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William J. Ciriello Plumbing stands out for more reasons than one as Laura Ciriello-Benedict hires on character and trains for skills. p42.

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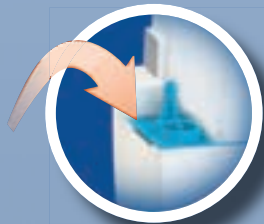
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ON THE COVER

William J. Ciriello Plumbing Stands Out ...
... for more reasons than one as Laura
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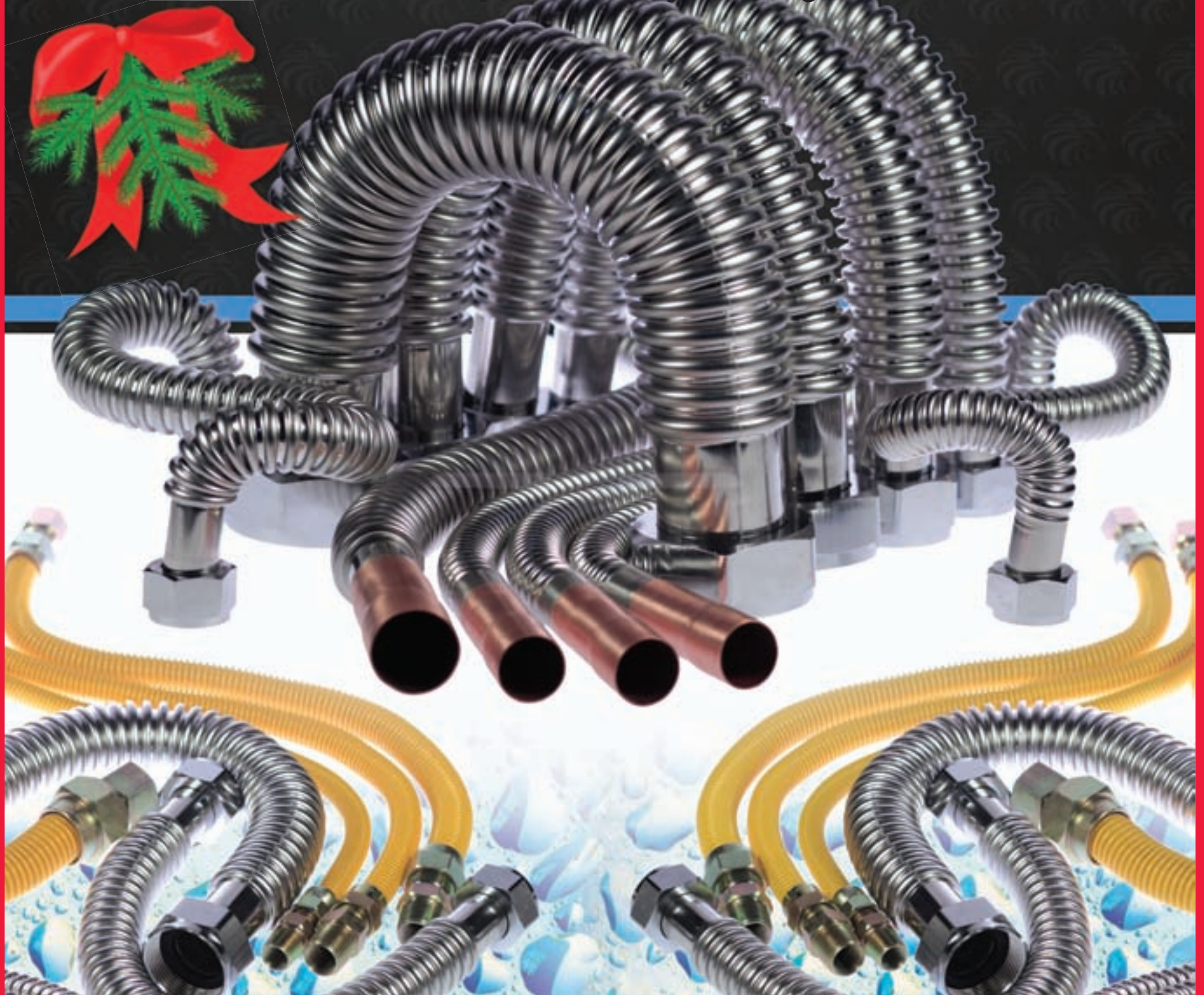
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PHCC Project Management Boot Camp Goes Virtual

The Plumbing-Heating-Cooling Contractors (PHCC) National Association Educational Foundation faced a tough question this year. How could its forty-plus hour, four-day Essentials of Project Management boot camp be successfully run online to avoid COVID-19 concerns? The answer was to partner with the professional crew at A. O. Smith University (AOSU) to provide the instruction over Zoom from their advanced video studio in Ashland City, Tennessee. This partnership allowed the first online PHCC Essentials class to run from last Wednesday to Saturday with eighteen project managers in attendance.

Kirk Alter, associate professor at Purdue University, is the lead instructor for the Essentials of Project Management class. His teaching style is highly energetic and interactive, featuring constant dialogue and role-playing exercises with the attendees. The AOSU studio allowed Alter to move as he would in a physical classroom, teaching from slides or more often vigorously scribbling columns of numbers on a whiteboard to illustrate the impact project manager's decisions have in terms of real dollars. All the while, staff in a control room were switching the Zoom broadcast view from camera to camera in the studio, allowing the attendees to follow the action. The attendees were required to

keep their video on throughout the program, allowing a monitor in the studio to display a gallery view to Alter, facilitating "face-to-face" conversations.

After completing a full eight-hour day of training, attendees were tasked with completing intense project assignments in the evenings. They were additionally responsible for coordinating how they would conduct these meetings with their group members who were spread across the country. For many, it was the first time they had needed to create work product and develop a presentation with an entirely remote-based team.

Offering the class online eliminated travel and hotel expenses, reducing the costs for attendees. While A. O. Smith University supported the program through use of their studio, A. O. Smith and Kohler Company generously sponsored class, further reducing the registration fee for attendees.

Offering the class online also helped to reduce the risk of travel during a pandemic. One attendee even learned he had tested positive for COVID-19 during the first day of the class. He was able to attend the entire program safely while isolating at home.

The next Essentials of PHC Project Management course will also be conducted online March 17 - 20, 2021. The class will also be hosted by A. O. Smith University and sponsored by A. O. Smith and Kohler Company. Visit phccfoundation.org/essentials for more information and to register. The class size is limited, so early registration is encouraged.



The PHCC Educational Foundation, a partnership of contractors, manufacturers, and wholesalers, was founded in 1987 to serve the plumbing-heating-cooling industry by preparing contractors and their employees to meet the challenges of a constantly changing marketplace.

MCAA Kori Gormley-Huppert Featured in Maker Month Profile

MCAA Kori Gormley-Huppert Featured in Maker Month Profile 2

Kori Gormley-Huppert, president of the Mechanical Contractors Association of America (MCAA) member Gormley Plumbing + Mechanical and chair of MCAA's Women in the Mechanical Industry Steering Committee, is among those profiled as part of Stanley Black & Decker's Maker Month Campaign. The campaign is designed to empower makers and tradespeople around the world. Stanley Black & Decker is the parent company of DEWALT and LENOX, both MCAA members.

In the interview-style profile, Gormley-Huppert talks about her company, her career and the mechanical industry. She also offers advice to those who are just getting started thanks to perspective gained from her own experience and her work on MCAA's Career Development Committee.

In addition to profiles spotlighting a diverse range of makers and creators from tradespeople and engineers to philanthropists and innovators throughout the industry, the campaign shines a light on the trade skills gap, which is one of the biggest issues facing the workforce today.

"To help solve for the vast skills gap today, an issue made worse by the ongoing COVID-19 pandemic, businesses need to showcase and celebrate the wide variety of opportunities people can pursue across the skilled trades," said Jim Loree, president and CEO of Stanley Black & Decker. "Maker Month is our contribution to this effort, helping to highlight the vast potential these careers offer," he added.

Read the profile at www.stanleyblackanddecker.com/social-responsibility/maker-month/maker-month-kori

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Manhattan Mechanical Services Announces Opening of New East Chicago Facility

Manhattan Mechanical Services celebrated the grand opening of its new East Chicago facility on Thursday, Nov. 5, 2020. This new

welding booths, overhead cranes, pipe-cutting machines and heat treatment equipment located inside the fabrication shop/warehouse, Manhattan Mechanical has the ability to prefabricate process piping, erect scaffolding, structural steel and more.

Uremovich noted that the company's goal is to create 80 new jobs in East Chicago in the next three years and that Manhattan Mechanical's accredited training program through NCCER takes four to five years to complete. "We are committed to building a trained and certified workforce of



building comes on the heels of strong growth for the Manhattan, Illinois-based mechanical contractor since its initial startup in 2011. The 20,000-square-foot structure will serve as the headquarters and features a 50-by-200-foot fabrication shop, a craft training center, a warehouse and corporate offices. "We're very pleased to announce the opening of our new location in East Chicago," said Michael Uremovich, president of Manhattan Mechanical Services. "This is not only an opportunity to bring more jobs to the area, but the new location offers proximity to major refineries, making our services more accessible to customers and partners in Northwest Indiana."

The virtual grand opening event featured a behind-the-scenes facility walk-through, a pipe-cutting and beveling demonstration, and a look at the company's new Superheat SmartFurnace II. The facility also has a computer lab to serve as a training center. With

craft professionals who can provide support to our customers in multiple craft areas," he explained. According to Uremovich, entry-level pay is \$16 per hour, but that once the apprenticeship ends, a worker will be in a position to earn a six-figure annual wage.

"Through strategic initiatives like this new facility, Manhattan Mechanical Services can remain at the forefront of the industrial market by providing outstanding mechanical services to both our current and prospective partners."

Virtual Financial Forum Brings Unified Group Members Together

Each year, The Unified Group — an association of leading independent HVAC commercial contractors in the industry — hosts a Financial

Forum to help member companies and their teams reach their goals. Due to the pandemic, this year's event went virtual for the first time and was a huge success. Attendees learned about financial benchmarks and KPIs to track for their companies, how to lead effective remote teams and more.

More than 36 attendees from 22 member companies logged in for the virtual event from Oct. 4-8. The first full day began with a presentation from Ted Janusz, titled "Like Herding Cats on Zoom? Leading a Virtual Team." Due to COVID, many companies are struggling with keeping remote employees connected and company culture intact. The group learned about managing different personalities, setting goals and the success formula: Event + Reaction = Outcome, where people are encouraged to change their response to different events to achieve more desirable outcomes.

On the second day, Shane and Melissa Dick from Atlas Accounting and Consulting shared a review of The Unified Group's Financial Benchmark to see how the group and individual members compare year-over-year, then broke out into smaller groups for discussion and screen sharing.

"I loved hearing the story they told using numbers, then looking at our numbers in comparison," said Cheri Lurvey of VHV Company. "The KPI breakout was great to share ideas and struggles. I don't feel like I'm on a desert island trying to reinvent the wheel, and I'm excited to look at the spreadsheets that were shared and develop more KPIs for our company."

Cashflow and forecasting were the topics on the third day, with Shane Dick leading the group in a discussion about forecasting models. Many members shared what they were using to monitor workload, revenue, margin, income and cashflow.

"If I didn't attend this meeting, I would have missed the camaraderie that develops when we realize that we're all struggling with the same thing," said Gretchen Riddle of A&G Services. "I love that so many companies were able to send different participants to the meeting this way. It's always good for me to hear how other departments are using information."

Because remote work is a new phenomenon for many companies, the meeting wrapped up on the final

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day with a group software discussion since software issues have become commonplace.

"The information shared in the software session was encouraging. I've learned that others are struggling with pieces of their software like I do with mine," said John Garvert of Glassman Corporation. "It's good to have a 'backup group' to share both problems and successes with."

All in all, the association's first virtual forum was a success, and The Unified Group is excited to continue finding new ways to offer value to members during these challenging times.

Bronx Design and Construction Academy Partners with SupplyHouse.com to Uplift Trades Work

SupplyHouse.com, an e-commerce company that sells plumbing and HVAC supplies has partnered with the Bronx Design and Construction Academy [BX Design], a NYC trade high school, to exemplify how skilled jobs are viable career options.

As vocational workers retire from their current positions, the demand for skilled trades work increases. However, a majority of high school graduates are pursuing paths such as traditional university degrees, leaving a gap of necessary skilled work.

To help reduce the gap, SupplyHouse.com and BX Design came together to inform students of

the benefits of working in the trades. These include job security, steady income, little to no student debt, working outside of an office, and the opportunity to run a business.

BX Design and SupplyHouse.com will work together providing students with resources needed for success. So far, SupplyHouse.com has donated plumbing products for BX Design students to utilize in their classes.

"Using modern plumbing materials from SupplyHouse.com provides the medium for students to develop relevant skills for their plumbing career as they complete their education at BX Design," said Anthony Johnson, plumbing instructor at BX Design.

BX Design is a Career and Technical Education high school that provides students from 9th to 12th grade with opportunities to learn about skilled work. They offer coursework in areas including carpentry, plumbing, heating, ventilation and air conditioning, electrical, and architecture/architectural drafting. The school's programs allow for students to advance into entry-level trade positions or further pursue secondary education programs. BX Design's coursework gives students opportunities to work hands-on; practicing installing full-scale systems in addition to internship experience and receiving valid trade certifications.

"As a collaborative community, we engage staff, parents, students, and industry partners ensuring our students are prepared for both direct entry into design and construction careers and/or college, upon

completion of high school," said Orvil Boatswain, career and technical education work-based learning coordinator at BX Design.

SupplyHouse.com is an e-commerce company that focuses on providing excellent customer service in the plumbing, heating, and HVAC industry. SupplyHouse.com has 488 employees across their four locations in Nevada, New Jersey, New York, and Ohio. With its core values and unique company culture, SupplyHouse.com strives to make a positive impact on its customers, employees, and the greater community.

CAL SMACNA Launches Choose Bigger Recruitment Program

The Los Angeles Rams' SoFi Stadium, Salesforce Tower and Pixar Animation Studios couldn't be more structurally different. But one thing they all have in common? The use of sheet metal and HVAC professionals in their construction.

The California sheet metal industry prides itself on recruiting the brightest talent to design and build everything from museums and entertainment venues to hospitals and high-rises throughout the state. And they're looking for the next group of young, hungry individuals ready to enter a career with unlimited benefits — whether through the sheet metal HVAC apprenticeship program or as a degree-holding professional.

To help generate awareness of and interest in a career in the skilled trades, the California chapter of the Sheet Metal and Air Conditioning Contractors' National Association (CAL SMACNA) has launched Choose Bigger California, a recruitment program for industry professionals both in the field and in the office.

"Maintaining a legacy of skilled talent in the construction industry is essential to economic growth, as well as public health and safety. We're excited to launch this new initiative to continue the excellence and quality of workmanship our state and country is accustomed to," said Chris Walker, CAL SMACNA executive vice president. "Our association represents the interests of more than 600 union sheet metal and air conditioning contractors throughout California,



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and we're committed to investing in the resources that will provide rewarding opportunities to bright young men and women to keep the pride of our industry moving forward into the 21st century."

How does the program work?

Choose Bigger California was designed with two distinct audiences in mind: apprenticeship candidates and students who are working toward or have obtained a college degree.

Apprenticeship. Here, potential applicants to the apprenticeship program can browse an overview of a career in California's sheet metal industry, including average wages, career benefits and requirements of a successful candidate. After five years of paid hands-on training in a state-of-the-art training center, apprentices earn journeyman status.

"We have a great pension, we have a great salary as journeymen, we're in a membership that's 6,100 members strong," said Mike Debellis, a 2010 graduate of the Local 105 JATC. "We do a lot of different projects, from high-profile tenant improvement, remodels, retrofit, new construction — the list goes on. Apprenticeship programs are great for men and women that are looking for opportunities to advance themselves and pursue a career path that extends 30 years."

College degree. Those with a college degree can discover how to use their education in a challenging and rewarding field. Once on the site, students can filter opportunities in

the sheet metal industry by type of degree, interest or career options, like design engineer or financial controller.

The recruitment campaign also extends to the parents, school counselors and other influencers in a student's life. Even if a student isn't actively looking for a career, it's possible someone they trust can guide them to choose a bigger future for themselves among one of the industry's many diverse career specialties. In the coming months, each target audience will be exposed to Choose Bigger California messaging through various digital platforms. With careful monitoring and proven strategies, getting more students on the path to a bigger future will become an achievable goal.

Creating community and health-focused solutions

Sheet metal HVAC professionals are fiercely proud of the iconic buildings they've helped design, deliver and maintain. But their work runs deeper than the visual beauty visitors see on the outside. Members of the sheet metal industry also create and install the high-efficiency indoor air systems that are essential to achieving energy efficiency and a healthier indoor environment for all.

"Sheet metal professionals are tasked with finding sustainable solutions that not only make a building look beautiful on the outside, but also improve indoor air quality for the people working and living in those buildings," Walker said. "A good mechanical system

makes up the lungs of a building, which is essential to the health of the occupants."

In early October, Governor Newsom signed Assembly Bill 841 into law, which will make public school air safer to breathe and water safer to drink — all while reducing energy bills. Among other things, the new law will help fund the assessment, repair and replacement of inefficient ventilation systems and provide new filters to reduce exposure to COVID-19 and wildfire smoke. Skilled and trained sheet metal professionals have been identified for this important public health effort.

"California has always been a leader in indoor air quality (IAQ) policy and initiatives," said Phil Phillips, Vice President of Operations at Southland Industries, one of the nation's largest MEP building systems experts. "For a long time, we've recognized the impact of poor IAQ on development and learning within our schools. In the current environment, there's an additional pressing need to ensure good ventilation in the classroom to protect our students and teachers. I find it incredibly rewarding to be involved in an industry on the front line of addressing this important concern."

Whether you've graduated from high school or college or are just deciding on a career path, choose bigger with a career in California's sheet metal HVAC industry. Visit www.ChooseBigger.com/California for more information or to apply.

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My pet peeves: factory-installed pressure relief valves and inconsiderate customers.

BY STEPHEN MINNICH



I may get some eye rolls from boiler manufacturers on what I'm about to say, but I blew that stop sign long ago, so why stop now?

I wish they would just leave pressure relief valves out of the residential hot water boiler packages and let contractors choose their own. Or better yet, put a better one in the boiler package.

Why would I say such a thing? What's my problem with boiler manufacturers? I've no problem with boiler manufacturers except for this one pet peeve. I say it because if I were still a mechanical contractor, I would welcome a price increase on the boiler to get this upgrade. It would save me the trouble of spinning off the one that comes with the boiler and spinning on a better one.

Early on, we're all taught the ins and outs of relief valves. What to do and what not to do and if you do that, the boiler will blow up. It's important stuff, this list of things given to us:

- Install the relief valve on a horizontal plane.
- Terminate the discharge pipe within six inches of the floor.
- If you're using iron pipe, don't leave threads on the bottom of it. Ideally, cut the bottom of the pipe at an angle.
- Use the minimum number of 90-degree fittings possible.
- Discharge pipe size must be the same size as the outlet of the relief valve.
- Valve lever must be exercised once a year to ensure the waterways are clear.

That's it. That last bullet point is why the choice of pressure relief valve should be left to the contractor or give us a better one. Here's why — look at the typical pressure relief features used on residential hot water boilers:

- Stainless-steel ring;
- High-heat-resisting silicone disc; and
- Bronze seat.

Now, take a look at what you'll get with a pressure relief that costs a bit more than \$15:

- Nonmechanical seat-to-disc alignment that will not stick

Here's another thing the service tech has to deal with. The preventative maintenance call on the 3-year-old boiler that was working fine before you arrived, and supposed to cost X amount of dollars, now costs two or three times that. And before proceeding with the valve replacement, the tech has to explain it to the customer.



Quality matters to contractors. Photo credit: Stephen Minnich

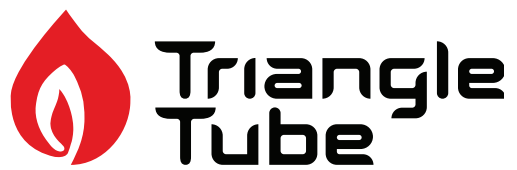
or freeze;

- Water seal of high-temperature-resisting materials isolates spring working parts from water during relief; and
- A seat located above drain; water can't be trapped and sediment can't foul the seat.

Suppose service technicians' expectation includes lifting and exercising the relief valve every year on preventative maintenance calls. In that case, the expectation also should have assurances that once the lever is raised, it will reseal without leaking. That's not asking too much, right? I don't think so, but it rarely happens with the ones from the factory. And if it does reseal the first year or two, it most likely won't in year three or four. At least, that's been my experience.

Here's another thing the service tech has to deal with. The preventative maintenance call on the 3-year-old boiler that was working fine before you arrived, and supposed to cost X amount of dollars, now costs two or three times that. And before proceeding with the valve replacement, the tech has to explain it to the customer. If you're reading this, you already know how the conversation is going to play out.

And here's how it gets worse for a guy like me. The boiler needs to be drained; maybe the whole system needs to be drained if isolation valves weren't installed. The boss is going to expect you to collect for every cent you're there. I get it, but the customer is going to be pretty upset about the whole deal. And I get that, too.



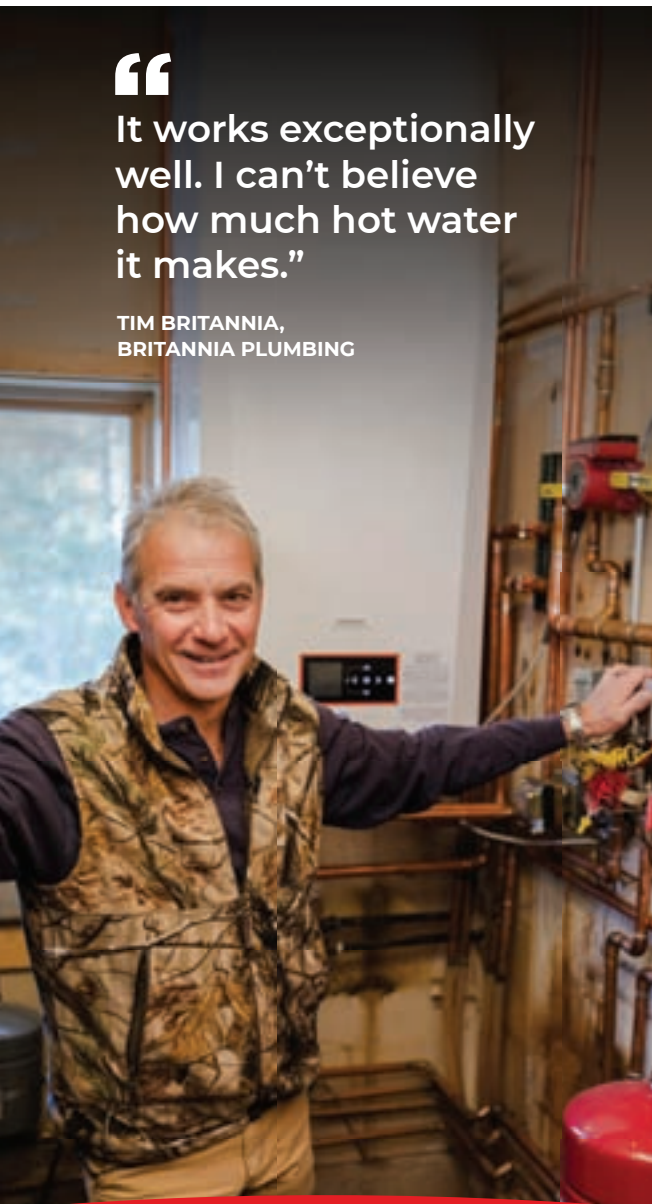
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Discharge pipe angled cut. Photo credit: Stephen Minnich



The concept of fairness and honesty within me gets all jammed up because I'm caught in the middle between them. Here's how I handled this situation as a contractor as opposed to as an employee. I'd give the customer the option of upgrading to a better relief valve before the job is even started. Maybe manufacturers could offer that choice as well?

Respect and courtesy

One more thing that grinds my gears and then I'll shut my piehole. It involves customers this time.

You've spent two months, off and on, trying to close this sweet boiler and near-boiler piping job you'd really like to get. You know it will make an impactful improvement on what's there now — and you'll make a tidy profit while doing it.

Finally, you get the green light to move forward. You get your down payment, order the equipment and material from your supply house. Now, you're setting up shop to prefab the near-boiler piping, which is always a favorite of mine. You've dotted your Is and crossed your Ts. You're as prepared as you'll ever be. You get the trucks loaded the night before. You're cocked, locked and ready to rock come morning.

The customer knew to expect you and the guys at 7:30 a.m. I always told my guys — if you're not at the jobsite five minutes early, you're late. I'm tough on things like that; I got it from my dad.

You roll up at 7:15 because it's what you do. The guys get there 5 minutes later, but it sure doesn't look as if the homeowners are ready. Shades are drawn, there are 6 inches of fresh snow and three cars still plopped down, in your way, on the driveway.

At 7:30, the prescheduled time, there are still no signs of life after ringing the doorbell. When 7:40 rolls around, you impatiently ring the doorbell again. Nobody answers, so you try again. Nothing. You bang on the door, expecting different results. Still nothing.

While mumbling some unrepeatable words under your breath, you head back to your trucks. You trying calling

them, but it goes right to voicemail. You tell your guys you'll give them another 20 minutes or so.

It's 8:20, and you're ready to move on to something a little more productive when the front door slowly opens, and your customer appears in a bathrobe, waving a finger telling you to hold on a minute. You're thinking, really? You've been holding on for almost an hour with three guys. You've already lost money on the job; now you need to wait until the driveway is cleared of snow and cars.

This is not a good way to start the day, and there are many ways to get off to a bad start on any given morning. But something like this? It is so disrespectful and inconsiderate of people in the trades.

Despite all the machinations necessary on your end to get prepped for the job, arrive early despite considerable snowfall the night before and the miserable traffic that comes with it the morning after, you are now being delayed by someone who clearly doesn't get it. Someone who clearly does not understand or care to understand the cost of lost productivity hours. You got to pay the guys starting at 7:30, regardless if the customer was ready for you.

This wouldn't bother me so much if it were a rare occurrence, but it happened enough times that I felt the need to share it. Now and again, I'll have somebody do work at my house. It's rare, but when I do, I'm ready for them. I even get the area they'll be working in ready for them. It's the least I can do for those who put in a long hard day, every day.

There. I said it.

I can move on now. ●

Stephen Minnich has nearly 40 years of experience in the heating industry, primarily designing, servicing and installing hydronic systems. He's moved from the Chicago area to Las Vegas and has hung up the tools for good. His newest venture is Minnich Hydronic Consulting & Design. He can be reached at stephen.minnich@yahoo.com or 630-291-3028.



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Convenience or Performance?

Customers will appreciate better quality and efficiency, if contractors can demonstrate the benefits.

BY BOB "HOT ROD" ROHR



Life is full of choices. In the contracting business, many decisions are financially based. The buyers of our products and services are many times concerned with the cost of the job. Or at least they say they are.

In truth, many shoppers appreciate better quality and efficiency, if you are skilled at explaining the reasons and benefits of the more-efficient products and installations. I know of projects where the homeowner or customer trusts the contractor to select the best option.

Time is money; I think we all agree on that. Contractor labor rates are, or should, represent the cost of providing services; that applies to all trades. If labor rates are in the \$200-plus range, there are good reasons to take labor cost out to be competitive.

The cost decision also may come down to product selection; balance it with the convenience factor. Would you consider a faster or easier-to-install product, if there is a trade-out for performance?

Thermal images

Here is a story that illustrates convenience vs. performance. Nowadays, we have pretty solid information about radiant slab performance based on common installation methods. Radiant slabs, for example, have been around long enough to offer some documented working data.

We can measure and, in some cases, see the performance with heat-seeking cameras. And we can use finite element analysis (FEA) to predict or confirm a radiant heating system's performance.

We all know the performance and output of a radiant slab are dependent on a number of factors. One consideration is where the tube is placed in the slab. The numbers — and common sense — indicate that the deeper tubing is placed in the slab, the lower the output. This is based on the resistance of the material over the tube; for example, we know the specifics of concrete resistance.

I recently decided to build up a couple of sample slabs to try and put some color to the question of tube placement and performance. Over the years, we have read articles showing how tube placement affects the output. Most of the PEX manufacturers analyzed and provided this information. John Siegenthaler has run some FEA models and come up with some predictions going back to 2005.

I built three different common slab samples:

Slab 1 has the tube installed over 2-inch EPS and the suspended about 2 3/8 inches below the surface; 1/2-inch PEX, 5/8-inch PD was supported on 1-inch tall chairs.

