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TRADITION AND NEW TECHNOLOGY KEEP LEVINE & SONS MOVING FORWARD **PAGE 28**

CIPP LINING METHODS AND PROJECTS

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FLORIDA CONTRACTOR DRAWS ON MULTIPLE TECHNOLOGIES TO TACKLE A WIDE RANGE OF LINING CHALLENGES

BY SCOTTIE DAYTON

Born from OPPORTUNITY

A crew from Lanzo Trenchless Technologies takes temperature measurements on a new sewer liner. (Photography by Alain Alminana)

Nobody wakes up thinking it's a good day to line a pipe.

"They wait until the road caves in," says Fred Tingberg Jr., co-owner and business development manager of Lanzo Trenchless Technologies in Deerfield Beach, Fla. Such a back-to-the-wall situation birthed the company in 1993, and rehabilitating similar predicaments has been its bread and butter ever since.

By not limiting itself to one lining technology, Lanzo became one of the largest independent cured-in-place pipe (CIPP) lining companies in the U.S., enabling it to establish a reputation for accomplishing the impossible. "We rarely do anything straight out of the box," says Tingberg. "Overcoming challenges is the reason we get up in the morning."

Word of their successes helped to expand operations in Florida, Michigan, Georgia, Ohio and throughout the East Coast. Along the way, Lanzo set a record for the largest non-circular CIPP in the world, and won the Dow Chemical Fabricator Award of Excellence for advancing the field of composite resin technology. The company has installed more than 9 million feet of CIPP lining in 6- to 108-inch pipes in the United States and Canada, generating annual revenue of more than $50 million.

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Rino D'Alessandro and Michael Nocca connect a pipe to the discharge bypass system.

profile

LANZO TRENCHLESS TECHNOLOGIES, DEERFIELD BEACH, FLA.

OWNERS:	D'Alessandro family, Fred Tingberg Jr.
FOUNDED:	1993
EMPLOYEES:	150
SPECIALTIES:	Cured-in-place pipe lining, sliplining, tunneling, micro-tunneling, NSF 61 water main rehabilitation
SERVICE AREA:	Florida, Michigan, Georgia, Ohio, East Coast
WEBSITE:	www.lanzo.net

BIG BANG

Opportunity knocked the day officials from the Miami-Dade Water and Sewer Authority approached its contractor, Lanzo Construction Co. in Pompano Beach, Fla., and suggested entering the pipelining business.

"In 1993, the authority had access to only one lining company's products to comply with a U.S. EPA consent decree," says Tingberg. "Anticipating that sewer rehabilitation would become a very large program, they wanted another bidder."

The D'Alessandro family, co-owners of Lanzo Construction, agreed and Lanzo Lining Services became a subsidiary. The company has since become Lanzo Trenchless Technologies.

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Fred Tingberg Jr.

Lanzo buys liners from Applied Felts, Masterliner, and Mississippi Textiles Corp., and the RS CityLiner lateral system. For lining potable water mains, the company uses NSF/ANSI 61 Nordipipe from Sekisui NordiTube and Citiliner from RS Technik. Composites One, Interplastic Corp. and Dow Chemical Co. supply the resins.

The company's municipal work grew rapidly and now accounts for 70 percent of the business. The remainder is comprised of commercial/industrial customers that include U.S. Steel, Total Petroleum, General Motors, city ports and airports, golf estates, and yacht and country clubs.

Lanzo cracked the industrial/commercial market in 1994 by rehabilitating a 30-inch acid collection trunk for the ACDelco spark plug manufacturing facility in Flint, Mich. The invert was missing from the 1,750-foot pipe, which carries a 10 percent solution of hydrochloric acid at 120 degrees F to wash ceramic materials.

Before work began, the crew went through ACDelco's safety training program. Tingberg chose a vinyl-ester resin from Dow Chemical to handle the high temperature and caustic environment.

