



THE PIPELINE

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through Innovation and Technology

VISITORS TO THE PLUMBING MUSEUM can see examples of the ways that plumbers have plied their trade through the years. Exhibits of chamber pots, high tank water closets, and antique water heaters show how the industry has progressed and evolved. The state of the art in any field is a moving target, but the pace of innovation in the plumbing industry has really revved up lately.

It's partly driven by technology, such as the digital tools that plumbers now use to manage information and perform work in the field—tasks that used to be (and in many cases, still are) accomplished by hand. It's also driven by changing needs, such as the energy- and water-saving systems needed for today's green-focused construction projects. Customers want

contractors who can perform the work faster, smarter, and with a keen eye on the budget.

The Plumbers Local 12 Training Center is riding the wave of innovation. Classrooms, computer labs, workstations, and plumbing system models are abuzz with activity as apprentices, and journeymen participating in continuing education classes, learn the latest techniques and advances.

PHCC of Greater Boston represents dozens of skilled contracting companies. Several of the largest firms, such as E.M. Duggan, J.C. Cannistraro, and American Plumbing and Heating, are among those investing in cutting-edge technology. They exemplify the progressive attitude that today's shops need to stay relevant and competitive.

So-Called "Right to Work" — Could It Happen Here?

Indiana and Michigan passed "right to work" laws in 2012, and the politically charged developments have stirred anxiety. Along with the Wisconsin legislation enacted in 2011 that curbed the collective bargaining rights of most of the state's government employees, does the passage of the "right to work" laws signal a larger shift in attitude towards unions across the nation? And if there is anti-union sentiment brewing, might it gain traction in Massachusetts?

It is a complex issue, but the simple answer, according to Frank Callahan, president of the Massachusetts Building Trades Council, is no. "I'll never say never," he says. "But we have a unique labor movement in the state. It is strong and broad based." Strong enough, he contends, to withstand the forces that wreaked havoc with labor laws in the Midwest states. Callahan

E.M. Duggan: 122 Years Young

If the mantra, "innovate or die," has merit, E.M. Duggan of Canton is a beacon of innovation and endurance. Established in 1891, it has reinvented itself

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PREFABRICATION, such as this truckload of units assembled at American Plumbing and Heating, has revolutionized the industry.

"Technology for technology's sake is not necessarily a guarantee for success. It needs to promote collaboration and provide benefits."

-John Cannistraro
See cover story



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Helping Members Do the Right Thing—and Saving Money

With Obamacare in the national spotlight and health-care expenses chipping away ever-larger chunks of our household budgets, there's been much talk about ways to rein in spiraling medical costs. It's a complex issue with many variables and challenges. But Plumbers Local 12 has found a relatively simple way to lower the claims costs for its health plan—and save some of its members out-of-pocket expenses to boot. Best of all, the Diabetes Care Rewards Program it recently launched is helping members better manage their disease and enjoy improved health.

Who likes going to the doctor? Or taking cumbersome medication? If you answered, “just about nobody,” you understand why diabetes can be such a tricky disease to get under control. Nationally, about 6% of diabetics regularly monitor their blood levels, take insulin, visit their physicians, and do all of the other things they are supposed to do. That means that 94% of them are at some level of increased risk for developing diabetes-related complications.

“People know how to manage diabetes, but it is difficult,” says Sean Follick, director of sales for Abacus Employer Health Solutions. There is a daily regimen to follow, many doctor appointments, and other responsibilities that take time and effort. “What

we often hear is that life gets in the way,” he adds.

Based at Brown University, the organization uses behavioral psychology to help develop programs such as the Diabetes Care Rewards initiative it brought to Local 12. Put simply, the program gets members with diabetes to do what they know they should be doing—and even want to be doing—by bribing them.

It offers a deal to members who voluntarily sign up for the program: In exchange for man-

IT MAKES FISCAL SENSE FOR LOCAL 12 IN THE LONG RUN

aging their health, they receive all of their diabetes medications and supplies at no cost to them. That's an out-of-pocket savings of \$50 or more per month in co-pays. It is enough of an incentive to keep about 75% of participants in full compliance with their diabetes management schedule. That is a far cry from the 6% of the general population of diabetics who stick with their care program.

Although it requires up-front costs to launch and ongoing costs to maintain, including footing the co-pay bills, it makes fiscal sense for organizations such as Local 12 to adopt the diabetes program. That's because in the long run, it will save money—lots of it.

“Diabetics face lots of potential issues,” says Roger Gill, adminis-

trator of Local 12's Health and Welfare Fund, which is run jointly by the PHCC of Greater Boston and Local 12. If not properly managed, their disease can lead to hospitalizations, dialysis, and other costly medical claims.

