

SMART SOLUTIONS

WINTER 2013

Helping contractors save money and enhance productivity

ACCO Pairs BIM and Daikin McQuay Chillers for North America's Greenest Urban Office Building

Commitment to energy-efficient products such as Daikin McQuay's Magnitude® chillers and reliance on building information modeling (BIM) to manage a complex project helped ACCO Engineered Systems complete what has been called "the greenest urban office building in North America." The San Francisco Public Utilities Commission (SFPUC) headquarters in downtown San Francisco at 525 Golden Gate opened in July 2012. It produces a 50-percent-smaller carbon footprint and uses 32 percent less energy and 60 percent less water than similar 13-story office buildings.

Complexity Demanded Teamwork

The scope of the SFPUC building project entailed an exacting design and construction process. ACCO Engineered Systems in San Leandro, CA, served as the mechanical contractor on the project. Nial Keeling, P.E., ACCO HVAC project engineer, said the project's complexity demanded teamwork, so he relied on BIM.

"This was not a standard job," said Keeling. "The sheer volume of paperwork involved, including owner-directed changes and requests for information, was huge due to the complexity of the systems. Everyone on the team worked well together."



Photo ©Bruce Damonte. Used with permission.

ACCO met the complex requirements of the SFPUC Headquarters, which includes integrated hybrid solar array and wind turbines, by using BIM and energy-efficient products such as Daikin McQuay chillers.

Solar and wind power, high-efficiency mechanical systems, natural ventilation, and daylight harvesting all contribute to the remarkable energy savings at 525 Golden Gate. The exterior of the building uses roof-mounted solar arrays and wind turbines that can generate up to 7 percent of the building's energy needs. On the interior, additional shading devices control glare and minimize

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U.S. Engineering Company Improves Productivity, Cuts Costs Using Prefabrication with Victaulic Grooved Technologies

For U.S. Engineering Company, finding creative ways to keep the University of Colorado Hospital's (UCH's) new expansion on track helped them increase productivity while delivering on schedule and on budget. To maximize productivity, U.S. Engineering decided on a multi-trade prefabrication process using Victaulic grooved systems whenever and wherever possible.

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To meet the rigorous demands of the University of Colorado Hospital's expansion, U.S. Engineering fabricated with Victaulic grooved systems as much as possible to meet a fast-track schedule.



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MCAA

Adding Value to
Your Supply Chain

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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Prefab, Products, and Productivity

In this issue of *Smart Solutions*, learn how contractors are increasing productivity and efficiency by using prefabrication, building information modeling (BIM), and enhanced products. For example, CFI Mechanical relied on Technical Sales International's BIM software to execute an \$8.5-million job and prefabricate piping, completing the job two months early. ACCO Engineered Systems used BIM to manage the complex tasks of creating "North America's greenest urban office building" (and installed Daikin McQuay chillers to meet demanding efficiency standards).

Smith & Oby Company prefabricated thousands of feet of pipe using ERICO's new CADDY® ROD LOCK channel nut, saving time and money. U.S. Engineering Company employed a multi-trade prefabrication process using Victaulic grooved systems to increase productivity while staying on schedule and on budget.

Software solutions are also helping members gain a competitive advantage. Tweet/Garot used Bidtracer's invitation management software to win and manage a \$165-million contract to renovate the Green Bay Packers' Lambeau Field. ACCO is putting WennSoft's MobileTech solution in place to streamline processes dramatically and eliminate paperwork.

Member suppliers continue to improve products to meet increasingly complex needs. Jay R. Smith Mfg. Co.'s Enviro-Flo drain solved a dirt-floor arena's unique problems. For a biotechnology company's exacting requirements, Hart Engineering turned to Viega ProPress systems for stainless steel to get clean, consistent connections quickly. Auburn Mechanical installed Aquatherm's polypropylene-random pipe systems to combat the aggressive water that had damaged a jail's existing pipes. Pyke Mechanical installed a new, high-efficiency BITZER Screw compressor at only marginally higher cost than rebuilding its client's original compressor.

Members are finding that GRINNELL Grooved Flexible Couplings reduce vibrations and minimize noise while also providing a tight seal to prevent leaks. They are also using positioners designed specifically for the pipe welding industry, such as those built by Team Industries, Inc., to reduce welder fatigue and increase the work quality. To fill the occasional need for large, specialized equipment, contractors are renting from suppliers such as Lifting Gear Hire Corporation.

Finally, members can rely on our partners at CNA to keep up to date on how to protect their businesses. In this issue, learn whether your company needs a U.S. Department of Transportation (USDOT) number.

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 for a complete list of MCAA Supplier Partners or find them in person at *MCAA 2013*.

A handwritten signature in blue ink that reads "Frank R. Schaezke".

Frank Schaezke, Chairman

Join me in welcoming our newest supplier partners:

- Atlas Copco Compressors LLC
- DRYCO
- Kitz Corporation of America
- LSB Strategic Accounts, Inc.
- Oventrop Corporation
- Sumner Manufacturing Co., Inc.
- United Rentals
- Ward Manufacturing, LLC

Hart Engineering Minimizes Facility's Downtime Thanks to Speed of Viega ProPress for Stainless

Faced with the challenge of replacing all of a biotechnology company's existing piping with stainless steel in just 14 weeks, Hart Engineering found that Viega ProPress® systems provide clean, consistent connections quickly. Viega ProPress for stainless steel offered a complete solution, including pipe, valves, and fittings in two high-quality grades of stainless steel, 304 and NSF-approved 316.

Hart Engineering, the mechanical contracting arm of The Hart Companies of New England, undertook the installation for one of the world's leading biotechnology companies, a manufacturer of pharmaceutical products designed to treat serious diseases. The company's plant was shut down for 14 weeks so that all of the existing piping could be replaced with stainless steel.

"The project involved us going through all of the suites in the plant and repiping them," said Mike Feldman, Hart Engineering's vice president. "We had to take the rooms apart and redo the piping and insulation through the ceilings and ceiling grid. It was a major effort, and it was all done on very short notice. We worked seven days a week, around the clock, for those 14 weeks."

According to Feldman, the customer had more than 20 pharmaceutical manufacturing suites in its facility. The high-purity suites contain equipment such as bioreactors, which grow bacteria and other organisms used in the production of pharmaceuticals.

"In biotech applications, we use Viega ProPress for stainless primarily for drains and vents," said Feldman. "Because it's stainless steel, we are able to install it in the high-purity manufacturing suites. We installed Viega

ProPress for stainless in the large suites, one of which had four bioreactors with multiple reactor vessels."

Founded in 1941, The Hart Companies has specialized in biotechnical applications since 1989, when the industry began to grow throughout New England. The Hart Companies encompasses a group of design, engineering, and construction companies headquartered in Cumberland, RI. Hart Engineering had previous experience with Viega ProPress systems.

Viega ProPress systems allow installers to make secure, dependable connections for copper or stainless steel in less than seven seconds on sizes up to 4". Because Viega ProPress fittings are available in more than 600 different configurations, a complete system can be installed with the same press tool.

Built for Speed

Before starting the project, Hart Engineering first had to convince the plant's owners and engineers that the work could be completed much faster by using the Viega ProPress for stainless system. "Viega ProPress for stainless wasn't in the original specifications because the company's engineers didn't know about the system at the time," said Feldman. "We showed them what we wanted to do. Once they understood the benefits, they wrote a special clause in the specs allowing us to use the Viega system."

"We saved about one third of the time compared to welding. That time savings is huge, considering that the labor rates for my guys are almost a hundred dollars an hour."

— Mike Feldman, Vice President, Hart Engineering



Installing Viega ProPress systems for stainless steel required about one third less time than welding would have required, enabling Hart Engineering to repipe an entire pharmaceutical manufacturing plant in 14 weeks.

Feldman explained that it was critical to get the biotechnical plant up and running again as soon as possible because as long as they were working, the plant wasn't manufacturing. The longer the installation took, the longer the plant would have to go without producing product.

