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MARK ELLEFSON SET A HIGH BAR WITH PRODIGY
PLUMBING AND HIS TEAM'S EXCEPTIONAL
SERVICE LIVES UP TO THE NAME / 14

PIPELINE
REPAIR AND
REHABILITATION
DIRECTORY / 34

SERVING
THE PUBLIC
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COMMITTED TO ITS
CUSTOMERS / 40

PRODUCT FOCUS

CIPP LINING METHODS AND PROJECTS / 52



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CONTENTS

OCTOBER 2022

14 COVER STORY: FULFILLING THE MISSION

Mark Ellefson set a high bar with Prodigy Plumbing and his team's exceptional service lives up to the name.

// By Ken Wysocky

FEATURES

34 >> SPECIAL SECTION << PIPELINE REPAIR AND REHABILITATION DIRECTORY

40 PROFILE: SERVING THE PUBLIC

PSI carries on its founder's legacy providing construction and maintenance services to loyal municipal customers. // By Giles Lambertson

DEPARTMENTS

8 FROM THE EDITOR: A SENSE OF DIRECTION

Where is your company going and how will you get there? // By Kim Peterson

10 @CLEANER.COM

Be sure to check out our exclusive online content.

24 MONEY MANAGER: TAX IMPACT

How you structure your business entity determines its tax classification and how much you will owe. // By Joan Koehne

28 SAFETY FIRST: REVIEW YOUR RESCUE PLAN

Even the most experienced technicians need continual training in confined-space entry procedures. // By Rick Pedley

48 MONEY MACHINES: MORE THAN MEETS THE EYE

A custom-built multiuse sewer truck racks up revenue for A-1 Total Service Plumbing. // By Ken Wysocky

52 PRODUCT FOCUS: CIPP LINING METHODS AND PROJECTS

// By Craig Mandli

58 CASE STUDIES: CIPP LINING METHODS AND PROJECTS

// By Craig Mandli

60 PRODUCT NEWS

Spotlight: Videoscope helps techs find issues in tough locations // By Craig Mandli



ON THE COVER // Mark Ellefson started Prodigy Plumbing in Long Beach, California, in 2010. He knew from the beginning that he was setting a high bar with that name, and his mission from day one was to live up to that. The company provides drain cleaning, trenchless pipe rehab and plumbing in a service area that covers a 25-mile radius around Long Beach. Ellefson applies a unique personal strategy to running his business, and it's paid off. The company has grown to 30 employees, and runs about 20 service vehicles and a roster of equipment to provide diverse services. As Ellefson says, "We operate a certain way and achieve certain results." (Photography by Ed Carreon)



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ADVERTISER INDEX

ALLAN J. COLEMAN
SINCE 1905

Allan J. Coleman Co. 45, 63



Apex CIPP Solutions..... 32

ARIES

Aries Industries 43

Back Municipal Consulting..... 26

THE
CABLE
CENTER

Cable Center, The..... 31, 69



Cam Spray 22



Central Oklahoma Winnelson..... 61



Coast Manufacturing..... 59



CUES..... 27



DCD..... 23



Duracable Manufacturing Co..... 7



Easy-Kleen Pressure Systems..... 12



Envirosight, LLC..... 5



Enz USA, Inc. 12



Forbest Products Co. 65



GapVax, Inc. 71



General Pipe Cleaners/div. of

General Wire Spring..... 2



GI Industries, Inc. 25



Gorlitz Sewer & Drain, Inc..... 29



HammerHead Trenchless..... 39

Hermann Sewerin GmbH 59

Hurricane Reinstatement Solutions . 69



IPP Solutions, LLC 47



Ken-Way Corporation 65



Lasans Mfg. by Vanderlans 18-19

MAXLINER

MaxLiner 49



Milwaukee Rubber Products, Inc. ... 26



MyTana LLC..... 37



NozzTeq..... 51

NTS (National Trench Safety) 38



Nu Flow Technologies..... 3



Pearpoint (USA)..... 70



Picote Solutions..... 38

Pipeline Renewal Technologies 17

Pow-r Mole Trenchless Solutions..... 30

Pro-Built Tools, Inc..... 13



Ratech Electronics, Ltd..... 32

RFI Construction Products..... 50



RIDGID..... 9



RODDIE, Inc..... 22



Root Rat..... 65



SECON 8



Spartan Tool, LLC 72

SubSurface Locators, Inc..... 63



T&T Tools, Inc..... 68



The Sewer Camera Center..... 51



The Sewer Camera Connection..... 38

Trenchless Supply, Inc. 6



TRY TEK Machine Works..... 63



Vivax-Metrotech Corp. 21

Warrior Trenchless Solutions..... 11

Western Drain Supply..... 59



Westmoor Ltd. 51

WJTA..... 33

WWETT Show 62

Classifieds..... 66-68

Marketplace..... 64

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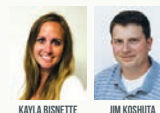
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Email me with comments, questions or opinions at editor@cleaner.com

A SENSE OF DIRECTION

Where is your company going and how will you get there?

ONE THING I have learned from the contractors we profile in *Cleaner* every month is that you need to have a vision for where you're headed. At first it may seem unnecessary to have a mission statement as a drain cleaning company. It's pretty straightforward work and customers should know what to expect from you. But a mission statement is more than just explaining the work you do.

Of course you have goals for your business; but "growth" or "better profit margins" is not a mission statement. The mission is how you will achieve your goals. And how you will treat your customers as you do that.

If you don't have a stated purpose, at some point your business may stall or falter.

Opportunities will be presented to you that don't align with your goals. Maybe someone will approach you to partner with you or work for you but you sense that person doesn't meet your standards or have the same values as you. Knowing what you stand for will help you make decisions for the future of your business.

You never know how a new endeavor will work out, but you can probably sense the ones that are wrong for you if you take some time to consider the possibilities.

Sometimes it takes a lot of poor decisions to realize you need to start doing things differently. Mark Ellefson turned his life around after making some personal changes, took a plumbing course, and eventually started his own business, Prodigy Plumbing. "I went through a rock-bottom thing and personal development was the only way out of it. I changed my belief system and mindset to create a different life for myself ... and I figure if I could do that for myself, I can do it for my employees, too. I want to share that wisdom and power."

Ellefson infuses his work with his own personal spiritual philosophy, and while he knows that's not for everyone, he's created a supportive, positive work environment where employees and customers are most important.

"It's all about intention — intention is everything in life," he says. "I have to repeat it over and over, explain why we do things. ... You have to connect the 'whys' with the big picture."

Other times, the change is forced upon you. When founder Mike Aiello passed away, PSI Pumping Solutions acting CEO and Vice President Dara Myers stepped up to steer the business forward. "The people here at PSI have weathered quite a storm," says Myers. "Since January, I have been interacting especially closely with the team. They are exceptional and talented. We've been together for years and they do what they do well."

As both companies have found, having good people to serve alongside you is key to achieving your company's mission. "We have been very open about the company being founded for the purpose of investing in people," says Meyers.

Invest in people who will help you uphold your vision and your company is almost guaranteed to succeed.

I hope you enjoy this month's issue. **c**

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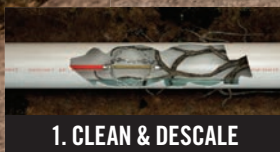
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INDUSTRY TRENDS

Should You Get Into Vacuum Excavation?

Excavation work may not be an everyday occurrence for many plumbers and drain cleaners, but when it is required on a job, it can be a time-intensive and costly pain. Vacuum excavation is a good remedy to those pains, and the technology in recent years has become increasingly more accessible to contractors of all types with more compact and affordable options like trailer units. Master plumber and YouTuber Roger Wakefield talks more about it in this video.

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LOOK OUT

4 Work Zone Safety Tips

One of the biggest threats to crews working on or near a roadway is a vehicle crashing into the work zone. In this online exclusive, two utility companies recognized for outstanding safety discuss how they manage this risk.

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ROLLING BILLBOARDS

Companies Showcase Vehicle Wraps

The options for business advertising are plentiful. One of the most common for plumbing and drain cleaning companies is making use of the vehicles and equipment they already own and rely on every day. Here's a look at how some companies approach the design of their rolling billboards. >> cleaner.com/featured

OVERHEARD ONLINE

"I've sent emails that the recipients later told me they almost didn't respond to because the language sounded too formulaic and professional. People do business with real people — use real language instead of something you would never say in real life."

— The Ins and Outs of Business Email Greetings

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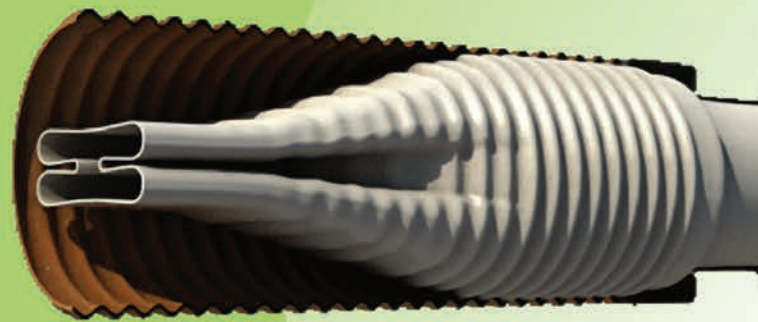
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FULFILLING THE MISSION

MARK ELLEFSON SET A HIGH BAR WITH PRODIGY PLUMBING AND HIS TEAM'S EXCEPTIONAL SERVICE LIVES UP TO THE NAME

// By Ken Wysocky

When Mark Ellefson decided to call his company Prodigy Plumbing, he knew he'd raised the bar high and would have to provide the kind of exceptional service implied by the name.

So far, so good.

"My mission from day one was to live up to that name," says Ellefson, who founded the Long Beach, California-based company in 2010. "And I've totally done that."

The numbers certainly reflect his aspirations. The company — which does drain cleaning, trenchless pipe rehab and plumbing — has grown to 30 employees, including more than 20 technicians, and runs about 20 service vehicles. It owns an impressive roster of equipment required to provide diverse services.

And perhaps most telling of all, the company is on pace to generate more than \$6 million in sales revenue this year, compared to \$4.5 million in 2021, says Ellefson, 37.

"We operate a certain way and achieve certain results."

The key to such success includes significant investments in equipment and technology that amp up efficiency and profitability; a business coach; a strong emphasis on obtaining online reviews (505 on Google and 1,328 on Yelp, and counting); and a Zen-like approach to business that creates a corporate culture that fosters employee retention.

"When I was a rock-and-roll musician, I developed some bad habits — a bad lifestyle," Ellefson candidly relates about his previous foray into punk rock. "I went through a rock-bottom thing and personal development was the only way out of it."

« Owner Mark Ellefson leads a team meeting at the Prodigy Plumbing offices in Long Beach, California.





« Jose Flores wipes down the camera head on a RIDGID SeeSnake inspection system after viewing a line.

“I changed my belief system and mindset to create a different life for myself in my early 20s — created massive change for the better. And I figure if I could do that for myself, I can do it for my employees, too. I want to share that wisdom and power.”