Follick says that a member with diabetes will incur, on average, about \$12,000 per year in claims costs, a figure that is three of four times more than a member without the disease. A member with diabetes who is enrolled in the monitoring program will save an average of 75% in medical costs over someone who is not managing his disease.

To document that they are in compliance with the program and qualify for the waiver of their co-pays, participants and their medical care providers complete online forms and paperwork certifying that they are up-to-date with exams, tests, and other procedures. “If you want to be proactive in managing your health and help save the union money, you can share in the savings,” says Follick about the win-win nature of the program.

Abacus offers care management programs targeted to other diseases and issues including smoking cessation, cardiovascular disease, hypertension, and weight control. Gill says that Local 12 is considering adopting other wellness programs, but that the one for diabetics offered the biggest bang for the buck.

Local 12 and its contractors offer not only a comprehensive health plan, but also extensive continuing education, a full pension plan, and an annuity plan similar to a 401(k). “It is all part of our effort to train, retain, and keep healthy our Local 12 employees,” says Hugh Kelleher, the PHCC contractor representative who chairs the funds. “We invest in our workers, and in return we get quality results.”

Micro Units Maximize Plumbing

How small is too small? That is a question development authorities have been wrestling with as they balance the need for affordable housing in urban areas against reasonable minimum living standards and building regulations.

Joining a nationwide trend, Boston has permitted construction of about 195 “micro” apartments, some as small as 355 square feet, in the South Boston Innovation District. While they will be considerably smaller than the city's current minimum of 450 square feet, other municipalities, such as San Francisco and New York City, are considering units as small as 220 square feet.

An intriguing consequence of the drive to reduce the size of living spaces is that the buildings potentially contain more work for plumbing and mechanical contractors. Micro-housing buildings often include shared amenities such as kitchens, dining areas, and meeting rooms. But employing clever design that makes use—sometimes multiple uses—of every available square inch, each unit typically includes its own bathroom, kitchenette, and temperature controls. That means that owners must bear extra initial costs to develop micro-unit buildings since there are more kitchens, bathrooms, heating and cooling units, and plumbing (as well as walls, doors, and other components) per square foot than conventional apartment complexes. And that means more work for plumbers.

While the concept is sound (ideally, smaller spaces would translate to lower rents in high-demand/low-capacity areas), it remains to be seen whether the trend will take off. If it does, it might mean a windfall (or at least a micro windfall) for plumbers.

“Right to Work” Legislation Unlikely for Massachusetts

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doesn't believe, however, that unions in Massachusetts are facing any similar, imminent threat.

What is “Right to Work?”

The name itself, “right to work,” would seem to be a clever (devious?) ploy on the part of those who are pushing for it to deflect attention from what is really at stake, raise confusion, and gain support. Who, after all, would be against the right to work?

The legislation actually refers to a provision that allows workers to opt out of joining unions that represent organized companies. It has the effect of choking off dues and undermining unions. Ironically, a union is required to act on behalf of all workers at an organized company, whether they are dues-paying members or not. Free riders, those who choose not to join, still share in the union's efforts to negotiate wages, hours, working conditions, benefits, and everything else that members receive. But operating from a weakened position, unions in “right to work” states are less able to advocate for any workers. That's why labor leaders more accurately refer to the law as “the right to work for less.”

On the face of it, “right to work” sounds vaguely democratic. But Callahan argues, “What if people who voted for Mitt Romney decided that since Obama won, they no longer want to pay their taxes?” Using the benign term “right to work” and positioning it as giving more choice to workers may be a smart public relations move, but Callahan says the real motive is to attack collective bargaining and wear down unions.

The Smart ALECs Behind “Right to Work”

The anti-union effort, according to labor leaders, is largely being driven by the American Legislative Exchange Council, a conservative quasi-lobbying organization focused on influencing state legis-

lators to craft laws that benefit major corporations and other big-business interests. While it masquerades as a grassroots organization, ALEC is primarily funded by corporations and the usual right-wing, deep-pocketed, influence-peddling suspects such as the Koch family.

It may seem implausible that Michigan, home of the U.S. auto industry and a union stronghold, would enact a “right-to-work” law. But the bill that led to it sidestepped the petition ballot initiative process and was passed by a lame-duck session of Republican-led legislators. A recent poll indicated that 51 percent of

Menino Focuses on Buildings' Energy Efficiency

AS PART OF A LARGER CAMPAIGN to reduce greenhouse gas emissions in the city of Boston, Mayor Thomas M. Menino has filed a proposed ordinance that would require commercial building owners to report annual energy and water use. Certain buildings would also need to perform periodic energy audits and determine options to improve their energy efficiency.

