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

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Network connectivity allows remote diagnostics and maintenance, as well as automatic firmware updates. (The latest update adds tools to measure defect size, flow capacity, and interal angle alus marte for one-button crawler return.) lateral angle, plus macro for one-button crawler return.) view/record

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**On the cover:** Levine and Sons in Redford Charter Township, Mich., is a family-run business that spans three generations. Tom, left, started working for his father at age 18. His three sons, including Jim, right, are now part of the operation as well. (Photography by Gerald Bernard)

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# **Down the Line**

# CIPP TECHNOLOGY HAS OPENED NEW DOORS IN THE PIPE REHABILITATION INDUSTRY

# **BY LUKE LAGGIS**

IPP lining is relatively new in the centuries-old sewer business. It has been around for a few decades now, but only in more recent years has it become almost universally accepted as a structurally and economically sound method of pipeline rehabilitation.

In 1971, Eric Wood implemented the first cured-in-place pipe technology in London, England. He called the CIPP process *Insituform*, derived from the Latin meaning "form in place." Wood applied for a U.S. patent in January 1975, and it was granted two years later. Today, as everyone in this industry knows, many companies provide a vast array of cured-in-place materials and methods. The technology's evolution makes CIPP lining a viable option in more and more situations.

The "Tough Job" feature in this issue of *Cleaner* is a great example of how far the technology has come and how much it has changed the nature of pipeline repair and rehabilitation.



# Projects like this would have been unthinkable just a few decades ago, but the technology has rapidly advanced, and more and more contractors and manufacturers are stretching the limits with CIPP lining.

When a string of contractors tried and failed to fix leaks in a pair of storm drains without tearing up the historic Wallace-McGee house in Columbia, S.C., the owner went looking for other options. Traditional repair likely would have meant ripping up the roof, tearing through 12-inch-thick concrete walls, and damaging the irreplaceable tiles and bathtub.

It didn't take long to locate a contractor, and soon Drain Pro, in Columbia, was televising and cleaning the 30-foot-long lines in preparation for lining. The lines included a 90-degree bend, which complicated the process, but the contractor was able to use 2-mil-thick flex liners to line right through the bend.

There were obstacles, but lining presented a solution that no other repair option did, and the building's historical integrity was protected.

Another example of how CIPP lining has progressed lies further down the East Coast with Lanzo Trenchless Technologies, profiled in this issue.

In 1993, before the expiration of Eric Wood's original patent, the Miami-Dade (Fla.) Water and Sewer Authority had access to only one lining company's products. Expecting sewer rehabilitation to become a very large program, the authority wanted another bidder and so asked its contractor, Lanzo Construction Co. in Pompano Beach, to consider entering the pipelining business.

The D'Alessandro family, co-owners of Lanzo Construction, agreed, and Lanzo Trenchless Technologies became a subsidiary. Municipal work now accounts for 70 percent of the business. In 1994, Lanzo cracked the industrial/ commercial market by rehabilitating a 1,750-foot-long, 30-inch acid collection trunk for the ACDelco spark plug manufacturing facility in Flint, Mich. But that's not the only unusual and substantial project the company has taken on.

Lanzo lined the 140-foot-long, twin-barrel, 108-inch culverts between Florida's Lake Okeechobee and the irrigation waters of the Seminole Indian Reservation. The company also earned a \$5 million contract to rehabilitate a triple-barrel 7- by 8-foot rectangular outfall for the City of Detroit. Crews overcame bitter winter weather and the challenges of non-circular geometry to successfully install the 1,200-foot-long, 52-mm-thick oval liners.

Projects like this would have been unthinkable just a few decades ago, but the technology has rapidly advanced, and more and more contractors and manufacturers are stretching the limits with CIPP lining. As older infrastructure continues to degrade, lining technology will only become more crucial.

I hope these stories provide some inspiration and lead you to new and better solutions to some of the challenges you face every day. Perhaps you'll even come up with the next innovation that drives this industry forward.

Enjoy this month's issue. c

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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-inplace 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 moming."

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. (continued)

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

### **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.

# "We rarely do anything straight out of the box. Overcoming challenges is the reason we get up in the morning." 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.

# 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: WEBSITE:	Fiorida, Michigan, Georgia, Ohio, East Coast www.lanzo.net

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 *(continued)* 

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Five new service trucks were delivered to Zoom Drain & Sewer Service located in Philadelphia, PA during the summer of 2012. This makes a total of 18 trucks delivered over the past ten years, 7 for the year 2012. Every service truck contains a US Jetting 3010 High Pressure Jetting Unit (3,000 PSI @10 GPM) with 180 gallon water storage tanks within a fully wrapped Hackney Service Body mounted on an Isuzu chassis. The latest 5 trucks have PTO - hydraulic drive pumps instead of diesel power, a compact design upgrade that greatly increased storage space. Read more about all the Zoom trucks built over the last decade at www.usjetting.com.

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.

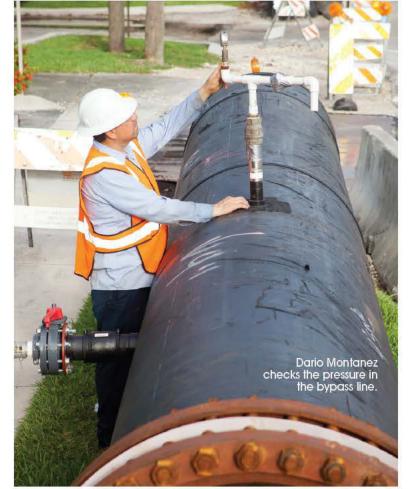
"He was about 20 feet into the west culvert when he let out a yell," says Tingberg. "We saw a bunch of bubbles and the next thing he was kicking like crazy coming out of the pipe after seeing an 8-foot-long alligator."

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.

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.

(continued)

# **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 50page contracts with reams of conditions, terms and disclaimers. Potential clients also appreciate the personal touch of a privatelyowned, 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."

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Puma Claw Grabber: This is a great tools to pick up bricks, bottles, rocks and more from the bottom of manholes and catch basins. The fiberglass extension pole extends to either 15' or 16' and comes with Heavy Duty Jaws with Teeth on the edge for a better grip. They are spring-loaded open so just pull the rope to lock jaws on the object. The rope locks in place and keeps the 7" jaw closed so you can easily remove the object. Just pull up on the rope and it releases. Part no. GWCT

The "Deep-Vac" Manhole Tube Holder is a "Patent Pending" design that solves a constant and at times, dangerous situation. For manholes, catch basing and Wet wells. Clamp the Deep-Vac around your tube in any location. The tube is then lowered into the manhole and supported by the Deep-Vac's 4 steel extension arms. Keep adding tubes and un-clamp the "Deep-Vac" holder and move up and over the next flange connection. As tubes become heavier you then connect the Combo's Suction Boom hose to the end tube to support the weight. At that point you un-clamp the Deep-Vac and move it above the next flange. The boom lowers the tube assembly. Add another tube and repeat the process.

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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

"The men understood that the sheer cost of materials meant we couldn't afford a failure." Fred Tingberg Jr. challenges included working nonstop in temperatures of 8 degrees F to complete the project in time for Super Bowl XL.

"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 ini-

tial 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.

more info

Applied Felts, Inc. 276/656-1904 www.appliedfelts.com

Aries Industries, Inc. 800/234-7205 www.ariesindustries.com (See ad page 25)

CCP Composites (Cook Composites and Polymers) 800/821-3590 www.ccponline.com

Composites One 800/621-8003 www.compositesone.com

Dow Chemical Co. 800/258-2436 www.dow.com

Enz USA, Inc. 877/369-8721 www.enzusainc.com (See ad page 48)

Integrated Chemical & Equipment Corp. 888/423-8121 www.integratedchemical.com

Interplastic Corp. 800/736-5497 www.interplastic.com

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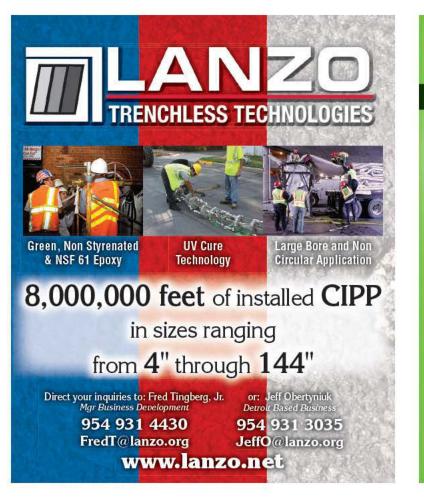


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# Getting a Handle on Remote Monitoring

CONTRACTORS SHOULD UNDERSTAND NEW TECHNOLOGIES THEY'LL ENCOUNTER ON THE JOB

# BY PETER KENTER

ewer and water utilities have long been turning to sophisticated sensors and monitoring devices designed to keep tabs on a host of information ranging from flow volumes to leaks and line integrity. How that information is transmitted to the utility is a critical decision that impacts not only the cost, but also the reliability of the data reported.

Cleaning and pipeline contractors are currently encountering these technologies in the course of regular cleaning and maintenance work for utilities, so it's important to understand the differences and how they are designed to function. Contractors are also being requested to assist in the installation of the flow monitors that interface with these systems on behalf of municipal utilities.

Industrial automation specialist ProSoft Technology of Bakersfield, Calif., primarily offers its clients two different remote monitoring methods - private radio frequency (RF) and industrial cellular technology – or a combination of technologies. The company has no financial interest in promoting one technology over another. Its specialty is creating communications modules and their associated software to ensure that monitoring technology of any type can com-

municate effectively with any of hundreds of networks and all major protocols in a cost-effective manner.

"A lot of larger companies want to focus on their core networks, but they don't want to get locked out of a project because their system won't talk natively to their clients' supervisory control and data acquisition (SCADA) system," says Jim Ralston, product strategy/wireless product manager with ProSoft. "That's where we come in."

# **DESIGNING THE PROJECT**

Remote monitoring technologies are particularly useful on large water district systems that include pumps and water mains in remote locations. To help customers design a waterline monitoring

ProSoft Technology Industrial Hotspot Radios were installed at Padre Dam in mid-2010, providing reliable, high-speed communications. (Photo courtesy of ProSoft Technology) project, Ralston must first take down details on the length of the line and on how many monitoring stations the client wants to place along its length. The distance from the monitors to the company's SCADA system is also critical.

Next, engineers will determine how much reporting data is required, whether simple data, photographs or streaming video. How quickly the data is required and how often the monitors are polled is also an important consideration, determining the maximum data throughput of the system.

Finally, the terrain of the area will be analyzed to determine what sort of communication system will be most reliable and cost-effective, given such potential impediments as hills, valleys, buildings and structures or foliage.

# **CHOOSING A MONITORING SYSTEM**

In the 1990s, the traditional method of transmitting waterline data was to lease telephone lines from the phone company to poll the electronic devices involved, says Ralston. However, that technology has continued to fall out of favor with ProSoft clients.



"Phone companies are reluctant to stretch their land-based systems to reach pumps and water mains located in remote areas," he says. "The conversion from analog telephone signals to digital was also problematic, as was the cost of a host of monthly land-based phone bills. Also, with phone lines in remote areas, some of our clients were experiencing reliability issues. They received repair and troubleshooting service on a schedule well below the priority reserved for residential customers, leading to system outages and higher maintenance costs."

# THE SATELLITE OPTION

Satellite monitoring service, on the other hand, uses satellite systems to relay monitoring data back to headquarters. This technology might suit an extremely remote site where other technologies would prove more expensive to

establish. The third-party satellite monitoring service may also be costly, ranging typically around \$200 per month per data monitoring point.

"When you add up a number of pump stations and multiply by \$200, that can add up to a significant operating cost for the monitoring system," says Ralston.

## THE MOVE TO RF

For a private RF monitoring system, the cost is limited almost entirely to purchasing and setting up the RF transmitter, receivers and antenna systems. Depending on the terrain, surrounding buildings and foliage, the system may also require the installation of transmission towers, which would add to capital cost. However, the

"In many cases, simply upgrading the RF system to something faster than might have been installed years ago provides a significant improvement." Jim Ralston

long-term cost of operating the RF equipment is negligible, largely because the client owns the system and there are no recurring charges or third-party transmission costs involved.

"Also, with complete ownership of the system, they would know exactly what to troubleshoot, and how to fix any problem," says Ralston. "In many cases, simply upgrading the RF system to something faster than might have been installed years ago provides a significant improvement."

A case-in-point – a current project at the Padre Dam Municipal Water District (PDMWD), located in Eastern San Diego County, which serves several communities from Santee to Alpine. Relying on old radio technology, the district's existing system employed a 4,800 baud modem to transmit data from all 70 monitoring points across 85 square miles in a less-thanblazing 90 seconds.

The radio transmitters were replaced with ProSoft Technology Industrial Spread Spectrum Radios in mid-2010.

