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MARCH 2020
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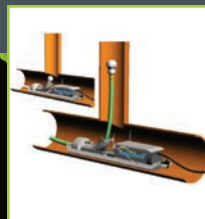


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MAKES CREATING SATISFIED
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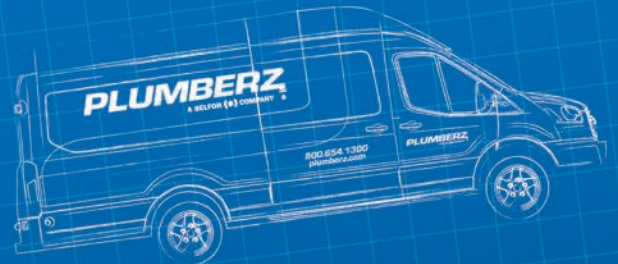
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ON THE COVER

Joe and Danielle Lienhard started Straight Flush Drain Solutions when they spontaneously decided to take care of a sewage backup in a rental property on their own. They've since grown into a multiservice pipe cleaning company with six employees that does business in a 100-mile radius around their home base in Great Falls, Montana. (Photography by Thom Bridge)

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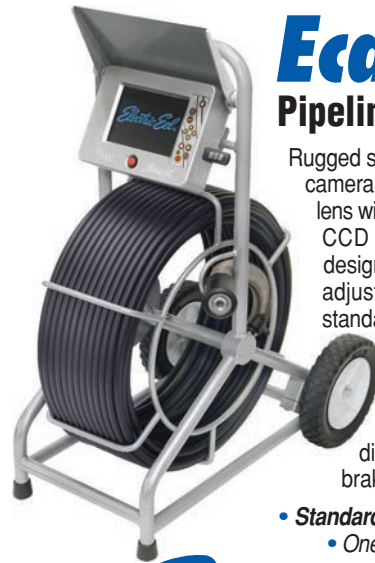
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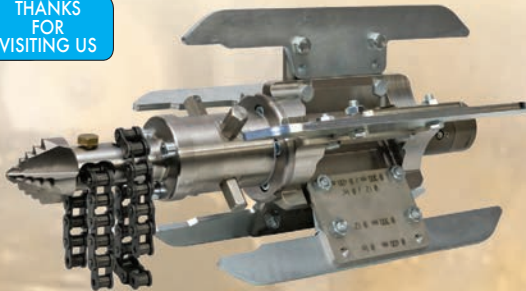
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Published monthly by COLE Publishing, Inc.

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Mon-Fri, 7:30 a.m.-5 p.m. CST

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CIRCULATION: Circulation averages 26,000 copies per month. This figure includes both U.S. and international distribution.

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Show Your Worth

Not everyone appreciates the value of your services, but explaining your work to customers goes a long way in rectifying that

Just like customers do before hiring a drain cleaner, I do a little background research on companies that I am considering for a contractor profile.

After looking over one company's website, I clicked through to a couple reviews and saw a lower average rating than I was expecting. Granted, it was not one of the most popular reviewing sites and there were only about 20 reviews for this company. The first several were "five star" reviews so I was even more puzzled by the low average.

Then I got to the reviews from early 2019 and found that three or four people had given one or two star reviews. I read through them,



Kim Peterson

and saw that bad customer service wasn't the problem — the company was getting publicly bashed for high prices.

These complaints always baffle me. Most of the time you're probably able to give customers a quote, or use flat-rate pricing. The cost is usually not a surprise. If they think your prices are too high, they are welcome to call around. It's understandable that drain cleaning services are not what people want to spend their money on. But it's important maintenance, and sometimes a genuine emergency, and people should value both your services and the investment they're making in their home.

Teaching customers about what you're doing and why is important. For one thing, it can minimize those reviews focusing on things other than your service. A technician who is helpful, respectful and teaches the homeowner the reason for an inspection or why using a jetter is the best option even if it costs more will save you from a bad review and probably earn you repeat business.

Joe Leinhard, co-owner of Straight Flush Drain Services, profiled in this issue, focuses mainly on residential services, and has started doing sewer line inspections for real estate companies. "We tell new homeowners that drains are just like maintaining your car," Lienhard says. "Knowing what material the pipe is made from tells them how much they will have to maintain the pipe. Clay pipes have more joints where roots can come in, for example. When you know those joints are there, you can systematically control the roots."

Comparing drain work to basic vehicle maintenance is something most customers will understand. Of course, there will be those people who want the cheapest oil change too, and go as long as they can before getting their car serviced, but explaining the reasoning behind it goes a long way in softening the blow of a big drain cleaning bill.

Then encourage those educated, satisfied customers to leave you a good review. If a few disgruntled people still end up leaving you a bad review, my advice is to take a deep breath and politely respond as best you can. Ask what you can do better, explain your pricing and the value you provide, and do whatever you can to make it right.

I'm not advocating for refunds or suggesting you lower your prices when I say "make it right." But as a consumer, a few bad reviews don't bother me if I see the company addressed them proactively, especially if there are only a few unhappy people. But when several bad reviews go ignored, the company's commitment to good customer service can come into question.

There will always be people you can't please no matter what you do, but taking the extra steps to educate customers and make them feel respected will go a long way.

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



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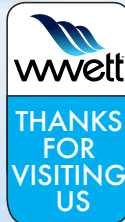
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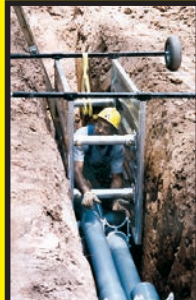


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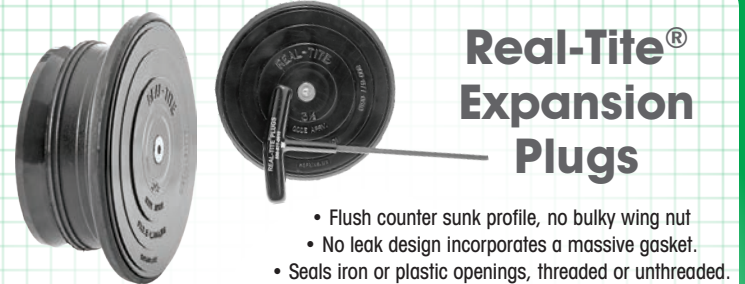


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JOB SITE SAFETY

Mitigating the Risks of Worker Fatigue

Due to the constant movement of people and equipment, worker fatigue can be particularly dangerous on a job site. Nothing beats getting the correct amount of sleep, but there are other methods and tools that can help as well, which this online exclusive covers. >>cleaner.com/featured



TOP TOOLS

Companies Talk About Important Pieces of Their Equipment Arsenal

Koberlein Environmental Services, All Drains Drain Cleaning and Plumbing Repair, and DrainPro are all companies that have recently been profiled in the magazine. In this series of online exclusives, the companies discuss key pieces of equipment they rely on and the various benefits. >>cleaner.com/featured



PHOTO GALLERY

Cleaning Contractors At Work

When photographers accompany our featured contractors on job sites, far more photos are taken than are able to fit on the pages of the magazine. We put together another gallery of the best of all those extra photos of recently profiled companies. Check it out. >>cleaner.com/featured

“We’re always telling stories in our head of what might happen if we raise a concern, and we usually envision the worst outcome, which is a shame because almost all the time having these conversations enriches relationships.”

— How a Culture of Nice In Your Company Can Have a Negative Impact
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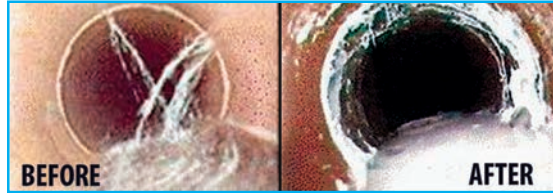


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at 8:00 AM EDT

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Thursday, March 26, 2020
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- Grout Truck Technicians
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Registration Contact:

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Jessica Williams
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-- Speakers --

This class is presented by CUES, Avanti International, and Logiball. These firms are active members of the Infiltration Control Grouting Committee (ICGC), which is affiliated with the National Association of Sewer Service Companies (NASSCO).

-- Travel & Lodging Info --

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✓ The Straight Flush Drain Solutions team includes (from left) Brady Schwertz, Zach Gloege, Danielle Lienhard, Joe Lienhard, Dennis O'Connell, and Ashley Keeler.



PLAIN DEALING

Straight Flush Drain Solutions makes creating satisfied customers its top priority

By Giles Lambertson // Photography by Thom Bridge



Four and a half years ago, Joe and Danielle Lienhards had a sewage backup in a rental property. Rather than wait for a service call from a local firm, they borrowed a RIDGID sewer cleaning machine and cleared away the blockage themselves.

That spontaneous act of self-reliance turned out to be the launching point for Straight Flush Drain Solutions, the couple's Great Falls, Montana-based multiservice pipe cleaning company.

"I laugh now because I came up with 'Straight Flush' without even thinking about the poker angle," he says. "They said I needed a name that was straightforward, that gets right to the point. I thought, Well, we want stuff to flush straight down into the pipes. So I settled on 'Straight Flush.'"

SATISFIED CUSTOMERS

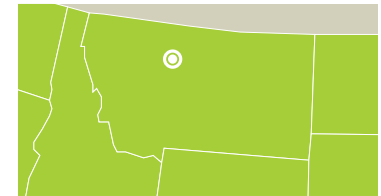
Today, Straight Flush answers distress calls in a service area that stretches 100 miles in any direction from Great Falls, with occasional jaunts into Wyoming and other surrounding areas. It is steadily building its business on the back of professional competency and small-city friendliness. The latter is critical because business and social lives intersect frequently in small metro areas.

"Sixty thousand is not a lot of people," Joe Lienhard says. "It's a small town. We see our customers in the grocery store and at the movie

theater. I never want my employees to be in the position where they want to hop to the next grocery aisle so they won't have to talk to someone who was a disappointed customer."

His wife, Danielle, is also adamant about satisfying their customers. "We have to do it right the first time. If we don't do it right, we have to make it right. There's no way to get around that. I always look at jobs from the customer's point of view. In general, I think customer service in many companies is not what it should be. Our goal is to have every person have the best possible experience."

Straight Flush customer experiences range across a spectrum of services, from sewer line jetting to grease interceptor pumping and dewatering to plugged toilets. The company has, year after year, expanded its portfolio of services within the core wastewater handling industry. It does so with pride. The company website puts it this way: "It's a nasty job but a necessary one and we're proud to do it."



Straight Flush Drain Solutions

LOCATION: Great Falls, Montana

OWNERS: Joe and Danielle Lienhard

EMPLOYEES: 6

SERVICES: Drain cleaning, sewer jetting, CCTV inspections, sewer lining and point repairs, septic cleaning, municipal sewer jetting and cleaning, lagoon pumping, dewatering, chemical root clearing

SERVICE AREA: 100-mile radius from Great Falls in northcentral Montana

WEBSITE:

www.straightflushdrainsolutions.com/services



Joe Lienhard uses an EnviroSight Verisight push camera to inspect a drainline in a residential bathroom.



Technician Dennis O'Connell connects an extension tube to the Vector's vacuum boom while Zach Gloege cleans debris from a manhole.

Joe Lienhard uses a RIDGID K-1500 sectional machine to clear a stoppage in a bathroom drainline.



"I never want my employees to be in the position where they want to hop to the next grocery aisle so they won't have to **talk to someone who was a disappointed customer.**"

Joe Lienhard

That statement characterizes the spirit the Lienhards bring to their business. They compare the work their employees do to that of an educator or an insurance agent — that is, the company educates homeowners to avoid costly failures and reassures them about the integrity of their infrastructure.

Residential services do comprise the bulk of the firm's business, from clearing kitchen sink drains to jetting laterals. A corollary service is inspection of sewer lines for residential real estate companies. When called in by a real estate agent, a Straight Flush crew runs a camera through lines to determine if there is a break or separation in a system. As a bonus, a future homeowner learns what type of pipe is buried under the lawn.

"We tell new homeowners that drains are just like maintaining your car," Joe Lienhard says. "Knowing what material the pipe is made from tells them how much they will have to maintain the pipe. Clay pipes have more joints where roots can come in, for example. When you know those joints are there, you can systematically control the roots."

» Technician Dennis O'Connell puts the jet/vac controller away after cleaning a manhole.

Vitreous clay is the most common type of pipe in Great Falls, but there is Orangeburg pipe, too, the fiber conduit made of pulpwood and pitch. It is an old and less durable piping, he says. "When we find it, I tell homeowners to start budgeting to replace it." The identification of PVC pipes, on the other hand, is a reassuring discovery for a homebuyer.

