

# SMART SOLUTIONS

WINTER 2018

Helping contractors save money and enhance productivity

## North Mechanical Cuts \$1 Million in Shared Costs by Using Trimble SysQue to Optimize Workflow

To speed the design and fabrication workflow for a customer's research facility build, **North Mechanical Contracting & Service** used **Trimble®** systems, saving an estimated \$1 million in costs and cutting by 400 percent the time that would have been needed for traditional materials take-off tasks. The project required North

Mechanical to generate material takeoffs and fabricate all mechanical and plumbing components for a laboratory building in south-side Indianapolis, IN. It represents the company's largest fabrication contract to date for one of the area's largest manufacturers.

continued on page 10



Using Trimble SysQue with Autodesk Revit, North Mechanical has eliminated the restocking fees and labor costs associated with conventional takeoff methods. They estimate the company is saving 400 percent of time compared with traditional materials takeoff tasks.

## Easy Installation, Reliable Service Lead Cannistraro to Name Jay R. Smith Mfg. Co. as Supplier of Choice

When **Cannistraro**, Boston's largest mechanical contractor, needed a drain system for their own new fabrication and manufacturing facility, they turned to **Jay R. Smith Mfg. Co.®** for a solution that was delivered on a just-in-time basis to avoid the need for storage and was easy to install quickly. The level of service Smith provided cemented Cannistraro's decision to name Smith their supplier of choice.

continued on page 12



Cannistraro installed 120' of Smith's Enviro-Flo II Trench Drain System in just one working day. The system was crated and shipped in batches to arrive in time for each of the four scheduled pours.

## WHAT'S INSIDE

CFI Mechanical, Carrier Work Together to Keep School on Schedule .....	3
Braconier Reins in Costs with Viega Products .....	5
Daikin Modular Central Plants Speed Installation .....	6
Circulating Air Speeds Installation with Uponor Radiant .....	20
Advance, Sloan Team To Increase Hygiene and Efficiency at Ballpark .....	21
Martin Associates, Victaulic Partner to Stay on Schedule .....	22



## SMART SOLUTIONS

Helping contractors save money  
and enhance productivity

*Smart Solutions* showcases new technologies and promotes cost-saving and productivity-enhancing applications available from members of MCAA's Manufacturer/Supplier Council. *Smart Solutions* is published biannually for contractor members of MCAA and its subsidiaries.

All information in this newsletter was supplied by members of MCAA's Manufacturer/Supplier Council. MCAA is not responsible for any claims made regarding products or services mentioned.

**Cynthia Buffington**  
Senior Executive Director

**Jan Grillo**  
Director, Membership

**Adrienne Breedlove**  
Director of Digital Media

**Dana Trevas**  
Consultant

1385 Piccard Drive  
Rockville, MD 20850-4340  
301-869-5800  
Fax 301-869-3520  
e-mail [cbuffington@mcaa.org](mailto:cbuffington@mcaa.org)  
[www.mcaa.org](http://www.mcaa.org)



## More Efficient Onsite, In the Office

As you look for products and processes to squeeze every ounce of efficiency out of your work—onsite, in your shop, and in your office—this issue of *Smart Solutions* highlights ways to improve productivity. Learn how contractors are combining technology solutions with prefabrication, like North Mechanical Contracting & Service, which used Trimble® systems to speed up design and fabrication workflow, cutting traditional materials takeoff time by 400 percent. Applying the ManufactOn cloud and mobile solution to organize and monitor shop work, TG Gallagher has increased and improved its prefabrication capacity.

Anything that saves installation time saves money. Circulating Air was amazed by how quickly and easily they could install Uponor's PEX tubing for a radiant heating and cooling system. Cannistraro workers put down 120' of Jay R. Smith Mfg. Co.® trench drain in just one day for their new manufacturing facility. Working closely with Carrier on a "just-in-time" delivery schedule helped CFI Mechanical save installation time and costs. Martin Associates combined Victaulic grooved mechanical solutions and Construction Piping Services to streamline its drawing and installation processes, reduce waste, and cut project costs. Opting for the easy Viega press approach cut installation time dramatically for Braconier Mechanical and Plumbing, bringing costs under control. Easy-to-install, pre-assembled Daikin Modular Central Plants were ideal for a data storage company that could not afford any downtime.

Others are beefing up efficiency by applying tech solutions to office management. Goshen Mechanical has accelerated cash flow and eliminated paperwork errors by adopting MobiliForms from iBusiness Technologies (a system that paid for itself in just two months). Using Connect, a data collection and analysis solution powered by KEY2ACT, Tozour Energy Systems is locating and even fixing customers' HVAC problems remotely, saving time and money. Instead of uploading and organizing photos from jobsites manually, the FotoIN mobile application automates the process, saving time and improving productivity.

For some clients, energy efficiency is paramount. Advance Mechanical was pleased to outfit Wrigley Field with sleek new Sloan Valve Company products, ensuring fans an efficient, hygienic visit to the restroom.

This issue also offers safety tips for maintaining wire ropes and slings from the experts at Lifting Gear Hire and advice from Service Trade on creating a premium customer service program. Visit our Supplier Partners at *MCAA18* to learn how they can help your company become more efficient.

Bill Tavenner, Chairman

MANUFACTURER / SUPPLIER COUNCIL

# MCAA

Adding Value to Your Supply Chain

# CFI Mechanical, Carrier Work Together to Keep School on Schedule

## *Carrier Equipment Expected to Deliver High Efficiency with Low Maintenance for Houston's Northside High School*

Close coordination with **Carrier** on a “just-in-time” delivery schedule is helping **CFI Mechanical** keep a Houston school renovation project on track while saving the contractor installation time and costs. By using Carrier HVAC systems, CFI mechanical is also meeting the school's energy-efficiency goals.

### *Growing Student Body*

The Houston Independent School District (ISD) is the largest school district in Texas, and the seventh largest in the United States. The population of Houston has increased significantly in recent years. In 2012, Houston voters approved a \$1.89-billion bond to repair or replace 44 schools, including Northside High School. Houston-based CFI Mechanical was selected to deliver a high-efficiency, low-maintenance HVAC system solution for Northside.

The approximately \$66-million renovation is extending the footprint of the original 1926 school building and its 1978 addition to provide much-needed space for 1,500 to 1,700 students in grades 9–12. In addition to its general education curriculum, the school provides a magnet program for culinary arts and hotel management. CFI Mechanical chose Carrier equipment to provide Northside High School with reliable and precise comfort for its students, faculty, and staff, with a minimum of time and effort invested by the school's maintenance staff. They also recognized that Carrier products would contribute to the Houston ISD's goal of building to LEED® standards.

### *Tried and True*

Given Houston's warm and humid climate, the HVAC system for

Northside must address temperature, humidity, and indoor air quality in every space within the facility. Houston ISD had previously chosen Carrier equipment for other projects, so district leaders were familiar with Carrier quality and reliability. When the HVAC system was being selected for the Northside High School expansion project, Carrier became the basis of design.

However, Carrier did not rest on their laurels. Ron Dausat, senior project manager at CFI Mechanical, said, “Carrier was very competitive at bid time.” CFI Mechanical has completed successful installations in diverse sectors of the private, public, and government markets. They recognize that each project is unique, so they perform a complete analysis of individual job conditions prior to installation.

With school fully in session, meeting the HVAC equipment delivery needs of the Northside High School project required a coordinated effort between Carrier and CFI Mechanical. As the full project will take approximately 18 months to complete, multiple releases and delivery of Carrier's equipment was essential. Precise just-in-time delivery of the necessary HVAC components to the project's lay-down areas facilitated CFI Mechanical's project schedule—saving the contractor both time and related installation costs. Required delivery times that range between 48 and 72 hours entail ongoing

communication between Carrier and CFI.

A Carrier AquaEdge® 23XRV screw chiller and AERO® 39MW and 39S series air handling units were specified to serve the main areas of the building, including a facility for the culinary arts students, along with several Comfort™ 24ACC air conditioning units to serve ancillary spaces not on the chilled water loop.

### *High Efficiency, Low Maintenance*

During the planning stages, project engineers visited Carrier's Green Done Easy event at their factory in Charlotte, NC, where they saw the Carrier 23XRV screw chiller



With a total timeline of 18 months for the Northside High School renovation, often while school is in session, CFI Mechanical is working closely with Carrier on a just-in-time delivery schedule, so HVAC components are sent to the project's lay-down areas at prescribed times, saving the contractor both time and related installation costs.



A CFI Mechanical technician installs a motor for a new air handling unit for Northside High School, one of several Carrier products selected to provide high-efficiency, low-maintenance cooling in warm, humid Houston—and to help the school qualify for LEED status.

in action and realized the benefits it would bring to the school. The Carrier AquaEdge 23XRV screw chiller is a high-efficiency, variable-speed, water-cooled chiller that uses non-ozone-depleting R-134a refrigerant. It provides integrated part-load values as low as 0.299 and is designed for both long-term reliability and minimal maintenance. The AERO 39MW air handling units offer variable frequency drives for excellent part-load efficiencies and include features such as double-wall casing for ease of cleaning.

To give the school's staff precise comfort control in real time, the new HVAC system at Northside High School will have digital controls to integrate all its new and legacy HVAC equipment components. Rusty Bell,

project manager at CFI Mechanical, said, "The BACnet® controls will enable us to integrate both the new and existing HVAC equipment into one network that we can optimize for efficiency. The digital controls will also make it easier to expand the system in the future if that becomes necessary."