Challenges included the site terrain, which ranges in elevation from 100 to 2,600 feet. "There are many natural and man-made difficulties, which made line-of-sight an almost impossibility, even though some of our sites are on the highest points around the county," says Rich Mellor, SCADA technician with the PDMWD. "Using some ingenuity and the radio's repeater ability, we were able to use some of the 900 MHz radios as repeaters allowing us to pass information through very difficult terrain."

ProSoft's wireless engineers assisted Padre Dam officials with a field study and helped the client create a communications system using nine 2.4 GHz radios linked in a circular pattern. This allowed the district to drive communications in any direction should one radio ever fail. The system works with local 900 MHz radio and control devices to transfer microprocessor data gathered *(continued)* 

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along the line to the central office at high speeds, where it's stored on a ControlLogix programmable logic controller (PLC).

At some of Padre Dam's remote locations there is no AC power, so some of the RF sites were powered by solar energy and backed up by batteries. "This was a learning curve, between the size of the panels and the type of batteries," says Mellor.

Parabolic antennas and wireless radio monitors were phased in over time to limit disruption to the water system. "We had to be careful to not interrupt operations too much," Mellor says.

The system received an acid text recently, when a motorist struck a hydrant and destroyed one of the system's microprocessor units.

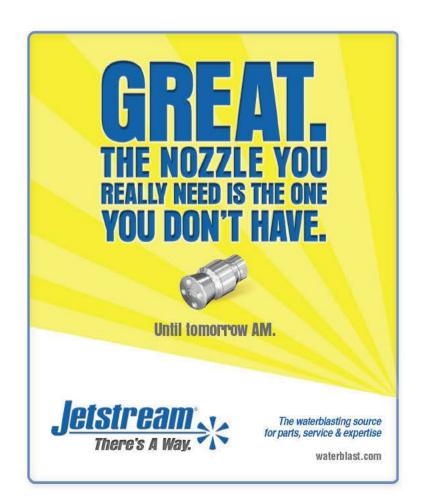


The rugged terrain at California's Padre Dam Municipal Water District relies on radio transmitters to relay water system information to headquarters. The installation in the foreground is the district's water recycling facility. (Photo courtesy of Padre Dam Municipal Water District)

"Within just a few seconds, we recorded an alarm of low pressure and total loss of communications with that site," Mellor says.

# **INDUSTRIAL CELLULAR DATA**

ProSoft is seeing considerable interest from large water districts in industrial cellular data technology as a method of remote polling. As cellular networks



expand, more and more remote sites are covered by either Code Division Multiple Access (CDMA) or Global System for Mobile Communications (GSM) networks, providing access to 3G and 4G cellular data service.

The company's cellular data system employs Ethernet cellular radio modems powered by 12-volt DC batteries or solar power. The units are small enough to fit into the palm of a hand, and employ external antennas for extended range.

The technology has been employed by the Cobb County-Marietta Water Authority (CCMWA) in Georgia, which currently operates two cellular radios to monitor water pressure at remote sites.

"We were initially leasing a landline for one site that was costing us a telephone bill of \$500 per month," says Ben Mahaffey, process control programmer for CCMWA. "We wanted to convert to DSL [digital subscriber line], but the service wasn't available at that location."

Two years ago, the authority accepted ProSoft's recommendation to move to cellular monitoring devices. The cost of the cellular line? Less than 10 percent of the cost of a land line on a two-year contract with AT&T.

Installation of the units is straightforward. Mahaffey installs the units with minimal technical assistance, relying on contractors to tap the main and assist on the water side of the project. The job is finished when a test cellular call is placed to ensure the device is properly connected. With two years of cellular service under its belt, the authority plans to install an additional six cellular monitors.

"We like the durability and versatility of the system," says Mahaffey. "The modems are tough and operate in a wide variety of temperatures. One of the units operates reliably powered by a solar panel."

Ralston notes that cellular systems aren't limited strictly to data – they can also transmit images from a site.

He notes, however, that cellular isn't a catch-all solution.

"Cellular isn't necessarily as fast as a private RF network, but neither is satellite," Ralston says. "And RF is usually near 100 percent reliable, while cellular availability may be less. Currently, RF and cellular are becoming popular, with clients usually only going to satellite if those options are ruled out.

"However, we're finding that clients are not only interested in saving money – at the lowest price point, they're encouraged to improve monitoring and automation of their existing water system networks." c





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# COVER STORY

Gary Doan, left, and Chris Vandalen jet a commercial sewer line with a US Jetting 5018 jetter system mounted on a new trailer. (Photography by Gerald Bernard)

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Levine and Sons is a family-owned business that's been active in the Detroit area so long that when it first opened in 1927, technicians on plumbing service calls traveled by trolley with their toolboxes. The company has remained true to its plumbing roots, but has expanded into related areas of service, including commercial and residential HVAC and sewer lateral relining. The business operates on four simple principles to thrive in an economically challenged market: know your market, know your job, arrive quickly and work efficiently.

The business, founded by Louis Levine, went on hiatus during the Great Depression but was firing on all cylinders by the end of World War II.

Louis' son, Tom, got into the business when he was 18 years old and is still working with the company at 82 (see sidebar).

Then, as now, the company's bread and butter was service and repair work including both plumbing and heating. The company also performed

# profile

# LEVINE AND SONS, REDFORD CHARTER TOWNSHIP, MICH.

OWNERS:	Jim, Paul and Dan Levine
FOUNDED:	1927
EMPLOYEES:	25
SPECIALTIES:	Plumbing, HVAC, pipe replacement,
	trenchless sewer repair, CCTV Inspection, jetting,
	point repair, pipe bursting
SERVICE AREA:	Greater Detrolt area
WEBSITE:	www.levineandsons.com

heavy industrial work at local oil refineries, working on large cast iron pipelines for such companies as Marathon Oil. Even then, the company hedged its (continued)



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bets, preparing for the possible conclusion of the refinery work with an increased investment in the plumbing business.

Today, the business employs 25 people and is headquartered in Redford Charter Township, Mich., a little more than 10 miles west of Detroit. Tom's three sons assist him with the business, with Jim running operations and estimating, Dan handling finances, and Paul specializing in ordering, inventory management and equipment maintenance.

The company offers drain cleaning, sewer lining, pipe bursting, CCTV inspection, and dig-andreplace sewer line work in addition to standard plumbing and HVAC services. The customer mix is 80 percent residential and 20 percent light commercial.

# CONCENTRATING ON THE PRIVATE SECTOR

While municipal work is available for bid, Jim Levine says the company sticks to residential and commercial contracts, including such clients as office complexes, banks, restaurants and medical offices.

"We don't own the big vacuum trucks and we're geared to responding quickly, working quickly and billing quickly," he says. "We've



The Levine family, from left, Paul, Dan, father Tom, and acting director Jim Levine, stand with one of the company's new service trucks.

# A FAMILY AFFAIR

Tom Levine (aka The Plumbing God) was just a kid when he started helping his father on plumbing jobs in the 1940s. At 82 years old, he's still an active member of the business, performing estimates, weighing in on tough jobs and providing a familiar touch with the company's long-time clients.

"I used to help my dad when I was a little kid and I learned a lot of important lessons about doing work right," says Levine. "When we were ready to slide a bathtub into the compartment, he would sign his name behind it with a big lumber crayon as part of his commitment to the customer and the trade. He used to tell me, 'Nobody will see it, but I know it will be there.' That's still our attitude to company service."

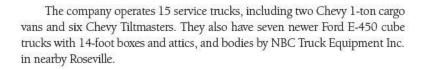
All three of his sons worked in the business during summers. Today, they're equal partners.

Jim (aka The Boss) spent time in California and returned to the business in 1990, and Paul (aka Pauly) returned around the same time. Dan (aka The Brains) was the last to come home.

"He graduated from Yale with an MBA and went to work in Manhattan," says Jim Levine. "I told him we'd leave the light on for him, and he rejoined us in 2004.

"We've all done our time elsewhere but we really enjoy the business and we all know what we're good at. At one point I considered law school. A lot of my friends wound up as lawyers, but seeing where they are today, I'm glad I didn't."

developed a great rapport with home and business owners, but dealing with the city is another type of work altogether, including permitting and major traffic control. The municipal jobs are generally longer-term contracts, and the longer you're on the job, the greater the chances of running into a snag."



"Years ago, it wasn't considered fashionable for a master plumber to do sewer work. Today, with all sorts of cool, high-tech gadgets, it's much more glamorous to get involved in sewer drain work." Jim Levine

"We're doing things a little different with the bodies," says Levine. "We got away from aluminum body components, which corrode too quickly, especially at the back of the truck. We're using fiberglass reinforced polymer bodies for the box, and all the trim is stainless steel instead."

Drain cleaning and sewer line work form a steady 20 percent of the company's revenue stream. The company devotes a full-time crew and three trucks to this segment of the business.

"Years ago, it wasn't considered fashionable for a master plumber to do sewer work," says Levine. "Today, with all sorts of cool, high-tech gadgets, it's much more glamorous to get involved in sewer drain work. We offer a range of services to help reinstate laterals and leave it up to the customer as to which method they want us to use." (continued)







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ABOVE: The Levine & Sons staff includes, in front, Gary Doan, Ron Moore, Dan Levine, Paul Levine, Rob Bain, Troy Genqa, Theresa Esper, Robert Kaminski, and Peter Kastelan; middle: Chris Van Dalen, Tom Levine, Alfred Bruce and Jeff Grassel; back: Tony Andress, Bruce Bourton, Bill Haskee, Brent Bastein, Tom Sese, Mike Neal and Jim Levine. BELOW: The old company paint scheme and logo (inset) was replaced with a new scheme on three new 2012 Ford Super Duty trucks with NBC Truck Body custom boxes.

The work begins with a free video inspection. Levine and Sons operates seven CCTV cameras, including the RIDGID SeeSnake, the Gen-Eye GL from General Pipe Cleaners, and Radiodetection models.

"Video inspection is really a loss leader for the drain cleaning and rehabilitation side of the business," says Levine. "Generally, they also want their sewer line traced and we use either a RIDGID or Radiodetection locator for that."

### **TRADITIONAL VS. TRENCHLESS**

Customers are offered a variety of options from root cutting to hydrojetting and relining.

To help provide year-round service in cold weather, the company uses a US Jetting 5018 600-gallon heated trailer unit. Root cutting nozzles include models from Enz USA and StoneAge.

"I explain to the customer that I can try to cut out roots, but that I can't clean out all of the roots from a 6-inch clay pipe with a 3.5-inch cutter," says Levine. "We tell them that we'll clear out 100 percent of the roots with a



"I explain to the customer that I can try to cut out roots, but that I can't clean out all of the roots from a 6-inch clay pipe with a 3.5-inch cutter. We tell them that we'll clear out 100 percent of the roots with a hydrojet but they will still have root regrowth at some point – or we can reline the lateral so they'll own a seamless length of pipe with no joints and will never have to experience root intrusion again."

hydrojet but they will still have root regrowth at some point – or we can reline the lateral so they'll own a seamless length of pipe with no joints and will never have to experience root intrusion again."

Levine and Sons primarily works with cured-in-place pipe (CIPP) technology on 4-inch residential lines through the 6-inch transitions and will work on lines as large as 12 inches for light commercial customers. All CIPP technology is supplied by Formadrain's pulled-in-place, steam-cured pipe repair system. "It's a licensed product and we buy all of the fiberglass and epoxy from the supplier as well," says Levine.

The product is a rubber bladder wrapped with epoxy and fiberglass, which becomes the new sewer line. Once prepared and delivered to the site, a rope is run from the city manhole to the cleanout.

"We then pull it through from the basement using a four-legged, torque-multiplying winch with a tow strap as the crew feeds it through the manhole and communicates with the guys in the basement with a walkie-talkie," says Levine.

The product is then inflated and cured.

"We like this product for two reasons," he says. "First, it's approved by the National Sanitation Foundation, which is required by the Michigan State Plumbing Board, and second it's steam-cured. We've tried ambient cure products that we have to baby-sit for two to six hours, and with Formadrain we're ready to move to the next project in 45 minutes."

The CIPP process works well if there's a structure running over the target pipe, or under a pool, garage or other building or addition. *(continued)* 



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Jim Levine, center, lends a hand to Tom Sesi and Gary Doan as they roll a liner into size and shape.

"For broken clay pipe, I can't use the system," says Levine. "If there are sharp chunks of clay you might get an aneurysm in the bladder when it's inflated prior to curing. Then we're stuck with wet, goopy fiberglass that's partially hardened."

If the lateral is impacted over a short section, Levine offers to install a

### FLUSH TV OFFERS NOVEL EXPOSURE

Levine and Sons relies on word of mouth, Yellow Pages ads and its own extensive website to generate most of its business. The site includes links to a series of five-minute reality TV-style episodes called Flush TV, which feature the staff.

"These were done by Jennifer Katz, a Brooklyn filmmaker friend of Dan's," says Levine. "They were fun to do and they've been good for recognition value. Occasionally, people will walk up to me and say, 'You're the guy from Flush TV."