EQUIPPED FOR ANYTHING

Two years ago, the company started relining failed pipes using the Quik-Shot inverted bladder system (Pipe Lining Supply). To date, the largest lining job has been a 130-foot length of 4-inch lateral pipe. Just in the last quarter, Straight Flush began to repair larger pipe using the QuickLock point repair system (Pipeline Renewal Technologies). This new offering has expanded the company's service area: A company truck was driven south in early November to a Wyoming ranch for installation of a QuickLock patch.

Trenchless pipe repair is especially suitable for places like Montana where November through March is a true winter season. It gets cold and can stay that way for a while. Consequently, pipes sometimes are buried 6 feet deep to protect from freezing. "That makes it especially costly to dig it up," Lienhard says.

So, the company has invested in the underground inspection and repair tools that avoid the big dig. Its Quik-Shot and QuickLock equipment is complemented by Envirosight push and crawler cameras, RIDGID cable machines and mini-cameras, and jetting machines by Jetters Northwest and Shark Cart. A Great Falls supplier, NorMont Equipment, is the source of many of these tools, as well as equipment troubleshooting expertise.

For some jobs, Lienhard calls on his Vactor combination hydrovac unit. It's fitted with a 1,000-foot hose and a Warthog switcher nozzle (StoneAge). He has trailer and cart jetters for smaller jobs. All the equipment gets regular workouts. "The pressure cleaning work is growing quite a bit."

CONTINUED >>



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Training over experience

Joe Lienhard doesn't interview credentialed sewer technicians when he adds to staff at Straight Flush Drain Solutions in Great Falls, Montana. He looks for professional character — and for veterans.

"I have no desire to hire someone with drain cleaning experience," he says. "If a candidate for the job can carry on a conversation and is personally presentable and of good character, I can train him to do everything else. There's an art to the work, but it's not that difficult."

The fact that each member of the Straight Flush crew is — like Lienhard — a veteran of one of the military branches is not just happenstance. "It's something we look for," says wife and co-owner Danielle Lienhard. "It's not a coincidence."

The substance of this hiring approach is that, while skills can be learned, initial impressions can open the door to using them. Joe Lienhard stresses appearance and attitude in his employees because he wants to instantly assure new customers that they have contracted with reputable, "truly professional" people.

To that end, a Straight Flush tech arrives at a job dressed in a white polo shirt with navy blue pants and black shoes and belt. Before a plunger, cable or jetter hose is inserted into a plumbing fixture or line, the tech slips on some coveralls to protect his uniform and booties to protect the customer's home.

"We want to take care of our customers," Lienhard says of this routine. "The biggest thing is to be as fair as possible. We want them to know upfront that their task is something we can handle. But we also want them to see right at the door that we understand their house is their most valuable asset and we want to keep it clean."

He says this considerate mindset is incentive for techs to always do the very best job they can. "It is an amazing marketing tool, as well. When people who have been customers see us, they smile and tell someone something like, 'He pulled my grandson's toy out of the toilet.' Those are the best kind of professional relationships."



🚚 Zach Gleoge sets up a Rover X for a sewer inspection.



"We tell new homeowners that drains are just like maintaining your car.

Knowing what material the pipe is made from tells them how much they will have to maintain the pipe."

Joe Lienhard

However, persuading residents to jet their lines — instead of just cabling through an obstruction and calling it good enough — is not always easy, Lienhard says. "Some people don't understand that jetting can do so much more cleaning. There's a good, better and best way to respond in a standard pipe blockage situation, and the best is jetting. It gets the pipes so much cleaner and the homeowners won't have to call on us again for a couple of years." Still, up-selling a property owner to more expensive jetting can be a challenge.

Because rural properties surrounding Great Falls have many septic tanks, the company has one of its four technicians pretty much assigned to septic work. The tech drives an International truck outfitted for the task. Other vehicles rolling from the equipment yard include two 2018 Dodge

ProMaster 1500 cargo vans and a 2017 Nissan NV2500 cargo van. A Ford E-350 van hauls the company's CCTV equipment.

The crew is cross-trained so that "we all know how to do everybody else's jobs," Lienhard says. "But, if someone is more passionate about something, I'll let that person focus on it." For example, one crew member is convinced the company should be doing more municipal jobs, so Lienhard gives him hours in his week to call small towns around Great Falls and try to drum up the work. "It's a slow process, but it's starting to pay off."

Each week the crew takes a maintenance break to clean the trucks and service equipment, followed by a refresher on machinery operating techniques. Recently, for instance, the company got a new jetter nozzle, so Lienhard grabbed

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◀◀ Bradley Schwartz feeds cable from a RIDGID K-400 drum machine into a blocked sink drain.

“I’d love to see it grow and have different stores around the Northwest. I go to conventions and see people building companies, and I smile and say to myself, ‘Why can’t that be us?’”

Joe Lienhard

heads of lettuce and practiced blowing them through a pipe. There is also periodic classroom training, and each year everyone attends the Water & Wastewater Equipment, Treatment & Transport (WWETT) Show in Indianapolis.

DETERMINED TO SUCCEED

The workload of the company varies from season to season. In the summer months, Straight Flush takes on cured-in-place relining jobs. Winter sees more septic work and clearing of frozen lines — as well as more dewatering jobs in commercial and restaurant properties. The volume of work for the latter service ramped up when a regional grease services firm dropped Montana from its service area.

“That left a huge void in our state,” Lienhard says. The two or three companies that provide the service now find themselves working together and undertaking jobs outside their normal service area. Straight Flush responds to such calls with one of its pump trucks. It hauls the greasy waste to a shop where a Flo Trend Systems Sludge Mate dewatering unit separates solidified grease for later disposal in a landfill.

While Straight Flush benefited from the regional firm pulling out, Lienhard doesn’t entirely credit serendipity for the resulting good fortune. He cites author and *New Yorker* writer Malcolm Gladwell’s book *Outliers*, in which Gladwell concludes that, while circumstances help determine outcomes, personal determination is a key marker of success. It isn’t just being in the right place at the right time.

So it was that when the former boatswain’s mate in the U.S. Navy and his wife had a sewer problem, they not only rolled up their sleeves and fixed it themselves, they decided to fix other people’s sewer problems, too. This entrepreneurial instinct runs in the family.

Danielle Lienhard’s grandfather operated an appliance repair business, her stepfather a plumbing and heating business. Both were one-man shops. She played a central role in Straight Flush taking the next business step and employing people. Danielle has a degree in finance

and, just two months after she and her husband opened the doors of Straight Flush, she parlayed her real estate license into ownership of a real estate office. Clearly, these are ambitious business partners.

Yet they hedge a bit about the future of the sewer cleaning company. “I’d love to see it grow,” Joe Lienhard says, “and have different stores around the Northwest. I go to conventions and see people building companies, and I smile and say to myself, ‘Why can’t that be us?’ Realistically, we could grow to a pretty good size just in Montana and surrounding states.”

For now, Lienhard is enjoying the work today and appreciates the labor and genius of those who preceded him. “We fell into an industry that is so neat. We get to work with infrastructure and utilities that our grandfathers and great-grandfathers put into the ground. We are able to go in and find things they were sure would never break and rehab them using new technology, fixing them for another 50 or 100 years. It’s so neat to be a part of that, to be a part of the work of the great generations.” c

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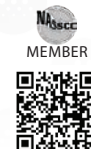
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Retain the Best

A ‘golden handcuffs’ agreement with your best employee is a smart way to reward your worker and optimize growth

By Patrick Ungashick

High-performing employees are often the most valuable assets in a company. Customers, products, technology, inventory and many other assets come and go.

A company that cannot hold on to its best employees, however, likely cannot grow. Yet few companies take any formal steps to minimize the risk of losing top employees. Sure, you pay your best employees well and presumably have a great culture and work environment. But your competitors can offer the same incentives. To truly hold on to your best people, consider tying them to your company with golden handcuffs.

“Golden handcuffs” is a generic term describing a wide range of programs that share one core purpose: to incentivize top employees to stay with your company for the long term. There are many types of programs: incentive compensation plans, stock options, phantom stock, stock appreciation rights, synthetic equity programs, share bonus plans and more.

The potential for a future compensation payout orients the employee toward achieving the company’s business goals, especially if the payout amount is tied to long-term company growth.

Making things even more confusing, each of these types of programs has variations in its design and operation. This complexity makes it difficult to approach these programs and select a plan design that best fits the situation. However, learning about golden handcuffs programs is worth the effort. They offer a unique combination of advantages and benefits that can help your company reduce risk, propel growth and maximize value at exit.

Companies that design and implement effective golden handcuff plans can accomplish the following seven important outcomes:

- 1. Reduce the risk of top employees leaving prematurely or unexpectedly.** Golden handcuff plans accomplish this by offering a future compensation payout that is partially or completely forfeited if the employee should terminate employment prior to an agreed-upon date (such as retirement age) or an event (such as the sale of the company). To create the desired impact, the potential compensation amount must be significant — typically several times the employee’s current annual income or more.
- 2. Incent top employees to help create long-term, sustained company growth.** The potential for a future compensation payout orients the employee toward achieving the company’s business goals, especially if the payout amount is tied to long-term company growth.
- 3. Create incentives for top job candidates to join your company.** A golden handcuffs program offered to a desired recruit — in addition to competitive pay and compelling career opportunities — can be the tipping point that convinces an important hire to join your business.
- 4. Protect the company against the risk of losing customers, other employees or trade secrets should an employee who has those relationships and information leave.** Golden handcuff plans should include a legal agreement that commonly includes provisions such as noncompete, nonsolicitation and nondisclosure language wherever possible.
- 5. Provide a way for business owners to create alignment with nonowner top employees around creating business value prior to exit.** Many business owners are understandably concerned about discussing their future exit plans with their top employees who don’t have an equity stake in the company. In those situations, the owner’s future exit is a potential wealth-building event for him or her, but it presents career uncertainty and risk to the nonowner employee. Golden handcuff plans build a bridge between owner and nonowner top employees by including those employees in a wealth creation opportunity at exit and providing for their career stability.
- 6. Enhance business value at company exit, particularly upon the sale of the business.** Your future business buyer will often see greater value in your company if a golden handcuffs plan has been effectively implemented, particularly when the plan includes “stay bonuses” that incentivize top employees to stay with the company after a sale, typically for one to two years.

7. **Thank top employees for their service with the company.** Most business owners want to thank high-performing employees after they have given years of effective service to the organization. While golden handcuffs plans are primarily intended to incent and reward top employees, they can perform double duty by providing lucrative compensation awards in the future to the very same people you likely will want to acknowledge.

Many business owners and advisors assume a golden handcuffs plan requires sharing actual ownership interest with the employees who will be included in the plan. This is not always true. Some programs such as stock options plans include the potential for actual ownership sharing. Other plan types such as phantom stock or executive bonus plans involve compensation and do not share actual equity. Sharing ownership with employees presents significant risks and downsides. Whenever possible, consider a golden handcuffs plan that pays out compensation to the employee rather than shares actual company equity.

Business owners and leaders need effective tools to motivate top employees, retain them for the long term and drive company growth. Few tools have the potential to address all of these needs simultaneously like a well-designed golden handcuffs program. A little research here can go a long way to securing a bright future for your employees and your company. **c**

ABOUT THE AUTHOR

Patrick Ungashick is the CEO of NAVIX Consultants, a celebrated speaker on executive and business owner exit planning, and the author of *A Tale of Two Owners: Achieving Exit Success Between Business Co-Owners*. With his wealth of knowledge on exit planning, Ungashick has provided exit advice and solutions to business owners and leaders for nearly 30 years. For more information on Ungashick, visit: www.navixconsultants.com.

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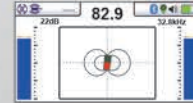
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No Waiting for This Cure

A pipe lining newcomer completes four lateral lining jobs in one day with a new product that allows liners to cure unattended

By Ken Wysocky

Lining one or two sewer laterals in a day would be considered great production by anyone's standards in the trenchless pipe rehab industry. Doing four lining projects in one day — performed by a company that's never even lined a pipe before, no less — sounds almost impossible.

But that's exactly what Russell "Russ" Joe, the owner of Quality Sewer & Drain Cleaning in Danvers, Massachusetts, accomplished last July in Boston. With a strong assist from Ken Beyer, owner of Clog Squad in Hamilton, Michigan, Joe and his employee, Brian Dacey, lined approximately 225 feet of failing clay and cast iron sewer laterals at four different homes.

The total time to do all four linings was about eight hours, including travel time between job sites. Gross revenue for the projects was around \$35,000.

