

MAY/JUNE 2021

SMAC NEWS

Choosing the Right Metal for Architectural Design





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Prevailing Wage, Buy American, Energy Efficiency and Labor Standards Efforts

Washington lawmakers remain focused on issues of importance to SMACNA contractors. The Senate voted for the first expansion of Davis-Bacon in decades. Negotiations continue on a broad infrastructure plan and in a variety of vehicles, including authorization and tax bills. Bills that will benefit energy efficiency and increase SMACNA contractor market opportunities are also under consideration. There is an encouraging amount of focus on federal labor standards favorable to SMACNA members in infrastructure and energy bills.

The upcoming virtual SMACNA/CEA virtual National Issues Conference will focus on many of the above issues,

including others SMACNA is working on, with important updates from the PBGC on regulations regarding the American Rescue Plan Act for multiemployer pension plans.

PREVAILING WAGE / BUY AMERICAN Senate Adds Davis-Bacon to Construction of U.S. Computer Chip Manufacturing Plants

In a move strongly supported by SMACNA contractors and chapter executives, the Senate passed an amendment to add Davis-Bacon Act coverage to the Endless Frontier Act., a \$250 billion 10-year package designed to fund science and technology efforts to make the U.S. more competitive with

China and other countries.

The amendment expands Davis-Bacon coverage for the first time in decades. The vote passed by a surprising margin when eight Republicans Senators voted with Democrats to support inclusion of the prevailing wage language. The House is expected to add the prevailing wage chip plant language by August.

The Senate-passed bill also includes a second amendment to close loopholes in the decades-old "Buy American" law that gives preference to American companies in government purchasing. The language includes exceptions and waivers for federal agencies to avoid the requirements of the law, for example, when there is limited availability and quality of U.S.-made products, or in cases when it's in the public interest. It would also establish a "Made in America Office" within the White House Office of Management and Budget which would target compliance.

ENERGY EFFICIENCY / LABOR STANDARDS

Energy efficiency bills supported by SMACNA:

- The Clean Energy for America Act" introduced by Finance Committee Chair Wyden (D-OR) with 24 cosponsors, is supported by SMACNA. The bill passed committee and awaits floor action as part of the infrastructure package or a tax reform package focused on energy efficiency. SMACNA worked to include efforts to improve commercial,





FROM THE PRESIDENT

Angie Simon

residential and industrial combined heat and power (CHP) systems construction project quality. The bill would:

- Build on the extension of section 179D by providing greater flexibility and encouraging taxpayers to pursue bigger efficiency gains.
- Reform the current incentive for energy efficient new homes by expanding the credit.
- Create an emissions-based incentive that would allow taxpayers to choose between a production tax credit (PTC) or an investment tax credit (ITC) and allow CHP, the emissions to be calculated using both electrical and useful thermal energy.

- **The Energy Efficiency Public Buildings Act** SMACNA's New York City Chapter endorsed the bill, sponsored by Rep. Nydia Velazquez (D-NY) with seven cosponsors. The bill would protect the public from COVID-19 and other public health threats by requiring upgrades in ventilation and HVAC systems as well as make significant investments for retrofits in public libraries, hospitals, community-based non-profits and other state and local government buildings.

This bill also aims to include federal labor standards. It would expand registered apprenticeships and skilled construction jobs by providing \$4 billion over four years to fund energy efficient retrofits in public buildings. ▼

Design-Build Delivers Best Possible Outcomes

Being an engineer and running a full mechanical contracting company, I appreciate the benefits of bringing together architects or engineers and different trades to discuss projects before they are on the jobsite. Jobsites to me are like an orchestra, where coordination is paramount to successfully produce the desired outcome. You need a conductor (owner) and a rehearsal (meeting) to make sure everyone knows their role, the right instruments (team members) and the correct coordination to get everyone ready for the live performance (the jobsite).

Analogies aside, design-build increases communication and understanding of what's needed on the jobsite and increases the probability the project will meet or exceed customer expectations. Unlike sports, which is always my go-to, a win-win is the best outcome possible and design-build delivers on several fronts.

ASHRAE President Chuck Gulledge and I recently agreed that engineers and contractors working together from one model saves time and money. Chuck added a poignant comment that resonated with me and that is "The world is evolving to a single narrative, full team, all-engaged at conception, and working in one model - and the owner owns the model.

For many contractors, design-build may not be a common occurrence in your shop, if at all, but nearly 80% of Western Allied Mechanical's work now has design-build built into the project scopes and I couldn't be happier. For those contractors looking to add design-build capability into their business, my good friend Guy Gast, President of the Waldinger Group, Iowa Division, shared some sound advice on our Let's Talk Shop podcast episode.

Guy recommended "you partner with an engineering firm instead of hiring a person and announcing you now have design-build capabilities. Together with your partner firm, you can then market yourselves to engineering firms that appear to be in the end-user space. You want to then pitch engineering firms that are influencing decision makers and owners in the space where you work. Become more familiar with them whether it is through local ASHRAE meetings, or other social networks and be intentional about the process."

The last piece of advice Guy shared was, "what's the worst thing that would happen by getting into design-build? I might not succeed...I might not get my foot in the door...I might not develop that relationship I was seeking. If that's the worst that would happen, then why wouldn't you try it if it's not going to cost you any money?"

I couldn't agree more. ▼

Sincerely,

Angie Simon, SMACNA President





Contractor Scores Big with Completion of New Big 10 Stadium

Before COVID-19 hit, the University of Iowa — a member of the NCAA Big 10, the oldest Division I conference in the United States — did a massive upgrade to the premium and club seating options in their new state-of-the-art college football stadium. The school demolished the entire seating area on the north end zone to create a new grandstand area for public seating, as well as premium seating and a clubhouse area.