"We did everything we could to minimize the downtime," Feldman said. "They really couldn't afford to waste any time. Every day of the shutdown was costing a lot of money. The customer agreed to use Viega ProPress for stainless because it was a very large building and we had a

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CFI Mechanical Completes Healthcare Facility Ahead of Schedule Using Technical Sales International BIM Software, Tools, and Prefabrication

When CFI Mechanical in Houston, TX, took on an \$8.5-million mechanical job with an aggressive schedule requiring massive coordination before the structure was built, they knew they could count on building information modeling (BIM) software tools from Technical Sales International (TSI) to get the job done. Led by President Chuck Fell (who is also MCAA's senior vice president and treasurer), CFI Mechanical has been using BIM tools for over a decade to improve efficiency and mitigate risk in fabrication and construction.

Because of their experience and reputation, CFI Mechanical was called upon to provide the full plumbing and HVAC mechanical systems and equipment for the new Harris Health System Smith Clinic. In fact, CFI Mechanical finished work on the Smith Clinic two months ahead of schedule.

Coordinating Multiple Systems

Opened in September 2012, Houston's Smith Clinic is a five-story, 168,000-square-foot facility with a central plant. It features more than 100 exam rooms and the latest medical technology, including three linear accelerators, three CT scanners, two MRIs, five ultrasound units, a PET scanner, six digital mammography units, three digital radiography units, a bone density unit, and 26 infusion therapy stations. The clinic is expected to serve an estimated 160,000 patients annually, primarily low-income and uninsured.

For medical institutions such as Smith Clinic, specialty plumbing and mechanical systems—including compressed air, vacuum, nitrogen, oxygen, reverse osmosis, deionized water, high pressure steam, condensate return, and acid waste—are typical, and CFI Mechanical was in charge of it all. They knew that using BIM would



“Our strategic commitment to BIM and prefabrication using the software from TSI helps give us a more lasting competitive advantage,” said Chuck Fell, president of CFI Mechanical. Here, two prefabricated toilet batteries are ready for installation onsite.

help them coordinate and keep track of the many competing demands. “Early on we recognized that the BIM approach could benefit our company, our clients, and our industry,” said Fell. “Our strategic commitment to BIM and prefabrication using the software from TSI helps give us a more lasting competitive advantage.”

However, CFI Mechanical's lengthy experience with complex healthcare projects has taught them that design drawings often lack detail and are not fully coordinated, especially mechanical, electrical, and plumbing (MEP) systems drawings, which can cause significant problems during construction. By contrast, the shop drawings produced by CFI Mechanical, using TSI Managed Content in conjunction with Autodesk Fabrication 2013 CADmep and FABmep software, contain the needed detail and dimensional accuracy to properly fabricate and install the MEP system components. TSI Managed Content is a comprehensive database (www.Building-Data.net) of real-world pipe fittings and valves and HVAC standard fittings and accessories that no other software can match.

With the fabrication-level detail of TSI's Managed Content libraries, CFI Mechanical can prefabricate HVAC piping and plumbing systems from spool sheets automatically produced from the Autodesk Fabrication 2013 CADmep product. Each manufacturer component is meticulously modeled in 3D for dimensions and likeness, and all of the required information—labor hours, material prices, submittals, and specification documents—are built into the job, ready for extraction. Each individual line item in TSI's Managed Content database has an extensive set of attributes already attached to it, meaning that the intelligent data about the designs could be forwarded to anyone in the project.

Using TSI Managed Content in Building-Data.net provides CFI Mechanical with sustainable content to support estimates, procurement, submittal documents, piping pre-fabrication, CAD/CAM fabrication, modular pre-fabrication, field layout documentation, staging, and as-built documentation.

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TSI

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Prefabrication Paves the Way

The Smith Clinic building is a four-pipe system with 7,500 linear feet (lf) of chilled water piping and 7,000 lf of hot water piping for the HVAC system. The building also has two process chillers with 1,800 lf of refrigerant tubing. Additionally, the job included 7,200 linear feet of storm piping, 13,450 lf of waste and vent piping, 5,060 lf of domestic water piping, and 4,140 feet of underground sanitary waste piping—all of which was designed and detailed at the CFI Mechanical shop using the Autodesk Fabrication 2013 CADmep software from TSI. CFI Mechanical was able to pre-cut over 65 percent of the piping for prefabrication, almost every hanger, and all the plumbing piping for the toilet batteries in their fabrication shop. Even the storm drains, including the multi-length hangers to account for the slope, were prefabricated in the shop ahead of time because of the capabilities of the fabrication software.

The entire building structure was concrete, and over 3,000 inserts for pipe hangers and more than 600 pipe sleeves were set through the floor prior to the concrete pour. “The Smith Clinic building was a 100-percent concrete structure with an aggressive pour schedule, and we got out ahead of it because of the CADmep from TSI,” said Fell. “Additionally, while laying the sleeves, we found wall layout issues before the walls were built and sleeves put in, avoiding much bigger problems.”

Accommodating a Compressed Schedule

The entire facility was completed in less than two years. However, because Smith Clinic is a hospital/research facility, the HVAC systems needed to be fully functional a year early so the building air would be tempered, sheet rock could be hung, and expensive and



Hospitals have unique requirements, such as these pipes that pull acid away from drains. CFI Mechanical relied on TSI BIM software to coordinate and keep track of the complex and competing demands for Houston's new Smith Clinic.

sensitive equipment could be installed. CFI Mechanical started their groundwork in December 2010 and had the air conditioning fully functional a scant 10 months later—quite an achievement considering the volume of piping necessary to complete the job.

Maintaining a Competitive Advantage

Using TSI's software, CFI Mechanical can take design-intent models from designers and engineers and create models that can be built efficiently from real-world, manufacturer-specific content. With BIM software from TSI, CFI can proceed to estimate, cost-analyze, prefabricate, procure, manufacture, and install their building systems with greater levels of productivity.

Fell's team at CFI Mechanical feels strongly that without their collaboration with TSI, meeting these tight project deadlines would not be possible. “The software is very fast, efficient, and user-friendly. And most importantly, TSI's professional services—from configuration and implementation to training, phone, and online support—are great. TSI provides the kind of service and expertise (most of their team have real-world, on-the-job MEP experience) that you just don't get when dealing with big conglomerates,” said Fell.

Fell continued, “TSI's MEP managed content library is far superior



CFI Mechanical prefabricated these toilet batteries and other structures for the Smith Clinic in its shop, relying on TSI software to improve productivity and gain a competitive edge.

to what's otherwise available, because TSI really listens to the end-users, takes that input, and improves their product offerings on an annual basis.”

CFI Mechanical's prefabrication and modularization help speed up their projects. They also reduce the project budget and required onsite resources and cut purchase and installation costs. Their software features spooling tools that enable them to slice their models into manageable, modularized sections that contain all of the information required for fabrication so that most, if not all, of the skill and labor required for fabrication can be done in the shop, which increases efficiency, productivity, and safety in the field. “And improving field productivity,” said Fell, “is key to how a mechanical contractor earns a profit.”

For more information, visit www.technicalsalesinternational.com.

Smith & Oby Combines Prefabrication and ERICO's New CADDY ROD LOCK System to Cut Installation Time

In early 2011, Smith & Oby Company began work on a new office building in Cleveland, OH, that included 250 active chilled beams, which required an extensive amount of small-diameter copper pipe and multiple trapeze racking systems. To manage installation of approximately 28,000 linear feet of pipe in a 95,000-square-foot building, Smith & Oby turned to ERICO for an innovative and time-saving installation solution.

Having worked with ERICO on many projects in the past, Will Vranich, project manager at Smith & Oby, knew the company could supply the right products for this demanding project. So when ERICO suggested a newer product—the CADDY[®] ROD LOCK channel nut—Smith & Oby was willing to give it a try.

“ERICO is aggressive in adding new products in the marketplace,” said Vranich. “Not every item will be a hit, but it’s the best way to improve the industry.”

The Idea Behind CADDY ROD LOCK

Threaded rod is one of the most commonly used products by contractors of all trades, but it can be very difficult and tedious to work with. The ability of contractors to use pre-assembly for many high-volume applications is severely limited by how standard threaded connections are made. The CADDY ROD LOCK system, which includes a beam clamp, channel nut, and anchor screw, seeks to eliminate the need for contractors to rotate the threaded rod.



Smith & Oby is using ERICO's CADDY ROD LOCK system to install 250 active chilled beams in an office building. With the new system, instead of rotating threaded rod, workers push them into position, saving installation time.