### *Back to School in 2018*

Fortunately, Northside High School was not damaged by Hurricane Harvey when it struck Houston in August of 2017, and construction is on schedule. "We're piping up the chiller right now and will be phasing in the new equipment with the existing system," said Bell.

The Northside High School project represents the successful combination of a quality-oriented contractor and Carrier products. CFI Mechanical's demand for high quality in all phases of their operation, coupled with ongoing communication and coordination with Carrier, will translate into

a productive educational environment for Northside's students, faculty, and staff. Additionally, CFI Mechanical will deliver an efficient, energy-saving, and precise system solution that will help positively impact the school's bottom line.

The finished building is expected to be ready for students by next fall, providing spacious, modern facilities for all the students of Northside and enabling the Houston ISD to continue pursuing their goal of providing top-quality education to their diverse and growing student body.

*For more information, visit [www.carrier.com/carrier/en/us/](http://www.carrier.com/carrier/en/us/). MCAA thanks Carrier Corporation for being a major sponsor of MCAA18 and co-sponsoring the Golf Tournament.*



CFI Mechanical chose Carrier equipment, such as the air handling unit shown here, to provide Houston's Northside High School with reliable and precise comfort for its students, faculty, and staff, with a minimum of time and effort invested by the school's maintenance staff.

# Braconier Reins in Costs with Viega Products

## Pressing Cuts Installation Time, Keeps Braconier Competitive

Faced with the possibility of losing money on a building expansion project, **Braconier Mechanical and Plumbing** found that using **Viega** products was an easy way to trim costs. The ease of installation with the Viega press approach cut installation time dramatically, bringing costs back under control. In addition, Viega turned out to be a better choice for a job where the original specs called for threading pipe.

Braconier was among the crews working on a large expansion at Aims Community College in Greeley, CO, that had a maximum guaranteed price. It involved remodeling the existing 15,000-square-foot welding building at the college, plus adding on a 60,000' three-story building. When the project went over budget, everyone was looking for ways to cut costs. The original specs called for threading the pipe, and Braconier Project Manager Todd Self saw that as an opening for Viega MegaPress.

"When it was over budget, I looked at what we could substitute. Originally the only [Viega product] called for was potable water, but we got other Viega items in. It was value-engineering with the budget," Self said. Braconier purchased two sets of MegaPress jaws for the project.

### Pressing Saves Time

Ricky Maynard, the plumbing foreman on the job, echoed that Viega was the best way to go for both ProPress and MegaPress. "It's faster because no hot work permits are needed. And running the water pipe in a three-story building—we would have needed two or three times as long to do it," he said. "I've been pressing since I came to Braconier six years ago, and if the specs allow it,

[Viega] is what we do."

Time saved adds up, and it was crucial to the budget. Maynard also noted that original plans in the building called for threading oxygen pipe, which would not have worked. Lines cannot be used for oxygen if they have had threading oil on them—offering yet another reason to call on Viega.

"Viega evens the playing field for us," Self said. "We can drop our labor costs and be more competitive. Labor savings are huge, so we do what we can to decrease them. When I started [with Braconier] four-and-a-half years ago, I always pushed for ProPress and the labor savings it brings. The prep time to press versus weld a joint is so much less."

### Strong System Holds Up

Dan Guidry, pipefitter foreman for Braconier, said that with so many workers constantly flowing through the building, at times some of his pipe was pushed around or shuffled out of the way. Still, there was not a single failure on any Viega fitting, a testament to the strength of the system. ProPress lines run throughout the newly revamped building for hot and cold domestic water. In the remodeled welding lab, MegaPress and MegaPressG lines run a variety of things, including natural gas, compressed air, and welding gases, such as argon and acetylene.

The original welding lab, built in 1983, was gutted to a shell, with just



Braconier ran nearly 5,000' of new piping in the renovation and expansion of the Aims Community College welding building. It was estimated that pressing with Viega cut at least a week off the installation time in the welding lab alone.

the welding booths remaining. All the piping—nearly 5,000' of it—was newly run. It was estimated that pressing with Viega cut at least a week off the installation time in the lab alone.

The addition to the building is a huge boost for the Aims campus and, with all the offerings available, will bring in lots of new students. Students can study construction management, CAD, materials testing, robotics, 3D printing, alternative energy, and more.

The entire building is meant to be a teaching vehicle. For example, the back of the elevator is exposed so that students can see all the working elements that make it run. Exposed pipes throughout the building serve as examples of top-notch workmanship to which students can aspire.

*For more information, visit [www.viega.us](http://www.viega.us). MCAA thanks Viega for being a benefactor of MCAA18 and sponsoring the student chapter activities.*

## Daikin Modular Central Plants Speed Installation, Eliminate Downtime for Data Center

With fast installation as high a priority as efficient cooling, Herakles Data of Sacramento, CA, chose pre-engineered, pre-assembled Daikin Modular Central Plants to meet their cooling demands. “Our number-one requirement in selecting a new system was speed,” said Laurence Stancil, director of facilities at Herakles Data. “The new cooling system had to be installed and operating as fast as possible, with minimal interruption.”

Four Daikin modular systems were successfully installed in just one week, resulting in no downtime for the data center. Moreover, the new systems slashed energy use, earning Herakles Data a substantial municipal rebate.

### Cooling Is Critical

Positioning itself as the ultimate data center, Herakles Data offers uninterruptible power, improved cooling, and redundant internet bandwidth to its co-location customers seeking to outsource their primary or disaster recovery IT infrastructure. At a co-location data center, corporations rent specific spaces to operate their data servers in a common physical location alongside the servers of other companies.

*“Final site assembly was a very clean process—fast, easy, and efficient. ... I would never do it the old way again.”*

—Laurence Stancil, Director of Facilities, Herakles Data

With all the critical servers housed in the facility generating heat, “cooling is essential to our business,” said



Installing Daikin Modular Central Plants not only met Herakles Data's high-capacity cooling demands but also cut their energy use, earning the company a \$50,000 municipal rebate.

Stancil. “In fact it's the number-two essential factor after uninterrupted power for our customers.”

Herakles Data President and CEO Lou Kirchner stressed how important cooling is to their success. “We've had customers come to us after leaving a previous data center because cooling was inadequate or unreliable,” Kirchner said. “And with the newer servers being more powerful and more compact than ever, they produce even more heat. With our facility near 100-percent capacity, it's critical that our cooling capacity be able to handle the heat of the newest generation of servers.”

Herakles Data realized that its rapid business growth meant that it had outgrown the capacity of its existing four air-cooled Daikin chillers. It now needed additional capacity that could

meet the demands of its mission-critical interior space and ambient temperatures that typically reach 95° F during the summer. “Under California's Title 24 standards, we couldn't add a fifth chiller to meet our growing capacity needs, so we had to consider alternatives outside the box,” said Stancil.

### A Pre-Engineered, Pre-Assembled Solution

Herakles Data evaluated its alternatives and selected Daikin Modular Central Plants. Modular central plants are pre-engineered and pre-assembled, with the chiller, pumps, cooling tower, and interconnected piping from one supplier, and then shipped to the jobsite for final assembly. Their unique modular configuration reduces site assembly time compared with traditional “site built” cooling plants, with the chiller,

cooling tower, pumps, and piping all coming from separate sources.

Stancil was initially skeptical of the modular central plant concept, but the installation process made him a believer. "Our first four modular ventral plants were dropped, bolted, and wired—fully assembled—in a week. I'd compare it to changing a propeller in flight," Stancil said. "You have to get it right the first time. And we did. Final site assembly was a very clean process—fast, easy, and efficient."

It was so fast and easy that Stancil now prefers the modular central plant concept to the traditional site-built central cooling plant. "I would never do it the old way again," he said.

Kirchner was especially pleased that the one-week installation process resulted in zero downtime for the data center. "It was seamless for our customers," said Kirchner.

#### **Capacity Goals Surpassed**

A total of six Daikin Modular Central Plants provide chilled water to 59 computer room air conditioning units in the 52,500-square-foot data center. Each of the modules consists of a 500-ton Daikin centrifugal compressor water chiller pre-engineered and pre-assembled with pumps, piping, cooling tower, control panel, and associated water treatment system.

Kirchner's original goal of increased cooling capacity to meet Herakles Data's projected growth was not only achieved, but also surpassed. "We provide N+1 business solutions for our customers, meaning we meet their needs plus provide redundancy," he said. "Today, however, we have surpassed that goal, because we typically run only two of the four original modular central plants. That results in 2N cooling capacity today available to our data center customers."

*"Modular central plants are a simple yet brilliant solution to today's business requirement for consistent, quality design and zero downtime. It's the only way to go."*

—Lou Kirchner, President and CEO, Herakles Data

#### **Energy Savings a Bonus**

In addition to fast-track construction and commissioning, the new Daikin Modular Central Plants resulted in impressive energy savings compared with the old system. "Our old system used 3,600 kilowatt hours (kWh)/ton a day; the new system uses 2,800 kWh/ton a day for a 22-percent reduction in energy," Stancil noted. That reduced energy usage earned Herakles Data a \$50,000-rebate from the Sacramento Municipal Utility District for the new system.