Slab 2 was a 2-inch thick pour on one of the knob-type insulation products; this method is sometimes referred to as a topping slab. It would be placed over the top of an existing structural slab, for example.

Slab 3 was a 2-inch knob board with a 4-inch pour. The decision on this type of installation is where to measure the slab thickness. I chose to pour a full 4 inches over the top of the knob, so the slab ended up 5 inches between



A thermal imaging scanner can show where radiant tube placement will provide the best heat output. Photo credit: Bob Rohr

the knobs. This puts the top of the tube at 4 3/8 inches below the surface of the slab.

We took the 4-foot by 2-foot formed slabs to the ready-mix plant and poured them in their lot with a typical six-bag, 7-slump, 3/4 aggregate mix.

I chose to use a Flir E40 thermal imaging camera on all three slabs and record the warmup every 15 minutes over 90 minutes. Water was supplied at 105 degrees, with the ambient temperature around 65 degrees.

As expected, the thicker slab, or the slab with the tube at the bottom of the 5-inch pour, lagged behind the other two. I planned on running the three slabs until the surface temperature reached a commonly accepted 82 degrees.

My recorded information matched fairly close to what Siggy's FEA predicted. Comparing the slab temperature against the ambient, you can closely predict the output in BTU/square foot. So, the slab with the PEX tube at the bottom had about 30 percent lower output.

Sure, this could be accommodated by raising the supply temperature, and I found about a 15-degree warmer supply would be needed on the slab with tube at the bottom to equal the performance of the slabs with PEX tube closer to the top.

Deeper tubing, lower performance

So, what is the takeaway? Clearly, a designer or installer should know this information. The system may not meet the heat load on design days if the output is this much lower than the requirement. The additional supply temperature required will be reflected in the operating cost. One boiler manufacturer suggests that for every 3 degrees you lower the supply water temperature, you gain 1 percent. So the additional 15 degrees cost you 5 percent.

Bottom line: The tube deeper under the surface carries some penalties. Same issue with tube stapled to the foam insulation. In addition, the knob foam products add some

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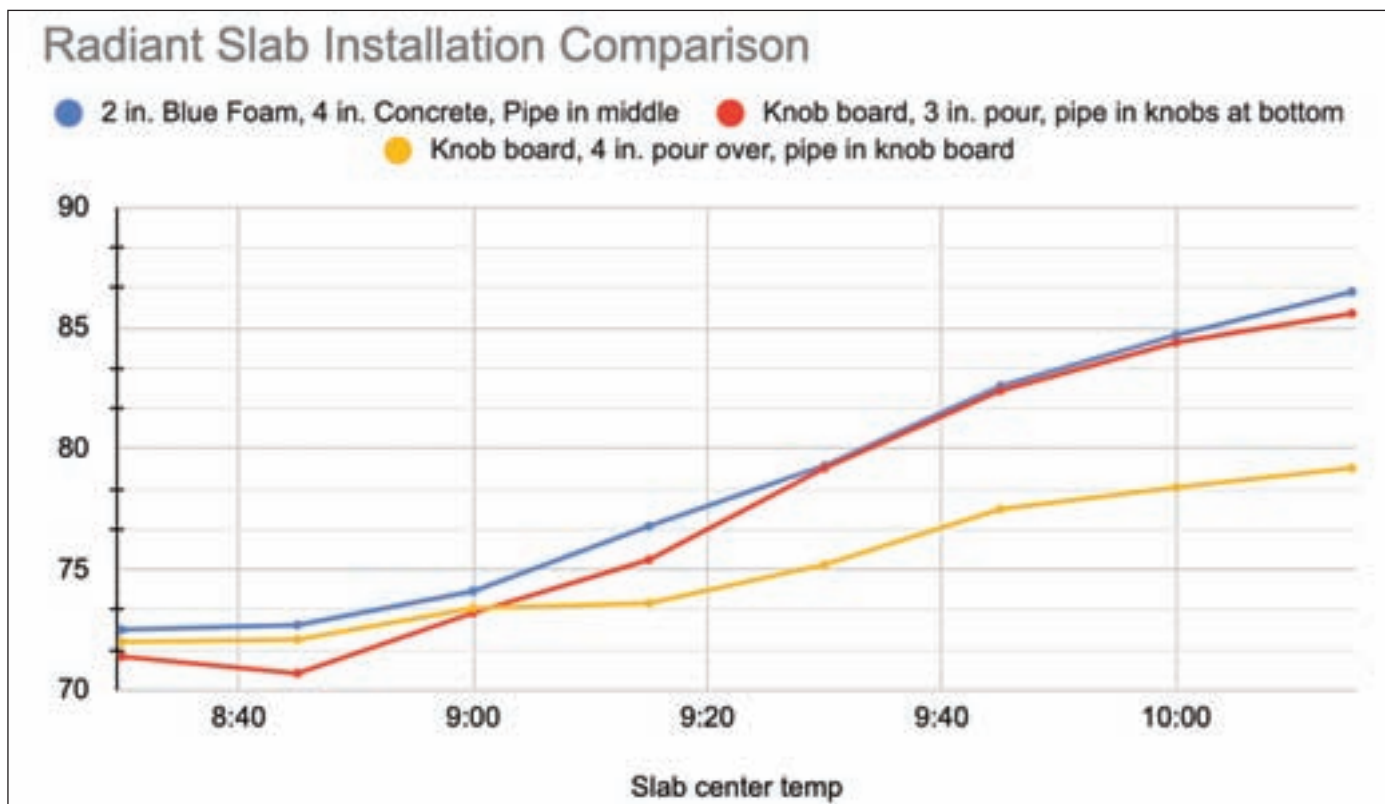
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I have used the knob foam products and also stapled to foamboard. I understand the benefits regarding installation time, and this is where the decision between performance and convenience comes into play. The knob panels are super-easy to install PEX tubing. Often you do not even

need to bend over; you just walk the tube into place.

But be sure the system can perform as you expect. If someday a heat pump is used, that low water temperature operation will make a big difference in its efficiency.

At the least, it is good to know this data when you do a design. Understand that the more contact the tube has with the concrete, and the closer to the surface it is, the

quicker the ramp-up and lower SWT required.

A design or below day will be when you notice the lack of performance. The common fix is to increase supply temperature. This can lead to uncomfortable surface temperature and a slab very slow to ramp down.

Remember to take all the factors — labor, ease of installation, material costs, efficiency and performance — into the total price of your jobs. Develop the sales and communication skills required to help your customers understand enough about the mechanics to make the best decision. Until the value of your recommendations has been established, you're stuck talking about price. ●

Bob "Hot Rod" Rohr has been a plumbing, radiant heat and solar contractor and installer for 30 years. Rohr is a longtime RPA member and Plumbing Engineer and PHC News columnist. He joined Caleffi North America as manager of training and education. He can be reached at hotrodradiant@me.com.

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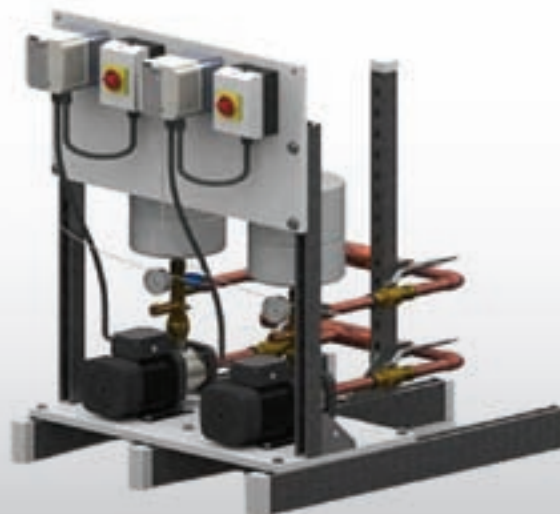
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Remote Pennsylvania Facility Caters to Remote Workers

Heating system helps people who prefer to work away from home rather than just at home during the pandemic.

BY DUSTIN EBERSOLE

Many American workers have grown to appreciate the opportunity to work from home, perhaps, brought on by the global health crisis of 2020 that has left many of us with that only option. the flexibility, lack of congested commutes and office hours spent in casual attire are significant benefits.

Yet some professionals still prefer a more structured environment than a spare bedroom and a laptop can provide. As a result, co-working spaces are on the rise in the US. These facilities, where single offices can be rented short- or long-term, provide a nice middle-of-the-road option for busy office professionals.

We recently updated and expanded facilities at a remote property called River Mountain, in Pennsylvania. The goal there was to provide attractive, efficient co-working opportunities for people looking for another option than just simply working from home and want an “away-from-home” working environment during the COVID-19 crisis, and beyond.

Buildings at River Mountain are now divided for different purposes; our task was to complete installation of all HVAC systems for the

remodeled facilities. Today, the main lodge, commercial kitchen facility and dining hall all serve co-working clients.

The property’s four cabins are rented out for ‘glamping’ – or, glamour camping. I’m told it’s become a popular thing.

The property is within two hours of Washington DC, Baltimore and Pittsburgh, the three metros that the owners mainly draw clients from.

Eliminating backup heat

River Mountain consists of seven buildings, six of which are fully conditioned by systems installed by High Efficiency Solutions.

The original log home, built in 1807, has been renovated for use as a dining hall, with a garage converted to a commercial kitchen. An old barn, also remodeled, now serves as a laundry and activity area. A new, modern-looking main lodge, at 2,500 square feet, is tightly constructed, as are four, 1,600 square-foot cabins.

Our firm was contacted about the project by Quarry View Building Group, based in Lancaster. River Mountain is outside the normal High Efficiency Solutions service area, but the size of the project, and the fact that wholesaler, APR Supply,

River Mountain is outside our normal service area, but the size of the project, and the fact that wholesaler, APR Supply, has nearby locations meant that we could take on the job.

has nearby locations meant that we could take on the job.

The original design provided by an engineer called for the use of mini-split heat pumps in all of the buildings except the kitchen, where a conventional packaged heat pump would serve most of the load. The drawings also included installation of electric resistance baseboard heat for backup. When I first met with the builder and owners, a key concern expressed was to eliminate electric baseboard from the design.

Also, the original spec called for a mini-split heat pump brand that we don’t install. That equipment didn’t offer the low outdoor ambient operating temperatures that we can provide with Fujitsu’s XLTH line, with models that can provide efficient heating at outdoor temperatures down to minus-15 degrees.

Another goal for the HVAC system was to provide efficient comfort and keep the system as aesthetically pleasing as possible, especially in common areas.

Design changes

We began our work by performing a heat load calculation for each of the buildings. Although the job is more than two hours west of our shop, the load considerations are very similar to our usual designs. The heating load is quite a bit higher than the cooling load, and snow accumulation is guaranteed. I submitted this new design, minus the electric baseboard, and was given approval to proceed.



Dustin Ebersole, owner of High Efficiency Solutions, starts up the Halcyon mini-splits that serve the main lodge.

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Early this year, High Efficiency Solutions installed the mini-split systems. The crew worked on and off as construction progressed, lodging nearby while onsite and going home to work on other projects in between.

The modern, architectural lodge features 10 zones, all comprised of multi-zone Fujitsu Halcyon systems. Two bunk rooms are conditioned with ceiling cassettes installed in drop ceiling. A laundry, shower, medical room and a hallway were handled similarly, with cassettes ranging from 7,000 to 12,000 BTU/H. Two slim duct units are used in a conference room with high ceilings, and a third in a hallway without the ceiling clearance to install a cassette.

The four identical cabins feature the same HVAC system design. A single two-ton multizone condensing unit in the back of the cabin is paired with two wall-hung indoor units. An 18,000 BTU/H unit is used near the front of the building in the bunk room, while a 7,000 BTU/H unit in the rear conditions the bathroom and storage spaces.

Slanted exterior walls and roof overhangs gave us the opportunity to mount some of the condensing units out of direct weather exposure. Here, with less concern about snow accumulation, units were mounted on pads and risers at a height of 8 inches. In places where overhead protection wasn't available, the units were mounted with brackets at a height of 18 inches.



A log home, built in 1807, was converted to a dining hall for co-working clients.

Handling challenges

High Efficiency Solutions serves a territory where old homes and retrofits are very common. Our experience allowed me and Mike Keener, lead installation tech, to take in stride the challenges presented by the old buildings.

But two stood out.

We had to carefully calculate our line set lengths in several of the buildings, being sure to mount condensing units out of sight. Had we needed even a few more feet of length, we'd have installed several Fujitsu J-II single-phase VRF systems instead of mini-splits.

The tight construction of the cabins presented their own set of challenges. Solid urethane foam

insulation filled the stud bays, and there was no dead space in which to run refrigerant lines. Having visible conduit wasn't an option either.

I didn't expect this issue, but we worked around it. We carved the foam out where needed, and were even able to maintain access to our flare joints.

Because there may be long periods of time when the buildings go unoccupied, we installed small, electric wall convectors in any bathroom that has an exterior wall. This way, the heat pumps can be turned way down without risk of freezing domestic water pipes.

Like the spray foam and efficient heat pumps, there are other green elements at the property. Condensing tankless water heaters provide all domestic hot water. Sustainably-sourced wood products are used inside and out, and the shape and orientation of the buildings lend themselves to passive-solar benefits.

We completed our work in August. When complete, I did a walk-through with the builder and one of the owners; everyone was happy with the result. The buildings are comfortable, utility bills will be inexpensive and the place looks fantastic. With that, they began to attract campers, and professional clientele. ●

Dustin Ebersole is the owner of High Efficiency Solutions, Lancaster, Pennsylvania.



The four new cabins at River Mountain are identical, are served by an 18,000 BTU/H unit in a large bunk room and a 7,000 BTU/H unit in the rear for the bathroom and storage spaces.

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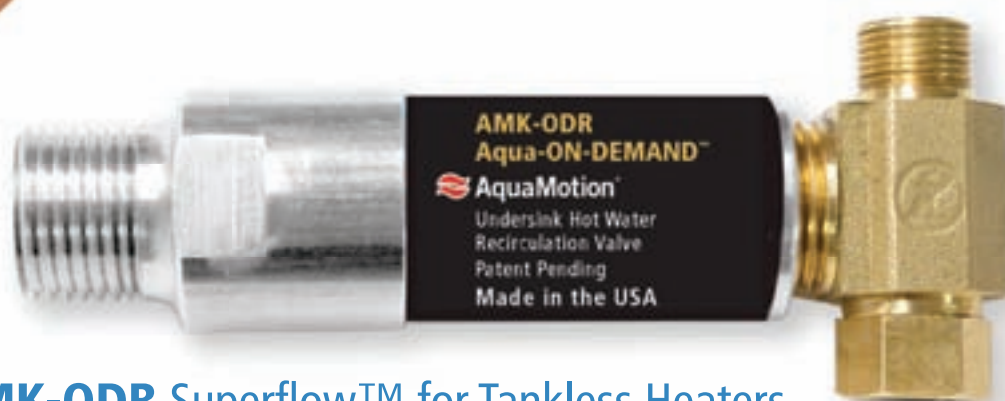


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Solving the Biggest Problems Contractors Face

How to set sales prices, give consumers a reason to trust their businesses, and hire/retain good techs.



BY RICHARD DITOMA

Before you can solve any problem, you must recognize the fact that a problem exists. Then you must identify the problem. Not properly pricing services to maximize profits is the biggest problem contractors encounter. Many contractors sell their services below their true cost and have no profit to maximize as they accrue deficits and scratch their heads in bewilderment.

Not knowing how to identify actual costs is the foundational cause of this mathematical problem. If you don't know your actual expenses, it is impossible to know whether you are selling your services above the cost you incur to provide said services.

You can guess at your true cost, but guessing is not knowing. And since you only have three choices — sell at, below or above your true cost — the odds that your guess will be wrong are 2-to-1 since only selling above your actual cost can fulfill the reason your business exists in the first place. Not choosing a properly profitable margin to apply to your actual costs exacerbates the problem.

A lack of confidence in your prices combined with the fear that consumers will question or not accept your prices brings up another problem: consumer questions. Address consumer questions about your prices or any issue regarding your business in an honest, intelligent, informative and rapid manner. It will give consumers confidence in your abilities to professionally address their requests.

If you employ technicians who lack confidence in your prices and do not know how to properly serve your clientele, your problems fester by proxy. Dealing with this problem requires you to hire techs who are qualified as good business surrogates as well as good technical agents representing your business.

The three biggest problems you, as a contractor, face are improper and nonprofitable selling prices; not knowing how to give consumers a reason to trust your business; and not hiring and retaining good techs.

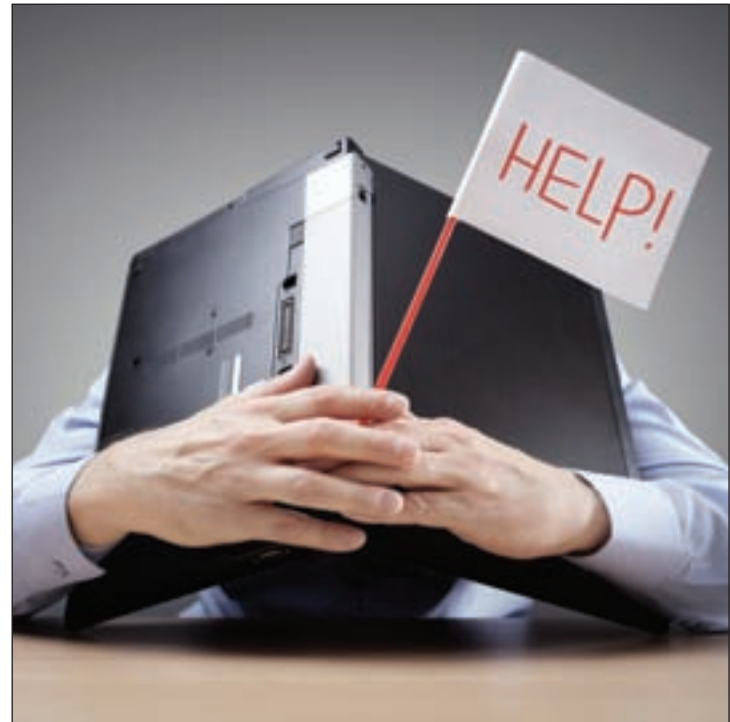
Knowing your true cost

Knowing your true cost is the foundation of appropriately profitable selling prices and requires identifying all your tangible and intangible expenses. Tangible means you spend actual dollars, such as buying a truck or a gallon of fuel for the truck.

Intangible means those issues that cost you money through actions, such as callbacks, consumer relations, etc. All contractors have callbacks, even the one-person operation who never admits mistakes or shortcomings. Therefore, ignoring the existence of callbacks when calculating your real costs and developing your selling prices is foolish.

Identifying your real costs requires you to address all administrative and technical salaries and salary-related expenses such as FICA matching funds, unemployment and disability insurances, vehicular expenses and a myriad of miscellaneous expenses.

Once you accurately identify all your true costs, you must apply a proper profit margin to fulfill the reason your



business exists — to make and maximize a profit above your true cost.

Maximizing profit

Maximizing your profit requires you to consider your goals and the issues that can affect your ability to earn and maximize your profit. A profit margin is not the same as a markup on cost. Profit margin is the percentage of money related to the selling price you get to keep (before taxes) after all your expenses have been met.

For example, if your labor/overhead cost (based on selling all your tech hours all the time) is \$700 and your material cost is \$300 for a task, your total task cost is \$1,000. If you want a 10 percent profit margin, your selling price would be \$1,111.11 ($\$1,000 \div 90\% = \$1,111.11$). Your pre-taxed profit is \$111.11. That \$111.11 represents 10 percent of the selling price ($\$111.11 \div \$1,111.11 = 10\%$) and that 10 percent is referred to as a profit margin.

If you marked up the \$1,000 cost by 10 percent, your profit would only be \$100 ($\$1,000 \times 10\% = \100). Your selling price would be \$1,100. In that instance, you would have missed the opportunity to bring in \$11.11 to your business and your profit margin is only 9 percent ($\$100 \div \$1,100 = 9\%$). In other words, you neither attained a 10 percent profit margin nor maximized your profit.

If your strategy is to set your prices and offer discounts, your profit margin must absorb the discounts without jeopardizing your ability to bring in more money than the service costs you to deliver. Therefore, a 10 percent discount on a task that only has a 10 percent profit margin defeats your purpose for being in business — it would only recover your cost if you sold all your tech hours all the time.

However, since no contractor sells all available tech hours all the time, an unapplied labor factor must be considered



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in choosing your profit margin. As I describe this factor, I will refer to tech hours. Please understand that I do not recommend time and material pricing. I believe in contract pricing (aka flat rate or upfront pricing), which gives the consumer a price before commencing service.

Contract pricing is based on the average tech's average time to perform a service, multiplied by the hourly labor/overhead cost if all tech hours are sold all the time. The average material cost spent on the task in question is added to that task's average labor/overhead cost to arrive at the total task cost to you, the contractor. Next, your profit margin is applied to the total task cost to arrive at your contract-selling price.

With this pricing method, combined with the excellence of techs who are above-average and administrative personnel who know how to purchase material wisely, profits can be maximized.

True cost per tech hour should be calculated on selling all your available tech hours all the time because it is the only constant. Business hours sold fluctuate; sometimes you sell more hours than other times. Therefore, your profit margin percentage must be higher than 10 percent to attain your 10 percent goal.

If you only sell 70 percent of your available time on average, you need a 30 percent profit margin just to break even on labor and overhead expenses. If you only earn a profit on material, you should consider getting out of the contracting business and open a material supply house business. However, there, too, you will encounter labor and overhead costs for the personnel, equipment and real estate you employ, use and occupy.

If all tech hours are not sold all the time and you only sell 70 percent of your available revenue-producing tech hours, the previously mentioned example task estimated to cost \$1,000 to perform would increase. The estimated labor/overhead expense would increase by 42.86 percent, making your actual labor/overhead cost \$1,000.

When you add the \$300 material cost, your total true task cost is \$1,300. In which case, instead of earning a profit, you would incur a loss.

Properly applying mathematics to your business numbers is as important to your business' health as measuring the pipe's length twice before cutting the pipe is to perform a task.

Addressing consumer questions

I don't know anyone who likes to be told untruths. Misinformation is the foundation for a lack of trust. If consumers don't trust you, they will have difficulty with any price you quote to them. When that happens, you will have difficulty closing the deal.

Understand that consumers prefer honest, intelligent, precise and rapid answers to their questions so they can decide whether they want your business to perform a service for them.

The following example is an excerpt from my book, "Solutions Management Theories and Methods for the Contracting Business:"

"A consumer asks, 'How much do you charge per hour?'

"By not charging by the hour and implementing contract pricing protocols, your honest, intelligent, precise and rapid response could be:

"We do not charge by the hour. We charge by the job. Think about it, (caller's name); you don't want to pay by the hour. You want to know the cost of the job before you authorize the work to be done.

"When you pay by the hour, you don't know the cost until after the job is finished. If the person performing the work is slow or unfamiliar with the task you need performed, you, (caller's name), will be paying for that slowness, inefficiency or lack of ability.

"If you pay someone by the hour, (caller's name), it would be in that person's interest to stretch the job as long as he/she could. This would cost you more money.'

"Using a contractor who charges by the hour is like ordering a meal from a menu with no prices. When it comes time to pay, they both may be hard to swallow."

With an answer like that, consumers with a modicum of intelligence will know you are an upfront, elegant and intelligent businessperson. They will understand that knowing the price beforehand is wiser than getting sticker shock after the job is done.

Striving for 'Star Techs'

A "Star Tech" is a technician who possesses certain assets and strives to be the best. If you want "good help," you must know what to look for before hiring anyone.

There are seven top assets a candidate for employment must possess. People either have them or they don't. Star Techs must have them all: integrity, loyalty, aptitude for the position for which they are being considered, great mental attitude, self-motivation, excellence in performance, and the intent to follow legitimate orders. There are many more than those seven needed, but they can be taught.

Once you have ascertained that the candidate for employment possesses those assets, you must decide whether or not to give probationary employment for a short term (one to six months) to see how things work out.

This means you must objectively evaluate the probationary employee's performance. And if you keep the person on staff, you must continue to evaluate performance throughout the employee's time at your company. Performance evaluation requires a list of issues you must critique without prejudice.

Retaining great employees requires you to make them feel comfortable in their employment and content in their compensation. If they feel comfortable but under-compensated, or feel contently compensated but underappreciated, you are asking for problems and may not be able to retain them in your employment.

Appreciation is easy to show; put on a smile and give a pat on the back. Content compensation is more complex to deliver. I believe a bonus or commission incentive program based on employee performance and doable goals can enhance compensation above salaries and keep your staff content.

By rewarding techs who perform in a superlative manner, you are giving other techs a model to emulate.

If you have any questions regarding the information contained herein or need help in solving any business problems, please give me a call. ●

Richard P. DiToma began his PHC industry career in 1970; first as an apprentice, then became a journeyman, a master plumber, an award-winning contractor and now a business consultant. He created his Contractor Profit Advantage program to help contractors improve their business results. DiToma has authored books on contracting business management as well as customized price guides for contractors. Contact Richard at 845-639-5050, richardditoma@verizon.net, or R & G Profit-Ability Inc., P.O. Box 282, West Nyack, NY 10994.



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William J. Ciriello Plumbing Stands Out ...



Laura Ciriello-Benedict, with oldest daughter Riley, a senior at Ball State University, and her husband, Jake Benedict, after Laura was named the PHCCCONNECT2019 Contractor of the Year.

... for more reasons than one as Laura Ciriello-Benedict hires on character and trains for skills.

BY STEVE SMITH

The best place to start this story is to go back to 7:30 a.m., Oct. 4, a year ago at a special workforce breakfast discussion held during the PHCCCONNECT2019 in Indianapolis.

The topic: women in the industry. On the panel: three women PHC business owners from Indiana, including Beth Rovazzini, B&W Plumbing and Heating; Cathy Stegemoller, Steg Plumbing; and Laura Ciriello-Benedict, William J. Ciriello Plumbing.

Growing up in a family business, Laura said the industry was always a part of her life. But by the time she was in college, she told everyone attending the morning forum that she did not want any of it.

"I knew I wanted to go into business," she said, "and I thought I would be an accountant because they were the exciting people."

The crowd got a big laugh out of that one.

But Laura's father, William J. Ciriello Jr., who was running the Beech Grove, Indiana, plumbing business his father opened in 1952, invited Laura to lunch one day.

"My dad said to me, you know, you're kind of bossy, and I am kind of bossy," Laura remembered.

He asked her about joining the business; after all, she did want to go into business. And she said she would join him as long as she could go into it planning on one day owning the business. So, after graduating college in 1995, Laura studied for the state contractor's license and showed up with about a hundred others to take the test. She was the only woman taking the exam.

"I aced the test," she added, "got a very high grade on it. And I've been working in the industry for 25 years

now, and have owned my company for almost 10 years."

Later during the panel discussion, Laura said something that stuck with us and made us curious to find out more about her and the business.

"We hire character and teach plumbing," she said. "I can't teach you to be a good person. I can't teach you to be honest and trustworthy. But I can teach you to be one hell of a plumber."

'We hire character and teach plumbing. I can't teach you to be a good person. I can't teach you to be honest and trustworthy. But I can teach you to be one hell of a plumber.'

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If that wasn't enough to perk our interest, then, a few hours after the morning meeting we knew we'd definitely have to plan a return to Indianapolis since Laura was named the National PHCC Plumbing Contractor of the Year, an annual award sponsored by Delta Faucet, handed out during the convention's Awards Luncheon.

More to it

Now, once we did finally make the trip to visit her last October, we figured there was more to her success than just being bossy. Besides the commitment to training, Laura also has a natural gift to spot talent and the personality to share the benefits of a career in the trades to the next generation.

"She's well aware that being a female business owner and licensed plumbing contractor means she is often in situations where she stands out," Brenda Dant, executive director of the Indiana PHCC and who moderated the PHCCCONNECT2019 panel, told us as we planned our coverage for own Contractor of the Year. "She takes those opportunities to promote the trade, dispel stereotypes and sell not only her company, but the entire industry."

That's as good a summary statement as we could hope to write, so let's break this down and take a further look:

• Training

"We've always been known for having highly technically skilled techs," Laura says of her crew, which focuses solely on service work with 60 percent of it in the commercial market and the remainder in residential. "We say we are the 'plumber's plumber.'"

A lot of other local plumbing companies know if they can't fix it, then Ciriello can.

"We do work for a lot of other plumbing companies because the skill has always been the center of what it is that we do," Laura adds. "Our approach is fix the things that need to be fixed with good advice, go home at the end of the day and be proud of what he did."