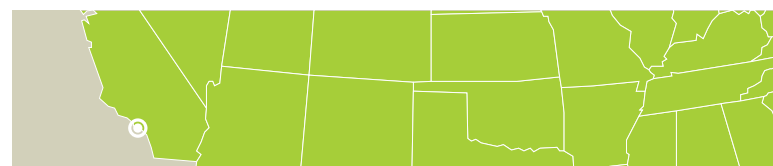
Ellefson concedes the spiritual approach isn’t for everyone.

“I’ve had guys leave because they weren’t in it for the Prodigy big picture, where we show people compassion, love and true, genuine support,” he explains. “But the guys that stay are true believers. ... They see other guys buy into it and make boatloads of money because of their attitude and energy. They become better husbands and fathers at home.

“It’s a very tangible and powerful thing.”

BACK TO SCHOOL

To help cultivate the type of corporate culture he desired, Ellefson hired a business coach for a year. The coach taught



Prodigy Plumbing Inc.

LONG BEACH, CALIFORNIA

OWNER Mark Ellefson

FOUNDED 2010

EMPLOYEES 30

SPECIALTIES Plumbing service/repair, drain cleaning and trenchless pipe rehab

SERVICE AREA About a 35-mile radius around Long Beach

WEBSITE www.prodigyplumbers.com

employees about the seven habits of highly effective people (based on the best-selling book by the same name, written by Stephen Covey and published in 1989).

Employees attended weekly, half-hour-long workshops, followed by individual sessions if needed, says Ellefson, who

EXPERIENCE PAYS DIVIDENDS

It seems like every plumber who does trenchless pipe rehab has a favorite story about an unusually tough job — one that really stands out because it challenged his or her skills and capabilities.

For Mark Ellefson, the owner of Prodigy Plumbing in Long Beach, California, the job that immediately comes to mind was a pipe lining project the company performed about two years ago.

A 10-store strip mall in Anaheim had a deteriorating 300-foot-long sanitary sewer line that ran under the stores' concrete-slab floors. To make the job even more complicated, there were about two dozen tie-ins for sinks, toilets and the like — and no clean-outs for easier access, Ellefson says.

"The owner didn't want to excavate to replace the entire lateral because that would have been a nightmare," he explains. "And the sewer line was one of the worst I've ever seen, with rotted bottoms and massive cracks and corrosion, not to mention all the reinstatements that would be needed at the tie-ins.

"The owner kept calling other companies, but no one was interested; they wouldn't even provide a price. But we love a good challenge, so we decided to figure out how to line this really bad, 4-inch-diameter cast iron pipe."

An inspection with a SeeSnake camera revealed that two sections of the pipe were so rotted out that pipe lining wasn't even an option. So the Prodigy crew had to bust open two holes — one in each of two stores — to manually replace two sections of pipe.

Technicians then used those two holes as access points to shoot hot-water-cured felt liners from MaxLiner USA, using a MaxLiner inversion system.

To avoid totally disrupting the businesses in the strip mall, all the work was performed at night. Technicians used Midi and Maxi Miller drain machines from Picote Solutions to reinstate the tie-ins and a Quik-Coating System from Pipe Lining Supply to restore the original cast iron pipe.

The project took about a week to complete, Ellefson says.



"WE'RE SUCCESSFUL BECAUSE WE THINK DIFFERENTLY. JUST BECAUSE WE'RE PLUMBERS DOESN'T MEAN WE CAN'T THINK AT A HIGHER LEVEL. IF YOU'RE NOT GROWING, YOU'RE MOVING BACKWARDS."

MARK ELLEFSON

got into plumbing by taking a one-year course at a trade school in Long Beach in 2005.

"It was worth doing it for our guys," he says, noting that Fortune 500 companies do the same thing. "This is how we change the standards of the industry.

"Every plumber I talk to about this says, 'Who does this?!' And I say, 'We do.' We're successful because we think differently. Just because we're plumbers doesn't mean we can't think at a higher level. If you're not growing, you're moving backwards."

CUSTOMER-CENTRIC MINDSET

Ellefson always moved forward in his career, working for several

plumbing companies — both big and small — before getting laid off and starting Prodigy.

"A friend of mine said I should start my own business," he recalls. "I didn't know anything about running a business. But plumbing was the only thing I knew how to do, so I went out and did it."

Ellefson's top priorities were treating people well and paying them well.

"This can be a negative and toxic industry, full of stereotypes," he notes. "That's not what I'm about. If I'm going to shine and be a prodigy, I have to live by certain values and enforce them for anyone who want to work with me — things like be positive, be nice to

« Jose Flores (left) and Jared Paredes prepare a liner for a residential pipe lining job.

each other, have integrity and over-deliver when it comes to customer service.”

Regarding the latter, it's not only the right thing to do; it also leads to word-of-mouth referrals. When his technicians install a new faucet and leave an undersink cabinet cleaner and more organized than it was before, for example, it makes a big impression on customers.

“It blows people away,” Ellefson says. “Things like that only take a few minutes and they don't cost us anything. And customers see we care about them and tell their family and friends about us.

“You don't have to spend a million dollars and market your company to a million people. All those little things make an impact and motivate people to refer you to other people and keep calling you forever.”

LOW-COST MARKETING

Ellefson says he devotes only about 3% of his company's budget to marketing, yet still generates a large return on investment. For example, he says 84% of Prodigy's revenue

comes from repeat customers and his company has dominated the local market for the last eight years.

“We try to avoid killing our guys with work and having them burn out,” he says, explaining the relatively low level of marketing expenditures. “So if we spend less on marketing, we can pay our guys more and keep them happy, which keeps our existing clients happy and also helps us maintain job quality.”



« Flores inserts a liner into an inversion machine.

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Online reviews, which are low-cost and very effective, have been critical to the company's marketing efforts, so Ellefson emphasizes to technicians the importance of motivating customers to post reviews.

"It's all about intention — intention is everything in life," he says. "I have to repeat it over and over, explain why we do things and how they allow us to afford other things, make more money and generate more career opportunities.

"You have to connect the 'whys' with the big picture." As an example, he says he tells employees that strong online reviews can help them afford nice things for their families.

"You need to stay with it until you get to that 'aha' moment. You need the patience to keep repeating things like a broken record. As a leader, you have to be the one refocusing and re-energizing people about the big picture."

◀ Rafael Madrigal and Jose Flores tape off the end of a liner as they prep for a lining job.

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A NEW MARKET

Entry into new markets also drove growth. Prodigy started doing pipe lining in 2017 when Ellefson grew frustrated with using subcontractors.

"Subs could never get to a job as quickly as we needed them to," he explains. "Furthermore, I want to have complete control over the services we provide for our customers to ensure quality.

"Plus, when you hire subcontractors, you're leaving money on the table."

Ellefson invested in a pipe lining system from MaxLiner USA, which uses hot-water-cured felt liners. On average, he estimates the company installs about 15,000 feet of liner a year, mostly in residential sewer laterals.

"We shoot about three liners a week," he says. "We do 100-foot runs, on average."

Employees learned the ropes by shooting sample liners in pipes set up in the company's warehouse. Ellefson still remembers his first job out in the field: a 45-foot-long, 4-inch-diameter residential, clay pipe lateral line with separated pipe sections and tree-root intrusions.

"It was one of the scariest times of my life," he recalls. "The cure time was pretty short back then, so you had to install liners quickly before they cured on you.

"But we grabbed it by the horns and ran with it. My hands were shaking and my heart was jumping out of my throat."

Shortly after that, Ellefson met Jose Flores, a very proficient and experienced MaxLiner installer. It took two years, but Ellefson finally convinced Flores to come on board in 2018.

"He's very well known in the industry because of his social media exposure," Ellefson says. "Having him on board was a real game-changer. He's done the most technical and complex lining job ever with zero failures during the last four years. As a result, we're now very confident installers."

EQUIPMENT INVESTMENTS

The company runs 20 service vehicles, most of them Ford Transit vans and Ford Transit cutaway vans with KUV box bodies from Knapheide.

"They're great because you can keep all the materials in the outside cabinets and expensive things on the inside, where they're

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» The crew at Prodigy Plumbing includes (from left) Rafael Madrigal, Jared Paredes, owner Mark Ellefson, Jerry Rodriguez and Jose Flores.

» Prodigy Plumbing technicians make final adjustments before shooting a liner on a residential pipe lining job.



"I really like the Picote machines because they scrape the insides of pipe wall so thoroughly, almost fully restoring the original pipe diameter," he says. "That minimizes callbacks."

The company also relies on inspection cameras from RIDGID, including standard, microReel APX and Mini Reel SeeSnake models, as well as RIDGID SR24 and SeekTech SR-60 pipeline locators.

In addition, Prodigy owns a Quik-Coating System from Pipe Lining Supply. It robotically applies thin coats of resin with brushes to pipes and is primarily used for restoring cast iron pipes.

"WHEN YOU GET THROUGH THE TOUGH JOBS AND HARD TIMES AND GET THAT FEELING OF VICTORY, AND CUSTOMERS ARE SO HAPPY WITH WHAT YOU DID TO HELP THEM, IT'S ONE OF THE MOST FULFILLING FEELINGS IN THE WORLD. THAT'S WHY I LOVE THIS BUSINESS."

MARK ELLEFSON

more secure," he notes. "The open floor space in the middle saves us a lot of headaches."

Prodigy also owns a Mongoose water jetter (a brand owned by Sewer Equipment), mounted on a Ford F-450 flatbed truck. It features a 300-gallon water tank and a water pump (5,000 psi at up to 19 gpm) from Mongoose and is used primarily to clean residential and commercial sewer lines.

Ellefson says he decided to truck-mount the jetter so any technician could drive it.

"If it was on a trailer, we'd have to wait until there was a truck available with enough towing capacity," he explains. "Plus, trailers are harder to park. With a truck, anyone can jump inside and drive it to a job site. It's all about efficiency and saving time."

For drain machines, Ellefson prefers equipment from Picote Solutions, mostly Maxi and Midi Millers, and various-size cable machines from Gorlitz Sewer & Drain.

EFFICIENCY GAINS

Ellefson also invested in ServiceTitan business management software about four or five years ago in an effort to minimize paperwork. The cloud-based platform enables technicians to create and upload service-call reports that can include notes and photos that verify repairs made by technicians.

"Sometimes people call and say one of our guys touched something and now it leaks," Ellefson says. "But when we have photos that show the customer declined to repair that same leak, it protects us from expensive callbacks and legal liabilities."

"ServiceTitan literally will revolutionize any small business. We no longer have file cabinets filled with thousands of paper documents. You just hit a button and up pops a customer's history."

"It makes life so much easier. It's expensive — we probably pay about \$5,000 a month. But with all of our moving pieces, it keeps things organized and pays for itself through greater efficiencies."

Ellefson says he firmly believes that technology buys time which leads to greater freedom and less stress for both him and employees.

SUSTAIN THE SWEET SPOT

As Ellefson was preparing to graduate from high school, his father told him that being a musician was a tough way to make a living. So he urged his son to learn a trade and suggested plumbing.



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In trade school, he asked a counselor which career would be more recession-proof as well as more lucrative. The answer was plumbing.

"So I said, 'Sign me up,'" he recalls.

It turned out to be the right choice. Despite the stress that comes with the territory, Ellefson has no regrets about becoming a plumber.

"At times, it can be the most mentally excruciating and stressful job," he says. "But when you get through the tough jobs and hard times and get that feeling of victory, and customers are so happy with what you did to help them, it's one of the most fulfilling feelings in the world. That's why I love this business.