"In just one day, we basically made back the money I invested in the lining equipment," says Joe, who established his company in 2016 and works primarily on the north side of metropolitan Boston. "My philosophy is that scared money doesn't make money," he adds, noting that taking calculated risks on new technology is essential to growth.

And for any doubters, Joe streamed parts of all four jobs live on Instagram. He estimates that thousands of contractors watched it live; eventually, the videos received more than 15,000 views on Instagram and another 3,000 views on Facebook.

"It was a pretty big to-do to shoot four liners in one day, especially on our first go-around," Joe says. "I thought it was pretty amazing. It shows what can be done if you're willing to learn."

A CURING INNOVATION

Initially, no one intended to line four pipes in one day. But the more Beyer thought about it, the more he thought it might be possible. The reason for his optimism was a new device he'd developed called a curing cap, which essentially allows contractors to leave job sites and let liners cure unattended.

"I was headed out to Boston for a week to train Russ," says Beyer, whose company also sells drain cleaning equipment and trenchless pipe rehab systems. He also runs a Clog Squad Academy for pipe lining training. "He had five lining jobs already lined up fairly close to each other, and I had just come up with the curing cap, so it seemed like doing four of those jobs in one day just might be doable."

Joe admits he was a bit skeptical at first. "I definitely was a little nervous, too," he says. "I didn't think there was any way we could do four in one day. But we banged them out."

It helped that the jobs were close together and that any required excavation was done the day before. But the real key to success was the curing cap technology, Beyer says.

"As soon as the 'shot' is completed, the cap goes on where the pipe terminates," he explains. "Then we just put hot water into the cal tube (a bladder that keeps the liner tight against the walls of the host pipe) and hook up an air compressor to regulate the pressure and be sure it doesn't drop. That frees you up to leave and go on to the next job and the next job."

Without the cap, the liner would have to remain hooked up to the inverter, with hot water circulating through the inverter into the liner, which would require continuous monitoring. In addition, doing multiple jobs in one day would require a water heater, an inverter, an air compressor and other items on each job site. That would make doing multiple jobs a day an expensive proposition, he says.

DYNAMIC DUO

To line the pipes, Joe used a Sactools inversion drum, which Beyer helped develop for the U.S. market in conjunction

« Johan Lindholm teaches Quality Sewer & Drain Cleaning owner Russell Joe and his employee Brian Dacey how to attach the liner to the nozzle of the Sactool inversion drum.



with Sacpro AB, a Swedish company that makes pipe lining systems. He used liners made by Sacpro (Clog Squad is the U.S. distributor for Sacpro) and MaxLiner USA.

The crew also used resins made by Trelleborg Pipe Seals. The resins can be heat-cured in about 1 1/2 hours by either hot air or hot water. But they can stay pliable for up to 12 hours before heat is applied. "That takes away that time bomb ticking on you," Beyer says.

Joe and Dacey did the work, supervised by Beyer and Johan Lindholm, the owner of Scandinavian Relining in Finland. Lindholm does pipe lining training for the academy.

"We had to think out of the box to do four in one day," Beyer says. "We also had to get past the mental hurdle, sort of like breaking the four-minute barrier."

"We were there just to instruct and provide guidance. Russ and Brian did all the work. For them to do that many linings on their first time doing it was pretty unbelievable. Russ is amazing."

"It was hands-on training, not just us standing by and watching," Joe adds. "We couldn't possibly have done this without Ken and Johan. They're a huge inspiration to us and awesome mentors."

FULL DAY'S WORK

The four projects were similar in scope, with each one requiring at least one excavation pit. All the laterals suffered from cracks and some had root intrusions. But all were structurally sound and good candidates for lining, Beyer says.

The first shot started at about 8:25 a.m. on July 29, a 93 degree F day in Boston. It involved lining about 70 feet of 6-inch-diameter clay pipe, Beyer says. Because the home had no basement or clean-out, a pit had been dug down to the pipe, several feet away from the house. Joe shot a MaxLiner liner from that pit out to the mainline. The total time for job one was about two hours.

After a 15-minute drive, work began on the second job — a 37-foot-long stretch of 4-inch clay and cast iron pipe that Joe lined with a Target liner. Like the first job, there was no basement or clean-out available, so he had to dig a pit in the yard. He shot the liner from there to an entry in the home's slab foundation. The job was finished by 11:45 a.m., Beyers says.

The third job was another 15-minute drive away and centered on a 73-foot-long section of 4-inch cast iron line that transitioned to a 6-inch clay pipe. This time a clean-out was available in the home's

"If you deviate from the process and try to cut corners, you only create problems for yourself.

Patience is a virtue when it comes to pipe lining."

Russell "Russ" Joe

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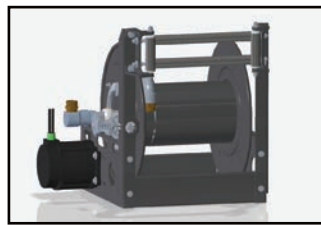
Brian Dacey, Russell Joe and Johan Lindholm prepare to shoot a liner through a calibration tube that keeps it from expanding.

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basement, so the crew shot a Target liner from inside the home's basement. That job ended around 1:45 p.m., he says.

The last job was about 15 minutes away. For this project, Joe used a 45-foot-long Target liner to rehab a 6-inch clay pipe that transitioned down to a 4-inch cast iron pipe. The shot started at about 2 p.m. and ended at about 3 p.m. The crew used a clean-out in the home's basement to shoot the liner from inside the house, Beyer says.

The last step involved going back to each job site and inspecting the liners, which they finished at exactly 4:58 p.m., Beyer says. "We wanted to finish by 5 p.m., and we just made it."

ALL ABOUT THE PROCESS

The process at all four jobs was similar: inspect the pipe with a camera system made by CustomEyes Cameras, mill them out with a Clog Dog milling machine manufactured by Clog Squad, jet the line with a Soldier trailer-mounted water jetter (3,000 psi at 12 gpm) built by Spartan Tool, reinspect the line, take measurements with the camera, build and wet-out the liners, and shoot the liners.

"Before shooting the liners, we also tested all the equipment to make sure everything was 100% operational," Joe says. "It all went pretty smoothly. There were a few hiccups here and there, but that's to be expected with lining pipes."

The hardest part was following all the instructions and adhering to exactly the same process every time, Joe says.

"If you deviate from the process and try to cut corners, you only create problems for yourself," he says. "Patience is a virtue when it comes to pipe lining."

Beyer's takeaway from the day is: Don't let conventional beliefs limit expectations. "Don't box yourself in by thinking you can only do one liner a day," he says.

For anyone thinking about getting into pipe lining, Joe suggests going into it 100% committed. It's a big capital cost upfront, but the payback is quick, he points out.

"We've shot 1,028 feet of liners since then. We now feel very comfortable with the process and love doing it. Sure, things can go wrong. ... But it works if you stick to the method, be patient and don't cut corners." c

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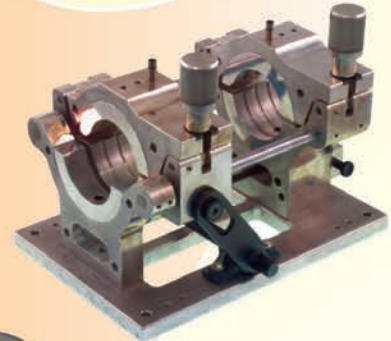
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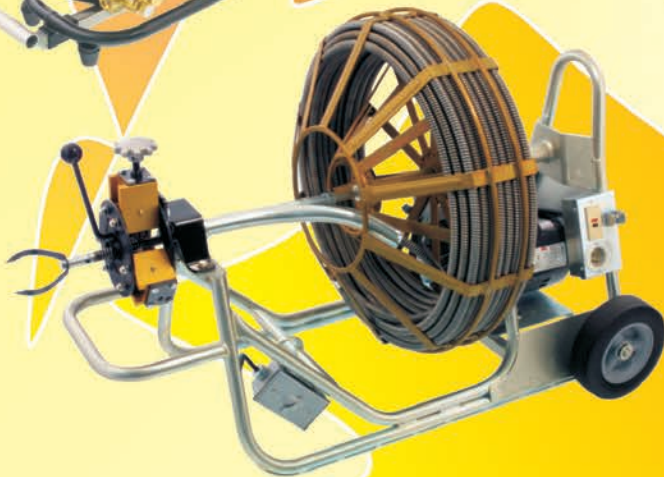


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NOT FOR THE **FAINT OF HEART**

Progressive Pipeline Management has built a reputation renewing aging cast iron natural gas mains that others won't touch

By Ken Wysocky // Photography by Kevin Blackburn



In a calculated strategy implemented more than a decade ago, Progressive Pipeline Management (PPM) decided to invest in trenchless pipe lining technology commonly associated with sewer lines and waterlines and apply it in a completely different market: natural gas mains.

The gamble proved to be a good move. Today the company earns more than \$25 million a year in gross revenue and has lined approximately 975,000 feet — about 184 miles — of gas pipelines in 18 different states. Furthermore, it employs 120 people and has built an inventory of specialty trucks and equipment with a book value of more than \$8 million, says Dave Wickersham, the owner and CEO of the Wenonah, New Jersey-based company.

The success of PPM hinges on two key factors: Acquiring the exclusive North

« Progressive Pipeline Management technicians Miguel Robles (left), Tom Nestoras and Kacy Wright load a 42-inch liner into the starline inversion drum. This natural gas main in East Orange, New Jersey, was the largest pipe the company has lined to date.

» An aerial view of the starline inversion drum and launch pit shows all hands on deck as the PPM crew prepares to install a liner.

American licensing rights from Germany-based Karl Weiss Group to sell the starline cured-in-place lining technology and capitalizing on the need for trenchless rehab of aging cast iron gas mains.

“Similar to the water industry, cast iron gas mains were installed from the late 1800s to the 1960s,” Wickersham explains. “Over the years, the joints loosen, and that’s where they leak.

“The oldest pipeline we ever renewed with the starline technology was an 1890s vintage, 16-inch-diameter cast iron main that runs along at the base of the Brooklyn Bridge.”

Just like aging sewer lines, gas main infrastructure is extremely expensive to replace, which makes lining them an attractive proposition for natural gas utilities. “It’s almost impossible to replace these large-diameter cast iron mains because they’re the backbone of many distribution networks in older cities,” Wickersham says. “Furthermore, there simply isn’t enough space under our congested roadways to install more pipelines amid the myriad other pipelines and conduits.

“And last but not least, utilities can’t afford to shut these mains down for extended periods of time in order to replace them.”



Progressive Pipeline Management

LOCATION: Wenonah, New Jersey

OWNER: David Wickersham

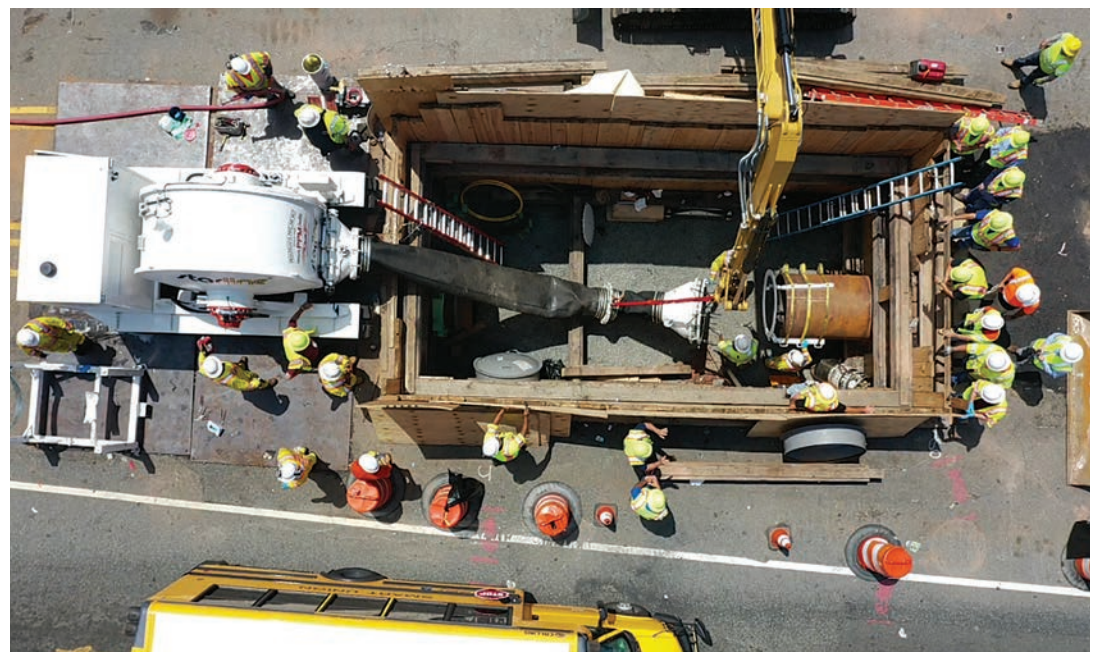
FOUNDED: 2002

EMPLOYEES: 120

SERVICES: Trenchless rehab for natural gas pipelines

SERVICE AREA: Mainly mid-Atlantic and Northeast states

WEBSITE:
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Rising to the challenge

Progressive Pipeline Management (PPM) enjoys tackling difficult jobs, those showcase projects that create a buzz in the industry. A good example is a project the company completed in 2019: lining a challenging 160-foot-long section of a 30-inch-diameter cast iron gas main in Brooklyn, New York.