SOME PEOPLE ASSUME WHEN A PROJECT HAS A HIGH-TECH LOOK THAT FIT AND FINISH ARE NOT IMPORTANT, BUT IT'S ACTUALLY JUST THE OPPOSITE.

D&S Sheetmetal's part of this \$89 million renovation project took place mainly in the new 17,000 square foot concourse and clubhouse area with concession areas, restrooms and support spaces.

Using approximately 130 sheets of carbon steel, 50 sheets of 3/16" stainless steel and 50 sheets of perforated carbon steel, the D&S Sheetmetal team created more than 550 unique components while providing detailed shop drawings to facilitate installation in the field. They



fabricated 3/16" thick polished stainless steel countertops, soffits and end panels in the concession areas, 16 gage carbon steel wall panels in the concourse and clubhouse and restroom areas, 16 gage carbon steel wall panels and trim and accent components in the restrooms, and 16 gage powder-coated carbon steel custom perforated fin tube heater covers.

Additional work included stainless steel and carbon steel wall panels and trim at skywalk entries, 3/16" thick polished stainless steel frames at backlit graphic display panels in the concourse/clubhouse, and 3/16" thick stainless steel base trim in the concourse/clubhouse.

Tom Grommon, estimator and project manager at D&S Sheetmetal, notes that, though, this type of work is familiar to the company, the quantity was unusual for a single project. The architect's plans used materials in different ways as well, starting with the polished stainless steel countertops in the concession areas.

"Typically you'd see 16 gage stainless used for something of that nature. The effect the designers wanted was a solid bold stainless steel edge, so we fabricated those items out of 3/16 stainless plate. Not only would you have



LEFT & RIGHT: The new concourse areas contain 16 gage carbon steel wall panels with 3/16" thick polished stainless steel frames and trim at backlit graphic display panels in

MIDDLE: A view of a concession areas that include thick polished stainless steel countertops, soffits and end panels. The solid bold stainless steel edge was a key component of the design plan.



for the graphic displays were unique," said DeRycke.

The schedule was a challenge too, as all of D&S Sheetmetal's work had to be done during the last four months of the 28-month project schedule, after other work was complete. "Because so much of our work was decorative, we were not able to measure and field verify the work until substrates were in place," Grommon explained.

The high-tech nature of the project was another challenge. "With the concession stand stainless steel tops, end walls and soffit, all of which were visually bold, we needed to make sure that planes and corners lined up correctly, and things met up and matched up, so that the fit and finish would be correct," said Grommon. "Sometimes we had to be a little creative. Some people assume when a project has a high-tech look that fit and finish are not important, but it's actually just the opposite. Because there are no coverings or finishes to hide imperfections and blemishes, you want the project to look clean and appealing when it's all said and done."

Hopefully the project will get a lot of use during the upcoming 2021 season, when thousands of Iowans and Hawkeyes fans will be able to enjoy this unique space.

When the project was complete, the D&S Sheetmetal team took a field trip to the stadium. DeRycke says, "We were able to take everyone through the completed project who had worked on it at any given point. It was really nice for our employees to see the finished product. There's a lot of pride of workmanship that goes along with that." ▼

the stainless steel top, but you would see the thickness of the edge of that material as well so that you see a stainless line as you look at it from a distance. The detailing was unique in that regard."

Another unique element was the use of carbon steel for decorative wall panels. "We had to be very careful about the material that we were receiving, and how we were handling it because carbon steel often shows signs of heat treatment or cutting," said Grommon. "There were actually several times during the project where we rejected material from an aesthetic standpoint, which, for carbon steel, would be very unusual. With 99% of the carbon steel that most sheet metal shops use, nobody really cares much about the appearance of the material. Because of the nature of this work, it was pretty critical that it was always as uniform as possible."

Valerie DeRycke, president and co-owner of D&S Sheetmetal, and a former president of the SMACNA Iowa chapter, found it interesting to see how the architect chose materials. "It was so different than anything we'd ever done. It's not unusual to have polished stainless countertops, but the carbon steel wall panels and the frames that were built



D&S SHEETMETAL
ds-sheetmetal.com

KINNICK STADIUM
RENOVATION
kinnickedge.org



WSCC's Summit Expansion a Peak Project for Contractor

The Washington State Convention Center (WSCC), the premier meetings and events facility in the Northwest, is doubling in size with its new Summit building in downtown Seattle. The Summit addition, which is scheduled to open in mid-2022, will add 1.25 million square feet of convention space and 250,000 square feet of parking and retail in an innovative program including stacked exhibit halls, two stacked meeting room levels, and an

“AT ONE POINT THE BUILDING LOOKED LIKE A GIANT STAIRCASE OF STEEL.”

industry-leading 60,000 square foot ballroom. The final funding to complete the Summit building project was secured in April of this year.

WSCC was particularly selective in awarding the HVAC contract for this expansion, which involves a 4,000-ton central utility plant and 1.3 million pounds of ductwork. “MacDonald-Miller had to submit pre-qualifications and go through our financials to even reach the interview process,” said MacDonald-Miller’s Operations Manager Rylan MacCay. “We had to demonstrate that we could take on a project of this size, especially with the scale of the ductwork.”

WSCC also evaluated the planning team. During pre-construction, detailers from MacDonald-Miller co-located at the Arup Engineering office to model the systems in 3D and speed up the coordination process.

