

# SMART SOLUTIONS

WINTER 2014

Helping contractors save money and enhance productivity



To meet the needs of the Joplin, MO, community, construction of Mercy Hospital Joplin is on a fast track. U.S. Engineering is relying on Trimble technologies to coordinate with the other MEP partners and achieve the goal of opening the hospital in 2015.

## U.S. Engineering Fast-Tracks Project Using Trimble Technology

### *Devastated by Tornado, Joplin, MO, to Get New Hospital in 2015*

The new Mercy Hospital Joplin in Joplin, MO, is on schedule to open in 2015, thanks in part to efforts by **U.S. Engineering**. To meet the needs of this fast-track effort to replace the former St. John's Mercy Regional Medical Center, destroyed on May 22, 2011, by an EF-5 tornado, U.S. Engineering used a host of **Trimble** solutions to establish one of the industry's most efficient, accurate, and repeatable design-to-fabrication-to-installation workflows ever put in place on a hospital project.

Mercy, the sixth largest Catholic health care system in the U.S., initiated plans to build the new \$335 million Mercy Hospital Joplin with a design-to-construction-to-commissioning goal of just three years. The decision was made early in the design phase to bring in the major MEP partners in a design-assist role, or modified integrated project delivery (IPD).

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## FW Spencer Tackles Transportation Challenge with Anaco Husky Couplings

### *Prefabricating Plumbing for San Francisco 49ers' New Stadium Cuts Costs in Half*

Prefabricating plumbing systems offsite can save time and money, but getting those systems to the jobsite poses its own challenges. For Levi's Stadium in Santa Clara, CA—future home of the NFL's San Francisco 49ers—**FW Spencer and Son, Inc.**, had to transport the high-capacity, back-to-back gang toilet systems that it had fabricated at its facility to the jobsite while maintaining

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Levi's Stadium, future home of the NFL's San Francisco 49ers, will have over 1,000 toilets and urinals. **FW Spencer** knew that using Anaco's Husky Couplings meant the prefabricated units would hold up during transport and onsite. Courtesy of San Francisco 49ers



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## 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.

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## Efficiency = Competitive Edge

Efficiency is key to maintaining your competitive edge. In this issue of *Smart Solutions*, read how contractors are using prefabrication to speed installation, as FW Spencer and Son did for a stadium's plumbing systems using Anaco's Husky couplings. Braconier found that Jay R. Smith Mfg. Co.'s solutions allowed for faster installation of their prefabricated systems. Palmer Christiansen used Victaulic grooved couplings to quickly install 130,800' of prefabricated pipe.

Still others are employing advanced technology to make the most of every job. Starco is using GRINNELL products and services to maximize efficiency. With Trimble technology, U.S. Engineering can locate thousands of points in a fraction of the time that traditional methods take. MMC Contractors credits Autodesk® Point Layout construction software with helping them shave weeks off a hospital construction schedule.

Innovative products increase efficiency as well. For a job requiring welding hundreds of feet in the air, Modern Piping saved time and enhanced safety using Miller Electric Mfg. Co.'s PipeWorx 350 FieldPro™ System. Broadway Mechanical-Contractors found that OmegaFlex's TracPipe CounterStrike® corrugated stainless steel tubing was easy to install and ideal for projects in earthquake-prone areas. For a campus retrofit, John E. Green met a rush deadline thanks to the unique heat fusion process for Aquatherm Blue Pipe®. Using Viega ProPress® fittings, MMC Contractors rapidly installed more than 15,000' of stainless steel piping in a new solar power plant.

Computer software for contractors continues to evolve. West Chester Mechanical Contractors, Inc., partnered with iBusiness Technologies to streamline operations by moving to mobile technology. By adopting WennSoft's Signature® system, Atomic Mechanical Services dramatically simplified its accounting processes, improved capabilities, and boosted productivity.

In this issue, learn how you can take advantage of expertise in the field to realize efficiency. Bradford White explains how to plan ahead for new energy efficiency mandates, and GPS Insight offers tips on what to look for in a GPS tracking system. Read how BMW Constructors partnered with Lifting Gear Hire for both equipment and planning expertise.

Environmental efficiency remains a key concern. For two Los Angeles buildings, ACCO Engineered Systems replaced aging technology with new BITZER compressors, helping their client qualify for a substantial municipal rebate.

I encourage you to support the suppliers who support your association by choosing their products and services for your next bid. Visit [www.mcaa.org/directory/supplierpartners.cfm](http://www.mcaa.org/directory/supplierpartners.cfm) for a complete list of MCAA Supplier Partners or find them in person at *MCAA 2014*.

A handwritten signature in blue ink, appearing to read "Mike Farrington".

Mike Farrington, Chairman

### Join me in welcoming our newest supplier partners:

- A-Gas RemTec
- Anaco/Husky
- Autodesk, Inc.
- Fastenal Company
- iBusiness Technologies
- Makita USA
- Wheatland Tube

## MMC Contractors Credits Viega ProPress With “Tremendous” Time Savings on Solar Power Plant Job

### *Finds Pressing Faster, Safer than Welding*

The speed and ease of installation with Viega ProPress® fittings, as well as overall lower costs, were significant factors for MMC Contractors as they installed more than 15,000’ of stainless steel piping in a new solar power plant in the southwestern United States. Jim Ed Thompson, project superintendent at MMC Contractors, said that by using Viega ProPress to join stainless pipe, MMC’s installers saved a significant amount of time per fitting.

The world’s largest solar power plant, constructed in 2013, will generate electricity using concentrating solar power technology. Covering an area of 1,900 acres, the plant has a 280-megawatt capacity, which is enough to power 70,000 homes while avoiding approximately 475,000 tons of carbon dioxide output.

Solar energy is here to stay thanks to renewable energy source regulations. The local metropolitan utility service contracted to purchase all of the power generated from the new station to meet the mandate that the state’s regulated utilities provide 15 percent of their electricity from renewable sources by 2025.

*“Pressing with the Viega system provides a tremendous time savings and makes the entire setup process much more flexible. It takes only seconds to join the pipe with pressing compared to over an hour if it had been welded.”*

— Jim Ed Thompson, Project Superintendent, MMC Contractors



Using Viega ProPress dramatically cut the time it took for MMC Contractors to join 15,000’ of stainless steel piping in a new solar power plant.

### *Project Specs Call for Viega ProPress*

“The original potable water plans for the solar power generation station construction had to be updated,” said Dan Goellner, industrial account manager at Viega LLC.

“It was essential that the system was compliant with the ASME B31 Piping Standard and was listed with the NSF-61G Zero Lead™ certification.” The updated project plans also specified Viega ProPress for stainless in the station’s construction plans for process water, service water, and instrumentation air systems.

By selecting Viega ProPress for stainless, the construction project saved more than 30 percent on materials and labor combined. The process water system is used for transporting waste water produced during cooling.

The service water system encompasses the emergency eye wash stations and safety showers at the power plant. The instrumentation air lines are used to regulate media flow using air pressure.

### *MMC Leads the Way*

MMC Contractors acted as the lead contracting company for the Viega ProPress installation. At any given time during construction, as many as 2,000 installers were onsite. Although MMC had experience with Viega ProPress on copper systems, all of the contractors installing the system took part in training with Viega representatives.

“Our team’s training on Viega ProPress for stainless was quick and easy but it was also thorough,” said Thompson. “Pressing with the Viega system provides a tremendous time savings and makes the entire setup process much more flexible. It takes only seconds to join the pipe with pressing compared to over an hour if it had been welded.”

Thompson pointed out that Viega’s system saves more than time. “Aside from being quick, there’s an additional

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# West Chester Mechanical Goes Digital with iBusiness Technology, Saves Time and Money

## Apple iPads Replace Mountains of Paperwork

To streamline the large amount of paperwork generated by each project and jobsite and to make it easier for key project team members to access, share, and update information, **West Chester Mechanical Contractors, Inc.**, partnered with **iBusiness Technologies** to convert their processes and project documents to mobile, digital formats. The move was prompted by recommendations from both the MCA of Eastern Pennsylvania and Apple®.

The iBusiness Technologies team worked closely with West Chester Mechanical staff to understand current processes and design digital workflows to leverage the powerful, affordable MobiliData and MobiliForms platforms. “Our employees report that having instant access to critical data on iPads saves a tremendous amount of time and

allows them to resolve important project and customer issues quickly,” said Mark Rogers, chief operating officer of West Chester Mechanical.

### Focus on Customer Satisfaction

West Chester Mechanical has an ambitious, yet straightforward, mission: Satisfy all customers, all of the time. Rogers credits the West Chester Mechanical staff, from sales estimators and project managers to on-site technicians and subcontractors, for the company’s success since its founding in 1996. “Our staff is our most important asset and the

cornerstone of our customer satisfaction strategy. We believe that a staff dedicated tirelessly to serving our customers is the best sales and marketing tool there is,” he said.