With the energy savings, the benefits of the Daikin Modular Central Plant extend beyond the initial benefits of the fast, easy installation. "Those energy savings were a very good

bonus," Stancil said. "With our new modular central plants, we not only got the increased capacity that we needed, we also got significant energy savings over the life of the equipment."

Kirchner sums up the entire experience as phenomenal. "Modular central plants are a simple yet brilliant solution to today's business requirement for consistent, quality design and zero downtime. It's the only way to go."

*For more information, visit [www.DaikinApplied.com](http://www.DaikinApplied.com). MCAA thanks Daikin Group for being a benefactor of MCAA18 and providing beverages on Wednesday evening.*



Each of the Daikin Modular Central Plants consists of a 500-ton Daikin centrifugal chiller pre-engineered with pumps, piping, cooling tower, control panel and associated water treatment system. Because they were pre-assembled, these four modules were successfully installed in just one week, resulting in no downtime for Herakles Data.

## FotoIN Automates Photo Organization and Storage, Saving Contractors Time

Instead of uploading photos from jobsites manually and trying to keep them organized and accessible, contractors are using the FotoIN mobile application to streamline the process, saving time and improving productivity. Users have found FotoIN easy to use in the field and in the office and report that it works well with other office systems.

Mechanical contractors are increasingly required to document conditions onsite with photos and key information to capture details about the condition of assets, work progress, and other specifics for scoping, estimating, and documenting finished work. Yet, they are wasting time with inefficient, overly manual, archaic field processes. Efforts such as the following can be cumbersome and time-consuming for both field and office staff:

- Capturing many photos with many devices on many projects and writing notes by hand

- Manually uploading, naming, and filing each photo to the right folder back in the office
- Wasting time waiting for the photos or searching for them to estimate work, resolve disputes, or report to management and the client

FotoIN helps speed up the photo documentation turnaround time. Users gain control of photo management with an end-to-end easy, actionable, and open solution that:

- sends photos to the designated server directly from the site, saving thousands of hours a month with automated filing and organization;
- creates a well-organized photo archive (capable of storing millions of photos across hundreds of thousands of projects) that is easily searchable;

- enables easy, daily reporting, saving time; and
- works seamlessly with other systems, such as Egnyte and Salesforce.

Office staff saves time by having FotoIN pull job names and codes directly and automatically from Salesforce, for example. FotoIN then names the photos and files them to the correct folder in real time. Automated filing in turn enables project managers to get access to the photos faster than manual processes, which helps them expedite the estimating process time for the client. Having an easily manageable and well-organized photo archive also allows for effective dispute resolution.

Contractors have found that using FotoIN increases overall productivity and efficiency of photo documentation. It also improves customer satisfaction by shortening turnaround times (e.g., in finding photos).

*For more information, visit [www.fotoin.com](http://www.fotoin.com).*



Using the FotoIN mobile app, contractors can capture photos from the jobsite and upload them to the server with important details and accurate job or project identification, so photos and information are automatically organized in a searchable archive, saving office staff time and minimizing errors.



Looking for a smart solution to your latest business challenge? The members of MCAA's Manufacturer/Supplier Council can help! Check out the Smart Solutions Case Studies and be sure to visit the Virtual Trade Show at [mcaa.org](http://mcaa.org).

## Tozour Energy Systems Keeps Costs in Control with Connect from KEY2ACT

Using Connect, a data collection and analysis solution powered by KEY2ACT, Tozour Energy Systems can pinpoint and even fix customers' HVAC problems remotely, saving time and money. When Tozour's technicians go on site, Connect helps them more accurately diagnose problems so they know exactly what they are looking for when they arrive. "They're not wasting their time or the client's time and money looking around for problems that don't exist," said Tozour's Executive Vice President Frank Rhea.

*"We're able to find those problems and fix them remotely, so we're saving truck rolls."*

—Frank Rhea, Executive Vice President for Services, Energy, and Contracting, Tozour Energy Systems

Connect is a cloud-based solution that identifies system-level deficiencies based on data collected from building systems and equipment. The solution also integrates seamlessly with building automation systems. Service contractors can use Connect deficiency reports to focus attention on areas in a building that truly need it, providing a better service experience, creating customer loyalty, and cementing long-term relationships.

Tozour Energy Systems recognized more than a decade ago that data analytics would play a huge role in the success or failure of businesses that provide HVAC and building automation services. Rhea and Tozour President Kevin Duffy knew they would need to implement a connected services strategy built on data analytics technology to continue their success in the field.

For the past several years, Tozour has used Connect as a key component of that strategy. Connect helps Tozour collect information from every piece of equipment within its customers' buildings, then feeds that data to the Tozour SMART (Strategic Measurement and Response Technology) Center, where it is analyzed by trained technicians.

The energy savings and improved dispatch enabled by Connect have led to more satisfied customers, greater customer loyalty, and higher building retention rates. "It has been extremely important to us," said Rhea, who oversees Tozour's services, energy, and contracting divisions. "It enables us to deliver measurable results. It really keeps us on the cutting edge."

### **Connect: The Right Tool for the Job**

Tozour has been serving the Philadelphia and southern New Jersey areas since 1979. When Tozour decided to commit to a connected services strategy 13 years ago, company tech leaders began by creating their own tools, starting with phone

line-based connections and internally developed algorithms. Tozour used the data gathered by those tools to score how customers' equipment was operating, and their first connected services solution was born.

That new solution quickly showed its worth. A year after Tozour started using connected services, technicians found an issue in a customer's building that they would not have been able to discover using traditional methods. "We found the problem through our algorithms and then knew there had to be something wrong, and it was a \$50,000 savings for the customer on this one building annually," Rhea said.

Soon, Tozour began looking to add value to their solution by partnering with software companies that specialized in data analytics tools. Tozour tried a number of different solutions, none of which fully met the company's needs. In 2011, they finally found success with the product that is now known as Connect.

continued on page 13



Connect from KEY2ACT helps Tozour collect information from every piece of equipment within its customers' buildings, then feeds that data to the Tozour SMART Center, where it is analyzed by trained technicians. The energy savings and improved dispatch enabled by Connect have led to more satisfied customers, greater customer loyalty, and higher building retention rates.

## TRIMBLE

continued from page 1

North Mechanical is well known in the industry for successfully using the integrated project delivery (IPD) method to deliver challenging industrial projects on time, under budget, and with fewer risks. IPD is a collaborative approach to project delivery that integrates people, systems, business structures, and practices of all stakeholders to optimize project results and increase value to the owner.

Dustin Allen, project and building information modeling (BIM) manager for North Mechanical, explained that technology is fundamental to the IPD process and critical to optimizing the design-to-fabrication-to-construction workflow. “Today we take on a lot of industrial IPD builds, which means we have a much bigger role in the actual project design piece,” said Allen. “There is a real need for more intelligent, fabrication-ready models that have the actual system components included. That’s why we turned to Trimble SysQue®.”

### *Technology Improves Efficiency*

Traditionally, manual processes for this type of work included measurement of end-to-pipe and pipe-to-hanger dimensions, manual quantity takeoff, and individual component labeling. With the typical fabrication cut sheets consisting of about 50 pieces, elevations, and more than 30 fittings each, the process is tedious, prone to errors, and inefficient. Looking to eliminate unknowns and create a more automated and accurate fabrication workflow, North

*“Having this level of manufacturing detail on our hanger and component labels increased our efficiency and allowed us to cut our workforce in half during the peak of the job.”*

—Dustin Allen, Project/BIM Manager, North Mechanical

Mechanical adopted Trimble SysQue and the Autodesk® Revit® platform—first for the fabrication of hangers and then for pipes and components.

“We knew we wanted to eliminate manual steps for fabricators and improve the accuracy and efficiency of everything from fabrication down to installation,” said Allen. “When you add fittings into SysQue, the model is smart enough to give you the pipe length, and when you get to the end, pipe length is reflected in the schedule. You can cut 100 pieces at five feet and put pieces on with fittings with extreme accuracy. We knew this would save a tremendous amount of time and rework, and the big payoff would be big savings for our customer.”

North Mechanical uses SysQue to design fully constructible Revit LOD 400 models based on manufacturing-specific content. Using SysQue in Revit enhances the model of systems with materials and sizes based on actual manufacturer products by name and part number. As a result, fabricators can produce pipes, fittings, and hangers much more quickly and accurately than using conventional methods. Allen explained that with SysQue, the model includes relevant fields for spool drawings for fabrication and installation, such as piece number, diameter, nominal size, size, family and type, system classification,

system abbreviation, material, count, and length.

The laboratory project also helped North Mechanical establish a completely new fabrication workflow for producing piping spools and fabricated skids that can be replicated for other projects. That includes importing raw component data into Excel and Word programs to easily organize, print, and apply labels to each hanger and component.

*“Our new workflow with SysQue and Revit has helped improve collaboration with fabricators tremendously.”*

—Dustin Allen, Project/BIM Manager, North Mechanical

“Having this level of manufacturing detail on our hanger and component labels increased our efficiency and allowed us to cut our workforce in half during the peak of the job,” said Allen. “By allowing us to fabricate roughly 90 percent of components offsite, we also reduced our footprint on the job and allowed for increased efficiency among our partners because they had more insight into and they had longer to complete their work,” he added.