“Everyone — engineers, detailers, project managers — would get together in a room and hash out those items, which allowed us to identify issues that would have been very serious later in the game had we not talked about them,” says Project Manager Jon Osman. “For instance, the early design had single coil air handlers. Our detailers saw that we needed dual coil air handlers, which required major changes in piping and connection.” Rigorous constructability reviews allowed MacDonald-Miller to manage adjustments before the AHUs had been procured or installed.

The Summit includes 35 dual coil air handlers in multiple mechanical rooms. The biggest AHUs are 15 feet tall and 45 feet long by 15 feet wide and weigh around 50,000 pounds each. “They’re huge. We’ve been looking



LEFT: One of the outside air ducts coming off of AHU-601. It is 142x72 with 1" liner.

MIDDLE: AHU-604. The outside air ductwork goes up and over the supply as it goes to the exterior of the building.

TOP RIGHT: The main smoke exhaust unit for the Level B2 Exhibition Hall and the Level 5 Flex Hall. This supply ductwork will be able to reverse and become exhaust in the case of a smoke event.

RIGHT: An AHU-604 (front) and AHU-603 (back). The overhead ductwork in front is 88x56 supply air, 4" pressure class and 4" liner.



MACDONALD-MILLER
macmiller.com

WASHINGTON STATE
CONVENTION CENTER
SUMMIT ADDITION
wsc.com/venues/
summit-addition

at the drawings for two years, but it's not in perspective until you see one in person."

The entire project is on the same massive scale. "We have spiral duct that goes up to 78 inches, and there's an 82-inch run as well," says MacCay. The ductwork is up to 20 feet wide, and one single fitting will be 20 feet by 30 feet. "That fitting is built to a pressure class of 10 inches," Osman says. "I feel like you could run water through it."

MacDonald-Miller subcontracted some of the spiral but is fabricating the rest of the duct in-house. "We have 60 to 80 sheet metal workers in our fabrication shop," says MacCay. "For most of last year they've been working three shifts, so the shop runs around the clock, five days a week." Besides the team in the shop, they expect to have 60 sheet metal workers on site next month.

"Most jobs I've encountered start on the ground and move up, so one of the biggest challenges of this site is that it's built on a billboarding system," Osman says. The

unique plan organizes the construction into five towers or 'billboards' in a row, to brace one other and support the load. Area One went up first, then Area Two and so on. Area Five has reached the seventh of fourteen levels.

"At one point the building looked like a giant staircase of steel," says Osman. "It takes significant coordination to manage these different billboards while also moving up the building. Since the systems are not complete horizontally, we'll cap systems off in order to start the TAB process soon. Due to the schedule, we simply can't wait for the end of the job," he said.

Another aspect unique to the project is that the scaffolding is not as permanent as it may be on other sites. It sits in place for a day or two to load materials, then it's moved to a different location for walls to proceed.

"This is definitely the biggest job I've ever been on," Osman. "It might be the biggest of my career. I have never done anything like this before." ▼



Contractor Helps Grow Company's Pharmaceutical Niche

January 8, 2021, was another proud day for everyone at Ernest D. Menold, Inc. The Lester, Pa., SMACNA contractor celebrated the successful completion of a 310-square-foot stainless steel platform for a Teva Pharmaceuticals manufacturing and research facility in nearby West Chester, Pa.

Menold, Inc. designed the platform to allow Teva personnel elevated access to three new 8-foot-tall bioreactors. The project checked all the right boxes: quality craftsmanship prefabrication, on-time installation, good profit margin, and a happy client.

For Ernie P. Menold, the fourth-generation Menold to work in the family business started by his great grandfather, this project validated that the company can find success in utilizing modern construction technologies and delivery methods.

"We have really grown our business through the pharmaceutical/life sciences/biotech sector in the past five to 10 years," said Ernie P., vice president at Menold, Inc., which serves the greater Philadelphia region. "We pride ourselves and really go after that niche."

Determination to succeed in that sector meant that Menold, Inc. had to match the strict environmental and safety standards that come with most life science projects.

"The company commitments we've made — to safety,

collaborative design assist project delivery methods, pull planning scheduling, modular pre-fabrication and just-in-time delivery — have changed the way we perform work," Ernie P. said. "When we were first approached by Teva's engineers, they had a firm date about four months out by which the bioreactors needed to be up and running. We were able to design, get engineered stamp drawings, fabricate and install this project before Teva's deadline. For us a contractor, it validates the benefits of having both design-assist delivery methods and pre-fabrication capabilities."

Ernest P. also made some big personal and professional commitments a few years ago when he returned to Menold, Inc. after nearly a decade working in digital marketing.

"I grew up working here," he explained. "In high school, I started doing general maintenance in the shop, then grew into helping a mechanic with some fabrication." In college, Ernie P. returned on summer and winter breaks and worked as an assistant project manager, helping coordinate projects and estimate upcoming work.

"I was always attracted to construction because it's



LEFT: Complete installation of the platform in Teva's cleanroom.

MIDDLE: Assembly of the platform in EDM Inc.'s shop.



tangible. There is great satisfaction in taking an idea from a drawing to a finished product," he said. "It's been quite a change for me over the past few years."

The Teva platform project further validates that he made the right decision.

Ernie P. said the biggest challenge at Teva was the installation had to be performed in an active 'clean room,' meaning absolutely no grinding, sanding, cutting or welding on the job site.

"We prefabricated the entire platform in our shop, labeling and sequencing each structural member for delivery, then disassembled and bundled all the parts for storage for a sequenced installation," he explained.

The platform was fabricated out of 8,000 pounds of stainless steel, including 4" x 4" x 1/4" and 2" x 2" x 1/4" structural tubing. All visible outside corner welds were grounded smooth and polished. The Menold shop team used a new pipe bender to fashion the platform railings out of 1 1/4" SCH. 40 PIPE 304-4F. The platform floor was created with 1/4" type 304 stainless steel diamond plate, with a cup finish on top.