West Chester Mechanical management offers their commercial clients a full range of services, including air conditioning and refrigeration, mechanical and industrial construction, energy, fire protection, renovations, and more. West Chester Mechanical generally works on large-scale projects, such as hospitals, universities, corporations, and laboratories, which require a sizable team of employees in the field at any given time.

Because of the variety and number of services performed at each jobsite, the ability of the West Chester

*“Our employees report that having instant access to critical data on iPads saves a tremendous amount of time and allows them to resolve important project and customer issues quickly.”*

—Mark Rogers, COO, West Chester Mechanical



Thanks to fully integrated mobile solutions from iBusiness Technologies, West Chester Mechanical’s John McNeila and Chris Kemner can access detailed project information onsite using MobiliData on iPads, saving time, improving communication, and reducing the potential for costly errors caused by missing paperwork.

Mechanical team to access data instantly while in the field is crucial. Historically, all job-related paperwork—including time sheets, daily logs, submittals, change orders, estimates, materials lists, drawings, schedules, and contracts—was kept in a paperwork folder for employees to borrow and access. This method was time-consuming, requiring employees to halt their work to seek out and update paperwork and notify other team members of changes and updates. This process was also cumbersome and costly. The company was concerned that critical, constantly-changing information might not reach team members in a timely manner and that important documents for multi-site jobs could be lost even with the most diligent and conscientious staff.

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## Modern Piping Increases Productivity and Safety in the Field with Miller Electric's Multiprocess Welding System

Modern Piping Inc. put the PipeWorx 350 FieldPro™ System from Miller Electric Mfg. Co. to work to save time and enhance safety for a job where some welding took place hundreds of feet in the air, far away from the power source. International food and agricultural producer Cargill had purchased an unfinished corn wet-mill ethanol plant in Fort Dodge, IA, in 2011 and contracted with Modern Piping of Cedar Rapids to complete the construction on an aggressive schedule.

The facility has the capacity to grind 150,000 bushels of corn each day and produce 115 million gallons of ethanol per year. Before production could start, however, Cargill needed to finish construction on the facility and bring it up to Cargill standards for quality and safety.

### *Remote Control Saves Time, Increases Safety*

Modern Piping used the PipeWorx 350 FieldPro system at the Cargill site for stick and TIG welding. The FieldPro machine can also be used for MIG and flux-cored welding, as well as the advanced technologies of pulsed MIG and regulated metal deposition (RMD), a modified short-circuit process. The optimized welding performance offered by the system specifically meets the needs of open-root pipe welding and helps reduce training time.

Modern Piping was tasked with laying out, fabricating, and installing the ethanol plant's piping systems, including multiple process piping systems, compressed air lines, vacuum piping, chemical lines, cooling water supply, and return and steam. Much of the welding involved schedule-10 stainless steel pipe that had to be welded in elevated areas, requiring the use of scaffolds and manlifts. The remote



Thanks to the remote control capabilities of Miller Electric's PipeWorx FieldPro System, Modern Piping workers could make process and parameter changes at the weld, saving time. The feature also increased jobsite safety by reducing trips up and down stairs and ladders to change welding processes and parameters at the machine.

control capabilities of the FieldPro System saved time by allowing process and parameter changes at the weld. The feature also increased jobsite safety by reducing trips up and down stairs and ladders to change welding processes and parameters at the machine.

"It's good for us because it increases productivity, improves value to the end-user, as well as reduces safety concerns. There is great value to have a system that is very safe," Modern Piping President Ken Brown said.

### *Made for the Field*

Constructed to withstand the rigors of field use, the simplified cable management of the PipeWorx FieldPro saved Modern Piping journeyman pipefitters time by eliminating the communication cables that cause clutter on jobsites. Journeyman pipefitters using stick and TIG processes were able to change process selection, amperage adjustment, and stick electrode selection remotely, and the push-button process

changeover eliminated the need for swapping cables.

In addition, workers were able to reduce the likelihood of weld defects because the correct polarity is automatically set for each welding process. The FieldPro System alerted Modern Piping journeyman pipefitters if the weld cables were connected incorrectly. The machine's ability to set optimal parameters automatically improved quality control by helping ensure a consistent bead profile and by minimizing defects caused by incorrect welding parameters, such as porosity or lack of fusion. Each setup of a new weld process is done with the touch of a button, so the streamlined system helped avoid downtime and focus on the weld.

"It's nice to have it within arm's reach," said Tony Hensley, a journeyman pipefitter with UA Local 125 in Cedar Rapids who worked on the project. "Every time you have to go

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## Palmer Christiansen Cuts Costs, Installation Time with Victaulic Grooved Products, Keeping Salt Lake City Courthouse on Schedule

With 24 months to install 130,800' of pipe, Palmer Christiansen Company relied on Victaulic for high-quality systems that reduce labor costs and installation time. As a result, the new federal courthouse in Salt Lake City, UT, is expected to open in March 2014, with the mechanical system coming in on budget and ahead of schedule.

The building, located in downtown Salt Lake City on the same site as the former Frank E. Moss Courthouse, was designed to be a noticeable presence in the city's skyline. The 10-story building has a glass façade and stands an impressive 200' tall. The facility was built to achieve LEED Gold certification, and the interior flaunts 21' ceilings to give the feeling of grand courtroom spaces.

### Mechanical System Poses Challenges

As a result of the design, the 375,000-square-foot building needed to accommodate high loads, and the central plant had to be sized to provide service to an adjacent federal courthouse. Palmer Christiansen, which specializes in installing large, complex mechanical systems often associated with hospitals, semiconductors, clean rooms, and research laboratories, was selected for the project.

"The boiler room and chiller room in the federal courthouse were two of the largest mechanical rooms



"The size of the building and size of the load were huge and the downtown site provided us with very little space to lay materials," said Brett Christiansen, president of Palmer Christiansen, so his company prefabricated the piping and assembled it onsite using 3D renderings, minimizing installation time and cutting costs.

that we've ever done," said Brett Christiansen, the third-generation president of Palmer Christiansen, whose grandfather founded the firm in 1946. "The size of the building and size of the load were huge and the downtown site provided us with very little space to lay materials."

In addition to the 3,500-square-foot boiler room and 3,200-square-foot chiller room located in the basement, 30 air handlers were housed in the additional 28 mechanical rooms,

with two located on every floor, including the roof and basement. Knowing that the project was specified to include large amounts of grooved end fittings, the contractors turned to Victaulic for support. Palmer Christiansen has been partnering with the manufacturer of grooved mechanical systems for about 40 years and knew Victaulic could deliver high-quality systems that reduce labor costs and reduce installation time.

"We were an early adopter of Victaulic technologies, and we see them as the leader in developing grooved mechanical systems," said Christiansen. "As partners, they help us work smarter and more efficiently, and we knew Victaulic products would deliver labor savings on this particular application."

### Planning and Prefab Address Space, Time Constraints

To increase efficiencies on the job, the contractors used 3D renderings and prefabricated the HVAC piping offsite using automated Victaulic roll grooving equipment for standard and large-diameter piping. To address the tight working conditions, Palmer Christiansen shipped the piping just in time and assembled it onsite. The piping included sizes up to 20" for the condenser water, chilled and hot water, a glycol snowmelt system, and domestic water system. For the 20" condenser water line, Palmer Christiansen relied on Victaulic Advanced Groove Systems (AGS) to join the large-diameter piping. The domestic water system used Victaulic copper grooved systems and dielectric waterway fittings for transitioning between materials. Victaulic flexible couplings helped to reduce motor vibration off the pumps, cooling towers, and air handlers, minimizing the transfer of vibration into the building.

*"As partners, [Victaulic] help[s] us work smarter and more efficiently, and we knew Victaulic products would deliver labor savings on this particular application."*

— Brett Christiansen, President, Palmer Christiansen

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## Starco Maximizes Efficiency on School Project with GRINNELL Products, Services

### **Prefabrication Helps Small Firm Thrive in a Tight Market**

To win the bid for a new Early Childhood Learning Center in Dayton, OH, **Starco, Inc.**, proposed using **GRINNELL** products to speed installation time and **GRINNELL Mechanical Services (GMS)** to plan ahead for maximum efficiency. Northmont City Schools, based on the outskirts of Dayton, broke ground on the Early Childhood Learning Center in 2012, and Starco was awarded the hot and chilled water services for the project in 2013.

The new structure brings together the district's entire kindergarten, first-grade, and special needs pre-kindergarten students in one, standalone building. It enables the district to consolidate resources and improve focus on supporting those pivotal educational years. The new facility will also relieve overcrowding of the district's existing elementary schools, which will now support fewer grades.