To that end, first and foremost, Ciriello Plumbing, as do all other Indiana contractors who can take advantage of it, profits from Mechanical Technical Skills Inc., and its four-year apprentice program administered by the Indiana PHCC. The school trains more than 700 apprentices a year, making it the largest plumbing apprenticeship school in the country.

Throughout the Mechanical Skills program, students learn the most basic of plumbing skills all way to in-depth knowledge of design and regulations that cover best practices.

Laura's father was one of the program's founders and is the unofficial superintendent of the school. But the

History of William J. Ciriello Plumbing Inc.



That's Laura's father, William J. Ciriello Jr., as a youngster in his father's truck.

After serving in the navy during WWII and working as a plumber for a number of years, William J. Ciriello, started his namesake company in 1952.

"He borrowed \$200 to get started," says his granddaughter Laura Ciriello-Benedict, "and within the month he completely paid back the loan."

With the post-war housing boom well under way, Ciriello figured that rather than going after the construction market, he'd focus on service work.

"And we've been primarily service since the get-go," Laura adds.

Eventually, William J. Ciriello Jr. joined the company, working as usual in a family plumbing business doing odd jobs as a youngster. By 1980, he'd bought the business from his father.

"My dad is that incredibly rare combination of a brilliant technician and a brilliant businessman," Laura says. "Those two things don't typically go together, but he really has a very methodical mind and a real knack for business."

While we've already heard a bit of Laura's story in our opening paragraphs of the main feature, no one will be surprised that she and her younger sister, like their dad, answered phones and washed trucks while they were in grade school.

Laura eventually graduated from Indiana University in 1996 with a degree in business management and human resources and had that fateful lunch with her dad.

"I've always been proud of the family business," she says. "I mean, how could I not? It's been an exceptional cornerstone on the South Side of Indianapolis for almost 70 years. But whether or not I thought I could do it, I had to get in there and try, and I ended up loving it."

Laura eventually called the place her own following a buyout from her dad completed 10 years ago.

The overall company remains committed to service and repair, which has afforded Ciriello Plumbing disciplined growth over the decades for its 17 employees.

"All businesses need to be bottom line driven," Laura explains. "But I think so many business owners get hung up on the top line of sales. To me, the bottom line is the only line that matters. We've never wanted sacrifice that for growth. So it's been a slow, steady climb on purpose."

Like her father, Laura is heavily involved in PHCC activities, and most recently became a Zone 3 director for the PHCC – National Association.

By the way, grandfather William is currently 91 and nurtured his interest in antique cars when left the business in the hands of his son, William Jr., who is now 68.

"I think he actually played more golf back when he was working than he does now that he's retired," Laura adds. "He says it's not as much fun when you get to play golf anytime you want. When you feel like you're not supposed to, that's when it's fun."

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school really is a labor of love for a very committed PHCC group.

"Plumbing in Indiana is really like a big family," Laura adds. "We are the largest PHCC chapter in the country with more than 263 contractors."

Laura, herself, was the chairwoman of the school's board of directors for three years, during which the curriculum for each of the four years underwent review. As a result, weekly lesson plans were rewritten and teacher manuals developed. The Distance Learning Program was expanded to have a live classroom feed so that the online apprentices were able to take part along with the in classroom students.

"These were things that were talked about for years," Dant told us, "but

lacked the leadership to successfully complete the project. Laura provided that leadership."

Anyone Laura hires to start a plumbing career makes a beeline straight to the next class at Mechanical Skills, where over the course of those four years students spend about 576 hours in the classroom and another 7,600 hours in on-the-job training.

Sounds good enough, but not good enough to make the grade at Ciriello Plumbing.

"In addition to the world-class training at Mechanical Skills," Laura adds, "which is highly sought after and fantastic training on its own, we enhance it here. We give our techs twice as much training and piggyback

off of what they learn at Mechanical Skills."

To do that, Ciriello Plumbing includes a formal classroom along with a hands-on lab featuring working plumbing products. While she says everyone with experience is counted on to help train the rookies, colleague Pat McCullough, aka "The Professor," is in charge of training that presents apprentices with instruction on four days a week.

And it's not just the typical classroom or hands-on training either. Every day, Laura sends out a training video to synch with whatever topic McCullough is currently teaching. These are typically videos of no more than five minutes long that Laura typically finds on any number of manufacturers' YouTube sites or other web searches.

Techs also get trained in the soft skills of customer service, as well as financial planning and budgeting advice.

"We are very blessed in this field to be a very high wage industry," Laura adds. "But we also have young people joining the business who may have never heard anything before about finance."

Training isn't just for apprentice plumbers. All experienced techs are in the training center, too, on a regular basis, and the administrative staff isn't forgotten either.

"Laura believes in training at all levels of her company," Dant says. "She sends her employees to PHCC training courses and then they have meetings on what they learned. She has her front office attend customer service training courses and they are so proficient that others in the class have asked to duplicate their processes."

• Spotting talent

"There's not one person here who was a plumber before they came here," Laura says. "Probably my biggest gift is that I can see talent. I love to surround myself both professionally and personally with people who have big dreams and big thoughts."

For future techs, that means being on the lookout for anyone Laura comes into contact with who provides exceptional service.

Like the guy who was busy making pizzas.

"He was inundated with calls and with people coming in," Laura adds, "but he greeted each customer kindly. So, I waited until the place was quieter and asked him if he wanted to make pizzas forever." He later became a tech at Ciriello Plumbing.

Or it could be McCullough's niece who was working at a White Castle and is currently a Ciriello apprentice.

Or it could be Richard Walker who was putting in water treatment

COVID-19 Concerns

The company was putting the finishing touches on updated office space in another part of its Beech Grove, Indiana, facility when the first news of the pandemic hit.

And a good thing, too. Hand sanitizer. Gloves. Face shields. Other PPE. All were in short supply at the time, but at least the new space literally helped physically separate office staff during the early days when just exactly how COVID-19 spread was anyone's guess.

In addition, the company typically had the techs park their trucks at the shop at the end of the day. That also changed since the company purposefully continued to isolate workers from one another as well as the office staff. Techs could be easily routed to calls from home with trips to the shop made only to stock the trucks.

"So many hard business decisions had to be made," Laura explains. "I still remember getting that first phone call from a customer who said she was recovering from COVID, but still needed service. We had to run through all these scenarios and change protocols for everything and everyone. In many cases, our techs may have been the first people allowed into a business or home."

No amount of proper planning, however, could erase the business impact of the pandemic.

"April and May were certainly eye-opening," Laura adds. "Our business didn't stop, but, of course, we certainly weren't as busy as were used to being."

Then and there, Laura decided to focus on a company trademark.

"We decided we were going seize this opportunity to do what we do best and focus on training," she explains. "To make ourselves more

efficient, better tooled and better trained. So we made a concerted effort to give hours to our techs when they weren't in the field and pay them for that extra time in the classroom. That would help keep families fed and everyone safe in the short-run, and benefit all of us in the long-run."

While commercial work in such places as restaurants has continued to suffer on account of public health shutdowns, Laura says she's never seen such a high demand for changing commercial plumbing to electronic, touchless styles.

"We are changing faucets, bottle fillers, paper towel dispensers all over the place," Laura adds. "We've always done that work, but never on this scale. We've had commercial customers tell us to just change everything to hands-free."

As you can imagine, that's kept Ciriello Plumbing crews very busy as of late.

Here, too, the training wasn't just on hard-and-fast installation and service, but also soft skills.

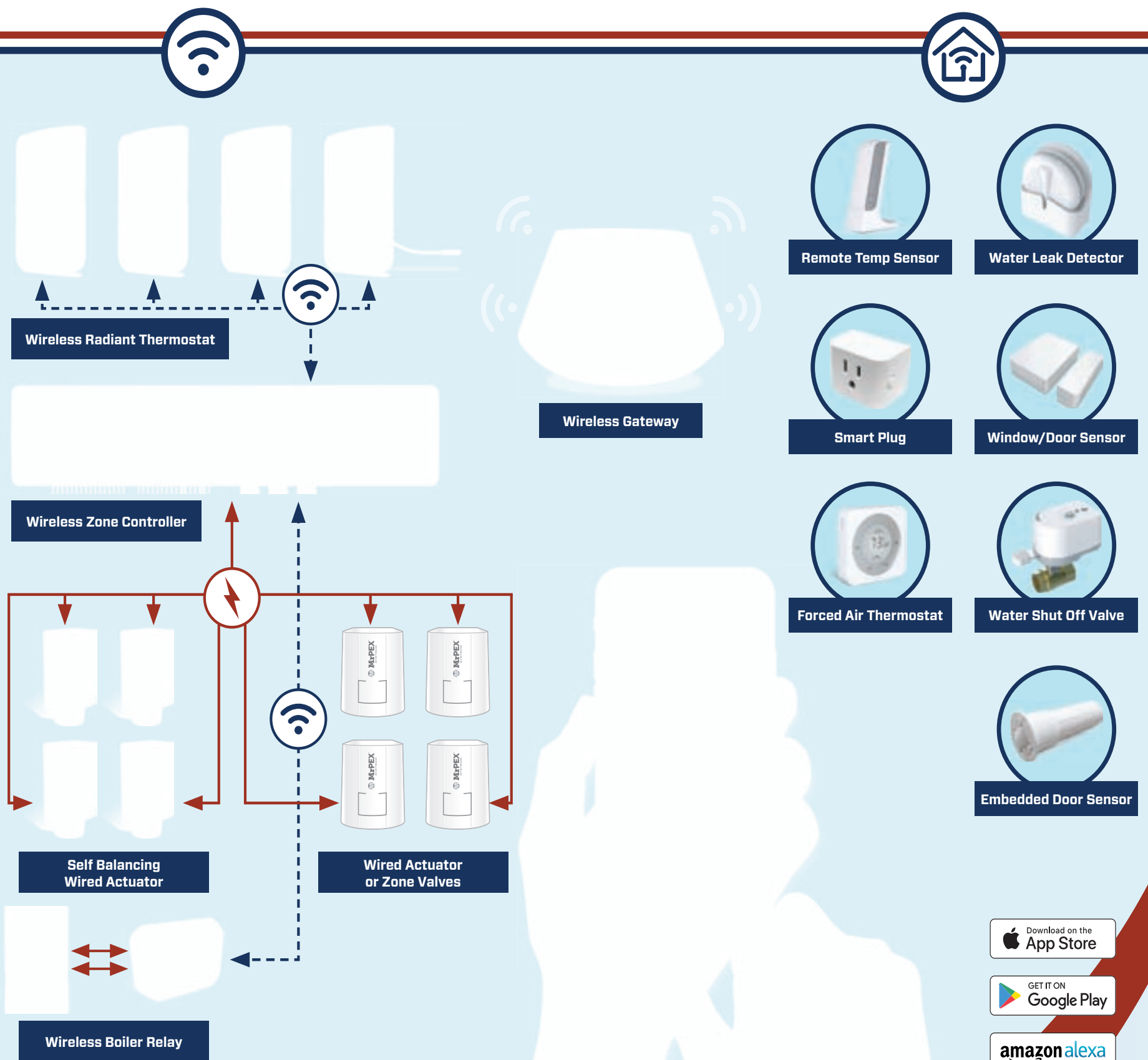
"How do you effectively communicate with customers when you're wearing a mask," Laura says. "We did find content about this, such as tilting your head to one side to show empathy. Maybe, exaggerate your eyes so that people can tell you're smiling."

Above all, Laura advises an optimistic mindset for these times.

"It's natural to be upset and afraid," she explains, "but you also have to show everyone that this is going to be OK, that we are going to make it, and this how we are going to do just that. Every piece of information that I could get that I thought would be helpful, I would share. That's all can do right now."



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equipment for Laura's office manager one day.

"I went over there to see what he was doing, and his copper piping was beautiful," Laura adds.

He even had directional arrows on the piping. And his truck was clean and organized.

"I told him the top of his field was the bottom of mine," she says. "If he was interested in a change, I told him to let me know."

That was 15 years ago, and today, Walker is a vice president and partner in Ciriello Plumbing.

"We're almost a production facility when it comes to our ability to make well-rounded technicians," Laura says. And while technical training is important, Laura says so is the helpful environment of the overall team, including office staff checking in on and rooting for the technicians.

"Sometimes the key is asking how things are going," Laura explains, "Or how the kids are doing. People who work here are not one-dimensional."

The ability to spot and nurture talent also extends beyond fieldwork. To further encourage growth and momentum, Laura recently implemented a management team to add another dimension to organizing the business.

The team is comprised of:

- Karie Beckham
- Jake Benedict
- Pat McCullough

"I love the family business," Laura explains, "but for so many family businesses, it can completely consume and become your everything. I knew for me, that wasn't it."

The concept of this extra layer of management is still new, but Laura says the idea is to create "real structure for the business so it will be ready for the next challenges and opportunities."

• Promoting a trades career

As it turned out, Laura had an eventful week, to say the least, during PHCCCONNECT2019. Right before the conference began, she hosted eight students from Beech Grove High School to explain the plumbing industry.

The local school district used to require service days for high school graduation that typically included some type of volunteer work. While it still does that, school officials also opened up that time up to learn about skills training, too.

The students gathered at the shop to listen to a 20-year-old apprentice talk about his work, in other words, a guy who the students could have likely gone to school with. And they also got to try their hand at soldering. That was a big

hit, Laura adds. But so was the event. After a career counselor asked the eight students if they would consider joining the trades, all indicated they would.

Over the years, Laura's been a big proponent of taking part in career fairs and talking up the trades as a career. When her two daughters were younger, she even slung a 48-inch pipe wrench over her shoulder for show and tell.

"Let's be really honest," Laura explains. "I am somewhat unique. So you might pay more attention to me simply because you can't believe that I'm a plumber. So I like to talk to young people about the field, just because I'm so proud of it. That's No. 1, but the money that they can make here without the debt of college is definitely worth explaining to kids who really have no idea what a plumber even does."

Laura also serves on the Beech Grove High School Work Ethic Certificate Advisory Board. The purpose of the

committee is to develop specific traits employers look for when hiring. Laura is the only plumbing contractor on the committee.

"We've pushed college for so long as if it's the only path to take," she explains. "But college and trade school are really equal in their own ways."

Through the work with the advisory board, Laura has also taken part in many conversations with career counselors, even to the point of attending that group's own national conventions.

We asked Laura if she felt a change in the mood of counselors treating trade schools on the same footing as a college degree.

"We just had this conversation the other day," she said. "I'd like to say that in my lifetime, I will see a huge influx into the skilled trades. I think it's going to come back. And consider that when COVID hit, who was still working every day? Plumbers! We're an essential workforce." ●

Indiana PHCC Names All Its Contractors "Contractor of the Year"



With the year all of us have had, we doubt any PHCCPro would disagree with a proclamation issued recently by the Indiana PHCC that named all Indiana PHCC contractors as its Contractor of the Year for 2020.

Normally, the trade group honors one company through a nomination process. However, this year the decision was made to acknowledge the contributions of the entire mechanical contracting industry during the ongoing COVID-19 pandemic.

Officially, the proclamation reads: WHEREAS, Indiana PHCC names a Contractor of the Year annually; and

WHEREAS, that Contractor is singled out for significant contributions to the plumbing, heating, air conditioning and/or mechanical contracting industries in

Indiana and to the PHCC association and who has been an effective leader; and

WHEREAS, the year 2020 has brought on unprecedented challenges due to the COVID-19 pandemic; and

WHEREAS, the Indiana PHCC Contractors have had to endure trials and lead in new ways while keeping employees and clients safe; and

WHEREAS the Indiana PHCC Contractors continued to provide essential workers to the public and kept the economy growing;

NOW, THEREFORE, I, Adam Meny, President of the Indiana PHCC, do hereby declare and express that Indiana PHCC Contractors are the best people with the best practices and proclaim that ALL Indiana PHCC Contractors are named the 2020 Indiana PHCC Contractor of the Year.

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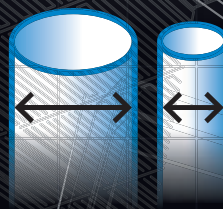


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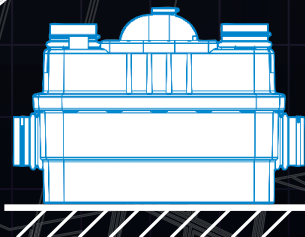
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A Legacy of Innovative Solutions

General Pipe Cleaners marks 90 years of designing durable products to boost customer productivity and professionalism.

BY RUTH MITCHELL

With nearly a century of market knowledge, equipment reliability, creative solutions and industry leadership, General Pipe Cleaners has forged a robust reputation for turning good ideas into great products.

As multiple generations of the General family and workforce celebrate the company's 90th anniversary this year, let's look back at how it all began — in 1930.

That's when Abe Silverman stepped out on his own from his uncle Frank's Rapid Wire Spring Co. to found General Wire Spring Co. His brother-in-law told him, "What's good for General Motors should be good for you."

As a growing manufacturer of metal springs, Abe remained keenly attuned to promising market opportunities. So to expand his customer base, he began making quality drain-cleaning cables for local plumbers.

But settling for simple springs as drain-cleaning snakes proved equally unappealing to Abe Silverman. So in the 1940s, he patented a process of wrapping spring wire tightly around a braided wire core — vastly boosting strength, kinking resistance and flexibility.

He called the heavy-duty design Flexicore cable. The innovative

invention instantly surpassed all competitive products and has remained the core of General's business ever since.

But Abe didn't stop there.

He soon developed the Sewerooter, the company's first power-driven drain cleaner. Followed by their first hand-held drain cleaner, the Handylectric. Over the years, General introduced a broad line of drain cleaning machines, water jets, and integrated sewer inspection camera and water leak location technologies.

Nine decades later, Abe Silverman's company, now marketing under the name General Pipe Cleaners, is still going strong. But like so many firms founded during the Great Depression, it constantly leveraged hard work, market savvy, inventive approaches and plain luck to survive — and thrive.

Generations of trust and service

General continues serving plumbing, drain cleaning, maintenance and rental professionals with "the toughest drain cleaning tools down the line."

Multiple generations of customers cite General products as preferred brands. Company records boast

countless cases of two, three and — astonishingly — even four family generations trusting equipment such as Handylectric, Super-Vee, Sewermatic and Speedrooter. Its customers count on General's durable equipment to boost productivity enhance return on investment and.

General's ongoing product-improvement efforts take great ideas — and make them even better. That's especially apparent in the company's line of cable drain-cleaning machines.

In the mid-1960s, automatic cable feeds boosted the appeal of new General equipment. Shortly after that, the manufacturer introduced the Feedomatic and Sewermatic, followed by the popular Power-Vee with power cable feed.



Second, third and fourth generations of the Silverman family at General Pipe Cleaners (from left to right): Mike Silverman, Jeff Silverman, Steve Glick, Steve Silverman, Art Silverman, Marty Silverman, Bob Silverman, Lee Silverman, David Silverman and Ethan Silverman (The first of the 4th generation to join the company).

New variants of classic General machines are meeting customer needs today, such as Speedrooter XL and the portable Mini-Rooter XP.

But plumbing, drain cleaning and maintenance pros know that cable machines alone can't clear clogs such as grease, sludge, sand, sediment, ice and similar sticky stoppages.

So three decades ago, General developed its Jet-Set water jets, which unleash high-pressure water streams to pulverize clogs and flush them away. Nozzle thrust drives the hose down lines and gives wall-to-wall pipe cleaning action.

The portable JM-1000 Mini-Jet packs 1,500 psi of cleaning power in a compact package, yet weighs only 23 lbs. For large jobs, General's gas-powered machines punch through stubborn stoppages in longer and outside 4-inch to 8-inch lines.

Large or small, General's rugged, reliable electric, gas and trailer jets are excellent for restaurants, hotels, hospitals, factories, schools, sports arenas, care facilities and shopping centers.

Enhancements maximize performance

Quickly and correctly spotting troubles also helps contractors boost both productivity and profitability. So from the late-1990s, General popularized integrated video and audio inspection technologies to find and diagnose stoppages with speed and accuracy. Its Gen-Eye sewer inspection camera systems are available in a variety of models and sizes. They are augmented by the Gen-Ear LE acoustical water leak location device.

General inspection equipment shows users exactly where and what problems are without needlessly busting up concrete driveways or destroying expensive landscaping trying to spot breaks or blockages.

That sort of precision also enhances professionalism by cycling jobs more quickly. "We fix problems faster — and get more jobs done in less time," one professional notes. "We firmly believe that giving customers the service they deserve enhances our professional reputation."

Over the past decade, General extensively enhanced its range of video inspection and locating systems, including the compact, lightweight Gen-Eye X-POD and Micro-Scope2 systems with USB ports to record video inspections to flash drives.

Professionals also need to spot problems — fast. And they can't



General offers a full line of water jetters including electric and gas-powered, and trailer-mounted. JM-1000 Mini-Jet clears sinks lines of grease clogs with 1,500 psi, yet weighs just 23 lbs.

afford downtime learning how to operate complicated new equipment.

That's why, for nine decades, General tenaciously leveraged technical progress to speed and simplify work to boost customer productivity and professionalism. One result is the Hot Spot digital pipe locator. Users know what the problem is, where it is and how deep to dig — eliminating guesswork when inspecting and tracing sewer lines, drain lines, septic tanks, active power lines and buried utilities.

Other inventive, productivity-boosting General products — such as the ClogChopper cutter and Kinetic Water Ram drain cleaner — claim fame as equal heirs to Abe Silverman's pioneering legacy. Those innovative General technologies help customers maintain their competitive edge.

Past is prologue

Today, General Pipe Cleaners boasts a full line of advanced drain-cleaning tools — including reliable drum-type and sectional drain-cleaning machines, gas- and electric-powered water jets, sewer inspection cameras and pipe location systems, acoustical water leak location equipment, pipe freezers, thawing machines, and accessories.

Though the company worldwide, they are proudly based and manufacture most of their products

"Product reliability and innovation have forged our reputation," -- General's President, Lee Silverman, Abe's son.

here in the USA. Sales and marketing efforts include French and Spanish websites, expanded social media platforms, and a YouTube channel. Yet General, its staff proudly notes, sells only through wholesalers supporting its distribution channels.

Abe Silverman's lasting legacy of innovative solutions, product reliability and customer service continues today. And his great-grandchildren — the founding family's fourth generation — have now joined the business.

Moreover, better than 40 percent of General's workforce remains multi-generational — with children often working shoulder-to-shoulder with their parents. Even the company's independent salesforce remarkably reflects two and three generations representing General equipment.

With a nine-decade heritage, the people of General Pipe Cleaners keep working hard to serve even more generations of customers to come with the "Toughest Tools Down The Line"! ●



Matco-Norca Lead-Free PEX Ball Vales with Tee Handle

Matco-Norca now offers lead-free brass PEX ball valves with a tee handle option. These full port brass ball valves are available in 1/2 -, 3/4- and 1-inch sizes. Tee handle options include Crimp PEX (754PXTLF) and Cold Expansion Connection (754PXCELf) versions. Ideal for use in potable water and hydronic heating applications, their quarter turn handles provide for quick and easy flow control in tight spaces. The 754PXTLF Crimp PEX tee handle option (600 WOG) is NSF 372 certified. The 754PXCETLF Cold Expansion Connection ball valve (400 WOG) is NSF 61 and NSF 373 approved. www.matco-norca.com



American Standard Beale MeasureFill Touch Pull-Down Kitchen Faucet

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Rheem®, a leading global manufacturer of HVAC and water heating solutions, unveiled the industry's most efficient hybrid electric water heater. Named ProTerra™ for its unmatched efficiencies, this ENERGY STAR® certified water heater from Rheem is over 400 percent more efficient compared to any standard electric tank-type water heater in market and is more eco-friendly than ever at up to 4.0 UEF.

The ProTerra's compact design makes it a perfect tank replacement for even the home's smallest spaces. The system is available in the widest selection of gallon sizes in its category – 40, 50, 65, 80 – to support various hot water needs, and the ProTerra with LeakGuard™ model is now the industry's only hybrid water heater with built-in leak detection and auto-shutoff that limits water loss from the tank to no more than 20 ounces.

LeakGuard protects the home against water damage, providing peace of mind for end-users.

This all-new hybrid water heater also has Rheem's exclusive EcoNet® WiFi technology built in. Once connected through the EcoNet mobile app, users can monitor the system from any location, adjust water temperatures for controlled comfort and receive maintenance alerts to ensure the system continues to run smoothly without interruption. Additionally, through the EcoNet mobile app, users can access Rheem's Hot Water Availability feature which indicates how much hot water is available in the tank, preventing any cold shower surprises. Other advanced features include scheduling around peak electricity rates, an energy usage tracker to manage consumption without sacrificing comfort and five operating modes to balance between energy usage and hot water availability.

Plumbers can access detailed system diagnostics through Rheem's Contractor App,



which shortens service visits and improves credibility in the field. The ProTerra has all serviceable components on the front of the unit, which also saves plumbers valuable time on a jobsite. Another benefit to plumbers is the unit's zero clearance requirement on the sides. This makes earthquake straps easy to install, providing an extra benefit in California where earthquake straps are code.

The ProTerra qualifies for the highest level of energy rebates, will save homeowners up to nearly \$500 in annual energy costs¹ and will pay for itself within two years². For more information on utility rebates, ask your local utility provider and visit www.Rheem.com/Hybrid.

¹Based on comparison against the estimated annual operating cost of a standard electric water heater of like capacity manufactured prior to 2015 under NAECA II which is likely being replaced. ²Based on purchase price and energy cost savings of a 50-gallon Hybrid Electric Water Heater with 3.55 UEF (3.50 EF) over a 50-gallon standard residential electric water heater with a 0.93 UEF (0.95 EF).



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¹Information on tax credit accurate at time of publishing; consult your tax advisor for details on eligibility requirements for tax credits or go to rheem.com/federal-tax-credit. ²Based on comparison of the 50-gallon Hybrid Electric model against the estimated annual operating cost of a standard electric water heater of like capacity manufactured prior to 2015 under NAECA II which is likely being replaced. Savings varies per gallon capacity. ³Leak detection and leak protection built in for ProTerra Hybrid with LeakGuard only.

QuickBooks Online: Housekeeping Tips

The ability to connect to an online system while in the field results in more accurate financial reports.



BY ELLEN ROHR

Once upon a time, my mentor Frank Blau taught me how to read and use financial reports. He convinced me that it's a good thing to know how much you have, owe and own. He taught me that you have to charge more than it costs or you'll rack up a pile of debt. Sound counsel, right?

Thank goodness for Frank. I'm also grateful for my first accountant, Brenda, who explained accounting to me with kindness and patience. And I am incredibly grateful for my sister, Gail, who is the world's best forensic bookkeeper. Gail can fix any mess; she's fixed plenty of mine.

She changed my life by teaching me the basic accounting equation and double-entry accounting: "Ellen, when something changes, something else also changes. It's got to go to or come from somewhere."

Let's define a few terms. Accounting is the system of summarizing business and financial transactions and verifying the results. A bookkeeper is a person who records the transactions.

The accounting program tracks and processes the transactions, which populate the financial reports. It does the math, engaging debits and credits to update the accounting equation: Assets = Liabilities plus Equity; Debits = Credits. Double-entry accounting uses debits and credits to keep this equation in balance.

Accounting is a garbage in/garbage out situation. If you do bookkeeping poorly, the books will be a hot mess. Early on, mine were. Since then, I've figured out my assets from my elbow, but it took me a minute.

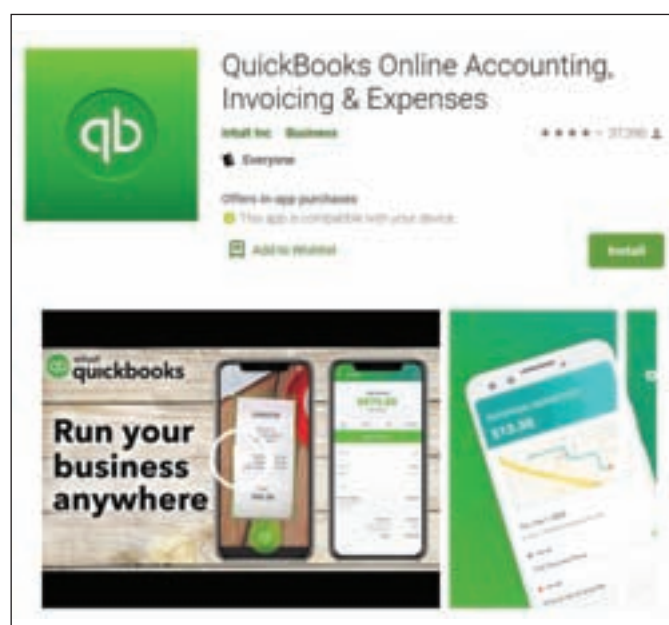
Once the light bulb went on, I've spent the greater part of my life encouraging people to get to KFP — a known financial position — so they can make better, faster, more profitable decisions. It's empowering to know where the money is, where it comes from, where it goes — and how to make lots more of it.