"I also love the problem-solving, the diagnosing and the troubleshooting. It forces you to think bigger and outside the box. You have to find a way to solve problems. And we do."

Looking ahead, Ellefson says he's not interested in more rapid growth because the company has hit a "sweet spot" in terms of revenue and net profits. He's also concerned that more growth could dilute the company's culture, diminish its quality control, reduce customer service and decrease profit margins.

"I have the most amazing team I've ever seen," he says. "The way I see it, if I'm happy with the revenue the company is making and happy with the money I'm making, and employees are happy with the money they're making, we just might stay where we are for quite some time."

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No matter what happens, though, maintaining the company's unique culture is of utmost importance to Ellefson.

"It's important to live in a state of gratefulness and empower everyone around you. At the end of the day, those are the essential things we all need." **c**



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Joan Koehne

TAX IMPACT

How you structure your business entity determines its tax classification and how much you will owe

// By Joan Koehne

CORPORATE TAXES take a big bite out of small businesses. With today's high inflation rates and the threat of an economic recession, small-business owners are looking for every possible way to save money.

Taxation isn't an exciting facet of the business, but the impact of corporate taxes can't be ignored. Is your small business taking advantage of every tax break available? By reducing the corporate tax you owe, you'll keep more money in your pocket, making it easier to finance and grow your business. Roman Basi, attorney and certified public accountant at the Center for Financial, Legal and Tax Planning in Marion, Illinois, recommends a variety of strategies to save money on corporate taxes.

"What comes to the forefront is, 'How can you structure your company to save taxes?'" he says.

STRUCTURE TO SAVE

When advising clients, one of the first things Basi checks is the legal and financial structure of a company. He performs a tax minimization analysis to compare the tax impact of different organizational structures. Tax classification varies, depending on the way an entity is organized.

For example, many small businesses form their legal entity as a limited liability company, S corporation or disregarded entity. The Internal Revenue Service taxes these entities through the owner's personal income tax form. All income and expenses flow to the

business owner's 1040. Hence, these entities qualify for "flow-through taxation." The business owner files an annual income tax return and a separate corporate tax return (if an S corporation) for the business yet the corporation pays no taxes. Although a flow-through taxation designation may yield the most favorable tax outcome, oftentimes it's worthwhile to consider alternatives.

The tax minimization analysis answers the question: What happens if we change this company to a C corporation, which is not a flow-through entity? Taxes are paid by the company instead of the business owner. To create a clear and understandable comparison, Basi's team develops a mock-up of financial statements showing the tax implications if the company switched to a C corporation. The tax minimization analysis considers alternatives to flow-through tax designation.

The results can be surprising. One of Basi's business clients with a flow-through tax designation was paying taxes at a rate of 37%. By restructuring the company as a C-corp, the tax rate dropped to 21%.

"The tax minimization analysis goes a long way for small businesses," Basi says. The analysis especially is valuable for business owners preparing to sell or transfer their business. Sellers want to maximize the value of the sale and earn enough money to transition to a new career or enjoy their retirement. The analysis helps business owners make educated decisions based on financial data, not guesswork or gut instinct.

FIND THE RIGHT PROFESSIONAL

When it comes to business finances and taxation, a certified professional tax adviser simplifies the decision-making process. Basi recommends selecting a tax adviser who does more than just prepare tax returns and financial statements.

"I think it's crucial whenever you're dealing with tax law and tax advice to speak to someone that's not just a CPA but a tax attorney who specializes in the federal tax laws," he says. "They interpret what they see on the tax returns and financial statements as they relate to the tax code."

"YOU SHOULD SEEK OUT ADVISERS THAT ARE SIMILAR IN SIZE TO YOUR COMPANY. DOES A SMALL, THREE-MAN OPERATION WANT A 100-PERSON LAW FIRM OR ACCOUNTING FIRM GIVING THEM ADVICE? NO. THEIR INTERESTS AREN'T ALIGNED THAT WAY."

ROMAN BASI

Business owners who can't find accounting and legal designations in a single provider should work with a team of professionals.

Another factor to consider when choosing a tax consultant is the size of the tax advisory service.

"You should seek out advisers that are similar in size to your company," Basi says. "Does a small, three-man operation want a 100-person law firm or accounting firm giving them advice? No. Their interests aren't aligned that way."

One of the benefits of working with tax advisers is their knowledge of current state and federal tax laws. Tax consultants like Basi base their advice on the latest tax legislation.

"There's nothing new that business owners absolutely need to know about right now. What they must know about is what's going to expire," Basi says.

NAVIGATING LEGISLATION

The most prominent tax legislation about to expire is the federal estate tax exemption, which sunsets at the end of 2025. Currently, a person can pass away and not pay any federal estate tax if they own up to \$12.06 million in assets, doubled to \$24.12 million if married. If Congress doesn't act on this legislation before it expires, the federal estate tax exemption reverts to \$5 million in total assets, adjusted for inflation (estimated to be \$6.6 million), but not doubled for married couples.

"There's been no discussion on whether it's going to be extended or not. People have to start planning," Basi says. Business owners should calculate what their assets are worth. If assets are above the federal estate tax exemption, they may end up paying 40% in federal estate tax. Additionally, state estate tax laws don't always align with the federal estate tax laws. As the end of 2025 draws closer, Basi recommends keeping an eye on federal and state estate tax exemptions.

Another thing to keep an eye on are tax deductions. Tax deductions are a key strategy to reducing taxes. They lower a business entity's taxable income, so the business owes less to Uncle Sam.

One important deduction is the qualified business income deduction. The QBI prevents flow-through entities from paying taxes on 20% of their income.

"Most business owners know that clause, but some do not. Some of them are not taking advantage of that," Basi says.

Another one of the most common tax deductions for small business is the meals

deduction. Business meals are tax deductible. So, keep track of restaurant receipts and meal expenses for corporate events like employee picnics and holiday parties. Also track expenses for meals when traveling for business, entertaining a client or attending business conferences.

Mileage is another expense to track, both for fleet vehicles and private vehicles used for business purposes. The current standard business rate set by the IRS is 62.5 cents per mile. In addition to mileage, business owners can deduct the depreciation of work automobiles placed into service in 2022.



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REVIEW YOUR RESCUE PLAN

Even the most experienced technicians need continual training in confined-space entry procedures

// By Rick Pedley

WORKING IN A CONFINED SPACE exposes workers to risks that can lead to devastating injuries. A confined space is defined as an area unfit for prolonged human occupation, such as a manhole, utility tunnel or basement. These spaces have limited ventilation and few entrances and exits, which makes it difficult for workers to breathe. Hazardous gases can also be present, increasing the risk of asphyxiation or a flash fire.

Every crew should have a confined-space rescue plan in case of an emergency, so workers can test the space before entering and quickly leave if it becomes unsafe.

TESTING THE SPACE

A lack of oxygen or the presence of toxic, flammable gases aren't easily noticeable — many of these gases are odorless, tasteless and colorless. You need proper equipment to test for those conditions. A four-gas monitor with a sample pump will draw air from inside the space to test it for hazardous gases, including oxygen, carbon monoxide, hydrogen sulfide and lower explosive limits of combustibles.

Once the team is aware of the potential risks, the crew should try to minimize these hazards as much as possible by bringing fresh air into the confined space. Confined space ventilation equipment pumps clean air into the area while forcing the toxic air out. Some spaces might be better served by exhaust ventilation systems that extract harmful fumes rather than pushing air in. Workers will also need to wear the appropriate protective personal equipment including respirators, arc flash or flame resistant workwear, hard hats or helmets,

harnesses and other fall protection for rescue and descent situations, and portable gas monitors in case the air quality changes.

SAFELY REMOVING WORKERS

Your crew will also need to create a system for quickly retrieving workers from the confined space. This may be if a worker is injured or unconscious, or when hazardous gases are detected. It is absolutely critical that entry by team members outside the space is not required to effect a rescue. A huge percentage of deaths in confined spaces claim would-be rescuers. Don't let this happen to you.

Time is of the essence and every member of the team should be fully trained on the rescue plan. Attendants, rescue personnel, supervisors and any other employees who might be present on these job sites should undergo training for various situations where they may encounter confined-space hazards or be assisting with someone who might.

» Every crew should have a confined-space rescue plan in case of an emergency, so workers can test the space before entering and quickly leave if it becomes unsafe.



During training, focus should be spent on OSHA's definitions and requirements for permit versus nonpermit confined spaces as well as the criteria for reclassifying a confined space. Training should also involve raising awareness and understanding of common hazards associated with working in confined spaces and how to best protect yourself and coworkers from these related dangers which can include chemical, physical, electrical and/or fire hazards.

REPETITION AND REVIEW

Reviewing roles and responsibilities of certain team members, and what each person needs to do should an emergency occur, can help avoid confusion and panic. While the hope is that an emergency will never occur, identifying the rescue resources and planning around one should not be overlooked.



For vertical entry into a confined space, workers should be trained to use a rescue and descent system that lowers in and out, and a person remaining on ground level should watch for signs of danger, so they can rescue workers even if they are unconscious.

Checklists that go over PPE items and procedures and protocols that need to be done prior to entering, as well as while working within a confined space, help aid in preparation. Training should be done continuously, to keep everyone on the same page, especially as new workers join the team.

Communication is essential. Since these spaces are restricted, workers can use hardline radios that are intrinsically safe to communicate with those overseeing the job site. Managers and



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workers who are not in the space should watch out for signs of danger, so they can rescue workers even if they are unconscious.

When entering confined spaces vertically, a rescue and descent system that lowers the worker in and out of the space is needed, paired with a full body harness attached to a winch with a steel cable. Rescue and descent systems usually include a tripod with another overhead system, anchor bolts for securing the tripod around the entry point, like a manhole opening, and the winch for retrieving the worker.

Every job site is different. Tailor your confined-space equipment and rescue plan based on the unique dimensions and characteristics of the space. Workers may need to wear wristlets when the space is too narrow so that the worker can hold onto the handles as they get carried toward the surface before pulling themselves out of the

EVERY JOB SITE IS DIFFERENT. TAILOR YOUR
CONFINED-SPACE EQUIPMENT AND RESCUE
PLAN BASED ON THE UNIQUE DIMENSIONS AND
CHARACTERISTICS OF THE SPACE.

space. Confined-space rescue kits include the important tools that you may need to rescue workers from other narrow work sites — tripod systems, ventilation blowers and ducting, gas monitors and more. These could also include gear designed to protect against chemicals, fire, arc flash or respiratory hazards; communication equipment; and additional fall-protection gear and components. These all-in-one rescue kits are sold for various industries, so be sure to select the one appropriate for your work site.