During the bid process, Starco, a small mechanical firm of approximately 20 employees, knew they would have to deliver a solution that was both efficient and effective. Project leads considered various options when designing the system for the Learning Center. The facility had to connect multiple air handling unit hook-ups, as well as VAV connections. To speed up the installations, Starco planned the hot and chilled water systems throughout the building using **GRINNELL** grooved steel piping, 2-1/2" through 6" in the mechanical room, and up to 2" **GRINNELL** G-Press Copper press in the distribution piping.



To speed up installation of multiple air handling unit hook-ups and VAV connections in Dayton's new Early Childhood Learning Center, Starco used **GRINNELL** grooved steel piping, 2-1/2" through 6" in the mechanical room, and up to 2" **GRINNELL** G-Press Copper press in the distribution piping.

*"Communication is 100 percent of why we're so successful. ... Upfront attention to detail is a big thing, and you have to work together as a team to manage projects effectively."*

— Tony Johnson, Project Manager, Starco

### **Communication Is Key**

To further reduce time on the job and maximize the effectiveness of their limited staff, Starco project leaders turned to **GMS** to create the drawing package and lay out the project ahead of time. Starco provided on-site measurements and communicated their overall plan to the **GMS** team, which then provided 3D isometric drawings. The drawing package listed the elevations and pipe lengths and labeled the fittings and components in the mechanical room and distribution piping in the building. Throughout the project, Starco resources handled the coordination with other trades, discussing construction site changes and options with the **GMS** team.

Tony Johnson, project manager for Starco, said, "Communication is 100 percent of why we're so successful. If all the participating parties don't work together, something can go

wrong at any or all stages of your measurements, drawings, fabrication, or installation. Then it doesn't matter what you quoted or how fast your installers are. Upfront attention to detail is a big thing, and you have to work together as a team to manage projects effectively."

Planning and cooperation were key for Starco. Johnson noted, "If we show up in the field with a huge trailer of prefabricated materials that don't work, it would have an impact on our bottom line. That's why we had near daily conversations and e-mail exchanges with the **GMS** team about what they thought would work best and what we thought needed to change."

Johnson appreciated the close relationship between **GMS** and Starco. "The **GMS** designer was very

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## Support the Suppliers Who 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 play an increasing role in MCAA's commitment to lifelong learning by participating in a number of educational ventures. Over the past several years, the Manufacturer/Supplier Council has had the opportunity to cooperate with MCAA initiatives that produced or are in the process of producing 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 publish the semi-annual *Smart Solutions* newsletter to showcase new technologies and

promote cost-saving and productivity-enhancing applications.

Learn more about MCAA's Supplier Partners and find contact information for the key individuals who can assist with your next project in the *MCAA Membership Directory & Buyer's Guide*. Then, plan to meet your supplier partners in person at the Annual Manufacturer/Supplier Exhibit at *MCAA 2014*. You will have an opportunity to learn about new products, see new technologies demonstrated, find new services, get solutions to your challenges, or stop by just to say hello and renew acquaintances.



Supplier Partners also can be found at MSCA's annual conference and select MCAA meetings. And, their websites are easily accessible via links at [www.mcaa.org/directory](http://www.mcaa.org/directory).

***When contacting MCAA's Supplier Partners, remember to thank them for all they do for your association.***

## VICTAULIC

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"In comparison to other grooved systems, Victaulic AGS couplings are about 15 percent faster to install because they use only two bolts in comparison to four," said Kevin Rasmussen, project superintendent at Palmer Christiansen. "The Quick Vic style couplings also give us a huge labor savings because they don't have to be disassembled to install, so we don't lose parts and can reduce warehousing."

Rasmussen added that the mechanical contractors at Palmer Christiansen pride themselves on being craftsmen, and Victaulic represents top quality in grooved systems that help the firm uphold its reputation.

"In the 30 years that I've worked with Victaulic, I have never been called back to the jobsite to fix a problem," said Rasmussen. "Because of that, my preference is to work with Victaulic every opportunity I get."

Christiansen echoed the sentiment. "Victaulic has the best engineering group that we deal with," he said. "They are exceptional problem-solvers, so we're big believers in Victaulic and grooved piping to help us be more competitive on jobs. We've done a lot of our high-profile projects with Victaulic, and they delivered again on the federal courthouse project in helping us increase efficiencies and achieve labor savings."

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

***MCAA thanks Victaulic for being a major sponsor of MCAA 2014.***



## John E. Green Company Earns High Marks for Campus A/C Retrofit Using Aquatherm's Blue Pipe and Heat Fusion

To install a central air conditioning system in a high school campus' main residence building during the short summer break, **John E. Green Company** called on **Aquatherm** for an easy-to-install, in-ground piping solution that allowed them to meet the rush deadline. The Aquatherm piping also proved to be an environmentally friendly solution for the University of Detroit Jesuit High School and Academy (U of D), addressing concerns about the potential problems of burying pipe.

The highly respected U of D was founded in inner-city Detroit in 1877. Most of the campus was

built in 1930 and renovated in the mid-1990s. The 50,000-square-foot residence building originally housed the school's priests but now serves as counseling, meeting, and administration space. A boiler house located 120' from the residence building originally contained a coal-fired boiler that served radiators in the school. In recent decades, the boiler house was upgraded with modern equipment, including water source heat pumps, and configured for future expansion.

### *Summer Rush Job*

The project's design was fairly straightforward. Three new Daikin two-ton water source heat pumps

were installed in the residence building and tied in with existing valves in the boiler house. This arrangement would supply the main residence building with heat pump water and provide extra capacity for up to 20 new heat pumps in the residence building that will be adjoined to a new Science Wing addition scheduled for construction in 2014.

However, the 4" supply and return lines running roughly 120' between the boiler house and the residence building had to be buried. Neither Bob Williams, director of plant operations at U of D, nor Mark Bobrowski, senior mechanical engineer for preconstruction services with John E. Green, was enthusiastic about traditional pipe options for this application because of insulation and lifecycle concerns.

Bobrowski (a U of D alumnus) said Aquatherm's polypropylene-random (PP-R) pipe system "seemed like a great fit" for this job. "You wouldn't put normal plastic pipe in the ground for this application—and I don't like putting pipe in the ground at all—but with this product I'm not worried about it."

One of the reasons Bobrowski and Williams were comfortable direct-burying Aquatherm Blue Pipe® was the heat fusion connection method, which heats pipe and fitting on a 400–500° F iron during the connection. This approach bonds the pipe at the molecular level without chemicals or mechanical connections and eliminates systematic weaknesses.

Once the trench was dug, the building penetrations completed, the proper fusion welding equipment rented, and the Aquatherm training course completed, the crew fused 4" Aquatherm Blue Pipe. "We just basically threw it in the ground—I watched the guys do the installation and it was pretty

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John E. Green workers were new to the heat fusing technique for Aquatherm Blue Pipe (shown here) but very quickly got the hang of it, cutting hours off the job.

## Easy Installation, Excellent Safety Profile Make TracPipe's CounterStrike Ideal Choice for BMC

**BMC Shaves 30 Days Off Schedule with OmegaFlex's Flexible Piping**



BMC chose TracPipe CounterStrike flexible gas piping for its ease of installation over traditional black iron pipe, and its superior safety performance in earthquakes made the product ideal for a San Francisco apartment complex.

For the gas piping in the new Candlestick Heights apartment complex in San Francisco, CA, **Broadway Mechanical-Contractors, Inc.** (BMC), chose **TracPipe CounterStrike®** because it is easier to install than traditional black iron pipe, saving BMC time and money. The fact that TracPipe CounterStrike, OmegaFlex's premier corrugated stainless steel tubing (CSST), provides vastly superior safety performance in earthquakes made the product the ideal choice for the job.

According to Robert Isom, BMC's director of procurement, "CounterStrike not only provided a substantial cost savings but allowed us to finish this project 30 days faster than it would have taken if we had used black iron."

CSST tubing was widely adopted following the 1995 Kobe, Japan, 7.2-magnitude earthquake, which killed over 5,500 people and destroyed over 300,000 homes. According to Tokyo Gas Company, there were over 11,000 reports of damaged indoor, low-pressure, steel gas pipes compared to just eight for CSST. Now, CSST is used almost exclusively in new construction in Japan.

OmegaFlex's product safety track record in earthquakes and other natural disasters made it ideally

*"[OmegaFlex's TracPipe] CounterStrike not only provided a substantial cost savings but allowed us to finish this project 30 days faster than it would have taken if we had used black iron."*

— Robert Isom, Director of Procurement, BMC

suited for use in the Candlestick Heights construction. The 198-unit complex is located adjacent to San Francisco's Candlestick Park, the site of the 1989 "World Series Earthquake," which shook the stadium with a 6.9-magnitude quake and halted play for 10 days.

OmegaFlex's TracPipe CounterStrike gas piping is manufactured in the United States and is listed by Factory Mutual for seismic resistance. In contrast, most rigid pipe is imported with little or no quality control and is not tested or listed to any national gas piping standards.