Cable TV advertisements, pay-per-click services and direct emails continue to become more important advertising vehicles.

"We keep an email database and will run email blasts to our existing customers," says Levine. "On Thanksgiving, we'll run a Turkey Day garbage disposal installation or maintenance special, or a discount on air conditioning service on the first day of summer. Sometimes we'll offer a discounted line inspection and jetting service in a particular neighborhood when we're getting a lot of storm advisories – whatever it takes to spur on existing customers."

In Detroit, the economy remains weak and the middle class is under considerable economic pressure.

"At the same time it seems there's a lot more competition than there ever was," says Levine. "We're even facing competition from municipal utili-

ties who are making a profit on selling their services to homeowners, charging a flat monthly fee for plumbing service. These deals don't always offer the best value to the customer because so much of the potential work is not actually covered."

Still, the company is on a growth trajectory, including plans to expand geographically.

"We'd like to grow and service more adjacent counties," he says. "Michigan was hit hard by the recession so we can make up some of the lost work by carefully expanding into new territory, without expanding to

"We keep an email database and will run email blasts to our existing customers. On Thanksgiving, we'll run a Turkey Day garbage disposal installation or maintenance special, or a discount on air conditioning service on the first day of summer. Sometimes we'll offer a discounted line inspection and jetting service in a particular neighborhood when we're getting a lot of storm advisories – whatever it takes to spur on existing customers." Jim Levine

2- or 4-foot length of Fernco PipePatch from Source 1 Environmental. "These are packers pushed in using 10-foot fiberglass rods with their ends wrapped in epoxy and fiberglass," he says. "We push them in place and then fill them with an air compressor."

Patching and CIPP lining cover most of the company's rehabilitation work, but in some cases they turn to their pipe bursting system from Pipe Genie Manufacturing.

After all of the trenchless options are offered, the company will also provide dig-and-replace service.

the point where we lose control of the network. But we still serve some of the same customers that we served when we started in 1927, and we're going to keep taking care of them as we grow."

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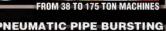
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### **Hiring the Steve Jobs Way**

CANDIDATES' SOFT SKILLS CAN BE OF EVEN GREATER IMPORTANCE THAN WORK EXPERIENCE

### BY PATRICK VALTIN

im was the perfect candidate with many years of solid experience as a professional sales rep and had an obvious talent of persuasion and communication skills. But the hiring manager had some strong reservations during the interview, including Jim's focus on immediate results and a certain aggressiveness that could potentially overwhelm or upset clients.

In regards to Jim's focus on the purposes of the company, its role in the community, the vital importance of innovation and unselfish dedication to excellence, he did the perfect job. He sold himself like never before and got hired.

Four months later, Jim was fired for lack of vision, lack of dedication and worst of all, for his lack of honesty in his intentions.

The manager knew he had to hire "the Steve Jobs way," but had no real clue how to do it. He hired what he saw and what he heard "at the moment." He was trapped by Jim's salesmanship and fooled by his hidden intentions: to get the job, no matter what needed to be said.

#### **STEVE JOBS' HIRING PHILOSOPHY**

Steve Jobs was an amazing and unconventional leader in many respects. His reputation as the best entrepreneur of our time can be summarized in a few words: he and his top execs never compromised with the talents and qualifications required of their employees. He personally interviewed over 5,000 applicants during his career. He and his executives considered very different qualities in people than most business owners. When you thoroughly analyze Apple's hiring philosophy, you find out that there have always been fundamental, uncompromising attributes needed to get a job with the company.

You can apply these attributes when looking to attract top players and ensure you avoid troublemakers. To help you in the hiring process, here are the main Apple selection attributes.

It is very well known that recruiters who focus on soft skills in their personnel selection process are, on average, 50 percent more effective in selecting top players.

Vision-minded. Everyone joining the company must have a clear picture of its management vision – and fully agree to fight for it, to defend it and to live with it every day. Applicants who do not seem to get it are systematically rejected. When you hire people who don't seem to agree with, or care about your company vision, you are potentially employing future enemies.

**Innovation-minded**. Steve Jobs always emphasized the vital importance of hiring people who are innovative – willing to create something from nothing. Applicants are first chosen for their ability and willingness to constantly create, rather than for their technical competence.

Future-minded. Employees at Apple are driven by their leader's vision of the future and they contribute every day to creating the future, more than just beating the competition. Each of them owns the future of the market because they know they can contribute to creating it. The eagerness to create – not follow – the future is a vital attribute observed in top players, no matter the industry.

**Passion-minded**. Steve Jobs' first principle was: "Do what you love." People are hired because they love the product, the company and its vision. Applicants who do not demonstrate a genuine passion and "love" for the company's purposes and business philosophy will never make it.

Contribution-minded. A statement given by an Apple recruiter is clear enough: "We didn't want someone who desired to retire with a gold watch. We wanted entrepreneurs, demonstrated winners, high-energy contributors who defined their previous role in terms of what they contributed and not what their titles were."

Engagement-minded. Over two-thirds of Americans are not engaged in their workplace. Apple management is strict on employees' level of commitment. Committed individuals who are inspired by a grand purpose make the difference in the most competitive conditions.

**Excellence-minded**. Steve Jobs was known for his passion of perfection. The company always tries things out until they are perfect. The same attitude is expected of every collaborator. Applicants who do not share that passion for excellence do not have a chance.

#### **OTHER CRITICAL ATTRIBUTES TO EVALUATE**

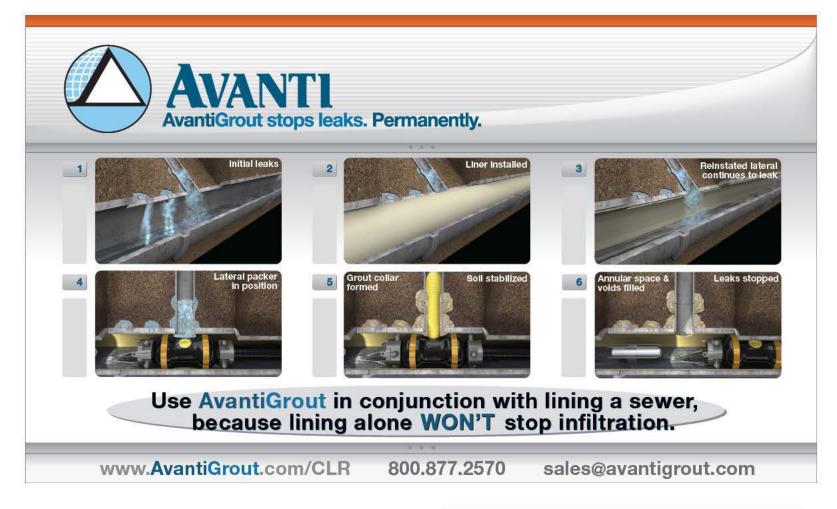
You will notice that these seven points enforced in Apple's personnel selection are all personality-related attributes, also called soft skills. They do not

always guarantee performance, but the chance of selecting productive people is at least 200 percent higher when focusing on these vital soft skills. It is very well known that recruiters who focus on soft skills in their personnel selection process are, on average, 50 percent more effective in selecting top players.

So, in order to avoid falling in the momentary personality trap, as the hiring manager in the above example did, focus on the following two basic soft skills:

Honesty. Did you know that one third of all business failures in the USA are due to employee theft? This is definitely a crucial criterion to evaluate. Everybody recognizes the importance of honesty so it would make sense to evaluate it prior to evaluating any other soft skill, wouldn't it?

There are strong indicators that allow you to precisely evaluate honesty. Here are just a few: gaps in the resume, contradictory data between the resume and your standard job application, negative reaction or embarrassment from the applicant to your challenging questions and lack of accuracy in applicant's explanations of previous achievements.



Willingness. According to the U.S. Department of Labor, more than 87 percent of employee failures are due to unwillingness to do the job. You can't simply force someone to do something if they do not want to. Such persons will do what you want in order to keep their job or to avoid penalties, but they will not really put their heart into it.

Most applicants will tell you that they are willing, of course. The key to finding out if they are honest is to ask them to prove it. Challenge them to demonstrate that they have been willing to work hard, learn something new, question their old habits, work under tough conditions, etc.

So, hire the Steve Jobs way, by all means. But don't forget these two basic attributes in the same process. Inform applicants that your company's values and management philosophy imply honesty and a positive attitude as primary selection criteria, no matter the position – lack of either is enough to be considered unqualified. c

#### **ABOUT THE AUTHOR**

Patrick Valtin is the author of No Fall Hirhg and a 24-year veteran coach and trainer in the fields of management and human resources. He is the president of M2-TEC USA, Inc. For more information, visit www. nofailhling.com.

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### CLEANERS NEED TO TAKE EXTRA PRECAUTIONS WHEN WORKING IN FLOODED AREAS

**BY LUKE LAGGIS** 

eavy rains over a short period led to massive flooding and the destruction of infrastructure around Duluth, Minn., in late June. While much of the rest of the country was dealing with worsening drought conditions, many in Duluth and the surrounding communities were dealing with flooded and contaminated homes.

Cleaners should be well aware of the necessary safety precautions for working in areas where the sewer has backed up, but floods bring additional concerns and require extra precautions. The OSHA Fact Sheet on flood cleanup outlines the following hazards for those in the cleaning industry.

Floodwater can disrupt water purification and sewage systems and sweep up toxic waste, chemicals and other contaminants previously stored above ground. Although most floods do not cause serious outbreaks of infectious

disease or chemical poisonings, they can cause sickness in workers and others who come in contact with contaminated floodwater. In addition, flooded areas may contain electrical or fire hazards connected with downed power lines.

Floodwater often contains infectious organisms, including intestinal bacteria such

as *E. coli*, *Salmonella* and *Shigella*; Hepatitis A Virus; and agents of typhoid, paratyphoid and tetanus. Most cases of sickness associated with flood conditions are caused by ingesting contaminated food or water. Tetanus, however, can be acquired from cuts, abrasions or puncture wounds simply coming in contact with contaminated soil or water. Tetanus is an infectious disease that affects the nervous system and causes severe muscle spasms, known as lockjaw. The symptoms may appear weeks after exposure and may begin as a headache, but later develop into difficulty swallowing or opening the jaw.



Floodwaters also may be contaminated by agricultural or industrial chemicals or other hazardous agents present at flooded sites. Although different chemicals cause different health effects, the signs and symptoms most frequently associated with chemical poisoning are headaches, skin rashes, dizziness, nausea, excitability, weakness and fatigue.

In addition to the dangers associated directly with contaminated water, pools of standing or stagnant water become breeding grounds for mosquitoes, increasing the risk of encephalitis, West Nile Virus and other mosquitoborne diseases.

It is often difficult to maintain good hygiene during flood cleanup operations. To avoid waterborne disease, it is important to wash your hands with soap and clean, running water, especially before work breaks, meal breaks,

Cleaners should be well aware of the necessary safety precautions for working in areas where the sewer has backed up, but floods bring additional concerns and require extra precautions.

and at the end of the work shift. Workers should assume that any water in flooded or surrounding areas is not safe unless the local or state authorities have specifically declared it to be safe. If no safe water supply is available for washing, use bottled water or water that has been chemically disinfected or boiled for at least 10 minutes. Water storage containers should be rinsed periodically with a household bleach solution.

If you or any of your employees experience any of the signs or symptoms listed above, it is important to seek out appropriate first-aid treatment and medical advice. If the skin is broken, particularly with a puncture wound or a wound in contact with potentially contaminated material, a tetanus vaccination may be needed if it has been five years or more since your last tetanus shot.

The OSHA Resources page has QuickCards and Fact Sheets that provide details about hazards present in flooded areas and after a flood has occurred. For more information, visit www.osha.gov. c

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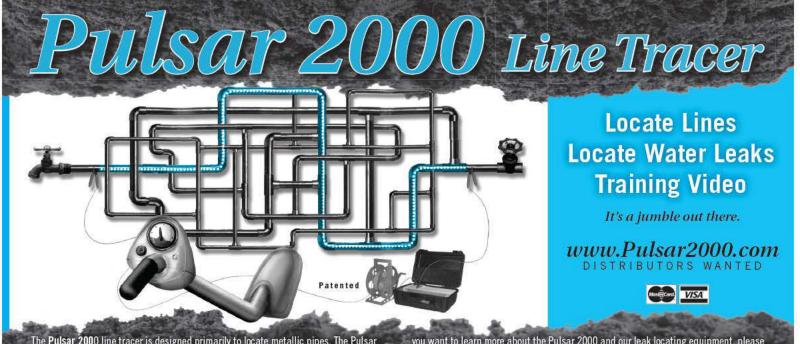
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### **Consider a Living Trust**

DO YOUR ESTATE PLANNING NOW, AND EASE A BURDENSOME TASK FOR YOUR HEIRS

### BY FRED S. STEINGOLD

lanning your estate is a bit like rotating your tires: you know it's a smart thing to do, but you just can't find the time to get the job done. Fortunately, putting your estate in order isn't all that difficult. When you're done, you'll feel a sense of accomplishment and relief. Those who survive you will appreciate your thoughtfulness in simplifying their work.