All of this stainless steel was essentially assembled twice: first in the shop, then at Teva. For the second assembly, the Menold, Inc. field installation crew had to go through a clean room gowning procedure with booties, hair nets, Tyvek suits, and masks. They were on site for about two weeks.

"If any field corrections had to be made to our pre-fabricated structural members, we would

have had to exit the facility, perform the work outside, and re-gown to re-enter the clean room," Ernie P. said. "With the proper coordination between design, shop and field personnel, this was avoided entirely.

Menold, Inc. has around 90 employees, and Ernie P. is quick to give credit to all of them, including members of Sheet Metal Workers Local 19. "The success of this project is a credit to our employees who executed it, such as Project Manager Bo Smart and Design Manager Lou DiTomo," Ernie P. said.

He also noted that it takes a lot of skill to work with stainless steel, and Menold, Inc. fabricators are top notch craftsmen. "Phenomenal job to our design, shop and field crews for completing this project on-time, safely and with the highest quality. They first began working with Teva's engineers developing the scope of the project, all the way through installation of the bioreactor tanks."

"At the core of our company, we solve our customer's problems," Ernie P. says proudly. "We like to take on our customer's issues, and design, fabricate, and install the solution. That's exactly what we were able to provide for Teva. We continue to take on more complex projects, often in highly controlled environments." ▼



ERNEST D.
MENOLD, INC.
menold.com

TEVA
PHARMACEUTICALS
tevapharm.com



SMACNA Contractors Feel at Home Providing Residential HVAC Services

At a time when many SMACNA members are not entering the residential market, these contractors say maintaining a homeowner-focused department is a smart business move.

When asked what they think about residential HVAC work, a lot of SMACNA members express similar sentiments:

“It’s too cutthroat.”

“There’s not enough profit.”

“Can’t compete with unlicensed people who have a van and a toolbox.”

With comments like these, it’s not surprising that many union contractors no longer have a residential sales and service department. It’s hard to explain to homeowners the value that a highly trained SMACNA member offers — especially when a non-union competitor is willing to do the same work for a lot less.

But some SMACNA companies are defying that trend. They’re expanding their residential service departments, adding new customers and keeping longtime clients happy.

What’s their secret?

For some, like Scott Tucker of Tucker Heating & Air Conditioning in Middletown, Ohio, it’s the personalized

service and competitive pricing that comes from having just a two-person operation. For others, such as Todd Geisler of Geisler Bros. Co. in Dubuque, Iowa, it’s having an almost 130-year-long reputation in the community that keeps customers coming back.

One thing these SMACNA members have in common: They have no plans to exit the residential heating and air-conditioning business. It’s a core part of their company’s brand identity. While it may not be as profitable as commercial or industrial HVAC, residential service does have some advantages, such as quick payment, these contractors say. Plus, it’s hard to beat the business impact of positive word-of-mouth, they add.

Here’s how — and why — three SMACNA members continue to feel at home offering residential services.

EVERGREEN STATE HEAT & AC, EVERETT, WASH.

Ask company owner Russell Kimball what makes Evergreen State Heat & AC stand out in the crowded Seattle metro market and he cites what he calls “The Evergreen Difference” from the company’s website: “Transparency. Honesty. Enduring. Responsive.”

For homeowners, that means “no surprises, fair rates, quality work, outstanding service and humility,” he says.



LEFT: Evergreen State Heat and AC maintains an active residential service department. Among its staff are: Chester the dog (left), sales manager Leslie Chapman, pipe/wire/fire foreman Cliff Anderson, pipe/wire/fire journeyman Brandon Cope, service foreman Chad Smith, and service journeyman Keith Ragusa.

MIDDLE: Scot (left) and Todd Geisler own Geisler Bros. Co., in Dubuque, Iowa. The 130-year-old contractor has been involved in residential HVAC services for decades.

MIDDLE: Rob (left) and Scott Tucker of Tucker Heating and Air Conditioning in Middletown, Ohio, say they like being a two-person residential HVAC service company.



were sold in an adjacent hardware store. Almost 130 years later, the fifth generation of the Geisler family (Todd Geisler is president; Scot Geisler is vice president) run the contracting firm that now encompasses roofing and HVAC construction. It also maintains a large and active residential service department.

Many homeowners are willing to pay more for the company's straightforward approach, according to Todd Geisler. "A lot of customers sign with us based on how well we've done explaining the system to them," he says. "We make them part of the process. We tell them what we're doing, why we're looking at this and explain everything to them. We give them a lot of options."

Besides word-of-mouth from satisfied customers, the company supports the brand with newspaper and radio advertising, as well as targeted Facebook ads and other social media campaigns.

TUCKER HEATING & AIR CONDITIONING, MIDDLETOWN, OHIO

For Scott Tucker of Tucker Heating, the best way to fight against the lower-priced competition is by offering personalized service — very personalized service. And it's easy, because there's only two employees in the whole company.

"My brother and I," Tucker says. "We have an official motto: 'When you call Tucker, you get a Tucker.'"

It keeps things busy, but Scott and his brother Rob like it that way.

"We just decided that we wanted to work and not manage people," Scott Tucker says. "We make it work. It's a little more hours when it's hot and when it's cold, but we don't have to worry about laying people off or finding people."

Tucker estimates that the company's work is about 85 percent residential, with some light commercial thrown in.

"Residential is our bread and butter," he says. "Because most of it you collect when you're there. It's quick money." ▼

"If we don't do it right, we'll make it right."

