienced staff up to date on new technologies and applications, and allows new workers to get up to speed quickly.

The City of Tulsa also benefits greatly from having McElroy Manufacturing located in the city, along with the high-quality low-cost training provided at its facility. Every two years, Tulsa personnel are certified by McElroy as qualified technicians in the butt fusion and electrofusion processes. Howery notes, "Our guys really enjoy the McElroy University HDPE training. They have been a fantastic resource for us on our trenchless journey."

EXPERIENCE

Under its in-house trenchless program, the City of Tulsa has done CIPP point repair work up to 24 inches in diameter and up to 30 feet in length. The majority of the City's slip-line work has involved 8-inch nominal host pipe, with 7.125-inch DR 19 HDPE

As trenchless technology advances, more municipalities will begin using more of it in house.

– ROBERT HAMRICK, ASSISTANT WASTEWATER COLLECTION SUPERINTENDENT, CITY OF AMARILLO WASTEWATER COLLECTIONS

pipe inserted. The largest slip-line installation was a 36-inch stormwater application, which involved the rental of butt fusion equipment because the size was beyond the capability of the in-house machine. Pipe bursting is chosen when the flows are significant enough to maintain the same size diameter pipe, or to upsize the pipe if it is determined flow capacity needs to be increased.

"We can be very effective and efficient because we have capabilities in the majority of pipe diameters that we have in our sewer system. I believe our crews are in the sweet spot of what we can do with the resources we have," says Howery, while acknowledging larger diameter projects need larger equipment and are often more cost-effectively performed by contractors.

Hamrick has seen a similar progression in the City of Amarillo, "When it comes to smaller projects, it is more cost effective for us keep it in-house than to pay a contractor to do it." He sees the city crews acquiring greater skill with the trenchless equipment, "There were a few issues when water department first started doing the boring mainly due to it being new and everyone was learning the ropes. As each line segment is being done they gain more experience and are completing the jobs in a timely manner."



In-house trenchless programs are effective and efficient



Hammerhead HydroGuide HG1200AT constant tension winch a huge improvement in the capability and safety of pulling process

THE FUTURE

Howery foresees a bright future for the expansion of in-house municipal trenchless programs and broadening of the applications employed.

This bright future for trenchless in Tulsa potentially includes a CIPP private service lateral rehab system, as long as the necessary legal hurdles regarding ownership are addressed. Systems being looked at rehabilitate the private lateral from the city's main to the property, easement or right-of-way line. "I believe the technology has matured to the point where in-house crews could be successful

using it on a regular basis and it could be a critical part in our battle against root and I & I-caused sanitary sewer overflows."

In Amarillo, Hamrick concludes, "As we move forward, we intend to continue to do both boring and line bursting in-house on a more frequent basis. I feel that as trenchless technology advances, more municipalities will begin using more of it in-house."

Howery agrees, "We can't open cut everything. The future is in trenchless to minimize social impact and lower costs of sewer rehabilitation." 📌

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