Using SysQue on the lab project, North Mechanical fabricated 60,000 linear feet of piping and over six dozen skids and preassembled modules. Allen believes that the solution has strengthened the quality of the piping and component design by

*“This new process eliminated 90 percent of rework on the lab build, which is huge. We had zero change orders due to clashes or coordination issues on that job, which is outstanding.”*

—Dustin Allen, Project/BIM Manager, North Mechanical

providing fabricators with access to 3D, information-rich models very early in the prefabrication process. “Our new workflow with SysQue and Revit has helped improve collaboration with fabricators tremendously,” said Allen. “They now ask more meaningful questions, which leads to better coordination between us, less rework, and higher quality design. This new process eliminated 90 percent of rework on the lab build, which is huge. We had zero change orders due to clashes or coordination issues on that job, which is outstanding. The intelligent 3D model gives fabricators a better sense spatially of the components and eliminates problems before they happen.”

#### *Leveraging Just-in-Time Ordering*

North Mechanical is also generating material takeoffs from the schedules developed with SysQue and Revit. Vendors receive a part list with approximately 1,000 line items, organize and accept the spreadsheets, and place orders directly using North Mechanical’s schedules. In most cases, components are delivered in two to three days—enabling fabricators to have the exact materials they need, precisely when they need them.

Allen estimates he has ordered 90 percent of all materials for the lab project from his desk with 100-per-

cent accuracy in terms of the precise number of components, fittings, and valves required. This precision allows Allen and his team to be more focused and deliberate with fabrication and management on the job. He estimates it can cost tens of thousands

of dollars in restocking fees and labor costs to perform takeoffs using conventional methods. With SysQue, North Mechanical has eliminated those expenses and other possible unknown expenses required for take-off. Altogether, Allen estimates today

*“The intelligent 3D model gives fabricators a better sense spatially of the components and eliminates problems before they happen.”*

—Dustin Allen, Project/BIM Manager, North Mechanical

the company is saving 400 percent of time compared with traditional materials takeoff tasks.

#### *More Accurate Layout and Installation*

North Mechanical is also using Trimble Field Link for MEP, a solution that consists of the Trimble Field Link software powering a ruggedized tablet connected to a Trimble Robotic Total Station for laying out hangers and assigning naming conventions to embedded structures in the field. This approach reduces errors and extends the BIM workflow by allowing North Mechanical to export hanger points or cable tray attachment locations from the 3D MEP models to the field for simplified field location and staking.

“With SysQue and Revit we’re able to validate install with the BIM model first, which increases savings and reduces rework and change orders required dramatically,” said Allen. “Overall, I would estimate we achieved at least a 10-percent shared

cost savings using SysQue and Revit on the lab build, resulting in about \$1 million savings in total. Best of all, it made our customer very, very happy and we now have this streamlined fabrication workflow in place that we’ll leverage, and it will make us more competitive going forward.”

*For more information, visit [www.trimble.com](http://www.trimble.com). MCAA thanks Trimble for being a supporter of MCAA18 and providing a convention souvenir.*

*North Mechanical will present on best practices at the MCAA 2018 Fabrication Conference.*

*“With SysQue and Revit we’re able to validate install with the BIM model first, which increases savings and reduces rework and change orders required dramatically.”*

—Dustin Allen, Project/BIM Manager, North Mechanical

cent accuracy in terms of the precise number of components, fittings, and valves required. This precision allows Allen and his team to be more focused and deliberate with fabrication and management on the job. He estimates it can cost tens of thousands

Overall, Allen believes that one of the biggest competitive advantages of using SysQue and Revit is that the platforms have improved their models and they deliver a higher quality of design and higher quality of installation.

## JAY R. SMITH

continued from page 1

### *Building for Efficiency*

Cannistraro is renovating an industrial Art Deco-style building at 25 Fid Kennedy Avenue in Boston's Seaport District. It was built in 1940 by the U.S. Navy as a multi-trade, heavy machine shop. The renovations are preserving the legacy of the architecture and its original utilitarian use. The new 157,000-square-foot building will be Cannistraro's manufacturing facility for plumbing, HVAC piping, fire protection, and sheet metal trades.

Courtney Carroll, a project manager for Cannistraro's Plumbing Group, said they do a great deal of fabrication. "We fabricate as much of our work as we can. It makes the field more efficient, and it's safer working at a table level height rather than onsite, where we're sometimes working in precarious positions."

This new facility will replace three separate shops spread out over the Boston area. Not only will each trade have its own state-of-the-art space in the single location, but there will also be collaborative space for multi-trade modular assemblies.

The extra space will also allow Cannistraro to utilize flex space



A worker begins installation of a Smith Enviro-Flo® II Trench Drain System in the facility that will be Cannistraro's manufacturing facility for plumbing, HVAC piping, fire protection, and sheet metal trades. Cannistraro was so impressed by Smith products and services that they named Smith their supplier of choice.

within the facility for innovative modular projects in collaboration with other industry partners. "This space is not just about mechanical, plumbing, and fire protection fabrication; we have an opportunity to give back to a city that has helped build us as much as we have built it. We are dedicated to employing Boston residents and growing the community workforce," said Joseph Mierzejewski, vice president of plumbing at Cannistraro.

"Our clients used to have to rent out space for this purpose. Now they can all come to our Collaboration Space," said Carroll. "It's more efficient to send fabrication from all of our trades from one site on one truck."

### *Smith Drains Speed Installation*

The new building required about 250' of trench drains in total, and the longest single span was 120'. Smith supplied the Enviro-Flo® II Trench Drain System. Each section included a flow arrow and was numbered sequentially to match the drawings, which made for a smooth and efficient installation. The system was crated and shipped in batches to arrive in time for each of the four scheduled pours.

"It was nice to phase it onto the site," said Carroll. "Often, things get damaged, misplaced, or just get in the way. Storing 120' of trench would cost money just to move it around. Shipping it right when it's needed for the install saves on shifting it around the facility."

One of the features of the Enviro-Flo II that Carroll found beneficial was the removable factory insert board constructed from post-industrial recycled material that functions as a stabilizer and debris guard. She said, "Having the insert board slide in to keep [the drain] as straight as possible is a great feature, especially on 120' of drain, and it protects it from the pour."

The entire installation was done with one-meter (3.28') sections. Typically, in situations like this, Smith would prefabricate the system in 10' sections for the customer. However, because changes to the drawings bumped up against the pour timeline, Cannistraro decided to go with the one-meter sections instead of waiting on the prefabricated pieces.

Despite working with the shorter lengths and a system that was new to the installation team, Cannistraro was able to install 120' of Enviro-Flo® II trench in just one working day.

Watch a short, time-lapse video of the Cannistraro crew installing the system as well as real-time, step-by-step installation of one section: <https://youtu.be/afCuGm0uMZE>.

### *Building Relationships*

As part of its business strategy, Cannistraro selects "vendor partners" with whom they can build a relationship. Smith had made the short list, and they invited the Cannistraro team to Montgomery, AL, to get to know the people they would be working with and tour Smith's manufacturing facility.

Mierzejewski was part of that visit, and he was impressed with the culture and family feel of Smith. "Cannistraro is not a small company but still retains the important family values and culture that started when the company was founded by John Cannistraro, Sr. We definitely appreciated that alignment of cultures as well as the Smith product," he said. Another point that stood out to Cannistraro was the longevity, friendliness, and happiness of the people who work at Smith. It is not unusual to meet someone who has been working at Smith for over 20 years or even come across a second- or third-generation employee. In fact, almost half of the Smith employees have been

with the company for 20 years or more, and 32 percent of that group has been with Smith for over 38 years.

Mierzejewski's impressions do not come as a surprise to the employees at Smith. Al Mills, a senior engineer at Smith, said, "I think this industry is more conducive to relationships. We are all customer-driven. We like what we do, and everything we do is for the customer."

Smith's vice president of engineering, Jerry McDanal, added, "We work as a team, and we have each other's backs. People get along, and they enjoy working with one another. Many of us have worked together for many years. When I look around, I see a lot of people smiling. I see people wanting to help each other. We are a family."

As much as anyone wants to partner with and work with helpful, friendly people, that is not enough to merit being named a supplier of choice. Cannistraro was looking to build a relationship, and service was an essential part of their selection process.

"From a technical side, [Smith] has been great since we've committed to them. People are always available, quick to get back to us, and quick to help us out. They keep us out of trouble, which is something we try to do with our clients. We need vendor partners that share that same commitment with us. Between Smith and our local vendors, we're confident in the team that has been built" said Mierzejewski.

*For more information, visit [www.jrsmith.com](http://www.jrsmith.com). MCAA thanks Jay R. Smith Mfg. Co.® for being a supporter of MCAA18 and supplying badges and lanyards.*

## KEY2ACT

continued from page 9

Tozour is now rolling out the Connect solution to most of its more than 100 technicians, said Lisa Hendy, Tozour's SMART Services leader. Within the next five years, the company plans to have 80 percent of all its technicians using Connect.

### *A Better Customer Experience*

On the wall of Tozour's corporate office in suburban Philadelphia is a quote attributed to company founder Doug Tozour: "The measure of our success today is how many of our customers say 'I want Tozour Energy Systems on my next job!'" Customer satisfaction is paramount at Tozour, and the company's connected services strategy plays a key role in that satisfaction.