I've written a lot about accounting and bookkeeping. Today, let's focus on accounting software, particularly QuickBooks Online (QBO).

Connect, access business accounts

I love QBO. There are other fully functioning

Accounting is a garbage in/garbage out situation. If you do bookkeeping poorly, the books will be a hot mess. Early on, mine were. Since then, I've figured out my assets from my elbow, but it took me a minute.



accounting apps — Xero, FreshBooks and ZOHO, to name a few. One not-for-nothing consideration is that many more people can help you with your accounting and bookkeeping if you use QuickBooks because it is the world's most popular accounting program.

I know a few super-smart contractors who have embraced apps as a way of life. There are loads of apps for spending and saving and tracking, and they can connect nicely with QBO. However, those apps must ultimately result in a current, accurate and understandable set of financial statements — essentially, the balance sheet and profit-and-loss statements.

Warning! Don't overdo the app integration. You run the risk of entering things more than once or compromising how the software is supposed to work.

The best way to ensure that the financials are correct is to audit your accounts daily, weekly and monthly. The reconciliation feature in QBO allows you to match what you think you have in your accounts compared to what the bank, credit card company or vendors say you have.

If you are using QuickBooks desktop, I heartily recommend updating to QBO. The online version makes it super easy to connect your bank accounts and credit card accounts to the accounting software.

Pro tip: If you run multiple companies, use separate credit cards and bank accounts for each, and keep all your business accounting separate from your personal accounts. It makes it so much easier to track and verify transactions. It's cleaner, should you get formally audited by the IRS. And it makes for a simpler due diligence process if you intend to sell your company someday.

Uploading receipts via mobile app

Does your dispatch/management software import

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As one company, we're better able to deliver what you value most. Best-in-class solutions. Domestic and international sourcing. Consistent availability. Outstanding support, responsiveness and ease of doing business.

Everything you need to get the job done.



The ability to upload information to your accounting software while on the jobsite saves time and virtually eliminates errors. Photo credit: iStock.com/ MachineHeadz



to QBO? If so, this can be a huge time saver. We use ServiceTitan at Zoom Drain. In this situation, you import revenue into QBO and the accompanying payment and import deposits into QBO from your checking account integration.

You will want to be meticulous in your setup before pulling the trigger to connect the two programs. You run the risk of entering data twice or sending it to a surprise QBO-created account, so explore the “Match” and “Confirm” features in QBO.

The mobile app is helpful. Download it to your tablet or phone. There’s a nice feature on it that allows you to take a picture of — or “Snap” — your receipts and upload them to QBO. You also can forward an email with an attached receipt. Or take a screenshot of an emailed receipt and drag and drop this into your QBO receipts module in the program’s banking section.

You don’t want to send a receipt multiple times or in different ways. Upload it once, verify that it shows up in QBO, then delete the email or the picture you uploaded. If not, you get confused.

Once you’ve added the receipt, you can match it to the transaction that is waiting to be categorized in the banking section of QBO. Attach as a receipt for items that have been paid already, via credit card or electronic transfer.

Don’t create a bill if the transaction has already happened and the expense has been paid. Do create a bill and schedule payment, if the uploaded item is an invoice that has not yet been paid.

Pro tip: Upload receipts on a daily in-the-moment basis. When you purchase fuel for your truck with a credit card, upload the receipt immediately. If you are trying to figure out what you did a week or a month ago, you will waste a lot of time. Spend 10 minutes every day updating your bookkeeping or verifying — auditing — your bookkeeper’s work.

Handling payroll

Now, when it comes to payroll, I am a big fan of payroll services such as ADP or Paychex. Yes, the QBO payroll feature works if you set it up correctly. This comes down to personal preference. If you use an external payroll service, use a recurring transaction created in QBO to record the transaction. Then, when the cash requirement amount imports from the bank account, exclude that transaction.

Are you connecting the dots already between QBO, your financial institutions and other software already? Good for you! It saves so much time, money and energy and helps you be a better financial steward. If you are not yet, and now eager to do so, you will probably need some help, especially for payroll set up and app integrations.

I’ve had success with the “Live Bookkeeping” help available at QBO. Note the “My Experts” button on the top right of the page when you are in your account. The QBO expert won’t replace your accountant — or you as the financial manager. However, he or she will show you the ins and outs of the software and may be able to do some data entry for you. It’s a very good solution, especially for a small business (three or fewer trucks).

This YouTube channel, officially sponsored by the QBO team, is a terrific resource (<https://bit.ly/38jM0My>). These short videos are super helpful for figuring out the basic bookkeeping workflows.

There is much more to “unpack” on this topic. I’d love to hear from you! Send your comments, questions or helpful tips and hacks to ellen.rohr@zoomdrain.com. ●

Ellen Rohr is an owner and franchise operations manager of drain and sewer experts Zoom Drain, www.zoomdrain.com. She offers "in the trenches" insights to contractors and family business owners. Reach Ellen at 877-629-7647 or ellen.rohr@zoomdrain.com. For business tips, problem-solving webinars, moneymaking tools, visit ellenrohr.com.



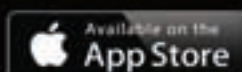
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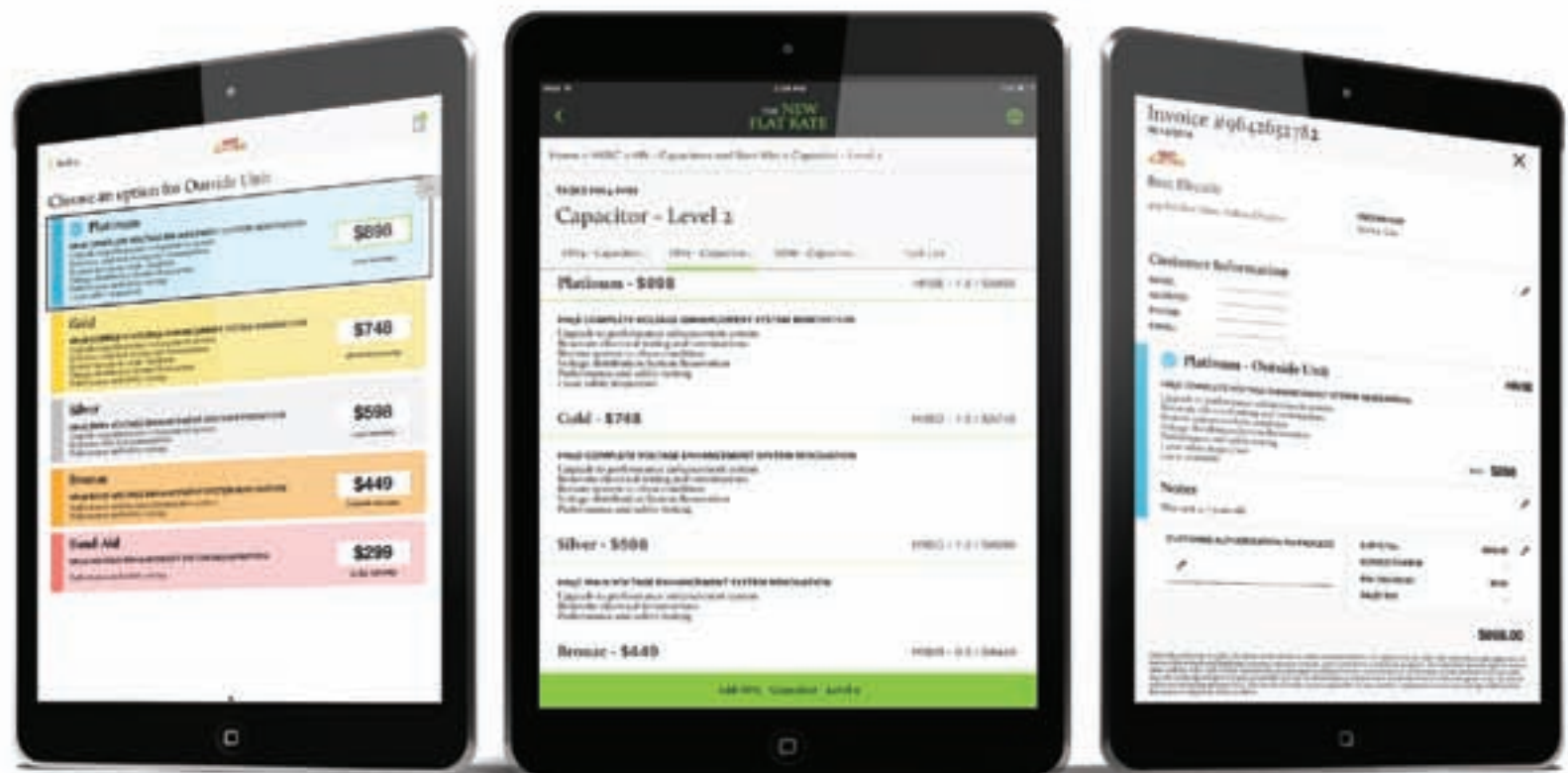
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Start Your 2021 PR, Marketing Plans

Differentiate your company from your competitors by focusing on digital platforms, safety protocols to stay competitive and profitable.

BY HEATHER RIPLEY



Finally, 2020 is on the way out! Now it's time to plan for growth in a new year.

While final industry figures aren't compiled yet, indications are that 2020 will end on a positive note, with home service industries seeing a slight gain over 2019. Even in challenging times, many service industry businesses maintained their staffing levels and even added new techs to meet demand. Predictions released by Kenneth Research currently show a potential 4 percent global increase in these businesses for 2021 (<https://on.mktw.net/3p1mm4Y>).

Other sources suggest the increase in business could be closer to 13 percent, but it's still too early to know what next year will be like. In any case, when business is good, competition is strongest, so it's critical to work at keeping or upping your marketing and PR activities next year to stay competitive and profitable. Now is a great time to review past marketing campaign pros and cons and plan next year's marketing tactics.

What will marketing in 2021 resemble?

If your service business rolled out new procedures or products but did not promote these effectively, plan on using more PR strategies to promote them in 2021. Digital technology and safety protocols are still the prime concerns for most clients, whether residential or commercial, so ensure your public relations plans highlight these offerings; it will be critical to your service business' success in 2021.

If you don't have in-house PR professionals, hiring a PR agency to start 2021 with a bang could be a good business plan.

Here are marketing and promotion tips for home service companies in 2021:

- **Promote your digital service tech tracking:** Clients want to feel safe; that will continue in 2021. Adding technology allowing them to see who the tech is, his name and experience, where his vehicle is, and what time he is expected to arrive will be what customers expect going into the new year.

Smart companies are using videos and images of techs on the job to market their services through social media. If you aren't doing this, you should.

- **Promote safety:** Companies that promote their cutting-edge safety technologies will get the lion's share of customers. Among the technology service businesses will want to market are HVAC sanitizing services, such as UV lights and virus control devices.

- **Promote your service business software:** You'll be left behind unless your service business uses client-facing software. Allowing customers to schedule their service appointments, request a tech, ask questions, and receive texts and appointment updates is essential to compete. Promote it as a safety and convenience tool for clients.

- **Publicize your business with truck wraps:** Even smaller service businesses can benefit from vehicle



marketing. Clients trust a company whose vehicles are identifiable; wrapped vehicles promote your business as professional and reputable. They are a 24/7 marketing tool.

Don't forget lessons learned in 2020

Plumbing, heating and air-conditioning contractors for residential and commercial customers had to adapt by adding safety precautions and other processes to stay competitive. Smart contractors will continue to incorporate the lessons in 2020 into their ongoing PR and marketing tactics:

- **Do customers know you are in business?** Ensuring your digital platforms are making that information loud and clear is essential to staying successful. If your company did not jump into digital marketing this year, you will need to in 2021.

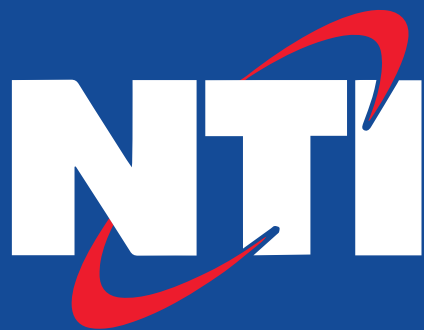
- **Do you promote your safety compliance practices?** Again, using digital platforms, including websites, social media, videos, email marketing and other online processes to promote your business' safety protocols is critical.

- **Do you use digital platforms to reply to customer inquiries quickly?** With businesses reducing onsite staff, phone systems are overloaded and customers are frustrated by long waits or no answers.

Businesses rising to the challenge by adding live chats (or chatbots) to their online platforms or ramping up their staffing to monitor customer inquiries on social media platforms improved their reputation with the public — and got more business.

The truth is, no one knows what 2021 will be like, but marketing and PR are going to be the way your home service business differentiates itself from your competitors, especially during challenging times. ●

Heather Ripley is CEO of Ripley PR, a global public relations agency specializing in home service and building trades. For additional information, visit www.ripleypr.com.



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The Spearin Doctrine: 100-Plus Years Old and Still Going Strong

All parties to construction contracts must be aware of its limits and contours to understand properly their exposure to liability.



BY STEVEN NUDELMAN

“Errors and omissions” is a phrase that keeps design professionals awake at night. Plans and specifications may contain mistakes or inaccuracies that are identified by a contractor after construction on a project begins. If those inaccuracies cause delays, the question arises: Who is responsible for the associated costs? While the design professional may ultimately face liability from the owner, the initial tussle over responsibility is typically between the contractor and the owner.

In response to this “tussle,” courts across the country have developed a doctrine known in some jurisdictions as the “implied warranty of design adequacy.” This implied warranty is commonly known as the Spearin Doctrine, named after an infamous construction case dating back to 1918.

Under the Spearin Doctrine, “if a contractor is bound to build according to plans and specifications prepared by the owner, the contractor will not be responsible for the consequences of defects in the plans and specifications.” *United States v. Spearin*, 248 U.S. 132, 136 (1918). However, this general rule is subject to exceptions that contractors must familiarize themselves with to avoid unnecessary exposure to liability.

Background

The Spearin Doctrine originated in the U.S. Supreme Court at the turn of the 20th century. In 1905, George Spearin contracted with the federal government to build a dry dock at the Brooklyn Navy Yard for \$757,800 (more than \$19 million in present value). The government provided the plans and specifications. To complete the project, Spearin had to divert a nearby sewer.

Approximately one year after that diversion, heavy rainfall coinciding with a high tide broke the sewer and flooded the dock. Upon inspection, Spearin learned there was a dam within the sewer. The diversion of the sewer increased pressure on the dam substantially, causing it to break. All parties were unaware of the dam, which was not mentioned in the specifications provided by the United States.

Spearin refused to continue work unless the government paid for repairs. The government refused to compensate



him further and elected to use other contractors to complete the project. Spearin sued the federal government, arguing that the faulty design specifications it created caused damage and delay to the project.

The government argued that because Spearin’s contract obligated him to inspect independently the actual conditions of the site, the government was not liable for providing incomplete specifications. In what has become a landmark legal decision in the construction industry, the U.S. Supreme Court rejected this argument.

The court held that “[t]he obligation to examine the site did not impose upon [Spearin] the duty of making a diligent inquiry into the history of the locality with a view to determining, at his peril, whether the sewer ... would prove adequate.” *Spearin*, 248 U.S. at 137. In other words, a general requirement in a contract that a contractor inspect the site does not obligate the contractor to unearth unknown conditions that should be in the design specifications.

Since *Spearin*, nearly all 50 states adopted some form of the doctrine. See 3 *Brunner & O’Connor, Construction Law* § 9:81. The precise contours and limitations of the doctrine vary from state to state. While most states simply refer to the Spearin Doctrine, some jurisdictions use the phrase “implied warranty of design adequacy.” See, e.g., *MidAmerica, Inc. v. Bierlein Cos.*, No. 4:19-cv-04096, 2020 WL 5995981 (W.D. Ark. Oct. 9, 2020); *Costello Constr. Co. v. Charlottesville*, 97 F. Supp. 3d 819 (W.D. Va. 2015).

Despite the doctrine’s wide acceptance, there are a number of landmines contractors must avoid to take advantage of it. For example:

- The Spearin doctrine will not apply if a plaintiff failed to adhere to other parts of the contract. See *Al Johnson Constr. Co. v. United States*, 854 F.2d 467, 469-70 (Fed. Cir. 1988); *S. Comfort Builders, Inc. v. United States*, 67

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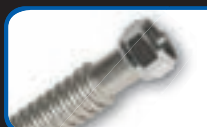
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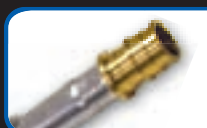
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Fed. Cl. 124, 134 (Fed. Cl. 2005); Fid. & Deposit Co. of Md. v. Travelers Cas. & Surety Co. of Am., No. 2:13-cv-00380, 2018 WL 4550397, at *13 (D. Nev. Sept. 21, 2018).

- The Spearin doctrine does not apply if the supplier of the plans and specifications exculpates itself from responsibility for inaccurate descriptions from the site, as opposed to merely placing a general burden upon the contractor to check the site. See Sasso Contracting Co. v. State, 173 N.J. Super. 486, 489-91 (App. Div.), certif. denied, 85 N.J. 101 (1980).

- A contractor otherwise entitled to relief under the Spearin doctrine will not get it if the site specifications contained an obvious discrepancy. See Metric Constr. Co. v. United States, 80 Fed. Cl. 178, 186 (Fed. Cl. 2008).

- The Spearin doctrine will not apply when site specifications are incomplete, leading to numerous Requests for Information. See Dugan & Meyers Constr. Co. v. Ohio Dep't Adm. Servs., 864 N.E.2d 68, 73 (Ohio 2007). At least in Ohio, the Ohio Supreme Court limited Spearin to a very specific type of claim and it cannot be used as a free-wielding sword to recover for delays to a project.

Notably, the above restrictions to Spearin are only applicable to the referenced jurisdictions. Courts around the country differ in their interpretations of Spearin and its limitations.

Application of Spearin

While owners such as the federal government lost the battle in the Supreme Court in 1918, the war against contractors is ongoing. After Spearin, an owner cannot assign the contractor an independent duty to inspect the project site and expect a court to absolve the owner from liability for inadequate design. This scenario is illustrated in a recent case out of the Western District of Arkansas, MidAmerica, Inc. v. Bierlein Cos.

This case concerns a construction dispute related to the decommissioning of a retired power plant. Defendant Bierlein was the general contractor; plaintiff MidAmerica was its subcontractor charged with removing fuel oil. MidAmerica prepared a bid for its subcontract work based on specifications provided by Bierlein. After performing an on-site inspection, MidAmerica submitted what was ultimately a winning bid and was awarded the subcontract.

Upon commencing work, however, MidAmerica discovered that the site contained No. 6 fuel oil instead of No. 2 fuel oil. Types of fuel oil range from 1 through 6. The higher the number, the more difficult and expensive it becomes to remove. In litigation, MidAmerica claimed that Bierlein misrepresented the grade of fuel oil in the site documents.

As a preliminary matter, the court held that the Spearin Doctrine is not limited to public construction contracts; it extends to private projects as well.

Bierlein relevantly argued that the requirement that

MidAmerica inspect the site absolved Bierlein of responsibility from a discrepancy in the site documents. The court, however, soundly rejected this argument. It held that under Spearin, "a warranty made by positive affirmation as to site conditions cannot be undone by language requiring a site inspection to determine the scope of work." Id.


Takeaways

The Spearin Doctrine should loom large in the minds of both owners and contractors. While the Spearin case itself focused on the owner, other courts, such as the MidAmerica court, have extended the doctrine to cover other parties who supply plans and specifications, such as the general contractor. See, e.g., L.K. Comstock & Co. v. United Eng'g & Constructors, Inc., 880 F.2d 219, 226 (9th Cir. 1989).

The Spearin Doctrine can operate as both a sword and a shield. That is, a contractor may sue for relief if an owner fails to compensate the contractor properly for additional work not contemplated in the plans and specifications. Or, instead, the contractor may use it as a defense if an owner sues for damages to complete the contract if the contractor decides to stop performance due to differing site conditions.

In either situation, all parties to construction contracts must be aware of the limits and contours of the Spearin Doctrine, as it has been applied in their particular jurisdiction, to understand properly their exposure to liability. ●

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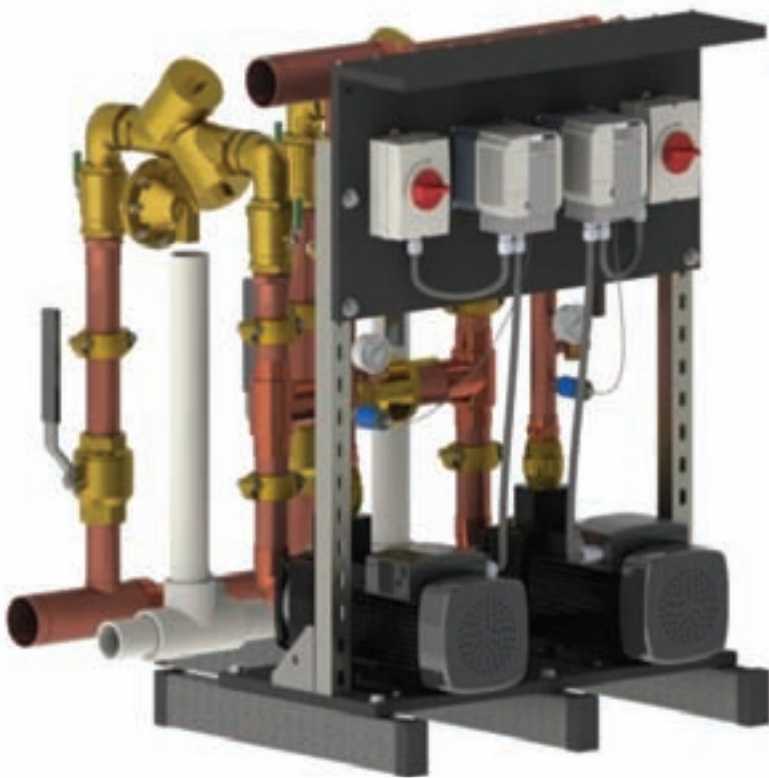
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
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BUSINESS RESOURCES

Show Us Your Truck

As always, our readers don't let us down when it comes to sharing information about their vehicles.

BY STEVE SMITH

Showing off their trucks seems like a natural for contractors. Here's a roundup of our latest batch. And take note: Plenty of readers say their trucks are the "best." But this is no contest, and we think everyone's truck looks pretty great.

Absolute Plumbing Appleton, Wisconsin



"Absolute Plumbing was established in 2008 by our owner, Nick Jackels. He founded the company in April of 2008 when he was at mercy of losing his position with the plumbing company he had been with for 10 years due to the recession. Nick saw that there was still a great need and took the leap.

"Absolute Plumbing started out doing all aspects of the plumbing trade, but over the years found that residential service was our niche. We are now running 95 percent residential service and have an amazing team with great culture and respect for one another and the customers we serve. We are adding to our fleet because the demand for our services is growing greatly. We are proud of our trucks inside and out!

"As for the design, it is a collaboration of our friend who is a designer, Fast Signs, and myself. We worked together to come up with this design. We wanted the name to pop when the truck is going down the road so there was no question of who we are and what we do."

—Courtney Jackels

A.J. Alberts Plumbing Inc. Woodbury, Minnesota



"Our truck is the best because of the high visibility graphics wrap and the feedback we get from people in our community. Lots of folks tell us "I see your trucks all over and they look great" The trucks are a great investment that provides a rolling billboard for years to come."

—Jim Alberts

APES Plumbing/HVAC and Appliance Repair Peoria, Arizona



"APES is all bananas to submit our photos because we've slowly grown our once small "family business-that-could" into a fleet of 22 trucks and growing. We've been told by new customers that they often call us just by seeing our trucks either on their way to work or during daily travels.

"All of our trucks are colorful and showcase a friendly ape who's always got his thumb-up because no matter what, there's always a reason to smile in today's world! We truly get excited at the opportunity to take our 24/7 vehicles on important tasks that make a difference for customers who need to stay cool when an air conditioner is broken down, can't wash clothes because the washing machine isn't spinning or to repair a residential leak so the wooden floors won't get damaged. Whatever it is we literally go BANANAS to serve those who need an important job done right!"

—Allison Contris

C. Woods Company Tyler, Texas





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“Down here in Tyler, Texas, everyone knows every business, so we need to make sure that we make an impression on our customers every single time they see us. That impression starts with our trucks. We wanted to make sure that we had a logo that could relate to the older generations along with the younger generations. We chose bright colors so our customers could see us coming. Our trucks allow us to say who we are and the quality of service we provide without ever having to tell people. We make sure our trucks are fully stocked so we can provide a better faster service for our customers. C. Woods Company has had a few different looks over its 64 years in business. But each look has sent a message that our customers understand and know we back up.”

—Chad Westover

Crestwood Plumbing Inc. Pewee Valley, Kentucky



“Our 2019 Chevrolet Express KUV van provides us with enough capacity to carry to the jobsite all the connecting pipe and fittings we need to do the job. The separation from the front cab away from the rear area, also keeps all our tools and chemicals secure from any spillage or damage. The full electronic locking system makes using this truck a breeze for easy entry and one-touch locking.

“Having a custom-made pipe rack for the top allows us to carry 20-foot sticks of pipe, which is how most of the pipe comes in our industry. The storage capacity in the side bins also allows our plumbers to walk up to the side of the van and access anything needed without walking inside the back. We can transport water heaters, and bath tubs inside the rear without any exposure to the weather.”

—Jerry Head

Eco Plumber Hillard, Ohio



“Our trucks feature our logo prominently and we consider them moving billboards that market our brand throughout the city. Over time we have simplified the truck design as we have built our brand recognition, moving to minimal copy and simple, bold graphics. The Eco Plumbers truck

design captures our brand essence, which blends the feeling of 5-star customer service with eco-friendliness. Our illustration puts a smart, tech-savvy, service-oriented spin on the traditional plumber. We keep our truck's graphics clean and simple. The bold graphics are connected and grounded to clean flowing water. The imagery brings out our strong branding message. Our customers always say they see our trucks everywhere.”

—Megan O'Neil

Engineered Lining Systems Jacksonville, Florida



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“Climate controlled operator room, 300 cubic/feet inside storage, 100 cubic/feet of underbody storage, hose storage and all aluminum toolboxes are just some the creature comforts. Reinforcing the ELS “All Day/Every Day” safety mantra, a full LED lighting package and perimeter strobe system provides maximum visibility.

“Custom graphics by Mullins Kustom Designs lets everyone on the job site know that Engineered Lining Systems has arrived.”

—Don Arch

Fort Collins Heating & Air Conditioning Fort Collins, Colorado



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BUSINESS RESOURCES

vehicle to the gleam of the diamond plating in our logo, the Fort Collins Heating & Air Conditioning truck oozes cool.

"It states that we are locally owned and trusted and 'Serving Northern Colorado Since 1934. It is something we are very proud of, 86 years of serving our community."

"We are proud that our fleet of 47 Ford trucks and Nissan cargo vans are made in America. The van in the photo is manufactured in Canton, Mississippi. All of our vehicles are all fully stocked to keep our service, retail, new construction and plumbing department's running smoothly.

"The trucks also have our slogan, 'Big Enough to Serve, Small Enough to Care,' which is true. We sincerely care about our customers in Fort Collins and the surrounding area."

—Todd Harding

Hurlburt Heating & Plumbing Durand, Wisconsin



"Our service, sales, and install vehicles are all vividly wrapped with our signature orange, black and blue look. They are sure to turn heads on the road! The bright colors are visible from all sides of the vehicles, with our logo and contact info prominently displayed as well.

"The fun colors certainly stand out when they're parked at a job, too, be it a commercial job site or residential location. We often have people tell us they called because they saw our trucks. The eye-catching design and color combination help us build brand recognition in our service area, and keep our company name fresh in customers' minds."

—Christina Hager

Patriot Plumbing Ormond Beach, Florida



"We have been in business since 1998 and specialize in service, repair and bath/kitchen remodeling. We are a small company with 4-5 employees and are veteran owned. Our trucks have gone through several facelifts with the water and American flag design being our latest look. We have the mentality to offer our clients the best possible professional, honest service and to stay on top of all the

changes that has occurred in our industry with all the technology and ability to communicate with the client. We have an interactive website www.patriotplumbingco.com and a new feature so clients can book online directly from the site."