In 2012, the University of California, San Diego's Englekirk Structural Engineering Center simulated some of the largest recorded earthquakes on a hospital structure piped with CSST and traditional black iron pipe. The results were very clear: CSST withstood the tests without any failures, while the black iron pipe fractured. Ultimately, OmegaFlex's TracPipe CounterStrike provides these safety features at less cost than black iron pipe because of the ease of installation.

Over the past 20 years, over 750 million feet of CSST have been made and installed in the United States. While Candlestick Heights marks OmegaFlex's first San Francisco CSST installation, it certainly won't be the last, because TracPipe CounterStrike's superior safety record and cost-effective installation make it a natural fit for the Bay Area.

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

## Braconier Sees 50-Percent Labor Savings With Jay R. Smith Mfg. Co. Quarterback Water Closet Support

Minimizing installation time was an especially high priority for Braconier Mechanical & Plumbing Services' work on a children's hospital, so they used Jay R. Smith Mfg. Co.'s new Quarterback Water Closet Support for the project. Tom Stone, president of Braconier, said the Quarterback provided a 50-percent labor savings because it's quicker to build and assemble and more adjustable, offering more flexibility when compared with the older Linebacker model.

The Children's Hospital Colorado, Anschutz Medical Campus, in Aurora, CO, had been open less than 5 years when their reputation as one of the nation's leading hospitals led them to expand the still-new facility. In February of 2011, the hospital embarked on a \$230 million renovation and construction project, which included a three-story addition and renovation of 89,985 square feet of the existing structure. The renovations took place in active areas of the hospital that administered critical care to

patients. Throughout the project, all of the contractors were challenged to think outside the box to minimize the impact of the work on patients and caregivers.

### *New and Improved Design*

As any plumbing contractor who has worked on a health care facility knows, off-the-floor mounted fixtures are the standard, because infection control is paramount. Off-the-floor water closets make cleaning floors and walls efficient and thorough. Concealed water closet supports are essential to provide the proper structural support while relieving any loading from the wall structure.

The Quarterback Water Closet Support's new leg design provides easy front access to the securing bolts, allowing easy height adjustments even with adjacent wall framing. Four securing slots per leg allow for the securing of attachments and accessories. This design provides versatility in the prefabrication of water closet batteries while allowing the required

slope in the horizontal waste line. The redesigned legs also provide a better fit against the angle iron often used for prefabrication. When working inside a shallow chase, an offset in the faceplate moves the legs back, providing a rough in depth that is 3/4" shallower for singles and 1-1/2" shallower for doubles.

Another significant improvement is the new vent placement. Vent placement 2 3/8" from the centerline of the waste outlet eliminates interference with the water supply to the flush valve, especially in back-to-back applications.

### *Prefab Speeds Installation Time*

Most of Braconier's work on the hospital project took place in individual patient rooms, rather than public restrooms with multiple fixture installations. The project involved a mix of newly constructed patient rooms and, on some floors, rooms that had been shelled out during the original construction.

When working in the individual patient rooms, Braconier found it beneficial to start the water closet support setup in their fabrication lab. They unboxed and assembled the faceplate to the fittings, adjusted them to the correct fixture outlet roughing height, and sent them to the jobsite.

The labor savings that resulted from using the Quarterback Water Closet Support and assembling it offsite reduced Braconier's costs and added convenience. For the hospital project, however, Braconier found themselves in a situation where speed was especially important.

In the hospitals' Neonatal Intensive Care Unit (NICU), for example, the project called for converting a one-room unit, where patient beds were separated by curtain dividers, into individual rooms to give the families of these vulnerable patients privacy during a very stressful time in their

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The new design of Jay R. Smith Mfg. Co.'s Quarterback Water Closet Support provides versatility in prefabricating water closet batteries. Because they could assemble the units offsite, Braconier reduced costs and saved time while renovating Children's Hospital Colorado.

## TRIMBLE

continued from page 1

As part of the team, U.S. Engineering was contracted to handle the mechanical and plumbing design, fabrication, and installation of the entire project. Given the tight schedule and size and scope of the job, and the survey-accuracy positioning required for every component, U.S. Engineering knew it would have to draw on all of its technology expertise to keep the project on track.

### *Design to Fabrication*

The new 875,000-square-foot Mercy Hospital Joplin, designed to withstand a powerful tornado, will include beds for surgical services, critical care, women's and children's services, behavioral health, and rehab. The bottom three floors of the structure will include hospital space along with a seven-story patient tower and a four-story clinic tower rising above the hospital space.

The facility also incorporates heavy duty mechanical, plumbing, and electrical systems. A new 30,000-square-foot central utility plant

(CUP) will house emergency equipment and generators located away from the hospital with a strengthened exterior. Utility service access to the CUP from the hospital will be via a 450-foot underground tunnel.

The hospital mechanical and plumbing systems include the necessary components for fuel storage, air supply and return, chilled water, condenser water, HVAC, and plumbing, as well as piping for the tunnel between the hospital and the CUP.

For example, the CUP system includes three steam boilers and boiler feed pumps fed by a high-pressure 12" steam main. The CUP chilled water system includes three 2,000-ton chillers and three chilled water pumps with 24" supply and return mains from the chillers to the tunnel and chilled water return main from pumps to chillers. The CUP also has three cooling towers and three condenser water pumps connected by a 30-inch underground main.

For the project, all of the subcontractors were required to have 3D coordination capabilities. Because of the fast-track nature of the

project, the goal was to use the detailed 3D model, which would include all MEP elements, to issue construction documents and facilitate a speedier start to fabrication concurrent to contract documents.

Jeff Kiblen, U.S. Engineering's project manager of fabrication/3D coordination oversight for the mechanical and plumbing systems on the project, recalled, "We came on board in December 2011, and we were putting in deep underground by March 2012. Most projects of this scope and scale would require six weeks to complete drawings, issue documents, and finish detailing. Because of the modified IPD methodology, we had to be exponentially faster."

### *Tech Support*

The Mercy Hospital Joplin project broke ground in January 2012. Once the foundation and structural steel had been installed on the site and the first floor deck pour was complete, U.S. Engineering began installing the hangers and sleeves for the piping and sheet metal components that would be routed overhead.

Kiblen noted, "This was our biggest challenge on the project. On any given day, we'd need to locate hundreds of points on a given floor, which spanned over 100,000 square feet. At the beginning of the project, we had three Trimble RTS robotic total stations to be used by our six-to-eight-member field team." The pace of the project design, fabrication, and installation drove the need for more robotic total stations, which U.S. Engineering was able to rent from Trimble.

For the hospital project, the team used three Trimble RTS773 Robotic Total Stations connected to the Windows 7 Trimble Field Tablet and two Trimble RTS655 Robotic Total Stations



Using Trimble Robotic Total Stations, a U.S. Engineering worker in the field can lay out between 40 and 50 points an hour, which has helped the company locate more than 78,000 points for sleeves, embeds, floor penetrations, drains, and hanger supports so far in the new Mercy Hospital Joplin.

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## BMWC Safely Executes a Heavy Lift, Thanks to Lifting Gear Hire

### Cooperation and Planning Help BMWC Move Quickly, Save Costs

For a challenging project with a short timeline, **BMW Constructors, Inc.** (BMWC), partnered with **Lifting Gear Hire** (LGH), who not only supplied the appropriately sized, tested, and certified lift equipment but also expertise in developing a lift plan. As a result, BMWC set two 15' x 52' cooling tower unit sections inside an active, working refinery without disrupting day-to-day operations, completing the project on schedule and under budget. In addition to coordinating placement and use of a 550-ton crane, submitting an engineer lift plan for approval, and preparing the site to meet the project soil compaction requirements, BMWC was also responsible for removing the HVAC/scrubber units.

#### The Lifting Solution

Lifting Gear Hire provided the correct design configuration of the rigging and modular spreader beams to the structural engineer to create the critical lift plan. The quoting process used by LGH assisted the structural engineers in easily identifying equipment weight and capacities needed for calculations, as well as providing all of the safety certifications needed. "The involvement of LGH's team really built a high level of confidence with our client," states Dan Stegvilas, BMWC purchasing manager.

Stegvilas added, "LGH has also been proactive instead of reactive, and they are always available with the right tools and expertise when needed."

The lift design configuration was planned so that the same rigging equipment could be used for both critical lifts in different configurations as needed, further enhancing BMWC's cost- and time-savings. Modular spreader beams played a key role, allowing the project's structural engineer to adjust the equipment according to each lift quickly—within

the two-day time frame allotted for both lifts.

#### Ideal Outcome

The entire scope of work was completed in one week, with the critical lift taking place over a weekend. The project was completed without injury or incident, on schedule, and under budget as well. John Manta, BMWC vice president of marketing & sales, said, "Working with LGH is always a positive experience. From top to bottom within their organization, every individual that I've worked with or come across nationally has been 100-percent supportive of our company's efforts in all areas."