“We typically don’t line the low-hanging fruit,” says Dave Wickersham, the owner and CEO of the Wenonah, New Jersey-based company. “We get the calls for the toughest jobs.”

At issue were leaks in three lines: two 30-inch-diameter cast iron mains more than 100 years old and one 16-inch cast iron main. The job was complicated by the fact that the mains run through a tunnel under the now-dormant Gowanus Canal, built in the mid-1880s to provide a 1.8-mile-long link to New York Harbor for manufacturers, refineries, tanneries and chemical plants.

PPM lined the 16-inch main about 10 years ago and one of the 30-inch lines in 2018. It tackled the second 30-inch line in 2019, Wickersham says.

Adding to the challenge were six 90-degree offset bends, plus two 40-foot vertical drops that, in essence, created a U-shaped section of pipe. The horizontal run of that “U” was 36 inches in diameter and about 100 feet long. On one end, a “bastard fitting” connected it to one of the vertical runs. On the other end, a conventional 90-degree elbow connected the horizontal run to the second vertical run.

The bastard fitting made things difficult because it prevented the liner from smoothly transitioning between the vertical and horizontal runs. “The bastard fitting is like an elbow fitting, but it’s not,” he says. “And even clean 90-degree elbows are tough enough to line. We had to figure out how to get the liner to make that turn through the fitting.”

To solve this problem, the one 40-foot vertical leg was removed and lined above ground, then reinstalled, he says.

An old 30-inch flanged tee connected to the horizontal run also posed an obstacle because it couldn’t support the liner during installation; because the liner is installed with about 15 psi of air pressure, it likely would bulge into the tee opening and possibly rupture. Normally such a fitting would be removed, but that wasn’t possible in this case because the tee connected to a gas supply line.

As a workaround, crews used a custom-built robotic sled, an inflatable bladder, sheets of carbon fiber material and an adhesive to create and install a tubelike structure within the tee. This effectively formed a pipe within the old tee that sealed off its third opening and provided support for the liner. Later, PPM workers used the same robotic tool to reinstate the old tee.

“It probably was our most challenging job to date because we really had to invent things on the fly to get the job done,” Wickersham says. “Because of the main’s location, there were zero other alternatives available. Excavating the line would’ve cost a small fortune.”



As such, PPM officials worked hand in hand with the gas utility industry to rigorously test the starline product and prove to regulators that if installed correctly, it’s as good as a completely new pipe.

Along the way, PPM has earned a reputation for tackling tougher lining jobs, such as lines carried alongside bridges and under highways, rivers, railroad lines and environmentally sensitive areas. “We work a lot in areas where it’s expensive or hard to access (to replace pipes) or in places that can’t withstand disruption,” Wickersham says. “That’s where we can hit a home run for our clients.”



➤ Miguel Robles (left) and Kacy Wright mix buckets of two-part resin in preparation for lining a 42-inch cast iron host pipe.

◀ Wright, Ian Gallagher and Robles work together to hot glue a liner. This step assists in maintaining air pressure during the inversion process.

FINDING A NICHE

Wickersham started his career working for a company that specialized in handling oil spills, many of which were pipeline related. The issue of pipeline safety and integrity led him to a job at a civil and environmental engineering company, where he helped clients comply with pipeline regulations. Next came a stint at a firm that decontaminated natural gas pipelines.

During that time, he saw the starline system in action and became intrigued by the technology. “I asked some customers if they thought there was a future in this lining process, and they overwhelmingly said yes,” he says.

So in 2002, Wickersham started negotiating with another company that had brought the starline technology to the U.S. market in 2000 but wanted out. Then he bought that company’s equipment, started PPM and negotiated a new licensing agreement with Karl Weiss.

CONTINUED >>

“We work a lot in areas where it’s expensive or hard to access (to replace pipes) or in places that can’t withstand disruption. That’s where we can hit a home run for our clients.”

Dave Wickersham

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“We started at zero and now generate in excess of \$25 million in revenue annually,” he says. “Customers love the fact that lining saves them money: Sometimes it’s 50% cheaper than conventional open-cut line replacement. So it allows them to recapitalize their existing infrastructure with proven technology. They like the technology play.”

PPM doesn’t have any direct competitors, largely because it has established solid, long-standing relationships with large, regional gas utilities and a reputation for quality work. Moreover, starting from scratch would be very expensive, which provides a strong barrier to market entry, he says.

“It’s definitely not for the faint of heart, financially speaking. Furthermore, many contractors are wary about doing natural gas pipeline work. It’s one thing to have a leaking sewer main, but a whole other issue with a leaking gas main.”

INNOVATIVE TECHNOLOGY

The starline lining system has been critical to the company’s success. It employs a cured-in-place liner that cures ambiently (no heat required) in 12 to 18 hours in warm temperatures and up to several days in cooler temperatures. “We’ve done some emergency jobs in below-freezing temperatures, but it takes longer to cure,” Wickersham says.

“After the cleaning process removes years of scale and buildup, it’s like putting a second skin on an existing pipe without reducing its capacity.”

Dave Wickersham

The liner is considered semistructural, which means it relies on the host pipe for structural strength. Made from woven polyester, the liner is seamless and features a fused-on polyurethane and polyethylene coating on one side. “It’s not sewn together like a felt liner (for sewer pipes), which allows it to withstand higher pressures without tracking natural gas between the liner and the pipeline,” he says.

After it cures, the liner is about 3 mm thick. “After the cleaning process removes years of scale and buildup, it’s like putting a second skin on an existing pipe without reducing its capacity.”

The installation process primarily involves five main steps: a camera inspection to spot any unknown problems or anomalies, sandblasting the pipe clean, a post-cleaning camera inspection, installing the liner and a post-lining camera inspection. The technology is suitable for pipelines up to 48 inches in diameter.

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⤴ The Progressive Pipeline Management crew includes (from left) Jeremy Diehl, Anthony Flores, Fabian Becerra, Lawrence Howard, Shane Lapresti, David Wickersham, Thomas Nestoras, Angel Ledyc, Dino Gonzalez, David Coates and Jeff Chamberlain.

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👁️ A bird's-eye view of the PPM crew, starline system and pit during the lining of a 42-inch natural gas main in East Orange, New Jersey.

➤ The liner is moved into place to rehabilitate the cast iron gas main along Central Avenue in East Orange.

After the liner cures, PPM also performs a pressure test to ensure the liner's strength and integrity.

The largest pipe PPM has lined was 42 inches in diameter. The project occurred in East Orange in July 2019 and involved lining a 600-foot-long run that descended an 80-foot-deep embankment, went under the Garden State Parkway and traveled back up another embankment, Wickersham says.

"We expect to line a 48-inch line within the next year or two. But 16- to 36-inch-diameter cast iron gas mains are our sweet spot."

Spot repairs on gas lines are rare because most gas companies figure if they're going to go through the hassle of bypassing a line to take it out of service for lining, it makes more sense to line the entire section from end to end. Furthermore, lining from end to end allows customers to apply the cost of the project to their rate case because regulators consider it as equivalent to new pipe versus absorbing the cost as an expense on their balance sheets.

MORE CUSTOMERS, MORE EQUIPMENT

To best serve customers, PPM has invested heavily in developing a fleet of equipment that enables it to maximize productivity and profitability. "When it comes to technology, I'd rather be on the front edge of it than on the back edge," Wickersham says.

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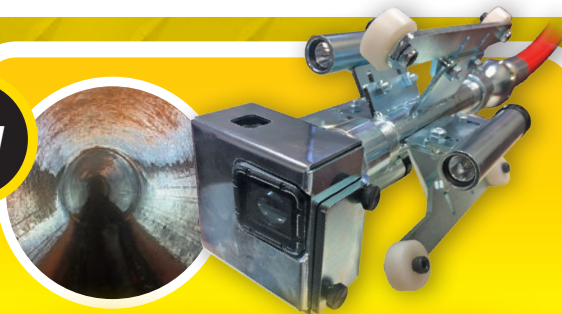


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“When it comes to technology, I’d rather be on the front edge of it than on the back edge.”

Dave Wickersham

The company’s investments include three vacuum trucks built by Guzzler; three trailer-mounted dust-collection machines from Rapid Prep used to capture dust from sandblasting; three Hino 268 trucks that carry sandblasting equipment built by Clemco Industries; and six Hino refrigerated box trucks that transport equipment for wetting-out liners.

In addition, the company relies on 12 Hino camera trucks that carry Aries inspection camera systems housed in 24- and 26-foot box bodies made by Morgan; six RIDGID SeeSnake standard cameras and three SeeSnake Mini cameras; a Spartan Tool Warrior trailer jetter (4,000 psi at 18 gpm); and an ET-180 trailer jetter (4,000 at 18 gpm) made by Harben.

For pipe lining, PPM owns six starline inversion drums, carried on trailers made by Bri-Mar. The company also relies on a PRD-Blast rotary sandblasting head made by Pacific Roller Die, as well as several pipeline winches made by TT Technologies. The company also owns three custom-designed and custom-built abrasive-blasting trucks, built on Hino chassis and rigged with Pirate Brand air-drying tanks, blasting pots built by Clemco Industries, and custom-designed reels built by Hannay Reels.

The company also does some sewer lining, using SAERTEX multiCom UV-cured fiberglass liners; a UV-C tech ultraviolet light

« David Wickersham, founder and CEO of Progressive Pipeline Management.

train from Vioguard, carried in an International truck outfitted with an 18-foot Morgan box body; air compressors made by Airman USA (475 to 950 cfm); and a Power Cutter 200 line-reinstatement system made by Innovative Sewer Technologies GmbH.

“We prefer fiberglass because we felt it was a better all-around product,” Wickersham says. “It offers a cleaner and easier installation process. Plus, it’s a stronger product.”

ACCELERATED GROWTH

As PPM gained traction in the industry, growth came slowly but steadily. But now Wickersham says the company is ready to put pedal to metal. “We were able to survive those early years,” he says. “But now we’re in grow, grow, grow mode as spending on infrastructure increases and our success with big customers further establishes our brand.

“We just bought a new facility on Long Island (New York) to better service National Grid (a giant supplier of natural gas and electricity to customers in Massachusetts, New York, Rhode Island and the United Kingdom) because we’ve been doing so much work for them. We’re also eyeing facilities in Boston, and then Chicago is on the radar, too.

“The infrastructure industry is constantly evolving and changing every day. So we continue to see a lot of opportunities and look forward to continuing to grow our PPM-starline brand and our business as big as we can.” c

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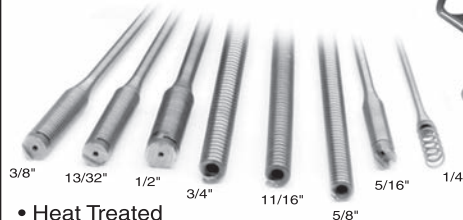
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Profile

NuFlow Certified Contractor

When John Perry and his dad, Harley, decided to add pipe lining to their plumbing business, they took their time evaluating partners. **“We decided on NuFlow because of the quality of the product. Their product is far superior than all the other companies out there.”**

When John attended a NuFlow Annual Summit and met other NuFlow Certified Contractors it was a turning point for his business. **“After the summit we designated a crew specifically to pipe lining. Eventually, we had to rebuild our entire plumbing business because our pipe lining took off.”**

John still keeps in touch with the NuFlow team and the network of NuFlow Certified Contractors. **“Anytime one of us has a question about a job, we can reach out to see what other people have done. The NuFlow crew is experienced and knowledgeable. We make a great team!”**



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Brigham Dickinson

Play to Your Strengths

Narrowing your focus and learning to delegate are key to building a successful business

By Brigham Dickinson

Life as a business owner can be tough and lonely. It's easy to lose track of your goals and squander potential, whether you've been in business for two years or 20.