Pipetechns Plumbing Raleigh, North Carolina



"With the help of Capital Wraps, we have outfitted 25 trucks with an eye-catching design that shows 'We mean business.' We were sure to prominently position our phone number and website to ensure our customers can easily obtain that information when seeing one of our trucks on the job or driving by.

"We also wanted to focus our truck design on showing that Pipetechns is an environmentally conscious business. As an EPA WaterSense partner and certified Green Plumber, Pipetechns is committed to water conservation and energy efficiency.

"We offer certified plumbers experienced in everything from large commercial construction to small residential services and offer the top-notch customer service required to see our customers through their issues from start to finish."

—Chelsea Stangel

Pioneer Comfort Knoxville, Tennessee



"Here is a picture of our latest install truck. We have always had the big oval on the trucks, but wanted to put the Smoky Mountains and a pioneer figure on them, too. When we couldn't come up with a figure that we liked, someone in the office came up with this option with me, the owner, as the mountain pioneer.

"Everybody here liked it, or wouldn't say if they didn't, and the rest is history. It is just on our trucks that we have wrapped. I guess eventually we will have it on all 40-plus trucks. We get a lot of comments about how much customers like it. Yes, I get people occasionally that say, 'Hey, you're the guy on the truck.'"

—Gordy Noe

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PowerHouse Solar Redding, California



"At PowerHouse Solar, we have a fleet of different vehicles to do the job of installing solar for homeowners. I chose this grey truck to send to you because it shows that we will do whatever it takes to make the job happen."

"This 4WD Duramax Denali can go in any field, across snow or mud puddles. It pulls the equipment trailer loaded down to any location for trenching and auguring holes for posts and power poles."

"The custom-welded rack over the camper shell has hauled a 25-foot power pole and loads of steel to job sites. The side of the camper opens for easy access to hand tools and supplies. At the back of the bed, a rollout tray fully extends for access to the entire contents of the bed."

This beast of a pick up has served us well. At PowerHouse Solar, we get the job done!"

—Sue Blake

Roscoe Brown Murfreesboro, Tennessee



"Roscoe Brown has been in business for 80 years, and all of our trucks have Roscoe's face prominently displayed on them. As moving billboards, our trucks need to get noticed while driving around our service area. Our blue and green colors are bright, we list our services on the side of the truck, and our phone number and website are easy to read, right next to Roscoe's face! Roscoe Brown is a third-generation family owned business with deep ties to our community. So when people see our trucks, they think "Roscoe Brown ... who you trust."

—Kara Carpenter

Russell & Abbott Heating and Cooling Maryville, Tennessee

"Our distinctive yellow trucks are our strongest marketing tool. When we ask customers how they heard about us, the answer is, "We saw your truck with the dog on it," as often as it's, "We found you on Google."

But our trucks display our company culture and history, too. Our mascot, Olive, is based on a real dog, a shelter



pet who came to our office with her owner, now retired. Recently we adopted Onyx, a black lab mix. He's also a shelter pet who first came to our attention because his name matched our proprietary brand of heating and cooling equipment."

"We like to say that our mascot represents the qualities we embody in our community: trustworthiness, friendliness and reliability. Olive also represents our commitment to helping animals as well as humans. We recently donated \$3,000 to the Blount County Animal Shelter in honor of our good boy Onyx."

—Shannon Bryant

Tom Hundley Heating & Cooling, LLC Broken Arrow, Oklahoma



"After one of our 2008 Silverados bit the dust with a bad transmission last year, we decided to upgrade to a newer fleet consisting of two new 2019 Silverados, a 2018 F150, and even an additional truck – a 2019 Dodge Ram with the 5.7L for towing abilities."

"We had a customer with a graphics business install our logo with a slight facelift from the previous trucks, incorporating a wave without being too "busy" so as to detract from our contact information and credential logos also displayed. We've been getting a lot more calls from customers saying that they simply "saw our truck" – proof that having a fresh image will make a good first impression on the public."

Tomkin Plumbing Riverside, California

"So four years ago, I needed a new work truck and was looking at options. I had purchased "Buster" (named after the guy I bought it from) the previous year and had it sitting in the yard along with a retired 1997 GMC 3500."

"After taking a few measurements, I found that Buster's 1955 cab could be transferred onto the 1997 relatively easily. I found a custom truck builder, Brand New Classics, in Riverside, which I enlisted to help with the change over. Mike Mobley from Brand New Classics was amazing and extremely talented in all aspects of the project."

"We spent the next nine months custom fabricating



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the necessary hardware to achieve our goal. Mike simply adapted the '55 cab to the '97 chassis, drive train and electrical harness. We upgraded the '55's controls adding digital display, A/C, cruise control and blue tooth. We then added a new utility body with a pipe rack. Next, a company called World Class Restoration, also in Riverside, did the finishing touches with paint, bodywork and new glass.

"Once all was said and done, I had a "brand new classic" for basically the same price as a new modern truck with pretty much the same comforts.

"One of my main motivating reasons for the project was for the advertising aspect. As it turns out, it worked better than I could have imagined. There is not a single day that goes by that someone doesn't throw me a thumbs up. Whether or not they remember the phone number on the side or not, I couldn't tell you, but I believe they remember the name on the door. It now has almost 50,000 miles on it and still going strong."

—Terry Sunev

Towers Plumbing Murray, Utah



"At Towers Plumbing, we pride ourselves on continuing to uphold the strong tradition of excellent service provided to the community over the last 78 years. This all starts with making sure our customers know who we are and the quality service we provide. Our vehicles send this message out loud and clear. Making sure our vehicles stand out above those on the road is very important to us. Our trucks represent who we are, what we provide, and the quality you can expect from us. Our trucks are some of the largest investments we put into our company. We do not do that because they look pretty, we do it to make sure our customers remember us and know that they can expect the same service no matter what truck shows up at their house. Our greatest marketing tools are the trucks we have out on the roads and in the neighborhoods of our customers."

—Chad Westover

UMC Mukilteo, Washington



"UMC is dedicated to providing the right tools and support for our service team so they can solve complex challenges of built environments and their systems efficiently and effectively. Our trucks are the best because we have customized them with input from our service technicians to make them easy and efficient to work out of.

"The specially customized vehicles in our service fleet are outfitted with high quality materials, back-up tools, storage options that have been designed for parts and tools, safe ladder storage, ergonomic design, and even heated wash stations are being implemented throughout the fleet to encourage proper hygiene at every stop. Not only do the trucks help provide efficient service, but they are nice to look at and highly recognizable on the street."

—Leah Curulla

Valley Plumbing and Drain Cleaning West Jordan, Utah



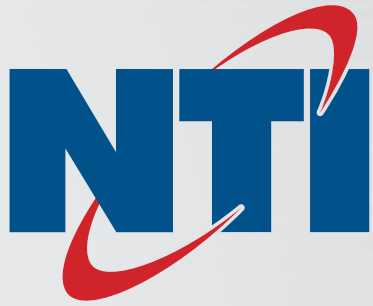
Here at Valley Plumbing and Drain Cleaning, we pride ourselves in being able to provide the best service our customers have ever seen. It starts with changing the way customers envision plumbers, from the vehicles we drive to the way our plumbers look when they are on your doorstep.

"We want to make sure that our vehicles stand out above all other vehicles. We want our customers to know when they see us that we are going to provide premium service at the best rate possible for them.

"We know our trucks are looked at more than any other marketing that we do. They not only sit in front of our customer's house; they are moving billboards throughout our service area.

"And finally, we want our customers to know that we are family friendly. When their kids see our trucks, they remember us. They remind their parents, and they are excited when we show up. Remember the "Truck with the Duck" and you will never have to worry about your plumbing."

—Chad Westover



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Condensing Heating Boiler

Easy link Cascade without master and slave function
Outdoor reset
LP conversion with simple orifice change
½" gas line up to 24'
2" PVC venting up to 60'
Warranty of 15y heat exchanger, 5y parts and 1y labor

BUSINESS RESOURCES

Technology Can Strengthen Your Leadership

From training to efficiency to retention, technology can boost abilities across the board and create a stronger business.

BY AUSTIN HALLER

Read any trade magazine over the past 20 years and you'll see that contractors have constantly been told that they need to work on their businesses — not in their businesses. Get out of the truck, they've been told, and tackle sales, marketing, finance and strategic planning.

And to do that, the best leaders hire great people and set them up for success by casting a clear vision and equipping them with the tools necessary to fulfill it.

Those tools are increasingly found in new technology that can automate processes in such a way that the contractor and staff don't need to worry about tasks that they previously had to do manually or that took multiple steps.

Less time dealing with processes and procedures means more time for thinking and planning. Here are some services we use to do just that:

Strong team communication: Empowering a team to achieve major results starts with strong communication. One communication platform used by nearly all high-performing companies is Slack. This communications platform is easy to set up and use, and helps leaders improve alignment

and collaboration across different teams and departments. Teams want to know what others are doing to move the business forward and leaders want visibility to frontline problem solving.

Better communication increases the speed of decision-making and problem-solving to better serve customers. The technology should make it easier for team members to ask questions and get answers in real time.

The solution should enable you to celebrate progress in real time. Everyone wants to be appreciated and the best time to show appreciation is immediately. Positive reinforcement drives teams to accomplish things they never before imagined were possible.

Marketing automation: A small marketing team can do the work of an army with the right MarTech platform to manage campaigns, communications, social media and your overall brand. These are critical to building your brand and driving demand for your services. There are many platforms out there capable of serving your needs. Your marketing leaders should know what's best for your company.

24/7 booking solution: Make

Less time dealing with processes and procedures means more time for thinking and planning.

it easier for your customers to do business with you around the clock because that's a minimum expectation. Customers should be able to make appointments for everything online, and that's becoming the norm whether it's a doctor's appointment or getting a haircut. Leaders who put their customers first always prevail. At the same time, the 24/7 booking solution also has to make life easier for your dispatchers. At Schedule Engine, for example, our technology is designed to allow you to meet evolving customer expectations without asking any more from your own people.

Communication and knowledge support: XOi is an all-in-one communication tool that seamlessly connects technicians, managers, and customers while enabling on the job photo and video documentation, workflow automation, real-time remote video support and training,



Once your team members understand the reasons and how the new technology will benefit them personally, they'll buy into the idea.

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and access to an extensive knowledge base of relevant equipment documentation and training content.

Field service management: You need a solution that will keep track of all fundamental business activities required to get the job done right and get paid. The best field service management systems make it easy for you to do this.

The right choice for your business depends on what you do and how big you are. Find out what your peers are using and schedule a few demos. Include your key managers in the process. The right field management system keeps you in control of your operations and provides managers with the information they need to make better decisions. Finding the right one is worth your time.

Employee and customer feedback: You must be able to capture feedback from both your employees and your customers. A good tool for employee feedback is called Office Vibe. It invites candid feedback from your people on how things are going. People want to be heard. Simply listening will drive

up your employee engagement and shape your decision making for the better.

For customer feedback I recommend a product called Podium. There's no better leading indicator for where your business is headed than feedback from your customers. You're only as good as your customers perceive you to be. Listen and use the feedback to grow your business.

Change management

A strong leader has to lead the change over to new technology. They can't just hand over a technology to their CSRs and service technicians and say, "Here, run with it."

People hate change. It creates uncertainty and a fear of loss of control or loss of autonomy. They think it will make more work. They're afraid that they'll screw up their use of the new technology and be embarrassed in front of their peers.

Contractor leaders have to sell the usefulness of the technology to

their team and train their people on it to show them that it will make their work easier. Once they see that a new technology automates processes that they previously had to do manually or in multiple apps or online forms, they'll be won over.

But don't forget that you're talking to a real person. Acknowledge their experience, value their input and make sure they know you'll thoughtfully consider it. Once your team members understand the reasoning and how the new technology will benefit them personally, they'll buy into the idea. They'll stop resisting and start embracing the new tools.

Not all technology has the desired impact on Day One. The key to driving adoption is helping team members understand how it will make their lives better. Be patient and remind your teams that the goal is to make their lives easier and to better serve the customer. The best companies find ways to get the most out of the tools they use. ●

Austin Haller is founder and CEO of Schedule Engine.

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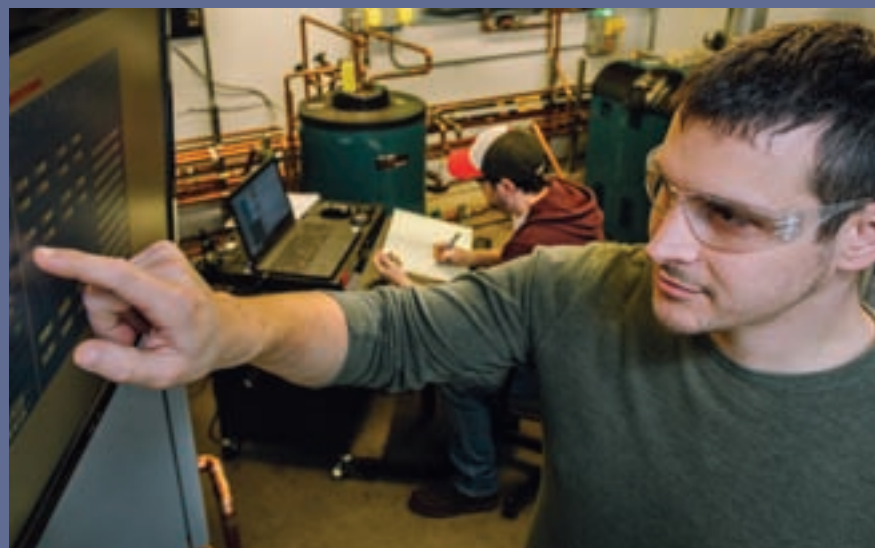


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2020 SUPPLIER PROFILES



See Inside a SharkBite Push-to-connect Fitting

Just as a steak is only as good as the quality of the beef and the technique used to cook it, a push-to-connect fitting is only as good as its parts and materials used to make it. Because of this, SharkBite's product development team works tirelessly to ensure our fittings are made to last.

What makes a SharkBite fitting so secure? And why is it superior to other push-to-connect systems? It all comes down to what's inside.

Peek inside a SharkBite Brass Push fitting to see the result of more than two decades of innovative plumbing technology.

SharkBite Fitting Parts

If you took apart a SharkBite fitting, you'd find plumbing parts that help make a 3-second connection long-lasting.

Release collar. Once the pipe is inserted into the fitting, it passes through the SharkBite release collar, which is recessed to prevent an accidental release. You can remove or readjust the fitting using a disconnect clip or disconnect tongs.

Grab ring. The pipe then passes through the angled 316 stainless steel grab ring, which has angled teeth to allow pipe to push through but not pull out. This allows for a tool-free pipe insertion and a strong, secure connection.

O-ring and protector. Next, the SharkBite o-ring protector aligns the pipe. It then passes through a chloramine-resistant EPDM o-ring, which creates a water-tight seal.

Tube stop. Once the pipe reaches the tube stop, a secure connection is made.

PEX stiffener. If you're using the fitting with PEX, PE-RT or HDPE tubing, the SharkBite stiffener helps keep the o-ring sealed tightly on the outside of the tube.

Body. Each SharkBite fitting's lead-free dezincification brass makes it strong, corrosion-resistant, durable and compliant with ASSE 1061, NSF/ANSI 61 and NSF/ANSI 372.

Shark emblem. On every SharkBite fitting, you'll see an imprint of a shark on the outside. Make sure to look



for the shark on each fitting to ensure you don't have a FakeBite.

How SharkBite Fittings are Made

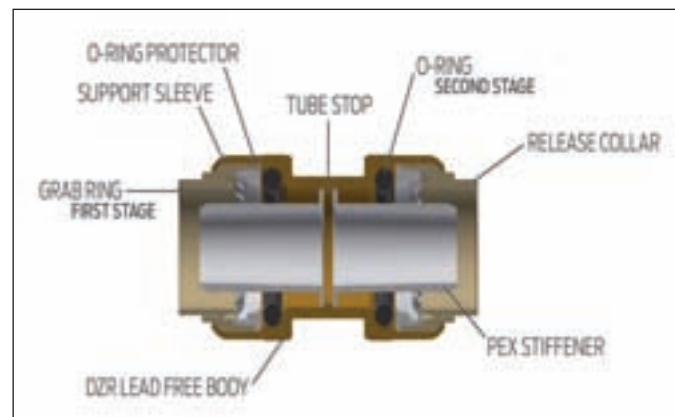
It's not only the parts of a SharkBite fitting that count but also how they are made. Here are a few ways we ensure high quality plumbing parts in our SharkBite manufacturing facility in Cullman, Alabama:

- **Manufacturing anomalies.** Fully automated systems identify anomalies during the manufacturing process, and we check those systems hourly.
- **Quality control.** Raw materials and finished products are inspected via cameras, measurement sensors and manually by our team to ensure quality.
- **Constant testing.** In most cases, our products are tested beyond the industry standards so you can have confidence they'll last long after installation.

Why SharkBite Fitting Parts Matter

So why does any of this matter? The reliability of SharkBite products is what helps reduce customer callbacks and gives you confidence every time you make a SharkBite connection. We don't take lightly your trust in our products, so we do everything we can to maintain a high level of quality control.

Learn more at <https://www.sharkbite.com/products/brass-push>.





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The New Normal: The Changing Standards of Servicing Customers

'If we aren't protected, our customers aren't protected.'

BY BRYAN BARNES

Throughout the COVID-19 pandemic, plumbers, HVAC technicians and other home service contractors have continued to be essential to the millions of Americans who find themselves sheltering at home.

In fact, most home service businesses have experienced an increase in business due to consumers using their appliances and home fixtures more. However, as the demand for home repairs and improvements has risen, so has the risk of exposure for both contractors and their customers due to the in-person nature of the jobs.

The long-lasting effects of the pandemic are already changing the way we do our jobs and interact with homeowners. As a master plumber, I am aware now more than ever of the potential exposure and risk my employees and I face while on the jobsite.

From personal protection equipment, such as masks and gloves to proper vetting of the customer's current health situation, we are trying our best to ensure that both the contractors and homeowners stay safe. But is it enough?

As this "new normal" continues to set in, the tried-and-true methods of in-person contact will need to be altered and improved in order to prevent the spread of disease and, ultimately, retain customers. If we aren't protected, our customers aren't protected. Good hygiene has now just become good business.

This time is uncertain, but there are solutions that we can implement to protect our employees, our customers and ourselves. The likelihood that we return to "the way it was before" is low. Homeowners will remain cautious of letting strangers into their homes, and that trepidation of in-home visits could be the new norm for our industry.

New strategies

Therefore, there is a critical need for new strategies, technologies and protection methods that both



New technology and new practices can modernize PHCP businesses without depersonalizing them.

contractors and customers can utilize in order to maintain that social distancing and ultimately create a more efficient working environment. This became even clearer a few weeks, when we were introduced to a customer who completely changed our view of how things can be done and how things should to be done.

Here's what I mean: Our customer, Ruth Ann, who is immunocompromised to begin with, has a daughter who was exposed to COVID-19 and started to experience symptoms. As a result, the entire family went in quarantine, but, of course at the worst possible moment, disaster struck. Her house began to flood, and the source wasn't immediately clear. She needed help fast, but still under quarantine, she couldn't let anyone in her house. She called a few plumbers she had used in the past, and no one could help solve her problem without going on site.

She eventually reached out to my company and we were able to quickly jump into action. After experiencing these problems firsthand, I cofounded an app, Pro Tech Direct, that helps connect home service technicians with

customers virtually through video chat technology to assess problems and provide estimates.

Originally created to save plumbers from wasting time and potential billable hours normally spent traveling to and from jobsites for in-home estimates, Pro Tech Direct quickly became our go-to tool in combatting social distancing. We were able to connect with Ruth Ann virtually through the app, walk her through the leak source and potential issues with the water heater, help her determine and implement temporary solutions that could limit the damage, and give her an accurate price quote.

Once Ruth Ann's daughter tested negative for COVID-19 a few days later, our early diagnostics allowed us to mobilize quickly and be onsite to stop the leak and fix the issue almost immediately.

Through the app, Ruth Ann was then able to watch our progress virtually from another room and continue to protect herself from any potential exposure on our end.

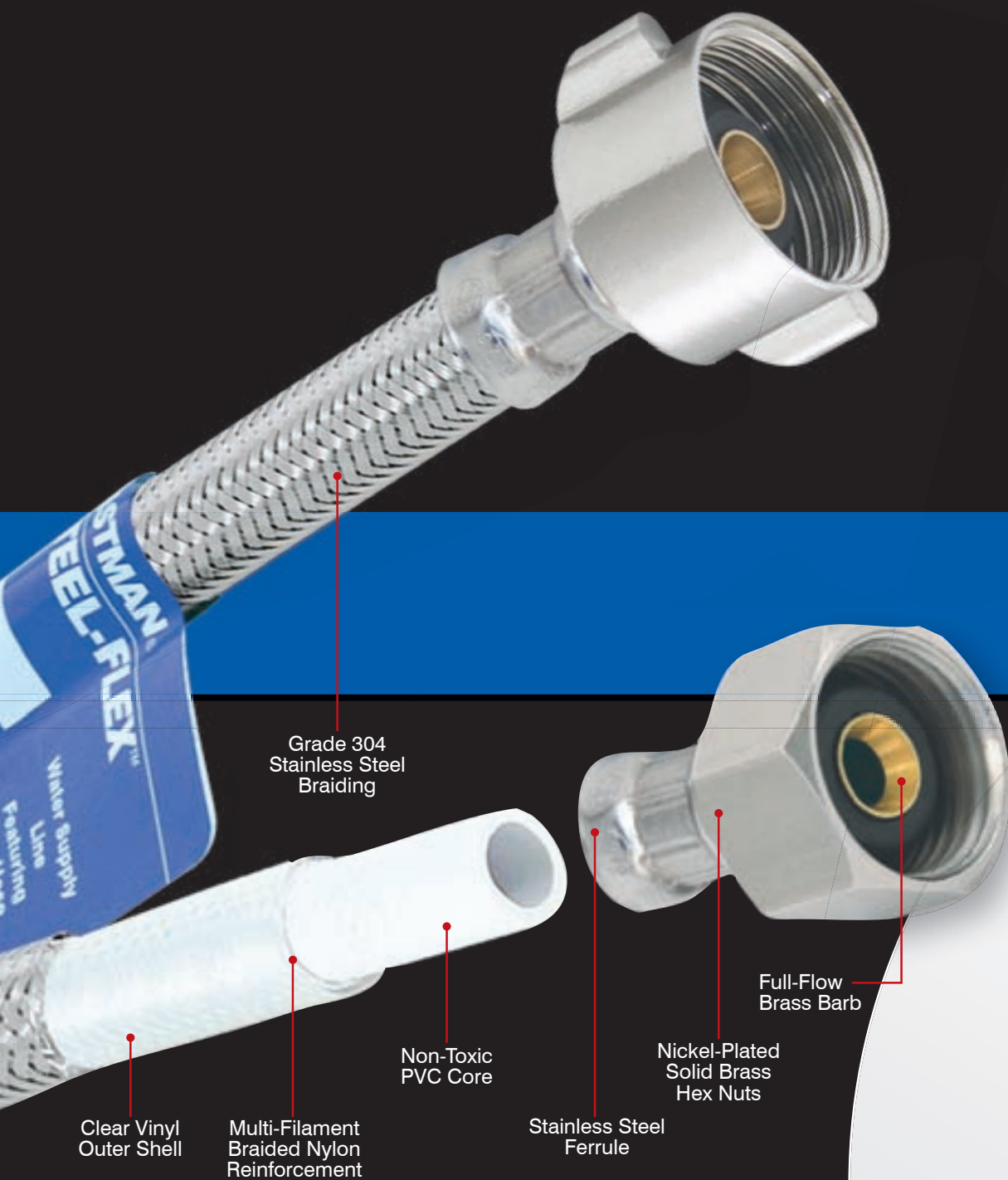
Without the Pro Tech Direct app, we would not have been unable to take the job and Ruth Ann's leak would've only worsened. Our ability to pivot and limit physical

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Homeowners will still be cautious of letting strangers into their homes, and that trepidation of in-home visits could be the new norm for our industry.

not only allowed us to accept Ruth Ann's business, but ensured client satisfaction and retention for any future plumbing issues. Ruth Ann has already reached out to us to share her appreciation of our company's flexibility and recommended both my business and the app to friends and family members.

Keeping businesses afloat

Our industry has been so focused on what has always worked that we sometimes forget what can be improved. Apps like Pro Tech Direct are vital to keeping businesses alive and afloat while the world changes and customer needs become more pressing.

Even looking beyond the pandemic, contractors should still remain aware of the environments they are exposing themselves to and ways we can improve our businesses.

For example, Pro Tech Direct allows us to still do our jobs without sacrificing not only our health, but also our time.

In normal circumstances, contractors spend hours in transit to perform in-person consultations and business is often lost due to the inability to be in two places at once. Through the virtual consultations, contractors can diagnose issues from a jobsite, their home or even in their

truck, making our lives easier and safer. Additionally, instead of waiting hours for an inspector to show up, the app allows the two parties to conduct the inspection immediately through video technology. This allows you to spend more time servicing customers and less time on transportation for in-person consultations and inspections.

True normalcy is still far away. Instead of limiting themselves and their livelihoods, contractors need to look for solutions that keep them healthy and increase productivity. Safety does not have to negatively impact your bottom line. Invest in new technology like Pro Tech Direct and new practices that modernize your business without depersonalizing it. The new norm is here. It's time to prepare to be prepared. ●

Bryan Barnes is a master plumber and founder of All Masters Plumbing in the Dallas-Fort Worth area. To learn more, visit www.protechdir.com.



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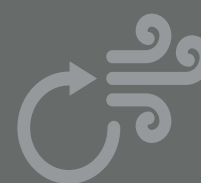
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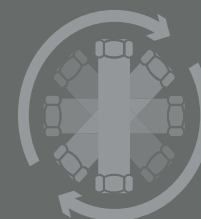
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| CASE STUDY |



The Easy Button for Inventory Control – And Increased Profits

Lanz Heating, Cooling & Plumbing in Champaign, Illinois, needed a better way to buy, organize and control its parts inventory. Technicians were spending too much time on supply house trips and product costs were higher than expected. The Stock Service System from Hodes Co. has delivered over \$100,000 in benefits by reducing inventory levels, cutting supply house trips by 80 percent, and keeping technicians in the field for more service calls.

Bill Yeakel was at his wit's end. He was stumped.

Parts tracking and replenishment at Champaign, Illinois-based Lanz Heating, Cooling & Plumbing had become an ongoing friction spot and cash drain that seemed to be getting worse, no matter how hard he tried to fix it.

Yeakel runs the service group at Lanz. His technicians and their seven service trucks fan out across the Champaign metro area of 200,000-plus residents every day fixing plumbing problems big and small.

The principles of plumbing they know. But parts inventory management is an entirely different kind of challenge.

"Parts inventory has always been difficult to manage, and it was never a priority," said Yeakel. "For years, we've been on an inventory rollercoaster, having too much, not enough, and storage was always a mess. We finally said 'enough.'"

Yeakel teamed up with Lanz inventory manager and service plumber, Alex

// In just our first year of using the Stock Service System, we can point to over \$100,000 in monetary benefits. We're buying smarter, we're buying less inventory, and we've got consistent margins built in to each product. We've turned a cost center into a healthy profit center for us. **//**



Bill Yeakel,
Service Manager



Conine, to research inventory solutions. They found Hodes Co. and its Stock Service System.

Joe Hodes, the president of Hodes Co., designed the innovative inventory control system after watching too many service companies and contractors waste too much time and money on parts management.

"As a distributor, one of our core areas of expertise is inventory control, it's what we do all day, every day,"

said Hodes. "It just made sense that we should share our knowledge and help our customers be more successful in this area of their business."

Upgrading to Ease and Simplicity

Yeakel and Conine went to work immediately putting the Stock Service System into action. The Hodes Co. provided everything needed including recommended parts lists, online ordering, and customized shelf label templates.



Pains & Gains

Pains

- The service parts inventory at Lanz Heating, Cooling & Plumbing was too high and operated at break-even or a loss.
- Storage systems in the warehouse were disorganized, making it difficult and time-consuming to find the right parts.
- Technicians were making too many trips back to the supply house, wasting time and reducing service call productivity and profits.

