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JANUARY 2020
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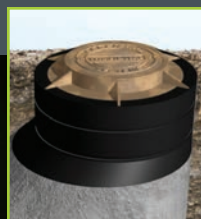


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ALL DRAINS INVESTS HEAVILY IN ITS
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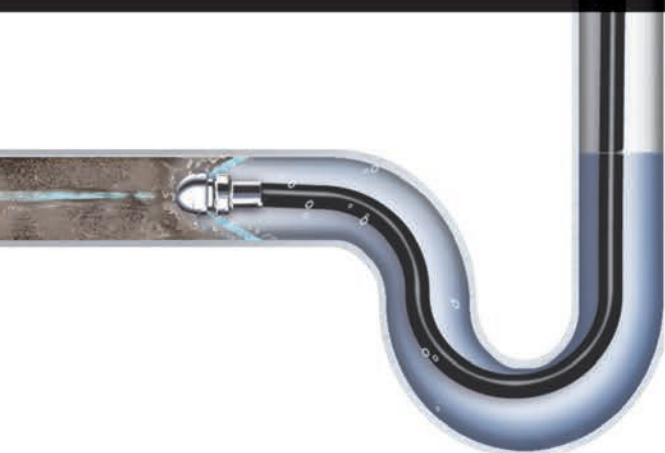


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Profile

NuFlow Certified Contractor

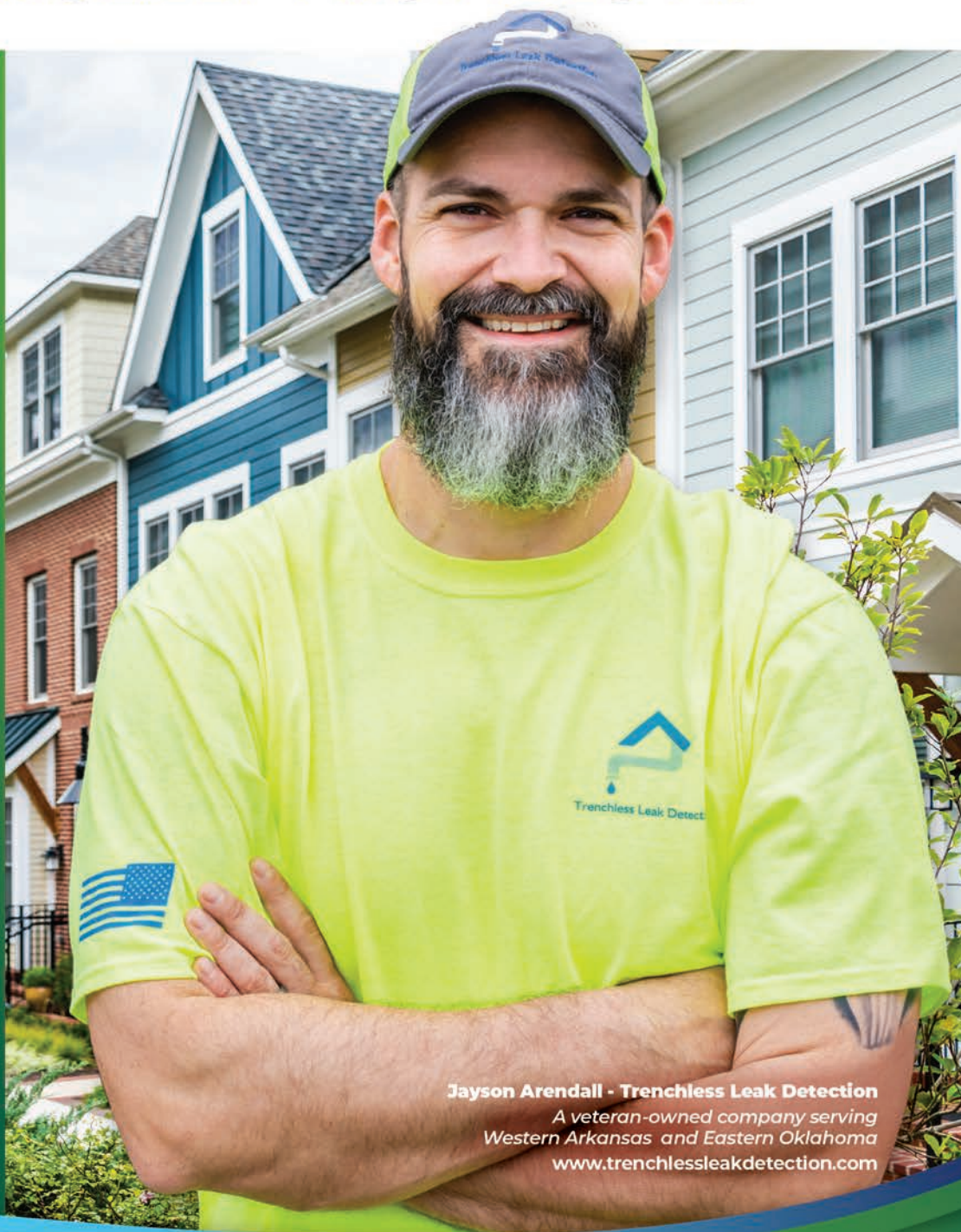
Jayson Arendall saw the need to expand and diversify his leak detection business. He chose NuFlow in March of 2019 because of their superior products and reputation for outstanding support.

"The culture of NuFlow is what makes this work. They give you a sense of family with the type of support they provide."

The NuFlow team worked with Jayson to get him up and running, first with hands on technical training and then following up with onsite support.

"One of my very first jobs was really technical. I called NuFlow and they sent two guys out to help me bid and execute the job. Everyone talks about support, NuFlow actually provides it."

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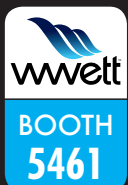
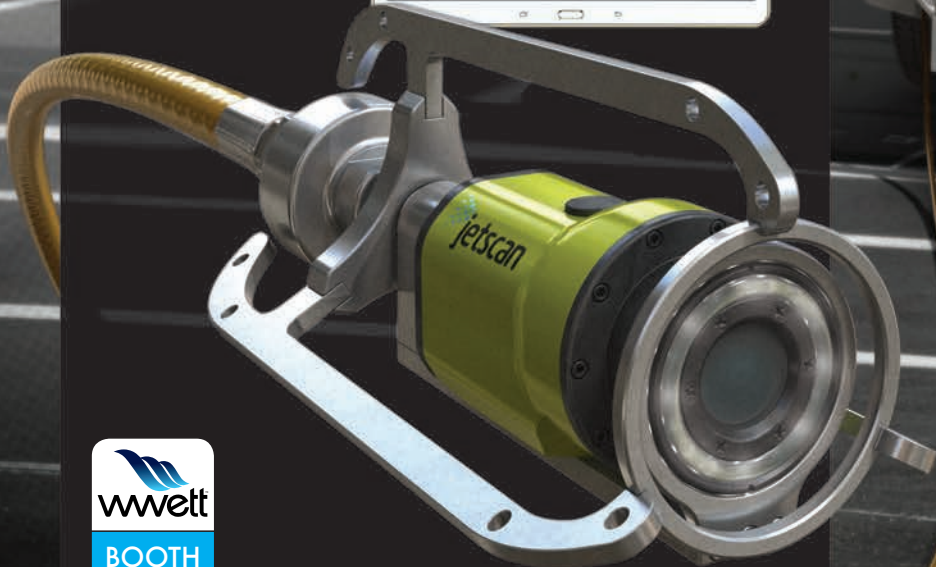


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ON THE COVER

Duane Goodpaster, owner of All Drains Drain Cleaning and Plumbing Repair, prides himself on turning his company into a one-stop shop. He lives up to his company name, purchasing all the equipment he needs to tackle any job that comes his way without needing to hire out any of the work to subcontractors. (Photography by Amy E. Voigt)

COMING IN FEBRUARY

Field & Office Technology

SAFETY FIRST: Mitigate the risks of manhole entry work

BETTER BUSINESS: Tips for navigating tough conversations with employees

MONEY MANAGER: Put a plan in place before offering service contracts

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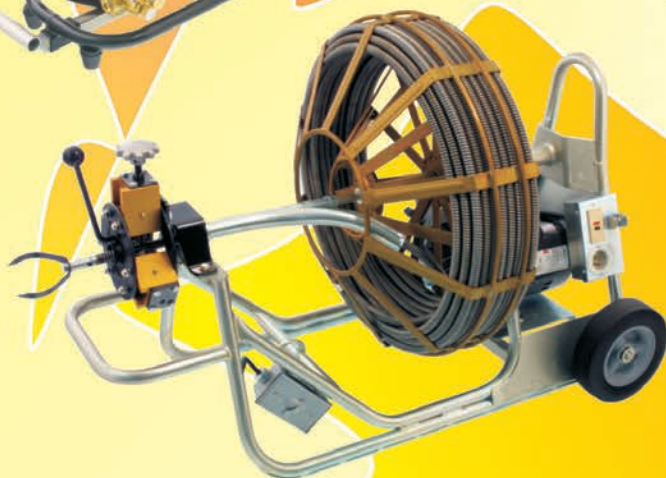
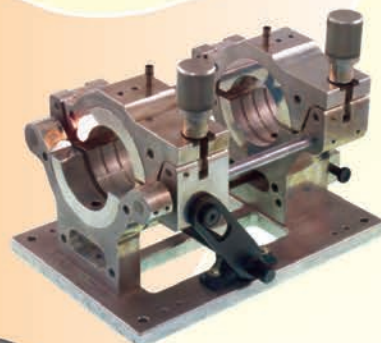
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New Year, New Start

This is the perfect time to review your business plan, analyze what's working and set new goals

January marks the start of not only a new year, but a new decade. There's something very refreshing and "clean slate" about Jan. 1, 2020.

The beginning of a new calendar year is the time many people put new goals and habits into action. And the more motivated among us may keep those habits for more than a couple weeks.

Even if ringing in the new year is barely a blip on your radar, it's not a bad idea to take this time to set some goals for your business. But no matter how motivated you are or how ambitious you want your goals to be for this year — or the next 10 years — you do yourself



Kim Peterson

a disservice if you don't first do some honest reflection about how things are going.

As a business owner, you have your finger on the pulse of your company year-round. At the same time, getting bogged down in the day-to-day work and short-term results can make you lose sight of the big picture.

You should have a business plan that outlines your goals and a clear path for where your business is headed. That plan is the blueprint that guides your whole operation. The problem is when the plan no longer reflects reality.

January is a good time to go over your business plan if you haven't done so recently and to make sure it still represents the direction you want your business to go. (In case you missed it, the November 2019 issue contains a Money Manager article that is a great guide to updating a business plan. It can also be found online, titled "Why Your Business Plan Needs to Be Updated.")

This is also the perfect time to try something new. If you've been thinking about making some changes to your marketing strategy or doing some research on a new service, now is the time. Even if it's something you can't immediately implement, you can outline a plan to reference throughout the year to keep yourself on track.

While trying out new ideas is never a bad thing, sometimes it just doesn't work out.

For example, DrainPro, the Baltimore-based company featured in this issue, started out with zero marketing. Pat Martin, general manager, and Melissa Martin, his wife and a co-owner of the company, drummed up business solely by pitching their services directly to plumbing companies. They use only unmarked vehicles and handle work that plumbers don't have the equipment to do.

Four years in, they decided to give traditional advertising a try. They saw an increase in call volume, which led to hiring more employees. But all those added expenses weren't worth it when their call-closing ratio took a hit. So the Martins went back to their original plan and have stuck with it ever since.

So if your goals for the year include some new ventures, don't be afraid to give it a shot. And even if it doesn't work out, that doesn't necessarily mean you failed. Maybe it just means you were right the first time.

I hope you enjoy this month's issue. c

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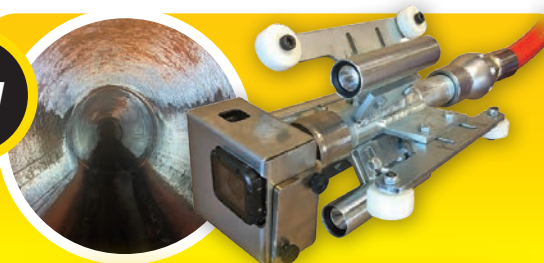


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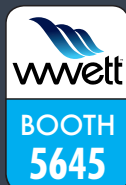
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EQUIPMENT STRATEGIES

To Rent or Own?