Every team needs a reliable rescue plan. Use this information to keep your team safe in every situation. **c**

ABOUT THE AUTHOR

Rick Pedley, PK Safety's president and CEO, joined the family business in 1979. PK Safety, a supplier of occupational safety and personal protective equipment and manufacturer of their own new FR line GRIT, has been operating since 1947 and takes OSHA, ANSI, PPE and CSA work safety equipment seriously. Contact their safety experts at 800-829-9580 or online at www.pksafety.com/contact-us/

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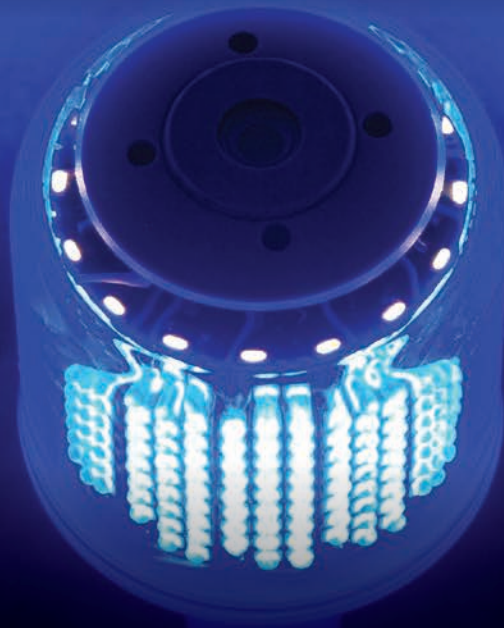


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SERVING THE PUBLIC

PSI CARRIES ON ITS FOUNDER'S LEGACY PROVIDING CONSTRUCTION AND MAINTENANCE SERVICES TO LOYAL MUNICIPAL CUSTOMERS

// By Giles Lambertson



» Service manager Clint Carey has been with PSI Pumping Solutions for three years after “a lifetime” of maintenance work including a 20-year stint as a contractor for the U.S. Army.

PSI PUMPING SOLUTIONS BEGAN WHERE MIKE AIELLO'S career on the high seas left off. Educated at the United States Merchant Marine Academy, Aiello earned a bachelor of applied science degree with a minor in chemistry and then served at sea for more than 20 years.

In 2002, Aiello came home and started his company, providing services to public and private water containment and treatment facilities in Pennsylvania.

Sadly, after 20 successful years in business, Aiello became ill and died in January. Command of the company was passed to a veteran PSI business administrator — acting CEO and Vice President Dara Myers.

“The people here at PSI have weathered quite a storm,” says Myers. “Since January, I have been interacting especially closely with the team. They are exceptional and talented. We’ve been together for years and they do what they do well.” Pumping Solutions Inc. is determined to continue.

BUILDING SOLUTIONS

When Myers joined York Springs, Pennsylvania-based PSI 11 years ago as office manager, the firm had about 20 employees. She characterized the company at that point as “robust for its size” and still growing. It currently employs 61 people.

PSI bills itself as a “solutions” company — specifically, pumping solutions. “We are a construction company in the sense that anything water and wastewater is what we do,” says Myers. “Pumping stations. New water and wastewater installations. Electrical and mechanical projects for facilities.” And so on.

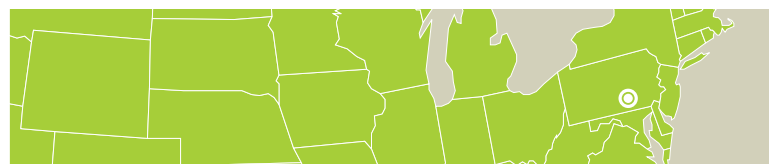
The range of projects PSI undertakes “helps keep the work in-house,” she says. “We are able to control costs and not pay subcontractors. There are some things we sub, but as much as possible we self-perform.”

Examples of company projects include the \$900,000 construction of a high school water treatment plant, water storage tank and booster pumping system. A \$5.5 million wastewater project for a township water and sewer authority involved — among other things — excavation and asphalt paving, fencing and metal fabrication, installation of wet-pit submersible sewage pumps, sequencing of treatment technologies and, of course, installation of pipes, valves and fittings.

FOSTERING RELATIONSHIPS

The expertise demonstrated by PSI on construction projects led to the company’s diversification. People started asking if they could hire PSI to repair and maintain water and wastewater plants. “The service department has grown organically, by word of mouth, over the last 11 years that I’ve been here and that was true before. That was really because of Mike and his relationship with municipal customers,” says Myers.

Clint Carey is PSI’s service manager, but his job description is broader than that. He heads the service division and also serves as chief electrician. “I try to get out of it as much as I can,” he says of his hands-on electrical work, “but it’s tough finding qualified people right now.”



PSI Pumping Solutions Inc.

YORK SPRINGS, PENNSYLVANIA

**ACTING CEO/
VICE PRESIDENT**

Dara Myers

EMPLOYEES

61

YEARS IN BUSINESS

20

SERVICES

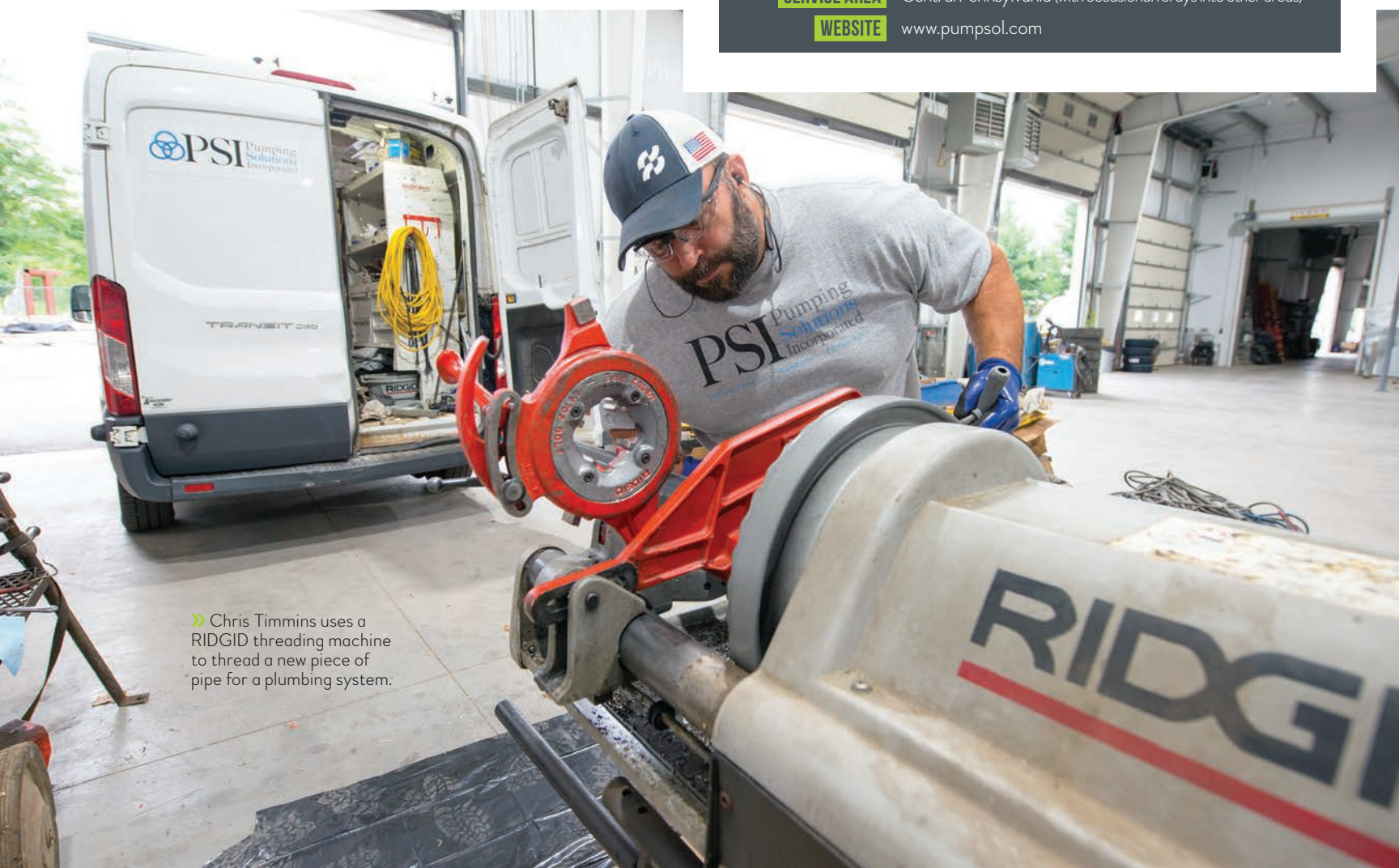
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» Chris Timmins uses a RIDGID threading machine to thread a new piece of pipe for a plumbing system.



« Lead technician Dustin Bailey and technician Fabian Posey assemble a grinder.

“THE SERVICE DEPARTMENT HAS GROWN ORGANICALLY, BY WORD OF MOUTH, OVER THE LAST 11 YEARS THAT I’VE BEEN HERE AND THAT WAS TRUE BEFORE. THAT WAS REALLY BECAUSE OF MIKE AND HIS RELATIONSHIP WITH MUNICIPAL CUSTOMERS.”

DARA MYERS

Carey has been with the company for three years after “a lifetime” of maintenance work including a 20-year stint as a contractor for the U.S. Army. Much of the service work is recurring, Carey says, meaning that once municipalities interact with PSI on a construction project, they come back to the company for maintenance or repair assistance. “We are their go-to company for such work.”

Service jobs vary from relatively simple electrical refitting to entire pump station rehabilitations. “Our bread-and-butter work is replacing pumps and doing electrical work. Municipalities generally don’t have employees who want to mess with high voltage systems.” The latter means three-phase systems ranging up to 480 volts.

Because the two company divisions sort of overlap in their purview — totally rehabbing a pump station is one step away from building a new one — the difference comes down to project cost and time expended. Service jobs can cost up to about \$300,000 and

take one or two weeks to complete, whereas construction jobs at PSI generally range from half a million to a million dollars — some far exceed that — and can require a year to finish.

CLOSE AND COMMITTED

Myers’ construction crews work solely for public agencies. However, the service team has public and private customers, including hotels, restaurants and some industrial clients. Residential water or wastewater systems are taken on only when the company is contracted to construct an entire development.

The company’s heavy equipment yard includes hydraulic excavators, mostly by Takeuchi, from compact to midsize units capable of lifting and setting manholes. Kubota and Takeuchi skid-steer loaders are commonplace and a medium-duty crane truck handles midsize wastewater plant components. A bigger crane is rented as needed, as is specialty equipment like an asphalt paver.

Eighty percent of PSI’s service work is on wastewater facilities, according to Carey. Myers says that probably a majority of the construction work is on wastewater plants, too, but it all depends on what is being bid out at any given time.

The company’s service crew numbers five — optimally, the number is seven, but, as Carey noted earlier, good help is hard to find. He keeps the skill levels of crew members current through regular hands-on and online training. Two men were sent recently

to Kansas City for additional schooling on epoxy coating of manholes, for example.

"I try to keep the guys close as a team. I take pride in building a good team environment and try to be there for the guys. If I can assist with personal issues, I will. I will work in the field with them if they need it. I do whatever I can to keep a close and committed team."

PSI construction crew members sometimes work on different stages of a project or concurrently on projects at different job sites. Project foremen are assigned to construction, mechanical or electrical projects and crews are assembled under them according to their skill sets, Myers says.

Though the company's work is highly technical, the company staff is light on

engineers. "We don't have need of engineers because projects already are engineered," says Myers. "Our job is to build according to the project specs."

The company's service area stretches up to 200 miles from York Springs. Closer jobs are preferred, however, because they can be more competitively bid. "The work we really enjoy doing is close by so our crew members can be home at night with their families. We like



▲ Dustin Bailey enters a manhole to inspect a sewer line.

raising the bar **UNDERGROUND**





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Chris Timmins measures a length of pipe.

doing jobs within the community. We just did a job for the local school district.”