Gains

- Lanz Heating, Cooling & Plumbing's new Stock Service System has automated parts inventory replenishment, control and pricing.
- Department managers and technicians can see and find quickly the parts they need in the warehouse, and Lanz service trucks are better organized.
- Parts inventory spending is down, margins are up, and cash flow has improved by more than \$100,000.

"The Stock Service System appealed to us because of its step-by-step instructions," said Conine. "It was easy to understand, get started, and implement."

"And the Hodes team also made us feel welcome and appreciated. Joe Hodes called personally to check on us and make sure we were getting everything we needed. That meant a lot."

The new system has made a big difference. Service parts are better organized in the shop and on the Lanz trucks. Technicians can find what they need more quickly, and they leave the shop for the day knowing they've got what they need for their calls.

// Hodes Co. is much more than a supplier for us. They are a strategic partner and consultant that is helping us learn, grow, and make meaningful improvements in our business. We couldn't be happier with this relationship and the results.



Alex Conine,
Inventory Manager



Parts are stocked based on individual customer purchase histories and broader industry statistics. Past orders, pending orders, and payments can all be accessed 24/7 at the Hodes Co. website.

"Because we've always got our top 500 repair parts in stock, both in the shop, and on our trucks, our technicians can stay in the field longer and handle more calls," said Yeakel. "In the past, technicians were going back to the supply house 2 or 3 times per day, now they only go there 2 or 3 times per week. That is a huge productivity and revenue boosting opportunity for us."

The bottom line results are proving the real value.

"In just our first year of using the Stock Service System, we can point to over \$100,000 in monetary benefits," said Yeakel. "We're buying smarter, we're buying less inventory, and we've got consistent margins built in to each product. We've turned a cost center into a healthy profit center for us."

Conine said the overall experience has been smooth and professional. Better inventory levels and profits aren't the only benefits.

"Hodes Co. is much more than a supplier for us," said Conine. "They are a strategic partner and consultant that is helping us learn, grow, and make meaningful improvements in our business. We couldn't be happier with this relationship and the results."



The newly-redesigned and reorganized stock supply bins at Lanz Heating, Cooling & Plumbing.



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Let's Build Back Better

With space heating becoming more standardized and with loads becoming smaller, domestic hot water is a new focus for innovation.

BY BF NAGY

After a 2020 that most people want to forget, hopeful humans can start to think about 2021 and, perhaps, the rebuilding of a better world. For construction, plumbing and heating engineers, there will be no shortage of new technological directions available to help us do things differently. Almost all will help make our air and water cleaner. They will often be supported by government regulations and incentives, especially at the city and state levels.

Some of the best developments in water heating during the 2010s involved heat pump water heaters, which were still mostly under the radar this year. But these systems might soon take off; sales are up and they offer advantages.

Among those working on low-load, low-carbon buildings for many years, a new reality is emerging. Mechanical engineers and consultants learned that tackling space heating by improving the building envelope and installing heat pumps and energy recovery ventilators is becoming common, with fewer challenges. What was previously seen as innovative or experimental has become a lesson learned or a best practice or something in between.

Among early adopters, a new low-energy building model is becoming more standardized in its component parts. In addition, the various green building certifications are heading in many of the same directions. This is good news because as climate change worsens, we think about an aggressive ramp-up of green building efforts for new and retrofit projects.

With space heating becoming more standardized and with loads becoming smaller, domestic hot water is a new focus for innovation. It is also proportionately more significant within total maximum building energy limits; the required temperatures are higher.

CO₂ for California Multiunit

I recently spoke with a few people from DB Architects, a company that has worked on LEED buildings for many years; more recently, it has evolved toward Passive House scenarios.

One of its projects is the Edwina Benner Plaza, a 66-unit, 110,000-square-foot, four-story affordable housing project in Sunnyvale, Calif. It includes a mix of one-, two- and three-bedroom units, with daycare and a computer center. It is one of the first all-electric buildings in the area, with mini-splits in each unit, including condensers on the balconies.

For hot water, the architects selected the SanCO₂ from Sanden (now ECO₂ Systems in the United States). As the name implies, this system moves beyond R410-A and uses CO₂ as a refrigerant; it reduces global warming potential from 2,088 to 1.

"That was the first time we installed the centralized system and it's working really well," says DB Architects founder David Baker. "I think testing and measuring is very important for the success of these projects, and at that one, they are doing a lot of testing."

They installed two of the larger SanCO₂ units (with



Edwina Benner Plaza, a 66-unit, 110,000-square-foot affordable housing project in Sunnyvale, Calif. Photo credit: DB Architects

an 83-gallon tank). Each one consists of two parts: the outdoor unit, where the hot water is produced by extracting heat from the ambient air, and the tank installed inside, within 50 feet. Installation is simple, with two pipes connecting the tank to the outdoor heat pump.

The SanCO₂ uses an inverter-type compressor, DC fan motor and pump; the design minimizes energy consumption, maximizes capacity and fast recovery. The result is operating costs four times lower than electric-resistance storage water heaters and a little better than conventional heat pump water heaters, partly because it does not scavenge heat indoors.

It operates quietly with a delivered hot water temperature range from -20 F up to 175 F, with no need for a backup electric element in the storage tank. The stainless-steel tank has a 15-year warranty.

The Edwina Benner Plaza, named after Sunnyvale's first female mayor, includes a 114-kilowatt photovoltaic solar array on its roofs and electric vehicle chargers in the garage. The developer says there were no significant construction cost differences when building an all-electric property compared with a traditional property. And as a bonus, the California Energy Commission provided some grant incentives.

Each unit includes an energy education monitor, a device that provides real-time feedback on energy usage. "Traditionally, these devices save 5 percent just by making residents aware of their usage," says Katie Ackerly, sustainability lead at DB Architects. "In some instances, if an education campaign accompanies them, they have saved even more."

She adds that the group also monitored water heat for the first year, with access to the utility data. "The building has incredibly low energy-use intensity even without the solar, Ackerly notes. "It was below 20 KBTU per square foot; with the solar, it went down to about 8 KBTU."

ERVs and Heat Pumps

If you head north from Sunnyvale to Canada, you will eventually come to a cooler place called Pemberton, British Columbia. It's in climate zone 6, which means 3,000 to 3,999 heating degree days. There you will find a three-story, 45-unit condominium building called Orion.

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It is expected to meet Step 4, the highest level of the BC Energy Step Code while maintaining the construction cost below the market rate. Step 4 is roughly equivalent to the Passive House construction standard.

Space conditioning at the 51,962-square-foot Orion is provided by a centralized heating, ventilation and air conditioning system, which includes a Swegon Gold RX-35 energy recovery ventilator unit with 86 percent efficiency. The ERV is connected to two Mitsubishi air-source heat pumps with variable refrigerant flow. The heat pumps allow the ERV to double its ventilation capacity and provide additional heating and cooling for peak demand.

The ERV includes a bypass mode to flush the heat out and help cool the building in summers when the exterior temperature is lower than the inside temperature, such as at night time. The building also has supplemental baseboard heating and individual thermostat controls in each unit.

A real-time data monitoring system controls the HVAC equipment, allowing the building manager to optimize the central heat pump and ERV systems' performance. It minimizes the need for less-efficient backup baseboard heaters.

Energy-efficient appliances with minimal need for venting are used to save energy and minimize envelope perforations that compromise airtightness. For example, ductless dryers condense extracted moisture and discharge it down the drain, avoiding the need for exterior dryer

vents in each unit. The kitchen hoods include recirculating fans that clean the exhaust air and release it back into the units. The ERVs have exhaust vents in the kitchens near the ranges.

Sanden air-to-water heat pump units are at work here as well, heating water in storage tanks by transferring heat from the outside air. Single-pass CO2 heat-pump DHW systems are most efficient when receiving the coldest water possible directly from the municipal supply. The Orion project's original design mixed the cold municipal water with the hot water produced by the heat pumps and the recirculated water from the building in the storage tank.

This was addressed by adding separate "swing tanks" to store the hot water from the heat pumps to supply to the building. The recirculated water was re-directed into the swing tanks. An electric boiler was added to provide supplemental heating when the water temperature from the heat pumps drops below 120 F.

Low-carbon building veteran Monte Paulsen of RDH Building Science says North America needs more options, such as larger CO2 heat pump water heaters. He notes that Asian manufacturers make them but don't market them here.

Paulsen believes we will experience a high level of innovation in mechanical equipment in the next decade, "more than we've seen in the last 50 years."

He says the architectural design reduced thermal bridges at the Orion and included insulated concrete forms and efficient LED lighting.



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Revisiting Philadelphia

Earlier this year, I wrote about Tim McDonald's Front Flats, a 28-unit residential and office building in the Kensington-Fishtown area of Philadelphia. It bears repeating in case you missed it because of the heat pump water heater context.

In this case, they ended up using the Rheem R410-A units and, with help from hot water expert Gary Klein, managed to significantly improve efficiencies. McDonald had been worried about losses during distribution, so they located pairs of heat pump water heaters in three locations, directly below the kitchens. It allowed them to reduce piping by 50 percent, pipe insulation by 50 percent and heat losses by 50 percent.

Klein then saved another 50 percent with a relatively innovative trick that employed the Viega pipe-in-pipe system for recirculation. The furthest fixture from the heat source was about five floors up, with residents expecting near-instantaneous hot water.

Viega makes a fitting that caps the supply line and allows a PVC pipe to fit inside the supply line so that when the water gets to the top of the riser, it goes directly into the recirculation line. Yes, this means the supply line is actually insulating the recirculation line.

Adversity Is the Mother of Intention

Although governments will continue to demand energy efficiencies, other events from the year we want to forget are helping to accelerate a move into tighter, low-load

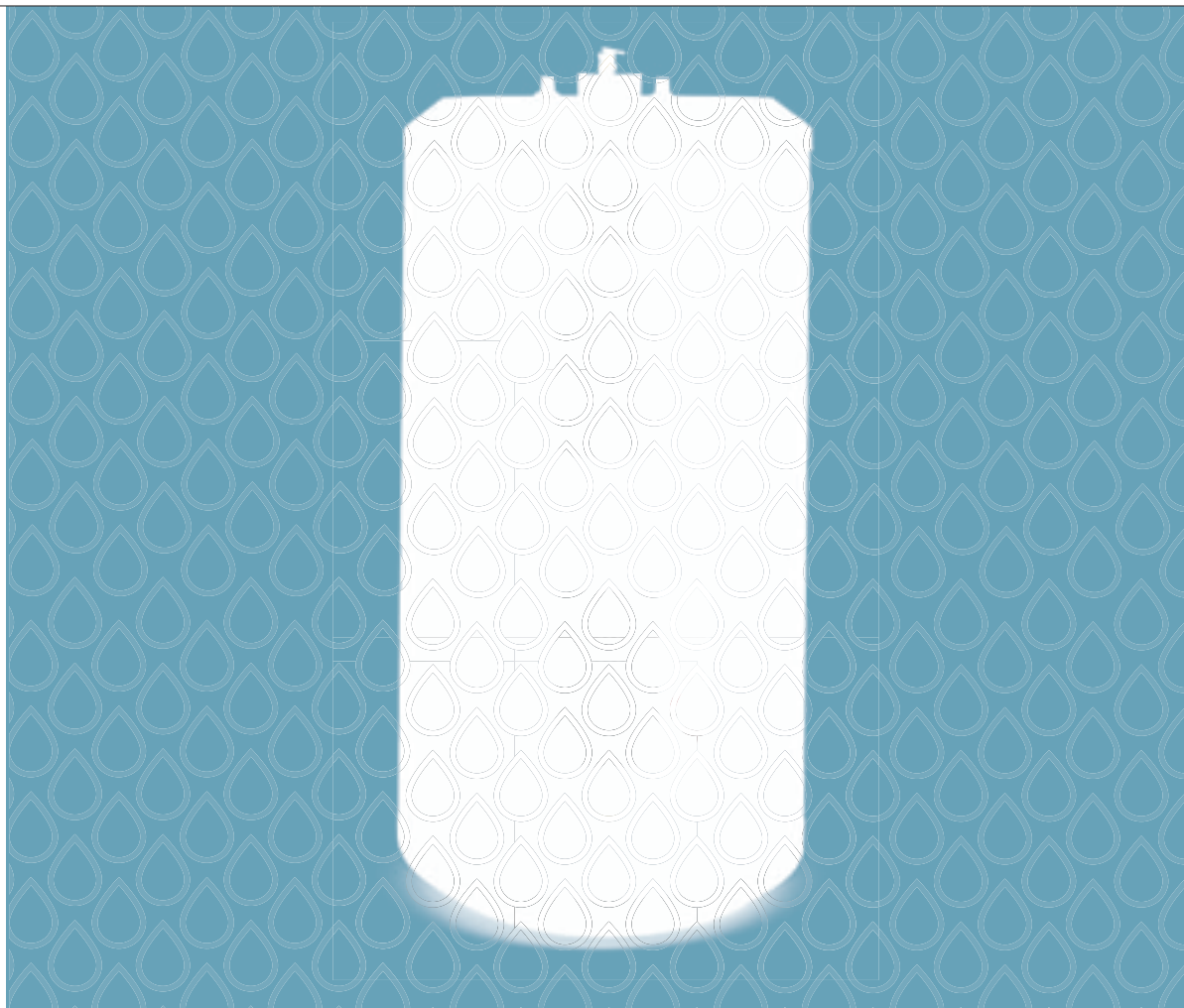
homes. The COVID-19 pandemic has meant we are all more likely to be confined at home or in other unexpected locations, which has heightened our curiosity about our indoor air's health. Because new buildings tend to use ERVs, they help alleviate this concern by providing 100 percent fresh air.

Architect David Baker says one of his clients built a project in Chicago and resisted Baker's suggestion that it be LEED-certified. The next time he worked with the same client, they suggested to him that they seek LEED Gold or Platinum because it now results in faster permitting.

Part three of the story was that the client's California project was near some of the raging fires during the year from hell. "Now the builder is advertising: 'Come and live here, we have HEPA filters in all the units to keep the air cleaner,'" he notes.

We may prefer to forget some of the events of 2020, but with clean, efficient heat pump water heaters and some other improved building practices, maybe we can start to build back better and rediscover hope for the future and positive aspirations for 2021. Happy New Year! ●

BF Nagy specializes in sustainable technology solutions, government energy initiatives and modern economics. He writes for magazines, journals and clean tech organizations all over the world. Nagy recently completed 15 years of expert interviews for a book that is nearing completion, "The New Energy Age."



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THERMOSTAT CONTROL SOLUTIONS

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INTRODUCTION

H2O Degree is well recognized as a leading provider of wireless utility submetering and leak detection systems deployed in multi-unit housing complexes. The system is based on the utilization of battery-powered water meters and a wireless communication network, has well-documented water conservation results achieved through a combination of proactive leak detection (through daily leak reports) and tenants' behavior change (based on awareness of actual usage.) In a similar fashion, networked, battery operated wireless thermostats and control devices integrated into H2O Degree's wireless network, provides energy savings and control for both building management and their tenants.

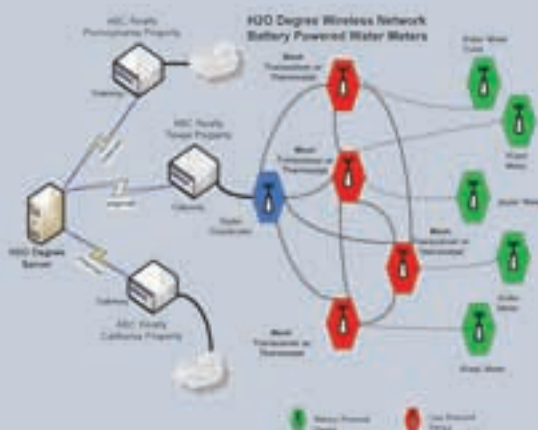
WIRELESS THERMOSTAT CONTROL

H2O Degree's wireless thermostat control solutions install quickly and easily, and allow property managers to take charge of their heating and air conditioning systems in their buildings. Owners can control temperature set-points, establish time-of-day setbacks, view real-time temperature inside the units as well as alarm for potential maintenance issues with equipment. The same types of features are made available to residents. Owners and tenants are able to better manage their utility costs in occupied spaces as well as establish a program to control vacant utility costs.

Tenants have the advantage of access to a web portal or mobile app to be used on their smartphones to control their thermostat. This creates a partnership among management and tenants to conserve energy. Documented savings have exceeded 20% in many properties.

THERMOSTAT CONTROL = ENERGY SAVINGS

H2O Degree's thermostat control system utilizes a wireless network device (gateway) within the facility to transmit and gather data from each thermostat. The gateway is connected to a cloud-based server that requires a unique user-name and password for users to access the online portal and mobile app for monitoring and thermostat control features. (Figure 1.)



H2O Degree's System can be Utilized on a Variety of Systems Including:

- Electric Baseboard
- Electric/Gas Heat
- Hydronic Heat
- Fan Coil Systems
- PTAC (Packaged Terminal Air Conditioner) Units
- Furnaces
- Heat Pumps

WIRELESS SYSTEM COMPONENTS

As depicted in Figure 1, thermostat data is gathered and transmitted to a cloud-based server via a wireless gateway. The wireless network can provide a two-way communication to gather the data and communicate to the individual thermostats throughout the property via H2O Degree's wireless mesh architecture that is well-suited for many multi-family facilities.

The data in the cloud server is then accessible by both management and tenants from any device with an internet connection. Within each apartment (and common spaces within the facility), control of the heat and air conditioning is monitored and controlled using a wireless thermostat and, in some applications, accessory devices as described below.

WIRELESS THERMOSTAT



The H2O Degree M5445x wireless, networked thermostat is simple to install and is a direct replacement for many 24 VAC based units. The M5445x maintains local HVAC control, even if network communication is lost. The smart thermostat communicates with the H2O Degree gateway wirelessly then connects to the H2O Degree cloud server.

Measurements controlled and reported by the M5445x include: heat run-time, cool run-time, humidity, heat set-points, temperature and cool set-points. The device allows property managers to set units to vacant to conserve energy. The thermostat is 7-day programmable with night setback for increased energy savings. The unit has non-volatile memory to maintain the last reading in the event of a power failure.

ENERGY HARVESTING HCV0104 WIRELESS RADIATOR ACTUATOR



The H2O Degree HCV0104 Wireless Actuator mounts directly onto thermostatic radiator valves where it controls the room temperature based on signals from the Wireless Thermostat fitted with an HCV0104 Thermostat Radiator Bridge. The wireless radiator actuator is radio-controlled and self powered by harvesting heat energy from the hot water supplying the radiator. The wireless actuator does not require any cabling nor does it consume batteries. It is designed for maintenance-free operation.

The wireless design makes the unit ideal for retrofit installation and cost sensitive projects where cabling is prohibitive. The HCV0104 contains a thermo-electric harvesting module and integral energy storage. Beyond this, it contains a electromechanical valve actuator, a radio module and a micro-controller that makes all parts of the system work together.

ENTERPRISE-WIDE SYSTEM UTILIZATION — FOR BOTH MANAGEMENT AND TENANTS ALIKE

Enterprise-wide monitoring and control of temperature in apartment units and in facility lobbies, meeting rooms, laundry and other common spaces is conducted by building management utilizing simple and convenient dashboard displays. These displays access real-time data downloaded from the H2O Degree cloud server and provide command and control of the entire system. The images on the right show example displays from both the management and tenant portals. Management can remotely set heating and cooling set-points for tenants and common areas, identify and reduce energy costs in unoccupied areas and identify malfunctions in building equipment. Tenants can see their personal usage in detail and on a day-by-day basis for the prior 7 days.



CONCLUSION

Enterprise-wide thermostat systems provide owners/managers as well as tenants another valuable tool enabling energy reduction and cost savings. Information provided by the intelligent system provide management with exceptional visibility and control over the property's heating and air conditioning operations and, as has been well documented with water submetering systems, tenant awareness of their usage leads to energy reducing behavioral changes.



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How Did the Pandemic Change Our Buildings?

Not that pandemic. Think 1918.

BY MAX ROHR



A virus spread across the world. The medical community didn't fully understand it, but it would come to realize that the virus could jump from person to person through the air. The first known cases were in Kansas. The year was 1918.

An estimated 500 million people caught the illness. What we now know as the Spanish Flu changed everything about normal life, including building construction. In light of COVID-19, what will be the lasting changes to building science?

In response to the Spanish Flu, History.com (<https://bit.ly/2IqOIF4>) explains: "Officials in some communities imposed quarantines, ordered citizens to wear masks and shut down public places, including schools, churches and theaters. People were advised to avoid shaking hands and to stay indoors, libraries put a halt on lending books and regulations were passed banning spitting."

The tail end of WW I sent the Spanish Flu all over the world as troops entered new lands, which led to 40 percent of the U.S. Navy and 36 percent of the U.S. Army becoming ill from the virus. Many of the photos from the time show large, indoor spaces crowded with sick patients on cots.

In 1918, Philadelphia was one of the hardest-hit U.S. cities. A Politico article describes how public health officials in Philadelphia downplayed the virus, explained it away as the regular flu, refused to close the Navy yard where infected soldiers returned home, and even held a major parade.

"Within 10 days, over 1,000 Philadelphians lay dead, with another 200,000 estimated ill," the article notes.

While Boston also was devastated by the Spanish Flu,

it had a bit of good luck that changed how we address disease transmission today. At the Camp Brooks open-air hospital, health officials noticed the low transmission rates. (The open-air recovery treatment concept had roots in Birmingham, England, but this was a large-scale test of the concept).

A doctor named George Bodington treated patients with tuberculosis outside with smaller doses of medicine, encouraging exercise. Many doctors, then and now, would shy away from exposure to the elements without the conveniences and controls of a building. However, there was a notable improvement in patients' health outside compared to indoor spaces packed with people and little outside air.

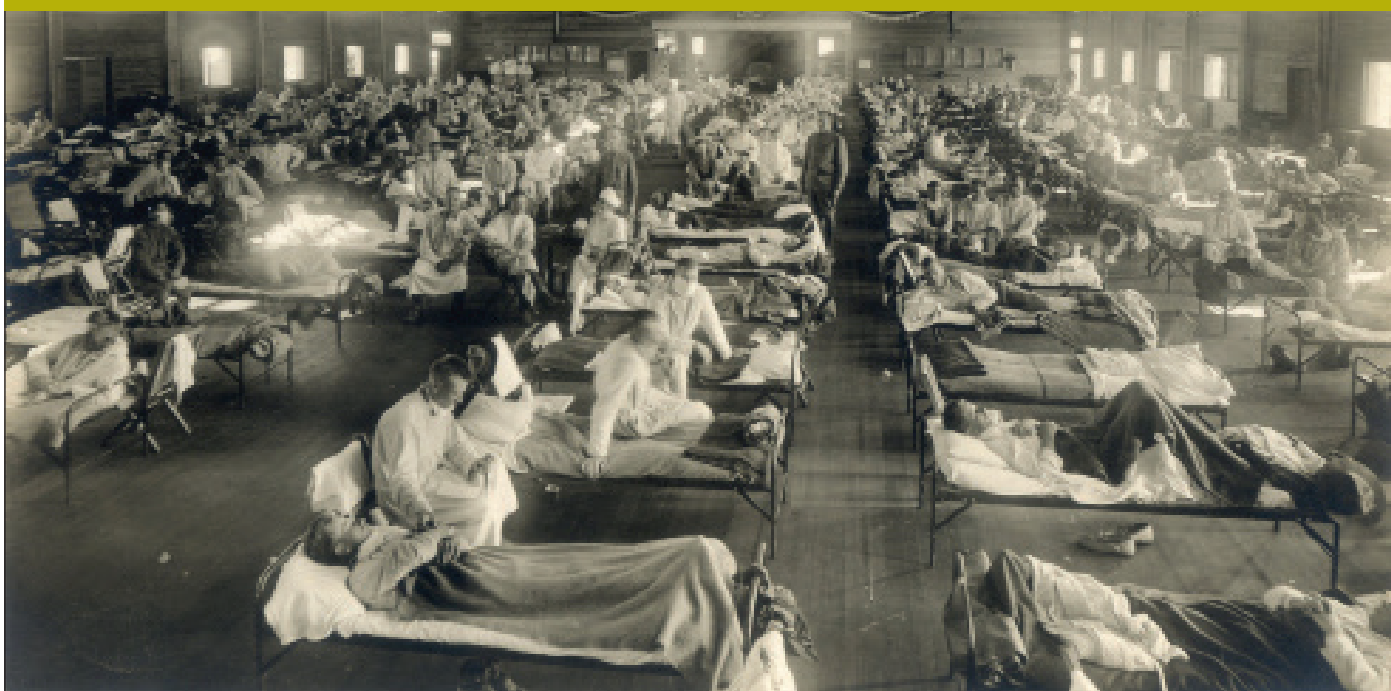
The medical community didn't yet understand an aerosolized virus or have tools to slow the spread. The first flu vaccines wouldn't be available in the United States for another 22 years. The review of the pandemic in subsequent years affected how the world responded to the coronavirus that causes COVID-19. The primary area of expertise that developed from that era involved how we move air in a building.

Ventilation and humidity

Eventually, the general public in 1918 realized the air was part of the virus spread. Not knowing how a virus moves entirely, stale air was thought to be a breeding ground, if not the cause of the disease. Windows flew open. Outside air flooded in. Active ventilation wasn't common, but the passive air exchanges to rooms with windows were (<https://bit.ly/2UinNhf>).

Unfortunately, another problem arose: People were now

Camp Funston, at Fort Riley, Kansas, during the 1918 Spanish flu pandemic.



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cold in their homes. Dan Holohan, industry historian, has written and spoken many times about how the Spanish Flu changed the heating systems in buildings (<https://bit.ly/32DIV62>). Heating system designers began load calculations assuming the windows would be open all day, which is why buildings constructed in that era may still have enormous radiators under windows.

Those buildings lucky enough to still have the large radiators can make great low-temperature hydronic heat emitters in a remodel.

Over the next century, the need for fresh air was better researched. Jumping forward to 2019, I attended a presentation by Dr. Stephanie Taylor on the relative humidity in hospitals, among other things (<https://bit.ly/38MGHWb>). Before COVID-19 hit, she walked the audience through her research on indoor air quality in hospitals.

Since the pandemic exploded, Taylor has become one of the busiest IAQ professionals in our industry because she possesses the data to better explain how a virus can move throughout a hospital.

Specifically, Taylor spoke about the relationship between relative humidity percentage in buildings and how it affects the transmission of airborne particles, such as viruses. One of her essential recommendations is to

keep indoor RH between 40 percent and 60 percent. For rooms falling within this humidity band, particles from a sneeze or cough will settle more quickly on a surface.

While the droplets on the surface remain an issue, they aren't blowing from room-to-room. Staying below 60 percent RH also prevents the acceleration of mold, fungus or dust mite growth.

For a deeper look at all the factors in play surrounding the transmission of infections in buildings, Taylor defined six factors:

1. The number of people producing infectious droplets;
2. The vulnerability of the secondary hosts (people);
3. The length of the occupant's exposure;
4. The ventilation rate;
5. The settling rate of infectious aerosols; and
6. The survival of pathogens in aerosols during transmission.

Pandemic-specific airflow

In light of the 2020 pandemic, how do we continue to modify our buildings, especially hospitals, to have more of the open-air recovery benefits?

ASHRAE has published recommendations throughout the COVID-19 pandemic (www.ashrae.org/technical-resources/resources), and it stresses the importance of

proper air movement: "Ventilation and filtration provided by heating, ventilating and air-conditioning systems can reduce the airborne concentration of SARS-CoV-2 and, thus, the risk of transmission through the air. Unconditioned spaces can cause thermal stress to people that may be directly life-threatening and that may also lower resistance to infection."

It is a very bad idea to turn off ventilation systems entirely.

The technology and control systems are more specific in 2020, but the concept of maintaining airflow remains consistent with the 1918 vision. There are many things we can't control about the current pandemic, but building ventilation design isn't one of them.

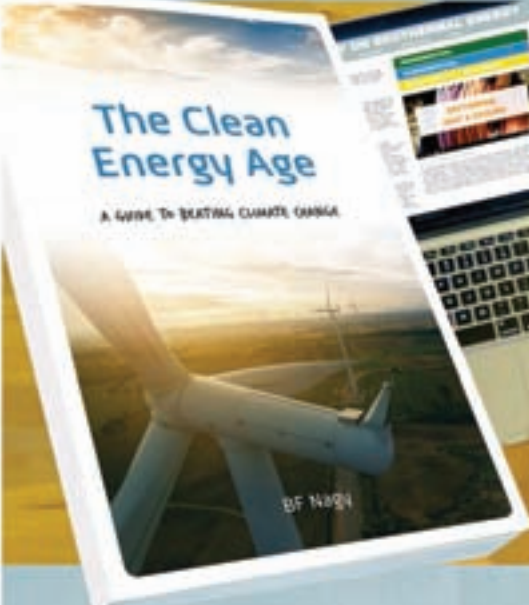
If you work in the new construction design world, keep in mind that both normal ventilation standards and pandemic-specific ventilation practices might need to be control options. Can modern designs do both well?