Equipment rental has its upsides, especially when it comes to reducing risk. However, there can be advantages to equipment ownership if you are confident in the technology and your work outlook for the machine. Every situation is unique, but this online exclusive covers four signs that rental may not be your best option.

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“Be careful not to pose your backlog in a negative light or else that’s how customers will perceive it. You don’t want them thinking the company is low on resources. You want them to perceive you as in high demand for all the right reasons.”

— Managing Your Customers

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MACHINE MAINTENANCE

Tips to Help Avoid Job Site Problems

Proactive equipment maintenance is a no-brainer in this industry. Equipment is worked hard out in the field and breakdowns can be costly to the company bottom line. Still, it remains something that can sometimes get overlooked. This online exclusive covers maintenance tips for various pieces of industry equipment that you may have in your arsenal. [»cleaner.com/featured](https://www.cleaner.com/featured)



INVEST IN PEOPLE

Workforce Investment Boosts Employee Retention

Much of a company’s success has to do with the quality of its employees, so it’s vital to hang on to the good ones. The three companies featured in this online exclusive serve as prime examples of the types of methods that tell your employees they’re valued members of the team.

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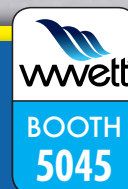


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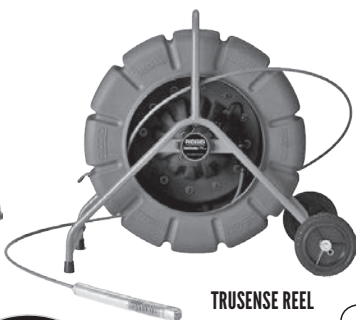
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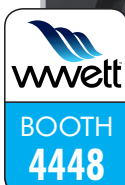


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» Duane Goodpaster, owner of All Drains Drain Cleaning and Plumbing Repair in Middletown, Ohio, uses a RIDGID K9-102 FlexShaft to clean a bathroom drain in Fire Station 81.

READY FOR ANYTHING

All Drains invests heavily in its equipment in order to make the most of every job opportunity

By Ken Wysocky

Photography by Amy E. Voigt

A recent residential pipeline rehab project completed by All Drains Drain Cleaning and Plumbing Repair vividly illustrates the southwestern Ohio-based company's recipe for growth since its inception in 2001. The project involved fixing roughly 50 feet of damaged 6-inch-diameter clay sewer pipe that ran under a busy four-lane road. Digging up the road to replace the approximately 15-foot-deep line, which was the homeowner's responsibility to repair, would've cost upward of \$75,000, says Duane Goodpaster, who owns the company with his wife, Tonna Goodpaster.

But All Drains stepped in and cleaned out the line with a drain machine, flushed the debris with a Warrior trailer jetter from Spartan Tool, inspected it and then rehabbed the pipe with Trelleborg Pipe Seals cured-in-place liner.

"They all work together," says Duane Goodpaster, 47, while talking about the competitive advantages of being a one-stop shop for customers, with no need to hire subcontractors to do work he can't perform. "I use the Clog Dog Flex Shaft (Clog Squad) and RIDGID FlexShaft to remove roots, the Warrior to clean pipes and create a surface clean

enough to bond with a liner, a camera to inspect the lines and the Sactools pipe lining system to renew the pipes.

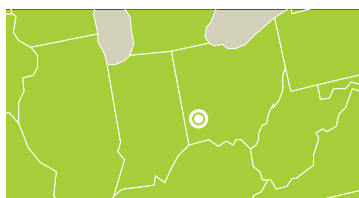
"You need to own the right tools to do the job. You can't just go in and fix everything with an old cable machine, which is what we started out with years ago. You're only as good as your tools and equipment.

"I tell people our company name is All Drains. You can't have a name like that and then refer clogged drains and broken pipes to another company. So over the years, I've always prided myself on investing in all the equipment we need to be the best."

Owning a full complement of technology also offers another benefit: Goodpaster consistently gets hired as a subcontractor by area plumbers, drain cleaners, maintenance crews and the like.

Investing in advanced, reliable equipment — such as the Warrior jetter purchased in mid-2019 — also provides another competitive advantage: The confidence to offer an ironclad guarantee to customers who are a bit nervous about spending substantial amounts of money to get sewer lines unclogged.

"I tell them if I can't get the job done, it's free," he says. "You can't beat that."



All Drains Drain Cleaning and Plumbing Repair LLC

LOCATION: Middletown, Ohio

OWNERS:
Duane and Tonna Goodpaster

EMPLOYEES: 3

FOUNDED: 2001

SERVICES: Drain cleaning, trenchless pipeline rehab, and service and repair plumbing

SERVICE AREA: 50-mile radius around Middletown

WEBSITE:
www.alldrainsonline.com

"You need to own the right tools to do the job. You can't just go in and fix everything with an old cable machine, which is what we started out with years ago. You're only as good as your tools and equipment."

Duane Goodpaster

« Drain technician Luke Brongersma uses a RIDGID K9-204 FlexShaft to clean a floor drain at the fire station.

STARTING OUT SMALL

Goodpaster got into drain cleaning after working for several years for another contractor. "I wasn't happy working there, but I really liked the service end," he says. "I liked the freedom of making service calls — getting jobs done. Eventually I wanted to start my own business."

So he established All Drains in 2001 in Middletown, which is about halfway between Dayton and Cincinnati. His equipment consisted of a \$200 used cable drain machine and a used cargo van he bought for \$600.

Today the company, which derives 70% of its revenue from drain cleaning and pipeline rehab and 30% from plumbing service and repair work, owns a significantly larger inventory of equipment. The list includes three Spartan 300 drum cable machines; two RIDGID SeeSnake pipeline inspection cameras (one standard model and one Mini model); four RIDGID FlexShaft drain machines (two K9-102s and two K9-204s); three Flex Shaft drain machines made by Clog Squad; the aforementioned Spartan Warrior, equipped with a 500-gallon water tank, 500 feet of 1/2-inch-diameter hose and a water pump that generates 4,000 psi at 30 gpm; and two RIDGID NaviTrack Scout pipeline locators.

For service vehicles, the company relies on three Chevrolet 3500s outfitted with 12-foot Spartan box bodies made by Supreme and a Ford F-350 that tows the Warrior jetter. The three Chevrolets are equipped with 2,000-pound-capacity winches made by Champion Power Equipment. The company also owns a trailer, made by Diamond C Trailer and used to carry pipe lining equipment and materials, as well as a skid loader and a mini-excavator, both made by Caterpillar.

TRENCHLESS PIPE REHAB

The pipe lining system from Sactools represents the company's most significant technology investment. Sactools is a brand owned by Sweden-based Sacpro AB.

"I found out about Sactools at the last WWETT Show," Goodpaster says. He bought the installation equipment from Clog Squad, a Michigan-based drain cleaning company that also sells and develops equipment. The company is also the North American distributor for Sactools.

The Trelleborg liner the company uses features an aluminum-infused epoxy resin that makes it harder and stronger. It also features an impermeable polyurethane coating on the liner's exterior. After technicians wet-out the liner with the resin, it's pliable for 12 hours. "You don't have that time bomb ticking," says Ken Beyer, owner of Clog Squad. It cures in about an hour, using either steam or hot water.

During installation, air or water pressure is used to invert the liner, which flips the resin-impregnated side of the liner to the outside, so it can adhere tightly to the interior of the host pipe. At the same time, the polyurethane coating gets turned outside in, forming a smooth and strong pipe within a pipe. The liner is suitable for pipes ranging from 2 to 8 inches in diameter, Beyer says.

"We have a lot of confidence in the system," Goodpaster says. "It's a very smooth and clean lining process. I love it."

A good match

When asked about the smartest business move he ever made, Duane Goodpaster answers without any hesitation: hiring his son-in-law, Luke Brongersma, age 30, as a drain cleaning technician.

"If I could clone him two or three times, that would be amazing," says Goodpaster, the owner of All Drains Drain Cleaning and Plumbing Repair in Middletown, Ohio. "People ask for him by name all the time, and he gets a lot more (online) reviews than I do."

"Luke explains things thoroughly to customers and tells them how they can prevent problems from occurring again. And there is no tension between us — no arguing, no problems."

Goodpaster got to know Brongersma at a local gym where they both worked out. When Goodpaster heard that Brongersma was no longer in a relationship, Goodpaster jokingly told him he should meet his daughter, Kodie.

"I didn't like the guy she was dating at the time, so I showed Luke a picture of Kodie," Goodpaster says. "As it turned out, Luke realized he already knew her from high school and we used to live on the same street." The two started dating a month or so later and got married in 2016. "Kodie accuses me of creating an arranged marriage," he says with a laugh. "But it has worked out great for all of us."

The key to successfully working so closely with family members is simply to treat them with respect, Goodpaster says.

Brongersma agrees. "A lot of it comes down to respect for each other," he says. "Every day I'm thankful Duane gave me the opportunity to have this job. So every day I do everything I can to uphold the standards he's established for this company."

It also helps that Goodpaster isn't a micromanager; he trusts Brongersma to make service calls by himself. "Also, we were friends before I married Kodie and we had a good relationship," Brongersma says. "And we've been able to carry that on. I definitely know this isn't super common. But it works really well for us."

Looking down the road toward retirement, Goodpaster says he'd be happy if Brongersma would want to take over the company. "It's been a really good adventure for us, and unless we hit the lottery and we both retire early, the company is his if he wants it," Goodpaster says.

"I definitely hope he'd want to do that, and I hope I provide him with enough knowledge and experience to do it. This work is demanding, and I know I can't do it forever. So if he wants to, that's definitely the direction we're heading."

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✓ Duane Goodpaster uses the remote control on a 2019 Spartan Warrior jetter to clean a drain.

QUALITY CONTROL

Goodpaster decided to invest in the Sactools system for two primary reasons. First, he's convinced that lining is the future of pipeline rehabilitation. Second, he didn't like the idea of hiring subcontractors to do the work.

"We want to make sure our customers receive the best possible results," he says. "I don't like putting my reputation for quality work in someone else's hands."

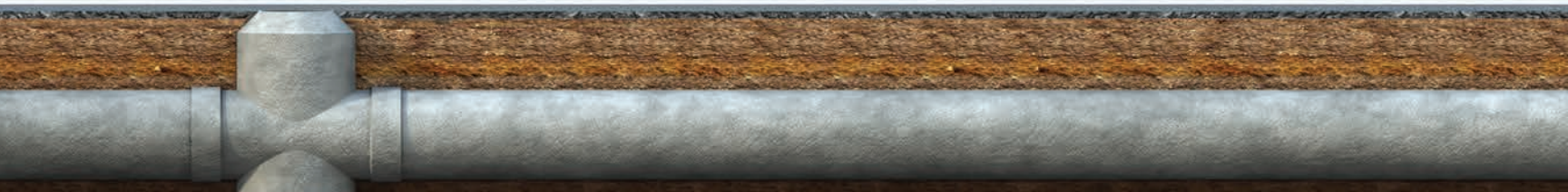
Goodpaster estimates that he invested around \$100,000 in the system. But he sees it as an instrumental part of his service offerings going forward. As an example, he points to one of All Drains' clients, a large global manufacturing company with a plant near Middletown that needs more than 100 feet of sewer pipe repaired.

The sewer line runs under large

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“The bottom line is you need to have the right tools for the job, and I think that’s definitely been one of the keys to our success.”

Duane Goodpaster

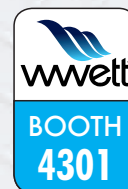
machines inside the plant, and moving them to excavate and replace pipe is an expensive proposition, plus it would cost the manufacturing company hundreds of thousands of dollars a day in lost productivity from prolonged downtime. “But with this trenchless, no-dig system, we can line the drain pipes without disturbing the company’s production.

“To some people, this might sound like a risky investment. But once I saw how well the technology worked, I couldn’t do it quick enough. To me, it was a no-brainer.



▲ Luke Brongersma is a valuable member of the All Drains team. Customers love that he explains things to them so thoroughly, and ask for him by name when booking jobs.

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“Our biggest challenge is getting homeowners to let us do what needs to be done, especially if previous contractors have failed. **That’s where our guarantee comes into play.**”

Duane Goodpaster

“The bottom line is you need to have the right tools for the job, and I think that’s definitely been one of the keys to our success,” he says.