SEEKING EXCELLENCE

Besides the loss of the company founder, 2022 has challenged Pumping Solutions Inc. in lesser ways. While Myers is not concerned about regulatory burdens on public projects, she would like to see the government step up and control inflation and help restore a stable supply chain.

change every 24 hours. Everyone is dealing with it.

“The lack of availability of major equipment and supplies has hit projects severely. It used to be we would wait a couple of months for a new generator. Now the wait can be years. The best we can do as a business community is to order early and often to mitigate surprises.”

Carey points to delays for electrical components, variable-frequency drives, “and that kind of stuff. We work around a lot of

“OUR BREAD-AND-BUTTER WORK IS REPLACING PUMPS AND DOING ELECTRICAL WORK. MUNICIPALITIES GENERALLY DON’T HAVE EMPLOYEES WHO WANT TO MESS WITH HIGH VOLTAGE SYSTEMS.”

CLINT CAREY

“Honestly, rising prices have been very challenging in this low-bidder environment,” she says. “Post-COVID, it has been especially difficult. Suppliers can’t guarantee their prices. We are seeing prices

issues in getting valves and piping. Nontypical stuff like an 8-inch gate valve takes months to get.”

Rising gas prices have changed some service routines, he says. “We are more conscious about cutting

CONTINUED >>

INVESTING IN PEOPLE

On the homepage of the PSI Pumping Solutions Inc. website, the Pennsylvania company clearly spells out its ideals in the first eight words of an introduction: “PSI Pumping Solutions, Inc., is a faith-based company...” A short scroll down the page reveals a daily Bible verse.

Such expression of religious affinity is somewhat unusual, but the company’s acting CEO and vice president says it is an intrinsic part of the character of the firm.

“We have been very open about the company being founded for the purpose of investing in people,” says Dara Myers, who is transitioning into the company’s top position after the passing in January of company founder Mike Aiello. Aiello was, in fact, an ordained Christian minister. “Mike and his wife were clear about this from the beginning. If Mike was going to start a business, it would be to invest in people, in employees as well as in various ministries, locally, nationally and internationally.”

Myers says competence and character are the only attributes company leaders look for in hiring employees. “All we want other than that is for people to share our values. We don’t ask anyone to sign a statement of faith. We do have a prayer meeting every Thursday in our office and anyone can attend. We are not going to change who we are. For the most part, we are just a business in the marketplace that happens to have people in leadership who are committed Christians.”

Myers says customer reaction to the open religiosity is uniformly favorable. “It’s not really talked about, but people can tell right away in our demeanor that there is something else going on here.”

She talks about a business dispute resolution a couple of years ago in which Mike Aiello worked with a lawyer. The legal mind came away impressed by Aiello’s attitude. “He said Mike did not lose his temper or lose his cool in the midst of a very frustrating situation, though he had every right to be angry. He said had Mike not remained calm, the matter could have ended a lot differently. That was Mike, and that’s how we demonstrate who we are and our values. People who work for us need not profess to be Christians, but it is important that they conduct themselves in line with the company values.

“Our faith is not the principal reason PSI exists. We are not a church. But people inherently understand that, if an organization professes to be faith-based, that organization is going to try to do the right thing.”

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▲ The PSI crew includes (from left) service coordinator Drew Frank, lead technician Dustin Bailey, technician Fabian Posey and service manager Clint Carey.

» Posey and Bailey unload scrap parts after a job.

down the number of trips we take. Carpooling is more common instead of everyone driving his own van."

After the recession of 2008, Myers says the company saw the entry of more competitors in the water-wastewater construction segment. "But now we are seeing municipalities and engineers narrow the bidding field, tightening who is qualified to bid on and



"I TRY TO KEEP THE GUYS CLOSE AS A TEAM. I TAKE PRIDE IN BUILDING A GOOD TEAM ENVIRONMENT AND TRY TO BE THERE FOR THE GUYS."

CLINT CAREY

perform the jobs to ensure that public dollars are well-spent. The projects are very technical and can go south very quickly. Some contractors don't fully understand what they are looking at."

Whatever the competition, PSI wants to be the flagship of the local water and wastewater construction industry. For the moment, Myers is focusing on the near term, this year and next, rather than looking further down the road as it would be under different circumstances.

"It is important to me, especially since January," she says, "that the company continue to do what we do and to do it with excellence. We first want to invest in our employees. Everyone shows up to earn an income, but we make sure they are being personally edified as well and make sure our customers continue to feel they are getting full value from the work we do." c

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MORE THAN MEETS THE EYE

A custom-built multiuse sewer truck racks up revenue for A-1 Total Service Plumbing

// By Ken Wysocky

FOR YEARS, Raymond Gray contemplated a big idea for what might be called a sewer truck on steroids. He envisioned a vehicle that would reflect the name of his Los Angeles-based company, A-1 Total Service Plumbing: a do-it-all truck capable of inspecting, waterjetting and robotically milling, repairing and coating pipelines.

Gray's vision became a reality in 2020 when he took delivery of this rolling Swiss Army knife, built by Midwest Technology Solutions in Indiana and Schwalm USA in South Carolina. Gray then further customized the truck with help from his cousin and mechanic, Joey Vizzini; his son, Daylyn; and his father, John Gray.

"We call it The Transformer because it's like Optimus Prime — it took a lot of parts to put it together and it can change into a lot of different things," says Gray, who established his plumbing, drain cleaning and trenchless pipeline rehab company in 2003. It employs 70 people and runs 83 service vehicles that work throughout Southern California.

"WE CALL IT THE TRANSFORMER BECAUSE IT'S LIKE OPTIMUS PRIME — IT TOOK A LOT OF PARTS TO PUT IT TOGETHER AND IT CAN CHANGE INTO A LOT OF DIFFERENT THINGS. IT DOES JUST ABOUT EVERYTHING EXCEPT COOK MY BREAKFAST AND MAKE MY BED IN THE MORNING."

RAYMOND GRAY

"It does just about everything except cook my breakfast and make my bed in the morning."

The price tag for the vehicle and the equipment it carries is an eyebrow-raising \$2.5 million. But Gray, who's a passionate technology geek when it comes to drain and sewer work, believes in the old adage about having to spend money to make money.

"I made most of that money back — about \$1.7 million — on one job," Gray says. "And by the time that job was finished, I had nine other projects lined up for that truck that generated another \$2 million."

"This truck allowed me to tap a big market for rehabbing and repairing commercial pipes."

Better yet, it's designed for easy operation. In fact, Gray points out that Jackson Rogan, the 19-year-old nephew of his general manager, Brandon Grove, learned how to operate it in about six weeks.

TOTAL-SERVICE VEHICLE

The truck is built on a 2012 Freightliner 26-foot box truck. The equipment and technology it carries or tows includes:

- Two robotic milling and sewer machines from Schwalm Robotic GmbH — a TALPA FSR 1330 (for working in 6- to 18-inch-diameter pipes) and a TALPA FSR 2060 (for 10- to 36-inch-diameter pipes).

A-1 TOTAL SERVICE PLUMBING

LOS ANGELES, CALIFORNIA

OWNER Raymond Gray

MACHINE Custom-built jetting/camera/robotics truck

FUNCTION Inspecting, cleaning and rehabbing pipelines

FEATURES 2012 Freightliner chassis; 26-foot Supreme Corp. box body; Schwalm Robotic cutting/milling machines; Jetstream water pump (40,000 psi at 6 gpm); an array of Aries Industries camera systems; custom-built water tanks, including one with a water recycling/cooling system.

COST About \$2.5 million

WEBSITE www.a1tsp.com

» Los Angeles-based A-1 Total Service Plumbing had this do-it-all truck custom-built in 2020 by Midwest Technology Solutions and Schwalm USA, then further customized it in-house. Nicknamed The Transformer, the truck is outfitted with robotic milling machines, a high-powered water pump, inspection systems, a jetter, and two 500-gallon water tanks.



- A 250 hp, diesel-powered water pump (40,000 psi at up to 6 gpm), made by Jetstream of Houston (a subsidiary of Federal Signal Corp.). It can be used independently or with the Schwalm cutters to remove large debris and concrete from pipes 8 to 36 inches in diameter.
- A Pathfinder XL TR3400 and a Pathfinder TR3300 crawler camera system, plus a LETS LE3270 lateral launch camera system, all from Aries Industries.
- Trailer-mounted, in-house-fabricated water jetter.
- Two 500-gallon, custom-built, stainless steel water tanks, equipped with cooling coils and a filtration system that relies on Nuvo filters.

One of the tanks is specially designed to contend with the problem posed by running equipment off the jetter that doesn't need as much flow as the massive pump provides. For example, Gray might only need 3 gpm to run a Schwalm robotic cutter, while the pump produces 6 gpm.

"You need an extra place for that excess water to go," he explains. "As such, we designed it with a bypass pump that sends the extra water to the other tank, where it goes through a series of 3/4-inch-diameter copper cooling coils and a filter before it's pumped back into the other tank for more jetting.


"It allows us to recycle and conserve water, which is a big deal here in California."


Gray says he loves Schwalm equipment because it's so easy to use and is extremely versatile, thanks to a wide variety of

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attachments that can do everything from jackhammer concrete, cut through steel rods with high-pressure water, pull point-repair bladders into place, flush and descale pipes, reinstate tie-in lines and more.

"I even rigged it with a special tip that allows it to spray an epoxy coating inside pipes," Gray says.

UP FOR A CHALLENGE

All Gray needed to make the truck a reality was a huge project that would justify the expense — and require its many capabilities. And that job finally came along in 2020, when the owner of a private dam in Northern California asked Gray if his company could tackle an unusually challenging pipeline repair.

The problem was a 60-year-old, concrete-encased, corrugated-steel casing pipe, 300 feet long and 24 inches in diameter. The pipe, which is used to control water flow or to drain the

lake behind it when needed, ran through the dam — 160 feet underground at its deepest point.

"The owner had the lake drained so the dam could be inspected," Gray explains. "They found the pipe had deteriorated so badly that the corrugated steel inside it had inverted on itself and created a blockage."

Completing the job required using almost all of the truck's capabilities.

The first step: removing about 80 feet of peeled-off pipe, which was accomplished by using a high-pressure waterjetting attachment on one of the Schwalm robotic cutters.

MONEYMAKER

Removing other debris from the pipe also posed a challenge because of accessibility issues. But Gray found a solution: He fashioned an adapter that allowed the Schwalm robot to carry a fire hose into the pipe to flush it out.

The company then used the Schwalm cutter to remove more damaged pipe that still was attached to the concrete casement. During that process, aggregate in sections of the concrete walls came loose, which threatened the integrity of the pipe.

So the A-1 crew installed three, 20-foot-long Perma-Liner Industries sectional point-repair bladders, using the Schwalm robot to pull them into place. Later they lined the entire pipe using a Perma-Liner steam-cured pipe lining system, he says.


The entire job took about two months to complete. They could have done it without the truck, Gray says — but it would've taken roughly 10 weeks longer. It also would've been much more expensive because he would've been forced to hire subcontractors as well as buy other pieces of equipment.