Additionally, if you find yourself in a hospital or any building with multiple factors affecting the transmission of disease, bring your humidistat. Look for that 40 percent to 60 percent range, or pull up a chair by a huge open window. Just because we have the ventilation technology available in 2020 doesn't mean it is being utilized properly. ●

Max Rohr is an education and training manager at Caleffi North America. He is a graduate of the University of Utah. He has worked in installation, sales and marketing in the hydronics and solar industries since 1998. He can be reached at max.rohr@mac.com, on Twitter @maxjrohr and Instagram @caleffi_na_max.

BF Nagy is known to PE readers for
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HoldRite Firestop Sleeve Parts

Interlocking telescoping sleeve design

Say goodbye to cutting sleeves on the job site and spending extra time on estimating measurements. You can adjust the HydroFlame Pro sleeve height anywhere from 8 to 12 inches tall by simply rotating the outer sleeve and locking it into place. And if you need to go beyond that, sleeve extensions have you covered.

The sleeves can also be cut down to as short as 2 ½ inches if needed. A non-telescoping design is available at 7 ¾ inches tall too.

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- Accommodating various pipe, conduit and cable types and sizes, from ½ inch to 6 inches.
- Including an inner sleeve with a built-in measurement guide system to make finding the right height easy during install.
- Reducing the number of parts needed to complete the firestop sleeve installation.

Water-tight mid-body seal

In addition to stopping the spread of fire, smoke and gases, the HydroFlame Pro sleeves also protect against water damage and mold. One of the key components that makes that possible is its superior UL W-rated seal. The seal is designed to grip pipe with up to 10 times greater surface contact than other manufactured sleeve devices

on the market. Due to its pliable elastic nature, it also works with off-center pipes.

Intumescent fire wrap

Intumescent fire wrap is UL Listed and built into each HydroFlame Pro sleeve during manufacturing to help stop the spread of fire and smoke.

Locator whiskers

Once you pour the concrete, you'll never have to guess where you placed your firestop sleeves. Color-coded locator whiskers poke out so you can quickly identify different through-penetration firestop types.

- Red whiskers = plastic pipe
- Black whiskers = metal pipe
- Green whiskers = electrical conduit or cable

Safety cap

With a threaded design and a Safety Cap Tool available, the sleeve's cap allows for easy, non-destructive removal after concrete pour, as well as tightening and untightening. It also meets OSHA's hole-cover requirements, helping to keep installers and the job site safe by preventing workers from tripping and falling through openings in floors.

Interlocking nail-in base

This quick-to-install base makes each placement secure and makes working in tight locations easier. The sleeves' bases are narrow enough for multiple sleeves to nest close together. This is uniquely true with the 1- and 2-inch sizes, where the outrigger wings can fold up and out of the way, allowing close nesting of the sleeves.

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Rules of Engagement: Do You Know What Your Teams and Customers are Thinking?



There is genuine concern among business leaders that physical distancing at work could hinder employee — and customer — engagement.

BY JAMES MILLER

While the rules of engaging teams and customers never change, the rules of how we interact drastically changed this year. As 2020 draws to a close, many are asking, “How can I prevent a remote workforce from causing unintended business challenges?” There is genuine concern about how long we can stay disconnected at work before unintended consequences start to arise.

Whether trying to run a business, lead project teams, manage field crews or maintain effective relationships with customers and project owners, executives and employees alike are trying to understand how to avoid “drifting apart.” They fear that months of physical distancing could stymie engagement and allow resentment to creep in.

In response, I’ve developed a tactical game plan to help drive genuine engagement across our business.

(subhead) Lean on operations support teams

Business operations support teams are key to effective engagement because they can help you communicate with staff. And in our current environment, you must remain vigilant about regular communications.

With teams physically disconnected, activities we might take for granted, such as monthly team newsletters or all-

hands meetings, are more important than ever. Use these channels to share current information with your teams.

However, it’s not enough to simply provide updates. Instead, connect the reporting with the work your employees are doing each day. Use recurring communications to demonstrate how their daily work contributes to team goals and progress.

Moreover, consider gathering safely at an outdoor location to meet in person, allowing employees to opt-out and offering a virtual option for those who aren’t comfortable doing so.

Show them you care

When it comes to field teams, leaders must show an interest in their workforce’s work. You must demonstrate genuine curiosity about how a project is going, what the experience is like, how you can help, and what the company can do to support them and the project.

Most importantly, your field team must recognize they have a support mechanism backing them up. If you haven’t interacted with your field team in several months, you run the risk they might convince themselves they’re in this alone.



Recurring communications demonstrate to employees how their daily work contributes to team goals and progress.
Photo credit: iStock.com/fizkes



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While professional staff works remotely, most craft teams and the projects they support continue showing up to work at the jobsite each day. This dynamic could drive a psychological wedge between the two interdependent parties if not managed with care.

To that end, we've built out a comprehensive list of suggestions for supporting field teams. These recommendations were developed with the understanding that a team in Seattle may require a vastly different solution set than someone in Texas, for example.

For many of our projects, we're conducting monthly "virtual job walks" via videoconference. While not the same as being there in person, it's better than no contact at all. They provide an opportunity to walk through project progress, hear what's working or what challenges exist. These virtual job walks should be used to express a genuine interest in what — and how — they're doing.

Another creative approach that adds an element of the traditional in-person meeting is to conduct what we call a "perimeter walk." This approach offers some much-needed personal interaction with your foreperson in a safer, socially distanced outdoor setting.

Perimeter walks allow you to point to jobsite progress and gain different perspectives on the project, such as from the sidewalk or across the street. It is a great way to satisfy the need for human connection and move beyond virtual meetings.

Lastly, the third approach we're using — but only when safe and approved by the project lead — is in-person visits onsite. Not everyone will be comfortable with this approach, and that is completely understandable. Don't push this option on teams if they're nervous about in-person visits.

However, this is why several options exist to suit varying needs and circumstances. If you haven't interacted with your foreperson in three or four months, disengagement can become an issue.

Keeping customers engaged

As with field team meetings, it's critical to the success of your project — and future projects — to not fall behind on regular customer communications. This should include daily, weekly and monthly interactions, which all too frequently aren't occurring, or not often enough.

To that end, it's incumbent upon us to find new ways to reconnect with customers. We started seeing examples of this near the end of summer, such as socially distanced golf tournaments.

Teams ignoring customer engagement may find themselves onboarding unintentional risk. Chief among them is the possibility that teams could face a shallow project backlog in the future. As with your field foreperson, disconnected customers may start to feel their project interests are not being supported. My instinct tells me that too much time has passed, and we need to get creative in finding ways to connect with our customers.

If necessary, engage with customers via videoconference; a virtual conversation is better than none at all. If possible, however, try to meet in person. Of course, it's critical to observe and respect legal, health and safety guidelines, but consider meeting outside or in a socially distanced conference room.

Throughout the pandemic, we've conducted monthly customer rhythm-of-business meetings to review project scorecards. These meetings offer a chance to remain

engaged, listen intently and find out how we're doing on their projects.

Occupational hazards partnerships

Several industry organizations we belong to are tackling what I describe as the new occupational hazards. While participation halted early in the pandemic, it's imperative that we collectively lean into these organizations with peers and competitors alike to find solutions to tough issues. These efforts have paid dividends recently, providing training and tools to address a host of new topics.

One organization we're a part of, SafeBuild Alliance Washington, is a nonprofit organization dedicated to transforming the construction culture and eliminating incidents and injuries on jobsites. However, in recent months, they've focused on emerging challenges in our industry, such as COVID-19, social unrest, political anxiety, and dealing with economic uncertainties such as a partner or spouse losing their job.

Previously considered taboo topics, our industry needs to address them head-on with care and empathy.

Similarly, there's been a trend in recent years to have a health specialist onsite for occupational hazards and safety. Since the start of the pandemic, however, they are often tasked with handling more difficult topics such as substance abuse, depression and anxiety, mental health and wellness, psychological safety along with physical security, and so on.

We've seen this health specialist role on a few projects in the past two years, and we're now using it as an on-call service for our project teams. As difficult as this year has been, I hope that COVID-19 serves as a catalyst to discuss these issues with our workforce.

But is it working?

Because these solutions are not one-size-fits-all, they must be continually monitored and measured to ensure they're addressing the engagement deficit. At McKinstry, we hold quarterly conversations with direct reports. These are not performance reviews; they're dedicated to asking employees how they're doing, what they need help with and where they're feeling constrained.

Most importantly for managers and leaders, these conversations provide an opportunity to listen and gauge what is and isn't working.

Survey tools such as SurveyMonkey are a great way to solicit feedback about how well your organization maintains engagement or to find out if employees feel supported. The feedback we've received has been mostly positive, with employees noting that they can tell we're doing what we can to help.

But responses change from month to month, which proves that you can't deploy one idea and assume it's the right approach four months later.

Until we've either adapted to this "new normal" or made it through the pandemic, this will be an ongoing leadership challenge because the ground will continue moving below us. If you take your eye off the engagement ball, you risk "losing" your teams, your customers — or both. If you ask me, it's not a risk worth taking. ●

James Miller is vice president of construction operations at McKinstry, a national leader in designing, constructing, operating and maintaining high-performing buildings. He is responsible for ensuring operational excellence in the planning and execution of construction projects throughout the Pacific Northwest.



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Using W-Rated Firestop Sealants

No current code requirements specify a W rating, but it is something project owners and stakeholders have asked for over time.

BY JEFF HAMILTON

When performing firestop installations, there are a few different industry-standard sealants to choose from: silicone and water-based intumescent or acrylic sealants. Depending on the type of penetrating item you're working with, the budget or what's most convenient for the specific job, you may choose one over the other.

Here are some basic questions to ask when picking a proper firestop sealant for an application:

- **What is the curing time?** If you need a fast cure, such as three or four days, then you'll want to pick a silicone sealant. Additionally, silicone sealants offer a more diverse application temperature range than standard acrylics or intumescent sealants.

- **What is the budget?** Silicone sealants are more expensive than intumescent or acrylic sealants, but they also have different abilities and limits to consider.

- **What aligns best with the project's needs?** Your first reference point is the 078400 specification section from the architect to see which material is specified. Then you can consider other details, such as if movement is expected to occur around penetrating items. If so, a silicone sealant may offer more movement capabilities than standard intumescent sealants offer.

- **Do I need a self-leveling or a caulk-grade silicone?** A self-leveling sealant is ideal for floor applications where it might be difficult to reach penetrating items or when professional looks are required. A caulk-grade non-sag silicone sealant can be used in either walls or floors.

In floor applications, a self-leveling sealant saves time by reducing the amount of labor required to "tool" the sealant within the opening.

Water-repellant sealant

For those in humid or rainy areas of the country, there is one other factor to consider when picking your firestop sealant: a UL-tested and -listed W rating. It's imperative for keeping work and the overall project's progress safe from water damage, which can lead to expensive repairs. If penetrating items



HoldRite HydroFlame silicone sealants help protect vertical and horizontal construction assemblies from the spread of flames, smoke and hot gases. Additionally, they repel water in washout conditions or in through penetrations where moisture is a concern. Photo credit: RWC

are expected to be subject to heavy moisture or standing water either during or after the construction phase, silicone sealants offer protection in these types of conditions.

In fact, some projects even require a W-rated sealant per the specification sheet. Other jobs may require every third or fourth floor to be W-rated. Even in areas that don't anticipate a lot of rainfall during construction, some buildings — no matter where they are — require water-repellant sealants for parts of the project where there are several water lines, such as a bathroom.

Though there are some intumescent W-rated sealants, you'll most likely find water-repellant silicone sealants because silicone repels water far better than water-based sealants do.

What is a W rating?

Just because a sealant is water repellent, however, doesn't mean it's W-rated.

Underwriters Laboratory created a testing standard, a Class 1 W rating, to prove a product's ability to protect against water from floor to floor. No current code requirements specify a W rating, but it is something project owners and stakeholders have asked for over time.

A Class 1 W rating means the firestop product has been subjected to three feet of water pressure for 72

hours, according to UL 1479. During the 72-hour testing time frame, not a single drop of water is allowed to pass through the firestop assembly. If water passes through it within that allotted time, it's recorded as a failure.

There's no substitute for quality. To find a premier sealant, first look for out-of-the-box W-rated solutions that don't require additional accessories. Look beyond the product and, instead, evaluate the manufacturer.

Does the manufacturer have a proven track record of reliability in various firestopping solutions? Have you used other of its products and been satisfied with the quality? If not, what do other contractors have to say about using multiple products from the brand?

If you or other contractors are confident in the quality of the manufacturer's solutions across various product categories, you may choose to source all firestopping products from one trusted source. Not only does this give you peace of mind, but it also can make the job easier since you're working with a single source that has designed solutions to work together seamlessly. ●

Jeff Hamilton is the fire stop product manager at RWC, a manufacturer of water control systems and plumbing solutions for residential, commercial and industrial applications.

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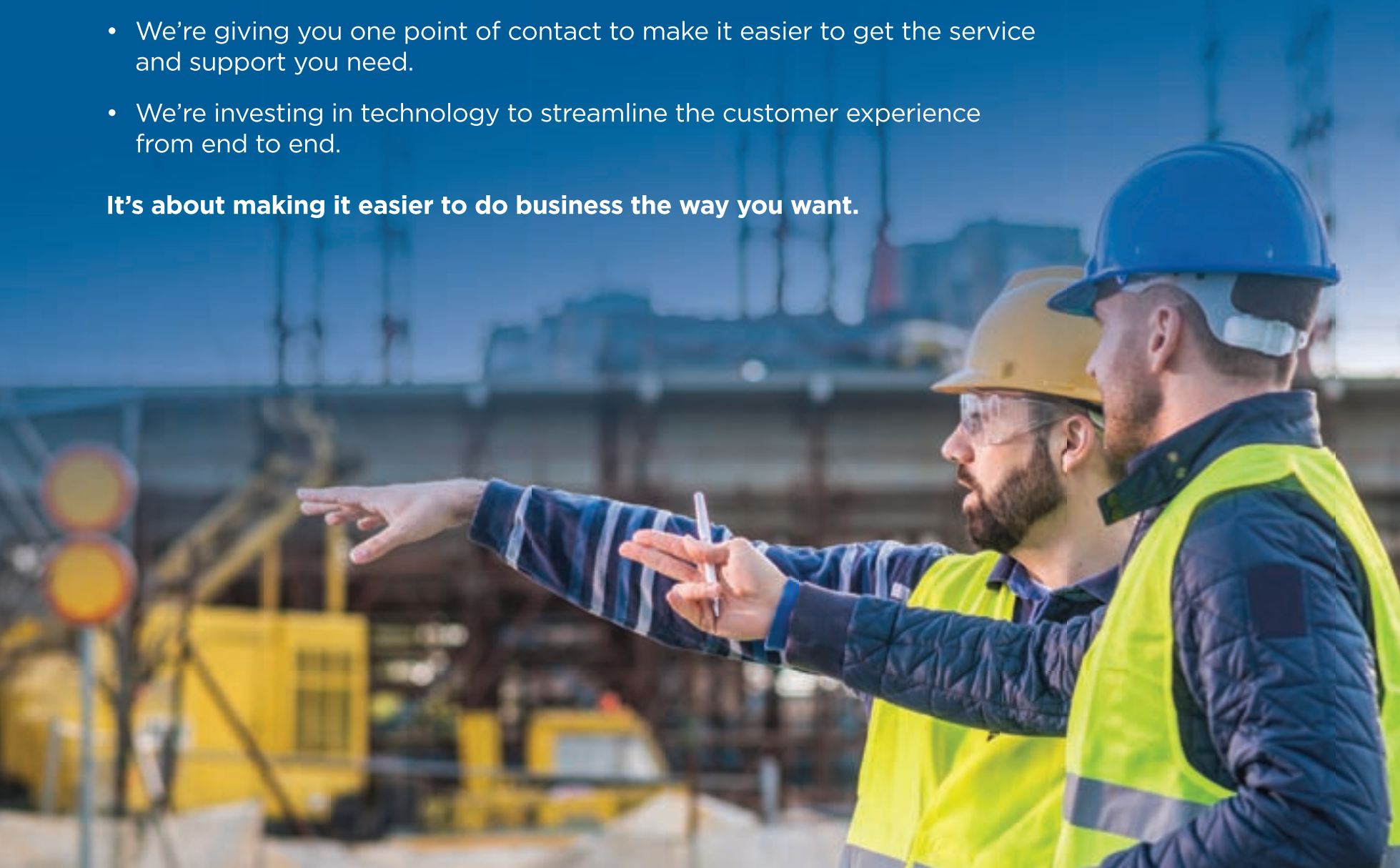
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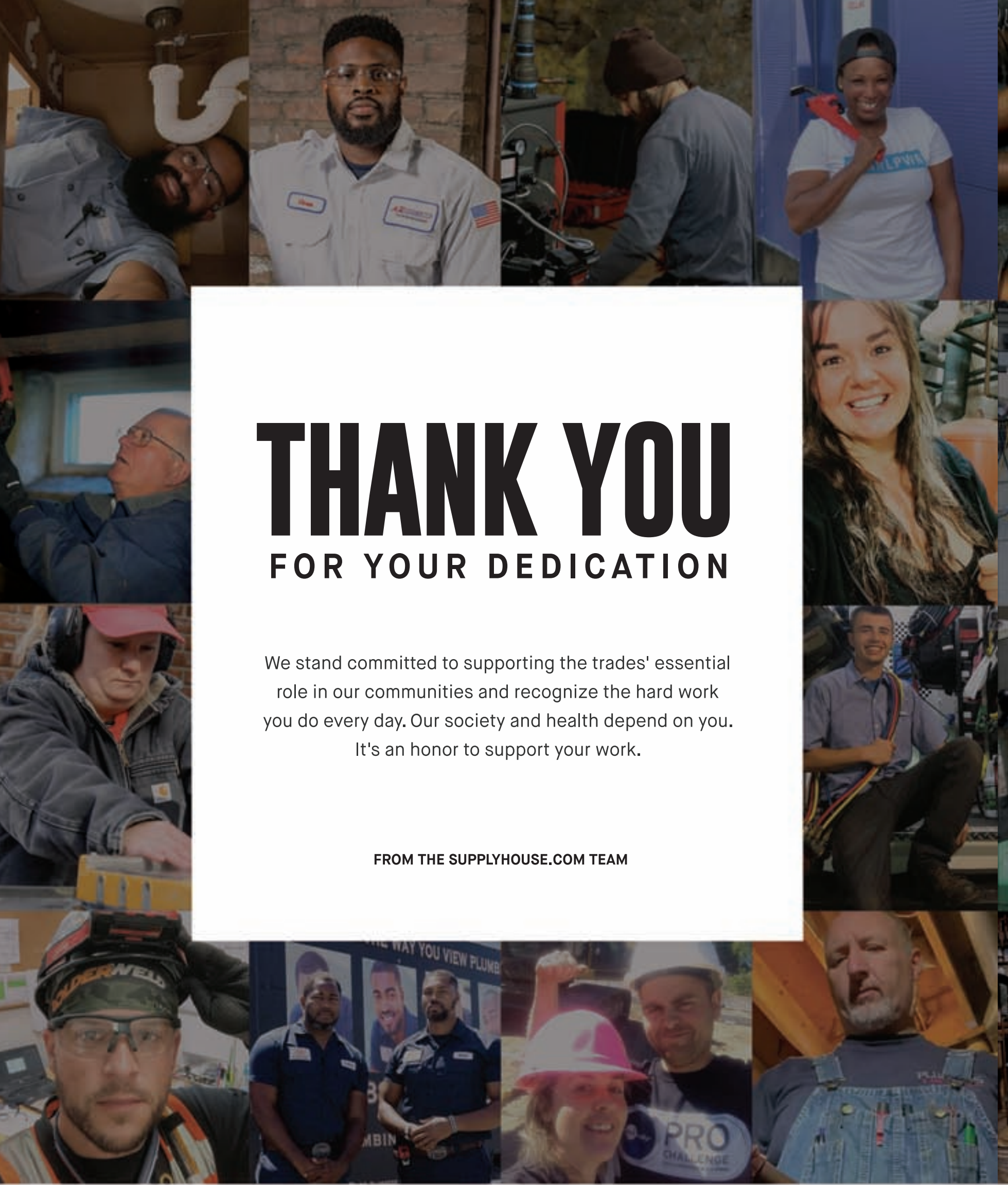
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Commitment To Water Safety In Ohio State Correctional Facilities

Caleffi's LEGIOMIX valves ensure safe and sanitary domestic hot water.

BY SHARON ALEXANDER

When MG Energy, an industry leader in the mechanical contracting field, was awarded two multimillion dollar energy- and water-saving performance contracts for two state correctional facilities, they trusted Caleffi.

Caleffi's LEGIOMIX electronic mixing valves were entrusted to provide a highly reliable, low-maintenance thermal solution for control of safe and sanitary domestic hot water as well as highly accurate mixed water temperatures.

The customer was the Ohio Department of Rehabilitation & Correction. The contracts were for enhancements at Mansfield Correctional Institution and

Richland Correctional Institution, located close to one another. As an interesting point of fact, they are also near the Ohio State Reformatory, which was the location for the movie Shawshank Redemption filmed in 1994.

Phase I and II

Servicing the commercial, institutional, and industrial market since 1999, MG Energy, in Mansfield, Ohio, is a full-service mechanical firm with a dedicated team of highly skilled engineering and construction trade professionals. The company's many certifications include licensed professional engineers, LEED AP, certification of state of Ohio HVAC/Plumbing, EPA

certification, master plumbers and certified energy managers.

Their foremost expert is at the helm. Company President David Metzger P.E., C.E.M., has more than 40 years of experience in mechanical design and construction as well as energy efficiency commercial and industrial projects.

After winning the first performance-based energy upgrade contract with the ODRC in January 2018, Metzger and his team completed the approximately \$8 million Phase I project replacing boilers, chillers, and pumps. New system design included a transition to indirect water heaters and LED lighting.

Within the next 18 months, MG Energy was awarded a second



A Caleffi 6000 Series LEGIOMIX digital mixing valve accurately controls domestic hot water temperature and controls legionella. The user interface is conveniently located for operator access to adjustment parameters, 40 days of logged temperature data, system status and alarms. Credit: MG Energy

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After being impressed by the new LEGIOMIX 6000 series electronic mixing valve technology at the AHR Expo in 2018, Metzger and his team recognized an outstanding opportunity to incorporate them into Phase II of the project.

contract for \$9 million at the same facilities. Phase II included a series of energy and water conservation and safety measures.

After being impressed by the new LEGIOMIX 6000 series electronic mixing valve technology at the AHR Expo in 2018, Metzger and his team recognized an outstanding opportunity to incorporate them into Phase II of the project.

"The prison facility had their fill of non-working, gummed up thermostatic mixing valves. The equipment we replaced required maintenance and cleaning biweekly," Metzger explains. "It was only until I was introduced to the Caleffi digital mixing valve with its self-cleaning ball valve design that I was actually confident enough to propose them. I knew the LEGIOMIX's maintenance savings alone would be a massive plus for the client."

One of the most innovative features of the LEGIOMIX is an automatic exercise function that rotates the ball valve daily to flush

out scale and debris, ensuring smooth operation. A clean ball valve increases efficiency and longevity while reducing labor costs.

A total of 15 LEGIOMIX mixing valves were installed in all control points for the major building domestic water systems, including those that supply tempered hot water to all the cell block areas and dormitories.

Safe, sanitary hot water

"We are committed to the health and safety of the offenders and staff," says Richard Shaffer, project manager supervisor, ODRC. "We wanted to find ways to reduce the risk of legionella within our facilities."

Considering that there are upwards of 5,200 mixed security inmates and nearly 1,000 staff members that occupy a total of 50 buildings on this project, it was imperative that a first-rate control method be implemented for safe and sanitary water. According to the CDC, the rate of Legionnaires' disease in the U.S. has increased nearly four and a half times over the past 20 years.

One of the many compelling functions of the LEGIOMIX digital mixing valve is its calendar-based automatic thermal disinfection program—the only one of its kind in North America. Although the LEGIOMIX offers the ability to start the disinfection process on-demand, at the touch of a button, in this case, they choose to operate with the more meticulous automatic, preprogrammed method.

Throughout both facilities, the disinfection process runs nightly without the need for technicians to initiate the process. The digital mixing valves deliver a thermal shock, disinfecting the recirculation systems, elevating the recirculating water to 150-160 degrees for a specific and measured period of time. This control method is robust, breaking through biofilm, scale, and sediment to destroy harmful bacteria. Point-of-use anti-scald valves ensure safety during the process.

Data logging

According to Shaffer, another compelling reason for the ODRC to select the LEGIOMIX is "because it allows for monitoring by the building automation system



David Metzger, president of MG Energy.
Credit: MG Energy.

and records water temperatures."

The digital recording capacity is comprehensive. All the parameters are updated daily and logged, with temperatures recorded every hour. The recorded data is capable of being connected to a building automation system for remote monitoring and access. Integral Modbus is standard with the Modbus-BACnet gateway available to order based on the specific project needs.

Having a consistent record of data at his fingertips means that Shaffer and the on-site maintenance staff can be 100 percent assured that "the LEGIOMIX mixing valves are delivering properly controlled water temperature."

After all, the key function of a mixing valve is controlling water temperatures. The LEGIOMIX delivers highly accurate mixed water temperatures, at all times, with variations limited to less than one-half of a degree. Having a record for verification and reference brings peace of mind.

Reflecting on the project, Metzger adds: "The State of Ohio had no extensive experience with digital mixing valves and the concept of precise control, reduced maintenance, temperature data logging, and prevention of Legionnaires' disease was so welcomed that the final decision to was really a 'no brainer.' My whole company is absolutely 100 percent sold on the LEGIOMIX. It is a game changer!" ●

Sharon Alexander is brand marketing manager for Caleffi North America.



Cutaway view of a Caleffi LEGIOMIX electronic mixing valve.



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Plumbing Systems Should Be Fluid

Plumbing pros should take the lead in making plumbing systems more dynamic and able to adjust to challenges.

BY EDWIN GONZALEZ, CPD

Google Building Automation Systems and you will get information that includes everything from MEP and HVAC equipment to lighting, security, power monitoring, fire alarm, elevators, and special system monitoring. These are systems we have come to see as systems that can be managed and adapted to fit a specific situation. We can set the lighting to come on and off on a set schedule or based on the occupancy in a room. The same can be done with HVAC systems, security, building power, and elevators. Making these systems dynamic and adjustable. In some cases, the building itself is dynamic such as sport facilities with retractable roofs, retractable replaceable playing area, buildings with rotating floors or buildings with transforming facades. The benefits of flexibility in a building environment can be endless. Multi-purpose use, cost reduction, user (tenant) needs, scalable flexibility demand is at an all-time high.

Although most building systems have been seen and designed as adaptable to the different variables, plumbing systems have been lagging in the flexibility department. The reason being is that plumbing, for the most part, is a building system. In other words, a system that encompasses an entire building which is seldom broken up throughout the building. Whether you are talking about a sanitary system, storm system, or water system, there is normally one point of connection to the utility, one central water heater. All rigid systems that normally connect to a single line like branches on a tree. Even when there are multiple points of connections, the limited amount of flexibility in the distribution of any of these plumbing systems is unavoidable. However, that does not have to keep plumbing systems from being dynamic.

Plumbing systems although rigid in nature, can be and should be designed to conform to different factors and conditions, not only to be able to keep up with dynamic buildings and other trades systems, but also for health reasons. Since COVID-19 first hit in March 2020, many professionals in the

Although most building systems have been designed to be adaptable to different variables, plumbing systems lack this flexibility.



plumbing industry, together with health officials, have been active in promoting the need to address the health issues in idled plumbing systems. Many organizations from the Centers for Disease Control and Prevention, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Canadian Water and Wastewater Association, have released guidelines to reopening buildings post COVID-19. And recently, the International Association of Plumbing and Mechanical Officials and the American Water Works Association have partnered to develop a manual titled Recommended Practices for the Safe Shutdown and Startup of Building Water Systems Due to Emergency to address the issue of problems associated with the water systems after prolonged stagnation.