For more information, visit [www.lgh-usa.com](http://www.lgh-usa.com).



To set two 15' x 52' cooling tower unit sections inside an active, working refinery without disrupting day-to-day operations, BMWC worked with LGH to create a lift plan that maximized use of the heavy equipment, saving BMWC time and money.

## JAY R. SMITH

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lives. The NICU was to remain operational while the work was taking place. The last thing Braconier wanted to do was increase the stress on the patients and families there. Stone said the Quarterback helped Braconier workers get in and out of the area with as little disruption as possible.

In total, 50 water closet carriers were installed. The entire project is expected to be completed in April 2014.

Stone said of Jay R. Smith Mfg. Co., "The products are good or we wouldn't buy them. They listen to the feedback they get from contractors and use that feedback to review and innovate their product lines, helping customers meet demands of ever

tightening schedules in today's marketplace. They have a good inventory, so we're able to get what we need when we need it. Their customer service is second to none."

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

**MCAA thanks Jay R. Smith Mfg. Co. for being a supporter of MCAA 2014.**

## ANACO

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a strong joint with a rigid seal. They chose Husky couplings from Anaco because they are designed to withstand joint movement while maintaining full joint integrity.

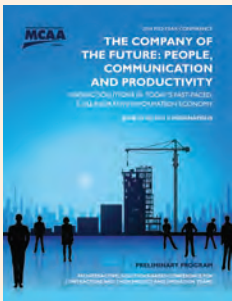
### *The Promise of Prefab*

Offsite prefabrication for plumbing reduces overall project costs by cutting labor costs and increasing efficiency. In addition, it allows multiple trades to coordinate. By prefabricating plumbing systems, contractors can identify any potential problems before the field work begins, saving time and cutting costs as much as 50 percent.

“One of the driving factors in the rise of prefabricated plumbing systems is the ability to improve productivity,” said Kevin Coyne, vice president



## MCAA Education, Resources Help Members Focus on Fabrication



Are you curious about the future of fabrication? Need to create buy-in company wide? MCAA's 2014 *Mid-Year Education Conference* has the information you need in a session on *The Future of Fabrication: Creating Buy-In Company Wide*. The interactive conference, which focuses on “The Company of the Future: People, Communication and Productivity,” emphasizes peer-to-peer learning. In addition to finding out which fabrication strategies have worked for your peers, you'll also learn about a variety of other strategies for increasing efficiency and

minimizing risks. Visit [www.mcaa.org/education](http://www.mcaa.org/education) to learn more and plan to join us June 23–25 in Indianapolis for what's sure to be an informative event.



Whether you've been thinking about making the jump into pre-fabrication or you want to ensure that your pre-fab processes are taking advantage of the latest technology and tooling, one of your MCAA member benefits can help. *The Pre-Fabrication Operations Guide for Plumbing* introduces pre-fabrication and explains how changing your company's culture to one that focuses on fabrication can yield benefits such as significantly reduced labor costs through productivity gains, reduced onsite installation timelines, increased quality and reliability of work and reduced waste. Get your free copy of this exclusive member benefit at

[www.mcaa.org/store](http://www.mcaa.org/store) or in the members-only area of MCAA's website.

FW Spencer prefabricated the plumbing lines for the new Levi's Stadium to save time and cut costs. Using Husky couplings from Anaco allowed them to air test the system at their facility and transport the complete system to the site without worrying about joint failure.

and chief estimator at FW Spencer. “Productivity is an important factor. By having the ability to control multiple elements of productivity, including project schedule, cost, safety, quality, and waste, it gives us a competitive edge in the marketplace.”

When joints fail on a jobsite, testing can be expensive and waste a lot of time in manhours. FW Spencer found that the Husky couplings all but eliminate the risk of a leak in the system and costly retesting.

Levi's Stadium will have the capacity for 68,500 spectators and provide over 1,000 toilets and urinals. FW Spencer chose the Husky HD2000 and Husky SD4000 heavy-duty high-performance couplings by Anaco for the project because of their prefabricated

continued on next page

plumbing trees. The rigidity and solid sealing qualities of Husky couplings allow them to withstand joint movement and maintain integrity. Their gaskets are molded from virgin Neoprene and have a unique rib design that provides multiple lines of defense against leakage. Their band-and-shield design is made from high-quality 304 stainless steel for maximum corrosion resistance and strength.

“By using the Husky Couplings by Anaco, we are able to air test the system at our manufacturing facility and then transport the complete plumbing systems to the building site without the worry that there would be joint failure. The Husky product is able to withstand the vigorous transportation movement from our factory to the installation site,” said Coyne. “It was a clear choice to use Husky that has had a reputation of producing high-performance couplings for over 30 years.”

#### *Designed for Durability*

Husky couplings are engineered to last through the lifetime of a building. They are able to withstand deflection caused by normal factors as well as extraordinary influences such as earthquakes. Husky high-performance, heavy-duty couplings are designed to withstand extreme forces, from the extended shield width to the additional stainless steel clamps, making them the ideal solution for critical projects, such as hospitals. Because of their design, they can tolerate movement and deflection far in excess of that anticipated in virtually any building application.

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

*MCAA thanks The Wade Group, which includes Anaco, for being a benefactor of MCAA 2014.*

## ACCO Installs BITZER Compressors To Breathe New Life Into Medical Office Towers

By installing new **BITZER** compressors to replace aging, inefficient, and unreliable technology, **ACCO Engineered Systems** of Glendale, CA, helped Cedars Sinai Medical Towers in Los Angeles improve the health of its two 11-story buildings. The upgrade not only met the needs of the building's inhabitants but also qualified for a substantial rebate.

The two 166,000-square-foot medical office buildings were in need of a mechanical upgrade. Each of the buildings had its own central plant made up of four 150-ton open-drive compressors that used 1950s reciprocating technology. In addition to being inefficient, the compressors and refrigeration components had been experiencing high failure rates.

ACCO conducted an engineering study to identify the system components that would deliver the best return on investment. They took into account the retrofit cost, energy efficiency, sound levels, ongoing maintenance costs, and reliability. Eight BITZER high-efficiency

CSW9573-160Y-4DU screw compressors were specified for the job.

The preeminent challenge for ACCO came in replacing 1,200 tons of cooling apparatus (coils, pipe, and compressors) without disrupting building operations during construction. The equipment was replaced in stages over four weekends. The job took five well-cho-reographed and specialized crews to accomplish the technically challenging changeover, ensuring that the new A/C system would be operational when the fully occupied towers opened for business each Monday.

BITZER is known for manufacturing reliable, relatively quiet semi-hermetic screw compressors that are well suited for direct expansion retrofits. This compressor upgrade, along with other system enhancements, justified a \$250,000 rebate from the Los Angeles Department of Water and Power.

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



ACCO installed high-efficiency BITZER CSW95 retrofit conversion screw compressors to replace the aging, unreliable compressors at Cedars Sinai Medical Towers in Los Angeles. ACCO's attention to selecting the most energy-efficient, reliable product to meet the client's needs resulted in a substantial rebate, justifying the costs. Image: BITZER US, Inc.

## VIEGA

continued from page 3

safety factor of not exposing anyone to the fumes produced from welding. Also, the system doesn't have to be drained fully in order to do repair work or make changes on it, which was another benefit."

### Quality Counts

Thompson explained that quality and consistent connections were important in the construction of the solar plant. "The foolproof connections that Viega ProPress for stainless provided were extremely valuable with so many different contracting companies working on the same systems installations on such a large-scale project," he said. "It was clear that Viega was offering an overall better product with Viega ProPress for stainless. Since Viega offers the larger-diameter sizes, we could do much more of the work with pressing than with other options. The speed of installation and the overall lower costs were also significant on this project."

The Viega ProPress system includes stainless steel pipe, valves in sizes ½" to 2", and fittings in sizes ½" to 4". Using Viega's revolutionary ProPress technology, installers can make watertight or airtight connections in less than seven seconds. The patented Viega Smart Connect® feature on all Viega ProPress systems guarantees easy identification of unpressed connections.

"It was a big project and there were a lot of deciding factors in the materials we specified in the plans," said

*"The foolproof connections that Viega ProPress for stainless provided were extremely valuable with so many different contracting companies working on the same systems installations on such a large-scale project."*

— Jim Ed Thompson, Project Superintendent, MMC Contractors



With as many as 2,000 installers on the solar plant jobsite at any given time, MMC Contractors, which oversaw the piping installation, appreciated the easy, foolproof connections achieved with Viega ProPress for stainless, as well as the safety benefits of pressing over welding.

Goellner, "Overall cost was important but we also needed materials that were quick and consistent to install and offered low maintenance. The goal was to be able to put it together and go."