INSTANT GRATIFICATION

One of the things that Goodpaster likes best about drain cleaning is the daily opportunity to both solve problems and help people. “There’s a lot of gratification in knowing you’re helping people every day — that we can show up with the right equipment, do a good job and make their day better,” he says.

“The problem-solving is a big part of it as well. Since we’ve been doing this for so many years and we have the right equipment, it’s often not as much of a challenge these days — we’re just really good at this. In fact, our biggest challenge is getting homeowners to let us do what needs to be done, especially if previous contractors have failed. That’s where our guarantee comes into play.”

Sometimes Goodpaster is surprised by his company’s growth. “On the other hand, I never thought about it not working out. In my head, it’s always just going to happen.

“I don’t think in reverse. ... I’ve always just thought about the next thing that can make things better. When you have two young daughters and a wife, you have to go out and make it work.”

Looking ahead three to five years, Goodpaster says he’d like to hire at least two more technicians. “I see us continuing to do what we do, just a larger volume of work.”

He doesn’t have any secret formula for hiring good employees — “Other than getting someone to marry my daughter,” he jokes, referring to Luke Brongersma, his son-in-law.

Goodpaster concedes that finding quality employees with a good work ethic is difficult. But



▲ Duane Goodpaster (left), with employees Tonna Goodpaster and Luke Brongersma, serves a 50-mile radius around Middletown, Ohio, and takes pride in investing in quality equipment that can tackle any drain cleaning job.

he’s so sure it’ll happen that in a mind-over-matter moment, he already bought a new truck and outfitted it with drain cleaning equipment.

He says his confident outlook always pays dividends. “In my mind, something is always going to work. There’s someone out there who needs a job or a career change. And I’m sure we can find that person.” **c**

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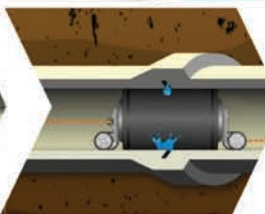
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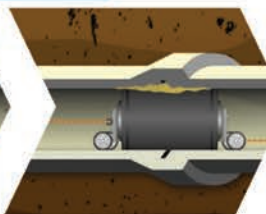
1 CCTV locates defect in pipe



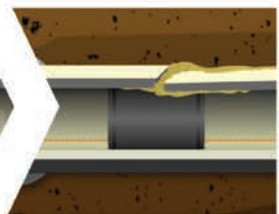
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3 Packer inflated and sleeve installed



4 Packer deflated while grout fills void



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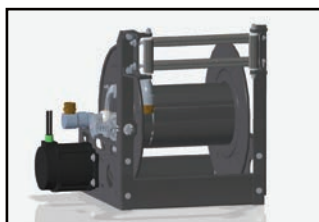
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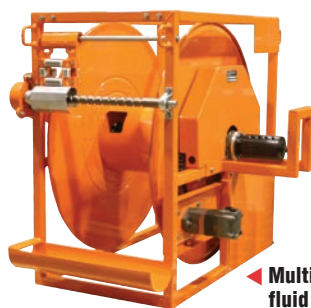
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Kenneth Burke

Customers Prefer Texting

A business texting tool can help you reply to customers quickly and land more jobs

By Kenneth Burke

Wouldn't you love an "easy button" you could press to magically grow your revenue? Magic buttons don't exist, but the next best thing in today's world is text messaging. Texting seems so simple, yet it can be that powerful.

Think about your daily experiences. Customers miss — or dodge — your calls. You're waiting on people to respond to emails, and you're pouring money into marketing trying to connect with customers. There's a lot going on, but you can easily improve in these areas to save time and grow your bottom line, all through text.

1. TEXT TO EARN MORE ONLINE REVIEWS.

Online reviews are the most important piece of your sales and marketing, because they directly affect how you rank in Google search results. The company with the most online reviews shows up first and historically earns twice as many opportunities as the second-ranked business and three times more than the third. That adds up fast.

Online reviews are also crucial to sales and marketing because about 90% of people use reviews to determine who they should hire. The more reviews you have, the more customers you're going to win. And to get more online reviews, all you have to do is ask through text.

For example: "Jonathan, it was a pleasure helping you with your drainage issues today. Would you share your experience with us on Google? I'd really appreciate it. Here's the link: www.google.com/bizreviews. Thank you!"

Companies that do this tend to earn 600% more online reviews than those who ask via email.

2. TEXT TO GENERATE MORE LEADS.

Did you know that nine out of 10 people would rather text you for service than call or fill out a form? Use that to your advantage by letting prospects text you from your website.

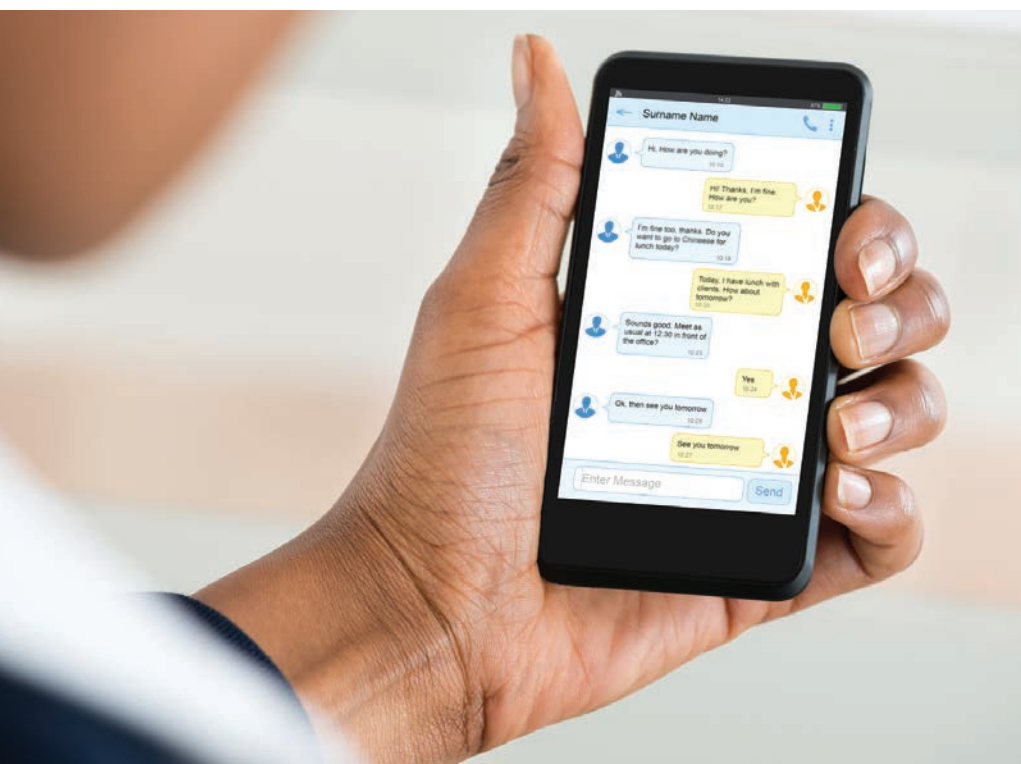
To do that, either use Click-to-Text, which lets mobile viewers click a button to start a text to your business' number, or use SMS Chat, which is a widget that lets both desktop and mobile viewers start text conversations with you from your website.

These are proven to increase leads, because you're able to meet customers where they are — on their smartphones trying to reach you, often outside of your 8 a.m. to 5 p.m. business hours.

3. TEXT TO CLOSE MORE DEALS.

It doesn't matter how many leads you get if you can't close them. But closing can be difficult, especially when up to 50% of deals go to the first person to respond. How can you reach leads before competitors and earn their business?

Text messages are five to seven times more likely to be answered than a phone call or email, and the average text is seen within five seconds of being sent. It doesn't get much faster than that.



You can have text follow-ups automatically sent to anyone who fills out a form on your website or texts your office line, and then you can personally follow up whenever you get a moment.

Did you know that nine out of 10 people would rather text you for service than call or fill out a form?

I normally recommend you do both — have an automatic response sent and then follow up personally. You'll instill confidence in the potential customer by sending the automatic response. And then they'll recognize your number when they see you text or call later, so you'll be more likely to connect with the customer than the other guys.

HOW DO YOU MANAGE TEXTING?

Adding text into your daily workflow is simple, but you'll want a software or integration with your field service management tool to make it happen. A few things you'll want are:

1. An option to text using your office phone number (a great experience for customers)
2. A multiuser dashboard so front office personnel and technicians can both text as needed
3. Two-way (conversational) texting
4. And a few bells and whistles like message scheduling, group (broadcast) messaging, picture messaging, etc.

Starting is easy. Find the business texting tool that works for you, and determine how you want to use it. As soon as customers know they can text back and forth with your business, you'll see traction — and more revenue. **c**

ABOUT THE AUTHOR

Kenneth Burke is the director of marketing for Text Request, a business text messaging software company that works with clients across North America. He has been awarded for his work in sales and psychological research and has helped dozens of businesses — from prelaunch startups to billion-dollar companies — achieve their goals. Burke and his insights have been featured in publications including *Forbes*, *Entrepreneur* and *StartupNation*. Burke can be reached at kenneth@textrequest.com.


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Patrick Ungashick

Know Your Worth

Determining the value of your company is complicated, but in many cases you don't need to pay thousands of dollars for a formal valuation

By Patrick Ungashick

Business valuations are an important tool for owners of privately held companies. For example, if you are doing sophisticated tax planning, buying-out a business partner or if an owner is going through a marital divorce, then a valuation may be highly prudent — if not legally required.

However, business owners should avoid rushing to get a valuation in circumstances where the need is not clear. Here are three common situations where getting a valuation may seem to make sense, but might actually be unnecessary or counterproductive.

SITUATION ONE: YOU ARE GETTING READY TO SELL THE COMPANY

A commonly held view among business owners is to get a formal valuation prior to selling the company. Some valuation firms, investment bankers and business brokers promote business valuations as a first step in preparing to sell. Presumably, this identifies the potential sale price and helps the selling owner set realistic expectations. A closer examination suggests a valuation in this situation is often unnecessary or even misleading.

Investment bankers or business brokers familiar with your company's industry should be able to provide an estimated range they expect the company could sell for, without a formal valuation. Also, a formal appraisal before selling the company can be misleading. To explain why, imagine you intend to sell your home, and to determine your listing price, you have the home appraised. The appraisal comes in at \$1 million so you list the home for sale at that price. After many months, you receive multiple offers but only for around \$800,000. In that example, the home's value is clearly closer to \$800,000 rather than \$1 million, regardless of what the appraisal said.

The same thing can happen in reverse. If you list your home for \$1 million but immediately you receive multiple offers for a much greater amount, then the appraisal was misleading — it was too low. Just like with a home, what your company is worth at sale is what a buyer will pay for it — period. The existence of a third-party

valuation claiming that your company is worth \$X will not cause a potential buyer to increase its offer price by \$1 more than the buyer is otherwise willing to pay.

If you are preparing to sell your company, instead of getting a valuation, ask several investment bankers or business brokers to estimate a likely sale price and explain their reasoning. You still may end up selling your company for a higher or lower price, but you will not have wasted time and money on a valuation that potential buyers will typically ignore.

Tracking company performance using a formal valuation may also be counterproductive
because a valuation is only partially based
on the company's internal results.

SITUATION TWO: YOU'RE CURIOUS

Knowing what a privately held company is worth is difficult or impossible most of the time. This can be frustrating, particularly when the company is usually the owner's most valuable (and cherished) asset. Imagine putting most of your money into an investment portfolio where you will rarely know what your investments are worth. Few people would be able to sleep at night in that situation.

Therefore, business owners can be tempted to get a formal valuation simply to know what their company is worth at that point in time. It can be helpful to periodically establish a realistic understanding of the company's value. However, paying thousands of dollars to get somebody's opinion about what the company is worth (even an expert opinion) is often not necessary because alternative methods may be available for little to no effort or cost.

One alternative method to gauge your company's value is to research what companies of similar size in your industry are currently selling for, based on a multiple of earnings (usually calculated as earnings before interest, taxes, depreciation and amortization — EBITDA) or in some cases a multiple of revenue. For example, if similar companies in your industry are currently selling for six to eight times EBITDA and your company's EBITDA is \$2 million, then your company value could fall between \$12 million and \$16 million. Clearly this approach does not provide the depth of analysis nor precision that is provided by a formal valuation. But a market-based

estimate will give you a general understanding of company value on a periodic basis — without the time and expense of a formal appraisal.