Kimball is fond of saying that his company performs basic services better than anyone else. Why focus on the basics? He says it's loosely based on something that former Pittsburgh Steelers coach Chuck Noll once said: "Champions are champions not because they do anything extraordinary, but because they do the ordinary things better than anyone else."

Through internet marketing and local advertising campaigns supported by brands such as Trane and Mitsubishi, Kimball positions the company's employees as home energy experts. Evergreen stresses that its service technicians and sales staff consult with homeowners to find the right solutions.

"Our design process is driven by input," Kimball says. "We ask a lot of questions."

Armed with the information those conversations provide, Evergreen's installers can put in a system that meets homeowners' needs — and their budgets.

GEISLER BROS. CO., DUBUQUE, IOWA

Geisler Bros. can trace its roots back to 1892, when Joseph Geisler opened a sheet metal shop, fabricating pots, pans and other small household goods that



TUCKER HEATING & AIR CONDITIONING
tuckerheating.com

EVERGREEN STATE HEAT & AC
essmwa.com

GEISLER BROS. CO.
geislerbrothers.com



COVER STORY

Choosing the Right Metal for Architectural Design

L. William Zahner clears up some of the common misconceptions about architectural metals in five-volume book series

Stainless steel will never corrode or rust. Aluminum is too expensive for many applications. And zinc is quick to deteriorate. L. William “Bill” Zahner III said those beliefs are common among architects and designers in the architectural metals industry. They’re also wrong.

"There's a lot of, shall we say, 'misinformation' that gets out there," he said.

Zahner would know. The president and CEO of A. Zahner Co. has written numerous articles and several books about the use of metal in architecture. He has appeared at SMACNA events many times to discuss the topic. His company, the 125-year-old Kansas City, Mo.-based A. Zahner Co., has done the design, fabrication and installation for some of the most well-known and iconic metal structures around the world — from international corporate headquarters to museums that draw millions of visitors annually.

The company's employees are experts at making metalwork for high-profile construction projects, whether it's fabricating gleaming stainless steel pillars or deep brown copper cladding. And since they have extensive experience not just with metal design but also its fabrication, Zahner and other company employees often act as consultants on metal projects worldwide.

Bill Zahner has written seven books on architectural metals. The latest series of five books covers stainless steel, aluminum, zinc, steel and copper alloys. Zahner picked those metals, he said, because they're the ones most commonly used in architectural projects. Each volume goes into extensive detail on the applications for using the material.

The most recent book in the series, *Zinc Surfaces: A Guide to Alloys, Finishes, Fabrication and Maintenance in Architecture and Art*, was just published by Wiley.

It's information that needs to get out to the broader architectural and design community, Zahner said.

"The point of (the series) was to educate designers and artists of the various idiosyncrasies between one metal versus the other and how they can be used in design and fabrication successfully," he said. "All the books delve into the actual surface of the material, how they're weathered, how they're going to respond to the environment, and how you can alter them to create various patinas or custom reflectivity from the surface."

Echoing some of the information that he covers in greater detail in the book series, Zahner discussed with SMACNews some of the most popular architectural metals in use today, their advantages, and some of the misconceptions architects and designers have about them.

"We use them all," he said. "What I try to do is shed some light and give real world (examples) and some scientific approaches on why certain things happen."



STAINLESS STEEL

Zahner has been involved in many noteworthy

architectural projects that use this material, including the Petersen Automotive Museum in Los Angeles, which features numerous stainless steel ribbons on its exterior.

"We're seeing stainless steel being used more and more (because) it's strong," he said. "It doesn't change or change is extremely slow. You can add color to it using an interference coloring technique, which is chromium oxide layers on the surface, or you can use physical vapor deposition, which is a very thin molecular coating of say, titanium carbide or titanium nitride on the stainless steel to give it those colored tones."

From Aluminum to Zinc, L. William Zahner Has Written a Book About It

L. William "Bill" Zahner has authored seven books, including a five-volume series about architectural metals.

The books are often referenced by architecture students and metal fabrication professionals looking for a deeper understanding of the materials they design for and work with every day.

Published by Wiley, all are available at Amazon.com, Wiley.com and other booksellers.

- *Copper, Brass, and Bronze Surfaces: A Guide to Alloys, Finishes, Fabrication and Maintenance in Architecture and Art*
- *Steel Surfaces: A Guide to Alloys, Finishes, Fabrication and Maintenance in Architecture and Art*
- *Aluminum Surfaces: A Guide to Alloys, Finishes, Fabrication and Maintenance in Architecture and Art*
- *Stainless Steel Surfaces: A Guide to Alloys, Finishes, Fabrication and Maintenance in Architecture and Art*
- *Zinc Surfaces: A Guide to Alloys, Finishes, Fabrication and Maintenance in Architecture and Art*
- *Architectural Metals: A Guide to Selection, Specification and Performance*
- *Architectural Metal Surfaces*

LEFT: The Institute for Contemporary Art at Virginia Commonwealth University uses 1,360 Rhein-zink custom-patinated zinc panels and 135 coping panels.

RIGHT: Instead of letting nature slowly transform the steel's appearance over time, pre-weathering steel in a controlled process allows it to quickly develop an oxidized appearance. All pictures courtesy of A. Zahner Co.



ZAHNER
azahner.com



LEFT: SoFi Stadium in Inglewood Calif., home to the L.A. Rams and L.A. Chargers, has 789 perforated, custom white anodized aluminum exterior panels that were manufactured by A. Zahner.