For a large office building project, Smith & Oby is prefabricating copper racks in its shop, shipping them to the jobsite, inserting ERICO's CADDY ROD LOCK into the strut, then lifting the racks in place to save labor and time.

The CADDY ROD LOCK's “push-to-install” design can dramatically reduce the installation time of threaded rod support structures when compared with conventional fasteners. “Contractors do not have to rotate a threaded rod into position,” said Eric Osborn, CADDY product development manager at ERICO. “Instead, assemblies can simply be pushed into position. This allows contractors to create modular assemblies in an efficient, safe way, saving huge amounts of time and money.”

So Much Pipe, So Little Time

By using ERICO's CADDY ROD LOCK channel nuts for the office building project, Smith & Oby could prefabricate their complex assemblies and then easily lift and lock them into

place at the jobsite by pushing the threaded rod supports into the channel nuts. The technology even works with threaded rod with minor burrs or imperfections, helping to eliminate clean-up time and the need to replace damaged threaded rod.

For the office building, Vranich said his process has been to prefabricate the copper racks in the shop and then ship the racks to the jobsite. “CADDY ROD LOCK is inserted into the strut, and once onsite, we lift the racks in place with some expected labor savings. The entire project includes about 350 racks of pipe.”

However, Vranich admitted that using CADDY ROD LOCK did take a

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Think You Don't Need a DOT Number? Think Again!

There has been much confusion about who is required to have a U.S. Department of Transportation (USDOT) number. Many contractors feel it's only needed for truckers hauling for hire, which is not the case.

A USDOT number is required for a commercial motor vehicle (49 CFR Part 390.5), which is defined as any self-propelled or towed motor vehicle used on a highway in interstate and/or intrastate commerce:

- to transport passengers or property when the vehicle has a gross vehicle weight rating or gross combination weight rating, gross vehicle weight or gross combination weight, of 10,001 pounds or more, whichever is greater; or
- to transport more than eight passengers, including the driver, for compensation; or
- to transport more than 15 passengers, including the driver, without compensation; or
- to transport material found by the Secretary of Transportation to be hazardous under 49 USC 5103 and transported in a quantity requiring

placarding under regulations prescribed by the Secretary under 49 CFR, subtitle B, chapter I, subchapter C.

The USDOT number serves as a unique identifier when collecting and monitoring a company's safety information acquired during audits, compliance reviews, crash investigations, and inspections. The following 31 states have laws agreeing to the enforcement of the federal USDOT regulations: Alabama, Alaska, Arizona, Colorado, Connecticut, Florida, Georgia, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Missouri, Montana, Nebraska, New York, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Washington, West Virginia, Wisconsin, and Wyoming. The other states have state-based USDOT regulations (similar to federal OSHA vs. state OSHA regulations). Many think that the USDOT number does not apply here, but lack of enforcement does not equal "not applicable." It is a federal regulation, and it applies to all subject commercial motor vehicles.

Vehicles that require USDOT numbers must have a name and USDOT number on both sides of the vehicle's power unit, in a contrasting color, and visible from 50 feet away when parked. Currently, there is no cost to register for a USDOT number. You can visit www.safer.fmcsa.dot.gov and select the "FMCSA Registration and Updates" link to register.

Real-World Examples

The law applies to every risk with a single power unit over 10,001 GVW; the misunderstood portion is that it applies to every combination of truck and trailer that exceeds 10,001 pounds. If the insured owns a small pickup truck but has a heavy trailer, the combined weight of the truck and the trailer's listed weight affects whether the rule applies. Also, a single pickup truck can be considered to be carrying hazardous materials, thus triggering the USDOT number requirement, by carrying, for example, one 100-pound propane tank; a 55-gallon drum of pesticide, herbicide, or fertilizer; or some acetylene tanks.

Why Should You Care?

First, noncompliant insureds are open to large fines for even the first violation. Second, violation of these rules may be used against a noncompliant insured in lawsuits.

The USDOT released a new Compliance, Safety, Accountability (CSA) program for enforcement of the regulations, resulting in stepped-up enforcement. More information about the CSA program and resources are available at the website <http://csa.fmcsa.dot.gov>.

For more information, visit www.cna.com.

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ERICO

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little getting used to. "There is a learning curve in anything new," he said. Initially, he saw that the installers were indifferent to using the product. "But indifferent is a really good reaction to new products, because they can often disregard new products quickly."

The CADDY ROD LOCK channel nut was chosen for this project because of the potential labor savings in the field in conjunction with prefabrication. "Prefabrication is vital to this project both to deal with the delays and also to

help manage the materials," explained Vranich. "And, we expect labor savings by moving work into the controlled environment of the shop."

For more information on the innovative CADDY ROD LOCK system, contact your local ERICO representative or visit www.erico.com/caddyrodlock.

MCAA thanks ERICO for being a supporter of MCAA 2013.

MCAA's 2013 Pre-Fabrication Conference includes a tour of Smith & Oby Company's facilities in Walton Hills, OH.

Jay R. Smith Mfg. Co.'s Enviro-Flo Solves Arena's Unique Drainage Problem

All stadiums and arenas tend to get dirty, but an arena floor covered in dirt poses a unique problem. Keeping such an arena clean is the challenge that Scottsdale, AZ, faced when it decided to undertake a \$42.8-million expansion of the Tony Nelssen Equestrian Center at WestWorld—a challenge solved by an Enviro-Flo drain from Jay R. Smith Mfg. Co. In addition, the Enviro-Flo was easier to install than standard floor drains, resulting in cost savings.

The goal of the expansion project was to enclose the Equidome and introduce climate control. But the dirt floor means that during the course of a show, horses' hooves kick dirt up into the air that floats into the grandstand, covering the stadium seating and floors in a fine coat of dust.

One might think people in dirt houses shouldn't throw water, but that's exactly what the WestWorld Equidome Arena employees do after each show. Thanks to the ingenious use of the Enviro-Flo drain, it turns out hosing down the stands is the fastest and easiest way to clean up without creating a larger mess.

Avoiding a Mud Pit

The challenge was how to capture all the water coming out of 1-1/2" fire hoses used to wash down the stands, which was heading straight for the dirt floor of the arena. To avoid ending up with a mud pit, the arena needed a way to catch all that water and dirt and get it out of the seating area quickly.

Installing standard floor drains into the existing concrete structure would not do the trick. Not only would



By installing the Enviro-Flo drain from Jay R. Smith Mfg. Co. in Scottsdale's Equestrian Center, staff can hose down the seating area after events without worrying about the water flowing into the arena's dirt floor. The Enviro-Flo was easier to install than standard floor drains, saving time and money.

water have to be directed specifically to the drains, but also the drains would not get rid of the water fast enough. There was the potential for mud to build up and clog the drain, resulting in an overflow situation.

Instead, contractors installed a trench drain system around the entire perimeter of the arena at the bottom of the existing seating area. This system would allow WestWorld employees to hose down the stands from top to bottom and from any point in the grandstand. The Enviro-Flo from Jay R. Smith Mfg. Co. with a presloped (.6 percent) radius channel and smooth, uniform interior was selected to handle the high volume of water and dirt.

Water and dirt would flow down through the grandstand and go straight into the trench. The drains had the ability to deal with a rush of water and dirt moving down and out of the stands. The trench drains were able to capture the water and prevent it from reaching the dirt-covered arena.

Ease of Installation Reduces Costs

One reason for choosing the Enviro-Flo was the cost savings due to easier installation. The lightweight, 100-percent polypropylene construction, along with the Enviro-Loc® mechanical interlocking joint and molded

outlet connection, make the Enviro-Flo contractor-friendly.

The new Enviro-Flo II promises to improve on the already easy installation process. The Enviro-Flo II now includes the standard rebar anchors that contractors have come to love. Furthermore, the new Rante-Arrow design enhances the installation process by allowing for side-to-side adjustment of the trench drain run.

For jobs similar to the Equidome where the trench drains have to cover a lot of ground, the Enviro-Flo II will be available in 20-meter sloped and 20-meter non-sloped configurations. The tongue-in-groove connection will also speed up installation because it requires no screws or channel clips. The new channel insert, also made of post-industrial recycled material, can be easily removed by the contractor after the concrete is poured.