To learn the applicable multiples, ask an investment banker or business broker who is knowledgeable in your industry. That person may know the current market multiples off the top of their head or can likely get the answer for little effort. Alternatively, research the subject online. You may find a recent article or report prepared by a trade organization, consulting firm or business advisor that summarizes market multiples in your space.

SITUATION THREE: YOU WANT TO TRACK COMPANY PERFORMANCE

The third scenario that seems to require a valuation is to track changes in your company's performance and growth over time. Again, the value of a privately held company can be a great unknown. Many business owners see benefits in engaging a valuation expert, and they use the appraisal to monitor the company's performance. However, getting a formal valuation in this situation may be unnecessary and counterproductive.

The valuation may be unnecessary simply because other metrics are usually readily available. You should be able to identify the five to 10 most relevant operational, sales and financial metrics that drive company results. Create a dashboard that frequently (preferably weekly and not less than monthly) displays these key metrics. This approach creates more timely and actionable feedback for the company leadership than a formal valuation.

Tracking company performance using a formal valuation may also be counterproductive because a valuation is only partially based on the company's internal results. Any formal valuation must consider external forces such as industry trends, economic conditions and capital markets. These external forces can mask how the company is empirically performing. To illustrate the point, using a valuation to track

company performance is like a pilot estimating his or her plane's arrival time but overlooking the effects of wind. If the pilot needs

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the plane to fly 500 mph to arrive on time and the current airspeed gauge shows 500 mph, then it might seem to the pilot that the plane will arrive on time. However, if the plane is only flying 450 mph but is currently boosted by a 50 mph tail wind, then only when the tail wind dies down will the plane's underperformance become apparent.

A dashboard that displays key operational, sales and financial metrics will provide the company's leadership with more relevant and visible performance feedback, without being diluted by the external data that is important in a formal valuation but counterproductive in this specific situation.

WEIGH ALTERNATIVES

Business valuations play a crucial role in many situations and offer owners and leaders an important tool to build successful companies and one day achieve successful exits from those companies. Yet, like any tool, valuations need to be used in the proper manner and at the proper times. Owners should apply care to determine if a valuation is truly needed or if alternative solutions exist. **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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Fix It in the Field

Use these troubleshooting tips to keep your hydroexcavator out of the shop and on the job making money

By Ken Wysocky

No matter how well a hydroexcavator is engineered and built, the rigors of working under difficult and demanding conditions take their toll. As such, some downtime is inevitable.

But savvy operators with the ability to troubleshoot problems can get their machines up and working again, without suffering significant losses in revenue and job site productivity.

With that in mind, here are some common problems operators encounter while running hydroexcavators and what can be done to solve them and keep the productivity train rolling.

Mike Selby, southeastern regional sales manager for Vac-Con, and Dave Barr, sales manager at Presvac Systems, who have a combined 60 years' experience in the industry, share their best tips for troubleshooting in the field.

LOSS OF VACUUM

This is typically caused by debris clogging a hose, a tear in a hose or dirty filters. "Most machines have a vacuum gauge," Selby explains. "If it shows elevated vacuum while it's not working, you have a hose restriction. If you have low pressure while working, you usually have some kind of tear or hole in the hose. Or the suction filters that protect the blower from carry-over contamination are clogged."

To fix clogged hoses, booms or turrets, shut down the machine and check out each one. "Blockages are most likely to occur where the hose has vertical to horizontal to vertical transitions," Barr says. "Prioritize the most likely location of the problem and move down to the least likely location. When you find the clog, move the hose out and give it a shake to loosen the debris."

To help prevent clogged hoses, Barr suggests using the following rule of thumb regarding hose diameter: The hose should be three times the size of the material being vacuumed. If it's 2-inch-diameter gravel, for instance, use a 6-inch-diameter hose.

If the hose, boom and turret are clear, then examine the cyclone separators. If they're clogged, lighter materials remain in the air-stream longer and carry over into the filter, which is final protection for the blower. The remedy for this is to clean or replace the cyclones and/or filter, Barr says.

CONTINUED >>

"If something fails on a nozzle and you don't have a replacement, then you're done - dead in the water."

Mike Selby



⚡ Knowing how to troubleshoot some common hydroexcavator problems will save you time and money and keep you out in the field working.



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Selby recommends having several extra separators on hand. While one is getting cleaned and washed, another can replace it and the truck can keep working. “If the cyclonic separators get full, material can’t settle out,” he explains. “So you need to keep the separators clean. Some have a removable receptacle at the bottom that can be pulled out and dumped.”

Operators should also carry extra filters to replace clogged filters. To minimize downtime, consider cleaning filters in between dump cycles, Selby advises.

If a hose is torn, use duct tape to stop air leakage. “You have to remember that material is running through the hose at 150 to 200 mph, and sands and rocks can eventually abrade a hose,” Selby says. “Wrapping a hole with duct tape is a quick field fix that’ll at least get you through the day until you have time to replace the entire hose. Trying to keep working with just a duct-tape patch only delays the inevitable total-hose failure.”

NO WATER FLOW

Presvac hydroexcavators are equipped with triplex plunger water pumps, in which water first passes through a strainer. A clogged strainer will stop water flow, which results in a hammering or banging noise, Barr says.

“The solution is to shut down the system, then check the water-supply line and the strainer to make sure they’re clear. When you start up again, be sure to open the drain valve to make sure everything flows properly and that there’s no air in the water-supply line.”

Selby also points out that some nozzles are more fragile than others. As a result, they’re more prone to clogging with whatever material is being excavated.

Fixing that requires taking apart the nozzle, which isn’t always feasible out in the field. “So carry extra nozzles,” he suggests. “If something fails on a nozzle and you don’t have a replacement, then you’re done — dead in the water.”

LOSS OF WATER PRESSURE OR FLOW

Several things typically cause loss of water pressure, including a worn or improperly sized nozzle tip or an unloader that’s stuck open or set improperly, Barr says.

Resolve the first two issues by replacing the nozzle tips. As for the unloader, which regulates water pressure, it needs to be disassembled and cleaned. “Usually there’s sand or particulate stuck inside the seats of the valve,” Barr says. “Because it’s a high-wear item, it’s designed to be maintained in the field.”

Furthermore, operators need to ensure the water pressure is set properly for the type of nozzle being used. “You have to size the

nozzle according to the pressure. We have an adjustable unloader you can set from 1,200 to 3,500 psi.”

BROKEN BLOWERS

There’s not much anyone can do in the field to repair a blower. But Barr points out that operators can minimize blower issues by not running the hydroexcavator at high vacuum while the engine is running at low revolutions per minute. This can occur when a hose gets clogged while cycle-loading heavy materials, such as sludge.

“As you create vacuum, the horsepower draw increases,” he explains. “But if you have high vacuum and low revolutions per minute, the torque goes up ... and the drive shaft can only handle so much torque.”

To avoid this, Presvac hydroexcavators feature a velocity-control valve that allows the operator to reduce load velocities as needed, he says.

If the blower isn’t working because carry-over debris has locked it up, an operator can try to physically turn the blower backward to work the material out. To do this, turn off the machine, then manually turn the blower in the opposite direction than it normally rotates, Selby says.

“You need to put a big pipe wrench on the drive shaft in order to get it to spin backward. The drive shaft is easily accessible.”

MAINTENANCE MATTERS

Performing routine maintenance and listening for unusual noises can go a long way toward minimizing repairs and keeping small issues from becoming bigger issues.

“An ounce of prevention is worth a pound of cure,” Selby says. “If you do periodic maintenance as recommended by the manufacturer, the machine should at least last through its expected life cycle of roughly 10 years.” **c**

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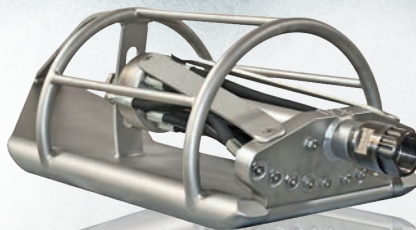
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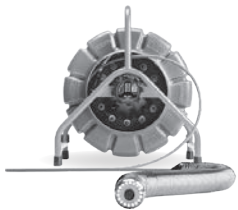
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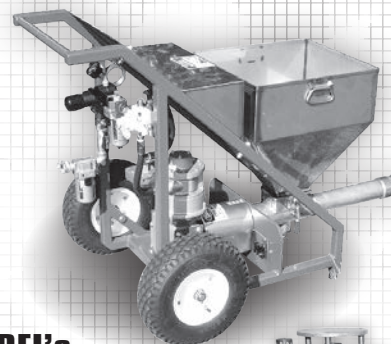


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✓ The DrainPro team includes (from left) Justin Householder, Paul Crook, Joe Clark, owners Carol Rimorin and Melissa Martin, Pat Martin, James Collins and Sean Wyatt.

COVERT OPERATION

DrainPro finds success quietly subcontracting for plumbers who don't want to invest in drain cleaning equipment

By Ken Wysocky // Photography by David Sinclair

Building a successful drain cleaning business without any advertising may sound about as plausible as an old clay pipe sewer line with no tree root intrusions. But that's exactly how DrainPro in Baltimore grew from a small, one-truck outfit in 2011 to a company that now generates more than \$1 million in annual gross revenue.

The formula for that growth was simple. Rather than paying big bucks to advertise its drain cleaning services to businesses and homeowners, the company instead opted to cultivate relationships with plumbers who avoid drain cleaning because of the labor and equipment expenses, explains Pat Martin, general manager of DrainPro.

"We knocked on plumbing company doors and told them we won't letter our trucks so we can work as (anonymous) subcontractors for them," Martin says. "We asked them to give us a shot ... and it kind of took off from there."

"The plumbers liked it because they didn't have to deal with all the woes associated with hiring people and buying equipment to do drain cleaning, as well as the fixed costs that come with all that. And if a job goes south, all of the risk is on us, not the plumber."

"The bottom line is it worked. And that's how DrainPro became the largest drain cleaning company in the Baltimore area that no one has ever heard of."

SHEER NECESSITY

Company owners Carol Rimorin and her daughter, Melissa Martin (Pat Martin's wife) felt they had no other choice than to consider this bold, unconventional strategy, he explains.

"Developing plumbers as customers required very little investment," Pat Martin says. "We barely had enough money for equipment back then, much less money for advertising. So there weren't many other choices other than going no-ad."

At one point, they did divert from that no-ad strategy. When the company was about 4 years old and on sounder financial footing, management decided to give advertising a try. But the company soon had to



DrainPro LLC
LOCATION: Baltimore, Maryland
OWNERS: Carol Rimorin and Melissa Martin
FOUNDED: 2011
EMPLOYEES: 8
SERVICES: Sewer cleaning and inspections, line location, smoke testing and leak detection
SERVICE AREA: Metro Baltimore area

DrainPro General Manager Pat Martin tracks an inspection camera with a Radiodetection RD4000 locator to trace a sewer line.

“We knocked on plumbing company doors and told them we won’t letter our trucks so we can work as (anonymous) subcontractors for them.”

Pat Martin



▲ Pat Martin inspects a residential sewer line with a RIDGID SeeSnake Mini, watching the progress on a CS10 monitor.

◀ Carol Rimorin and Melissa Martin are the mother-daughter ownership team of DrainPro.



hire more office personnel to handle the resulting increase in call volume, Martin says.

“So at that point, we not only had the extra expense of the advertising, but also the cost of hiring more people,” he says. “Our call-closing ratio went from one-to-one to five-to-one ... much less efficient than getting one call from a plumber for one job.

“So after about 1 1/2 years, we said, ‘Why don’t we just go back to doing what worked for us back in the beginning?’”

Over the years, the company has acquired residential and commercial customers that call DrainPro directly, with no plumber as a middleman. The split between residential and commercial customers, such as hospitals, apartment complexes, colleges and the like, is about 50/50.

“Some plumbers don’t want to handle certain jobs, so they refer customers to us and then they become our customers,” Martin says. “Now about 60% of our work comes from working as subcontractors for plumbers, and the rest of our business comes from our own customers.”

To cost-effectively promote the company's drain services to plumbers, Melissa Martin will periodically make trips to local supply houses with one of the company's trailer jetters in tow. The jetter usually sparks conversations with interested plumbers, as well as other tradespeople and facility management people.