The recommendations for safely reopening buildings will be a difficult task for building owners and operators. Requiring research, qualified individuals, time, and money. Harsh requirements necessary to mitigate the risks associated with the concerns of water systems in buildings that have been shut down since the beginning of the pandemic. These concerns go back years in which the industry has been dealing with issues of water stagnation or slow flowing water in building plumbing systems.

Ever since the Energy Policy Act of 1992 introduced low flow plumbing fixtures as a way to help with water conservation, thus helping the

environment, professionals have been studying the side effects of lower water flow in the systems. From how some low-flush water closets fail to properly wash and evacuate the bowl in the same way its predecessors did, to the hidden issues downstream in the drain systems due to lower scouring velocity, as well as reduced water exchange upstream in the water supply serving such fixtures. Yes, the problems could be found on both sides of the plumbing system.

Incorrect piping and little to no water flow can lead to an increase in biofilm growth in the supply lines. Therefore, it is important to consider how the low flow plumbing fixtures impact the flow and size of the system. This was not much of an issue pre low-flow fixture. When a single water closet flush would send 3-6 gallons of water rushing down the line, it was enough to scour the pipe lining while moving more water through the system and replenishing the flushed water in the lines with new water. Think of it as turning over your water inventory. We need to move the old water inventory out in order to bring in new clean water inventory for the next demand. Thus, keeping your water inventory fresh.

For that to happen, the systems must keep the water moving and at safe temperatures to minimize or eliminate waterborne microbial organisms such as legionella pneumophila, the cause of legionnaires disease. In 1976 the CDC reported the first outbreak of Legionnaires' disease, a lung infection

(pneumonia). Legionella can be found in systems such as cooling towers and decorative fountains. However, the plumbing system, which makes up the largest part of a building's water distribution, can present a huge legionella risk in a building. After the adoption of the Energy Policy Act of 1992, plumbing systems started being designed with low-flow water fixtures, once those systems were installed, the number of people with Legionnaires' disease has grown drastically. From 2000-2018 that number has grown 9 times faster. Reports say 1 in 10 cases end in death. The CDC has also noted that 9 out of 10 of its Legionnaires' disease investigations show that almost all outbreaks were caused by problems that could have been prevented with effective water management.

In most cases seniors and those with health issues, cancer, weak immune systems, underlying illnesses, smokers, are the most at risk of contracting the disease. Although most outbreaks are associated with large or complex water systems, often found in hospitals, long-term care facilities and hotels, there have been cases reported in theme parks, schools and even in residential systems as well, highlighting the need to design plumbing systems that meet today's health challenges in every application of the industry. Concentrating, not just on systems that transport water from the source to the end users as cheaply as possible but designing and installing plumbing systems whose priority is to protect the public's health while delivering clean and safe drinking water.

The challenges to improve the public's health in the buildings have not been isolated to the plumbing industry. In 1984 the World Health Organization created a 484-page book on Sick Building Syndrome, which has been used as the basis for legislation on indoor air quality. Ever since then improvements have been made to building construction, including materials, lighting, as well as heating, ventilation, and air conditioning systems to improve air quality and the health of a building occupants. A lot of these improvements have come in the form of technology. Technology that has helped with light management systems, as well as air quality systems to control humidity levels, minimized stagnant airflow, extreme temperature differences (hot/cold spots). Today's buildings are now smarter and healthier while

also helping the environment. The power of technology has allowed the design of dynamic systems to adjust as the needs change. Recently, the plumbing industry has been tasked with finding ways to use technology to improve plumbing system design and to eliminate the risks associated with today's health and environmental challenges. This brings us back to energy and water conservation where advancements have been made in everything from low-flow fixtures, booster and recirculating pumps, to mixing valves, to water heating systems. However, today's plumbing systems also need to be dynamic, adaptable, and capable of changing throughout the life of the building.

There are multiple reasons for the need to make adjustments to the systems within a building today, whether internal or external, a change in the usage of a facility can impact the plumbing system, a change from the water source (utility company), or a pandemic such as COVID-19. Technology is available to ensure plumbing systems stay operational, healthy, and keep moving forward while being more flexible than yesterday's systems. Expandable and upgradable systems offer the facility's owner more control and information to better manage the system. Today, we can specify smart pumps that can adjust based on the demand fluctuations during the day, we can also specify smart water heaters that can alternate their firing sequence among a gang of heaters to promote the most efficient performance. All with features that give the owner the data they never had before while also allowing them to manage and monitor the systems operations remotely.

Smarter systems are the answer. Technology is now available for plumbing components from balancing valves, flushing valves, temperature, pressure, to flow

sensors that can automate the systems and gives building operators the control and monitoring capabilities they need to manage their building water systems effectively. Automated valves can perfectly balance the hot water system by continuously sensing the water temperature and dynamically adjusting flow to meet the building's pre-defined parameters.

In addition to automatically maintaining the hot water temperatures throughout the building, the automated systems help prevent stagnation, minimize biofilm growth, and increase residual disinfectant levels by automatically flushing the building water system according to predefined parameters.

Connectivity to smartphones, tablets, CPUs, and building management systems keep facility managers up to date on their water systems operation. Data logging and reporting provide necessary information for risk assessment. This smart technology raises the bar on what we should expect from building water systems and how we approach building water management.

Today's plumbing design professionals should take the lead in designing systems to be more fluid (pardon the pun), to be smarter, more responsive, better managed to prioritize public health, and able to adjust to meet tomorrow's challenges. ●

Edwin Gonzalez, CPD is a Piping Systems Specialist at GF Piping Systems. He has been in the plumbing design industry for 35 years, he started as a drafter for an engineering firm in Wethersfield, CT and quickly began learning plumbing design. His experiences include plumbing systems design for major commercial work, multi-family, hospitality, health care, and institutional facilities.

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The Upside of Instagram: One Pro's Experience

Mike Flynn started posting on the image and video sharing app just five years ago, but has almost 17,000 followers.

BY DAN VASTYAN

For better or worse, social media has had a profound and irreversible effect on society. Its impact has reached every business sector in the world. And the skilled trades are no exception.

Some PHCP manufacturers were quick to build a presence, though serious work-related adoption of social platforms by tradesmen and women took some time. Now, however, the field has been populated by more than a few influencers who've differentiated themselves by regularly posting interesting and humorous content that others in their trade can relate to.

"Following other installers on Instagram has had a huge impact on my own work," says Mike Flynn, lead installer and job supervisor for Service Professionals in Union, New Jersey. "It pushed me to raise the quality of my work, especially from an aesthetic standpoint. You could plainly see the progress I made by comparing my own mechanical rooms to what I was seeing on social media."

Flynn says he's learned the most on Instagram from Aaron Bond (@bond_aaron), Motty Pliers (@mottypliers) and Howard Mechanical (@howardmechanical). But his list goes on and on.

Flynn began posting to Instagram in 2015, about the time he started running jobs on his own. He goes by @flynnstone1 on the photo and video-sharing app and has almost 17,000 followers.

His Instagram is populated by advice, tips, tricks and the rare tool review. Flynn's French bulldog, Bruce, makes a cameo appearance from time to time, and is depicted in the caricaturized stickers he made of himself.

These stickers – where Flynn appears with a giant pipe wrench and full arm sleeve tattoo – he trades with manufacturers and other tradespeople who use Instagram. The stickers he receives in return get applied to the inside of his van cab, acting as a backdrop when he records videos from the driver's seat, or on the bins in the back of the van.

"Of course, 17,000 followers is



Mike Flynn and just some of the sticker collection that adorns his service truck.

insignificant for a celebrity or a big, household name company, but for a tradesman, it's a very solid number," Flynn adds. "I appreciate my followers as much as I enjoy seeing other accounts that I learn from. I didn't start posting in order to gain a big following. It kind of happened by accident. Once I hit about 1,500 followers, I realized I might have something unique."

'Sunday Boiler School'

Flynn's Instagram account is characterized by super clean work and things he encounters on a daily basis. He also posts what he calls "Sunday Boiler School." He started these informative videos about two years ago.

"Sunday Boiler School is a way for me to address what I see in the field being done incorrectly," Flynn explains. "Steam boiler piping, circulator placement, venting and circulator sizing – the latter being something I promote working on with a manufacturer if help is needed. I often contact Dave Holdorf, eastern region residential trainer at Taco Comfort Solutions, when I'm not certain of the pump curve I need."

Flynn, however, knows his lane within the Instagram community, and does his best to stay in it.

"For that reason," he adds, "I don't offer advice on things I'm not really

confident in or passionate about. And, I don't do many tool reviews."

Having a robust social media presence has provided a number of opportunities for Flynn, whether to socialize, share information or improve his own skillset. He's been a guest on a number of podcasts, including HVAC Know It All, Bold City Plumber's "Bold Cast," and HVAC Reefer Guy.

And a photo that Flynn submitted to Ridgid Tools in 2019 – in which he stands atop a 550 MBH residential steam boiler with two pipe wrenches – earned him a ticket to the 2019 Ridgid Experience in Ohio.

On occasion, customers will recognize him from posts and ask, "Hey, you're the Instagram guy, right? But this typically comes after a salesman has shown the customer Flynn's Instagram.

"Service Professional's salesmen will sometimes use photos from my Instagram to show off our work to homeowners," Flynn adds. "So when they see the big guy with the beard and tats show up for the install, they sometimes draw the connection. Ultimately, my company likes that I'm active on social media. I'm careful not to let it interfere with my work."

Ample education

As an employer, what's better than a team member who actively

seeks out his or her own training opportunities? That's another advantage Flynn has found with social media. He's always abreast of the training being offered by several different manufacturers.

Most recently, Flynn has been attending Taco Comfort Solutions' online training, which he learned about on Instagram. The company has presented training material in two live webinars.

Taco Tuesday is a weekly webinar hosted each Tuesday at 12 noon EST. The webinar alternates between residential and commercial topics. John Barba and Dave Holdorf host the residential courses while Rich Medeiros and Brett Zerba host the commercial sessions.

In addition, Taco After Dark is presented weekly by John Barba, Dave Holdorf and Rick Mayo. The content from these webinars comes from Taco's full-day hydronic courses, broken into one-hour segments and, as the name implies, is on Wednesdays at 7 p.m. EST. (Check the Taco website for the most up-to-date times and dates.)

"The webinars are great," Flynn says. "I've met and learned from the hosts in the past. Dave Holdorf and John Barba are super smart and really funny."

A recent Taco After Dark topic was whether to zone with circulators or zone valves, a topic that Flynn was very interested in.

"My takeaway was that using valves or circulators is an entirely personal preference," Flynn adds. "There are slight advantages in certain situations, like price point

and redundancy, but it really comes back to sizing your circulator correctly for the demand. If you do that, the system will never be over- or under-pumped regardless of whether zone circulators or valves are used."

More often than not, Service Professionals uses valves to zone residential projects. Flynn speculates they do so only because that's the way they've always done it. But it wasn't long ago that Flynn had the opportunity to install a lot of pumps in a single residence.

The Palace

"We arrived at a large residence in Upper Saddle River, New Jersey, to find a huge 20-year-old cast-iron, 12-section boiler, a 100-gallon gas-fired water heater and 11 zones of baseboard, radiant, convectors and hydro coils, none of which were working properly," Flynn explains.

Plus, the piping left a lot to be desired. The owner only had three requests: replace it all, make it work and zone the house with circulators. That's exactly what the Service Professional crew did.

"You can argue all day about whether zone valves or zone circulators are better, but I think everyone will agree that you have to pick one or the other for a single zone," said Flynn with a chuckle. "The zones on this system had zone valves downstream of the zone circulators. As you'd expect, the homeowner had all sorts of problems."

Over the course of a week, the system was torn out and replaced,

this time with two, 200 MBH condensing NTI boilers and an 80-gallon indirect tank. Primary-secondary piping is facilitated with a large hydro separator.

"We installed a Taco 007e ECM circulator on eight of the zones, with a pair of 0011s on the remaining two zones," Flynn adds. "The 007e dependable, readily available, and efficient. We install hundreds of them every year. The boiler circs are 0013s."

Venting the job was the only challenge, given the mechanical room's location in the middle of the beautifully finished basement. The joist bays ran the correct direction for combustion air and venting, but they would have terminated outside under a hardscaped stairway, so Service Professionals used the two existing chimneys that served the boiler and water heater.

"We ran both boiler exhaust vents through the existing boiler chimney with Centrotherm flexible poly vent lines," Flynn explains. "The smaller chimney only allowed us to run one of the intake vents. The second boiler draws combustion air from the big mechanical room, and the owner leaves the mechanical room open. He likes to show the room off to his engineer buddies. He calls it 'The Palace,' and he's really proud of it."

When asked about the fuel savings provided by the retrofit, the owner admits that he doesn't pay attention to his fuel bills. It's safe to assume, though, that the reduction in natural gas consumption is substantial.

The job was gratifying for Flynn. He designed the system himself and headed up the install. And like many of his other mechanical rooms, the system is now immortalized on his Instagram account.

"Half of the work I do is hydronic, and half of that is steam," Flynn says. "Last year we were installing four boilers each week. This year, for obvious reasons, we're installing fewer. But I'm keeping an eye on social media to see what others are doing as we emerge from the slow-down caused by COVID-19. Instagram is one way I can keep a pulse on things nationwide, and I'm hoping to see an uptick in boiler sales soon." ●

Dan Vastyen owns Delta C, LLC, a small communications firm focused on the plumbing, HVAC and energy industries. He can be reached at danv@deltac.biz.



Unlike many hydronic installations Service Professionals does, "The Palace" features a large bank of zone circulators.

Pilot-Operated PRVs: A 10-Step Checklist

How to prevent problems that could compromise a plumbing system's efficiency or lifespan.

BY MATTHEW SIRES

Inspecting a pressure-reducing valve is an inherent part of building maintenance, whether it is a newly purchased property or there is a need to identify and diagnose the source of a plumbing problem. From residential complexes to modern workplaces to industrial premises, any plumbing network will employ a wide range of water pressure-reducing valves. And like all mechanical components, these valves are bound to suffer wear and tear over time, even with normal usage.

This is why experienced building maintenance teams insist on regularly inspecting and servicing the PRVs to prevent any problems that could compromise the energy efficiency of a plumbing system, or threaten the lifespan of plumbing fixtures, connections and other parts/components that form the larger hydraulic system.

However, something as vital as a water pressure regulator needs a more coherent approach when inspected; keeping a checklist

handy makes this job a lot easier. This includes the following 10 parameters:

1. Check trapped air

Finding trapped air within the reducing valve, particularly within the cover chamber of the main valve and the pilot system, is a common problem. Failure to properly bleed air can result in unpredictable performance of a pilot-operated PRV. If equipped with a position indicator, water may be visible within the sight glass, but not all PRVs include a position indicator with a sight glass.

In some water pressure-regulator systems, a pipe plug is at the top center of the main valve's cover, which can be used to bleed the air from the highest point of the valve, where air may gather. At initial start-up and after servicing, or any other time when you suspect, you may have air trapped in the valve. Trapped air needs to be vented immediately. Not doing so means the readings of the pilot can be

inaccurate and the pressure may fluctuate.

Trapped air also should be bled from the pilot assembly fittings at the highest point of the pilot assembly tubing. Venting the trapped air is not difficult. This can be easily done by slightly loosening the flare fittings and pipe plugs as needed to help ensure all air is bled from the valve. While loosening any fitting, remember that you don't need to loosen all the way — just enough so that the air trapped inside can escape.

Air will be dispelled from the valve as a milky white mixture of air and water. To ensure all air is properly bled from the valve, simply allow the water to bleed out of the valve or fittings until the water runs clear. In some cases, the valve and pilot

Failure to properly bleed air can result in unpredictable performance of a pilot-operated PRV.



A pressure-reducing station. Photo credit: American Water Works Association

system may need to be bled more than once.

2. Check strainer screen

The strainer is likely to get plugged with debris, particles, or calcification over time. This is a common cause of water pressure-reducing valves malfunctioning. Dirt and debris inside a PRV can cause a failure to properly reduce the system pressure, and a fouled or blocked strainer screen may result in an excessive drop in pressure as flow occurs. If this happens, you may need to take a closer look at the strainer screen; any restrictions could cause the valve to malfunction.

Most plumbing experts recommend removing the blow-down plug that allows the water to flow, clearing trapped dirt and debris from the strainer and system. If this does not get the job done, you might need to remove the strainer screen to clean it properly.

This type of cleaning maintenance might be a regular need in some PRVs or PRV pilot systems. It is common to find plumbers doing away with the blow-down plug and inserting a standard, nipple-ball valve to make the entire cleaning process quicker.

3. Check pilot system

The pilot system of a reducing valve is subject to the same pressure found in the water supply lines. While the pilot system is supposed to last for years, it can be susceptible to corrosion or obstruction. Any leakage from the pilot system can compromise the performance of the valve, disrupting its ability to maintain the targeted system pressure. The pilot system also can be subject to abuse by lesser experienced repairmen who might step or place heavy tools on them, which can eventually cause damage.

When checking the pilot system, ensure you perform a thorough visual inspection. Though tight fittings are necessary, over-tightening the flare fittings might eventually cause cracking. Even the slightest drip could impact performance and should be addressed right away.

Pilot assemblies need to work in conjunction with the main valve, so check both when performing troubleshooting. To ensure that the

main valve works in conjunction with the pilot PRV, there may be a colored orifice fitting installed in the pilot assembly, which is critical to function.

If removed or replaced, the PRV may no longer perform as intended. The pressure setting of the pilot PRV controls the main valve, which trails the pilot PRV but does not sense the system pressure on its own.

4. Check choked fittings

Even with the strainer being clean, there is no assurance the pilot line will be clear. A typical reducing valve pilot will invariably have small orifices. These restriction fittings are common to most types of pilot-operated PRV configurations and, over a period, they can develop blockage or corrode, no longer providing accurate flow restriction.

This is particularly applicable for areas with high mineral content in the water or hard water supply. There is a chance of some solids blocking these fine cavities as well. While this definitely finds a place on the PRV maintenance checklist, you should also be ready for the chance that the fitting might need to be taken out and cleaned comprehensively or even replaced.

5. Check diaphragms

Diaphragms of the main pressure-reducing valve are meant to last for many years and don't need regular inspection. However, if problems with the water pressure regulator are not diagnosed in time, there is a chance the diaphragm might be suffering from scale buildup or hard water sediment.

Also, if the plumbing system and the pressure-reducing valve have aged beyond their expected lifespan, the diaphragm could be worn-out. A failed diaphragm typically prevents the PRV from functioning and allows the system pressure to creep up above the set point, matching the inlet pressure.

There are different ways to check the diaphragm, but it is recommended to target the pilot PRV first to ensure no leaks occur in the smaller, easy-to-access valve. This is made easier by having isolation ball valves that allow for simplified troubleshooting steps and help determine the location of a leak path (main valve or pilot PRV), if one exists.

As buildings are getting smarter, the push is for better, more intuitive plumbing systems that make it easier to track the performance and overall condition of vital components

If you notice a drip is present near the pilot PRV, even after repeatedly wiping the surface, the pilot diaphragm could be malfunctioning. Usually, such problems need timely repairs or replacement.

6. Check valve pressure setting

One of the most recurring needs for a healthy plumbing system is to monitor its pressure. Any indication of a system pressure above the desired set pressure may indicate a leak or a failing component. You should check the pressure gauge frequently; make all adjustments slowly as it takes a few minutes for the altered pressure setting to kick-in.

Most reducing valves include an adjustment bolt that makes for simple adjustment of the valves closing (sealing) or set pressure. You can use a standard socket wrench or adjustable wrench to adjust the pilot PRV. Turning the adjustment bolt clockwise will increase the set pressure.

It is important to set pilot-operated PRVs under the flowing condition. For a more accurate setting, flow as much water as possible, at least meeting the minimum continuous flow rate recommended by the manufacturer. If you find it difficult to get an accurate reading of the adjusted pressure, ensure someone else is watching the meter to check for flow; a valve set under the static condition may not accurately represent the system pressure once flow occurs.

7. Design out cavitation problems

Cavitation is a notorious problem in the pressure-reducing valve industry; it can severely reduce the working life of any valve. However, when a PRV system is designed

properly, it is relatively simple to avoid damage from cavitation.

Most types of pressure-control valves can experience cavitation. This occurs when reducing a very high inlet pressure to a much lower outlet pressure quickly; i.e., one valve performing this task. In applications requiring a steep drop in pressure, it is wise to install two PRVs in series (back to back) to reduce the pressure in two stages. Consult the valve manufacturer for more information on allowable pressure reduction ranges.

Cavitation manifests as bubbles caused by the transition from high pressures to low pressure phases; then those bubbles suddenly collapse. This phenomenon may result in premature wear and potentially sudden failure of the valve body. Many pressure-regulating valve applications may never see these types of extreme pressure reductions, but it is important to design the PRV system properly to prevent cavitation from occurring and to be aware of this potential cause of failure for all applications.

When checking for this problem, keep a close watch on the noise and vibration level of the valve and the piping system, which could be symptoms of a PRV with an extreme pressure drop or a low flow situation. If this is a recurring problem, you might want to consider installing multiple PRVs to reduce the pressure in stages.

When a PRV system is designed properly, it is relatively simple to avoid damage from cavitation.

8. Design out low-flow chatter and noise

One common mistake when designing a PRV station or sizing a pilot-operated pressure reducing valve is improperly sizing the valve based on piping size, and not taking into consideration the flow rates of the system. Pilot-operated PRVs are capable of meeting high flow demands but may not operate as smoothly at lower flow rates. This is the reason why it is so important to consider the minimum continuous flow rate of a PRV, as well as the maximum.

At low flow rates, when using a large valve, a PRV may open and close rapidly to meet demand, which can cause noise, shaking and significant pressure fluctuations. When you need to cover low-flow rates, as well as the high-flow rates, where these pilot-operated PRVs excel, it may be important to consider using a low-flow bypass (parallel branch with a secondary, smaller than main-line PRV) to handle low flow rates.

In some cases, a third valve may be required to safely and properly handle intermediate flow rates through a mid-sized valve. For more information on sizing or designing pressure reducing stations, contact the valve manufacturer for guidance or review.

9. Check servicing history

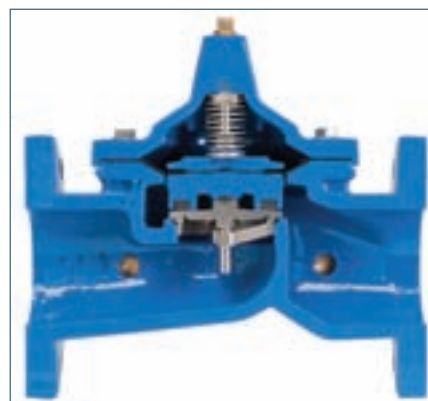
The service and repair history can vary across every plumbing environment. Regular servicing plays a major role in upholding a pressure-reducing valve's utility and makes an impact on decisions such as frequency of maintenance, inspection and replacing the valve or its components. This is why documenting the service history, as well as keeping accurate records of inspections and repairs performed, is so vital.

A basic visual inspection also includes evaluating the condition of seal washers and O-rings. Any broken or missing seals should be replaced. Always remember to perform a thorough visual inspection of sealing components and the mating parts or surfaces that they seal against.

Another visual clue to look for includes corrosion — this could mean the valve has not been regularly serviced or the water chemistry in the system could cause premature failure to seal. If this occurs, maintenance and repairs should be performed more frequently.

10. Check valve life, replacement need

Testing pressure-reducing valves for their natural end-of-lifecycle and replacement of parts is an important task in any plumbing system. While many valves might function for decades without needing a replacement, you cannot take chances of pressure exceeding its



Cutaway of Zurn's ZW209R pressure-reducing valve. Photo credit: Zurn industries

safety threshold due to a failure or obstruction within the PRV.

Every time the valve seals, it should close tight and prevent excessive pressure above the valve's setting. This is why checking the system pressure after flow stops is a good practice. This may indicate that a PRV reached its set point and attempted to close, but was unable to achieve a drip-tight seal.

Due to constant use or lack of regular maintenance checks, a reducing valve might struggle to maintain its set point. When a reducing valve fails to maintain a set pressure consistently, it is a good time to inspect, repair or replace the valve to avoid repeated site visits and incurring repair expenses.

As buildings are getting smarter, the push is for better, more intuitive plumbing systems that make it easier to track the performance and overall condition of vital components such as water pressure regulators. Zurn has taken the lead in this domain, creating a Connected Plumbing ecosystem (www.zurn.com/innovation-efficiency/plumbsmart) where critical plumbing components increasingly require constant monitoring.

System pressures, for example, can now be monitored by using a connected (wireless) pressure sensor to help watch monitor plumbing system pressures and even send alerts in the event of a dangerously high pressure. Constant tracking for deviation from the designed performance of plumbing products ensures the plumbing network remains in optimal working condition without the threat of emergency repairs, breakdowns and downtime. ●

Matthew Sires is an application engineer at Zurn Industries.



Reliance Worldwide Corp. HydroFlame 300 Series Silicone Firestop Sealant

After the successful introduction of the first iteration of HoldRite firestop sealants in 2019, Reliance Worldwide Corp. (RWC) is now offering an even more robust solution with the launch of the HydroFlame 300 self-leveling (HF300SL) and HydroFlame 300 caulk-grade (HF300CG) silicone firestop sealants. First introduced in June 2020, the HF300SL and HF300CG are moisture-resistant silicone fire sealants designed for areas subjected to high levels of moisture or when UL listed W ratings are required. As quick curing silicone sealants, they can also be used across a variety of pipe types. The self-leveling HF300SL is designed for floor applications, while the HF300CG is a caulk-grade sealant designed for use on both floor and wall penetrations. www.rwc.com

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Flomatic Model 80DIVFD Check Valves

Flomatic has announced the expansion of their American Iron and Steel (AIS) complaint Model 80DIVFD submersible pump check valve in a new 10-inch size. The company's new, special-patented submersible pump check valve is now available in an extended size range from 1 inch to 10 inches for use with variable-frequency drive (VFD) control submersible pumps or conventional systems. The unique Model 80DIVFD valve is designed to minimize flow losses and hydraulic shocks in the submersible pumping system. It features a standard epoxy coated (ANSI/NSF 61 approved powder) ductile iron body to support deep set pumps. An exclusive patented stainless-steel guided poppet system ensures that the valve automatically adjusts noiselessly from high to very low flow rates. www.flomatic.com



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VIEWPOINT

Continued from page 130.

Officials switched to chlorine permanently at the Quincy treatment plant in November 2015.

The Virginia Tech report, funded by the state of Illinois, specifically notes there were no state or federal violations when water treatment officials made the switch even though the concentration of disinfectant plummeted as a result.

"It is completely normal for utilities to do what they did," Rhoads said. "It really points out this gap in our regulatory structure that we can have these major changes at the water treatment facility, and not require any additional monitoring or communication with the community."

Since then, state officials have also put \$230 million towards a new facility with proper plumbing at the Illinois Veteran's Home to prevent the disease.

The report does suggest that anytime changes are made in water treatment of distribution system operation, increased monitoring of water samples needs to be implemented, along with monitoring for legionella, increased flushing and better communication between utilities and their customers. ●

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Municipal Water Treatment and a Legionnaires' Outbreak

BY STEVE SMITH, EDITOR



A St. Louis public radio station aired an interesting report on a Legionnaires' disease outbreak that killed 12 people and afflicted 58 others five years ago at the Illinois Veterans Home in Quincy, Illinois.

Although most of the cases were residents of the state-run retirement facility, four Quincy citizens with no known connection to the home also contracted the disease that same summer.

Virginia Tech researchers – an institute well known for its work investigating the Flint Water Crisis – spent the past year looking into the mystery and concluded the town made changes to its water treatment processes that created favorable conditions for legionella bacteria growth.

Seven months before the outbreak, the Quincy water treatment plant temporarily switched its disinfectant from chlorine to chloramine, a less potent but more stable substance.

Within a month, however, the concentration of disinfectant

in city water dropped in half to what it had been in the same period the previous year.

Compounding the issue, a record storm also hit Quincy that flooded the town's water system with storm and runoff just weeks prior to the August 2015 outbreak at the Illinois Veteran's Home.

"As it rained, the flow rate of the Mississippi River increased and suspended a whole bunch of gunk into the water," researcher William Rhoads told the radio station, adding that previous research has shown a spike in Legionnaires' cases after severe rainfall events. "It really makes the water more difficult to treat."

In fact, when Rhoads began his research he found that there was no disinfectant present in the initial tap water samples collected from the home following the outbreak.

According to the news report, these "sudden and major changes" in water quality along with a combination of documented problems with the Illinois Veterans Home's plumbing system, were probably "the last straw that pushed the facility over the edge."

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