Durability, Choice of Colors Add to Benefits

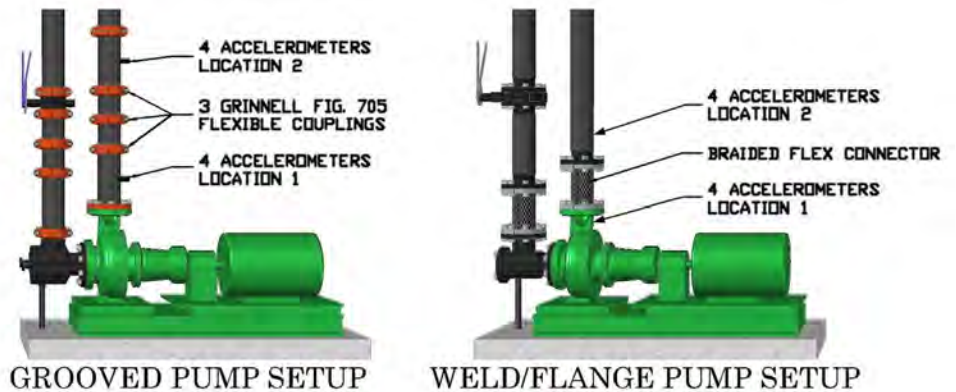
The Equidome project originally called for a fiberglass trench with a metal rail and cast iron grates in the horse stalls and wash-down areas. The Enviro-Flo with the poly grate was used there as well, because it would stand up to exposure to the water and

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GRINNELL Grooved Couplings Provide Tight Seals Plus Noise Reduction

To address the challenge of vibration noise from pipes, GRINNELL Grooved Flexible Couplings reduce vibrations, minimizing the amount of noise distributed through a pipe system, while providing a tight seal to prevent leaks. In contrast, some elastomeric and braided metal flexible connectors designed to minimize vibration noise require you to install additional parts to pipe sections, perform extra welding, or add large, heavy flanges on pipe connections to accommodate the system's lack of flexibility. These methods complicate the piping system and increase the risk of leaks.

GRINNELL Grooved Couplings provide an alternative solution to "one-purpose-only" elastomeric or braided metal flexible connectors, which can require additional time and resources to mitigate vibration and sound attenuation. GRINNELL Couplings not only reduce noise but also use an elastomeric pressure-responsive gasket to seal pipe joints tightly and work within the housing of the GRINNELL Flexible Coupling. This design creates additional features within joined pipes that address angular deflection and axial and rotational movement.



In a battery of tests using a pump within the system as the source for vibrations, grooved couplings repeatedly demonstrated a generally higher degree of attenuation. On average, a single GRINNELL Grooved Coupling displayed the same impact on vibration and noise reduction as one braided metal flex connector, but GRINNELL Couplings performed better as vibration attenuators as the number of couplings in the system increased.

Evidence of Vibration Reduction

In tests, on average, a single GRINNELL Grooved Coupling displays the same impact on vibration and noise reduction as one braided metal flex connector. However, the coupling's advantage becomes evident in systems with multiple connectors. Consistently, GRINNELL Couplings performed better as vibration attenuators as the number of couplings in the system increases. They also performed better at higher frequency levels.

In other tests comparing GRINNELL Grooved Couplings, rubber flex connectors, and braided metal flex connectors, all three systems performed similarly. However, when numerous grooved couplings were installed, the GRINNELL Couplings maintained a strong, tight seal and reduced vibrations when up to three couplings per pipe were used.

The Core Benefits

Vibration attenuation is a known challenge for developing piping systems. The right connectors are critical for attenuating vibration in pipes and reducing the resulting noise transmitted throughout the building. GRINNELL Grooved Couplings have been used successfully to address both issues without inhibiting a complete seal when joining pipes. They are especially effective when three or more are installed across a section of pipe. Also, they can help resolve minor angular offsets, simplify installation, and eliminate the need for specialized vibration attenuation components. As a result, contractors save money.

For more information, visit www.grinnell.com.

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JAY R. SMITH

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horse urine better than metal rail and cast iron grates, which would have rusted or deteriorated over time.

But this job wasn't only about the mechanics. Because the Equidome hosts some of the nation's most prestigious equestrian and other events, like the Barrett-Jackson Collector Car Auction, the City of Scottsdale also wanted a drain system that was aesthetically pleasing. The Enviro-Flo had an added advantage because it was available in a choice of colors.

The city chose a grey finish that blended in perfectly with the surrounding concrete.

Several events have taken place since the Enviro-Flo installation, and the drains are performing well as expected. Crews have been able to wash down the stands and the arena has stayed dry.

For more information, visit www.jrsmith.com.

MCAA thanks Jay R. Smith Mfg. Co. for being a supporter of MCAA 2013.

Tweet/Garot Teams Up with Bidtracer for Renovation of Green Bay Packers' Lambeau Field

To win the contract to renovate the Green Bay Packers' Lambeau Field, Tweet/Garot of Wisconsin put Bidtracer's invitation management software to work to solicit bids and organize proposals from vendor and subcontractors. Once awarded all of the mechanical work (HVAC, plumbing, and radiant systems) for the Packers' \$165-million South End Zone Project, Tweet/Garot turned to Bidtracer again for construction project management software for the submittal, request for information (RFI), and change-order process.

Tweet/Garot started using Bidtracer three years ago with the goal of increasing efficiencies in handling subcontractor proposals on the estimating side to the automated handling of the submittals process on the project side. They found that the software streamlines communication, saves time, and increases efficiency across the board.

'Put a Bid Together from Anywhere'

Using Bidtracer's bid estimating software, Tweet/Garot's upper management can view monthly activity of how much bidding is taking place and easily see charts of the status of the bidding process, ensuring proper follow-up is taking place by the sales team. "Through Bidtracer, we are now able to view vendor quotes immediately upon upload," said Ben Delcore, Tweet/Garot estimator. "No more running to the fax machine to check and see if a sub has their quote in. An estimator can now put a bid together from almost anywhere through Bidtracer."

Delcore continued, "This has opened up communication among team members, when you have multiple people



Tweet/Garot put Bidtracer's invitation management software to win a \$165-million contract to renovate the Green Bay Packers' Lambeau Field, then relied on Bidtracer again for construction project management software for the submittal, request for information (RFI), and change-order process.

working on bids. The audit trail gives estimators more access and control of subs and also the option to add more subs/vendors at any time to get the best possible price on bid day. We are able to obtain and organize more vendor quotes from subs."

Project Management Software Increases Efficiency

Bidtracer's unique submittal tool has helped Tweet/Garot save time gathering, organizing, and tracking submittals on the Lambeau Renovation. In the past, typical submittals took a lot of phone calls trying to organize one submittal process. Now, the project team can access real-time documentation both in the office and for the team working at Lambeau Field from an iOS or Android tablet. Alan Van Mun, project manager and LEED Green associate for Tweet/Garot, pointed out, "The increase in efficiency, though not documented, is roughly threefold. The submittal module allows project players to upload and review all pertinent project documentation."

Van Mun particularly likes the automatic reminders built into the

software. "The automatic reminders notify vendors of upcoming submittal and operations and maintenance deadlines, streamlining project start-up and closeout. The automatic reminders allow me to focus on pertinent tasks, not spend time chasing vendors and subcontractors for information."

Van Mun continued, "The best part is all the files are contained on the cloud, allowing access to specific information for all team members from the office, jobsite, or anywhere your job takes you."

Tracking RFIs and Change Orders

With Bidtracer, you can set a default response time so that the software automatically e-mails your customer, subs, or vendors when the RFI is overdue. "The RFI process is significantly shortened by giving the general contractor or construction manager the option to answer directly within Bidtracer," said Van Mun. "This in turn eliminates the e-mail or paper transfer issue and allows us to reference the RFI during change-order processing. The reduction in processing time equates to more time spent

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ACCO Builds on WennSoft Technologies to Increase Efficiency and Return on Investment

Move to Mobile Streamlines Paperwork, Saves Time

In 2012, ACCO Engineered Systems of Glendale, CA, trained more than 200 service technicians to use its new MobileTech system, tailored for ACCO by WennSoft, and immediately realized more benefits from the system than expected. The new technology speeds up and even eliminates some paperwork and improves communication. By using the streamlined, electronic quoting features, ACCO has already realized a return on its investment in MobileTech.