Running a business requires a constant, singular commitment to your vision, your employees and your best self. If you aren't prepared, you might miss opportunities to enhance your relationships and accomplishments.

Since starting my company, I've noticed three human tendencies that can get in the way of any business, no matter what size. They can lead to business owners getting stuck and complacent, failing to move forward and eventually falling behind. But there are ways to avoid getting trapped in them. Business owners need to know what to look out for and need a plan to cognitively deal with human tendencies before they manifest in your behavior.

To be successful, it is so important to not only know your limits and boundaries, but also where you're strongest. Nobody can do everything, but some people can do a few things well enough to turn them into value for others. What we should strive to do is identify our key strengths — those things we do better than anyone else — and push out all the rest. For business owners, this means focusing on just one part of the business and delegating the rest to your employees. If you're an owner and your strengths lie in being in the field, then it might be a better option to appoint someone who's really good at leadership to run your company than to do it yourself.

Compensation based on performance is not just for salesmen or athletes anymore, it's for everyone. Your performance in the role you play is more important than the role itself. You might feel like being the owner or the leader is the most important job. However, what's a leader without people willing to follow them? Your job does not matter as much as how good you are at doing your job. Whatever work you decide to do, work hard to be the best and you'll find that you'll get paid the most.

LEARN TO DELEGATE

As business owners, we need to know our own strengths and the strengths of those people with whom we surround ourselves. If you're assigning tasks to people who just aren't very good at those tasks, they won't get done as well as they should and you are wasting time and resources. But if you delegate according to your employees' strengths, you can start to deliver real value to your customers and stakeholders and really start growing your company as a result.

NARROW YOUR FOCUS

The thing you might want to ask is, "How can I, as a business owner, only focus on my strengths? Won't things get missed or left out?" And the answer is: trust. Trust in yourself and those you have delegated to. Develop a personal mission statement, and keep it front and center in your mind at all times. You need something that drives you and your team on a fundamental level, that keeps you all on track. Ultimately, you need to put your whole self into your business, into those strengths, relentlessly until you become the best at whatever it is that you're doing. In order to do that, you need employees who can and will do the same with their responsibilities, so you can delegate effectively.

Every morning, when I get up, I make a point to recite a personal mission statement. I even have it written on my mirror. After that, I take some time to read and reflect on the things I'm grateful for, and that helps me stay focused on what my goals are and how to get there throughout the day.

If you're unsure of what to focus on, figure out what your one, singular purpose is. Find a problem in your life, and work to solve it as quickly as possible. Home in on that one thing you want to achieve, chase after it, push aside distraction and do whatever it takes to reach that goal. You'll gain confidence in yourself, and future goals will be that much easier to achieve.

AVOID DISTRACTION

There's so much that can distract us. Every day, we wake up and we're just bombarded by distraction: the news, politics, even the weather. When I was working for a previous employer, one of my distractions was a competitor of ours who kept copying my ads. Every week, I would look at their ads and they were exactly the same as mine — except for one really good ad that featured the charred husk of a building. Our competitor's building had burnt down, and he was trying to sell the equipment he had bought just before the busy season to continue running his business.

It was a really good ad, and I got so focused on it that I let it distract me. I went to my boss' office, told him we needed to burn our



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building down, and he looked at me like I was crazy. He leaned over his desk and told me something important: He didn't care what our competitors were doing. He wanted me to focus on what I was doing, what our company was doing, because my job was to generate leads. He helped me to stay focused on what I could control — my own advertising, not trying to copy our competition — and we ended up putting together some of the best ads we ever ran.

TAKE IT TO THE NEXT LEVEL

The lesson in this is to focus on what you can control. Don't let other things distract you. Focus on your singular purpose, and help your employees do the same. Take some time every morning to really home in on what you want out of life and author your own destiny. Take some time away from social media, shove those distractions out of your mind and workplace, and focus on the task at hand.

In order to take your business to the next level, start with your focus. Your focus determines how you think, and how you think is what drives your emotions and actions. In order to have the right actions, which will build a stronger and more effective business, the first thing you need to do is change your focus by ignoring distractions. Keep what's most important front and center in your mind, and you'll find there's nowhere to go but up. **c**

After incorporating these principles into his own life, *Power Selling Pros* president Brigham Dickinson wrote *Patterned After Excellence* to share his experiences and lessons with other business owners.

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Clog Killer

Ripping through grease blockages quickly and efficiently with the Reaper means completing more jobs per day

By Ken Wysocky

Lines clogged with grease offer a tough challenge for drain and grease trap cleaners like Justin Elge, a technician at Midland Pumping Service in Omaha, Nebraska. But the Reaper, a powerful jetting nozzle made by Hydra-Flex, helps knock those difficult jobs down to size — and improves productivity and profitability along the way.

“The Reaper helps us make more money because it gets through clogs faster, which allows clients like restaurants to reopen faster,” Elge explains. “And if we do jobs faster, we make more money because we can do more jobs per day.”

In addition, an effective tool like the Reaper also helps Midland build its business without spending a lot of money on advertising. The company employs six people, and it cleans grease traps and car wash pits and pumps out residential septic tanks.

“Customers generally want us in and out quickly, especially restaurants,” Elge says. “And when they realize we can really get after it, their word-of-mouth referrals help us build a reputation as a company that gets the job done quickly and efficiently.

“We don’t really advertise our business, but we still keep growing. And tools like the Reaper are a big part of that.”

POWER AND FLOW

Hydra-Flex offers five different Reaper models; Midland owns a 9 gpm model with a 3/8-inch inlet connection, designed for 3- to 6-inch-diameter lines. One of the nozzle’s key features is a rotating front jet that emits a zero-degree, straight water stream.

At the same time, the stream rotates to create a 24-degree cone of coverage. (Other Reaper nozzles provide 30-degree coverage.) The bottom line: With a blasting capability of up to 4,000 psi, the nozzle plows through clogs that others can’t, Elge says.

The single nozzle port in the front of the nozzle generates flow of 3 gpm and the unit’s four rear nozzles produce 6 gpm, for a total flow of 9 gpm. The rear nozzles create a 20-degree spray angle for maximum propelling and pulling power.



Justin Elge from Midland Pumping Service with the Reaper nozzle. The powerful jetting nozzle from Hydra-Flex helps get through clogs faster with its 4,000 psi blasting capability.

“That powerful cone pattern on the front of the nozzle really eats away at clogs,” he says. “It really cuts things up compared to a standard nozzle with just a straightforward stream. It’s a really good penetrating nozzle.”

For contractors who don’t clean grease traps, Elge notes that grease can harden to an almost concretelike clog that bonds tightly to pipelines. “On a scale of one to 10, with 10 being the worst, grease can easily be a seven or an eight.”

PUNCH THROUGH GREASE

As an example of the Reaper’s power, he recalls a 4-inch line he cleaned at a school cafeteria last summer. After he started cleaning the line with a different nozzle, he noticed water coming back up the line; the nozzle just wasn’t hacking it.

“I wasn’t getting anywhere, so I switched to the Reaper,” he says. “And it punched through the grease without any effort

MIDLAND PUMPING SERVICE

OMAHA, NEBRASKA

OWNER: Mack Taulborg

TOOL: 9 gpm Reaper waterjetting nozzle from Hydra-Flex

FUNCTION: Cleaning clogged grease trap lines

FEATURES: 3/8-inch inlet connection; rotating front nozzle (3 gpm) with 24-degree, cone-shaped coverage; four rear nozzles (6 gpm) with 20-degree jet sprays for better thrust and pulling; stainless steel housing; handles pressure of up to 4,000 psi; tungsten carbide nozzle tip and seat

COST: Around \$620

WEBSITE: www.midlandpumpingservice.com

“It really cuts things up compared to a standard nozzle with just a straightforward stream. **It’s a really good penetrating nozzle.**”

Justin Elge



at all. It cleaned things up real nice and helped us avoid flooding on the top side.

“That often happens while jetting lines, so we sometimes take a pump truck along to vacuum up water. But with the Reaper, we don’t have to do that as often, so we save ourselves and our customers some money by not having to bring the truck along as much.”

In addition, only the stream of water from the front port rotates, not the entire nozzle. As such, the rotation doesn’t slow down if the nozzle encounters debris.

“It’s also a low-maintenance nozzle. You don’t have to periodically add viscous oil to lubricate the bearings.”

Elge also praises the nozzle’s durability, courtesy of a stainless steel housing and tungsten carbide nozzle tip and seat. And maintenance is simple: Just keep the ports clean, he says.

GO-TO TOOL

For waterjetting, the company — which was established more than 25 years ago and serves customers within about a 40-mile radius around Omaha — uses two different jetters mounted on an International truck chassis.

One features a 1,000-gallon water tank, 700 feet of 1-inch-diameter hose and a water pump made by Myers (a division of Pentair) that generates flow of 65 gpm and pressure of 2,000 psi. The other jetter was fabricated in-house and features a water pump manufactured by Pratisoli Pompe that generates flow of 11 gpm at 3,000 psi and 550 feet of 1/2-inch-diameter hose.

The dual jetters, which use the same water tank, allow one truck to handle both mainline sewers and smaller grease trap and lateral lines. “It’s a one-of-a-kind machine.”

A Reaper nozzle costs about \$620, which Elge says is a worthwhile investment. “It’s become my go-to nozzle. I’d definitely recommend it to anybody.” c

Hydra-Flex offers five different Reaper models; Midland owns a 9 gpm model with a 3/8-inch inlet connection, designed for 3- to 6-inch-diameter lines. The rotating front jet creates a 24-degree cone of coverage.

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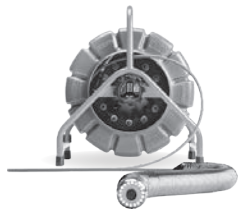
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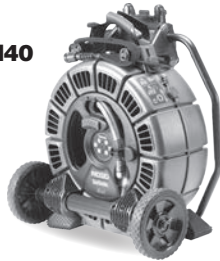
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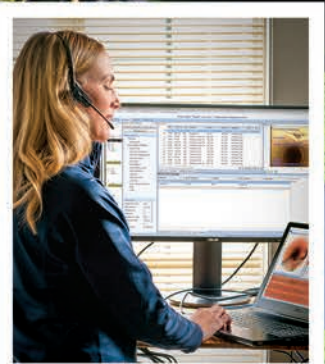
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Don't Go Unequipped

Employees entering manholes need the right equipment to make sure everyone goes home at the end of the day

By Giles Lambertson

EDITOR'S NOTE: This column is a follow-up to last month's Safety First, which covered best practices for safe man-hole entry.

A hole where toxic gas can lurk and a misstep means a painful fall is a dangerous workplace. To prevent injuries, companies whose employees must enter sewer manholes regularly train their crews to be safe and call upon equipment manufacturers to help them in that effort.

"Every time we go in, we test the gases — opening the manhole and dropping the detector in the hole," Horacio Franco says.

"We determine if it's clean of gases so we can safely have the guys go in. Every single guy is in a harness. They have their own gas monitors. They wear hard hats, respirators, gloves, boots ..."

The owner of H&R Underground sends rehabilitation crews into manholes all the time in and around El Sobrante, California. "Every day we have someone working in a manhole. Some days we might rehab 10 of them," Franco says. In every case, someone is standing at ground level near the manhole opening, sometimes monitoring readouts of air quality below or standing by to help the crew member or team in the hole.

Proper equipment can mean the difference between an uneventful workday and an emergency run to the hospital.

GAS DETECTORS

The foremost worry is hydrogen sulfide, which can poison more than one system in a body. There are two approaches to mitigating this hazard:

- Gas monitors worn by manhole workers take atmospheric readings on a bright LED screen, alerting the wearer to adverse conditions. One such unit is the Multi Gas Clip Plus by Gas Clip Technologies. This model gives readings for four

gases: hydrogen sulfide, carbon monoxide, oxygen and the minimum combustible point for ignitable gases. Thus, toxic, suffocating and explosive threats are all monitored.

When a threat is detected, the device alerts the wearer three ways: an audible sound is released at a minimum of 95 dB, a light flashes and the device vibrates. The unit functions in a temperature range of 4 degrees below zero to 122 degrees F. The battery will power the monitor for three years without recharging.

- Ventilation units keep air moving, thus diluting concentrations of explosive and toxic gases. This threat particularly exists at the bottom of manholes where the heavier-than-air compounds accumulate. Allegro offers a variety of types and sizes of ventilation fans powered by electricity, compressed air or gasoline engines. According to Michael Johnson of Industrial Fans Direct, the electric models are favored by contractors.