"Because the pipe was so hot, we pumped cold water through it for two days before it was cool enough to line," he says. "We completed the rehabilitation without affecting production, and that made us very attractive to other companies."

UNDER ATTACK

Hydrogen sulfide helped Lanzo receive the Dow Chemical Fabricator Award of Excellence by corroding the crown of a 14,000-foot force main in Boca Raton, Fla. Without warning, 6- to 16-foot sections of 8- and 16-inch pipe began collapsing.

"We had limited access because the line was buried next to an area with sea grapes, a protected plant species," says Tingberg. "The force main also didn't follow line and grade as exhibited on the 20-year-old engineering drawings."

Lanzo located the main by potholing with a Vactor HXX hydroexcavator from Jack Doheny Supplies, then sending the Pathfinder pan-and-tilt camera with sonde from Aries Industries into the main. Crews also excavated access pits and bypass points. During four-hour pump station shutdowns, they removed tuberculation with a chain flail (Enz USA) and pressure-washed the pipe.

"We had to open-cut and replace some ductile and concrete pipes at entry pits because they were too corroded to host the liners," says Tingberg. "Then we flooded the segment to minimize friction while inverting the tubes."

The shortest run was 200 feet and the longest was 1,800 feet.

The project, installed in 1996, was one of the first significant applications of inversion lining in force mains. Tingberg and Bill Cavalier, then the

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superintendent of Water and Sewer, co-authored a paper for No-Dig in 1999 presenting several technical innovations that sprang from the job, including Lanzo's proprietary liner termination process of connecting liner spigot to liner spigot with a pressure-rated end seal.

"The only thing preventing the decrepit pipes from caving in was the water in them. Dewater them and external hydrostatic pressure could push in sand and collapse the culverts."
Fred Tingberg Jr.

DOUBLE THE TROUBLE

The Army Corps of Engineers needed a quick solution when they realized Levy HP5 had become a dynamic situation. The 140-foot-long, twin-barrel, 108-inch culverts equalized levels between Florida's Lake Okeechobee and the irrigation waters of the Seminole Indian Reservation.

"The only thing preventing the decrepit pipes from caving in was the water in them," says Tingberg. "Dewater them and external hydrostatic pressure could push in sand and collapse the culverts."

Lanzo hired professional divers to take accurate span and rise dimensions of the pipes so Applied Felts could fabricate the 44-mm-thick liners. Company engineers watched the first diver's progress through his helmet-mounted camera, and directed him on what and where to measure via a microphone.

A new liner cures at the manhole opening.

"He was about 20 feet into the west culvert when he let out a yell," says Tingberg. "We saw a bunch of bubbles and the next thing he was kicking like crazy coming out of the pipe after seeing an 8-foot-long alligator."

Despite everyone's considerable effort, the reptile refused to budge until Lanzo received permission to close the slide gate and allow water to build up behind it. When he opened the gate, the resulting wave relocated the alligator to the lake.

"There were major environmental concerns with fish, turtles and alligators, so we devised containment strategies to ensure that no resin or volatile organic compounds would enter the waterway," says Tingberg.

WATER, HEAT, ACTION

A dive team cleaned silt from the inverts, extracted large rocks, and removed mollusk shells with chipping hammers. Debris was vacuumed with an air-lift pump connected to a high-volume air compressor and sent to sediment boxes for filtering. Clean water discharged over a weir and into the lake. Each culvert took a week to clean.

Dario Montanez checks the pressure in the bypass line.

To prevent the inverted liner from shooting out the culvert, the crew drove two steel beams in front of the mouth to stop it. They impregnated the felt tube with a thermosetting resin (Cook Composites and Polymers) that cures in wet environments, then fed the slack liner into the standpipe in the hydraulic platform, which was elevated to the proper height over the culvert. The platform was mounted on one of two barges at the mouth of each culvert.