It starts with the data visibility and equipment scorecarding provided by Connect, which gives contractors a holistic view of building operations. "We're seeing things in a different way today than we ever could before," Hendy said.

Better visibility means better dispatch decisions. Thanks to Connect, Tozour knows precisely where and when technicians are needed. That visibility also means better decision-making when it comes to optimizing equipment operations and helping customers use energy wisely. Connect helps find and correct problems like simultaneous heating and cooling, unnecessary operations in unoccupied areas, incorrect sequencing of equipment, and many other issues.

The bottom line for Tozour's customers? "It's saved them a lot of money," Rhea said. "We actually reduce our client's T&M [time and materials] because we're now able to fix their problems faster. We're able to find those problems and fix them

remotely, so we're saving truck rolls." Customers are also better able to retain their tenants, who renew their leases because of the much more comfortable working environment.

### *Connect vs. the Competition*

While there are other similar connected services tools on the market, Connect has proven to be the best option for Tozour, said Hendy. Some other tools offer only specific "canned" services, with everything already set up, and others require a lot of setup and programming to work. Connect offers the best of both worlds, combining flexibility when necessary with some standard preset offerings.

Rhea said Connect has helped Tozour differentiate itself from the competition. "It's really helped us solidify delivering a value outside of just the reliability of the technician," he noted. "Anytime you can make your techs more efficient, make your techs better, then you're always going to be that person delivering a better value."

*For more information, visit [KEY2ACT.com](http://KEY2ACT.com).*

## A Tech's Perspective

Tozour's technicians have found Connect simple to install and easy to use. Chris Gursky, a controls technician and systems performance analyst, described his experience: "It took me about a total of one day to learn how to do everything. I went out onsite with a technician, watched him do it, then came back to the office and did some things on the tool on my own time and kind of maneuvered around and figured out where everything was. Then the next time we installed one, I was able to do it on my own. That's how easy it was for me."

## Safety Tips for Maintaining Wire Ropes and Slings

Wire rope is a machine, and a rather complex machine. There are no precise rules to determine exactly when a wire rope sling has passed its service or expiration date. There are guidelines, though, to follow to know whether a sling is suitable for continued use or needs replacement.

Wire rope slings should be inspected prior to use to identify potential hazards or damage and to determine whether they are suitable for continued use. The Occupational Safety and Health Administration (OSHA) and ASME B30.9 standards dictate inspection intervals and procedures. They also require that inspections be executed by the sling user.

### Basic Inspection Criteria

According to the Wire Rope Technical Board, proper inspection should follow a systemic procedure, as described in the Wire Rope Sling Users Manual:

1. First, it is necessary that all parts of the sling are readily visible. The sling should be laid out so every part is accessible.
2. Next, the sling should be sufficiently cleaned of dirt and grease so wires and fittings are easily seen. This can usually be accompanied with a wire brush or rags.
3. The sling should then be given a thorough, systematic examination throughout its entire length, paying particular attention to sections showing the most wear.
4. Special attention should also be paid to fittings and end attachments and areas of the sling adjacent to these fittings.
5. When the worst section of a sling or the weakest link has been

located, this area should then be carefully checked against the criteria.

6. Label or identify slings that are inspected.
7. Keep records of inspections that include dates and corresponding conditions of slings.
8. Dispose immediately of slings that are rejected.

Ideally, other systems for ensuring the quality of your slings should be part of your warehouse or facility inspection procedures. For example, **Lifting Gear Hire** is completing the final stages of adopting a new, streamlined RFID tracking system to record when equipment was inspected, who inspected it, and if and when the equipment was damaged. You can also seek out good quality training resources or learning institutes that teach courses on how to properly inspect wire rope slings—preferably ones that also provide Rigging Gear Inspector certification.

### Storage Procedures

A sling's service life can be extended substantially with good care and maintenance. Proper storage demands that slings be housed in an environment where they are not exposed to water, extreme heat, corrosives, liquids, or sprays and not stored in a kinked position, among other things.

Slings should never be left beneath loads or lying around where they can be susceptible to damage. Steel is not impervious to destruction. Slings should be housed in a rack when not in use. Custom racks can be constructed to accommodate slings of any size.

As with most machines, wire rope is lubricated at the time of manufacture. No supplementary lubrication is generally required if the sling is used under typical conditions. However, if a sling is stored outside or in any environment that could cause corrosion, additional lubrication should be applied to prevent rusting or corrosion. If the wire rope needs to be lubricated, the same type of lubrication as used during manufacture should be applied.

The storage temperature plays an important role in preserving the lifespan of a sling. Generally, steel-cored slings should not be used at temperatures above 400° F or below -40° F. Although it is not always easy to see



Wire rope slings are complex machines that should be inspected and maintained to ensure safe use.

when a sling has been damaged, a general rule of thumb is that if there are any suspicions that a sling's integrity may have been compromised, it should be taken out of service right away or, at the very least, the manufacturer should be consulted.

### *Safe Operating Temperatures*

Follow the sling manufacturer's recommendations regarding use of steel-cored wire rope slings of any grade at temperatures above 400° F or below -60° F. At these temperature extremes, the internal structure of the steel may start to realign. If a sling will be or has been used in extreme temperatures, consult the manufacturer about ways to prevent degradation.

### *Removal from Service*

OSHA specifies that wire rope slings must be removed from service in any of the following conditions:

- Ten randomly distributed broken wires in one rope lay or five broken wires in one strand in one rope lay.
- Wear or scraping of one-third the original diameter of outside individual wires.
- Kinking, crushing, bird-caging, or any other damage resulting in distortion of the wire rope structure.
- Evidence of heat damage, seen as wire discoloration, burn marks, weld splatter, etc.
- End attachments that are cracked, deformed, or worn.
- Hooks that have been opened more than 15 percent of the normal throat opening, measured at the narrowest point, or twisted more than 10 degrees from the plane of the unbent hook.

- Corrosion of the rope or end attachments. Only extreme corrosion is necessary to reject a sling. Light corrosion does not substantially affect the strength of a sling.

ASME B30.9 has similar standards as well as the following:

- Bent hooks can be no more than 5 percent over the normal throat openings, measured at the narrowest point from the plane of the unbent hook.
- Any evidence of eye splices that have slipped, tucked strands that have moved, or pressed sleeves that show serious damage may be sufficient cause to reject a sling.
- A very common cause of damage is the kink which results from pulling through a loop while using a sling, thus causing wires and strands to be deformed and pushed out of their original position. This kink unbalances the sling, reducing its strength.

Should a sling be determined to be worn out or damaged beyond use, the inspector should immediately tag the sling as "do not use." The sling should be destroyed as soon as possible by cutting the eye and fittings from the rope with a torch. Cutting the body of the sling is also appropriate. This method of destruction should deter another employee from mistakenly using a sling that has been retired from service. Any inspection program, however thorough, is of no value if the slings that have been rejected or retired are not disposed of properly.

### *Repairs*

According to ASME B30.9, repairs should only be conducted by the manufacturer or a qualified individual with the appropriate experience and certifications. For example, if an end fitting such as a hook becomes

bent beyond guidelines, it should be sent back to the manufacturer regardless of whether the wire rope sling is intact and undamaged.

All repairs conducted on wire rope slings will require some proof of restoration. Replacement parts should be the same as those used in the original manufacturing. Following repair, a proof test of structural integrity should be conducted. With wire rope slings, the proof test is a 200-percent load test.

Should the wire rope used to craft the sling itself become damaged, it should not be repaired under any circumstances. For example, if one of the wires is damaged by weld splatter or heat damage, it is not possible to remove the one strand of wire and replace it. It is also not necessarily cost-effective to do so, as repair costs may outweigh the value of the sling.

### *Conclusion*

When and how often you should inspect a wire rope sling are often the subjects of debate. The number of inspections every year should correlate with the amount of usage. At a minimum, a wire rope sling should be inspected once a year. However, if it is used frequently or in conditions that may challenge the sling's integrity, then it should be inspected every month or quarterly, at least.

You should keep written records of when the wire rope was last inspected in case an accident or other cause for concern occurs. Keeping records also prevents someone from sending out a wire rope sling that is unsafe or has not been inspected. After all, the most important thing on a jobsite is maintaining safety.

*For more information about Lifting Gear Hire, visit [lgh-usa.com](http://lgh-usa.com).*

# Create a Premium Program for Your Mechanical Service Customers

## Lessons Learned from Amazon Prime

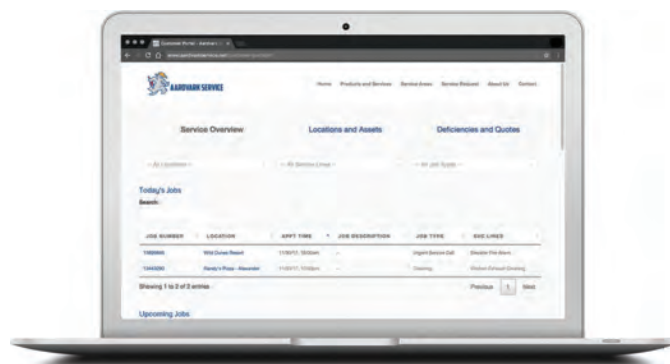
What are you doing in your mechanical service contracting business to get more by doing more for your best customers? Do you have a premium program like Amazon Prime that includes exclusive benefits covered by the price of a subscription? Is there a tier of service that includes the basic preventive maintenance program plus a bunch of extras that entices customers to pay upfront?