Blowers producing 2,000 cfm are frequently used, such as the Allegro 9539-12, because such models are easily moved (weighing only 31 pounds) in a constricted area. They are constructed of durable plastic. Some of the fans are explosiveproof, which is to say their motors are completely contained to avoid sparking flammable gases. The blowers cost about \$200 apiece.

LIGHTING AIDS

Working where the sun doesn't shine is a handicap and a danger. Even with the sun directly overhead, walls and deeper recesses sometimes are faintly visible. Some new products address the situation in slightly different ways.

- Illuminating the space in front of an individual worker is the goal of the Illumagear Halo. A construction worker, Max Baker, invented it. It came out in 2014 and originally had a cord running to a battery pack, but the latest model is self-contained and is attached to a hard hat. Different intensities of light are available by throwing a switch. The Halo's rechargeable battery lasts up to 34 hours.

Designed to both illuminate work and give workers visibility in low-light situations, the Halo is becoming more popular in underground work, according to Matt Squires, Illumagear director of sales. He says that in confined spaces, "With the Halo, you don't have to carry a flashlight or portable light. The Halo illuminates a whole confined area, with the light in the back reflecting forward."

- The patented Light Ring can light an entire manhole. The product's durable aluminum ring fits around a manhole opening and, when activated, an 18-volt battery sends LED light into the space below. The ring is bright orange to catch the eye of any worker approaching at ground level and has a raised edge as an alert in low-light situations.

Proper equipment can mean the difference
between an uneventful workday and an
emergency run to the hospital.

The patent-pending Light Ring mounts to a downrigger pulley on one side to facilitate running of cords and hoses. The side-mount pulley frees up the center of the hole for transfer of tools. Without a flashlight, workers can utilize their tools more effectively hands-free. The device comes in standard manhole opening sizes.

COVER LIFTERS

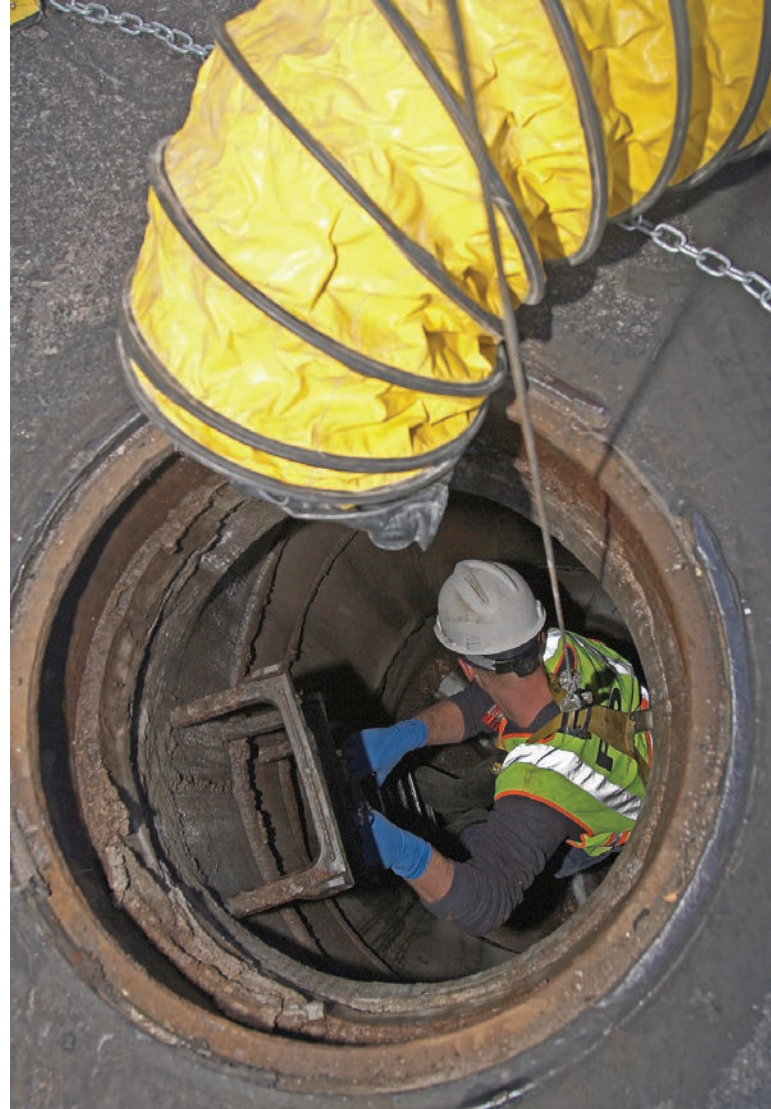
Covers fitted onto manhole openings are heavy by design — their bulk helps them withstand the weight and vibration produced by pedestrians or vehicles crossing them. A cover can weigh from about 100 pounds to three times that much. Consequently, removing them can be hazardous. Two types of solutions are offered:

- Manual lifts use the principle of a lever to multiply a worker's strength. The fulcrum of the lift is either on the same side as the lifting person, who pushes down to raise the lid, or on the far side, in which case the lifting person pulls up. One pull-up version is the LIFTPLAQ, a European product. It has an extendable rod handle on one end for 33 extra inches of leverage and a close-set pair of solid-rubber tires on the other end. Midway between is a dangling arm with a flat magnet at its end. The unit weighs about 40 pounds.

"One person can lift up to 300 pounds," says Pascal Philippe, U.S. manager for the manufacturer. The ergonomic tool makes the lift a function of leg power, rather than back exertion. "For very heavy plates, we offer a two-person model with two handles and more magnets." The LIFTPLAQ can be fitted with an extended axle so its tires straddle large rectangular covers and grates.

- An automated lift that fits on the front bumper of a pickup truck is simply called The Lifter. A product of an Iowa firm, Rock Mills Enterprise, The Lifter comes in two capacities: one that lifts conventional covers weighing less than 300 pounds and a heavier version that lifts up to 600 pounds. According to company consultant Don Moos, 95% of the units are sold with an optional hinged arm so a lifted cover can be swung to one side and set down.

Also optional is a front-end camera connected to a monitor on the dash of the truck that lets an operator position the lift while seated inside the cab. A wireless remote lowers and activates the electromagnet. This hydraulically operated, higher-tech lifting device with the camera option retails for about \$4,500.



⚠️ Wearing proper gear, such as gas masks and hard hats, is vital to safety but following safety procedures every time you enter a manhole is the best form of incident prevention.

FALL BARRIERS

When a manhole cover is removed, jeopardy mounts for anyone in its vicinity. A vitreous clay pipe representative, Jeremy Haskins, noticed that on a visit to a job site several years ago. "I saw one person after another almost fall into an open manhole. That was the genesis for designing the Holehat."

His device fits snugly on the rim of a circular manhole with a 4-inch roller mounted on it for raising and lowering of hose or cable. On its base are affixed pivoting, high-strength, 2-inch-wide aluminum arches that can be pulled up and locked, raising into place a brightly colored, durable canvas cover. When the "hat" is raised like the top on a convertible, anyone standing next to the hole is prevented from stepping into the void, and passersby are alerted to the hazard in their path.

"Contractors will put a piece of plywood over the hole, but that doesn't catch your eye," Haskins says. "The Holehat is both a structural barrier and visual warning." In 2017, the \$700 safety device was named New Product of the Year by the American Public Works Association. It currently is sold in the U.S., New Zealand and Australia.

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EMPLOYEE/TOOL LIFTS

Manhole work is vertical. Hoist systems keep workers safe on both the descent and ascent. While tripod cable-routing standards are popular, a more robust option is the Miller Durahoist DH-1 davit arm system (Honeywell).

The base of this welded aluminum device offers horizontal extensions that let it straddle rectangular manholes as well as circular ones. The unit is hand-assembled without tools and its main components each weigh only 31 pounds. The tower can accommodate multiple winches. Whereas tripod lifting units are available for \$1,500, the DH-1 is a \$7,500 piece of safety equipment because it is more durable and widely applicable to a broader range of manholes.

While manhole safety equipment is vital to keeping people safe, trained personnel are the real keys to safety. “One of the things we do not take for granted is safety,” Franco says. “The safety rules are there for a reason. Before anyone in our crews goes into a manhole, they have gone through eight hours of training. Then during the year, we have refreshers so they don’t forget it. There is nothing more important than their health.” c

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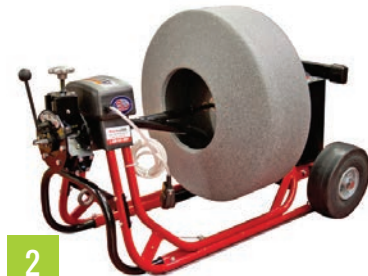
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Chemical and Mechanical Root Control

By Craig Mandli



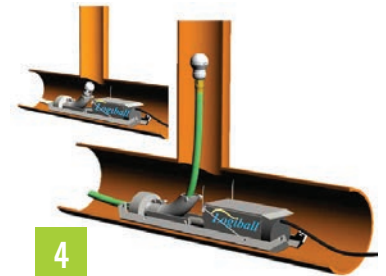
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CABLE MACHINES

1 / DRAIN REHAB SOLUTIONS ZIP-ZIP REVOLUTION

The ZIP-ZIP REVOLUTION from Drain Rehab Solutions is a flex shaft, high-speed drain cleaning machine that is available with either 125 feet of 3/8-inch or 100 feet of 1/2-inch premium flex shaft cable. It is powered by a Milwaukee Tool hammer drill, and the cables can be used in clockwise or counterclockwise rotation at speeds of 1,500 and 3,500 rpm to cut tree roots, descale cast iron or remove blockages. It is possible to use the machine while keeping an inspection camera in the pipe, allowing the user to watch live as they surgically perform precision spot cleaning with no more guessing. The 3/8-inch cables can pass through 3- and 4-inch P-traps and U-bends. The cable has a bright green flexible casing for easy camera viewing. 514-379-3544; www.drainrehabolutions.com.

2 / DURACABLE DM55

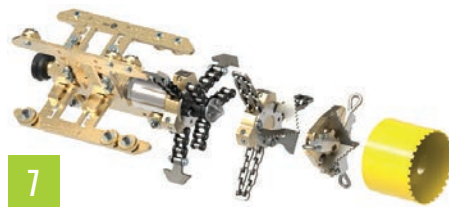
The DM55 from Duracable has a continuous-weld frame constructed from an aluminum alloy that the maker reports is as strong as steel. The sled design allows service technicians to operate the machine in either a vertical or horizontal position. To help protect the operator, the unit's electrical wiring runs through the frame. The winch hook on the frame makes it easy to lift the machine with a loading ramp or crane. It can fit four different styles of 26-inch reels with open-spoke metal or enclosed polyethylene drum options. Depending on which reel is used, it can run 110 or 150 feet of 11/16-inch cable. 877-244-0556; www.duracable.com.

3 / GENERAL PIPE CLEANERS SEWEROOTER T-4

The Sewerooter T-4 midsize drain cleaner from General Pipe Cleaners/General Wire Spring can be used to unclog 3- to 6-inch-diameter lines up to 100 feet long. It carries 100 feet of 9/16-inch Flexicore cable to clear stubborn stoppages in 3- to 4-inch inside lines. A heavy-duty, 9/16-inch cable provides more torque than traditional 1/2-inch cables offer, yet it can clean the same size drainlines. To clear tree roots and other tough clogs from 3- to 6-inch lines, simply switch drums to 75 feet of 5/8-inch Flexicore cable. To adjust to different cable sizes, just turn a knob on top of the feed. A labor-saving variable-speed power cable feed provides enhanced control through blockages to easily guide the cable in and out of the line at up to 20 feet per minute, yet keeps hands clean and off spinning cable. It comes with a fold-down handle, stair climbers and truck loading wheel for easy transport, maneuvering and storage. 800-245-6200; www.drainbrain.com.

4 / LOGIBALL LATERAL CLEANING LAUNCHER

The Logiball Lateral Cleaning Launcher is pulled in tandem with a multiconductor camera, positioned at the service connection where the guiding arm is rotated with tractor controls. The jet operator turns the pump on, and a 1/2- or 3/8-inch hose and nozzle are launched into the lateral from the main to clean grease, roots and buildups. Cleaning distances from 5 feet to as far as 70 feet into the lateral have been achieved. Units are available for 6- to 18-inch mainlines. 800-246-5988; www.logiball.com.