When you plan your estate, consider including a living trust. It can eliminate or greatly reduce the need for probate court proceedings when you're gone. Without a living trust, your family may face a flood of probate paperwork, excruciating delays and annoying expenses. With a living trust, the handling of your estate can proceed quickly and smoothly.

Here's how a living trust works:

#### **STEP 1 – CREATE YOUR TRUST**

Your lawyer will help you prepare a trust document called a *declaration of trust* or perhaps a *trust agreement*. You'll give the trust a name such as "The John Smith Living Trust." If you're married, you'll probably create a trust together with your spouse – "The John Smith and Jane Smith Living Trust."

In the trust document, you and your spouse will be called the *grantors*, meaning you're the people setting up the trust. You'll also be called the *trustees* because, as long as you're able to do so, you'll be running the trust.

You'll also name someone to be the *successor trustee* – the person who takes charge of the trust if you and your spouse have died or become incapacitated. Who will be the successor trustee? Anyone you choose. It can be an adult child, a friend, a business associate or a bank.

#### **STEP 2 – PUT ASSETS IN YOUR TRUST**

After creating the trust, you transfer property into it. This can include your home, your bank accounts and stocks, and the business you own – especially if it's a corporation or LLC.

To put your home into the trust, you sign a deed. John and Jane Smith, for example, would use a deed to transfer legal title to "John and Jane Smith as trustees of the John and Jane Smith Living Trust under agreement dated Nov. 12, 2012."

This sounds a little complicated, but it's routine stuff to a lawyer who sets up trusts. Your bank and stockbroker can easily do the paperwork for putting bank accounts and stocks into the trust.

You can also name the trust as the beneficiary of a life insurance policy, a securities account or a bank account. If you do, the proceeds will get transferred to your trust after you and your spouse have died. This is an alternative to transferring assets to your trust during your lifetime.

Something to keep in mind: Owning property jointly with your spouse is OK, but it's only a stopgap measure. If one of you dies, the other one becomes

the sole owner. When the second one dies, the joint property has to be probated. Putting property into a living trust avoids this.

Once you put property into the trust, nothing really changes from what you're doing now. As a trustee, you have complete control over the property. You can sell it or take it out of the trust, if you like, and you can revoke or amend the trust.

Putting your estate in order isn't all that difficult. When you're done, you'll feel a sense of accomplishment and relief. THOSE WHO SURVIVE YOU WILL APPRECIATE YOUR THOUGHTFULNESS IN SIMPLIFYING THEIR WORK.

#### **STEP 3 – USING AND DISTRIBUTING TRUST ASSETS**

After you and your spouse have died, the successor trustee takes over to do whatever you've instructed in the trust. You might, for example, instruct the successor trustee to use the trust property for the benefit of your children, holding the bulk of a child's share until he or she reaches the age you designate. This can be 22 years, 25 years, 30 years – whatever age you choose.

You can instruct the successor trustee to pay designated amounts to charities, friends or relatives. You can, in fact, do anything in a trust that you can do in a will. The trust will end once the successor trustee distributes all the property.

#### **OTHER ESTATE PLANNING TOOLS**

The living trust is usually the centerpiece of an estate plan. Your lawyer will probably want you to consider three other documents as well:

*Will.* A living trust doesn't completely eliminate the need for a will. If you have minor children, for example, you can use a will to designate who you and your spouse want as the children's guardian if you die while the kids are young. You can also use a will to cover any property you neglect to put into your living trust while you're alive. Typically, the will simply adds this property to your living trust.

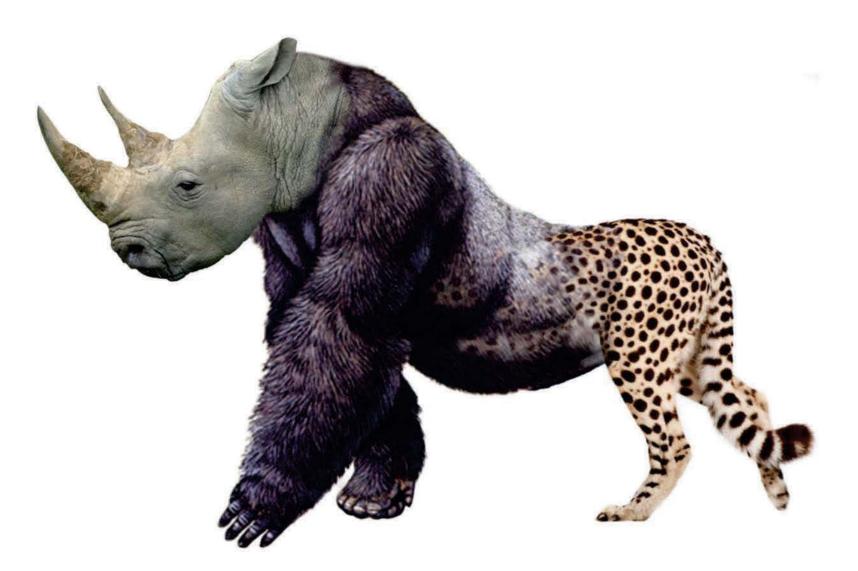
*Power of attorney.* You name an agent to handle your non-trust assets for you. This is convenient if you travel a lot or you want someone else, such as your spouse or an adult child, to take care of your financial affairs if you become ill.

Living will or health care power of attorney. This instrument helps assure that your wishes regarding health care are carried out if you're too ill to communicate with your doctor. Where permitted by state law, a health care power of attorney is usually better than a living will. In it, you can express your wishes about medical care, and also authorize a designated family member or close friend to speak for you in authorizing or declining treatment.

Fred S. Steingold practices law in Ann Arbor, Mich. He is the author of Legal Guide for Starting and Running a Small Business and The Employer's Legal Handbook, published by Nolo.



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### **Rescuing History**

CURED-IN-PLACE LINING SYSTEM HELPS CONTRACTOR FIX LEAKING STORM DRAINS WHILE PRESERVING THE HISTORIC CHARACTER OF A SOUTH CAROLINA LANDMARK

### BY SCOTTIE DAYTON

eaks above the second-floor master bath and shower were ruining the ceiling and wall in the Wallace-McGee house in Columbia, S.C. The two-story steel-reinforced concrete structure was built in 1937 and is listed on the National Register of Historic Places and the state Historical Archives.

One plumber blamed the problem on the roof, so the owner had it replaced. The leak continued. Another plumber replaced and caulked the vent stacks without effect. For more than five years, the owner paid contractors for repairs that didn't work, while the concrete ceiling and exterior shower wall flaked and separated.

Finally, a plumber sawed a 4-inch-square hole in the wall above the shower stall to expose the west storm drain. Someone had wrapped metal plating around a hole in the 3-inch galvanized pipe and caulked it. The patch had failed.

Fearing that repairing the drain would involve ripping up the roof, tearing through 12-inch-thick concrete walls, and damaging the irreplaceable tiles and bathtub, the owner went online looking for alternatives. He found Drain Pro, a local trenchless sewer contractor.

"When we evaluated the situation, our main concern was how to preserve the home's historical character if we had to make access points," says company owner Chris Bergeron. "Our next concern was which tools would be the least intrusive, yet do the best job." Using a boiler descaler and cured-in-place flex liners from Perma-Liner Industries, his team successfully rehabilitated the west and east storm drains in two days.



#### FRENCH CONNECTION

Both storm drains ran through interior concrete walls. The west drain popped out for two feet in the concrete garage before exiting through the floor and into a 6-inch concrete French drain. The leaking east storm drain discharged to a separate French drain.

Chris Bergeron (left of Drain Pro uses a 100-pound linoleum roller to impregnate the 2-mil-thick flex liner with a mixture of warm and hot epoxy resin, while Jeremy Bergeron checks the temperature of the resin.



Left to right: Jeremy Bergeron, part-time employee Victor Ponce, and Chris Bergeron monitor the inversion unit as it inverts 30 feet of 2-mil-thick flex liner into the west roof storm drain at 8 to 10 psi. (Photos courtesy of George Fulton Productions)

ough job			
PROJECT:	Rehabilitate roof drains at a historic home		
CUSTOMER:	Wallace-McGee house, Columbia, S.C.		
CONTRACTOR:	Drain Pro, Columbia, S.C.		
Equipment:	Lining system from Perma-Liner Industries 866/336-2568 www.perma-liner.com		
RESULTS:	Drains rehabilitated and historical character maintained		



Leaks above the secondfloor master bath and shower caused the concrete ceiling and exterior shower wall to flake and separate. A previous plumber sawed the 4-inch-square hole above the shower stall to expose the west storm drain.

To verify that stormwater was dispersing properly, Bergeron and his brother, Jeremy, inspected the backyard drainage system. The mini SeeSnake from RIDGID revealed root intrusion and sections of crushed pipe. They cleaned the line with an 8 gpm/4,000 psi trailermounted 300-gallon jetter from US Jetting, and a 1/4inch Warthog nozzle from

StoneAge. The team then exposed the damaged lengths with a shovel and replaced them with 3-inch PVC pipe.

The home and attached garage had flat roofs. To reach them, Bergeron rented a ratchet lift and positioned it in the driveway. After hoisting the equipment onto the garage roof, they relocated the lift to the house roof and repeated the procedure.

"For somebody scared of heights, working two stories up was nerve racking," says Bergeron. "I tried to stay away from the edge, and when I had to be there, I tried not to look down."

Before televising the 30-foot-long drains, the brothers used a garden hose to pour water on the roof and watched where it ran. It went straight down the drains. The camera showed the pipes were threaded, heavily deteriorated, and 20 percent occluded with scale. For 20 feet, they also had a 1/2-inch-thick layer of tar from the installation of the new roof, and below that, a 90-degree vent pipe.

"For somebody scared of heights, working two stories up was nerve racking. I tried to stay away from the edge, and when I had to be there, I tried not to look down." Chris Bergeron

"The bend changed our plans a little," says Bergeron. "Standard 3-mil liners won't navigate a right angle, so we ordered 2-mil-thick flex liners that would."

#### **GAINING ACCESS**

To prevent debris in the cleaning water from clogging the underground drains, the brothers sawed out the visible section of storm drain in the garage without damaging the walls. They then attached a temporary elbow and length of PVC pipe draining to a 20-gallon barrel.

Back on the roof, cleaning with the jetter went slowly. "The tar was hard, and if we became aggressive, we'd remove the whole pipe," says Bergeron. "Before long, the owner informed us that too much water was entering the master bath."

Bergeron had an electric Ream-A-Matic 4-60 rotary tube cleaner with a spingrit brush from Goodway Technologies Corp. that he typically used to reinstate laterals. The unit feeds water through the casing to the cleaning tool on the tip of an 862.5 rpm flexible shaft.

"I tried it as a descaler and it was much faster than the jetter," he says. "It also used a lot less water."

It took the team an hour to clean the pipe down to the vent. Because the cleaning tool wouldn't go around the 90-degree bend, they returned to the garage and cleaned up to it.

"We replaced the missing section of storm drain with PVC pipe attached to the ends with no-hub bands," says Bergeron. "After lining through it, we removed the bands and the pipe is now almost invisible against the white wall."

#### **STELLAR PERFORMANCE**

After hoisting the air compressor, inversion unit and other equipment onto the roof, the men unrolled sheets of plastic for wetting out the liners. "We used a 100-pound linoleum roller to impregnate the felt with a mixture of warm and hot epoxy resin that gave us 40 minutes working time," says Bergeron. "Then we rolled it up, loaded it into the gun, and inverted it at 8 to 10 psi."

When the liner reached the 90-degree bend, it hesitated. Bergeron dropped the pressure, rolled some liner back into the gun, increased the pressure to 10 to 15 psi, and released the liner. The momentum forced it easily around the bend. Inserting the calibration tube, inflated at 10 to 15 psi, required the same procedure. The liner ambient cured in four hours.

The next morning, the team used shovels to expose the east 6-inch concrete storm drain beside the home, then broke out a 2-foot section with a jackhammer and sledge hammers. To catch the cleaning debris, they inserted an elbow and short length of PVC pipe discharging to a plastic jug. Lining the second drain was identical to the first except for adding a cleanout.