Laying the Foundation for Mobile Success

ACCO has long understood the value of mobile technologies and has been planning a mobile strategy for years. Their first step toward a mobile solution began in 2005, when the company implemented WennSoft Signature, built on Microsoft technologies, as its new operational software solution. Chris Leu, director of information technology enterprise applications for ACCO, said the ultimate goal of the switch was to go mobile. “WennSoft had a complete system,” he said. “Even back in 2005 they had a mobile strategy.”

At the time, however, ACCO was not ready to add mobile capabilities. Instead, the contractor planned to hold out for better device options. Leu said, “In 2005 we didn’t have tablets, Androids, or iPhones. Back then it was very expensive and challenging to put that technology together.”

Implementing Mobile to Simplify Business

By the end of 2008, ACCO was ready to add WennSoft MobileTech to its existing WennSoft solution. The company conducted a pilot run through at the beginning of 2009, with several goals:

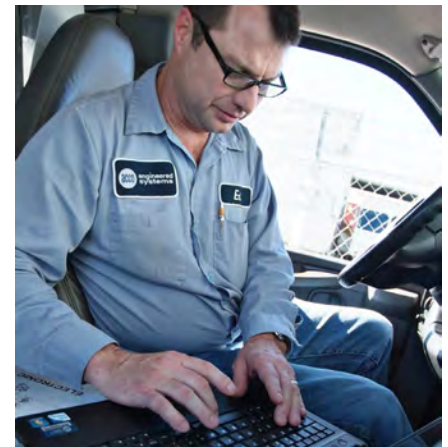
The administrative staff once spent every Wednesday inputting labor from work orders. Now they simply double-check the information as it is submitted, freeing them to focus on more valuable tasks.

- Incorporate maintenance contracts and service calls.
- Speed up the payroll process by having techs electronically enter time at the end of each job, rather than completing a written work order.
- Enhance the quoting process by having techs submit recommended work electronically rather than through a paper-based process.

Gathering valuable input from its service techs through the pilot program, ACCO worked with WennSoft to tailor the MobileTech solution to its needs. Leu said, “We worked with WennSoft to come up with a tailored screen, so the techs would see the same paperwork they were used to looking at for the last 25 years—just electronically.”

Increased Efficiency and Return on Investment

Following training of service techs throughout all locations in March 2012, ACCO saw the benefits of the switch to mobile. Because the electronic dispatch system automatically fills in the name and location for each job, the time to complete work orders was reduced. Many service techs can now process a work order in less than a minute, allowing more time to focus on customer needs.



Using the MobileTech system by WennSoft, ACCO service techs electronically enter their labor at the end of each job in about a minute, then send it to the office with one click. The new technology helps ACCO streamline paperwork and run more efficiently.

Additionally, electronic dispatching reduced the number of calls in which the service techs arrived at an incorrect location. In the past, techs would rely on phone calls or pages to determine where to go. Phone calls were often misunderstood or pagers, limited to 240 characters, would not show the complete address, leaving the techs to guess the location.

Through MobileTech, ACCO has also met its initial goals. Service techs electronically enter their labor at the end of each job, rather than doing paperwork at their leisure and driving to the office to turn it in. “The techs can spend a minute on each job to enter labor, and with one click, it is sent to the office,” said Leu. “After that, they don’t have to worry about the call anymore. That’s a pretty big advantage.”

By entering labor in the field, service techs also relieve the billing team. The administrative staff once spent every Wednesday inputting labor from work orders. Now they simply double-check the information as it is submitted, freeing them to focus on more valuable tasks. “The company used to shut down from a service perspective every Wednesday,” said Leu. “It was a big weekly challenge to process payroll,

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Auburn Mechanical Finds Aquatherm a Perfect Fit for Jail's Tough Pipes

To fix a decades-old leaky piping system in Seattle's King County Jail, Auburn Mechanical used Aquatherm's polypropylene-random (PP-R) pipe systems to combat the aggressive water degrading the existing pipes. Aquatherm's products not only provided an ideal solution but also cut installation time and cost when compared with copper piping.

The King County Jail houses over 1,000 inmates and employs over 350 people in downtown Seattle. With three towers, each with 20'-high floors, the 385,274-square-foot facility is equivalent to a 17-story building. Built in the mid-1980s, the jail used copper for the distribution system, with 4" and 6" galvanized steel mains distributing water in the sixth floor mechanical rooms. After roughly 11 years, however, the building's domestic water piping system began leaking.

Stephen Swinburne, architect and project manager for King County's Facilities Management Division, said the county had been "band-aiding and selectively fixing leaking sections of pipe since the early 1990s." In 2004, it was clear that a repipe was necessary, but the bids came in too high, and the project was shelved.

'Hostile' Water Takes its Toll

In 2009, pipe samples revealed that the hot water recirculating system was in the worst condition, followed by the hot water and cold water, respectively. The county embarked on a massive renovation project that included \$3.6 million for repiping. Engineering tests found that the failures in the copper piping stemmed from aggressive water, high water velocity, and potential installation problems. So the ideal pipe system



By using Aquatherm's polypropylene-random pipe systems instead of copper piping to combat the aggressive water degrading the existing pipes of the King County Jail, Auburn Mechanical saved installation time and costs.

would be rust-, scale-, and corrosion-proof—and easy to install. Relatively new to North America, German-manufactured Aquatherm has been used in plumbing and HVAC applications in more than 70 countries for nearly four decades. Aquatherm's heat fusion process involves no flames and is virtually leak-proof. The pipe and desired fitting are simply inserted onto an Aquatherm welding device and heated for a specified time (typically only seconds for the smaller sizes), then joined together. At the time of installation, copper prices were at all-time highs, so the PP-R pipe system cost less than soldered or press-fit copper.

The county selected Aquatherm for the project and Auburn Mechanical of Auburn, WA, to install the piping. Founded in 1975, Auburn provides a full range of preconstruction, mechanical, and building services. The firm was well suited to handle the live change-over job where the majority of water lines had to remain active and security was paramount.

Getting Up to Speed on the Job

Auburn's field foreman, Brent Delvecchio, oversaw the Aquatherm installation, which began in June 2011. Delvecchio specializes in high-rise mechanical installations (typically using galvanized steel and copper), and he knew working with Aquatherm would be a learning experience.

Delvecchio and his staff completed the initial half-day Aquatherm factory-certified training, which is a prerequisite to offering the company's 10-year, multimillion dollar insurance policy covering product liability, labor, personal injury, and property damage. The Auburn staff then gradually became adept with the fusion process, installing 6" and 8" Aquatherm Greenpipe® cold water mains and 4" hot water mains with 3" risers to all water closets and 1-1/2" to 3/4" branches for supply lines running to the individual cells.

"[Installation] has sped up over the time that we've been working with it.

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Weld Positioners Improve Productivity and Quality

While most weld positioners will improve the productivity of a pipe welder, a positioner designed specifically for the pipe welding industry to reduce welder fatigue increases the quality of the welder's work.

"Having a good positioner in a fabrication shop is a must regardless of shop size," said Ned T. Hawkins of Michigan's **W. Soule**. "A good positioner is like adding another fitter to your project without the added expense."

Positioners designed for a broad market base do not meet the productivity and ergonomic needs of the pipe welder. Pipe welding requires a wide range of rotational speeds to suit the range of pipe diameters and welding processes involved with each project.

Team Industries, Inc., began building weld positioners designed exclusively for welding pipe in 1997. Their products include features that provide ergonomic advantages, such as programmable acceleration and deceleration, a bi-directional foot

controller, air tool quick disconnects, variable rotation, and up to 135° tilt capacity. Several accessories can also be supplied with the positioner, including a universal gripper, self-centering quick disconnect jaws, thru-hole purge assemblies, and even a fan for welder comfort. Infinitely variable rotational speed control (.36 to 3.69 RPM) and a gear reduction option permit welding of piping of all sizes (small bore through large bore heavy wall). Thru-hole purging systems save welder time and reduce the cost of inert gasses.