A FOCUS ON DRAINS

Three people established the company: Rimorin, who was a retired electrical utility employee before joining the firm; Melissa Martin, who was working as a dispatcher for the drain division of a plumbing company; and Joe Clark, a friend of Melissa who worked as a drain cleaning technician at the same company where Melissa worked.

"The company they worked for was a miserable place to work, so they decided to start their own," Pat Martin says. "Joe was the first employee. The company focused on drains because that was his area of expertise, not plumbing."

"They named the company DrainPro because drains are what they did and the 'Pro' reflected the professionalism they wanted to bring to the industry."

Growth came quickly, with the company adding nearly one service vehicle a year since its inception in 2011. "It's been a booming economy, so we don't pat ourselves on the back too hard," Martin says. "But we've gone from one truck to six and from two employees to eight. And our revenue target in 2019 was \$1.6 million."

CONTINUED >>



➤ Pat Martin attaches a high-pressure nozzle to a jetting hose.



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UNDERGROUND

Don't be afraid to fire customers

One of the biggest business mistakes management made in the early years of establishing DrainPro, a drain cleaning outfit in Baltimore, was clinging too long to customers who didn't pay bills on time.

The drill is all too familiar for many business owners in the trades: Larger clients can take months and months to pay their bills, and contractors feel they have little leverage to demand timely payment, fearing they'll anger the client and lose the business.

"We tried to grow our company by accommodating large customers who didn't pay on time," Martin says. "But when you have to wait six to nine months to get paid, your company essentially becomes a bank that gives away drain cleaning services.

"We already work at a little bit of a discount (in order to obtain subcontracting work) from plumbers who need drain cleaning services," he adds. "Not every service call is a home run — margins are tight."

Furthermore, sending out 10 or 15 emails and making a dozen phone calls to try to get clients to pay their bills sucked up time and taxed office personnel, he says.

Around 2015, after four years in business, DrainPro took action. "Our accounts receivable were through the roof, and cash flow was down to almost zero," Martin recalls. "Everyone had money except for us. This forced us to tell customers they're on 30-day payment schedule."

If a customer didn't pay on time, DrainPro required credit card payments going forward. And if that didn't work, the company stopped doing business with those customers.

Interestingly enough, the policy didn't hurt business as much as management feared. Martin estimates DrainPro lost about half of the slow-paying customers, but he says the other half started paying on time.

"I don't know why. Maybe they respected us more for standing up for ourselves, or maybe they didn't want to lose us as a subcontractor. But in the long run, it actually strengthened some of our business relationships, plus it increased cash flow and lowered receivables.

"Sure, we lost some customers. But we also gained new ones. Doing this actually opened the door for better customers to come in."



Martin feeds a camera into a basement clean-out to inspect a residential sewer line.

As another measure of growth, Martin says the company now offers a full range of benefits, including 401(k) retirement funds; a low-deductible health insurance program in which the company pays 100% of the premiums; vision, dental and life insurance; and paid vacations. "We couldn't even talk about those things when we first started out," he says.

"If you go through all that work to find and train employees, why give them reasons to leave?"

Pat Martin

DIFFERENTIATING THROUGH EQUIPMENT

Investing in reliable and technologically advanced equipment, as well as keeping it well maintained, has also spurred growth. Today the company's roster of equipment includes two trailer jetters manufactured by US Jetting, a 4018 model (4,000 psi at 18 gpm) and a 4025 (4,000 psi at 25 gpm); a Brute 150 trailer jetter built by Jetters Northwest (150-gallon water tank and a 4,000 psi at 9 gpm pump); and three JM-1000 Mini-Jet water jetters (1,500 psi at 1.4 gpm) built by General Pipe Cleaners. Technicians use nozzles made by Enz Technik, StoneAge (Warhogs) and Chempure (Root Rat).

The company also owns numerous RIDGID sectional machines: K-50s, K-60s, K-1500s and K-5208s. It also has invested in a RIDGID K9-204 FlexShaft drain machine, a Zip-Zip flex-shaft drain machine from Drain Rehab Solutions, and a Mini Miller drain machine made by Picote Solutions.

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◀ Pat Martin sets up the US Jetting 4018 high-pressure trailer jetter for a cleaning job.

✔ Using a new RIDGID K5208, technician Paul Crook feeds a root-cutting head on 7/8-inch cable into a lateral line.



In addition, DrainPro relies on RIDGID Scout and Radiodetection RD7000 and RD8000 pipeline locators and a dozen RIDGID SeeSnake inspection cameras (one standard-size unit, one nanoReel, four microReel units and six Minis).

“We like to have multiple cameras on the trucks as opposed to having one and moving it from truck to truck as needed,” Martin says. “It’s just more efficient. Plus, this variety of cameras allows us to handle different pipe diameters.”

Having multiple cameras instead of one also simplifies job assignments because dispatchers don’t have to waste time figuring out which truck has the one camera, he adds, noting that the company uses dispatching and scheduling software developed by Jobber. “Some people think it’s crazy to buy that many cameras, but it gets the job done,” he says.

The company’s six service vehicles are all the same: Either GMC Savana vans or their Chevrolet equivalent, Express vans. Martin likes them because they’re heavy duty enough to tow trailers but small enough to fit into parking garages with low ceilings.

Having all the same vans also makes it easier to buy parts — things like wiper blades, brake pads and rotors, oil filters and so on — and keep track of inventory. Plus, the company can buy parts in bulk, which is more cost effective, Martin says.

The company hires a mobile mechanic to service its vehicles. After he finishes his work, new parts get ordered right away to replace whatever was used. “In our shop, we also keep four new tires already mounted on rims,” he says. “So if we need new tires, we just jack up a truck and we’re out the door in 20 minutes.”

MAXIMIZE EFFICIENCY

To keep technicians well equipped and working, the company foots the bill for replacing lost or damaged cutting heads on sectional drain machines. That runs counter to some companies that make

“Once a customer called and said our technician washed the dishes that were in the sink. Another time one of our guys helped a customer unload mulch from a vehicle.

It’s the little things you do for customers that count.”

Pat Martin

their technicians pay for new cutting heads, a philosophy that just doesn’t make sense to Martin.

“One thing we hear the most from our guys, almost word for word, is that their last employer never had any new heads on hand for their machines,” he says. “They had to buy their own and often couldn’t afford it. So they’d use the snake to poke a hole in the clog and drain it, rather than thoroughly clean it.

“We replace cutting heads, no questions asked. We make sure that no matter what our guys are prepared, which has contributed to our growth. Other contractors tell me I’m crazy because a company could lose hundreds of dollars a year by paying for cutting tools. But if you don’t have the proper tools, your callback volume goes up and over time you get distraught employees.”

CONTINUED >>



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Eventually, the unhappy technicians quit and then the company has to buy a new cutting head anyway. So companies really gain nothing by not supplying technicians with heads, he says. “If you go through all that work to find and train employees, why give them reasons to leave?”

Another growth-generator is the company’s stance regarding time spent on jobs. Instead of “nipping at technicians’ heels” to get jobs done quickly, Martin says technicians are told to take whatever time is needed to do a good job. This avoids profit-killing callbacks that end up consuming more time than if a technician took time to do a job right the first time, he says.

Management also encourages technicians to do little things for customers, like grab a newspaper at the end of a driveway and bring it to the front door, put things back in a kitchen sink when they’re finished working and so forth. “Once a customer called and said our technician washed the dishes that that were in the sink,” Martin says. “Another time one of our guys helped a customer unload mulch from a vehicle.

“It’s the little things you do for customers that count. Some companies might reprimand guys for doing that because they could’ve spent that time working on another job.”

SLOW, STEADY GROWTH

Looking ahead, Martin says the company isn’t interested in rapid, exponential growth. Management is concerned that fast growth would erode the good relationships the company has cultivated with employees and clients by potentially degrading service.

“I once read something that said that the enemy of good is ‘better,’” Martin says. “In other words, if you’re doing things really good, trying to make them ‘better’ sometimes can backfire and mess things up.

“You get into growth mode and then say, ‘Wow, we were so much better at five trucks, or even one truck. Our ultimate goal was to become no bigger than a three-truck operation, and here we are at six trucks. So it’s not that we’re against growth, you just have to manage it.”

There’s also the possibility of adding news services to meet the changing needs of customers. But one thing is certain: Technicians will keep working from their vanilla-white, unlettered trucks — stealth drain cleaners operating in plain sight. **c**



▲ Pat Martin operates the US Jetting 4018 trailer jetter with a remote on his left leg, a feature he credits with saving time and improving the safety of his technicians.

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Competitive Advantage

Trenchless spot repairs appeal to customers who can't afford expensive opencut pipe replacement methods

By Ken Wysocky

Roughly four years ago, plumber and drain cleaner Chris Bontempo wanted to offer his customers a sewer line replacement method that was less expensive and disruptive than traditional excavation. On the other hand, the owner of Bontempo Plumbing in suburban Milwaukee didn't want to get into full-scale pipe lining systems.

He found a solution in the PipePatch spot repair trenchless lining system from Source One Environmental (S1E).

"It's nice to be able to offer customers another option because not everyone can afford to dig up their sewer line," explains Bontempo, who established his company in 2013. "Now I can offer them a solution without digging up their front yards, sidewalks, landscaping or even streets."

"In fact, I often can install a PipePatch through a clean-out without even breaking up a basement floor. Or if a customer's sewer line dumps right into a nearby mainline, I can work backward through a manhole to their basement clean-out without even disturbing occupants in the house."

The longest S1E PipePatch is 4 feet. But he can install consecutive patches to cover longer distances. The patches also come in various diameters, from 1 1/2 to 72 inches.

"We just installed three 2-foot-long PipePatches in a row to replace about 5 feet of bad 6-inch-diameter clay pipe under a huge tree," Bontempo says. "It took us about nine hours, overlapping each patch by about 4 inches. The customer was extremely happy with the results."

MORE BENEFITS

The S1E system gives Bontempo a competitive price advantage compared to traditional excavation methods. In the aforementioned job, he charged about \$5,800, much less than the \$12,000



▲ The PipePatch spot-repair lining system from Source One Environmental is a trenchless option that can be installed through a clean-out, making it a great solution when opencut pipe replacement isn't feasible.

quoted by other contractors who proposed using opencut methods.

In another case, a customer received several bids for opencut installations, ranging from \$8,000 to \$10,000 to repair about a 6-foot section of a broken sewer lateral. "I came in at about \$3,100," he says.

Moreover, a patch system fixes only the section of pipe that needs repair, which reduces not only installation times compared to full-length pipe lining, but also the cost of materials, labor and initial equipment investments. It's also safer and requires no shoring systems like opencut jobs require.

BONTEMPO PLUMBING LLC ST. FRANCIS, WISCONSIN

OWNER: Chris Bontempo

TECHNOLOGY: PipePatch sewer line repair system from Source One Environmental (S1E)

FUNCTION: Trenchless spot repair of sewer lines

FEATURES: Cured-in-place pipe system that uses resin-impregnated fiberglass liners; patches come in lengths of 2 and 4 feet; accommodates pipes ranging from 1 1/2 to 72 inches in diameter; two-hour ambient cure time; snap-together pushrods to position the liner; inflatable packer devices compress patches against host pipe

COST: About \$3,000

WEBSITE:
www.facebook.com/bontemtoplumbing/

The system uses cured-in-place pipe technology, which essentially is a fiberglass patch that's impregnated, or wetted-out, with resins that cure at ambient temperatures. When it's fully cured, the patch — which is comparable to a stent inserted in a clogged artery to restore blood flow — is only about 1/8 inch thick. As such, the host pipe maintains nearly all of its original diameter.

“It's nice to be able to offer customers another option because not everyone can afford to dig up their sewer line.”

Chris Bontempo

SIMPLE INSTALLATION

Here's how the PipePatch system works: After wetting-out a patch with the resins, wrap it around an inflatable device called a packer. Use zip ties to keep it tightly bound. Then attach an air-compressor hose to the packer and push it into the host pipe using 5-foot-long pushrods that snap together to achieve the required length.

Bontempo uses RIDGID SeeSnake inspection cameras to determine the distance to the repair and a PORTER-CABLE pancake air compressor to inflate the packer. For general drain cleaning, he uses RIDGID machines and pipe locators and also owns one drain machine made by Milwaukee Tool.

When the packer is centered over the repair — Bontempo double-checks the position with his camera — inflate the packer. “We listen for the ties to pop open, so we know it's inflating,” he says.