Here are some suggestions for how to form a program that pays you upfront and smooths out your labor demand curve.

- 1. Give it a name.** Salespeople cannot talk about your program and customers cannot reference it if it does not have a name. Amazon chose “Prime,” whose root is from the Latin word “prim” or “primo,” meaning first, as in first in line. It is a good name because it conveys some meaning while also being easy to remember. You should do likewise. Obvious

choices are names like “premium,” “platinum,” or “gold,” which are unimaginative but at least connote value easily. Ideally, you can name your program in a way that has meaning, rhythm, and rhyme so it is easy to say and easy to remember.

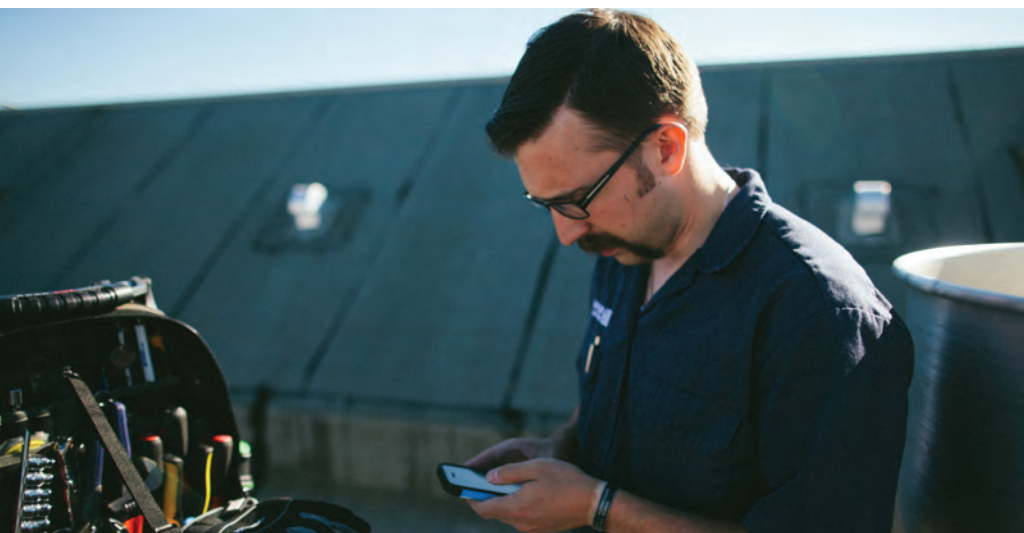
- 2. Charge a subscription fee.** You should collect a monthly, quarterly, or annual fee in exchange for the program. Angle for an annual fee for the obvious reasons, but offer other options that might appeal to different customers. Try to price it at a rate the average customer would happily pay for the benefits and that would provide you a decent margin on average. Some customers will be more profitable than others, but maximizing profit is not the



Creating a portal where customers can see the details of their own service plans gives them a reason to visit a company's website, providing an opportunity to promote services and lower costs by cutting down on the time staff spend responding to information requests.

reason for program fees. Locking the customer in to your services as the preferred vendor is the goal.

- 3. Offer expedited service response.** Everyone likes the idea that they will get priority service. If you are committed to great service, go ahead and promise your best customers that you will respond with skilled technicians to any problem within one or two hours. Or promise to return a call or web inquiry within 15 minutes. You are probably committed to it anyway, so why not get credit for it?
- 4. Include basic maintenance services.** If there is a preventive maintenance protocol for the equipment that will be under your care, and you are committed to delivering the work, build that into the program. Including preventive maintenance makes it easier to schedule (you do not have to ask customers or wonder if they will pay), and you may find opportunities to offer additional services.
- 5. Offer a lower rate on all planned services.** It is good for both you and the customer for all services to be planned instead of waiting for emergencies caused by failures. When you quote repairs



Generate steady income by offering customers a subscription-based service program that includes, for example, priority response for any service calls.

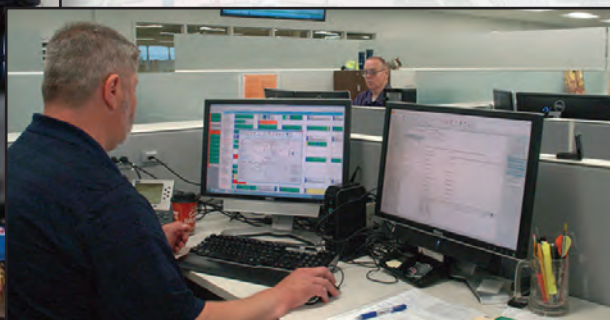
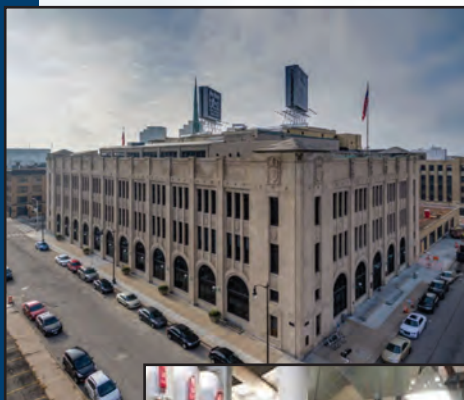
continued on page 19

# Interested in *MORE* “SMART SOLUTIONS”?

Check out the Smart Solutions Case Studies area at [mcaa.org](http://mcaa.org), where you'll find additional articles that spotlight mechanical contractors who found their win-win. In partnership with members of MCAA's Manufacturer/Supplier Council, these contractors found innovative ways to meet their clients' needs by improving productivity, cutting costs and saving time on the job.

This section of our website also features tips and ideas on other ways you and your company can save money and enhance your productivity.

Find **Smart Solutions Case Studies** under the *Virtual Trade Show* menu at [www.mcaa.org](http://www.mcaa.org)



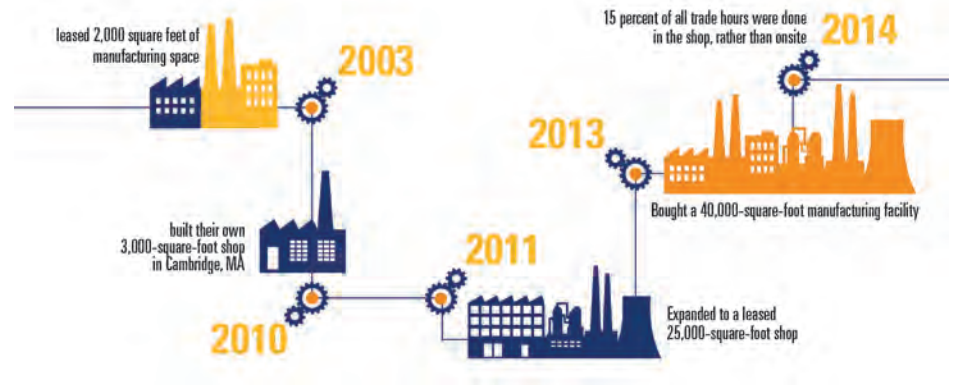
MANUFACTURER / SUPPLIER COUNCIL

**MCAA**  
Adding Value to Your Supply Chain

## TG Gallagher Improves Prefabrication Processes with ManufactOn

With the **ManufactOn** cloud and mobile solution, **TG Gallagher** has increased and improved its prefabrication capacity. The TG Gallagher leadership team can keep tabs on the status of prefab work and materials at all times. The field team can monitor the progress of prefabricated items, request them as they are completed, and tag products to keep track of them. By integrating prefabrication into TG Gallagher's supply chain, **ManufactOn** has helped them take the next step in the prefab revolution.

A leading mechanical contractor in the Boston area, TG Gallagher faces the same industry pressures as others in the field: high demand, tight budgets, and ever-shorter schedules. But TG Gallagher also faces challenges unique to the Boston area. The cities and towns are dense, leaving little room to work. Laydown areas and parking are scarce. Truck deliveries are tightly controlled to minimize noise and traffic. As a result, material delivery has to be just in time, and the supply chain must be fast, responsive, and accurate.



To meet these challenges, TG Gallagher developed a strategy around prefabrication, manufacturing and assembling as much as possible offsite, then delivering the products for installation. The company has been investing in prefabrication for 15 years. In 2003, they leased 2,000 square feet of manufacturing space while building Massachusetts General Hospital's Yawkey Center. By 2010, they had built their own 3,000-square-foot shop in Cambridge, MA. By 2011, they had expanded to a leased 25,000-square-foot shop. Finally, in 2013, they bought a 40,000-square-foot manufacturing facility. By 2014, 15 percent of all trade hours were done in the shop, rather than onsite.

A few years ago, TG Gallagher realized that it had a modern strategy that was being executed with 1990s-era tools: Excel, email, and phone. They partnered with **ManufactOn** in 2015 to help coordinate prefabrication planning and prefabrication production—and, most importantly, to integrate all of that into the supply chain. The **ManufactOn** cloud and mobile solution supports prefabrication planning

and manufacturing. The solution's Supply Chain Manager feature provides a detailed picture of all prefabrication work. Finally, the mobile app (for iOS and Android) uses QR codes to help field staff track and manage prefabricated items as they are manufactured and shipped.