“The biggest trend is using finishes that diffuse the light,” Zahner said, “like a finish that we developed over the years called ‘angel hair’ that has become very popular with architects because of the way diffuse light reflects from the surface. It’s as if light is being generated from the metal itself.” The Petersen Automotive Museum used this type of material.

Despite its popularity, some architects and designers do not fully understand how stainless steel is impacted by environmental factors, Zahner added. “People think stainless steel will never corrode and never rust, but there are certain conditions

where it does,” he said. “The prolific use of deicing salts in our cities can damage the surface of stainless steels.”



ALUMINUM

Aluminum is another architectural material where misconceptions are common, Zahner said. For example, corrosion is not as common as many designers think, nor is it a particularly expensive material choice.

“I think it’s probably more economical per pound per surface area,” he said. “There are certain conditions where aluminum is more optimal than

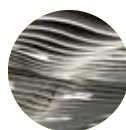
stainless. Aluminum takes very small amounts of other elements to change the characteristics considerably. All aluminum we see in use today are alloys of aluminum and trace amounts of other metals.

Certain trace elements added to aluminum can strengthen to levels reached by mild steels.”

Despite some misconceptions among designers, aluminum is growing in popularity, he said.

“I think you’re going to see an explosion of the use of aluminum based on some of the new techniques and new dyes that they’re impregnating the surface with,” Zahner said.

Among A. Zahner’s recent architectural aluminum projects was SoFi Stadium in Inglewood Calif., home to the L.A. Rams and L.A. Chargers. The building has 34,789 perforated, custom white anodized aluminum exterior panels that were manufactured by A. Zahner. “It’s an absolutely stunning, beautiful structure,” Zahner said. “That’s probably the biggest architectural piece of aluminum in the U.S.”



ZINC

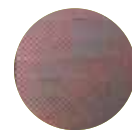
While popular, zinc is another often-misunderstood metal, Zahner said.

“There’s two rules of thought when you look at zinc and commercially pure zinc: People think it’s going to corrode and

corrode rapidly. Actually, it performs better on the sea coasts than other metals,” he said. “We’ve done some homes in the Bahamas using zinc surfaces. ... We’re finding zinc to be one of the more remarkable (materials) for putting patina on a surface. Zinc takes on different characteristics than other metals that are commonly used by sheet metal fabricators. Zinc won’t harden when it’s formed, like say stainless steel would,” he explained.

The offices inside A. Zahner’s 17,000-square-foot headquarters expansion, which was completed in 2018, features a thin skin of zinc panels.

Another major zinc project that involved A. Zahner is the Institute for Contemporary Art at Virginia Commonwealth University. The company provided 1,360 Rheinzink custom-patinated zinc panels and 135 coping panels. “It’s a beautiful use of zinc,” Zahner said.



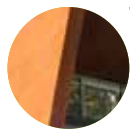
COPPER

Copper has been a popular architectural building material for thousands of years. The Statue of Liberty in New York Harbor is just one-high profile example of its use. While many architects love using copper for its beauty and durability, Zahner said, not all of them like what he compares to an awkward adolescence as the material matures.

That was a concern for the owners of the deYoung Museum in San Francisco’s Golden Gate Park. The building, which uses almost 130,000 square feet of copper panels, would not reach its final, earthy green color for more than a decade after its

2005 construction. That was not what they wanted to hear, he said.

The client even flew to Kansas City to look at mock-ups set up on site. "He says, 'Look Bill, I want this thing to look like a polished penny or the green like on the Statue of Liberty. I don't like those intermediate times' or as he called them, 'those teenage years with pimples and everything,'" Zahner explained. "And I told him, with this metal, if you allow it to grow like your teenager and you take care of it and you allow it to have its pimples, that eventually it's going to be a beautiful surface. And that's what happened."