5 / MYTANA MFG. M745 WORKHORSE

The M745 Workhorse drain machine from MyTana Mfg. can adjust cable speed on the fly for maximum performance, and it features two torque settings for safety. It incorporates SmartDrive technology, so cable speed can be throttled up to 300 rpm to negotiate turns, strengthen cleaning force, and expedite feeds and retrievals. Speed can also be reduced to as low as 100 rpm for tackling obstructions and debris. SmartDrive sounds an alarm when cable torque approaches unsafe limits and then automatically cuts power when that limit is reached. The machine comes equipped to work in 3- to 4-inch lines with 100 feet of cable, slip-joint fittings, autofeed, blades and accessories. A sink line kit is available to address 1.5- to 2-inch lines, and no tools are needed to swap reels due to the quick-release design of the drive system. 866-327-7176; www.mytana.com.

6 / SPARTAN TOOL MODEL 300

The Model 300 from Spartan Tool has a compact design that is suitable for tight spaces and narrow doorways. Its enclosed inner and outer steel drums keep the mess contained. It can be combined with up to 107 feet of Spartan Tool's Magnum cable for increased power and performance in a compact machine. 800-435-3866; www.spartantool.com.

CUTTING NOZZLES

7 / ENZ USA 10.300R ROTATING CHAIN SCRAPER

The 10.300R rotating chain scraper from Enz USA is an upgrade from the 10.200R chain scraper. It offers a pipe cleaning range from 8 to 20 inches. The chains are arranged for a multistage cutting concept, and the chain plates are harder and more durable. Because of its sealed bearings, this nozzle can be operated with both clean and recycled water while remaining relatively maintenance-free. It is a powerful root remover and can handle incrustations, concrete residues and other deposits. It can be used to prepare for restoration

work such as relining, grouting or applying coatings. Accessories include tap cutters for protruding taps and a wire rope head attachment for gentle cleaning in compromised pipes. 877-362-8721; www.enz.com.

8 / EPL SOLUTIONS MADDOG NOZZLE

The MadDog Nozzle from EPL Solutions, manufactured by Enz USA, is a redesigned Bulldog nozzle with optimized ceramic inserts for the highest ideal cutting power. It removes aggressive tree roots with flows as low as 5.5 gpm at 3,500 psi with 3/8-inch hose and up to 18 gpm at 4,000 psi with 1/2-inch hose. It is suitable for accessing mainline stoppages from a 2-inch toilet roof vent, wall clean-out or 8-inch manhole using a skid body since it is only 1.5 inches in diameter and 3.3 inches in length. A front oscillating penetrating insert is included and can be installed by the user for front cutting. It has a hardened steel body and is oil-free and zero maintenance. 714-453-9760; www.epls-usa.com.

9 / NOZZTEQ LUMBERJACK

NozzTeq Lumberjack cutters are low-torque, variable-speed, multipurpose cutting nozzles powered by common sewer jetting or combination trucks. The cutting chains rotate at speeds of 10,000 to 50,000 rpm, depending on pressure and flow rate. The precisely engineered cutter is designed to cut roots, but it also effectively clears out concrete, tuberculation, grease, protruding laterals and other obstructions. Low torque means it won't get stuck, won't harm host pipe and won't spin off the hose end. The cutters are sealed, include grease-lubricated bearings and are water-cooled so they don't need daily maintenance. Five models clear pipes from 3 up to 48 inches. The entire kit includes the turbine, water supply tube, chain plate/pull plate, tow ring, cutting blade, sleds, five sets of chain per sled size, propelling nozzle with jets and adapter, spanner wrench, hand tools and toolbox. 866-620-5915; www.nozzteq.com.



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10 / ROOT RAT CUTTING NOZZLE

Root Rat cutting nozzles are used with jetters from 11 hp to large truck-mounted models. The cutters are made of hardened stainless steel and come with a toolbox with two interchangeable rotors — one with cables and the other with chains. The combination kit includes extra chain, cable and bearings. They need no repair or rebuilding other than bearing replacement, which can be completed in less than two minutes for under \$10 in parts. 800-288-7873; www.rootrat.net.

11 / SEWER PRO SHOP VIPER

Viper chain cutters from Sewer Pro Shop are made of high-grade stainless steel and are equipped with ceramic nozzle inserts and UHMW wheels. They require no maintenance and are designed to be operator friendly for the municipal and industrial markets. The efficient, powerful hydrodynamic tool is designed to remove heavy obstructions caused not only by roots, but by grease, mineral deposits or other solid organic material as well. The unit is driven by a high-performance turbine, which doesn't require any lubrication. It utilizes turbine technology with optimized 3D hydromechanics, enabling less water and fuel consumption. The unit is available with three different-size, continuously adjustable guide skirts: 10- to 16-inch, 16- to 28-inch and 28- to 48-inch. It is also available with carbide bits for stubborn calcium deposits and scaling. It can be operated with recycled water. 877-864-9394; www.sewerproshop.com.

12 / STONEAGE WARTHOG WT-1/2

The Warthog WT-1/2 nozzle from StoneAge has been updated with a 1/2-inch inlet option and an R24 head engineered to increase the flow range up to 21 gpm. This configuration enables contractors to maximize use of their higher-flow pumps for more powerful cleaning while maintaining the small form factor of the WT for navigating pipe bends. The high-flow capacity paired with the company's WT 040-R24-C head allows contractors to utilize the full power of their pump to tackle the toughest jobs and achieve a higher rate of cleaning. The small form factor is optimized for cleaning 3- to 6-inch pipes with

elbows. The nozzle's slow, controlled rotation combined with high flow delivers optimal cleaning power for cutting roots or clearing tough deposits. 866-795-1586; www.stoneagetools.com.

13 / USB-USA HEAVY-DUTY TURBO CHAIN CUTTER

The Heavy-Duty Turbo Chain Cutter from USB-USA continuously adjusts from 8 to 15 inches (Turbo S200) or 12 to 24 inches (Turbo S600) and easily fits into the pipe. Turbine technology powers the durable chain retainer on a durable body to remove roots, concrete, calcium deposits, hardened grease and tuberculation from sewer lines. The chain cutters are very aggressive for the hardest materials. They have double the amount of turbine-driving water jets as the company's other cutters, generating tremendous cutting power. Easily adjust the cutter to within a 1/16 inch by spinning the rear to make it larger or smaller. Internal 3D fluid mechanics in conjunction with one-piece ceramic nozzle inserts allow the cutter to be used with recycled or clean water. 844-285-5770; www.usb-usa.com.

JETTERS

14 / CAM SPRAY CV SERIES

The CV Series cargo van drain jet from Cam Spray offers diesel-fired hot water for additional jetting power. Several models are available up to 4,000 psi and 12 gpm. A triplex plunger pump with power pulse valve provides an extra push when needed. Air purge and recirculation to the tank are provided for freeze protection. A 5-gallon fuel tank provides hours of runtime. It comes with a heavily built, powder-coated frame with full deck and 130-gallon water capacity; a 12-volt DC reel with 2-1 clutch drive allowing for free spooling; and a powered hose return. It is controlled by a push button or foot switch. Accessories include a four-nozzle set, storage box, tip cleaner, tiger tail, safety shield, rubber gloves, high-visibility safety vest, 50-foot washdown hose and trigger gun. 800-648-5011; www.camspray.com.



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15 / GAPVAX GJET

The GJet truck jetter from GapVax offers 500- to 3,000-gallon stainless steel water tank options and 40 to 100 gpm water pump options along with a front-mounted hose reel, various toolbox options, room for a vice or crane, and 10-foot tube trays. 888-442-7829; www.gapvax.com.

16 / RIDGID KJ-1350 WATER JETTER

The RIDGID KJ-1350 water jetter propels a highly flexible hose through 1 1/4- to 4-inch lines, blasting through sludge, soap and grease blockages. As users pull the hose back, it power-scubs the line, flushing debris away and restoring drainlines to their free-flowing capacity. A working pressure of 1,350 psi and flow of 1.4 gpm provides fast, effective cleaning of lines. It comes standard with a 1.5 hp motor that draws a maximum of 14 amps, can run on most standard 115-volt circuits, and is CSA and UL standards approved. Simply guide the hose into the drain while the thrust propels the hose down the line. Activate the pulse action to easily navigate difficult bends and traps, and use the pressure control valve for quick and easy pressure adjustment. An optional H-10 cart makes for easy job site transport. 800-474-3443; www.ridgid.com.

17 / VAC-CON HOT SHOT

The Hot Shot high-pressure water jet machine from Vac-Con is designed for removing stones, bottles, cans, grease, sludge and other debris from sanitary sewer and/or storm drainlines. Engineered for one-person operation, all high-pressure water and hose reel controls are located at the front of the machine for ease of operation and increased safety. Models are available with 1,000- and 1,600-gallon water tanks. Options include variable flow, articulating hose reel, polyethylene water tanks, 30 gpm at 3,000 psi water pump system, auxiliary engine or hydrostatic drive, cold-weather recirculation system, side-mounted toolboxes, air purge system, hose footage counter, arrow board, strobe lights, inspector cam, high-pressure spray bar, hose rewind guide,

600 psi handgun system with 25 feet of hose, and a selection of nozzles. 888-920-2945; www.vac-con.com.

18 / VACTOR RAMJET 850 SERIES

The RamJet 850 Series truck jetter from Vactor has a choice of front or rear hose-reel locations and productivity-enhancing options. An integral aluminum rear shroud with heavy-duty, see-through Lexan windows is available. Large service access doors on both sides of the shroud enable easy greasing, maintenance and service. The rear shroud keeps the hose and components warm and protected for quick setup and cleaning in extremely cold conditions. It comes standard with a certified flow of zero to 80 gpm at a variable pressure up to 2,500 psi at the hose reel to clean any size line. An optional JetRodder water-pump heated cabinet keeps the pump and plumbing covered and protected. The standard front-hose reel has a capacity of 800 feet of 1-inch hose and can telescope up to 15 inches forward and rotate up to 270 degrees. 815-672-3171; www.vactor.com.

ROOT CHEMICALS

19 / DUKE'S ROOT CONTROL RAZOROOTER II

Duke's Root Control uses Razorooter II, a thick, herbicide-laden foam with the consistency of heavy shaving cream. Since effectively killing roots in sewer systems requires access to the entire line, Duke's crew inserts a hose from manhole to manhole. The hose releases and sprays the foam in all directions, allowing it to adhere to roots and penetrate through wye connections to kill roots even in lateral lines. The entire system is treated as the foam compresses against pipe surfaces and penetrates cracks, joints and connecting sewers. Roots are killed on contact inside and outside the pipe walls, decay naturally, and slough away with regrowth delayed for two to three years. Trees and other aboveground vegetation are not harmed. 800-447-6687; www.dukes.com.



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20 / LENZYME TRAP-CLEER FOAMING ROOT CONTROL

Foaming root control from **Lenzyme Trap-Cleer** has double the active ingredient dichlobenil of previous solutions, along with a latex base designed to help it stick to roots longer. It is easy to apply and provides a slower foaming action to coat the entire pipeline and eliminate fast-foam-over messes. 800-223-3083; www.lenzyme.com.

21 / ROOTX CHEMICAL ROOT CONTROL

Chemical root control from **RootX** is a long-term solution to pipeline root intrusion. It stunts new root growth without damaging the pipe, clearing pipeline roots that can cause blockages and sanitary sewer overflows. The chemical won't harm water treatment systems and is registered with the U.S. EPA for both sanitary and storm use (EPA Reg. No. 68464). Simplicity of application enables crews to perform root control on demand or as scheduled preventive maintenance. 800-844-4974; www.rootx.com.

ROOT CUTTERS

22 / PICOTE SOLUTIONS MINI SWEEPER

The **Mini Sweeper** from **Picote Solutions** is designed to clean and descale pipes, including removing tree roots. It grinds away debris from the inside of the pipe at 1,000 to 1,500 rpm. The aggressive tool

is effective in situations where there is thick scale, rust or other waste materials that are difficult to remove. It can also be used to remove wrinkles in liners or to remove excess lining material from the pipe wall after a failed liner has been removed. It is rebuildable after the legs become dull. It is available for 2-, 3- and 4-inch pipe sizes and is powered by the Picote Mini or Maxi Miller. 708-267-6366; www.picotesolutions.com.

23 / PIPE LINING SUPPLY CHAIN KNOCKERS

Chain Knockers from **Pipe Lining Supply** are available in various diameters and cable sizes, and they are designed to be paired with the company's high-speed cable machines. They quickly cut roots using a cable spinning at high speed from 1,800 to over 3,000 rpm. The root removal process can be accomplished by drilling a hole with a hand drill, opposed to an electrically driven drill. While the slow hand-driven drill eventually bores a hole, speeding up the process using the high-speed cable machine results in faster drill cuts, saving time and effort. 888-354-6464; www.pipeliningssupply.com. **c**

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SPOTLIGHT

A confined-space lighting solution

By Craig Mandli



Working in confined spaces is difficult enough without dealing with the added burden of poor lighting. KH Industries solves that dilemma with LED HazRay hazardous location lights — available in a single hand-held and a stringer version, as well as a multihead light. These lightweight, fully customizable LED lighting solutions are suitable for an array of applications requiring certified CID1 lighting.