Gray points out that the truck, which took six months to build, is used for a wide range of applications but it isn't in the field every day.

"It may not go out on every job every day, and we don't always use all the tools," he explains. "But it doesn't leave our yard unless it's going to make \$50,000 for the week.

"It's 100% a money machine." **c**

Readers with questions about the A-1 Total Service Plumbing "super truck" can contact Raymond Gray at 562-318-4371 or rayg@a1tsp.com.



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CIPP LINING METHODS AND PROJECTS

By Craig Mandli

» CIPP EQUIPMENT AND MATERIALS

1 // AMERICAN PIPELINING SUPPLIES HOUSELINER CIPP

Houseliner CIPP lining materials from American Pipelining Supplies are designed to be highly flexible and provide a virtually wrinkle-free finish around multiple bends up to 90 degrees. The material also has the ability to transition in pipe size while maintaining the proper length and thickness of most traditional 3D and 4D liners. These high-performance liners are designed to be combined with Houseliner epoxy resin, which is available in a range of curing options. The epoxy resin is high quality and provides a finished product with several container options available for any size project. All liners and resins have been extensively tested for performance, chemical resistance and life expectancy. 888-258-9359; www.americanpipeliningsupplies.com



2 // APEX CIPP SOLUTIONS RENSSI CHAIN KNOCKERS

High-performance Renssi Chain Knockers from Apex CIPP Solutions are compatible with Picote Millers and RIDGID FlexShafts. The full range of cable sizes and chain configurations including those with drill heads, “starbits,” “cyclone,” with/without carbide, threaded or sleeve connections are available. In addition, cutter heads, sandpaper paddles and rolls, brushes, cable carriers, all-in-one drain cleaning machines and more are available. 855-997-0524; www.apexcipp.com



3 // ENZ USA MILLING CUTTER

The Enz USA Milling Cutter offers a complete line of cutting solutions for the toughest projects, according to the maker. The milling cutters can remove the hardest deposits such as lime scale and concrete. They work with a percussion system of 600 to 3,000 impulses per minute and up to 15 tons of impact force. For lime scale carbide teeth are recommended, and for concrete, diamond teeth. It can be used in pipes from 1.2 inches with the ML28 up to a 240-inch pipe. Most of the milling cutters work with recycling water. In many cases, the use of a percussion milling cutter is the only alternative to digging up pipes under foundations or roads. The diamond crown cutter can even remove protruding laterals. 877-362-8721; www.enz.com



4 // FORMADRAIN DURAPOX 501

FORMADRAIN's Durapox 501 is a two-part CIPP steam-cured resin with a 60-day open time. Ideal for remote jobs, the resin comes in two parts so it can be controlled when it's mixed. Because the resin remains “fresh,” it maintains optimal wet-out properties, but drips less once applied. Durapox 50 has the high-performance mechanical properties and cure times of the standard Durapox line plus the advantages of the company's Formapox resins. 888-337-6764; www.formadrain.com





5

5 // TRENCHLESS SUPPLY MIDICOATER+

The Midicoater+ from Trenchless Supply is a system capable of descaling, spraying and brushing. Inline with efficiency, the machine is also mixing epoxy at the spray head, which equates to virtually zero waste for unused epoxy and hoses. The unit features fast curing speeds (as quick as 45 minutes per coat), and has a built-in motor with a clutch that is capable of spinning up to 2,000 rpm. The clutch allows the descaling and brush coating to be performed. Its lightweight and compact footprint saves space and energy for the user. The unit has options for self-regulated heated hoses that plug directly into it. This allows for year round use in varying weather conditions. It can be used to spray from 1.5- to 6-inch-diameter pipe. 424-257-0453; www.trenchlessupplyinc.com



6

>> HYDROEXCAVATION

6 // DYNABLAST HV590FLS-12VRED

The HV590FLS-12VRED hydrovac water heater from Dynablast produces 590,000 Btus with an output temperature of 175 degrees F at 7 gpm. An optional electronic 12-volt thermostat can hold more precise water temperature. The unit is suitable for colder climates and improves digging in clay-filled areas. It enables fuel savings of 3/4 gph and weight reduction of 250 pounds over the current 690,000 Btu model. It comes with ETL certification for safety, which also includes certification on the coil for higher efficiency and heat transfer, stainless steel target plate for increased coil life and serviceability with momentary override control. 905-867-4642; www.dynablast.ca



7

7 // GAPVAX HV33

Designed to safely transport water and debris in urban areas, the GapVax HV33 is shorter, smaller and more compact than its predecessor. It is 30 feet long overall on a medium-duty chassis and includes a 600-gallon water tank, 6-cubic-yard debris body, 6- or 8-inch top-mounted telescoping boom with a 14- to 17.5-foot reach, 4,000 cfm power and an inverted, full-opening tailgate. 888-442-7829; www.gapvax.com



8

8 // HOTJET USA VAC 'N JET SERIES

The HotJet USA Vac 'n Jet Series of vacuum trailer jetters are rugged and compact, engineered to haul equipment and spoils loads, can clean valve boxes and storm drains, and hydroexcavate and/or clean drainlines and sewer lines. They offer hot- and/or cold-water operation with a choice of engines ranging from 13 to 66 hp and gas or diesel. They are equipped with premium triplex pumps, a 500-gallon spoils tank, 200-gallon water tank, Gardner Denver vac/blowers, 4-ton hydraulic dump and CentriClean filter system. They can also be designed to meet specifications. 800-624-8186; www.hotjetusa.com



9

9 // IMPERIAL INDUSTRIES HYDRO 3600 HYBRID EXCAVATOR

The Hydro 3600 Hybrid Excavator from Imperial Industries is short and compact for maneuverability in tight spaces. It is user-friendly, efficient and can be operated easily by a single person and is designed to minimize time spent on the job site. It includes a 3,600-gallon hauling capacity (customizable sizes available), optional water capacity, code and noncode availability, a three-stage lift hoist with built-in vibrator and full opening rear door for easy dumping, 20 gpm jetter up to 4,000 psi (adjustable), a National Vacuum Equipment 1600 blower and a moisture trap and grit ridder. Options include a 16-function remote control for easy operation of the boom, jetter, blower and vacuum. 800-558-2945; www.imperialind.com

10 // RIVAL HYDROVAC T7 TANDEM AND T10

The T7 Tandem from Rival Hydrovac was designed primarily to be a unit that could be loaded with debris and drive within legislated road limits with most types of debris on board. The unit comes standard with a scale that reads real-time weights both in the cab and on the wireless remote to confirm weight prior to travel. The T10 is built with the same features and operating system, but with larger capacities and components. It is popular with clients who do both utility and industrial work. It is available in three chassis layouts to meet weight restrictions in a given area. An air compressor option allows for excavating with air when required, while a truck-mounted coring system allows for removal of hard surfaces prior to nondestructive excavating. 403-550-7997; www.rivalhydrovac.com



11 // SOIL SURGEON HYDROEXCAVATING TOOL

The Soil Surgeon hydroexcavating tool fits any sewer combination truck equipped with a telescoping 6- or 8-inch boom. The tool has a 1-inch water connection. The operator controls water pressure and power through truck controls. It has a 6-foot Tuff-Tube with handles to guide the unit down for potholing or side to side for trenching. Six jets boring inward cut the soil, while six boring outward bring the tube down. 949-363-1401; www.soilsurgeoninc.com



12 // SUPER PRODUCTS MUD DOG 700

The Mud Dog 700 vacuum excavator from Super Products is designed for operator convenience and consistent performance to meet the challenges of compact, urban projects to large-scale excavation. It offers a compact footprint for excavation in urban environments while maximizing payload and maintaining the power and precision that larger units offer. The unit features a 7-yard debris body and 600-gallon water tank. This model comes standard as a dump body with an electric vibrator offering a 50-degree dump angle with the capability of dumping into a 48-inch container. Additionally, it is equipped with a rear-mounted, extendable, 8-inch diameter boom that reaches 18 feet, has 270-degree rotation and pivots 10 degrees downward, which minimizes job site restoration and eliminates traffic congestion near roads. 800-837-9711; www.superproducts.com



13 // TORNADO GLOBAL HYDROVACS F4 ECO-LITE

The F4 ECO-LITE from Tornado Global Hydrovacs has a 12-cubic-yard mud tank and holds 1,550 gallons of freshwater. The unit is more than 7,000 pounds lighter than the company's older models and offers more than double the payload. The boom has a 342-degree rotation and 26-foot reach. The smaller F3 ECO-LITE is a 10-cubic-yard, 1,250-gallon tandem-axle unit that more than doubles older payload capacities. It features an 8-inch boom and 3,800 cfm blower. 877-340-8141; www.tornadotrucks.com



14 // VAC-CON MUDSLINGER MS800

The Mudslinger MS800 trailer-mounted hydrovac from Vac-Con encompasses the same power, suction and capacity of a truck hydroexcavator on a portable, pull-behind trailer. It includes the choice of tier 4 diesel or gas engine options providing up to 1,190 cfm and 16 inches Hg with a PD blower and 325 gallons of water. An 845-gallon debris tank allows operators to stay productive on the job site, while a 9-foot boom with 24 inches of hydraulic extension provides a full range of motion. It is designed to be a powerful standalone unit, but can also provide support to construction, HDD and public utility fleets. It's at home in a variety of applications including daylighting, potholing, culvert and manhole cleaning, and utility locating. 904-284-4200; www.vac-con.com





» PIPELINE REHABILITATION/LINING

15 // ARIES INDUSTRIES TEST AND SEAL GROUTING SYSTEM

The Test and Seal Grouting System from Aries Industries reduces setup time and provides efficient hands-on control to quickly seal leaking joints. Grout — pumped to a leaking joint — flows through the leak, sealing the surrounding soil to form an impenetrable barrier. Sixty-gallon tanks and continuous-duty mixers provide high volume to seal large voids. Reels for fast deployment and retrieval, as well as high-power winches, quickly move the packer from joint to joint for high productivity. The unit's 800 feet of color-coded hose allows long runs. The truck comes with a bench, storage and room to work. The operator tests and seals the joints while working in the control room, where test data and the sealing process are easily viewed, recorded and logged. 800-234-7205; www.ariesindustries.com



16 // AVANTI INTERNATIONAL AV-100

AV-100 chemical grout from Avanti International is used to rehabilitate storm and sanitary sewer systems by eliminating infiltration in manholes, mainlines, joints, laterals, lateral connections, and before or after various forms of CIPP lining. It is injected after lining seals in the annular space between host pipe/liner, and lateral reinstatement, which are the primary sources of infiltration. It is an ultralow viscosity, chemically reactive gel with a similar viscosity to water. It can permeate anywhere water can travel and has adjustable cure times from seconds to hours, creating an effective, long-lasting water barrier while providing soil stabilization. 800-877-2570; www.avantigrout.com



17 // IPT INTERNAL PIPE TECHNOLOGIES PULL-IN-PLACE PIPE LINING SYSTEM

IPT Internal Pipe Technologies' Pull-in-Place Pipe Lining System completely rebuilds the horizontal and vertical drainpipes as small as 1 1/2 inches in diameter from the inside with a new pipe made of epoxy resin and felt. Liners can be launched from existing access points to not only seal cracks and leaks but restore sections of pipe that have deteriorated. These pipe systems include vertical sanitary stacks, horizontal sewer mains, branches, roof drains and lateral lines. The company has bridged the gap between technology and technician by utilizing a technique with data streaming, which is available on site to any smart device using QR codes. 888-478-6649; www.internalpipetech.com