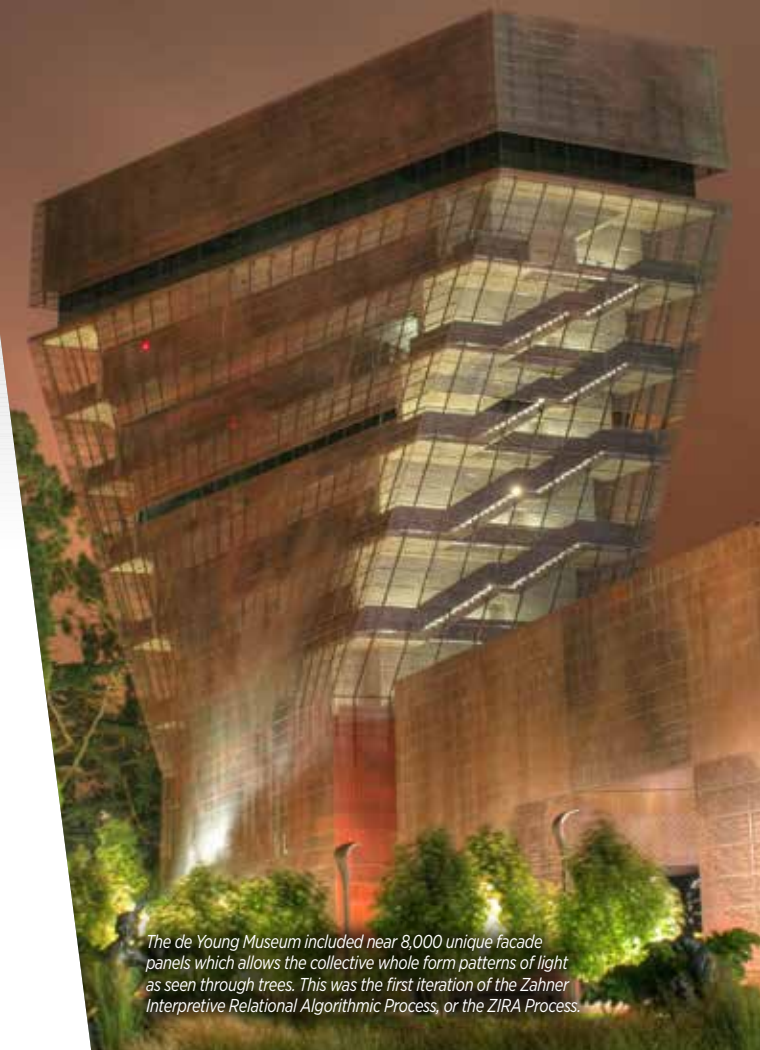


WEATHERING STEEL

This popular material was once found

under the brand name Cor-Ten, originally trademarked by U.S. Steel. Instead of letting nature slowly transform the steel's appearance over time, pre-weathering steel in a controlled process will quickly develop an oxidized appearance. The surface achieved is identical and as beautiful as the one nature produces. Additionally, this steel has excellent corrosion resistance and very high strength.

That makes weathering steel popular with many designers and architects. "It seems like most projects today, they want to accelerate the weathering to the point where it's more stable," Zahner said. "People want to know how it will change. They want to be able to predict it. We pre-weather it almost exclusively rather than allowing it to weather naturally." ▼



The de Young Museum included near 8,000 unique facade panels which allows the collective whole form patterns of light as seen through trees. This was the first iteration of the Zahner Interpretive Relational Algorithmic Process, or the ZIRA Process.

California Contractor Forecasts Pre-Aged Architectural Metals Trend to Continue

The use of weathering steel — so named because of its ability to quickly deliver the look of a metal that has been exposed to harsh elements — is also becoming popular in a region known for its lack of such weather: Southern California.

Mark Austgen, president and CEO of California Sheet Metal in El Cajon, Calif., said more designers and architects in the area are choosing weathered steel for its ability to quickly deliver a look that would otherwise take years to develop.

"We're seeing a lot of it," he said. "Whether it's on some of the facades of the building, or with people using it for planters and art pieces around their buildings."

It's become so popular that California Sheet Metal has a structure on its property dedicated to weathering steel to give it the look the company's clients are looking for.

It's one of the many trends that Austgen has witnessed during his time working on buildings in the Golden State. California Sheet Metal has a 100-year history of performing architectural work, ranging from building panel systems and handrails to artistic designs.

Its current projects include residential and commercial developments, as well as renovations of cultural institutions. The company is involved in a large, mixed-use development in downtown Los Angeles called the Grand L.A. Designed by well-known architect Frank Gehry, plans call for more than 176,000 square feet

of retail space, a 309-room luxury hotel and a 39-story, 400-unit residential tower.

"A lot of the exterior skin is a metal facade," Austgen said.

One exterior feature that Austgen said is becoming common in Southern California is using metal to simulate the look of wood.

"We're seeing a lot of requests for metal that has a woodgrain finish on it," he said. "Some of our paint vendors will try to put that wood finish look on the metal by a coil coat process." Others use a printing process or use aluminum extrusions to mimic the look.

California Sheet Metal Vice President Joe Isom said it's been a steady progression from adding simple colors to creating the multifaceted metal surfaces today's designers demand.

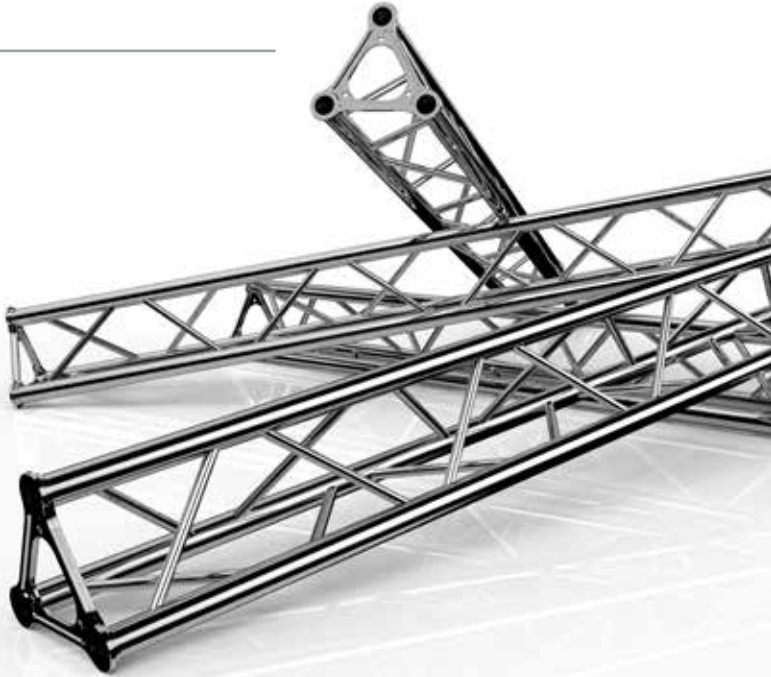
"It seems like in the past it was painted metal," Isom said. "(Now) I think the trend is towards finished, natural materials as opposed to paint. It will be a chemical process or some type of anodizing process. So it's natural materials with some type of finish that enhances the actual material." ▼



Weathering steel has become so popular that California Sheet Metal has a structure on its property dedicated to giving the metal its aged look.

Contractors Embrace Upfront Strategies for Gaining Efficiency

Steve Otis, virtual design and construction supervisor with mechanical contractor Hermanson Company, offers a unique description of the business of construction.