The patch initially is about 3/4 inch thick, but it compresses significantly when the packer presses it tightly against the host pipe. After about two hours of curing time, deflate the packer and pull it out. “Then we reinspect the patch with a camera,” he says.

It typically takes about five hours to install one patch about 30 to 40 feet into a pipeline. Pipes must be cleaned ahead of time; Bontempo uses a Clog Dog Flex Shaft drain machine (Clog Squad) to prep pipes. One person can install a patch, but two people make it a little easier, he says, given the limited time available before the resins start to cure.

TOP-NOTCH TRAINING

Bontempo says it took between five and 10 jobs before he felt confident about the installation process. He chose S1E's system because of the training and customer service. “S1E actually sent someone down to train me and perform test runs in various scenarios, using practice pipes,” he says.

It really is a simple process, but you still need to be vigilant, he adds. “The worst thing that can happen is the patch slides off

the rear of the packer. Then you need a retrieval tool; I use my Clog Dog.”

In situations where the patch covers a wye or tee branch connection, the PipePatch system enables contractors to reinstate the branches from behind the connection, perhaps from a toilet or some other fixture, he explains.

The initial PipePatch investment was about \$3,000. Prices for the patches vary, starting at around \$350 for a 2-footer. All in all, the system has been a very good investment, Bontempo says.

“It basically paid for itself after two jobs. It's definitely worthwhile when you're earning pure profit after just two installations. And it's always good to have as many repair options for customers as possible. Making that leap to trenchless repairs is the way to go.” **c**

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Shore Up Defenses

Knowledge of soil classification and proper shoring techniques will help you and your crews remain safe in the trenches

By Jared Raney

Eight service workers died in trenching accidents last April. Staying safe requires more than following regulations: It takes a thorough understanding of the tools available.

“Not everything these guys are confronted with is in the rulebooks,” says Jim Sullivan, president of Prospan Shoring. “They’re going to get into all different shapes and sizes; what they need to know is what’s in their arsenal when they pull out the door.”

There are three main types of trench collapse prevention methods: shoring, trench boxes and sloping. While there are some variations on these basic categories, the proper understanding and use of these three methods will ensure workers’ safety.

Anyone on an excavation site should be aware by now that any trench greater than 5 feet deep must have some type of collapse prevention. The method used for prevention depends on two factors: trench layout and soil conditions.

ASSESSING SOIL

OSHA rules break down soil conditions into several simple categories — A, B and C. Class A soil is so-called virgin soil, the most cohesive soil; on the other end of the spectrum, Class C is soil with very poor compaction.

“Once you identify what soil you’re in, then you have to look at a couple other influencing factors. If the trench is dug adjacent to a roadway, where most city trenches are and utility company trenches are, that means there’s roadway traffic. And with that comes vibration,” Sullivan says. “So if your ground is subjected to vibration from planes, trains or automobiles, you’re required to downgrade your soil classification by one.”

There are a few instruments and methods to test the soil compaction, but for the purposes of shoring options, everything’s on the table until class C.

“So in other words, all these cities and utility companies declare themselves in class C soil. So you can imagine, if you’re in real good A soil, we let you do more with a product,” Sullivan says. “Most people



▲ A trench box isn’t always the answer but can be a good option, like here during a pipe bursting job.

want the standard to be as simple as possible, so they just say, ‘We’re in class C soil — get on with your day.’”

THE PROBLEM WITH SLOPING

Once you’re into C soil, there is a distinction in the engineering requirements between C-60 and C-80 soil. C-80 essentially means that there’s no cohesion at all, and it’s at that point that shoring is no longer an option, leaving just trench boxes and sloping.

Unfortunately, for most municipalities, sloping, which OSHA treats as essentially the ultimate fallback for collapse prevention, is all but impossible in most urban settings.

“The reason people don’t use sloping is because they’d have to remove the street on every dig, if they followed the OSHA formula,” Sullivan says. “OSHA would say open up that trench. We don’t care: The employee comes first. And I don’t disagree with that. I’m

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« If trench boxes can't be used, shoring is also an option. This crew uses shoring tools to secure the walls of a trench.

“Anybody who’s attacking this the right way needs to have both shoring and trench boxes in their arsenal.”

Jim Sullivan

just speaking to you from a reality standpoint: They’re not going to remove the streets, they’re not going to tear up somebody’s front yard to the max, so really, people are out there using trench boxes or they’re using shoring.”

SHORING VS. BOXES

So for practical purposes, what the vast majority of contractors and municipalities need to understand is the difference between shoring columns and trench boxes.

“There’s a difference between shoring and trench boxes. Even though it all falls under one heading called ‘shoring,’ there’s a distinct difference. Shoring pressurizes the trench walls so they can’t cave in. They’re designed to pressurize the trench wall and take away its ability to lean in,” Sullivan says. “Trench boxes are designed strong enough to take on the collapsing soil.”

In simpler terms, while a trench box is designed to simply hold back any soil that does collapse, shoring is meant to prevent a collapse in the first place.

Shoring functions via a principle called an “arch effect.” Basically, at the point where the shoring contacts the soil, it compresses outward in an arching pattern. So from point of contact, there is a dome of protection in the arch wall, the size of which depends on soil type.

This means you must know the maximum allowable separation between each column of shoring, which is to say how far apart horizontally two shoring bars may be placed. Manufacturers must provide those distances for each soil type. For example, Prospan dictates a maximum of 6 feet for class C soil.

The manufacturer specifications, or “tabulated data,” also tells users when plywood is required with shoring. While it’s generally not needed due to the arch effect, sometimes it will be required to prevent minor collapses from the arch wall surface soil.

Due to the relatively complex nature of shoring devices, it can be tempting to use only trench boxes, but you could be asking for trouble.

“With trench boxes, you would think, Oh, this is a no-brainer: If they’re strong enough to take the collapse, why wouldn’t you use a trench box every single time?” Sullivan says.

The simple answer is that they can be less convenient and less versatile depending on the situational factors of a given trench. If laterals or other utilities are a factor in digging the trench, it could limit the space for a bulky metal box.

Another factor is that different types of boxes have varying weight limits. Depth is the main factor here — weaker aluminum boxes, while often easier to maneuver, cannot be used past a certain depth because it cannot hold the weight of all the soil that could potentially cave in. Even the sturdiest steel construction boxes have limits, though they are in most cases deeper than any realistic trench.

Boxes are also required to be stacked up to the top of the trench, so multiple boxes may be needed, which is a lot to haul or maneuver to and around a job site.

“You can’t rely on trench boxes all the time, because what if you can’t get the box in the hole?” Sullivan says. “And you can’t use shoring all the time because what if you’re in C-80 soil where shoring is not allowed. So anybody who’s attacking this the right way needs to have both shoring and trench boxes in their arsenal.”

PREPARE FOR ANYTHING

The fact of the matter is that preventing trench collapses is not always a simple endeavor. OSHA regulations attempt to simplify it as much as possible, but if it were a piece of cake, workers wouldn’t be dying.

Stocking collapse prevention devices may be a hassle, but supervisors at all levels don’t have the luxury of cutting corners — or fieldworkers will be those who pay, possibly with their lives.

“Depending on the task at hand, sometimes it’s hard to be compliant. As simple as it seems, it isn’t. If they’re putting in a catch basin or a manhole, or they’re doing something where their options are limited with the dimensions of that trench, it’s very difficult for them to stay protected,” Sullivan says. “Sometimes where they start to dig and where they finish can be two different animals altogether; they need to have trench boxes and shoring in their bag of tricks.” **c**



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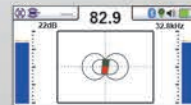
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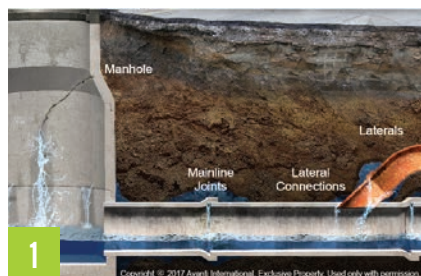
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The Dual-Color Epoxy Brush Coating System from Picote Solutions allows technicians to rehabilitate pipes from 1.25 to 12 inches for drains, sewers, water pipes, electrical conduits, and heat and air-conditioning ducts by brush casting a coating. The coating resin forms a pipe inside the original pipe that is a tested, safe and environmentally friendly product. The new pipe is dampproof, corrosion-resistant, wear-resistant and noncorrosive. It is ASTM and NSF certified (NSF/ANSI 61-5). It is a 100% solids epoxy, and the method allows for clear visual verification during the application process. Apply to small areas or all drains in multistory buildings. The system is practical and easily fits in tight places. 219-440-1404; www.picotesolutions.com.

4 / SAUEREISEN SEWERGARD 210

The epoxy-based SewerGard 210 family of products from Sauereisen is designed to enhance corrosion resistance and extend the longevity of underground infrastructure such as manholes and lift stations. It is available in several variations to accommodate desired thickness and method of application. Spray and plural-component spray application is ideal for preventive measures in new construction and rehabilitation. 412-963-0303; www.sauereisen.com.



INSERT

5 / PARSON ENVIRONMENTAL PRODUCTS HIGH-DENSITY POLYETHYLENE MANHOLE INSERTS

High-density polyethylene manhole inserts from **Parson Environmental Products** can help eliminate surface water inflow along with unwanted hydrogen sulfide odors and are easy to use and maintain. They include a vented PVC canister that stores 20 pounds of either activated or catalytic carbon. The result is a product that traps and stores all of the unpleasant hydrogen sulfide and methyl mercaptan odor molecules before they are released into the atmosphere. The only item that needs to be replaced periodically is the 20 pounds of carbon since it serves as the absorbent media that traps the odor molecules. One person can easily accomplish this. 800-356-9023; www.parsonenvironmental.com.

MANHOLE CAMERAS

6 / CUES SPIDER

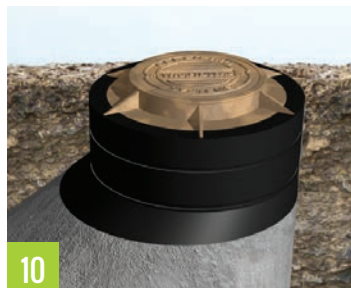
The SPiDER scanner from CUES can calculate its position in the manhole shaft by using its sensor data to measure its incremental motion instead of the payout cable. It weighs less than 30 pounds and can be hand-carried to easements or other previously difficult-to-access sites. This wireless portability is possible because the processing computer and battery supply are built into the scanner. It collects millions of 3D measurements during each manhole inspection, so the manhole can be measured to better than 5 mm accuracy. The point cloud can be used to evaluate the structural changes in a manhole before and after rehab. It also provides live-video stream and recorded MPG video, making it an ideal wireless tool for inflow and infiltration studies. 800-327-7791; www.cuesinc.com.

7 / ENVIROSIGHT CLEVERSCAN

The **CleverScan** manhole scanner from **Envirosight** performs a comprehensive, fully automated assessment of manhole condition in two to three minutes. It captures visual and dimensional data, and it presents the user with a flat scan with detailed image data covering every inch of the manhole wall; a dense point cloud for 3D visualization of the manhole structure and easy CAD integration; and a virtual view inside the manhole, where an operator can pan, tilt and zoom to areas of interest. It sits over an open manhole. With the press of a button, the system's probe descends into the manhole, capturing image data using five HD cameras and building a dimensional profile using an array of four lasers. An onboard rangefinder controls descent and determines when the scan is complete. Scan data is immediately transferred to a laptop running specialized software, where it can be viewed, annotated and shared. 866-936-8476; www.envirosight.com.

8 / RAPIDVIEW IBAK NORTH AMERICA PANORAMO SI

The **PANORAMO SI** manhole inspection system from **RapidView IBAK North America** offers 100% coverage, inspection speeds of up to 14 inches per second, geometric measurements from any point inside the manhole, laser depth measurement, 225 feet of cable, and can be operated in manholes 10-inch-diameter and up. The software allows the user to view the manhole from any angle and at any position, creating a virtual-reality-style view of the manhole. This file can be viewed from any computer, anytime. The system also automatically generates a 3D model of the inside of the manhole that can be rotated, viewed, measured or output to a CAD file for further analysis. The system can be an addition to a PANORAMO mainline inspection system or is available in a stand-alone version. It allows a crew to inspect more than 50 manholes per workday. 800-656-4225; www.rapidview.com.