While the proposal stops short of requiring building owners to make improvements, it would serve to shine a very public spotlight on energy and water use in the city. The annual reports, which would be posted online, would provide a scorecard for watchdogs to gauge whether buildings are making progress over time as well as how they compare to one another and against Environmental Protection Agency-backed Energy Star standards.

“In order for Boston to continue to be a sustainability leader, our buildings must aggressively invest in energy efficiency,” Menino said in a statement that accompanied the filing of his Building Energy Reporting and Disclosure Ordinance. “Through measure-

Michigan voters oppose the law, while 41 percent support it. The popularity of the state's Republican governor, Rick Snyder, has fallen dramatically since the measure passed. And voters elected five new Democrats to the state Senate in the November 2012 elections—senators who would have blocked “right-to-work” from becoming law had they been in office.

The “right-to-work” issue has less of a direct impact on building trades because of the unique nature of the construction industry. In most jobs, a worker is first hired as an employee and then joins the union. In the pre-hire

ment and transparency the ordinance will encourage cost effective building investments in energy and water efficiency that will improve building performance.”

While some building owners have raised opposition to the proposal, proponents point out that monitoring energy usage and, especially, making energy efficiency improvements could reduce owners' operating costs and save them money over the long run.

Green best practices, such as water reclamation systems, solar hot water, and low-flow fixtures are typically incorporated into the designs for new buildings. The law could provide additional work for plumbing contractors if there was greater demand to retrofit existing buildings with energy efficient systems and fixtures.

Setting an example, Menino says that the city will participate in the program by posting energy use for all municipal buildings by the end of 2013. According to the proposed ordinance, commercial and apartment buildings over 50,000 square feet would be required to start reporting in 2014. Smaller buildings would be phased in after that.

arrangement of the building trades, a worker joins the union first and is then hired by an employer. While the relationship with the union remains constant, a member often works with multiple employers throughout his or her career. Still, when the larger labor movement is weakened, it adversely affects the union building trades.

Cause for Concern

“Right to work” may not be coming to Massachusetts any time soon. But its successful passage in Indiana and Michigan is a cause for concern to working families. The construction industry was hit particularly hard during the recent economic downturn. While it is improving, there is still financial uncertainty. And the stunning lack of political will to compromise and take action in Washington D.C. and in the states is unsettling.

Now, perhaps more than ever, strong unions are needed to help maintain level playing fields. Yet, tactics like “right to work” make already difficult labor laws even thornier to navigate.



COMMERCIAL OFFICE BUILDING OWNERS would be required to report energy use under a proposed Boston ordinance.



THE GOAL OF THE PROGRAM is to get members who are diabetics to regularly monitor and treat their disease.



Three of the Region's Largest Contractors Embrace Innovation and Technology

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many times over and has diversified and grown to become one of New England's premier mechanical contractors. Over the past three years, as many firms struggled through the recession and one of the most challenging downturns ever in the construction industry, Duggan engaged in yet another transition by reinvesting in new technology and processes.

"We knew there would be a turnaround," says Len Monfredo, executive vice president of operations. "And we wanted to be prepared to take advantage of it. Now, we are well positioned."

Starting with its information management systems, Duggan conducted a top-to-bottom makeover of its computer network and upgraded all of its servers. It also looked at ways to improve how its employees were accessing information and interacting with clients and one another.

All project managers and foremen, for example, now have company-issued iPhones with which they can take and share photos and videos to more effectively demonstrate the work that is progressing in the field. "It is so much easier to explain things visually with the help of the iPhone," says Monfredo. "It has transformed the ways we communicate. The feedback is instantaneous."

About two years ago, Duggan added three Trimble stations, digital devices that incorporate GPS, laser, optical, and other technologies to automate construction layout design. The machines generate "Trimble points" to quickly identify coring holes and hanger locations. They were costly and also represented a considerable investment in time to learn how

to operate. But it is an investment that Monfredo says has paid dividends.

As part of the impressive makeover plan it has been orchestrating over the past couple of years, Duggan also purchased a new building adjacent to its existing headquarters to house an expanded pre-fabrication plant. Employees now work in the 36,000-square-foot facility cranking out pipefitting, sprinkler, and plumbing assemblies ready to deploy into place at project sites. The new building and the original one are connected to one another via fiber optics so that the computer and phone systems integrate seamlessly and operate as if they are under one roof.