To give a clearer picture, here is how TG Gallagher uses **ManufactOn** on a day-to-day basis:

- Once prefabrication opportunities are identified, they are listed in scope-of-work statements in the Prefab Planner module.
- These scopes of work are then broken down into production orders.
- Production orders go to the Production Manager module, where designs are added and manufacturing runs are worked out.
- The shop foreman then gets the production order and uses it to track work.
- Once complete, the production order is turned into a shipping order and queued up for delivery.



A TG Gallagher team in the fabrication shop using **ManufactOn** on their tablets checks the schedule of production and delivery to the jobsite. With the mobile solution, staff know the status of prefabrication work and materials at all times.

All these steps come together in the Supply Chain Manager module, an information kiosk that is available 24/7 to shop, field, and leadership teams. The Supply Chain Manager provides visibility into, and control of, the Prefab Planner and Production Manager modules. Dates can be edited during status and planning meetings. Orders can be paused when design changes happen. Activity logs provide detailed histories when issues arise. Shipping is monitored and managed. In short, the leadership team always knows what is happening, without having to make phone calls or download spreadsheets.

But the story does not end there. Using the mobile app, the field team can monitor both planning and manufacturing. The team can also request completed prefab items as they become available, making TG Gallagher's supply chain fast and responsive. In addition, ManufactOn can generate QR codes that can be attached to prefab items. The field team uses these QR codes to confirm and receive deliveries at the jobsite and to return damaged or incorrect items. The field team is now fully integrated into the supply chain.

*“ManufactOn has enabled us to do more prefab and do it better.”*

—Brian Potter, President,  
TG Gallagher

Looking to the future, TG Gallagher sees ManufactOn as a long-term partner for helping to evolve their business and innovation strategy. For example, Autodesk's recent investment in ManufactOn means greater integration with 3D model creation and viewing. ManufactOn currently integrates with Revit, and TG Gallagher detailers are piloting how to jump directly from model to plan in ManufactOn. TG Gallagher is also excited by the possibility of viewing the 3D model in BIM 360 Docs and using it to help monitor and control prefabrication and delivery.

“ManufactOn has enabled us to do more prefab and do it better,” said Brian Potter, president of TG Gallagher. “Prefabrication is a simple strategy—but getting the execution right is complex. We look to ManufactOn to help us manage that complexity and to keep us one step ahead of the construction industry's challenges.”



With the ManufactOn cloud and mobile solution, TG Gallagher has increased and improved its prefabrication capacity. This finished assembly was managed and tracked through ManufactOn.

*For more information, visit [www.manufacton.com](http://www.manufacton.com). MCAA welcomes ManufactOn as a new member.*

## SERVICETRADE

continued from page 16

and upgrades that can be scheduled instead of performed on an emergency basis, the rates will be cheaper. The more customers you get into proactive mode instead of reactive emergency mode, the more efficient you can be with your scarce technician resources.

**6. Offer an online account.** Give your customers a reason to come to your website. Showing them online details of their plan, history, equipment, quotes, etc., saves your employees time. It also sets your company apart from the competition and makes it more memorable.

**7. Offer a performance guarantee.** After you get their equipment into good order and you have a regular maintenance routine or remote monitoring to expose any risk, offer emergency service response at the subscriber program rates. This approach shows you have confidence in your plan, and it incentivizes the customer to approve your quotes for planned repairs so that the equipment stays in the program. Any equipment exhibiting failure symptoms that are noted and quoted by you is excluded from the plan if the quote for planned repair is rejected or ignored.

When customers feel that you have been thoughtful in meeting their needs with a premium customer service program, they will happily pay a program fee to claim their membership. You can use the steady cash flow and predictable schedules to hire, grow, and expand the program.

*For more information, visit [www.servicetrade.com](http://www.servicetrade.com) or contact Billy Marshall at [billy@servicetrade.com](mailto:billy@servicetrade.com).*

# Circulating Air 'Amazed' by Speed, Ease of Installing Uponor Radiant System

## Research Center Reaches LEED Gold with Efficient Solutions

Describing the **Circulating Air** crew's first experience using **Uponor** products, Job Foreman Matt Fitzgerald said, "We were truly amazed at how quickly and easily we installed the tubing for the radiant heating and cooling system." The Los Angeles-based mechanical contractor's four-man crew installed 16,000' of Uponor's Wirsbo hePEX™ tubing in a new research building on the campus of the University of California, Los Angeles (UCLA). Using the radiant heating and cooling system helped earn LEED® Gold status for the six-story, 100,000-square-foot Edie and Lew Wasserman Eye Research Center.

### *Efficient, Easy to Install*

The first three floors of the structure were specified to include radiant heating and cooling, a technology that embeds tubing into floors of the building to circulate warm or cool water to condition the space inside. Because water has the capacity to transport energy 3,500 times greater than air, it is an extremely efficient

method for heating and cooling an environment.

Working closely with Circulating Air, Uponor, which manufactures PEX tubing and provides plumbing, heating, and cooling systems, helped design the radiant heating and cooling system in conjunction with the engineers and architects on the project. The building's southern elevation is a wall of glass, and the radiant heating and cooling system takes a huge load off the forced-air system.

Circulating Air also had some onsite training from a local Uponor sales representative. "Receiving training onsite really helped us, and our crew felt up to speed very quickly," said Fitzgerald.

According to Fitzgerald, prior to the training, he was unaware how easy it was to make the connections to the manifolds and fittings. "I love how fast and easy the Uponor ProPEX system is," he said.

*"We were truly amazed at how quickly and easily we installed the tubing for the radiant heating and cooling system."*

—Matt Fitzgerald, Job Foreman,  
Circulating Air

Uponor's PEX tubing uses ASTM F1960 ProPEX expansion fittings, which require one simple tool to make fast, easy connections. The contractor simply places an expansion ring on the end of the tubing and expands the tubing and ring with a ProPEX expansion tool. After expansion, the contractor inserts a ProPEX fitting. The tubing and ring shrink back down, creating a strong connection to the fitting that holds tight with up to 1,000 pounds of radial force. Those familiar with traditional copper or other rigid pipe connections recognize that the ProPEX fitting system is a much easier, more reliable connection method.



The southern elevation of UCLA's new Wasserman Eye Research Center is a wall of glass that welcomes light in. Circulating Air installed a Uponor radiant heating and cooling system, which takes a huge load off the forced-air system and helped the building qualify for LEED Gold status.



Circulating Air's four-man crew installed 16,000' of Uponor's Wirsbo hePEX tubing in UCLA's new research center. "I love how fast and easy the Uponor ProPEX system is," said Job Foreman Matt Fitzgerald.

The system connected to six Uponor TruFLOW manifolds and six manifold cabinets divided between the three lower floors. “The installation was fairly straightforward,” Fitzgerald said. “And we didn’t encounter any obstacles that we couldn’t overcome.”

After the installation of the PEX tubing was complete, concrete was poured over the radiant system to create a large mass for heating and cooling the structure. Circulating Air then performed a pressure test to ensure system integrity before starting up and commissioning the system.

#### **Leading in LEED**

The Wasserman Eye Research Center is a culmination of a 50-year vision to house a world-class research and care center on the UCLA campus to preserve and restore eyesight. The \$115.6-million building garnered a Community Impact Award at the Los Angeles Business Council’s Los Angeles Architectural Awards and was named Best Medical Project by the Los Angeles Business Journal’s Commercial Real Estate Awards.

The University of California system became the first American university to have 100 LEED-certified facilities—an impressive milestone and a testament to the system’s dedication to responsible building practices. The Wasserman building was designed to ensure the structure included as many sustainable building technologies as possible. The three lower floors were dedicated to the expansion of the Jules Stein Eye Institute, making it a state-of-the-art research and treatment facility.

*For more information, visit [www.uponor-usa.com](http://www.uponor-usa.com). MCAA thanks Uponor, Inc. for being a major sponsor of MCAA18 and sponsoring the David Horsager Education Session.*

## **Advance Mechanical Brings Big League Bathrooms to Wrigley Field**

### ***Sloan Products Increase Hygiene, Efficiency***

Restoring Wrigley Field was an opportunity for **Advance Mechanical** to install sleek **Sloan** products that allow fans to experience an efficient, hygienic trip to the restroom and get back to their seats to enjoy the game. Sloan was named the official Water Efficiency Partner for the Chicago Cubs baseball team in 2015.

The legendary ballpark is undergoing extensive restoration, known as the 1060 Project, that began in 2015 and continues through 2018. It was outfitted with faucets, flushometers, and other Sloan products in all of the restrooms. The restrooms are designed for high-traffic use on game day to provide Cubs fans with a hygiene-friendly experience across all restroom fixtures. The largest public restroom in Wrigley Field is located 50 yards from the main entrance on the third base line.

The large restroom has two identical rooms with a corridor of Sloan products, built to funnel high volumes of people. Fans will appreciate the increased hygiene offered by concealed flushometers on Sloan’s hybrid urinals.

Everything in the ballpark’s restrooms is sensor-activated and operated hands-free, perfect for hygienic use by thousands of Cubs fans. Recognizing that the emphasis placed on hygiene and hands-free operation is bigger than ever, both flushometers and faucets utilize sensors to limit the spread of germs in the iconic ballpark’s high-traffic restroom.