MANHOLE LINERS

9 / APPLIED FELTS HYBRID LINERS

Hybrid liners from **Applied Felts** combine fiberglass reinforcement with traditional felt liner material to provide strong, robust liners. These hybrid liners perform and install in the same manner as nonreinforced liners with the benefit of reduced thickness, delivering significant resin savings and ensuring a close fit and faster install. AquaCure RP, PS and PW fiberglass-reinforced liners provide superior physical and mechanical properties that meet or exceed ASTM and NSF 61 testing standards. Additionally, traditional felt liners come in a variety of coating options for polyurethane, polypropylene or polyethylene. 276-656-1904; www.appliedfelts.com.

10 / CCI PIPELINE SYSTEMS WRAPIDSEAL MANHOLE ENCAPSULATION SYSTEM

The **WrapidSeal Manhole Encapsulation System** from **CCI Pipeline Systems** consists of an engineered primer and a wraparound, heat-shrinkable sleeve designed to seal joints and prevent groundwater from entering a collections system. This material has a high shrink membrane (70% stretch and 40% recovery) designed to shrink around any manhole profile. In addition, the high tensile strength accommodates structural movement, while the tough backing resists soil stress and provides suitable abrasion resistance. It can be used for new construction or for the rehabilitation of existing manholes to control infiltration through joints and prevent deterioration, thus eliminating costly maintenance repairs and the added expense of treating groundwater. 800-867-2772; www.wrapidseal.com.

11 / LMK TECHNOLOGIES CIPMH

The **CIPMH** (cured-in-place manhole) solution from **LMK Technologies** is a one-piece, resin-saturated liner designed to reduce I&I and renew structural defects in a variety of manhole configurations and sizes, including barrel sections, as well as eccentric and concentric cones constructed of brick and mortar, precast, or cinder block. This one-size-fits-most, reinforced and stretchable liner is engineered to resist traffic loading and freeze-thaw cycles while creating a corrosion-resistant lining. Available for chimney or full-depth manhole rehabilitation projects, the ASTM F3033-compliant, vacuum-impregnated liner is pressed against the existing manhole by a pressurized bladder until the thermoset resins have cured ambiently, typically within two hours. 815-433-1275; www.lmktechnologies.com.

12 / THE STRONG CO. STRONG-SEAL MS-2A

Strong-Seal MS-2A from **The Strong Co.** is a fiber-reinforced, spray-applied cementitious mortar. This product fills all voids and achieves a mechanical and chemical bond to the existing substrate. The results, when spray-applied to a minimum of 1/2-inch thickness, is an impervious monolithic liner with compressive and flexural strengths exceeding that of the original structure. It is made with Portland cement and is a cost-effective solution for stopping infiltration and restoring structural integrity. 800-982-8009; www.strongseal.com.

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13



14



15



16

MANHOLE PART AND COMPONENT

13 / USB-USA SPIN-JET

The Spin-Jet from USB-USA is a self-centering, controlled rotating nozzle that is used for cleaning lift stations, barrels and manholes prior to rehabilitation. Available in two different versions, it has driving nozzles that rotate in a 360-degree horizontal plane only. This action eliminates the need to cover the manhole during operation, allowing for constant viewing of the cleaning process. Front jets thoroughly clean any grease, sludge or mud at the bottom. 844-285-5770; www.usb-usa.com.

RISER

14 / CRETEX SPECIALTY PRODUCTS PRO-RING

The PRO-RING concrete-alternative manhole and catch basin grade adjustment system from Cretex Specialty Products is available in round, square and rectangular shapes. They are manufactured from expanded polypropylene, which is known for an exceptional strength-to-weight ratio, durability, chemical resistance and long service life under harsh conditions. One man can install the system in just minutes to within a 1/4 inch of finished grade, and they are watertight. A 6-inch system weighs just 14 pounds and stands up to all kinds of physical abuse. The system can dramatically speed manhole installation and repair time, allowing sites to be opened, repaired and closed in one day, reducing overall costs from 20% to 30% based on conditions. Angle rings are available to match slopes, eliminating the need for mortar and shimming. 800-345-3764; www.cretexseals.com.

SAFETY EQUIPMENT

15 / PERMA-LINER INDUSTRIES MANHOLE EDGE PROTECTOR

The Manhole Edge Protector from Perma-Liner Industries is made with a highly visible safety orange that helps identify the site and the open manhole, eliminating potential hazards. The 360-degree edge protection also eliminates the top-edge roller and top-wide tiger tail that can allow the cable to slip off the roller. The interior 3.5-inch flange holds back debris and any loose infrastructure from falling into the manhole. It is made with ABS 3/16 plastic, which is durable and withstands temperatures from 40 degrees below zero to 180 degrees F. The Manhole Edge Protector leaves the manhole completely open, providing accessibility and visibility while also protecting the camera and jetter lines. 866-336-2568; www.perma-liner.com.

SEALANT

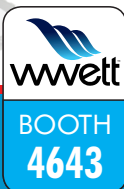
16 / SEALING SYSTEMS FLEX-SEAL UTILITY SEALANT

Flex-Seal Utility Sealant from Sealing Systems is a plural-component aromatic urethane with 800% elongation and a tensile strength of 3,200 psi. It is designed to prevent I&I and to provide corrosion protection at the grade adjustment ring section or joint section. It provides an ideal seal and will pass a vacuum test according to ASTM standards. The internal seal is manually applied using a paintbrush, and the kit is designed to cover 12 vertical inches on a 27-inch-diameter manhole. 800-478-2054; www.ssisealingsystems.com. c



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Manhole Inspection and Rehabilitation

By Craig Mandli

MANHOLE CUTTER MAKES HAWAIIAN ROAD REPAIR MORE EFFICIENT

PROBLEM / Major road construction companies like Grace Pacific maintain Hawaiian roads. These roads have an unusual number of manholes and water valve structures, which present a problem for pavers. Most paving projects in the islands require milling the road before paving. The milling and paving are much easier if the manholes and water valve structures are removed and steel plated. This process allows the milling and paving machine to operate as if the structures are not there. Not having to work around these structures makes for a much smoother roadway.

SOLUTION / Grace Pacific purchased the **Mr. Manhole** system for testing on the islands and subsequently made a second purchase. The company currently has two crews performing lowering and raising operations in conjunction with the paving crews. The crews have to maintain traffic during all operations so speed is very important. A typical lowering consists of cutting and pulling the manhole or water valve frame and placing a steel plate. The structure is GPS located, and after milling and paving, it is located and marked. The crews use the same cutting equipment to cut and restore the structure. The crews average about 25 minutes per structure to lower and about 30 minutes to raise a structure.

RESULT / Grace Pacific has completed 1,200 repairs to date with many more to come. 419-741-9075; www.mrmanhole.com.



MUNICIPALITY FINDS SOLUTION TO FILL GAP BETWEEN LINING ON MANHOLES

PROBLEM / After relining many of its old and deteriorating manholes, a Georgia municipality needed a solution to fill a 3- to 5-inch gap between the new liners and the manholes.

SOLUTION / **Precision Fill** from **Prime Resins** was chosen to fill this space due to its high expansion rate, the fact that it is hydro-insensitive and because its slower set time allows for a more consistent pour and prevents void pockets from forming. The project included several manholes, and each one used between 8 and 12 gallons of material. Recommended uses for Precision Fill include undersealing and stabilizing concrete slabs, compaction grouting of soils, stabilizing soils and filling voids behind pipes, walls, manholes and other structures.



RESULT / The process of lining and filling the annular space cost roughly a third less than tear-out and replacement. 800-321-7212; www.primeresins.com.

LINING SYSTEM USED TO REHABILITATE FORCE MAIN

PROBLEM / A 2-mile 27-inch force main that carries sanitary flow from a major pump station in Towson, Maryland, was incredibly deteriorated. The pump station hammer pressure produces extreme air and water pressures at the head of the flow that led to the complete structural failure of several brick structure outfall manholes. It ultimately caused the surrounding earth to enter these structures, producing major sinkholes in the area.

SOLUTION / The solution required trenchless rehabilitation technologies that address two priorities: providing a verified structural design for lining thickness based on third-party-verified physical strengths, as well as the ASTM F1216 standard, and the capability for immediate reinstatement of the sanitary flow to the structure. Bypass of this force main flow was not feasible, and only a two-hour shutdown was allowed at the pump station. Infrastructure rehabilitation contractor Abel Recon used the **SprayWall** polyurethane lining system from **Sprayroq** since the contractor and product were able to meet and exceed the requirements for this project.

RESULT / The contractor was successful in meeting the tough demands of the project while providing a long-term, verifiable, structural solution in an extremely short time window. The manholes are expected to service this densely populated area for many decades. 800-634-0504; www.sprayroq.com. **c**



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2 COXREELS IDLER SPROCKETS FOR THE 1195 SERIES

COXREELS' gear-reducing idler sprockets for the 1195 Series electric motorized hose reels reduces the rewind speed, increases motor torque and fits an optional three-way pin lock. The all-steel chain sprocket assemblies have a corrosion-protective coating that changes the drive ratio of the motor-to-drum drive system. The sprockets are available in three ratios: 1:2, 1:3 and 1:4. Each ratio will slow down the rewind speed of the drum by a multiple of the ratio factor, and they will increase the effective motor torque by the same factor, providing the necessary safety and control during rewind of large, 2-inch-diameter hose. The sprockets are mounted on zinc-plated steel axles and rotate on two self-lubricated bronze bearings. 800-269-7335; www.coxreels.com.

3 SUBSITE ELECTRONICS UTILIGUARD 2 LOCATING SYSTEM

The UtiliGuard 2 locating system from Subsite Electronics is a new multifrequency utility locator based on the UtiliGuard system. It uses automatic integrated data capture to provide information that can be used to prove or track performance, compare with benchmarks and provide actionable outcomes to help increase quality, reduce cable strikes and increase productivity. Available in standard and advanced models, integrated GPS positioning improves accuracy and reporting. An all-new user interface features simplified graphics that are easier and quicker to interpret. It also offers a 5- or 12-watt transmitter that drives signals farther down large, direct-buried utilities. The system also provides both the horizontal and vertical distance to the utility to make accurate locates of obstructed utilities. 800-846-2713; www.subsite.com.

4 RIDGID SEESNAKE COMPACT C40 AND M40 CAMERA REELS

The RIDGID SeeSnake Compact series of camera reels added the SeeSnake Compact C40 and M40, each powered by TruSense technology. Both camera reels feature a 0.98-inch self-leveling camera head, 131 feet of push cable and are compatible with RIDGID CSx series Wi-Fi enabled monitors. The quick-release docking system is ideal for the new CS6x Versa digital reporting monitor, and the sturdy metal frame provides a solid base that makes it easy to push and retrieve the cable for fast, efficient use. The C40's flexible push cable is designed for small or restricted branch lines with tight turns and shorter runs in main laterals, while the M40's moderately stiff push cable better suits longer runs in mainlines and branch lines. 800-769-7743; www.ridgid.com. **c**



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Waterline Renewal Technologies participates at WEFTEC

Waterline Renewal Technologies participated at the Water Environment Federation's Technical Exhibition and Conference in Chicago. Throughout the exhibition, WRT and its core brands — AP/M Permaform, CentriPipe, ConShield Technologies, LMK Technologies and Perma-Liner Industries — used live presentations to showcase the innovative trenchless technology of its core brands while also highlighting case studies and new products.

CUES opens new service center in Oregon

CUES announced the grand opening of its new, larger sales and service center in Estacada, Oregon, just outside of Portland. The factory-certified center will provide CUES customers with direct access to all levels of customer service, loaner equipment support and new equipment sales. The new location features over 6,000 square feet of offices, inventory, shop and service space.

Under Pressure Systems names business development director

Stephen Johns has been appointed the director of business development at Under Pressure Systems. In addition to leading the sales and marketing teams, his primary focus will be expanding the market share into the high-pressure industrial industries. Before joining the company, Johns worked as the director of sales and business development for CRP Industrial and for Nudraulix, where he supported multiple product lines. He has a mechanical engineering degree from Auburn University.