Team has also designed a variable height welding positioner that incorporates additional ergonomic features, such as a push-button hydraulically actuated system for smooth height adjustment and a self-leveling system. These features offer a huge advantage over manual height adjustment positioners, which require considerably more time and effort at each height change.

The workstation concept incorporated into Team's positioners improves the



Team Industries' weld positioner accommodates an eccentric load rotated to allow high deposition weld processes.

safety of the working environment for the welder. For example, positioners are equipped with 120V power outlets and air inlet filter/lubricator for air tool quick disconnects, reducing the propensity for trip hazards when using the positioner.

For more information, visit www.weldpositioner.com.



The Team Industries positioner includes steel-hardened insert jaws with small-bore adapters to eliminate the need for modified C-clamps.



The Team Industries positioner includes steel-hardened insert jaws with small-bore adapters to eliminate the need for modified C-clamps.

Pyke Mechanical Chooses High-Efficiency BITZER Screw for Compressor Retrofit

When the Miami International University of Arts and Design needed to upgrade its chiller, Pyke Mechanical was able to install a new, high-efficiency BITZER Screw compressor at only marginally higher cost than rebuilding the original compressor. The conversion went so well that Pyke plans to install BITZER screws whenever an upgrade opportunity presents itself.

BITZER's Senior Application Engineer Dave Streby used the system conditions to determine the best BITZER model to match the desired capacity and recommended BITZER's CSH8553-110-4PU. It operates at 45° saturated suction temperature, and 120° condensing temperature provides 109.9 tons of air conditioning capacity. The model comes standard with a 4-1/8" suction service valve and a 3-1/8" discharge service valve and has an integrated oil separator. The compressor uses 460 volts, 136 run load amps, and 895 locked rotor amps with direct-on-line starting.

Pyke Mechanical's technicians completed the retrofit conversion as follows:

Step 1: Removed the existing screw compressor and external oil separator, including all components and piping. Removed all piping associated with the heat exchanger on this circuit, as the BITZER CSH screw compressor provided the required capacity without the use of an economizer.

Step 2: Installed two 7'-long U channels for mounting the BITZER CSH screw. The channel was attached to the base frame by drilling 3/4" holes. The BITZER CSH was attached to the mounted channel with 5/8" bolts after holes were drilled to match the footprint.

Step 3: Repiped the existing suction and discharge connections from each

end of the existing compressor to the top of the CSH8553-110-4PU screw compressor. The existing piping was only removed to allow one 90° elbow in the suction piping and two 90° elbows in the discharge piping.

Step 4: Removed the existing economizer piping to the original screw compressor, capped it off, and left it in place.

Step 5: Reused the existing suction and discharge pressure transducers. The suction transducer was reinstalled into the BITZER service valve. The discharge transducer was installed into the upper pipe plug underneath the BITZER discharge service valve. The upper connection allows for the system pressure to be read by the controller.

Step 6: Installed liquid injection oil cooling using the existing piping from the economizer. Pyke also used the existing solenoid valve and only required two feet of 5/8" copper tubing and 4-5/8" 90° elbows to allow 8" of tubing rise from the inlet to the compressor.

Step 7: Installed the liquid injection controller inside the control cabinet and drilled a 3/8" hole through the panel to route the sensor cable to

the compressor. Mounted the liquid injection sensor 6" from the discharge service valve and insulated the sensor. With the existing operating parameters, liquid injection oil cooling is not required, but Pyke decided to install liquid injection to address a "worst-case scenario."

Step 8: Because the existing compressor used only one capacity control solenoid, Pyke installed a stand-alone controller to control the BITZER capacity control solenoids. A simple dual-set-point capacity controller is suitable. Pyke installed the BITZER capacity controller into the control cabinet and then installed the temperature probe into the same location as the existing system probe on the fluid outlet piping.

Step 9: Evacuated and charged the system, checked all the electricals, and then bump-started the compressor to ensure proper rotation.

Since this initial retrofit conversion, Pyke has installed two more BITZER retrofit screws at Miami International University of Arts and Design. John Marinello, vice president of Pyke, said that he and his technicians were impressed with how quietly a BITZER Screw runs.

For more information, visit www.bitzer.de/eng/Home.



Use Your MCAA 2013 App to Navigate the Exhibit

The MCAA 2013 App includes an enhanced exhibit map with clickable booths to help you do extended research on products and services in advance – or perform lookups on the spot – and make the most of your time with MCAA's manufacturer/supplier representatives.

To download the App, visit the Android Play Store or Apple's App Store and search for MCAA 2013.

WENNSOFT

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especially when you have about a dozen locations and a couple hundred techs.”

With real-time information, ACCO can now bill on a daily basis, rather than its previous two-week schedule. The sales team also benefits—they can access information that they can act upon daily, rather than waiting 10 days for the information to become available. “It improves our visibility of what’s happening on a service call, so we can be a lot more proactive,” said Leu. “I know our sales team likes it, because I hear from them right away if the system ever goes down.”

Furthermore, the solution streamlines the quoting process. Previously, service techs would fill out work authorization forms for recommended repairs they identified while on a job.

“The electronic quoting has paid for the entire project. The nice thing is we’ll get that return every year, minus maintenance and the cost of replacing equipment.”

— Chris Leu, Director of Information Technology Enterprise Applications, ACCO

The techs would then hand the forms to an administrator who, in turn, gave them to a project manager or sales member to analyze and discuss with the customer to get approval for the work. Now, when the techs electronically submit a quote, it bypasses the administrator and goes directly to the appropriate person. This saves administrative time, eliminates the chance of losing paperwork, and enhances the opportunity for new business.

ACCO hardly deals with paperwork through its fully integrated system. All documents are automatically filed in WennSoft’s document imaging system and immediately show up on sales reports, which saves the company the



When ACCO service techs identify a potential repair, they use WennSoft MobileTech to submit a quote directly to the appropriate person in the office, saving administrative time, eliminating the chance of losing paperwork, and enhancing the opportunity for new business.

time of tracking down paperwork. “There’s almost no touching of a piece of paper,” said Leu. “We used to have nice, extensive filing systems at all our locations, but most of them have been shut down for two to three years.”

Through these efficiencies, ACCO has achieved a quick return on investment from its MobileTech solution. “The electronic quoting has paid for the entire project,” said Leu. “The nice thing is we’ll get that return every year, minus maintenance and the cost of replacing equipment.”

Overall, ACCO finds that the mobile solution adds value to the company. ACCO is growing without adding resources, and its staff is now dedicated to more valuable tasks rather than re-entering information or moving paperwork around the office. Leu said, “Ultimately, it improves what we can deliver to the customer.”

For more information, visit www.wennsoft.com.

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.

Where to Find Them

In addition to this excellent resource, you will find the latest listing of MCAA’s Manufacturer/Supplier Council members (Supplier Partners) in MCAA’s annual Membership Directory & Buyer’s Guide and online at www.mcaa.org/directory.

How They 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 a semiannual newsletter, Smart Solutions, to showcase new technologies and promote cost-saving and productivity-enhancing applications.

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

BIDTRACER

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effectively managing projects, resulting in increased profit.”

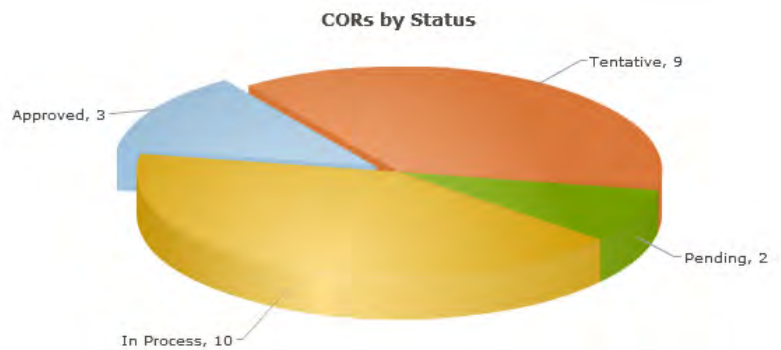
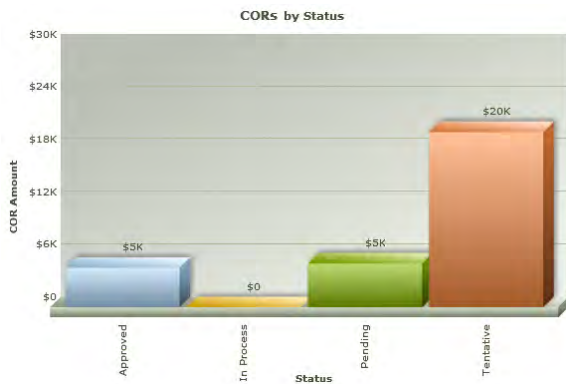
Tweet/Garot knows that when change orders fall through the cracks, the bottom line is affected. With Bidtracer, a potential change order

is generated at the time of an RFI to avoid such oversights. “Tying a tentative change order to an RFI helps increase the potential of our projects and helps our project managers not miss any change orders, increasing our profitability,” said Van Mun.