At Wrigley Field, Advance Mechanical installed sleek Sloan products that allow fans to experience an efficient, hygienic trip to the restroom and get back to their seats to enjoy the game.

The bathrooms feature Sloan’s innovative BASYS® faucet and soap dispenser line, which provide hands-free operation ideal for high-traffic restrooms. The sleek and modern faucet is both durable and versatile enough to meet the demands of Wrigley Field’s busy restroom.

Cubs Manager Tom Ricketts said, “Teaming up with Sloan is an important move for the Chicago Cubs. Sloan brings more than a century of experience and success in creating cutting-edge water solutions for a wide variety of venues all around the world. We are pleased to work with and learn from Sloan as we enhance our facilities and build for the future.”

*For more information, visit [www.sloan.com](http://www.sloan.com). MCAA thanks Sloan Valve Company for being a benefactor of MCAA18 and sponsoring the Tuesday Luncheon featuring Mark Gungor.*

## Martin Associates Partners with Victaulic, Stays on Budget, Ahead of Schedule

Using **Victaulic** grooved mechanical solutions and Construction Piping Services (CPS) for a cramped mechanical room in a new luxury apartment building, **Martin Associates** streamlined its drawing and installation processes, reduced waste, and cut overall project costs by three to four percent. Martin successfully installed, tested, and completed the HVAC system at 525 West 52nd Street in New York City's Hell's Kitchen neighborhood in a week and a half, staying on budget and ahead of schedule.

Home to several celebrities and a constant wave of newcomers, Hell's Kitchen is rapidly building out its living accommodations to keep up with its population growth. One of the neighborhood's newest luxury rental residences, commonly referred to as 525, is a 445,000-square-foot, mixed-use space that includes 392 high-end rental units and over 35,000 square feet of lifestyle and recreational amenities.

### *Tight Fit*

In 2016, Martin Associates was contracted to design and install the building's HVAC system. With more than 35 years' experience working in the New York area, the Martin team is accustomed to working in tight spaces. Anthony Cicchetti, Martin's project manager, immediately recognized the unique complexities of 525, including a smaller-than-normal mechanical room, even by New York City standards.

"This job was pretty typical for us except that the mechanical room was smaller and more compact than normal," recalled Cicchetti. "This made our approach to the drawings and installation that much more

important. The system had to be designed and assembled efficiently."

With the resources of his in-house design team focused on several other projects and a deadline quickly approaching, Cicchetti started to feel the heat from Hell's Kitchen.

### *Counting on Coordination*

Having used Victaulic's grooved mechanical solutions on multiple projects in the past, Cicchetti knew Victaulic was the most logical pipe-joining method for the job. Using grooved products reduces installation times, and they can be easily installed within the tight space Martin had to work with.

The size of the mechanical room, however, presented a bigger challenge and required extremely accurate drawings. Victaulic reached out to Martin Associates to discuss its CPS and to offer assistance to Cicchetti and his crew. The timing was opportune, as the contractor's in-house drawing team had multiple projects already underway.

"I'm glad we were able to make it work on this one," explained Cicchetti. "Victaulic's drawing team knows the measurements and the nuances of design,

which ended up making this project incredibly easy and efficient."

As revisions or changes were made, updated drawings were sent to Cicchetti within hours, significantly speeding up the preconstruction phase. Victaulic sales and CPS teams worked alongside Martin Associates to fine-tune the building's piping system designs, utilizing every available inch of the tight mechanical space.



Combining Victaulic's grooved mechanical couplings with its CPS solutions significantly sped up Martin Associates' installation of an HVAC system for a new luxury apartment building in New York City. The Victaulic CPS team and Martin Associates worked closely together to fine-tune the building's piping system designs, utilizing every available inch of the tight mechanical space.

*“Victaulic’s drawing team knows the measurements and the nuances of design, which ended up making this project incredibly easy and efficient.”*

—Anthony Cicchetti, Project Manager, Martin Associates

“Our CPS team coordinated all aspects of the design, working to ensure all critical components were successfully integrated into the drawings,” said Danny McNamara, Victaulic’s sales manager. “And as with all of our projects, we offered Cicchetti and his team best practices, advice, and recommendations where we could.”

Cicchetti recalled how combining Victaulic’s grooved mechanical couplings with its CPS solutions exponentially sped up the installation phase of the project. Product was delivered to the jobsite on schedule, bagged and tagged so it could be installed in the right place and in the right order, which allowed the project foreman and the rest of the Martin team to focus on other important details.

“Just as the materials would arrive onsite from the fabrication shop, the couplings would show up, ready to

install,” said Cicchetti. “In just a week and a half, we had the boiler landed, piping up in the air, and the system connected and tested.”

Victaulic QuickVic™ Style 107N rigid couplings and QuickVic™ Style 177N flexible couplings were used to make the 2 1/2” to 10” connections on the condenser and chilled water lines, along with Series 732 Wye-Type Vic-Strainers®, Series 761 Vic™-300 MasterSeal™ butterfly valves, corresponding fittings, and IMI TA balancing valves.

“Being able to count the number of conflicts we had on one hand was a huge win,” said Cicchetti. “Additionally, we saw waste significantly reduced during the project. Depending on the job, we can sometimes have as much as 15- to 20-percent waste. Both of the factors helped make this job one of the more successful drafting projects I have had in the last five years.”

In addition to streamlining the drawing and installation processes and eliminating waste, Victaulic’s solutions played a large factor in the overall savings of the project, reducing overall costs by three to four percent, and providing invaluable customer service throughout the job.

“To be honest, I was a little hesitant at first, since Victaulic’s CPS team is located in Pennsylvania, which could make coordination a nightmare,” said Cicchetti. “It ended up being extremely well done and very seamless. The CPS team physically came to visit the site, returned phone calls almost immediately, and were some of the most pleasant people I’ve worked with.

“Grooved couplings definitely reduce installation times,” said Cicchetti. “But I choose Victaulic because Danny and his team are always one call away. That one-on-one connection is the difference-maker for me and will keep me coming back.”

*For more information, visit [www.victaulic.com](http://www.victaulic.com). MCAA thanks Victaulic for being a major sponsor of MCAA18 and for co-sponsoring the Golf Tournament.*

## HOW SPONSORS SUPPORT YOUR ASSOCIATION

When choosing a product or service for that next bid, give an extra edge to the companies that support your association.

Members of the Manufacturer/Supplier Council **cooperate with MCAA initiatives** that produce some of the association’s most valuable educational products.

In addition, MCAA’s Supplier Partners **support our annual convention** through their sponsorships, and their participation at the exhibit. They also **share the latest**

**products and services** year-round in our **Virtual Trade Show**.

Their **Smart Solutions Case Studies** showcase new technologies and cost-saving and productivity-enhancing applications in a case study format that lets you learn from other contractors’ experiences.

Visit [mcaa.org](http://mcaa.org) to learn more.

# Goshen Mechanical Accelerates Cash Flow, Eliminates Errors with MobiliForms

## System Pays for Itself in Two Months

Goshen Mechanical is billing on the same day as service, has eliminated lost work orders, and has increased customer satisfaction by adopting MobiliForms from iBusiness Technologies. Cash flow has accelerated from even larger customers, such as hospitals, that now pay in as little as four days when Goshen times the invoice submissions to synch with their accounts payable cycle. “We should have adopted MobiliForms a year ago,” said Chris Gaffney, co-owner of Goshen.

Goshen Mechanical is a full-service mechanical and construction company operating 24/7/365. Gaffney knew that going mobile was necessary, but finding the right solution delayed the move.

*“The MobiliForms system—including all iPads—paid for itself in just two months.”*

—Jim Gaffney, CEO, Goshen Mechanical Contractors

“The MobiliForms system—including all iPads®—paid for itself in just two months,” said Jim Gaffney, Chris’ brother and co-owner and CEO of Goshen. Goshen’s field staff completes service tickets, preventive maintenance inspections, and startup checklists using the same, familiar forms, but now through MobiliForms on iPads. Customer feedback has been great, as 95 percent of Goshen’s customers do not want paper.

With MobiliForms, Goshen’s timesheets and payroll have become more accurate, as information arrives

from the field in real time. Industry wisdom suggests that time cards completed at week’s end are more likely to be rounded up than down, and such payroll inaccuracies become quite costly. MobiliForms timesheets are identical to the paper versions and are sent instantly to the cloud or payroll personnel.

“MobiliForms has completely changed our business,” added Jim Gaffney. “We were also surprised how easily guys learned the process—it took four hours for the oldest field tech with no device experience. Since MobiliForms provides the identical forms on tablets, there’s virtually no learning curve and no staff push-back.”

MobiliForms does not require any change in backend software, so it is compatible with any accounting system. Goshen found it to be a perfect companion to its QuickBooks system, and they were able to launch MobiliForms quickly.

MCAA contractors need the best tools to survive and thrive amid today’s competition. Reducing costs, getting paid faster, and increasing customer satisfaction are critical for success.

For more information, visit [MobiliForms.com](http://MobiliForms.com) or contact Steve Metzman at 215-850-5565 or [steve.metzman@iBusiness-Tech.com](mailto:steve.metzman@iBusiness-Tech.com).



Goshen Mechanical Technician Ben Shumoski enters system data in MobiliForms for immediate processing by Goshen’s main office. By using MobiliForms, Goshen has eliminated lost work orders and sped up payments.