"Viega's distribution channels came through for us and for the other contractors using it. We received all of our orders in a timely manner, helping keep the installation on schedule. It was clear that Viega offered the excellent inventory and delivery that a project with this magnitude requires."

For more information, visit [www.viega.net](http://www.viega.net).

***MCAA thanks Viega for being a major sponsor of MCAA 2014.***

## iBUSINESS TECHNOLOGIES

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### A Simple, Complete Solution

West Chester Mechanical management wanted a solution that was highly customizable, easy to deploy, and reliable and that required minimal maintenance. MobiliData provides instant access to critical project files from any Apple device. Files can be stored on the cloud or on company servers. Secure, two-way file exchange between office and field ensures all stakeholders have access to up-to-the-minute information. Flexible permissioning controls file access by job function. MobiliForms is a simple, complete iPad forms solution that enables companies to use their existing forms and checklists on Apple devices. MobiliForms returns field data instantly for immediate billing and streamlined operations.

iBusiness Technologies deployed two Apple servers and 35 customized iPads to tiered user groups who perform various job functions and need immediate access to project-specific content. The iBusiness team trained the West Chester Mechanical staff and provides ongoing mobile device management services.

"We are extremely pleased with the iPad solutions deployed by iBusiness Technologies," said Rogers. "Our workflow and internal communication process has been significantly streamlined."

For more information, visit [www.iBusiness-Tech.com](http://www.iBusiness-Tech.com). You are invited to attend the MCAA 2014 technology session *Demystifying Mobile Technologies*, where Steve Metzman of iBusiness Technologies will be a panelist.



## MMC Contractors Cuts Weeks Off of Hospital Project Using Autodesk's Automated Point Layout

MMC Contractors credits Autodesk® Point Layout construction software with helping them shave weeks off the construction schedule for the Martin Army Community Hospital at Fort Benning, GA. “The time and accuracy benefits we realized on the project are a great example of why we moved away from manual point layout processes,” explained Keith Flowers, vice president of construction planning for MMC Contractors. “When you can do things faster and more efficiently, you’re more competitive.”

The 745,000-square-foot facility will replace an aging hospital and serve military members and their families. It features 70 inpatient beds and additional intensive care, surgical, maternity, and psychiatric beds. Kansas City-based MMC Contractors has experience with health care projects and embraces new technology, such as the

advanced point layout technology used on the project.

### *Transitioning from Manual Point Layout*

In a traditional point layout process, MMC Contractors used manual measuring devices and calculations to install points in the field. Paper 2D drawings guided the process. Small errors had the potential to cause major rework, so field staff spent significant time on every job getting it right. Today, MMC Contractors creates points in Autodesk Point Layout software and installs them in the field faster and more automatically using a total station.

“The old process required people to interpret drawings in the field and then pull a string line and mark the points,” said Brian Muggy, MMC Contractors’ building information modeling (BIM) superintendent. “Misinterpret something and you’re off. The model-based designs used on large projects today make it easier to achieve such a high degree of precision with activities like prefabrication and coordination. We wanted to bring that efficiency and precision into the way we installed points.”

### *A New Point Layout Workflow*

MMC Contractors’ point layout workflow on the Martin Army Community Hospital looked quite different than one that relies on traditional processes. After receiving the designs from the engineers, the MMC

*With Autodesk Point Layout software, “[i]t’s faster to install the points, but you gain even more time by speeding up the whole process by not having to drill the concrete.”*

—Patrick Marshall, Assistant Superintendent, MMC Contractors



MMC Contractors took advantage of Autodesk BIM 360™ Field and Autodesk BIM 360™ Glue® cloud-based services, giving them access to project information on mobile devices onsite. “They used that information to save even more time while delivering a higher-quality product,” said Keith Flowers, vice president of construction planning.

Contractors BIM team added more detailed construction content. They then worked with the other trades on the project to create a model in Autodesk Navisworks® project review software that aggregated all the designs. Using clash detection tools in the software, they coordinated the project and addressed interferences.

Before going to the field, the MMC Contractors BIM team uploaded the coordinated model into Autodesk Point Layout to create points for items they needed to install, such as for pipes and other components. They exported the points into their total station, and installed them in the field.

“We expected to gain time and accuracy in the field by using a more automated point layout process,” said

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## AUTODESK

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Muggy. “Where we’ve been pleasantly surprised is that it’s faster in the office, too. We no longer have to annotate drawings with dimensions. In the past, we had to put two dimensions and an elevation on every location that needed to be called out. Considering that drawings are already packed with material notes, the designs stay cleaner and easier to read.”

### *Saving Weeks in the Field*

In his role as an assistant superintendent for MMC Contractors, Patrick Marshall experienced the real-world impact of faster, more accurate layout installation firsthand on the Martin Army Community Hospital project. “We used Autodesk Point Layout and total stations to lay out just about everything on the project,” he said. “For example, laying out the points for the 300 to 500 concrete hanger inserts per floor was night and day compared to manual processes. We just set up the total station at the control point on each floor, and it then knew exactly where it was—and where all the assigned points should be.”

In the past, contractors would have waited until the concrete was poured to lay out points for the installation of the hangers for each floor. They then would have measured the points onto the poured floors using traditional manual methods. Placing hangers at these points involved drilling holes into the concrete. The process would have taken as much as a month per floor.

MMC Contractors’ new point layout process didn’t require that floors be poured first. A team of two used a



Using the Autodesk Point Layout and a total station, MMC Contractors slashed time spent laying out points in the field, and because the process didn’t require that concrete floors be poured first, they saved as much as three weeks per floor installing the hanger points and hangers for the new Martin Army Community Hospital.

total station loaded with points created in Autodesk Point Layout software to locate each hanger. They were able to install all the points for the hangers and the hangers themselves in under a week per floor, saving as much as three weeks per floor.

“It’s faster to install the points, but you gain even more time by speeding up the whole process by not having to drill the concrete,” said Marshall. “We could go in right after the decking was installed. There’s no need to use walls or concrete as a reference. The process is safer, too, because you avoid having to drill holes over your head into concrete. You just lay out points, install, and move on to the next floor.”

### *More Information Onsite*

MMC Contractors used other technologies on the Martin Army Community Hospital project that let them take rich building design and

model information into the field. In addition to Autodesk Point Layout and total stations, MMC Contractors took advantage of Autodesk BIM 360™ Field and Autodesk BIM 360™ Glue® cloud-based services. These services let MMC Contractors’ team access project information on Apple® iPad® mobile devices at the point of construction. Marshall, who is a member of the UA Local 533, said, “I can see value in unions helping to train members in the use of this kind of layout and mobile technology. This is the wave of future.”

Flowers added, “It’s hard to imagine going back to completing projects like the Martin Army Community Hospital the old way. Being able to take the precision of models into the field added significant value throughout the project. We gave our people tools that let them access more than twice the information in less than half the time, as compared to older methods. They used that information to save even more time while delivering a higher-quality product.”

For more information visit [www.autodesk.com/point-layout](http://www.autodesk.com/point-layout).

*“We expected to gain time and accuracy in the field by using a more automated point layout process. Where we’ve been pleasantly surprised is that it’s faster in the office, too.”*

—Brian Muggy, BIM Superintendent, MMC Contractors

## TRIMBLE

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connected to Nomad handheld units. The Trimble robotic total station units integrated radio frequency communication capability instead of Wi-Fi, ensuring no loss of signal.

“The military-grade radio has made a huge difference in connectivity and communication throughout the project,” said Kiblen.

### *Point-to-Point Precision*

Once design of the mechanical and plumbing systems was coordinated and approved, U.S. Engineering used Trimble Point Creator for CAD and Revit (TPC) to create 2D and 3D field points within Revit.

“This was the first time that we had used TPC to this magnitude. One great advantage of the tool is the ability to break systems up into more manageable sizes,” said Kiblen. “For instance,

the mechanical systems might be broken up as third-floor patient tower exhaust, return and supply air.”

Once the team was ready to move into the field, the points were exported to a Trimble Field Link for MEP robotic total station to lay out the floor penetrations and hanger support embeds.

“Overall, it took us two to three weeks to complete each floor, including setting units, triangulating, and then positioning,” said Kiblen. “On average, the field layout person can routinely layout between 40 and 50 points an hour in good conditions.”

To date, U.S. Engineering has completed the design of the mechanical and plumbing systems and located in excess of 78,000 points for sleeves, embeds, floor penetrations, drains, and hanger supports. U.S. Engineering has also used the TPC and Trimble Field Link for MEP connection to verify as-constructed

conditions with the architectural floor plan.

In terms of accuracy, U.S. Engineering is very satisfied. Kiblen said, “Any inaccuracy, especially with sleeve layouts in walls for plumbing, would have created significant fit problems. We needed to be within .25 inches or .5 inches because of the density of ceiling spaces and tight coordination with all the other systems. Thus far, we’ve realized incredible accuracy thanks to our 3D model-to-field workflow.”