Thanks in part to Bidtracer software, the Lambeau Field project has been

a success for both Tweet/Garot and Packers fans, who are excited to enjoy the renovations in this upcoming NFL Season.

To chat online with a Bidtracer sales rep, click “Online Sales” at www.bidtracer.com/contactus or call 888-708-0921, extension 105, to talk to a representative.



Tweet/Garot streamlines management processes and increases efficiency using Bidtracer software, such as Project Management software that shows the status of change order requests, including tentative changes [bar graph], and allows them to drill down for more details [pie chart].

AQUATHERM

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You’ve got to learn to work with it. It’s a lot like gas pipe (HDPE), and you can’t work yourself into a corner. You’ve got to plan ahead and learn the tricks,” Delvecchio said.

One such trick for connections in tight spaces is leaving the fitting on the welding iron longer than the pipe, which allows the fitting and pipe to be handled separately. The Auburn staff created some onsite Aquatherm-specific prefabrication stations, which also increased installation speed.

Facing Challenging Conditions

With all work occurring between 7 p.m. and 6:30 a.m., the Auburn staff had to adjust to working in a jail—and always had to be within sight of a jail officer escort. In the confined spaces, there were instances where

making the heat fusion connections was challenging. “Working in the jail is like crawling into an attic and going down a long corridor, since the floors are 20’ slab-to-slab, and then you have to cut the ceiling out. You’re completely blocked, and it’s a totally tight space,” said Delvecchio.

“There have been four big water shutdowns on this job,” Delvecchio continued. “The flushometers on the toilets get stuck if you do a big shutdown, and even a 20-second shutdown would foul 80–150 flush valves, because the flakes in the galvanized steel would clog things up considerably. And you don’t want to go into 500 to 600 jail cells to fix all those stuck valves,” Delvecchio said.

Aquatherm Products Preferred

Swinburne said that despite the difficulty of fusing pipe in tight spaces, he is recommending Aquatherm for other county jobs on a case-by-case basis.

“It has many benefits over copper and other alternatives,” he noted.

The construction team and county officials have been pleased with the project. Auburn Mechanical Principal Kim Johnson said, “My favorite thing about [Aquatherm] is that if you have a leak, it is not typically going to be a catastrophic leak. It will not completely blow apart because of the way it’s connected. That’s not the case with other types of pipe. We have had only three leaks on this whole project—and they have been because guys didn’t fuse it correctly, but for the most part that doesn’t happen.”

Asked about the pros and cons of Aquatherm, Delvecchio concluded, “It is far superior to other plastic products on the market for water distribution. This is going to revolutionize the commercial industry as we know it.”

For more information, visit www.aquatherm.com.

Popular Rental Equipment Can Meet Contractors' Immediate Needs

The need for specialized equipment may arise so infrequently that a company cannot afford to purchase it. Moreover, storing, maintaining, and, in some cases, certifying equipment can create additional headaches. To meet their short-term needs, some contractors choose to rent equipment from sources such as **Lifting Gear Hire Corporation (LGH)**. Some of the most popular rental equipment includes the following:

Modular spreader beams range in capacities from 24–1,000 tons and have spans ranging from 3' to 100'. These beams are designed for

one-man assembly. Most spreader beams can be manually handled onsite, reducing assembly time and the need for lifting equipment. They also have a variety of top and bottom rigging available.

Air chain hoists have capacities ranging from .5–50 tons. These hoists are designed for maximum strength-to-weight ratio. They function well in most working environments, use uncomplicated electronic controls, and employ motors that function well in adverse working conditions. They can be chained to any height and can lift up to 50 times their own weight.

Come-a-longs are a versatile tool used for a variety of lifting or moving needs. They can be used in any angled position, even upside down. Come-a-longs are ideal for use in tight corners and have a capacity ranging from 0.75–9 tons. Come-a-longs are designed with low headroom and have a freewheeling capability that makes one-handed operation feasible. Because the braking mechanism is totally enclosed, the equipment is protected against dirt and moisture.

For more information, call 800-878-7305, e-mail sales@lgh-usa.com, or visit www.lgh-usa.com.

VIEGA

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lot of piping to install. It was to their advantage to approve the use of the pressing system. Time was of the essence, and pressing was the fastest way to do the job.”

The installation work was handled primarily by Hart's own crew of pipe fitters and tradesmen. Feldman estimated that his team used between 4,000' and 6,000' of stainless steel on the project.

“We used mostly 1” and 1-1/2” pipe all the way up to 2”,” said Feldman. “Most of the fittings were standard fittings, such as couplings, elbows, and tees.”

Saving Time and Labor

Feldman thinks that the best benefit of Viega ProPress for stainless is the time it saves. “It's much faster to install with pressing,” he said. “We saved about one third of the time compared to welding. That time savings is huge, considering that the labor rates for my guys are almost a hundred dollars an hour.”

Feldman's second most important benefit of the Viega ProPress for stainless system is that there is no flame, which negates the need for a hot work permit. “That's a huge advantage,” Feldman said. “With Viega ProPress for stainless, you can go into areas that don't allow hot work, even if it's a hostile environment. That's very important, especially in existing biotech suites.”

Before adopting Viega ProPress, Hart Engineering joined pipe by soldering and welding, depending on the piping that was being replaced. Feldman believes that other mechanical contractors are now using Viega ProPress for copper installations and that more will use stainless as they become more familiar with it.

Two years have passed since the biotech project, and Feldman and Hart Engineering were so pleased with Viega ProPress systems that they recently quoted another drainage and venting job for the same customer. “If we get approval, we'll be using Viega ProPress for stainless again for some of the installations,” Feldman said. “We are always trying to get our



Viega ProPress systems do not require a welding permit, which was especially important when Hart Engineering replaced all of the existing piping with stainless steel for a biotechnology manufacturing client.

customers to allow pressing for certain applications because of the time savings and safety benefits.”

For more information, visit www.viega.net.

MCAA thanks Viega for being a major sponsor of MCAA 2013.

VICTAULIC

continued from page 1

As baby boomers age, demand for healthcare services is surging. As a result, healthcare construction projects are bigger, more complex, and have shorter timelines than ever before.

“The UCH project was extremely aggressive based on the large volume of materials in a compressed timeframe, so pre-planning and creativity were needed in order to be able to perform well on the project,” said Scott Hager, associate vice president at U.S. Engineering, who was responsible for field operations on the project. “We had a 12-month critical path for all of the multiple trades to rough in, and we were anticipating the possibility of multiple shifts, seven-day weeks, and a great deal of overtime.”

U.S. Engineering is a 120-year-old, full-service mechanical contractor that has served the Rocky Mountain region for more than 40 years from its Loveland, CO, location. One of the firm’s fabrication shops is located in Aurora, near the UCH 12-story Inpatient Tower. Work on a second inpatient tower began in early 2011, with a facility opening date set for March 2013. U.S. Engineering was responsible for installing the sheet metal, mechanical, plumbing, and piping system for the 734,000-square-foot project. The \$400-million state-of-the-art building doubles the size of the facility’s emergency department and, when fully built out, adds 276 more beds.

The UCH project had two mechanical rooms in the basement. One housed the heating water and domestic hot water equipment and the steam generators; the second contained the chilled water and domestic water system equipment. A third mechanical room on the fourth floor housed large air-handling units and supporting accessories. All the chilled water and steam were drawn from the central utility plant owned by the university.