Designed with versatility and safety in mind, the HazRay is a lightweight, Class I, Div. 1 and 2 light that holds CSA certification for the U.S. and Canada. The NEMA 4X rating allows for integration in a wide range of outdoor and harsh-condition work site applications. The bright light's durable, lightweight body staves off fatigue in employees at the job site.

Standard features include shatter-resistant glass lenses on the LED modules, replaceable protective cover with diffused lens, black SOOW cord, and cord lengths of 25, 50 and 100 feet. The line also allows for many options, including clear replaceable protective lens covers, a cord gauge, custom cord lengths and daisy chaining. With a range of options in the market, all lights are manufactured with a blunt cut feed cord to allow customers to select the appropriate plug or connector for their application. Both hazardous and nonhazardous location plugs are available based on specific applications.

The 5-inch-diameter by 3-inch-tall HazRay single is a truly portable hand-held light that can be carried or mounted almost anywhere, including the most confined spaces requiring hazardous location lighting. With 45 LEDs in a single lamp head, it radiates 1,700 lumens and is 16.9 watts.

While lightweight and low profile, the HazRay stringer can be configured thousands of ways. A standard stringer that comes with five lamp heads weighs approximately 7.5 pounds and comes with a set of adjustable safety straps for each lamp head. It can be mounted to allow for wide area lighting using its 120-degree beam angle or directed for a more focused light path.

Based on individual application, the lightweight multihead light can be customized in any configuration of lengths and variations. With integrated cord management, this compact and powerful explosionproof light will help keep cords safely wrapped up when not in use. With ergonomic handles and teardrop-shaped holes that provide a closed-loop mounting option, positioning the multihead is easy. 716-312-0088; www.khindustries.com.



1 GENERAL PIPE CLEANERS JM-1000 MINI-JET

General Pipe Cleaners/General Wire Spring's portable JM-1000 Mini-Jet has a new, high-performance stainless steel braid jet hose that offers drain cleaning power and performance in a small package. The JM-1000 Mini-Jet is available with stainless steel braid/Teflon core hoses in a variety of lengths. It has 1,500 psi of cleaning power in a compact package, yet weighs only 23 pounds. The stainless steel braid hose design slides the jet nozzle down 1.5- to 3-inch drainlines and more easily navigates tight bends. The 3/16-inch Teflon core also reduces flow resistance, further improving small-line cleaning power. The standard package has a four-piece nozzle set, water supply hose, shut-off valve and universal faucet adapter. Safety features include a three-wire GFCI. 800-245-6200; www.drainbrain.com.

2 AVANTI INTERNATIONAL HYDROPHOBIC GROUTS

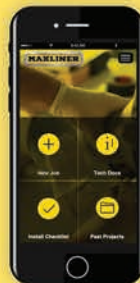
Avanti International's hydrophobic grouts are available in new, easy-to-use dual cartridges: AV-248-LV Flexseal LV with AV-249-LV Flexseal Cat LV, AV-275 Soilgrout with AV-276 Soilcat and AV-290 Fast-Set. These products are used to permanently stop leaks, stabilize soils and control groundwater. The catalyzed AV-248-LV and the AV-275 Soilgrout are a moisture-activated, MDI-based polyurethane resins. The AV-248-LV resin is designed to seal active and potential water leaks in various cracks and annular spaces where flexibility is needed but is susceptible to wet/dry cycles. The AV-275 is designed to bind together and waterproof loose granular soils. And the AV-290 is a midrange viscosity, dual-component, hydrophobic MDI-based polyurethane resin designed to fill large voids on the exterior of below-grade structures where high-water flow is present. 800-877-2570; www.avantigrout.com. c



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Amazing Machinery announces expansion of products

Amazing Machinery announced it has expanded its selection of cable machines, cables and blades. They now offer a full line of Drainscables Direct cables, replacement ends and blades. They have replacement cables for Electric Eel, Valor, General Pipe Cleaners/General Wire Spring, Cobra and many others. They also offer cable machines and sectional machines from Steel Dragon, RIDGID and General Pipe Cleaners. Cable lengths range from 10 to 150 feet, and cables are available in 1/4 to 1.5 inches in diameter. Additionally, they offer most cables with choice of no core, aircraft wire, cable core or plastic core.

Applied Felts acquires FerraTex Services

Applied Felts entered into binding agreements to acquire the business and assets of New Jersey-based FerraTex Services. The acquisition includes the complete transfer of all property, equipment, intellectual property and expertise.

In a release from Applied Felts, Alex Johnson, president, says, “FerraTex Services has built a very successful preimpregnated CIPP liner business by leveraging their extensive experience in

CIPP logistics and installation. Our close collaboration since 2016 has enabled us to witness firsthand FerraTex’s expertise and commitment to operational excellence. While ‘business as usual’ will be our operational guiding principle for FerraTex going forward, we are excited about what the future holds for this partnership, particularly our ability to enhance the offering to customers through the group’s manufacturing, R&D and global experience as the CIPP industry continues to expand.”

HOBAS Pipe USA participates in the Demand Response program

In addition to the certifications in accordance with ISO 9001 and 14001, HOBAS Pipe USA worked with its local energy company to participate in its Demand Response program. Demand Response is a solution that enhances energy reliability and helps electrical customers reduce their electricity usage during times of peak usage or community emergency, reducing electricity demand. HOBAS’ manufacturing plant is able to transition from grid power to generator when they are notified by the grid operator or utility company that the grid is stressed and approaching a high level, weather events signal potential power outages, or an emergency or catastrophic event requires curtailment.

Signature Equipment joins Vac-Con distributor network

Vac-Con announced that Signature Equipment in Salt Lake City has joined its distribution network. Signature Equipment has been in operation since 1994 when founder Reed Prows opened its doors to serve the Utah markets. In 2017, the company relocated to a larger facility to accommodate the growing demand on its workforce and staff. The Vac-Con product line will be the first vacuum truck portfolio that Signature Equipment has carried. Their other product offerings include refuse collectors, utility bodies, snowplows, salt spreaders and more.

Municipal sewer grout school dates announced

In conjunction with CUES, Avanti and Logiball the municipal grout school will be held March 25 and 26 in Orlando. The level 200 program will provide hands-on demonstrations for leak sealing and present technical information on several topics including lateral and mainline test-and-seal packer operation and performance, mixing and optimizing AV-100 acrylamide grout performance, review and demonstration of new NASSCO/ICGC grout specifications, live infiltration and grout-sealing demos, and new grout testing and monitoring information and methods. Attendees will receive credit for 10 professional development hours certified by the Center for Innovative Grouting Materials and Technology. To register, contact Jessica Williams at Avanti, 281-956-3111 or email jessica.williams@avantigrout.com. **c**

“I love to do what people say can’t be done ...

Even my dad told me

the world isn’t ready for a woman plumber.

I think he did it more to protect me

because people can be very harsh and cruel.

But he’s very proud of me, even though he fought me

on it and told me I was making a big mistake”

Jessie Cannizzaro, Owner

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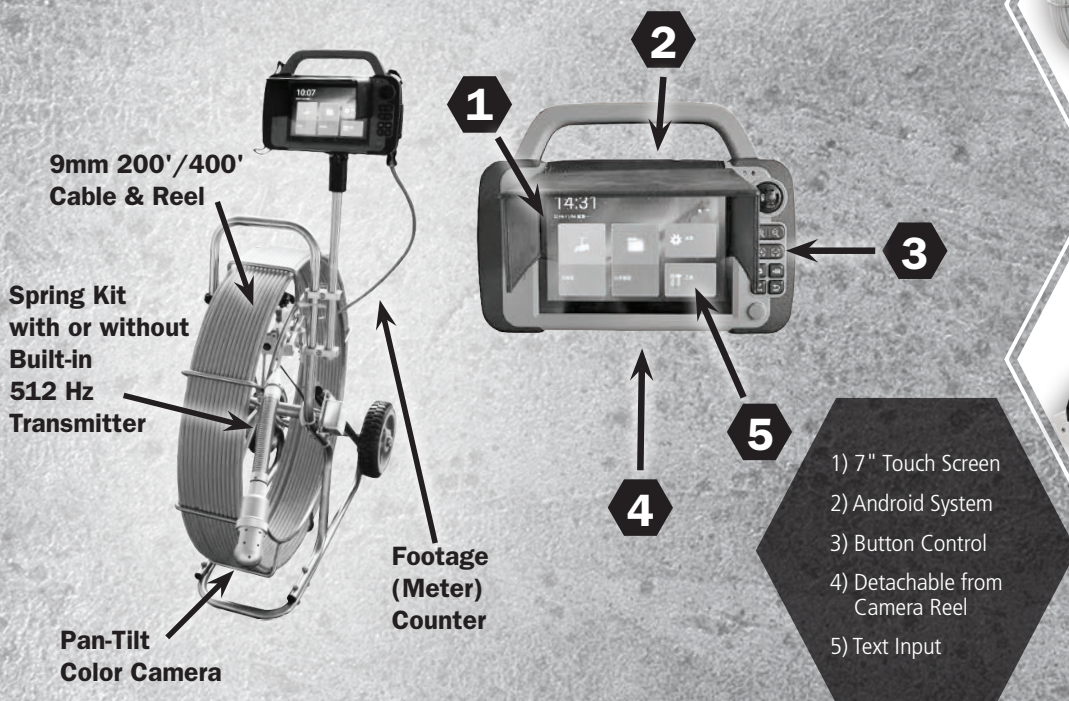
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613-293-1965, Ontario C04

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2007 Volvo with a Vactor 2115 combination unit. (Stock# 5903C). **(888) VAC-UNIT (822-8648); www.vsrentalsllc.com** (CBM)

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419-656-4035, OH C03



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Mike 515-707-9002, IA
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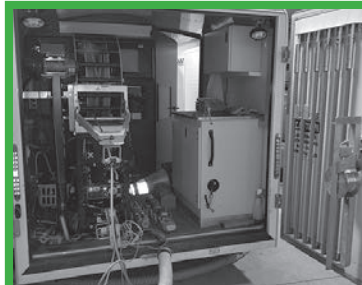
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613-293-1965, Ontario C04

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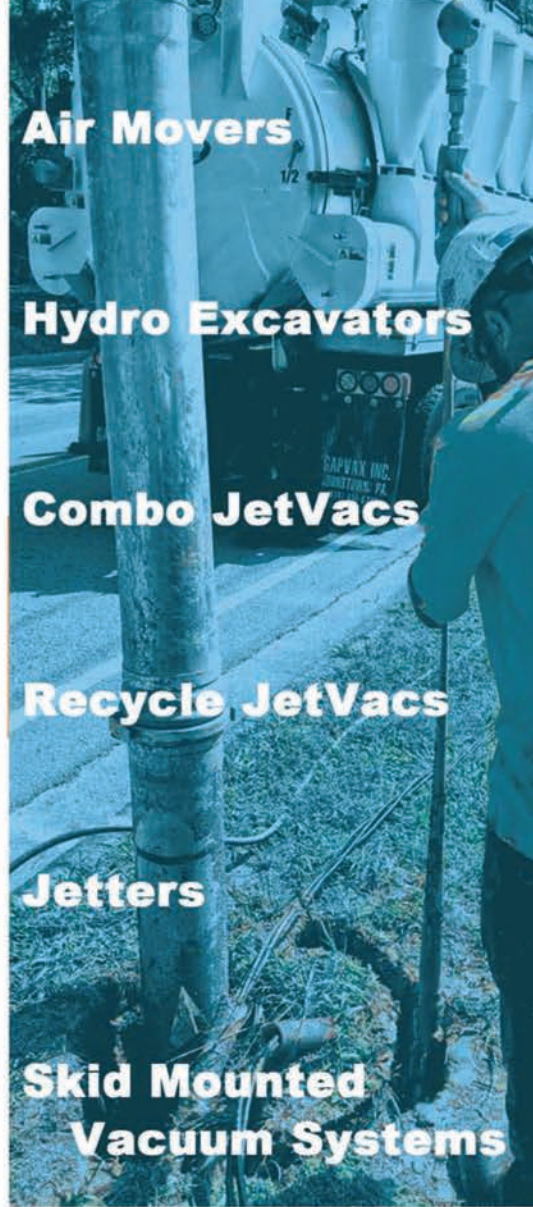


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