18 // PICOTE SOLUTIONS DUAL-COLOR EPOXY BRUSH COATING SYSTEM

The Dual-Color Epoxy Brush Coating System from Picote Solutions allows technicians to rehabilitate pipes from 1 1/4 to 12 inches for drains, sewers, water pipes, electrical conduits, and heat and air-conditioning ducts by brush-casting a coating. The coating resin forms a pipe inside the original pipe that is tested, safe and environmentally friendly. The new pipe is damp-proof, corrosion-resistant and wear-resistant. It is ASTM and NSF certified (NSF/ANSI 61-5). It is a 100% solids epoxy, and the method allows for clear visual verification during the application process. Apply to small areas or all drains in multistory buildings. The system is practical and easily fits in tight places. 219-440-1404; www.picotesolutions.com

19 // PRIME RESINS SOAKUM OAKUM KIT

The Soakum Oakum Kit from Prime Resins is composed of a dry oakum soaked in a hydrophilic polymer solution. When wet and either packed or worked into a joint or crack, the resin will foam to form a flexible and tight joint to stop groundwater infiltration. It reacts with water and becomes a watertight rubber-like composite. The oakum cord gives strength and density to the composite, and makes the application of the resin easier, especially when gushers are present. 800-321-7212; www.primeresins.com



20 // SOURCE ONE ENVIRONMENTAL QUADEX STRUCTURE GUARD EPOXY

Quadex Structure Guard, distributed by Source One Environmental, is a high-build epoxy coating formulated to provide long-term corrosion protection and structural enhancement for manholes, pump stations, treatment plants or any wastewater infrastructure subject to high levels of corrosion and/or abrasion in both municipal and industrial applications. It is also suitable for invert repairs. It can be trowel and/or spray applied, and is a 100% solids material with no VOCs and a fast set time. 877-450-3701; www.s1online.com



21 // WARRIOR TRENCHLESS SOLUTIONS THERMOFORM

Thermoform from Warrior Trenchless Solutions is a PVC-alloy structural pipe lining system designed for the trenchless rehabilitation of failing sewer and culvert pipes. It is an environmentally friendly, styrene-free thermoplastic. There are no harmful emissions, and it does not rely on any chemical reaction during installation. Factory-controlled production with rigorous material testing ensures a consistent quality product that conforms to and exceeds the expected standards. The material is highly flexible, allowing it to expand and fit tightly to the host pipe, including changes in shape and dimensions. It is produced in sizes ranging from 4 to 36 inches in diameter, and the wall thickness can be varied according to the application. All installers must be accredited and audited to ensure the highest quality work possible. 716-601-7760; www.thermoformliner.com



>> REINSTATEMENT CUTTERS

22 // CUES CURRAHEE CUTTERS

Small and large Currahee Cutters from CUES are designed to reinstate wastewater service laterals, remove protruding taps and brush-finish existing cuts. The cutters function in a range of 5 1/4- through 36-inch pipe, are equally effective in CIPP or fold and form liners and can be installed on a CUES K2 truck-mounted cutter system. A 1.9 hp air motor for the small cutter line provides more power, increased productivity and a smoother cut when operating in 6- to 12-inch relined pipe. Kits are available to retro-fit cutters for use with Kangaroo air-motors, and service kits can be purchased for regular maintenance intervals on existing motors. 800-327-7791; www.cuesinc.com





23 // TRY TEK MACHINE WORKS T80

The T80 3-, 4- and 6-inch small pipe lateral reinstatement cutter from TRY TEK Machine Works is ideal for relining smaller diameter lateral pipes that run from buildings to the mainlines. These smaller pipes crack, separate and break, and are responsible for 50% of the inflow and infiltration of groundwater processed by municipal treatment plants. Its water hydraulic cutting gives big power in a smaller package, while water hydraulics eliminate potential environmental hazards. It allows for access to pipe systems via clean-out ports or rooftop vents. Setup and operation are quick and simple, and it includes 100 feet of working cable. 717-428-1477; www.trytek.com

» UV CIPP

24 // MAXLINER USA MAXLIGHT

MaxLight from MaxLiner offers a 328-foot reach, five UV LightHead choices, two monitors to view installations, wireless Wi-Fi controls and works with existing systems (inversion or pull-in-place). Curing does not begin until the resin is initiated by finely calibrated LightHeads, allowing installers the option for applications in 2- to 24-inch-diameter pipes with multiple bends and transitions. Its styrene free, single-component resins are formulated to offer superior mechanical properties and chemical resistance. When production or tight deadlines are required, liners can be premade and impregnated at the shop or on site using compatible felt, glass and hybrid liners. It eliminates the stress of pot life concerns and allows for several installations per day. It is designed to dramatically increase work efficiency and take on challenging jobs using a tested system that exceeds industry specifications and ASTM standards for a fully structural CIPP liner. 877-426-5948; www.maxlinerusa.com

25 // PIPELINE RENEWAL TECHNOLOGIES SPEEDYLIGHT+

SpeedyLight+ from Pipeline Renewal Technologies is the LED-based solution for CIPP that expertly cures liners at speeds from 0.66 up to 3.3 feet per minute. Compatible with felt and invertible glass fiber, it can cure transitions, verticals and even 90-degree bends in lines from 4 to 12 inches in diameter. The integrated camera lets operators monitor the curing process in real time, allowing for ultimate precision. Liners can be wet out remotely or on site, and a portable design makes for easy deployment. Free of styrene and amines (and the associated odor), light-based cure technologies are minimally disruptive to the community. 866-936-8476; www.pipelinert.com

26 // WATERLINE RENEWAL TECHNOLOGIES LIGHTRAY LRI SYSTEM

The LightRay LRI System from Waterline Renewal Technologies allows complete operator control and closely resembles traditional ambient-cure inversion methods. It can accomplish throughput up to 6.3 feet per minute of casting with the light train, which incorporates cold LED lights that require no heat to cast the liner. The light train comes in a standard casting length of 50 feet, operates on a low-voltage DC platform and is internally protected to accommodate bends in pipes up to 90 degrees. Liners arrive ready to install without any need for refrigeration, which dramatically reduces the variability from mixing and preparing liners and eliminates the requirement for extra equipment in the field. The system uses nonthermal UV casting resin that is temperature-stable and only activated by UV light coupled with high-strength flexible fiberglass coated liners. 866-336-2568; www.lightrayinversion.com c

CIPP LINING METHODS AND PROJECTS

// By Craig Mandli

RELINING PRODUCTS USED TO RENOVATE 50-YEAR-OLD IN-HOUSE PIPES

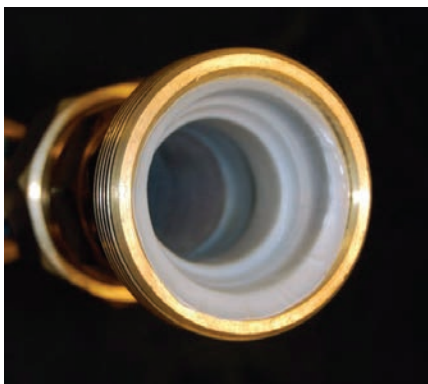


PROBLEM / The Pullman Hotel in Paris, France, had pipelines that were installed in the 1970s. The vertical wastewater pipes were made of cast iron and the building had to undergo a major renovation. Originally, all the wastewater pipes were to be replaced. During the renovation, the replacement of the pipes was canceled due to the high costs and time involved. After flooding on some floors due to damaged pipes, the work was re-evaluated, and the customer chose the relining method due to time and costs. The challenge was the very short time frame of only five weeks.

SOLUTION / The crew used **BRAWO SYSTEMS** products to repair 42 vertical cast iron DN 125 downpipes with lengths of 210 and 230 feet. Four technicians were needed to install the liners and 10 to re-open the connections. The seamlessly knitted liner adapts optimally. The extremely flexible polyester loop construction allows for enormous lateral expansion. This makes the **BRAWOLINER 3D** an optimal rehabilitation solution for difficult wastewater systems. “The work was cleaning, relining, re-opening connections and reconnecting,” says Yaker Ait, sales manager France at **BRAWO SYSTEMS**. “Because of the big job site we had a lot of equipment and people, so the tight supply demands had to be delivered just in time on the job site.”

RESULT / “We managed the supply and service of this big volume in spite of the extreme length of the liner just as planned,” Ait says. www.brawosystems.com

EXPANDABLE PRESSURE PIPE USED TO REPAIR RESIDENTIAL WATER SERVICE

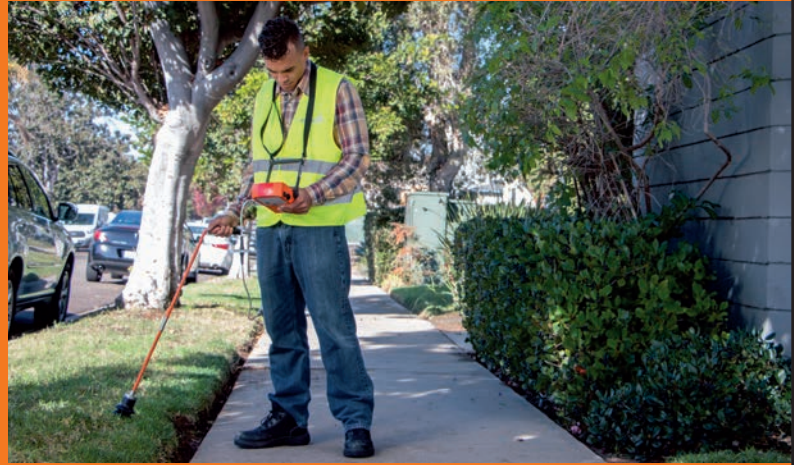
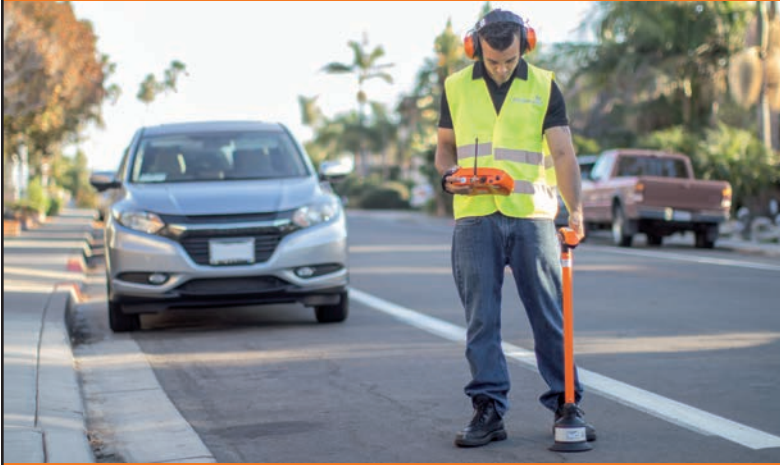


PROBLEM / At a Pittsburgh residence, it was discovered that a copper water service pipe was leaking. The pipe was approximately 220 feet long, with 25 feet of elevation from the shut-off to the in-house connection. Some of the pipe ran alongside and under a paved driveway and wooded area with many trees.