Prefabrication Improves Ergonomics, Safety, and Quality Control

The speed and ease of use of grooved technology in the fabrication shop wasn’t the only attribute that helped U.S. Engineering maximize productivity on the UCH project. The company also credits a variety of benefits associated with the prefabrication process. For the UCH project, prefabrication created a controlled environment that made for more ergonomic working conditions and better quality control. Also, the construction team’s use of multi-trade fabrication increased efficiency throughout the entire construction process. By collaborating with the general contractor and all trades—from mechanical plumbing, piping, and duct, to fire protection, electrical, gypsum board, framing, and controls—team members fabricated and assembled entire sections of corridors and headwalls at the U.S. Engineering prefabrication shop. Once the sections were complete, they were loaded on a truck and delivered to the jobsite for installation. This construction method allows multiple parallel activities to occur, resulting in faster completion times, reduced costs, reduced site safety risks, increased quality, and improved project performance.

“We took steps to incorporate Victaulic grooved technology where we hadn’t before and that helped with speed and ease of installation so we could successfully deliver on this fast-track project.”

— Scott Hager, Associate Vice President, U.S. Engineering

Victaulic Products Increased Speed, Ease of Installation

U.S. Engineering had prefabricated with grooved pipe-joining previously, but the UCH project was the first project on which it incorporated primarily Victaulic technology. As a result, grooved systems were used in a large portion of the major mechanical and large bore piping, including pump equipment work, headers, and connections, where the company had previously used welding. U.S. Engineering incorporated Victaulic Advanced Groove System couplings for quick and easy large-diameter connections, check valves, straining devices, butterfly valves, stainless steel systems, and flexible and rigid couplings. QuickVic® 107H Couplings with proprietary Grade “EHP” gaskets rated to 250° F (121° C) for unmatched performance on hot water systems were also included, as well as Style 607 QuickVic® copper couplings and Style 47 Dielectric Waterway fittings that served as a transition waterway between copper and stainless pipe.

“We took steps to incorporate Victaulic grooved technology where we hadn’t before and that helped with speed and ease of installation so we could successfully deliver on this fast-track project,” said Hager. “We definitely saw faster installation times in the mechanical rooms that were highly complex, and we were able to eliminate spool pieces of so many flanges by replacing them with Victaulic grooved couplings and valves.”

Hager, who began working with grooved mechanical couplings in 1989, said there were also big benefits in the quality of the completed product over welded flanges. “I have a lot more confidence in not experiencing leaks using grooved couplings. They are a lot quicker to install and are a great product.”

According to Bret Russell, superintendent at U.S. Engineering, who is responsible for managing the fabrication shop, the firm’s pre-planning paid off. No additional shifts and limited

continued on next page

VICTAULIC

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overtime were needed to complete the job successfully. And Russell would know. He measures the fabrication shop's productivity by calculating per inch of pipe used, per hour, per day.

"We were able to groove approximately 29,200 diameter inches for the UCH project from November 2011 through August 2012. And that's while also prefabricating for two to three other similar-sized jobs," said Russell. "Welding and flanging can't even compete. Grooved is more than six times faster, which is a considerable labor savings and a tremendous boost in productivity."

By using mostly Victaulic grooved mechanical systems in the fabrication shop for the plumbing and piping, Russell's team saw other cost-saving benefits. "We reduced the need for welding and soldering consumables and various equipment parts," he said. "These types of savings are increasingly more important as jobs become more demanding."

Increasing Safety

Using grooved systems also played a significant role in increasing safety in the shop. Mike Parker, project manager at U.S. Engineering, noted that the ability to take assembly off of the jobsite and into the fabrication shop in a controlled environment reduces the amount of field fitting and exponentially increases safety over welding. It also allows changes in the field without a big impact on labor. "With grooved, there's no cutting or grinding to create sparks and flames like welding," said Parker. "You don't have the added dangers associated with welding, soldering, and brazing, and that's important when you take safety as seriously as we do."

Hager agreed, saying, "Victaulic is much less accident-prone than heavy



Prefabricating with grooved systems like Victaulic's keeps U.S. Engineering competitive through improved control over project schedules, faster installation, reduced labor, and increased safety.

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— Bret Russell, Superintendent, U.S. Engineering

flanges and large heavier lug style valves that we've used in the past. I have no doubt that grooved offers safer installation than welding." He added that because grooved reduces labor, exposure to injury also decreases.

U.S. Engineering was recently recognized by the Colorado Division of Labor with an Excellence in Safety Award for their outstanding commitment to workplace safety and workers' compensation cost containment. "Ensuring a safe working environment" is among U.S. Engineering's core values.

Gaining a Competitive Edge

Hager, Russell, and Parker all felt that prefabricating with Victaulic grooved technology was the right fit for the UCH installation. The company believes so firmly in using prefabrication

as a competitive advantage that they now begin all projects by identifying what cannot be fabricated in the shop.

"Jobs are going to continue to get larger, harder, and faster, and for healthcare projects like UCH, thinking outside of the box and using prefabrication is the way of the future to meet budgets and tight schedules," said Parker. "Anything we can do to speed up the process ahead of time and offsite keeps us competitive. Using grooved couplings from Victaulic gives us a leg up and will definitely be part of our strategy for future projects."

For more information, visit www.victaulic.com.

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DAIKIN MCQUAY

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heat gain while light shelves facilitate daylight harvesting. Lighting and work station equipment shut off automatically after hours.

After factory-certified testing to AHRI Standard 550/590 for water cooled chillers, two Daikin McQuay Magnitude chillers were selected for the building, one 500 tons and one 250 tons. With magnetic bearing compressors and integral variable frequency drives, these chillers are 40 percent more energy-efficient than traditional centrifugal compressor chillers. Their performance allows the building to satisfy varied operating conditions efficiently, especially at part load, which occurs frequently in the mild San Francisco climate.

The SFPUC headquarters houses more than 900 employees and includes a data center in the lower level, a childcare center, and a café. The SFPUC estimates that building and owning its new headquarters will allow the department to save local residents around \$3.7 billion (\$500 million in 2012 dollars) over the expected 100-year life of the building.

A Traditional Mechanical System With a Modern Twist

The building's HVAC system design is based on a traditional four-pipe system and includes the two chillers, two rooftop cooling towers for the chilled water system, two large VAV custom air-handling units, heat exchangers, and an underfloor air-distribution system that conserves building space, minimizes ductwork, and allows personal control of airflow.

The building's underfloor air-distribution system accommodates data lines and most of the ventilation infrastructure, including air-handling equipment as well as linear and swirl diffusers in the floor that supply air



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Daikin McQuay Magnitude magnetic bearing chillers (center) used by ACCO for the SFPUC Headquarters are 40 percent more energy-efficient than traditional centrifugal compressor chillers—a high priority for “North America’s greenest urban office building.”

for cooling. The building envelope includes operable windows that occupants can control. If a window is opened, the building automation system shuts off the flow of conditioned air through the underfloor system to the corresponding zone.

With all the efficiency measures, the building's design exceeds ASHRAE 90.1 requirements for energy efficiency for heating and cooling in new office buildings by an impressive 51 percent.

The approximately 10-foot by 30-foot mechanical room is a partial 14th floor where the chillers were installed. “The rigging requirements included setting the chillers in place and anchoring them down based on the seismic data as calculated and signed off by the structural engineers and architect,” said Keeling. “The chillers, which themselves are seismic compliant, had to be anchored to undertake a seismic event and isolate the vibration between the chillers and the building.”

Building Intelligence

From the building elevators to the waste water treatment system to solar and wind systems, a comprehensive Integrated Building Management System monitors and helps to manage

approximately 13,500 data points collected from every building system. This system makes all HVAC-related information—including the plumbing and fuel oil system—readily accessible.

Another unique advanced system is an on-site grey- and black-water treatment technology called the Living Machine[®], which reclaims and treats all of the waste water from the building to meet the demand for the building's restrooms. The Living Machine can treat 5,000 gallons of water daily, reducing per-person water use from 12 gallons to five.

Public Enthusiasm

The SFPUC building has generated widespread enthusiasm from San Francisco residents. Public tours of the facility that began in June quickly reached capacity. The SFPUC encourages self-guided tours of the building lobby, where visitors can view the digital arts wall and read about the sustainability and architectural innovations of 525 Golden Gate.

For more information, visit www.daikinmcquay.com.

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