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See ad page 39	Avanti International 822 Bay Star Blvd., Webster, TX 77598 800-877-2570/281-486-5600 (f) 281-486-7300 sales@avantigrout.com www.avantigrout.com			×	~	V	~
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Placine Renewal See ads on pages 5, 11	Envirosight, LLC 111 Canfield Ave., Unit B3, Randolph, NJ 07869 866-936-8476/973-252-6700 (f) 973-252-1176 mail@pipelinert.com www.pipelinert.com			~		× 1	
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See ad page 27	Flow-Liner Systems, Ltd. 4830 N Pointe Dr., Zanesville, OH 43701 800-348-0020 (f) 740-453-9387 info@flow-liner.com www.flow-liner.com	<i></i>					
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See ad page 53	Gorlitz Sewer & Drain, Inc. 10132 Norwalk Blvd., Santa Fe Springs, CA 90670 562-944-3060 (f) 562-944-7630 sales@gorlitz.com www.gorlitz.com		<i>v</i>				





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Lanzo Trenchless Technologies - North 3800 Woodward Ave., Ste. 410, Detroit, MI 48201 954-931-3035 (f) 313-420-1177 jeffo@lanzo.orgSee ad page 20	۲		~	~	×	~
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### **Technology to Succeed**

ENVIROSIGHT INSPECTION SYSTEM HELPS COLORADO CONTRACTOR ESTABLISH NEW REVENUE STREAMS

### BY KEN WYSOCKY

or many customers with clogged drainlines, seeing is believing – and that's exactly why Dave Teeter, the owner of Action Services Inc. in Craig, Colo., recently purchased a VeriSight pipeline inspection camera system made by Envirosight LLC.

The VeriSight is one of six inspection cameras owned by Action Services (which does business as Action Drain Services), including three other Envirosight units and two RIDGID SeeSnakes, plus a GVision monitor made by EPL Solutions Inc. The cameras help generate more repair revenue by providing skeptical customers with convincing proof that something is wrong inside their pipes.

"When customers can actually see the problem, they know it needs to be fixed, so that makes repairs an easier sell for us," says Teeter. "Our sales have increased as we learned to use the cameras better.

"When I first started using inspection cameras 15 years ago, it was a tough sell because people didn't want to incur the extra cost of the inspection," he adds. "Now consumers understand cameras better and we understand how to sell it better. In fact, if they're not sure



they want to pay for the camera inspection, I tell them that if my diagnosis is wrong, I won't charge them for the inspection. That usually helps us move on to actually selling a repair."

Camera inspections contribute significantly to Action Services' gross revenues. In a good year, Teeter says they generate about 8 percent of the company's overall gross revenue and account for around 20 percent of the company's drain cleaning gross revenue.

"That amounts to a significant part of our revenue because we're a relatively small business," Teeter points out. "So far this fiscal year, 16 percent of our drain work is camera inspections. So if you put \$10,000 into a camera like this, the return on investment is very high and very quick."

Teeter lauds the durability and technological advancements offered by the VeriSight, which he purchased at this year's Pumper & Cleaner Environmental Expo International. The self-leveling, high-resolution color camera features auto focus, a stainless steel housing and dimmable ultra-bright LED

### money machines

OWNER:	Action Services Inc., Craig, Colo.
	VeriSight portable pipeline inspection camera system, made by Envirosight LLC 866/936-8476 www.envirosight.com
FUNCTION:	Inspecting residential and commercial pipelines
COST:	About \$10,000

arrays that produce shadowless videos. The controller features an 8-inch color display monitor, a microphone for inspection narration, analog/digital connectivity, an on-screen text generator, a footage counter and up to 45 hours of MPEG footage storage on a 60 GB internal drive. *(continued)* 

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### Dave Teeter

For customers who need a permanent record of an inspection, Teeter provides – for a nominal fee – a flash drive that plugs into a computer or television for convenient viewing. He puts the company's name, telephone number and website on the flash drive case so it doubles as a marketing tool, and buys the flash drives in bulk to reduce the cost, which is about \$10 per unit.

"Customers think it's pretty cool," he says. "We can put edited video footage, an invoice and an inspection report on the flash drive, which is more high-tech than most people expect. And when you use cutting-edge technology, it helps customers justify in their minds the prices you charge."

Teeter also says the VeriSight's simple design - just a few buttons for operating the controls - makes it very user-friendly for technicians. "With all the digital processing, they don't have to be computer whizzes to run this unit," he says.

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Aside from closing the deal on more repair sales, Teeter says the cameras also help his company generate new revenue streams. For example, he says that in his area, more and more realtors and mortgage lenders are requesting sewer-lateral inspections before property transfers occur. It's a market niche he's aggressively pursuing.

"Inspection cameras also help us verify that we've cleared an obstruction to the best of our ability," he adds. "That eliminates call backs, which are free for customers but not for me."

Overall, Teeter says his inspection cameras are vital to Action Services' success.

"They're as valuable as the drain cleaning machines are to my drain business," he says. "I don't think I could operate without them." c

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Money Machines, a feature in Cleaner, reports on innovative work vehicles that help contractors operate more efficiently, satisfy customers and earn more profit. We'd like to know about your Money Machine --be it a service van, camera truck, jetting rig, vacuum unit or any vehicle that really helps drive your business. To nominate your vehicle for a feature in this column, send an email to editor@cleaner.com. Tell us briefly but specifically what features make it a great producer. And send a picture --because appearance counts. We look forward to seeing your Money Machine.

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### **CIPP Lining Methods and Projects BY BRIANA JONES**



### 1. CHEMICAL GROUT

AV-100 chemical grout from Avanti International has the same viscosity as water, which allows it to quickly permeate the substrate and cure to form a matrix with the soil and porous rock. Pressure injecting the grout into void spaces with a remote packer also eliminates water migration into the sewer system.

The product has a 362-year half-life in soil as rated by the U.S. Department of Energy. The grout is a permanent solution for controlling groundwater and infiltration in manholes, laterals and mainline sewers. It can be used with a remote packer, encapsulating hazardous waste, preventing structural movement due to groundwater, and sealing entire sewer and underground transit systems. 800/877-2570; www.avantigrout.com.

#### 2. STREAMLINED CUTTER

The Dominator 430 from Bowman Tool Company & Systems is a 72-pound reinstatement cutter designed to operate in 6- to 30-inch lined pipe. There is no external air tube, giving the cutter a streamlined design. The head assembly is a pinion-less, quick-change design with only one adjustable gib to reduce adjustment time.

The device is configured for lateral reinstatement with the Bowman 0.8 hp or 1.2 hp crossflow air motor. Optimum performance is reached with the 2.5 hp geared air motor, which reduces reinstatement time by 80 percent. The cutter can be disassembled and reassembled in 30 minutes with the simple design and only eight moving parts. All electric motors are isolated at the end of the cutter in a watertight chamber, eliminating water damage and allowing for easy access. The cutter is manufactured from temper-hardened stainless steel and bronze to cut tough liners, including UV liners. 717/432-1403; www.bowmantool.com.

### 3. GROUT REHAB SYSTEMS

CUES portable and truck-mounted grout rehabilitation systems are available for mainline joint sealing/lateral sealing and can be equipped with the latest CCTV equipment for inspection. Applications include joint testing and sealing of mainlines and lateral joints, manholes, junction boxes, largediameter pipes or any other low-pressure waterproofing application.

All systems can be configured to run urethane, acrylimide and acrylate grouts. Dry freight box (for export) and trailer-mounted systems are also available. Grout packers are available for mainline and lateral sealing. TV/grout/lateral reinstatement trucks are also available as an all-in-one production unit for TV inspection of mainline, laterals (optional), joint sealing of mainlines or laterals, and lateral reinstatement (cutting). 800/327-7791; www.cuesinc.com.

### 4. PERCUSSION CUTTERS

Percussion Milling Cutters from Enz USA are designed to remove deposits such as concrete, injection cement and heavy mineral deposits. The cutter is sometimes the only alternative to digging up pipes under foundations or roads. The tools have a combination of carbide and diamond teeth and use rotating percussion power as a way to remove hard debris and deposits. The cutters offer 600 to 3,000 impulses per minute and up to 12 tons of impact force. They clean pipes from 4 to 24 inches. 877/369-8721; www.enzusainc.com.

### 5. CIPP

CIPP from Inliner Technologies combines a non-woven engineered tube or liner with a wide array of thermosetting resins determined by the pipeline problem and surrounding environment. The technology can span pipe from 4 to 120 inches in diameter; renew pipes with bends, diameter changes or non-circular geometries; and be used in gravity and pressure applications. The CIPP liners can be installed in contiguous segments of several thousand feet by accessing existing manhole structures. The product can be installed via inversion or pull-in-place methods and cured by a variety of methods. 812/723-0704; www.inliner.net.

### 6. SEALING SYSTEM

The Insignia Sealing System from LMK Technologies offers O-rings, connection hats and end-seal sleeves as solutions to groundwater infiltration at lateral/mainline connections and manhole penetrations. The seals swell three (continued)

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to five times their original size on contact with water, forming a watertight seal.

The end-seal sleeve offers a large sealing surface, preventing it from falling over once positioned within the pipe. The seamless molding provides a uniform 360-degree compression seal. The end-seal works for pull-in-place and inversion lining. 815/433-1275; www.performanceliner.com.

### 7. LINING BLADDERS

CIPP sectional lining bladders from Logiball cover 3- to 36-inch pipes in lengths as long as 25 feet. Available in different configurations, the bladders are resistant and reliable. If a sleeve is damaged, all sleeve installers can be factory re-sleeved. 800/246-5988; www.logiball.com.

#### 8. PIPE-WITHIN-A-PIPE

The Nu Drain system from Nu Flow Technologies creates a protective, structural pipe inside an existing host piping system without digging. The system can line inside infrastructure and underground pipe. The restoration uses a liner saturated with epoxy to create a barrier that can span missing sections of pipe, which commonly causes low flow and root intrusion. A seamless, jointless pipe-within-a-pipe is used to rehabilitate deteriorating sanitary drain and storm sewer lines, including mechanical systems, with minimal disruption.

The technology is suited for pipe 3/4 inch to 12 inches in diameter and for larger custom sizes, while accommodating multiple 45- and 90-degree elbows. It can be installed through one or two access points. The technology can also be used as a preventive measure against future cracks and intrusions. 800/834-9597; www.nuflowtech.com.

### 9. MINI STEAM UNIT

The Stinger mini steam unit from Perma-Liner Industries is a compact steam cure system for 2- to 6-inch-diameter pipes. The unit uses bladder inversion heads so users never lose pressure. Features include rapid cure times, infinite working time while still using 100-percent solids epoxy, no rush or downtime, and an average 45-minute cure time on a 60-foot lateral. The user-friendly unit is easily transported and allows operators to work yearround. 866/336-2568; www.perma-liner.com.

### **10. DUAL TECHNOLOGIES**

Quik-Shot from PrimeLine Products combines mainline technology and lateral lining technology to perform CIPP projects. The product will process any manufacturer's tube and resin combinations through the gun. For those using Canaflex hose as part of their system, the product has an adapter allowing the use of all camlock fittings and hose without reinvesting in nozzles for various size lining materials. The product allows for installation through a cleanout. 877/409-7888; www.prime-line.net.

### 11. FAST-SET EPOXY

**Raven 405FS** (fast set) from **Raven Lining Systems** is a solvent-free 100-percent solids, ultrahigh-build epoxy coating formulated for fast cure and little downtime while maintaining high-quality chemical resistance. The high-build ability allows the epoxy to be applied on vertical and overhead surfaces up to 150 mm thick in one application. It can be used on concrete as a structural lining in manholes, pipelines, tanks and other deteriorated structures. The coating will be tack-free in one and a half hours at 72 degrees F and hard-dry in about two hours. 800/324-2810; www.ravenlining.com.

### 12. DIGITAL CONTROLLER

The Digital Tap Cutter Controller from RS Technical Services is a singleconductor module that is compatible with all RST single-conductor mainline systems and operates multi-conductor cutters or other robotics. Features include the ability to control and monitor up to 10 functions, a proportional joystick control and programmable current limits to the motors to protect them from damage. The unit offers easy-to-read and interpret on-screen status display of settings, test modes and equipment operations. 800/767-1974; www.rstechserv.com.

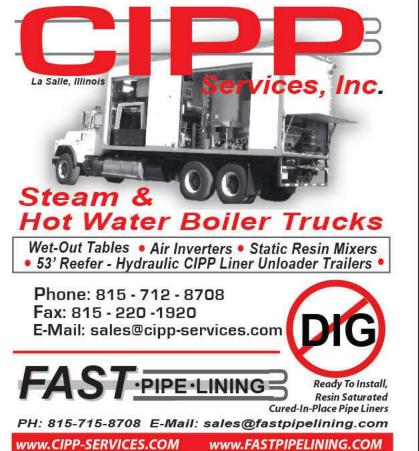
### 13. PORTABLE BURSTING MACHINE

With the ability to burst and replace 2-, 3-, 4- and 6-inch sewer pipes of virtually any material, the UnderTaker System from Spartan Tool includes a 30-ton puller unit, 4- and 6-inch bursting heads, a 2- to 6-inch fusion machine, a hydraulic power supply and a length of 3/4-inch swedged wire rope. The system breaks down into portable components, allowing its use in basements, manholes, and small entry pits. It pulls new HDPE pipe into position behind the bursting head, providing seamless transitions between old pipe and the newly installed line. 800/435-3866; www.spartantool.com.