The building exterior was completed in November 2013, and the CUP is scheduled to be operational by March 2014—just over two years after construction start, with the main structure expected to open in early 2015.

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

## MILLER ELECTRIC

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up and down on that ladder, that’s another possibility that you could get injured, that you could drop something, and that causes problems. That’s something you don’t want.”

These capabilities are important because many jobsites, like the Cargill plant, are expansive. Modern Piping workers sometimes were 200 feet in the air.

### *PipeWorx Saves Time, Money*

With the PipeWorx 350 FieldPro, the ability to make adjustments quickly from the weld site also helped save time and money. “It’s speed more than anything else—the efficiency that you get from this machine and this equipment, especially the FieldPro Remote, being able to turn up and down your amperage when you need that done,”



The simplified cable management of Miller Electric’s PipeWorx FieldPro saved Modern Piping journeyman pipefitters time by eliminating the communication cables that cause clutter on jobsites.

said Hensley. “It’s right there, it’s right next to you. It’s a tool in your toolbox that makes you that much better.”

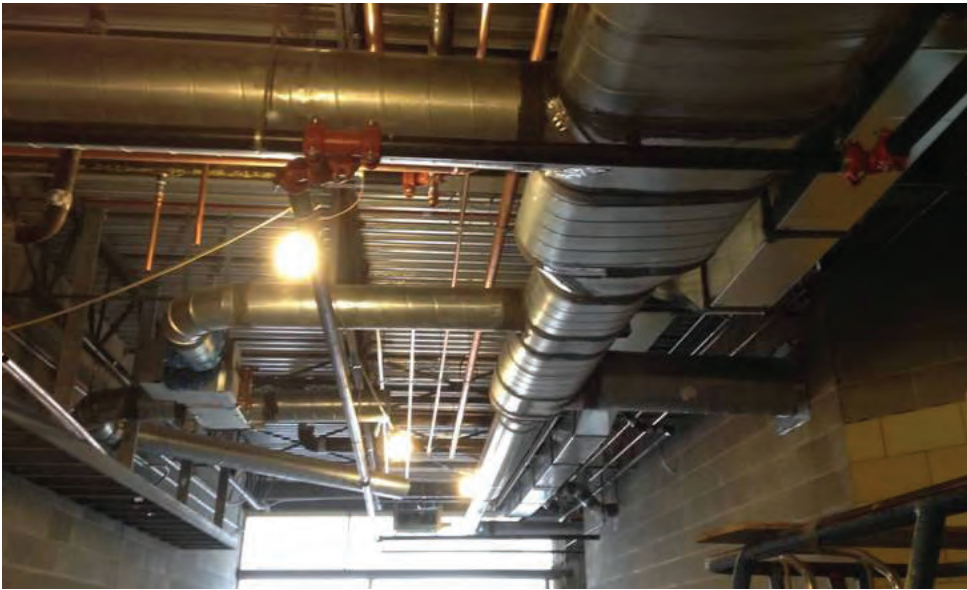
That ability to make finite adjustments at a rapid pace without interrupting the work for long stretches resulted in improved job quality and productivity.

“It does give us the ability to provide a higher quality weld because we can make those adjustments when we need to, in the right location,” Brown says.

According to Brown, the PipeWorx 350 FieldPro System provided many benefits for Modern Piping. “One of the goals of Modern Piping is to be so good that we don’t have competition, and the FieldPro System is another step in that direction,” Brown said.

Thanks to the system, Modern Piping more efficiently completed several months of work to ready the Cargill plant for grinding corn to produce ethanol and other bio-based products. The PipeWorx 350 FieldPro kept Cargill on schedule to open the facility, and continues to make Modern Piping more competitive.

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



To reduce time on the job and maximize the effectiveness of their limited staff, Starco turned to GMS to create the drawing package and lay out the project ahead of time. Partnering with GMS “allow[s] us to do what we do best—focus on our service and quality installations,” said Starco Project Manager Tony Johnson.

## GRINNELL

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flexible and supportive of incorporating our ideas. Services like this allow us to do what we do best—focus on our service and quality installations,” he said.

### *Prefab Pays Off*

Once the drawings were complete and materials such as grooved and press pipe were tagged, Starco’s experienced team assembled most of the large lengths offsite and later transported them to the construction site for installation. Although their prefab shop has been up and running for several years now, Johnson admitted not everyone was always on board with the idea of prefab.

“Lots of us were skeptical in the beginning,” he said. “Prefabricating takes a lot of the manpower and information upfront, and you only get out what you put in. You spend a lot of time in the beginning making sure what you’re drawing, ordering, and engineering is right.”

Again, Johnson pointed to good communication. “The coordination between the field, the office, and GMS services can seem daunting, but the GMS team worked with us along the way. At the end, we had better control of all the project variables, a solid materials list and tracking, and now everyone loves it. Prefab reduces our waste, and the GMS drawing package gives us one plan that brings our team together,” said Johnson.

Johnson also shared, “I think Starco has a really open mind. We all know that we don’t do things the same way we did 25 years ago—projects are more complex today and vary with the ups and downs of the economy. You have to be willing to discuss different technologies with new people like we did with the GRINNELL Mechanical Services team. When a company stops entertaining new ideas, they get rolled over.”

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

*MCAA thanks GRINNELL for being a major sponsor of MCAA 2014.*

## AQUATHERM

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slick,” said Williams. “The guys ... were brand new to the system themselves, but once they got a few fusion connections done, it went pretty good and quick, and I think we took several hours out of the job, because the installation went so well,” he added.

### *Savings on Multiple Levels*

Quick installation was important because the 6’-wide, 5’-deep trench was exposed for part of the project. The team budgeted for an excavator operator to remain onsite for eight or nine days, but the work only took six days. “If we had put steel or welded pipe in, it would have taken a lot longer. It went fast, faster than we were expecting,” Bobrowski noted.

Using Aquatherm instead of steel pipe delivered insulation savings. “Since it’s heat pump water, it’s not too hot or too cold and the [Aquatherm] pipe has some insulating value so we didn’t need to insulate it in the ground,” Bobrowski explained.

### *A Good Green Choice*

Williams liked that PP-R is environmentally friendly. “We always look to use green products, but ... that isn’t our main concern because when you ‘do green’ oftentimes it costs you a lot of ‘green’ and we can’t kill a project because of that. But we always look at ways of doing things green, and obviously Aquatherm is a green product.”

As the new four-story Science Wing will be a showcase of cutting-edge, environmentally friendly products, U of D is considering Aquatherm for the

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John E. Green found Aquatherm Blue Pipe to be “a great fit” for upgrading the piping at the University of Detroit Jesuit High School and Academy because it was easier and faster to install than steel or welded pipe, allowing them to save time on this rush job.

domestic water supply and HVAC pipe systems in that building. Aquatherm pipe’s 10-year multi-million-dollar warranty and the fact that PP-R is not targeted by scrap thieves are other benefits that might impact the decision.

With one successful job complete, John E. Green plans to use Aquatherm on other jobs. “I put this product in the ground and I’m not going to have to worry about it deteriorating or leaking. We even looked into whether we would be able to drive heavy equipment over it and that checked out okay too. I’m not a fan of putting pipe underground, but this was a good option,” concluded Bobrowski.

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

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# 2015 Energy Efficiency Mandates Will Affect Water Heater Installations

## Bradford White Highlights Potential Pitfalls, Opportunities

The Department of Energy's (DOE's) new energy efficiency mandates, which take effect April 16, 2015, will require higher energy factor (EF) ratings on virtually all residential gas, electric, oil, and tankless gas water heaters. These changes will impact how water heaters are manufactured, distributed, and installed.

### Energy Efficiency Requirements Increase

The EF is the ratio of useful energy output from the water heater to the total amount of energy delivered to the water heater. The higher the EF, the more efficient the water heater. While all affected models will see an increase in the EF requirement, the most dramatic changes are in larger capacity models (see the table). The DOE established the EF requirement for residential gas and electric water heaters over 55 gallons to drive manufacturers to implement new, more energy-efficient technologies. While the new rule does not require a specific technology, the only currently viable options to meet the EF requirement over 55 gallons are heat pump water heaters for electric and high-efficiency condensing technology for gas water heaters.

### Potential Changes in Size, Other Factors

Electric water heaters, already very efficient, will likely require more insulation, increasing the diameter or height of the water heater or both. Additional insulation may be required for piping and fittings such as drain, temperature, and pressure valves. For electric water heaters over 55 gallons, the only currently available technology that meets the EF requirement is a heat pump water heater.