SOLUTION / With the NSF 61 certified **Neofit+Plus Expandable Pressure Pipe** from **Flow-Liner Systems**, the only digging required was a small access pit at the shut-off valve located at the end of the long, paved driveway, leaving the driveway, trees, landscaping and other structures untouched. There was no need to demolish the walls or floors inside either, as **Neofit+Plus** expands to fit the existing pipe and then easily reconnects to the rest of the indoor piping.

RESULT / This residential job used a simple PEX crimp fitting to reconnect to the rest of the home's indoor plumbing. **Neofit+Plus** is not only suitable for fixing leaking service pipes, it's also a solution for removing toxic lead from drinking water. The EPP creates an impenetrable barrier between the lead pipes and water, protecting users from toxic lead contaminants. 800-348-0020; www.flow-liner.com **c**

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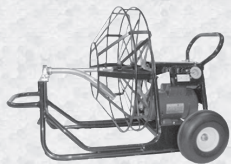


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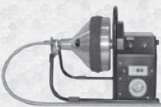
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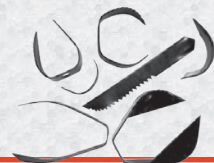
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PRODUCT SPOTLIGHT

VIDEOSCOPE HELPS TECHS FIND ISSUES IN TOUGH LOCATIONS

By Craig Mandli

Difficult-to-reach locations require tools that are compact and easy to use. But if you don't want to sacrifice performance and accuracy, a new, rugged industrial videoscope from Teledyne FLIR, part of Teledyne Technologies, can help quickly and safely find hidden issues.

The FLIR VS80 high-performance videoscope series is outfitted with a 1024x600 HD 7-inch touchscreen display and is available for purchase in seven different kits with the option to purchase waterproof, ultraslim probes that can be swapped in and out within seconds. Probe options include a 4.5 mm diameter, two-way articulating probe; a four-way articulating probe; a plumbing spool probe with a 25-meter cable; single HD and dual HD visible camera probes; a standard definition probe; and a general-purpose thermal camera probe.

"Technicians need to inspect targets in tight spaces, without time-consuming disassembly," says Rob Milner, business development director, Teledyne FLIR. "The new FLIR VS80 meets all these needs while providing an impressive range of diagnostic versatility across the visible and infrared imaging spectrums."

Teledyne FLIR offers live reference image comparison on the display screen to make historical or standard image comparisons easier. Inspectors simply add a side-by-side reference image with the live videoscope imagery. They can then quickly compare the imagery to see if a component has changed since the previous inspection, or if it needs repair or replacement. The information can also be added to a post-inspection report with multiple options for inspectors to



capture detailed information, including through text, voice, images and videos recorded with timestamp display.

The device is also compatible with the FLIR Tools Mobile app available for iOS and Android devices. From a mobile device, view saved images and video captured from the VS80, download files, and share them easily with customers or colleagues. The forward-facing thermal imaging probe brings thermal videoscope capabilities to a larger array of users a la carte, or as part of a kit. It offers 160x120 thermal on the end of a 1-meter cable to easily inspect areas in order to quickly identify damage, leaks and overheating parts that are invisible to the naked eye.

"Professionals are better equipped to find hidden dangers and damage in locations that are difficult or inaccessible," Milner says. "In total, the VS80 provides the ability to lower maintenance costs and the capital costs of replacement while improving productivity and safety on the job." 877-773-3547; www.teledyneflir.com

1 // MILWAUKEE TOOL REDLITHIUM USB STICK LIGHT

Effectively replacing alkaline and low-capacity flashlights, Milwaukee Tool's REDLITHIUM USB Stick Light with magnet provides heavy-duty equipment mechanics, automotive mechanics and technicians with a premium lighting solution for general task and inspection work. The stick light delivers utility for lighting in tight spaces. The light is designed with 220 degrees of vertical light head rotation and is paired with a slim light blade design and inspection light. Featuring four output modes: front, back, dual and inspection, the light provides users with ultimate control over the beam light. The light delivers 550 lumens of TRUEVIEW high-definition output and can run for two hours on high. 800-729-3878; www.milwaukeetool.com





2

2 // DITCH WITCH MT164 MICROTRENCHER ATTACHMENT

Built to help power and fiber optic contractors easily create a clean, narrow trench in one pass, the new Ditch Witch MT164 microtrencher attachment offers maximum compact cable installation performance. Equipped with a standard hydraulic plunger and option to offset the frame, the MT164 provides variable depth control and gives contractors the ability to cut right up next to a curb. It can trench up to 2 inches wide by 16 inches deep, allowing crews to cut deep enough to get through a standard-sized curb. It can also be set up for a push or pull application depending on the job site. The microtrencher's compact footprint provides operators increased flexibility with minimal disruption to surrounding infrastructure in urban areas. 580-336-4402; www.ditchwitch.com

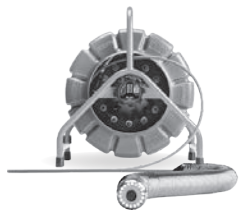


3

3 // HAMMERHEAD TRENCHLESS HYDRASLITTER KITS

HammerHead Trenchless HydraSlitter kits are designed to help industry professionals meet the 10-year U.S. goal of replacing all lead pipe service laterals. The newest addition to the HammerHead Same Path technology line, the HydraSlitter system provides a minimally invasive, low-cost, effective alternative to open-cut replacement of 1/2- to 1-inch-diameter lead potable water pipe. When ordered online, kits arrive within a few days containing all tooling and accessories needed for a specific job. Contents include the appropriate slitter, blades, expanders, cable, duct-rod and cable grip for the excavator, as well as a tooling assembly selection chart and instructions. 800-331-6653; www.hammerheadtrenchless.com c

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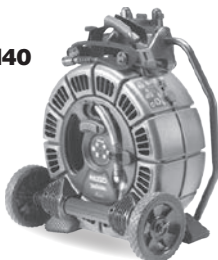
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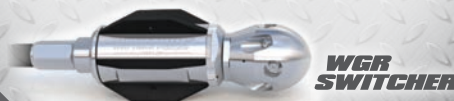
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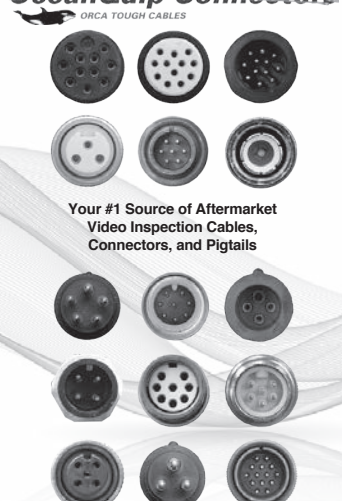
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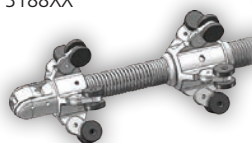
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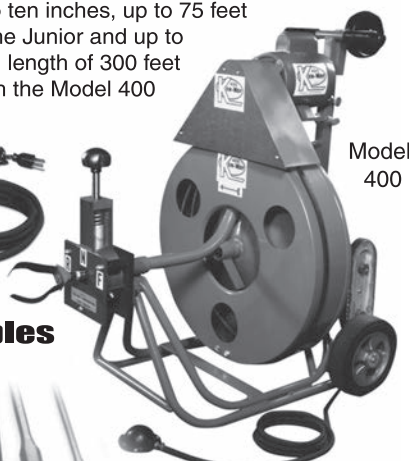
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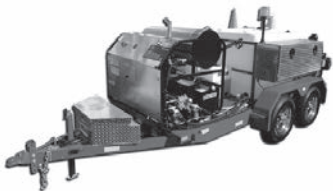
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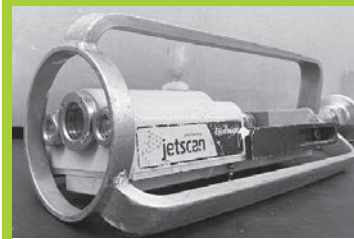
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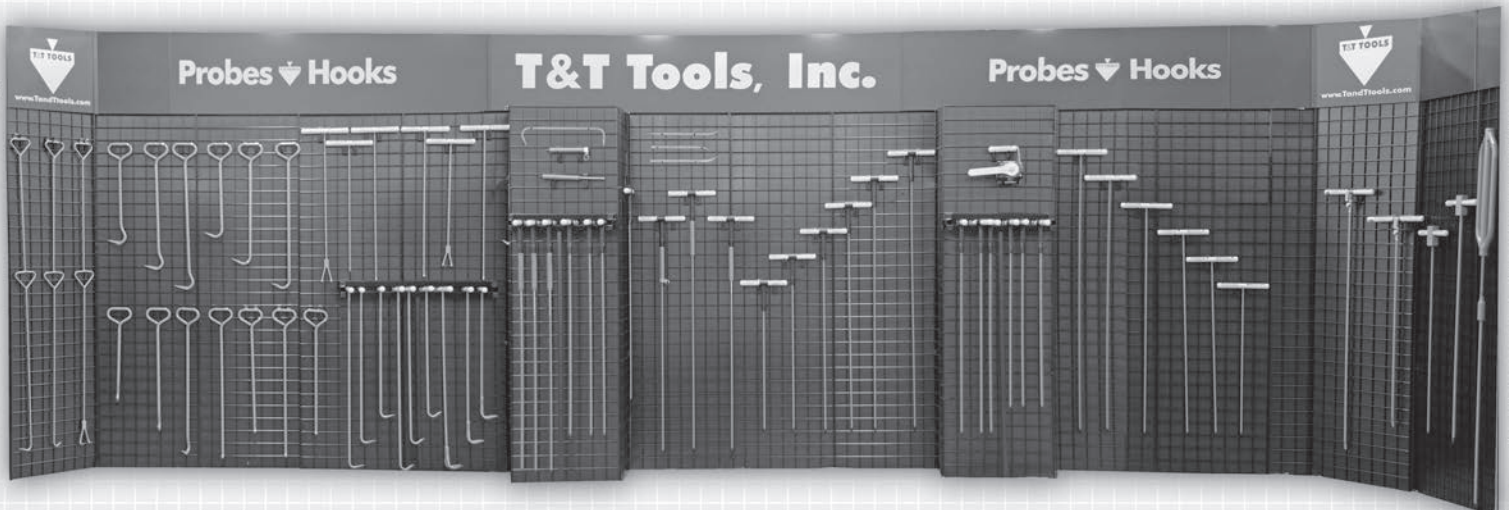
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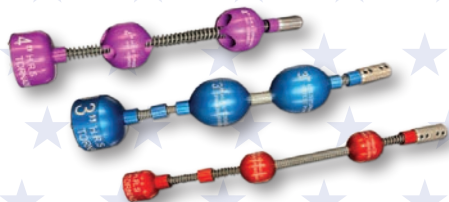
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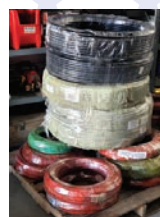


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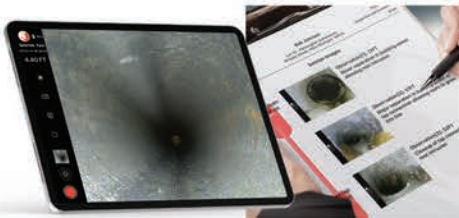
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