American Plumbing and Heating Practices What It Preaches

Dating back to 1985, American Plumbing and Heating of Norwell has become a major player in the piping business very quickly. But to Joe Clancy, founder and president, it's a third-generation business, since both his father and grandfather operated shops. Asked what his grandfather might have thought of the Trimble and other new-age technology that American now routinely uses, Clancy deadpans, "It was a pipe dream back then—pun intended."

His grandfather was still wiping joints, which was the state of the art in those days. Clancy says that plumbers back then would marvel at innovations such as the ProPress fittings that connect copper pipes without solder or a torch. But his grandfather might have to scrape his jaw off of the ground if he were able to see American's 30,000-square-foot fabrication facility.

The modern plant, which the company opened in 2006, has all the latest equipment and is optimized for maximum efficiency so that employees can design systems, generate CAD drawings, and fabricate on site. Clancy estimates that the shop is pre-building 80% of all American jobs.

The contractor was among the first in the region to adopt the pre-fab concept and began manufacturing assembled units about 15 years ago in a smaller space. Taking the leap by trying new initiatives such as in-house fabrication is one of the hallmarks of a successful contractor and has helped American grow and prosper. It has also helped it tackle large projects and gain a foothold in critical regional markets such as biotech, pharmaceutical, and research.

The pre-fab shop has another less-obvious benefit. By assembling most systems in the tightly controlled environment and by closely managing its supply chain of materials, Dan Bent, vice president, estimates that American is able to eliminate 98% of the waste compared to fabricating at job sites. That saves the company money, but it also reflects its commitment to green policies and practices.

Any pre-fab waste that is generated is recycled. All of the lights throughout its offices, warehouse, and shop operate via motion detectors. The company switched all of its fixtures to water-saving units. The roof of its building includes solar panels, which enable American to generate 110% of its electricity. (It sells the surplus back to the utility.) "All of these efforts help to showcase that we really are a green company," says Bent. In fact, American itself is LEED certified.

Nearly every new construction project now includes specifications to reuse water in some way and reduce water and energy usage. Awareness of sustainability, using re-



HIGH TECH IN THE FIELD. A plumber uses a Total Station Layout Trimble GPS device on a Cannistraro project.

sources more efficiently, and other green issues is at an all-time high. Bent believes that by "walking the walk, we demonstrate that we practice what we preach." And it demonstrates that American is indeed an innovative leader.

The Old Meets the New at J.C. Cannistraro

It's only a few steps from The Plumbing Museum, located in a 19th-century former icehouse on the campus of J.C. Cannistraro in Watertown, to the contractor's pre-fabrication shop. But it is a huge leap from the exhibits of quaint fixtures and old tools to the prefab shop. There you will find racks of assembled plumbing units, manufactured in house with precise accuracy from computer-aided design drawings, and ready to be delivered to job sites for quick installation.

John Cannistraro, Jr., president, traces the company's prefab roots back to 1989 when his father and company founder, John Cannistraro, Sr., was running the firm. One of its foremen, Hank Fandel, began designing templates out of plywood and colored markers. When the innovation proved successful, Cannistraro built a dedicated one-bay pre-fab shop and later expanded it to a two-bay facility. After the company landed the massive Gillette Stadium project in 2000, it purchased an additional building to create a 30,000-square-foot shop. Cannistraro says that outfitting the home of the Patriots required 3,000 plumbing fixtures, the piping for which was fabricated in advance.

Another major development that enabled the company to prosper and tackle enormous jobs started on a whim. In the late 1990s, one of

Cannistraro's engineers was moonlighting as a video game developer and suggested that the 3D computer-generated imagery used in that industry might have applications in the design of mechanical systems. The company embraced the concept and helped pioneer building information modeling, which is now required industry-wide on most projects. Used in tandem with pre-fabrication, BIM has helped revolutionize the plumbing and piping trades.

More recently, the firm has also embraced social media and extensively uses online tools, such as LinkedIn, Twitter, Flickr, and a blog, to drive its external communications and marketing. "It's important to get our culture and our brand out there," Cannistraro says. While it takes a lot of time and effort, he feels that it is critical and helps the company thrive. "It's amazing how quickly information becomes obsolete. By constantly updating online, we can stay of-the-moment."

The commitment to social media, along with the adoption of computer modeling, pre-fab, and other innovations requires a leap of faith and a dedication to innovation and reinvention. Cannistraro, who has studied at Harvard Business School, understands that not all efforts at innovation will succeed. Change comes with the cost of investing not only in technology, but also in staff training. "Short term, it may not be the most cost-effective way of doing business," he says. "But long term, it is what helps promote the sustainability and success of our firm."