Steve Johns

NASSCO announces new technical advisory council

With the transition of Lynn Osborn, NASSCO technical director, into his new role as president of the American Society of Civil Engineers' Utility Engineering and Surveying Institute, NASSCO has formed a technical advisory council. Announced at NASSCO's semiannual membership meeting in September, the council comprises five industry leaders, all representing different backgrounds and areas of expertise. The members are Christopher Garrett, P.E., vice president of Brown and Caldwell; Chris Macey, P.E., Americas practice leader for condition assessment and rehabilitation at AE-COM Canada; Lynn Osborn, P.E., owner of LEO Consulting; Kaleel Rahaim, currently pursuing a master's degree in civil engineering; and Jerry Weimer, owner of Jerry Weimer Consulting. **c**

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NEW 2020 MC1510 GapVax sewer cleaner: JD Brule equipment, located in Greely, Ontario, Canada, is selling a GapVax sewer cleaner on a 2020 Western Star 4700 chassis and is available immediately. The unit has 10-cubic-yard debris tank, holds 1,500 US gallons of water, standard 4,500cfm 18" Hg blower (8.6 hours), and Giant water pump. If interested, please contact Adam Russell:

613-293-1965 C01



2004 International 8600 Vactor 2100, 1,500-gallon tank and 1,500-gallon freshwater tank, very good condition. 84,728 miles. \$122,500

561-302-7195, FL C02



Lightly Used **2015 Aries UV Lining Truck**: JD Brule Equipment, located in Greely, Ontario, Canada, is selling a fully-equipped 2015 Ford F750 with 59,948 miles, 33,000 GVW, Aries UV lining truck, available immediately. The unit has 2 light trains included that can cure up to 48" diameter pipe, and 4 cans included. Unit is in great shape. Asking price is \$275,000 (USD) + applicable taxes. If interested, please contact Adam Russell:

613-293-1965 C01



2012 GapVax MC1510 w/hydroexcavation, Allison automatic transmission, Giant jetting pump, Giant hydro pump, 18" blower, new tires. International remanufactured engine 2019. Ready to work.\$190,000 OBO

William 317-773-7996, IN C02



2002 Vactor 2100 jet-vac Model 2112-824-16 with PD blower. Both engine and a/c run good. Unit is in good condition. Call or email John Koschewitz for more information. Reduced price \$39,900 OBO

856-689-1020, NJ
jfk@hadehart.com C01

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

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EASEMENT SEWER FLUSER

Extendajet Model 600 Easement Machine, 500+ feet of 3/4" hose. Onan 20hp engine. Hydraulic hose reel in/out. 450 hours on machine. Unit runs/works great. Includes 8' drop-gate trailer. \$5,000. Call 219-863-4414 or buschbroinc@gmail.com. (C02)

HYDROEXCAVATING EQUIPMENT



2001 Vactor 2112HXY hydro truck, dual fan system vacuum, 10gpm @ 2,500psi, 12-yard debris box, 1,000-gallon water tank. 8-speed manual transmission, 3126 CAT engine. 8" extendable boom. 86,000 miles (new engine in 2018), 10,774 hours. \$50,000

920-734-4707, WI C01

JET VACS

2013 Vactor on a Kenworth T440. 18Hg blower, 1,500 gallons of water, 15-yard debris tank with side pump-off. 70,000 miles, 2,393 blower hours. New: Tires, 100gpm rodger pump, DEF system, exhaust. Truck is loaded with options. Call for more info. Truck works everyday hours and miles will go up. \$220,000. Tony 612-226-0516 (C01)

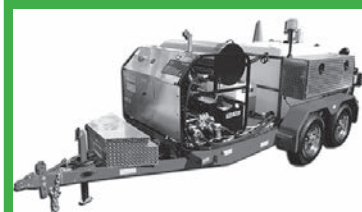
2001 Vac-Con VPD42HA/1300 sewer-cleaning unit mounted on a Sterling LT9501 with 131395 miles. 380hp Cat C12 in-frame rebuild at 101115 miles. Fuller 10-speed manual transmission, 120gpm FMC Quintuplex water pump, recent reman 165hp Cummins 8.3 auxiliary engine, recent reman Roots/Dresser 827 blower, cold-weather recirculation, 16-cubic yard-debris tank, 1,300-gallon water tank, 30' x 8" aluminum telescoping boom tube (great for catch basins), 500' x 1-1/4" hose on articulating reel. \$40,000. Call Mark 708-475-7116, IL (CBM)

2011 Vac-Con V390LHA combination cleaning truck. Low miles, great condition. 1998 Vactor 2110-36PD ex-city owned, low miles. See details of these units and CCTV inspection trucks at www.empireequip.com. Contact Craig at 714-639-8352. (CBM)

2014 Freightliner 114SD with a VacAll AJV1215; 12-yard debris body, 1,500-gallon water, combination vacuum/jetting unit. (Stock# 052R). **www.VacuumSalesInc.com** (888) VAC-UNIT (822-8648) (CBM)

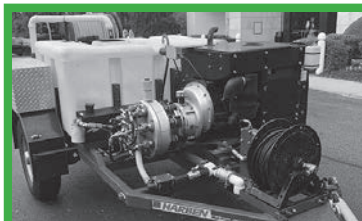
2007 Volvo with a Vactor 2115 combination unit. (Stock# 5903C). (888) VAC-UNIT (822-8648); www.vsurentalsllc.com (CBM)

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The **HotJet II**® is a best-selling hot- and cold-water drainline cleaner featuring a 35hp Vanguard engine by Toyota and delivering 10gpm @ 4,000psi that cleans drains up to 300' and 12" in diameter. Priced at \$32,995 including freight to the lower 48 states, the HotJet II® is American made using nonproprietary parts for affordability and ease in serviceability making its return on investment truly impressive. Financing available.

800-624-8186
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www.hotjetusa.com CBM



2017 Harben 4018 with Kubota diesel, 201.5 hours, new hose, small drain jet kit, remote.

757-490-7050, VA C02
mike@performanceplumbingva.com

LOCATORS

Used RIDGID NaviTrack, Gen-Eye Model 100 and Goldak Model 4400. The Cable Center 800-257-7209. (CBM)

Gen-Eye 185 Hot Spot digital pipe locator and 5-watt transmitter combination, includes padded bag. \$2,100. Serious inquiries only. Call 814-337-1191 (C01)

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Durand-Wayland, Inc. is seeking an experienced capital equipment sales representative to join our industry-leading organization. John Bean Jetters is a national leader in the manufacturing and distribution of trailer-based or skid-mounted sewer cleaning equipment to an outstanding dealer network. Those ready to grow their sales career with our established organization are encouraged to apply. Candidate will be available to travel with company vehicle, cell phone and laptop supplied. Candidate will possess sound business judgement, strong presentation skills, be people-oriented and a positive team player. Send resume and salary requirements to beckyj@durand-wayland.com. (C01)

PUMPS

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

New & Used Pumps – Vactor, General, Myers, Giant & others – New & parts also. Cloverleaf Tool Co., Sarasota, Florida. Phone 941-739-0707; Email: sales@cloverleaftool.com (CBM)

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

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TOOLS

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

Bosch Brute hammer drill with cart irons. The Cable Center: 800-257-7209. (CBM)
T&T Tools: Probes, hooks. Probes feature steel shafts with threaded and hardened tips. The insulated **Mighty Probe™** tested to 50,000 volts. **Top Poppers™** open manhole covers easily. Free catalog. **www.TandTtools.com.** Phone **800-521-6893.** (CBM)

TRAILERS



FOR SALE – 70-Tonne (+) winch trailer. 2010 Artis trailer S/N RC9121J Torsion flex 4500kg axles, pintle hitch with hydraulic surge brakes. Powered by a Deutz air-cooled engine S/N 8494592. Freshly rebuilt, 2 hours on engine. Bonfiglioli-type gear case with chain-driven winch reel, 500' 3/4" cable. Trailer has been given full maintenance, painted and ready to roll. Asking \$40,000 CDN, OBO + applicable taxes. Please contact Adam Russell if you are interested.

613-293-1965, Ontario C01

TV INSPECTION



2004 Ford E450 CUES camera truck with 91k miles. Onan 7kW generator (new in 2015) with approximately 3,500 hours. Camera reel with gold cable & technician station. No camera, transporter, or computer included. \$18,000

309-691-6653, IL C01

2002 CUES CCTV inspection truck. Ford F550 SuperDuty, 7.3 diesel engine with 71k miles, 16' box. Onan 7.5 HDK diesel generator with 3k hours. CUES reel with approximately 1,000' of cable, CUES 1208 PCU. Call Mark for more information. \$45,000 OBO. 708-475-7116, Chicago area (CBM)

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

USED EnviroSight ROVER Sewer Inspection Crawler: Overhauled with new parts and ready to run. Includes automatic cable reel, pan/tilt/zoom camera, steerable 6-wheel-drive tractor with various wheel sets, controls, and accessories. Call for pricing 973-252-6700. (CBM)

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Aries CCTV Inspection Truck: 2002 Ford E350, 5.4 Triton V8, 59,484 miles. Aries PCU, Dell operating system. New Onan commercial 7,000-watt generator. Pipe Tech pipeline inspection software, camera and transporter negotiable. Call for more information and more pictures. \$15,500. Mark 708-475-7116, IL (CBM)

2001 Chevy RST TV Van with POSM software. One (1) Omni 3 camera, Two (2) Omni 2 cameras. Two (2) 2-wheel tractors. 32,000 miles. \$28,000. Email cdscar@aol.com or call 916-207-7340. (C01)

PEARPOINT — Mainliner buying & selling used equipment. Canada & USA PEARPOINT MAINLINE EQUIPMENT ONLY. Will buy complete Pearpoint trucks. Will buy your old system. Do you need parts? 399, 599 reels; 420, 448 tractors: 494 digital and zoom 420 light heads. Call 800-265-4298 or mainliner2075@hotmail.com (CBM)

CUES CCTV Inspection Truck: 2000 Freightliner MT45 walk-in, Cummins 5.9, 71,086 miles. CUES PCU, Dell operating system, truck-mounted CUES grouting system. Onan 10.0 GenSet diesel generator. Software, camera and transporter negotiable. Call for more information and more pictures. \$19,500. Mark 708-475-7116, IL (CBM)

Used SeeSnake Camera Systems in all sizes; Used General Wire Spring Camera Systems in all sizes; Used machines in all sizes. We want your trade! The Cable Center: 800-257-7209. (CBM)

WATERBLASTING



Waterblasting Units for Sale. Unit 1 — 428; year: 1994; 494130-1; hours: 14,590; brand: NLB; pressure, 10,000 psi; other specs: 150 hp 6CT, 8.3-liter Cummins water blast units; price: \$10,000. Unit 2 — 429; year: 1997; 790260-1; hours: 16,996; brand: NLB; pressure: 10,000 psi; other specs: 150hp 6CT, 8.3-liter Cummins water blast units; price: \$10,000. 24 gpm pumps, trailered units, waterblast units and trailers have been well maintained and serviced regularly — annual DOT inspections. Waterblast units and trailers are fully functional and in good working order.

Mike 262-783-8100, WI C01



2003 Jetstream, 15,000psi/32.5gpm waterblaster, 235 Caterpillar engine, approx. 5,700 hours. Model #4200, Serial #03220, Pintle Hook trailer-mounted unit. \$34,000.

Contact Scott Mangum, KY
sm@kyblasters.com C02

Hydroblast company for sale (equipment only). Vac truck, 7 trailer-mounted pumps, ALL related hydro equipment (guns, hoses, tube/tank/pipe accessories, etc). Ethanol plant shutdown/paint shop cleaning. Many \$100,000's of related accessories and supplies. Most equipment needs attention. Heavy equipment includes 350hp 20/40K conv., 350hp 10/20K conv., 250hp 20/40K conv., and 4 NLB10150s. \$400,000 takes all. Equipment located in north-central Iowa. 515-344-4577 (C04)

20,000 - 55,000 psi Sapphire Nozzles, OS4, OS6, OS7 replacements, UHP hoses & replacement parts. Excellent quality & prices. 772-286-1218, info@alljetting.com, www.alljetting.com. (CBM)

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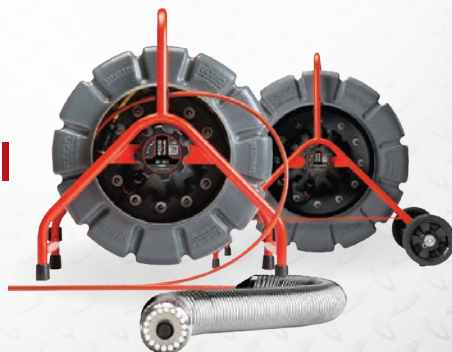
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