To meet the required minimum EF, gas models may need additional insulation, newer flue baffling technologies (including flue dampers), electronic ignition in lieu of the standing pilot, or a combination of these. Again, the likely impact will be an increase in the overall product size, especially in diameter. For gas water heaters over 55 gallons, high-efficiency, fully condensing combustion technology will be required, so line voltage and a means for condensate disposal will be needed. Much like gas products, oil-fired water heaters will likely incorporate additional insulation or completely new combustion systems.

The new minimum EF for tankless (instantaneous) gas will increase from .62 to .82. Most tankless water heaters currently have EF ratings of .82 or better.

### Impact on the Installer

Employees will need training to get up to speed on the new technologies. While manufacturers and distributors will provide resources to train installers, training will be time-consuming and may eat into employee productivity.

As water heaters get larger and heavier, installation may require more workers or larger trucks. Under the new regulations, some water heaters may now require electricity, drains for the condensate, or new ventilation systems, so installers will have to have the training, tools, and expertise to address these needs. In addition, new water heaters may require more space or be noisier than the models they replace, so installers should pay attention to the location of new equipment.

### Prepare for Changes

The 2015 DOE rule could pose challenges for manufacturers, wholesalers, installers, and customers. However, when products become more complex, it is less likely that do-it-yourself consumers will install them. Therefore, the 2015 water heater changes may increase the share of water heaters sold through wholesale distributors and thereby increase installation opportunities. You should spend the time to become well-versed in the changes resulting from the new rule. The time to prepare for these changes is now.

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

*MCAA thanks Bradford White Corporation for being a major sponsor of MCAA 2014.*

2015 Energy Conservation Standards for Residential Water Heaters		
Product Classes Affected by Change	Rated Storage Volumes/Inputs Affected by Change	New Energy Factor Requirements
Gas-fired	≥ 20 gal and ≤ 55 gal, ≤ 75,000 BTU/Hr.	0.675 – (0.0015 x V)
	> 55 gal and ≤ 100 gal, ≤ 75,000 BTU/Hr.	0.8012 – (0.00078 x V)
Oil-fired	≤ 50 gal, ≤ 105,000 BTU/Hr.	0.68 – (0.0019 x V)
Electric	≥ 20 gal and ≤ 55 gal, ≤ 12 KW input	0.960 – (0.0003 x V)
	> 55 gal and ≤ 120 gal, ≤ 12 KW input	2.057 – (0.00113 x V)
Instantaneous gas-fired	≤ 2 gal, ≤ 200,000 BTU/Hr.	0.82 – (0.0019 x V)
Instantaneous electric *	≤ 2 gal, ≤ 12 KW input	0.93 – (0.00132 x V)

\* NO CHANGE

# Atomatic Replaces Outdated Systems with WennSoft, Improves Efficiency, Boosts Productivity

## New System Dramatically Reduces Billing Cycle, Payroll Processing Time

By moving from an outdated accounting system to WennSoft Signature® and Microsoft® Dynamics® GP, Chicago-based HVAC firm Atomatic Mechanical Services dramatically streamlined its accounting processes, improved its service management capabilities, enhanced its customer service, and boosted employee productivity.

“Our first requirement was that the solution needed to handle the basics, such as core accounting, which Microsoft Dynamics GP does very well,” recalled Dick Hoffman, president of Atomatic. “Ultimately, it was the service management functionality of WennSoft that drove our decision. As a mechanical services company, our needs around managing service contracts and dispatching are unique and rigorous. WennSoft offers an extremely strong package in that regard and does a tremendous job of listening to users in our industry and responding to needs.”

### Time for a Change

Since the early 1990s, Atomatic had relied on a Concord job-costing system and FACS service management system to support operations. Lack of integration between these systems meant that once each week, employees in the accounting department had to manually re-enter data from the service management system into the job-costing system, which the company also used exclusively for payroll, accounting, and reporting. This time-consuming process resulted in an average billing cycle of three to four weeks and a lack of real-time insight into the business.

“Our job-costing system was based on UNIX® and grew increasingly cumbersome to use and manage,” said Steven Wiet, CFO of Atomatic. “The process for looking up and retrieving data was not user-friendly, and it was always difficult to find IT people who could help us support the system.” The legacy system also lacked some basic features that the company needed to manage business proactively. “We didn’t have the ability to see purchase orders or committed costs before the invoice came in,” explained Wiet.

### Improved Service and Better Insight

The service management capabilities of Signature helped Atomatic improve in several areas. Now, when on a service call, Atomatic service team

*“The WennSoft solution has helped us do a better job in tracking and converting our new construction customers to become service maintenance customers.”*

— Dick Hoffman, President, Atomatic

members can capture cost and history not only by customer but also by each piece of equipment, enabling them to track service history and promptly answer customer inquiries. Atomatic representatives can also provide customers with insight, such as when the cost of maintenance fees outweighs a new purchase.

“With the WennSoft solution, we can offer our customers details about their equipment and service agreements that save them money, such as benchmarking and other metrics,” said Wiet. “Our customers might

otherwise keep track of this information on their own or they might not. But we’re winning accounts because we can offer this level of service.”

In addition, “the WennSoft solution has helped us do a better job in tracking and converting our new construction customers to become service maintenance customers,” Hoffman said.

Reporting is also much more powerful. “Our ability to analyze profitability and optimally manage our operations has gone up considerably with the new solution,” said Wiet. “Microsoft Dynamics GP, because it is based on Microsoft SQL Server®, makes it easier to access data and report on data. When I investigate something, it takes me half the time that it used to.”

### Billing Cycle Reduced, Cost Tracking Enhanced

After implementing the new solution, Atomatic dramatically improved several accounting processes. “The

moment we went live on the solution, our billing cycle reduced from over three weeks to less than two weeks, without us having to change our processes,” said Wiet. “And as we continue to improve our processes in the future, the billing cycle will only get shorter.” Weekly payroll processing once took more than an hour, but now Atomatic can complete the task in less than five minutes.

Because of the system’s flexibility, Atomatic can track costs by

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## GPS Insight Offers Tips for GPS Buyers

A GPS tracking system can make your fleet more effective and efficient. GPS Insight suggests what to look for when buying a system.

### Top 5 Criteria for Selecting a GPS Tracking System

- **Highest Return on Investment:** Applications that are highly configurable and that analyze the widest range of fleet metrics allow you to measure and manage fleet operations comprehensively, so you can determine how much the solution will reduce your fleet costs.
- **Customer Service Quality:** Ideally, the system includes access to an experienced support team that will walk you through installation, troubleshooting, software instruction, and training 24/7/365 and resolve problems on the first call. The support team should also be able to access your account and make any needed changes while on a call.
- **Reporting Capabilities:** Advanced reporting capabilities let you take advantage of the wealth of data that can be pulled from a GPS tracking device. Do the reports offered provide all of the information your company needs? If not, will the company create customized reports or combine data from multiple reports?
- **Customization:** Most applications include dashboards, maps, reports, and alerts. Applications that can be highly customized give you the information you need, as you need it, the way you want to see it.
- **Integration:** Your GPS fleet tracking solution should integrate with your accounting, ERP, mapping, dispatch, CRM, and other back office systems to exchange information. Find out what the solution provider will charge you for the integration.

### Top 10 Capabilities To Look For in an Advanced GPS Tracking System

- 1 An intuitive and easily configurable interface that allows you to gather actionable data at a glance
- 2 Full-featured 3D mapping
- 3 A mobile application accessible from smart phones and tablets
- 4 Mechanisms for precise landmark creation
- 5 Capacity to measure all of the fleet metrics you need to monitor
- 6 Array of highly configurable alerts
- 7 Integration with your fuel card provider
- 8 Option to schedule maintenance reminders for each vehicle
- 9 Free unlimited historical data on your fleet
- 10 Capacity for any number of users with different user permissions to use the system software

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

## WENNSOFT

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*“The moment we went live on the [WennSoft] solution, our billing cycle reduced from over three weeks to less than two weeks, without us having to change our processes.”*

— Steven Wiet, CFO, Atomic

customer, equipment, technician, sales category, or other criteria. The company uses the pricing matrix to adjust categories, see labor rates and parts involved, and examine pricing on subcontractors. “We can set a fixed margin or tweak it to apply to the situation. In today’s economy, it’s especially helpful to have a tool like this that lets us easily analyze costs and see how those costs impact our profits,” Hoffman said.

“The greatest benefit we’ve received from our new system is integrating our job costing and service management,” said Hoffman. “Our dispatch and billing are much improved, and we have information about equipment, contracts, and quotes in a single place and available to more people.”

Hoffman is confident about his company’s future with Signature. “That this solution is based on technology from Microsoft is reassuring,” he said. “And, we are confident that WennSoft will continue to refine it to meet the needs of mechanical services firms.”

For more information, visit [www.wennsoft.com](http://www.wennsoft.com). You are invited to attend the MCAA 2014 technology session *Demystifying Mobile Technologies*, where Jim Wenninger of WennSoft will be a panelist.