So, what might be next for the forward-thinking company, which is celebrating its 50th anniversary? Cannistraro thinks practical applications for 3D goggles might be closer than we think. The devices could be used to pre-visualize mechanical systems and allow contractors to virtually walk through jobs before any concrete has been poured.

On a less futuristic level, he also believes that innovations such as electronic dashboards, which allow a contractor to compile and track all data for projects in one convenient computer program, will not only promote efficiency and communication within the company, but help it work together with owners and other trades. "Thanks to technology, we are heading to 100% collaboration

and 100% transparency," Cannistraro says. "And that's a good thing."

An Industry Experiencing Big Changes

All plumbing companies are being forced to adapt to innovation. In the same way that the original lead joints on bell-and-spigot cast iron pipe gave way to no-hub piping in the 1970s, we now see the digital revolution and prefab changing the way companies do business. In the future, trends such as automated welding and extensive digital coordination will become much more common. It's a safe bet that companies such as American, Cannistraro, and Duggan will be among the first to give the latest innovations a try. It's also a safe bet that they won't lose sight of the practices that have guided them to success through the years.

"Technology for technology's sake is not necessarily a guarantee for success. It needs to provide benefits and promote collaboration," says Cannistraro. The latest and greatest fad may change every few years, but there are constants that never go out of style. One of the biggest benefits of adopting technology, he adds, is that it helps attract young people to the firm, who in turn bring fresh ideas. It's a cycle of innovation. "We place an emphasis on human capital. It's our people who truly make the difference."

Duggan's Monfredo agrees. "Even more important than any technology we've adopted, is the great team of highly talented people we've put together. That is our biggest asset."



IT MAY HAVE A CLASSIC, ALMOST RETRO LOOK, but E.M. Duggan used a lot of modern-day technology when it worked on the Liberty Hotel in Boston.



THE FABRICATION SHOP at American Plumbing and Heating



AWARD WINNING. (L to R) Frank Callahan, president, The Construction Institute, Mary Vogel, executive director, TCI, Rick Carter, director, Local 12 Training Center, and Hugh Kelleher, vice president, TCI.

Training Coordinator Rick Carter Receives Award

THE CONSTRUCTION INSTITUTE

presented Rick Carter, the director of the PHCC of Greater Boston and Local 12 Training Center, with the 2012 Volpe-Eagan Construction Safety Award. The award dates back to 1970 and “honors significant achievements by men and women in advancing safety and health in the workplace,” according to Mary Vogel, the executive director of TCI.

As little as 15 years ago, safety glasses, gloves, and other protective gear were not mandatory at job sites. “The culture of safety has changed a lot over the past dozen years,” Carter says. “One of the primary goals of the training program is to teach apprentices how to work safely. I’m honored to get this award and to help promote safety.”

Carter joined Local 12 in 1993 as an apprentice and later became an instructor at the training center. Since assuming the directorship of the center in 2007, he has developed innovative programs such as onsite solar thermal water heating and rainwater reclamation systems for hands-on training. Exemplifying Carter’s commitment to safety, over 95% of Local 12 members have received OSHA 10 training under his leadership.

TCI represents building trade unions such as Local 12, union contractors, contractor associations, industry professionals, and skilled union crafts workers in Massachusetts. It helps advocate for and promote union construction through research, communication, and education.



ONE OF THE HANDS-ON CLASSES at the PHCC of Greater Boston and Local 12 Training Center, for which Rick Carter serves as director.

Airport Project Underway

Getting and returning a rental car at Logan Airport has been a disjointed and inefficient experience, but that will change when a new \$300 million Massachusetts’s Port Authority complex now under construction opens. Instead of the hodgepodge of in-airport and off-site locations, the new facility will consolidate all rental agencies under one roof. The four-level, 1.2-million-square-foot garage will include spaces for 3100 vehicles as well as a customer-service center, a service area to fuel and wash the cars, and a ground transportation area to accommodate limousines, taxis, and buses.

In addition to other efficiencies, the facility will allow the consolidation of rental car shuttle buses from more than 100 to a mere 28, thereby significantly reducing curb congestion. The shared buses will use alternative fuel.

Local 12 members working for PHCC of Greater Boston contractors, Commonwealth Plumbing Corp., J.F. Shine Mechanical, Inc., and P.J. Kennedy & Sons, Inc., are handling the mechanical and plumbing work for the rental car center. Preliminary occupancy is slated for late 2013, and construction is expected to be completed by September 2014.



A rendering of Logan’s car rental facility.

THE PIPELINE

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