### 14. LATERAL BURSTING MACHINE

The X20 lateral bursting machine from TRIC Tools is lightweight and compact. The unit is redesigned from the inside out for strength and reliability. It weighs under 70 pounds and delivers up to 20 tons of pulling force. 888/883-8742; www.trictools.com. c

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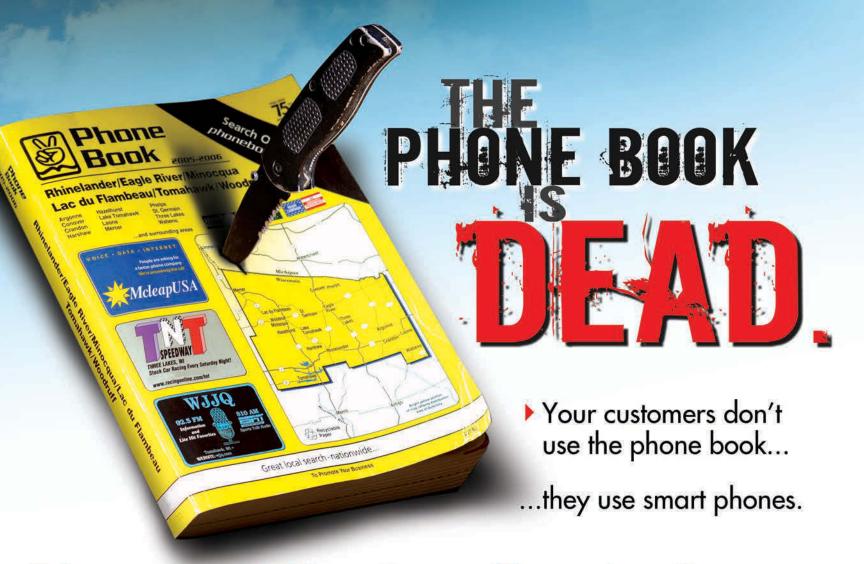
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### CIPP Lining Methods and Projects BY SCOTTIE DAYTON

### PRE-IMPREGNATED LINER SAVES TIME

### PROBLEM

The Louisville and Jefferson County Metropolitan Sewer District in Louisville, Ky., needed to rehabilitate 150 feet of 8-inch steel sewer pipe without disturbing the newly renovated wastewater treatment plant and underground utilities. The general contractor was on a tight schedule to complete the project.

### SOLUTION

A subcontractor installed a Pre-Wet-Out liner from Flow-Liner. The liner arrived impregnated with resin and steam-cured in less than three hours.

### RESULT

The project engineer stated, "We were very impressed and pleased with the installation, which saved us from excavating the pipe. We would certainly use the product for future projects." 800/348-0020; www.flow-liner.com.

### CURED-IN-PLACE LINER REHABILITATES CULVERT

### PROBLEM

Five feet of missing invert in four 80-inch oval culverts under a busy two-lane highway in San Antonio, Texas, threatened its integrity. Open-cutting to replace the pipes would close the road for months and cost the city hundreds of thousands of dollars.

### SOLUTION

To rehabilitate the culverts, the city chose the **Poly-Triplex liner system**, which uses 116 ounces per square yard of woven roving fiberglass and epoxy resins. Public Works crews grouted the pipes, then the liner was impregnated on-site, pulled through each structure, inflated with an internal bladder, and cured in place with air pressure and steam.

### RESULT

The rehabilitation was completed in two weeks without disrupting traffic. The city saved money and time. 850/547-9999; www.poly-triplex.com.

### LATERAL LINING SYSTEM FEEDS CONTINUOUS LENGTHS

#### PROBLEM

Aging wastewater lines at the Smithsonian Institution in Washington, D.C., needed rehabilitation, but replacement wasn't an option due to the disruption it would cause. Many lines had limited access or ran through attics and museum display areas.

### SOLUTION

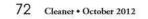
The Quik Shot lateral lining system from Quik Lining Systems fit in the small accessible areas. Technicians working after the museum closed for the day impregnated the liner as it came off the roll, fed it through the calibration roller, and loaded it into the inversion unit in one operation.

### RESULT

The lines were rehabilitated without damaging the priceless exhibits. 714/296-5262; www.quiklining.com.

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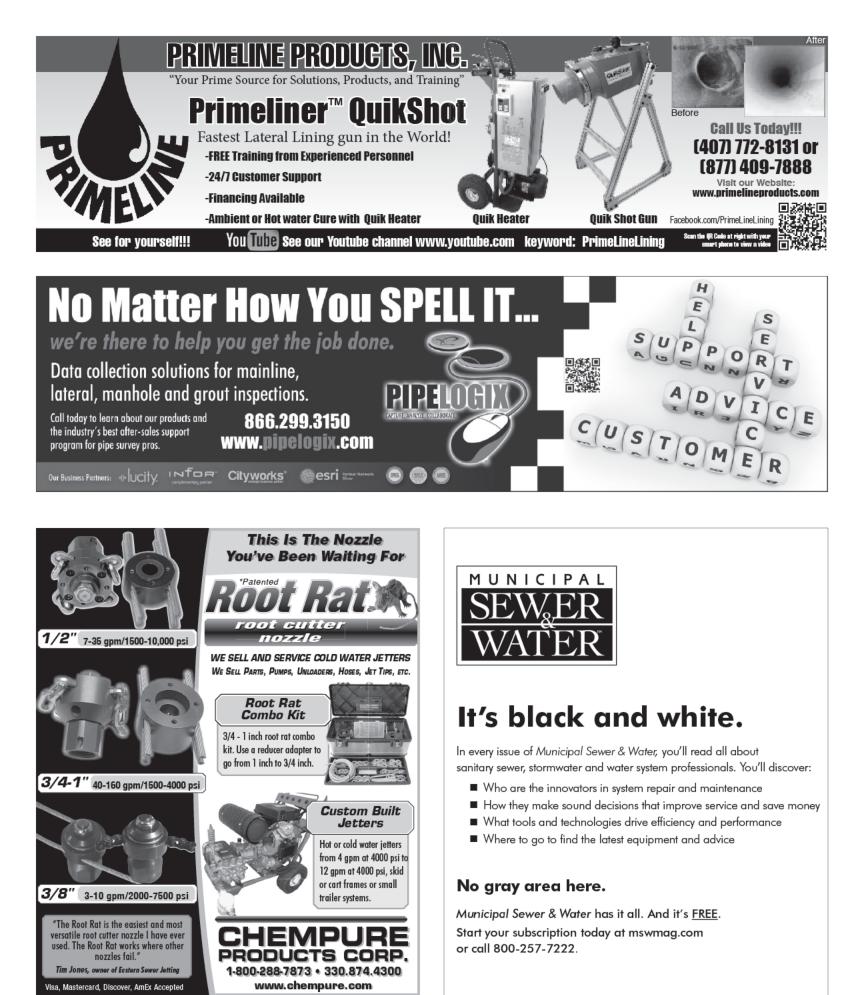
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## Hot-tap plug systems adapt to odd-shaped pipes

BY ED WODALSKI

PRODUC

Multi-Flex line stop plugging systems from Petersen Products are designed for insertion through a small hot tap into a larger pressurized pipeline to stop flows and make repairs without having to drain the pipe.

"Any type of pipe or conduit is fine," says Phil Lundman, general manager for Petersen Products. "Because it's so flexible the pipeline can be rectangular, oval or odd shaped."

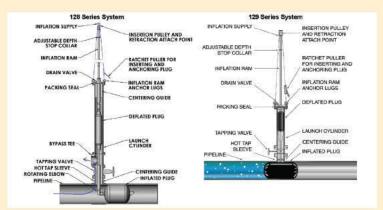
Made of ballistic nylon, polyurethane and rubber, plug composition can vary depending on chemical resistance and temperature requirements.

The 128 Series plug installs downstream of the tap, allowing bypass through a tee between the tapping valve and launch cylinder. The system includes a tapping saddle and valve, launch cylinder, Multi-Flex pipe plug with Z-swivel on the inflation end of the plug, and directional shoe on the lead-in, inflation controller with gauge, inflation hose, inflation ram assembly with centering guide, inflation ram packing seal and T-handle.

The 129 Series installs directly below the hot tap or nozzle and can withstand higher-pressure applications.

"As the pipe size gets larger, the pressure rating goes down," Lundman says. "For instance, on a 20-inch pipe, the most we've helped back is about 250 psi."

Plugs can be used on pipelines from 2 inches up to 21 feet (129 Series) in diameter. "There's really no limit to the size," Lundman says. "On the 128 Series, 96 inches is the practical limit." Custom configurations are



available. The plugs can be used on any type of pipeline and can withstand temperatures up to 400 degrees F.

Taps vary by pipe diameter. "A 36-inch pipe would require a 12-inch tap," Lundman says. "Once you have the tap in and the launch tube assembled and

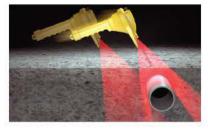


ready to go, all you have to do is open the valve and push it in. That should take 20 minutes at the most. An 8-inch (pipe) takes about a minute."

Air or nitrogen is used to inflate lower-pressure plugs. Water is used to inflate larger or higher-pressure plugs. Valves can be attached to the tap hole, or sealed once repairs are made. Plugs are deflated and removed using the optional completion valve. 800/926-1926; www.PetersenProducts.com.

#### SUBSURFACE PVC PIPE DETECTOR

The AML PVC pipe detector from SubSurface Instruments utilizes patented microwave technology to find underground PVC pipelines in tough conditions including clay, wet soil, snow or standing water without the need for a separate transmitter,



receiver or wires. Designed specifically for locating buried PVC pipes, the AML has a durable housing, LCD indicators, laser marker and sensitivity switch. 855/422-6346; www.ssilocators.com.

#### PURE SOFTWARE WINVIEW CCTV VIDEO SHARE

WinView 2.1 software from PURE Software Solutions enables CCTV operators to invite project-specific individuals to view the video stream directly from the CCTV equipment via the Internet and a secure



connection. Video also can be saved to a remote location for future analysis. Unlimited 3G/4G broadband wireless cards are available. 303/867-1414; www.puresoftwaresolutions.com.

#### THOMPSON HIGH-HEAD 6JCC PUMP

The 6JCC 6-inch, high-head pump from Thompson Pump and Manufacturing Co. delivers 1,100 gpm, heads up to 490 feet and 212 psi with automatic initial priming and re-priming. Applications include clear waterjetting, water boosting, wellpoint installation, water supply for hydraulic fracturing, washdowns, tank



cleaning and fire protection in mining, gas and oil production. 800/767-7310; www.thompsonpump.com.

#### HYDROLOGEX MOVING BED BIO-FILM REACTOR

The EnviroMBBR (moving bed bio-film reactor) system from HydroLogex provides stable treatment under load variations in a compact package to meet reduced ammonia TMDL (total maximum daily load) requirements. The add-on system features high surface area and non-clogging bio-film media for trouble-free operation. 615/975-4773; www.hydrologex.com.



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The Pro 2 eCAM pipeline inspection camera system from Electric Eel Mfg. features a self-leveling color camera that can negotiate 3-inch P-traps. The system includes 200 feet of Kevlar braided pushrod, 512 Hz sonde, 10.4-inch daylight readable monitor and allows for one-touch recording directly to a USB flash drive. Other features include on-screen footage counter, 2-hour battery with built-in charger, adjustable light controls, 16 pages of text writing, voice over recording and 8X zoom. 800/833-1212; www.electriceel.com.



#### **REELCRAFT ENCLOSED HOSE REELS**

Series 5000, 7000 and 8000 enclosed reels from Reelcraft Industries feature a steel enclosure that offers additional protection from potentially harmful debris. Removing the cover on either side allows access to most serviceable parts. A full flow shaft and swivel ensure hose delivery. Steel components are individually powder-coated prior to assembly. Cast guide assembly includes four

nylon guide rollers to prevent hose wear. 800/444-3134; www.reelcraft.com.

#### **FRENCHCREEK FULL BODY HARNESS SERIES**

The STRATOS Series of full body harnesses from FrenchCreek Production include permanently affixed Strato-lite comfort shoulder/back pad and leg pads with open-celled air-mesh for breathability and moisture control. Designed to meet and exceed OSHA and ANSI standards, the hamesses are offered in vest style,

construction style, cross-chest style and tower style with multiple options. 877/228-9327; www.frenchcreekproduction.com.

#### LOWELL EXTRA LARGE WRENCHES

Cast malleable iron 40 Series wrenches from Lowell are available up to 48 inches long with square, hex or round/keyed openings up to 4 1/2 inches. Features include reversing controls in the head, enclosed, replaceable gears and bolt-through design. The 50 Series



wrenches take a range of hex and square sockets that can be changed out with a removable retaining ring. Ratchet handles are available up to 64 inches long and socket openings up to 9 inches. 800/456-9355; www.lowellcorp.com.

#### ANVER VACUUM TUBE LIFTER COMPONENTS

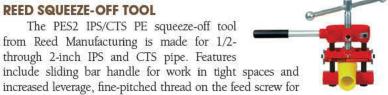
Vacuum tube lifter components from Anver feature air-powered, belt drive, electric vacuum stations and rugged black, highly compressible yellow and conventional orange tubes. Totally field-replaceable parts include



clamps, top and bottom swivel assemblies, quick disconnects and a range of adapters. 800/654-3500; www.anver.com.