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OPENING THE DOORS TO SUCCESS

Besides a resume packed with successful lining projects, Lanzo Trenchless Technologies in Deerfield Beach, Fla., attracts customers by presenting two-page proposals instead of 50-page contracts with reams of conditions, terms and disclaimers. Potential clients also appreciate the personal touch of a privately-owned, family-run business.

"We're handshake people, and that got us through many company doors," says co-owner and business development manager Fred Tingberg Jr. "Our policy is a deal is a deal and a handshake seals it."

Educating potential customers about the cured-in-place pipe lining process was another way of opening doors. "When we first came into the business, it was all cloak and daggers," says Tingberg. "We wanted people to see our jobs and invited them to watch the tubes go in."

Lanzo never does demonstrations. "Giving free demos accomplishes nothing because they don't induce a decision," says Tingberg. "If people pay so much as a nickel, they want to become part of the solution and we make a sale."

The Lanzo Trenchless Technologies team includes, from left, Ollie Scholer, Fred Tingberg, Rino D'Alessandro, Dario Montanez and Michael Nocca.

Once the over-the-hole lining process began, the crew worked nonstop until it was completed. They pumped water inside the liner to create 15 to 20 feet of hydrostatic pressure (3 to 4 psi), which moved the tube forward while expanding it against the inner wall of the host pipe. After inversion, water was recirculated at 180 degrees F through two boiler trucks to cure the resin.

"It took a week per culvert to line, cure, cool and reinstate the ends with 10 men working around the clock," says Tingberg.

SETTING THE RECORD

When Lanzo won the $5 million contract to rehabilitate the triple barrel 7- by 8-foot rectangular Joseph Campau B-10 outfall for the City of Detroit, the challenges included working nonstop in temperatures of 8 degrees F to complete the project in time for Super Bowl XL.

"The men understood that the sheer cost of materials meant we couldn't afford a failure."
Fred Tingberg Jr.

"Non-circular geometry presents structural stress inside the liner that can affect physical properties during the cure," says Tingberg. "To compensate, we grouted the haunches of the box culverts to support the 1,200-foot-long oval liners during installation."

Cold weather problems such as resin temperature, viscosity and bypass pump efficiency occurred daily. For a proper chemical reaction, more than one million pounds of isophthalic polyester resin from Cook Composites had to be maintained at 50 degrees F. During the coldest hours, crews mechanically agitated and warmed it. To ensure proper curing of the 52-mm-thick liners from Applied Felts, workers warmed them in heated tarp enclosures.

The crews spent a week rehabilitating each outfall. Although shifts changed twice daily, everyone suffered from sleep deprivation and fatigue. "The men understood that the sheer cost of materials meant we couldn't afford a failure," says Tingberg.

According to Cook Composites, the amount of resin used made it the largest non-circular pipe rehabilitation in the world.

PARADIGM SHIFT

Whenever the risk of contamination, odors or exposure rules out conventional resins, Lanzo turns to non-styrenated resins. Applications have included lining an 18- to 15-inch transition sewer 20 feet below the Greektown Casino and restaurant complex in Detroit, which remained open throughout the project, and 12-inch water transmission mains rated at 100 psi that served the Renaissance Center fountain in Detroit.

The company uses ultraviolet light-cured resins when on extremely tight schedules in densely populated areas. "The technology eliminates cooling the resin and releasing contaminated process water," says Tingberg. "With UV, we go from air inflate to cure. Odors are minimal because the impregnated tube is inside a UV protective sleeve."

For applications requiring little or no styrene discharge, crews use styrene-free resin (Interplastic Corp.) or StyRedux capsules (Integrated Chemical & Equipment Corp.), a compound that polymerizes the styrene for easy collection upon release of the cooling water.

Using a variety of products and technologies has helped Lanzo adapt and accommodate a wide range of challenging projects. The company has come a long way since that initial inquiry from the Miami-Dade Water and Sewer Authority. Twenty years of experience and a tight focus on rehabilitating pipes have given the company the skills and insight to respond with the best solution at the most economical price regardless of the situation. C

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