#### **REED SQUEEZE-OFF TOOL**

The PES2 IPS/CTS PE squeeze-off tool from Reed Manufacturing is made for 1/2through 2-inch IPS and CTS pipe. Features include sliding bar handle for work in tight spaces and



controlled, low-effort squeeze and grease fittings at friction points for smoother operation and longer tool life. Aluminum castings withstand varied climate and soil conditions. 800/666-3691; www.reedmfgco.com.

#### VAC-CON POWER FLEX **TELESCOPING BOOM**

The Power Flex telescoping X-Cavator boom from Vac-Con can rotate up to 315 degrees, articulate up to 110 degrees and lift up to 34 feet. The boom also telescopes out 8 feet for a reach up to 28.5 feet from



the truck and is top-mounted on the debris tank for front or rear positioning. 888/491-5762; www.vac-con.com.

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A15 load-rated 50-mm-depth trench panels from Fibrelite are available in sizes from 800 to 1,600 mm long. Made of recycled glass fibers, the covers offer a lightweight alternative to metal for access to sewage systems, underground pipework, drainage networks, electrical junction boxes, wastewater treatment plants and commercial fuel storage. The panels will not corrode and are not electrically conductive. 860/599-6081; www. fibrelite.com.



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## INDUST









#### VANAIR NAMES VPS, ANALYST, TECHNICIAN

Vanair named Jeffery Givens vice president of Vanair defense systems and John Graun vice president of drill and gas suppression. The company also hired Judy Bridgewater as purchasing analyst and Doug MacKenzie as service technician.

#### PEERLESS BECOMES EMPLOYEE-OWNED. LAUNCHES E-COMMERCE STORES

Peerless Electronics became an employee-owned company when the Peerless Electronics Inc. Employees Stock Ownership Plan acquired 100 percent of the business from the estate of the late owner. Alvin M. Shankman, Peerless had been privately owned since 1945. Robert Levine will continue to serve as president and CEO, William Gallucci as chief operating officer and David Rome as chief marketing officer.

The stocking distributor of electromechanical and interconnect products also launched six online e-commerce stores (www.peerlesselectronics.com/ store). Each store offers industry-specific products, including switches, relays, circuit breakers, contactors, connectors, terminal blocks, splices, heat shrink tubing, indicator lights and fuses.

#### ELECTRIC EEL OFFERS TOOL **SELECTION GUIDE, SAFETY VIDEO**

Electric Eel Mfg. offers a two-page guide for matching the right cable and cleaning tool for its line of drain and sewer cleaning machines. The company also offers an instructional video outlining the basic safety and operation of auto cable feed units. Both the guide and video are available at www.electriceel.com.

#### SPRAYROQ PRESIDENT APPOINTED TO EXPORT COUNCIL

Jerry Gordon, president of Sprayroq, was appointed to the Alabama District Export Council. The council is among 59 such groups made up of approximately 1,500 exporters and export service providers appointed by the U.S. Secretary of Commerce for renewable four-year terms. As a member, Gordon will assist in the planning and coordination of export activities in his region.

#### DWYER-OWENS NAMED ENTREPRENEUR OF YEAR



Dina Dwyer-Owens, chairwoman and CEO of Mr. Rooter Plumbing's parent company, The Dwyer Group, was named a winner in the Ernst & Young Entrepreneur of the Year Awards in the Southwest Area North program.

#### NU FLOW RECEIVES PLUMBING CODE CERTIFICATION

Nu Flow received NSF International Plumbing Code (NSF-I.P. Code) certification for its cured-in-place pipe lining material. c

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#### Inspector Training & Certification:

November 15-16, 2012 - Lakewood, CO CHURCH Onsite Wastewater Consultants, Contact: Kim Seipp (303) 622-4126 or highplains@tds.net

#### **Installer Workshops:**

October 15, 2012 - Dover, DE

DOWKA Conference Contact Hollis Warren at (302) 284-9070 or Htwarren430@aol.com

October 25-26, 2012 - Lakewood, CO CHURCH Onsite Wastewater Consultants Contact: Kim Seipp (303) 622-4126 or highplains@tds.net

#### NAWT Vacuum Truck Technician:

January 8, 2013 - East Lansing, MI MI & NAWT - Contact Mark Scott at (989) 275-5011 or mscott@i2k.com

#### Watch the NAWT web site and industry publications for updates --

For more information call: 800-236-6298



H

Operation & Maintenance Training Certification:

Operation & Maintenance, Level 2

Instructors: Nick Weigel or Kit Rosefield

**CEU's for NAWT Recertification:** 

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October 8-9, 2012 - Tucson, AZ

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#### CATCH BASIN CLEANER

2008 American La France Condor with a new VacAll VS10DC, 10 yard debris body, dual steer, dual sweep street sweeper and catch basin cleaner. (Stock #1791V) www.Vacuum SalesInc.com, (888) VAC-UNIT (822-8648). (CBM)

#### **COMPUTER SOFTWARE**

FreeServiceReminderSoftware.com, FreeServiceDispatchSoftware.com. (CBM)

## DEWATERING

Used MOBILE SLUDGE DEWATERING BELT FILTER PRESS, BDP Industries model DDP for sale or rent. Unit is a trailer mounted, self contained unit with polymer and sludge pumps and a 4" Vogelsang grinder. Press has a .9 meter belt, stainless steel plate frame, 3 belts, hour meter reads 900 hours, processes up to 100 gallons a minute. Purchase Price is \$220,000. Contact Todd at 814-251-5350 to discuss unit or rental prices. (C10)

#### **DRAIN/SEWER CLEANING**

Used and rebuilt cable machine in stock: RIDGID K-7500, K-40, K-60, K-1500, Roto-Rooter #55, WXL #C, Spartan #1064, #300, #100, Electric Eel model #C machines. The Cable Center: 800-257-7209. (CBM)

General Wire models J-3055, J-3080, and J-2000; Spartan #717; Electric Eel gas jetters. The Cable Center: 800-257-7209. (CBM)

#### **HAZARDOUS WASTE UNITS**

1995 International 4900 with a 2,300 U.S. gallon Presvac, carbon steel, DOT certified 412, vacuum pressure tank. (Stock #6004C) www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648). (CBM)

Presvac 2,300 U.S. gallon, carbon steel with a Masport H15W vacuum pump installed on a 1993 GMC Kodiak cab and chassis. (Stock #6615V) www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648). (CBM)

1988 Freightliner cab and chassis with a pre-owned 3,150 U.S. gallon, carbon steel, vacuum tank; with a Demag Wittig RFL100 vacuum-pressure pump. (Stock #173GC) www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648). (CBM)

New 3,200 U.S. gallon, carbon steel, DOT certified 407/412 vacuum tank; dump type with full open rear door and a Presvac PVB-750 vacuum-pressure pump installed on a 2012 Peterbilt, 348 cab and chassis. (Stock #13526V) www.VacuumSalesInc. com, (888) VAC-UNIT (822-8648). (CBM)

### **HAZARDOUS WASTE UNITS**

1998 Mack RD6885 with a 3,000 U.S. gallon, DOT certified, carbon steel vacuum tank unit. (Stock# 6653V) www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648). (CBM)

#### JETTERS-TRAILER

2006 ENCLOSED JETTER TRAILER: 14' ready for your motor and pump, 7,000 GVW, motorized hose reel, 50-gallon diesel tank, insulated, white, man door. \$4,900. 484-225-1442, cshafer@ptd.net, PA. (CP12)

2002 USJ 4018-300 remote: Hatz diesel engine, run dry pump w/700 hours, pivot reel, pulsation, hydraulic brakes, nozzles, spare tire, mounted mini kit, etc. \$18,600. Pictures - www. jetterdepot.com. Call 678-549-2621. (C10)



Xtreme Flow Hot/Cold Jetter! Model #HJ2TA8536, tandem axle trailer, 35 hp Vanguard 8.5 gpm @ 3,600 psi, 325 gallon water tank, 300' hose, General Pump. List \$34,995. On sale for \$29,995. Fully loaded!

800-213-3272 www.hotjetusa.com

CPBM

#### JETTERS-TRUCK

 1999 Freightliner FL 80 with 2100 Vactor, 12

 yard debris body, 1,500-gallon water tanks,

 80 gpm @ 2,500 psi water pump. \$75,000.

 614-837-3010, OH.
 (C10)

2006 GMC TC6500 cab and chassis with Pipe Hunter trunk mounted jetting unit, 3,000 psi @ 50 gpm with a 1,000-gallon water tank, rear mounted hose reel with Jet Eye Camera System, **6,800 original miles, like new. \$115,000 sale price.** (Stock #13234V) www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648). (CBM)

### JETTERS-TRUCK

Jack Doheny Supplies Inc. offers a full range of late model combo units and DOT industrial vacuum loaders. Call us @1-800-3DOHENY. (CPBM)

#### **JET VACS**



2007 Sterling LT7500: CAT C9, 335 hp, Allison 3000 RDS automatic, tandem, Camel 200 combo, 10.8 yard ejector style body, front mount hose reel w/ 600' of 1" hose, Roots 824 PD vacuum, 80 gpm @ 2,000 psi pump, 8' telescopic boom, 1,500-gallon poly water tanks, many more options. Chassis has salvage title but has been completely refurbished and is in excellent condition. (Stock #50019E)

Call Mark 515-864-1036 IA C10



**2003 Sterling L7501:** CAT 3126, 285 hp, Allison, tandem, Carnel 200 combo unit, 10.8 yard ejector style body, front mounted rotating hose reel, 1,000' of 1" hose, Roots 624 PD vacuum, vacuum super charger, Myers 65 gpm @ 2,000 psi pump, 5' telescopic boom, 1,500 gallon poly water tanks, cyclone separator, plus many more options. Municipal trade, about 47k miles/8,600 hours, excellent condition. (Stock #50022E)

Call Mark 515-864-1036 IA C10





#### **JET VACS**

1999 Sterling cab & chassis with a Vactor 2110, combination vacuum loader and high pressure sewer cleaning system. (Stock #2775C) www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648). (CBM)

2006 Sterling with a VacAll AJV 1215: 12 yard debris body, 1,500 gallon water, combination vacuum/jetting unit. (Stock #5673C) www. VacuumSalesInc.com, (888) VAC-UNIT (822-8648). (CBM)



 1998 International Vac-Con V-311:

 SHA jet-vac, DT-530, Allison auto., J.D.

 diesel upper, 3-stage fan, municipal truck, 60,407 miles.

 \$59,900

 814-696-4343 PA

 C10

2000 Sterling 2112 Vactor: 2 stage fan, low hours, hydro excavation kit, 80 gpm. Unit is in good condition. 2005 GapVax MC1510 with 18" blower, 800' hose reel, newer pump, 80 gpm. Unit is in good condition. Call Jeff at 602-614-3019. (C10)



#### **JET VACS**

2004 Sterling Vac-Con: New C-7 CAT engine with 2 years on warranty, Myers DP 80 gpm/2,000 psi pump, new telescoping boom, 12 yard debris tank, 3-stage fan, 126,000 miles. \$70,000. Call 813-489-3108. (C10)

2005 Sterling Vac-Con, re-powered with C-10 335 hp engine, Myers DP 80 gpm/2,000 psi pump, 3-stage fan replaced 2 years ago, 12 yard debris tank, 126,000 miles, ready to work. \$75,000. Call 813-489-3108. (C10)

1996 Ford LT9000 2112 Vactor: Cummins, 370 hp, 15 speed transmission with low reduction, twin fan, 100 gpm pump @ 2,000 psi, telescopic boom, extendable hose reel, debris pump off system, and more. Photos available. Call 503-931-6026. Price: \$70,000/OBO. (C10)

1995 Vactor 2100: 10-yd. debris tank, 1,000-gallon water capacity, articulating hose reel, and PD vacuum system, single axle L8000 chassis with 55,000 on odometer. Debris tank needs work. \$27,500. Call 262-951-8979, WI. (C10)

1995 Vac-Con with 1,250 gallon water capacity, 11-yd. debris tank, extendable boom, articulating hose reel, 3-stage vacuum, and John Deere aux engine with 1,074 hours. System mounted on a L8000 Ford chassis with 4,229 hours, municipal truck. \$40,000. Call 262-951-8979. (C10)

Vac-Con industrial machine mounted on a pre-owned 1999 International cab and chassis. (Stock #3918C) www.VacuumSalesInc. com, (888) VAC-UNIT (822-8648). (CBM)

1994 Vac-Con, 16-yd. debris tank, 1,250gallon water tanks. Telescoping boom with articulating hose reel, 3-stage vacuum. L8000 Ford chassis, 127,545 miles. \$45,000. Call 601-373-3736. (CPBM)

1980 Aquatech C-2000: 1,000-gallon water, 1,000-gallon debris, 60 gpm on 1980 International diesel w/automatic transmission, positive vacuum pump, front hose reel. \$7,000/OBO. 916-399-9595, CA. (C11)

### LEASE/FINANCING

North Star Commercial Credit: Commercial loans for trucks or equipment. Flexible purchase programs to fit your budget. 21 years in the industry. Contact Tom Myers -877-804-2274. (CPBM)

#### MISCELLANEOUS

Titan 8000 series, high performance, RIDGID 8000 Zero-Gravity. Cable Center: 800-257-7209. (CBM)

SEEKING EXPERIENCED CIPP installers, CCTV technicians, and Vactor drivers. CALL 352-239-8550, GA. (C11)

1996 fully operational GMC P3500 grout/ camera truck: Includes spare grouting equipment, packers and grouting materials. Call Lori at 717-737-6092. (P09CM10)

#### PARTS & COMPONENTS

Vac-Con parts for sale: 1) scissor lift for 12-yd. debris tank, 2) hydraulic oil cooler, 3) Aux engine (John Deere), 4) 8" extendable vacuum boom, 5) 3-stage fan, 6) hose reel on bumper. For more info call 970-653-8588, email freedomdrain@hotmail.com, CO. (C11)

US Jetting provides aftermarket rebuilding services and **replacement parts for Harben® pumps.** Low prices, fast response. Why pay more? Call today. 1-800-538-8464, ext 25 or 18. (CBM)

#### PIPELINE REHABILITATION

Perma-Liner lateral trailer. All equipment in excellent condition. Have 4, 5 and 6 inversion heads. Call 973-993-5544 or email for pictures, sewerpronj@aol.com. Asking \$45,000. (C10)

One trade-in model of Pipe Genie heavy duty, pipe bursting equipment. Excellent condition, looks new, 30-ton, 100 feet cable, full 2-year warranty. 877-411-7473. (CBM)

#### PIPELINE Rehabilitation

1974 International Braden: Winch truck with 3-speed hyd, 15,000# Braden, constant speed 6, capstan head with 1,200' of 1/2' cable, articulating hyd arm. No need for top or down hole rollers. Can be used for large diameter balling, bucketing, poly liner, or pipe bursting, mounted on 1974 International Cummins diesel with 13 speed. \$10,000/OBO. 916-399-9595, CA. (C11)

WANTED: Used boiler truck for CIPP lining. kenlow@theavrettcompany.com or 352-239-8550. (C10)

#### POSITIONS AVAILABLE

All South Underground, LLC, located in Tampa, FL, is hiring two experienced Manhole Rehab Foreman. PACP & MACP Certification a plus. Please call 813-925-3112. (C12)

Now Hiring experienced CCTV Operators, Grout Foreman, Manhole Rehab Technicians and Vac Truck Operators. Must have valid driving license and reliable transportation. 50+ hours per week. Please contact Billy Roese at 813-489-3108 or broese@vac-vision.com, FL. (C10)

Pipeline cleaning and inspection company is needing the following positions to be filled immediately in Houston, TX: CCTV Operator – PACP certification is desired but not critical. Supervisory experience is a plus. Vactor Crew – Driver, operator and 2 assistants, previous experience is desired for all but assistant positions. Must be able to pass background/drug screen, have a clean driving record and reliable transportation. Please email houston@pvicaz.com or fax resume to 713-691-1785. (C10)

Looking for dealers and distributors to market our high pressure nozzles to existing customers. Exclusive territory available throughout US and Canada. Fax resume to 678-807-2944. (C10)



#### **POSITIONS AVAILABLE**

SALES MANAGER needed to lead a field sales force for an industrial cleaning company located in southwest Ohio. At least 5 years sales management experience required. Email resume and salary requirements to hti707@aol.com. (CP10)



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Visit www.ApplewoodFixIt.com C10

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Honda model WP40X, 8 hp, 4" with hoses. Honda 4 hp, 2" pump with hoses. Cable Center: 800-257-7209. (CBM)

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Liquid vacs, wet/dry industrial vacs, combination jetter/vacs, vacuum street sweeper & catch basin cleaner, truck & trailer mounted jetters. All available for daily, weekly, monthly, and yearly rentals. VSI Rentals, LLC, (888) VAC-UNIT (822-8648) www.vsirentalsIIc. com. (CBM)

### **RODDING MACHINES**

1985 Champion sewer and duct rodder: 1,000 feet of continuous 1/2" rod, V4 Wisconsin on 1975 Ford 1-ton, hose, saws blades, tools and spare parts. \$6,000/OBO. 916-399-9595, CA. (C11)



and Stratton engine, all lights and gauges, work 200 ft of sectional rod, fresh white paint, ready to go to work.\$2,500 203-235-8504 CT c10

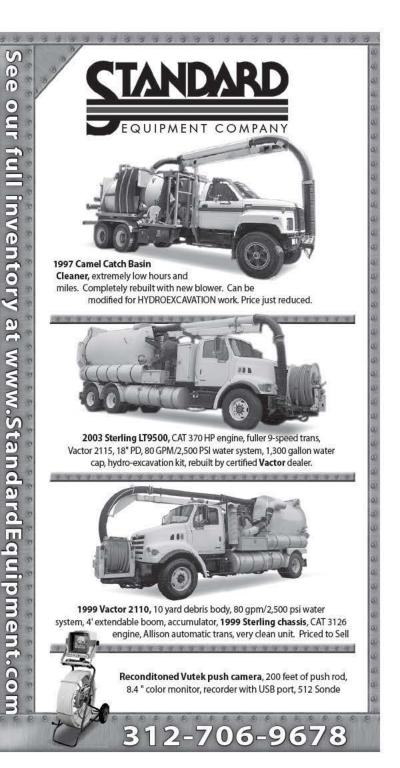
#### **ROOT CONTROL**

1992 Engineering Co. trailer: Hose thruster machine: Used to apply Sanafoam Vaporooter to sewer lines, trailer mounted, 2 cylinder Onan engine, can be connected to a jetter truck. \$6,000/OBO. 916-399-9595, CA. (C11)

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RIDGID model #300 with stand, RIDGID tristand vises, RP 330 ProPress kit. The Cable Center: 800-257-7209. (CBM)

Ritchie Yellow Jacket Recovery System & BULLET 7 cfm pump. The Cable Center: 800-257-7209. (CBM)

Bosch Brute hammer drill with cart irons. The Cable Center: 800-257-7209. (CBM)

#### TV INSPECTION

Ratech Inspection System: 1995 Ford E350 cargo van, new computer and data program, pan-and-tilts camera on crawler (with 1-yearold motor and transmission) 1,000' cable (1 year old). \$35,000/OBO. Call 519-294-6500, ON. (C11)

Envirosight Rovver 125 Camera System: Rovver 125 steerable crawler upgraded with back up camera, additional light, and 512 locator. Complete wheel sets, camera control unit, desktop and remote pendant, and was recently serviced. See pictures at www. empireequip.com. \$43,500. Call Craig at 714-420-4801, CA. (C11)

2000 and 2006 sewer line inspection cameras: (1) Omni II, (1) NovaStar and all the accessories (wheels, extensions, poles, etc..). Comes with 1,000 ft winch and a Onan generator and all computer hardware. All works good. \$4,500. Call 970-565-3962, Cortez, Colorado. (C10)



**1997 GMC Sierra 3500:** TV van has all UEMSI equipment, Prowler crawler, CUES track crawler, 2 pan and tilt camera, around 1,000 feet of cable, 73,000 miles, table computer and runs visual pipe. Ready to work today. ......\$22,000 Call 407-383-9512 FL c10

1998 Cues Mainline TV System: GMC Savanna 3500, Cues with Pro-Data on-screen titler, Honda generator, Sony combo DVD/VHS, 1,700' of M/C cable, pan & tilt camera with shorty transporter. \$39,500. 608-835-7767, WI. (CBM)

## TV INSPECTION

Aries video inspection equip. for sale: 2 Badgers, (1) camera, wheels, blocks, spare parts, Satellite III, and portable easement machine with 500' cable, used once. Call 800-356-4468 or email sales@russellreid.com for photos and details. (C10)

Used and rebuilt camera kits in stock: RIDGID Mini Compact, Mini Color, Standard Self-Leveling, General Gen-Eye I, II and III, Aries Seeker, and SRECO kits. The Cable Center: 800-257-7209. (CBM)

#### VACUUM LOADERS

2009 Peterbilt 365 Power Vac 3800: 3,250 U.S. gallon, carbon steel vacuum tanker with a Hibon PD blower 3800 SCFM with vacuum to 27" mercury, dump type, DOT 407/412 regulations. (Stock #3892C) www.Vacuum SalesInc.com, (888) VAC-UNIT (822-8648). (CBM)

1998 Sterling cab & chassis with a Cusco MasterVac 3800 wet & dry industrial loader. (Stock #5088C) www.VacuumSalesInc. com, (888) VAC-UNIT (822-8648). (CBM)

PowerVac 3800, 3,250 gallons, carbon steel vacuum tanker with a Hibon PD blower, 3800 SCFM with vacuum to 27" mercury, dump type, DOT 407/412 regulations installed on a 2009 Sterling tri-axle. (Stock #4931) www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648). (CBM)

1999 Sterling cab & chassis with a Cusco Turbovac 3800 industrial loader with a jetting system. (Stock #3163C) www. VacuumSalesInc.com, (888) VAC-UNIT (822-8648). (CBM)

POWERVAC 3800, 3,000 U.S. gallon, carbon steel vacuum tanker with a Hibon PD blower 3800 SCFM with vacuum to 28" mercury, hi-dump type, DOT 407/412 regulations. (Stock #13478V) www.Vacuum SalesInc.com, (888) VAC-UNIT (822-8648). (CBM)

#### WANTED

WANTED: Old sewer trucks running or not. Any brand, any make. PH: 713-900-9565, email: mmachinerymexico@gmail.com. (CBM)

Wanted to Buy: Vactor 2100's and late model Guzzlers. Cash. 800-336-4369. (CPBM)

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 psi.
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 MI.
 (C12)

### WATERBLASTING

FOR SALE: NLB 40-250, 40,000 psi @ 10 gpm, 3306 CAT engine, 1,100 hours. \$70,000. NLB 20-250: 20,000 psi @ 20 gpm, N14 Cummins engine, 4,700 hours. \$45,000. Tommy: 256-762-4392, AL. (C10)



ask for Wes or Craig C10

Gardner Denver T-375M: 21 gpm @ 10,000 psi. Gardner Denver T-450M: 52 gpm @ 10,000 psi. NLB 10-200: 34 gpm @ 10,000 psi. NLB 20-600: 44 gpm @ 20,000 psi. Gardner Denver LC-1500: 390 gpm max, 15,000 psi max. NLB 10-325: 10k max, 51 gpm max. NLB 10-235: 10k @ 34 gpm. Jetstream 4220: 20k psi @ 17 gpm, Allis-Chalmers 10x8x22, 700 hp. Boatman Ind. 713-641-6006. View @ www.boatmanind.com. (CPBM)

### WATERBLASTING

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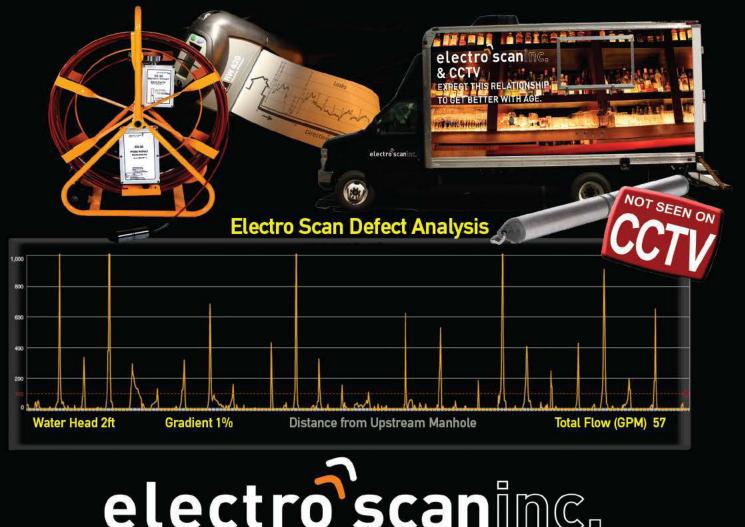
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I remember a call I got a little while back. This customer had an UnderTaker and had it on a pipe replacement job, and his client happened to be holding an outdoor event the day he must have to do the job. On ten of that it ways down he needed help with a part.

was there to do the job. On top of that, it wound up he needed help with a part unexpectedly or else he was going to have to go ahead and dig up the lawn. But I was close enough that I was able to get there and get him what he needed without ever disrupting his client's event.

#### Tough Customer Preferred Product: The UnderTaker."

Lets you replace 4" – 6" pipes with minimal disturbance to trees, landscaping, streets and sidewalks. A compatible water-line slitter for replacing galvanized or copper water lines is also available.