“It’s just chaos,” says Otis of the array of inputs, activities and workers converging to make a construction project happen. “The only way you make money is by managing the chaos that you have control over.”

Sheet metal and HVAC companies have relied on a variety of techniques and strategies over time to bring order to the chaos of a job site. Prefabrication, which by now is a well-established process and core to the construction trade itself, is one of the most common. Generally speaking, it shortens the time on a jobsite by building all or part of a structure in a contractor’s shop prior to delivery to the jobsite.

“We try and do some prefabrication on all of our projects at varying degrees,” says Matt Cramer, president of Michigan-based sheet metal and HVAC contractor Dee Cramer Inc.

Contractors are now leaning on increasingly sophisticated processes upfront to streamline prefabrication and design work. As a result, they are collaborating more effectively with partners and reducing the time spent on job sites.

PREFABRICATION’S APPEAL

What makes prefabrication so appealing to contractors? First, the element of control allowed by prefabrication facilitates better planning. Specifically, doing the work in the shop dramatically reduces the delays and down-

time that can be a common occurrence on job sites.

Moreover, prefabrication is safer. Rather than trying to assemble structures in variable conditions onsite, contractors do prefabrication work in a controlled manufacturing environment, which cuts down on common jobsite-related accidents.

“A safe job is a planned job,” Otis says. “If you have a job that’s a free for all, it’s unsafe every time.”

Prefabrication also supports superior quality control and consistency within a construction company’s final products. Otis notes that the ability to reproduce products consistently has taken on even greater importance as municipalities have tightened their building codes. “If we’re building a four-inch water gauge out of a Hermanson shop, everybody who touches it knows what it should look like,” he says.

Overall, prefabrication reduces labor costs and ramps up productivity. A study by the New Horizons Foundation, for example, found that contractors reported prefabrication produced overall productivity gains by as much as 33 percent over non-prefabrication work.

STREAMLINING DESIGN

The construction industry is now incorporating prefabrication into a growing push to improve collaboration and coordination in the early stages of projects.

Historically, construction projects have followed what is known as a “design-bid-build” model. First, architects and engineers work together to design a project. Contractors then bid based on that design. After the project is awarded, the parties would all work together to revise the original plans and coordinate the installation of the different parts of the project.

The process is now evolving so that more coordination occurs during the initial design phase, allowing contractors to complete projects faster with less time wasted on partners shuttling designs back and forth. “We’re basically finishing the mechanical design while the architectural model is being completed, so it’s really saving a step,” Cramer says.

What that new process looks like can vary. In a design-build project, owners work with one contractor to provide both the project design and construction services. Hermanson mainly does design-build work, and Otis stresses the benefits of marrying



CONTRACTORS ARE NOW LEANING ON INCREASINGLY SOPHISTICATED PROCESSES UPFRONT TO STREAMLINE PREFABRICATION AND DESIGN WORK.

the design of a project with the necessary fabrication work.

“We’re literally driving up our fabrication vision into the design,” he says. “We drive the design to our budget, and we have a happy client because there are no surprises at the end of the day.”

THE DESIGN-ASSIST MODEL

Joseph Lansdell, president of Indianapolis-based Poynter Sheet Metal, and a former SMACNA President, says he and his colleagues are seeing more requests for design-assist proj-

ects recently. In a design-assist project, a contractor offers input to guide a professional designer through the design phase. The designers benefit from the practical expertise of the contractors when it comes to laying out the plans for realistic structures that can be built under the parameters of a project.

Ultimately, the goal is to identify potential areas of concern at earlier stages in the design process. “This is great for all team members and eliminates duplication of efforts from the architects and engineers to

contractors,” Lansdell says.

Lansdell points out that design assist’s growth has created a better sense of teamwork between contractors and designers. In fact, he says Poynter has observed that collaboration between the two sides has never been better.

“We now have designers visiting us in our shop to understand

what we need from them to do our jobs,” Lansdell says. “Once a project is awarded, we see more trust in our area between designers and contractors to do our work.”

THE BIM EFFECT

Technological advances have enhanced the capacity of contractors to participate in design-build



Hermanson prefabricated Multi-Trade Racks for the University of Washington's Hans Rosling Center for Population Health building on the Seattle campus. The Racks were shipped from Hermanson's fab shop on custom-built frames that held three 20-foot sections. Once on-site, nine sections per floor were installed end-to-end on six floors.

The New Minskoff Pavilion at Michigan State University's Broad School of Business illustrates how design-assist raises the bar for collaboration in construction.



and design-assist projects. Namely, a growing number of contractors are using building information modeling — commonly referred to as BIM — which entails generating and manipulating digital representations of projects. Cramer describes BIM's effect as producing a “draw-it-once” mentality for a project. Contractors can use BIM software

to collaborate on one central design model in real time.

“You’re basically creating your design model and the installation model at the same time, so you’re not duplicating efforts,” Cramer says.

Hermanson uses a cloud-based BIM application that allows for dynamic revisions to project models.

“Any time of the day, I can link into the model and see where the design is, where the construction is,” Otis says. “You can collaborate in real time without moving files back and forth. You’re not chasing people around. Literally, all the information is right in front of you.”

Poynter has deployed BIM to collaborate with designers in one common model on design-assist projects. According to Lansdell, the benefits extended beyond a smoother project. “It not only worked very well, but we gained a level of mutual respect with the design team that lasted well past the project,” he says.

Cramer also points out that using BIM from the outset gives owners more visibility into the costs and benefits of different elements of the design. That

means fewer cases in which owners aren’t satisfied with the end result. In turn, that means fewer revisions on the back end of the project delaying its completion.

“It’s just a more efficient design process,” Cramer says. ▼



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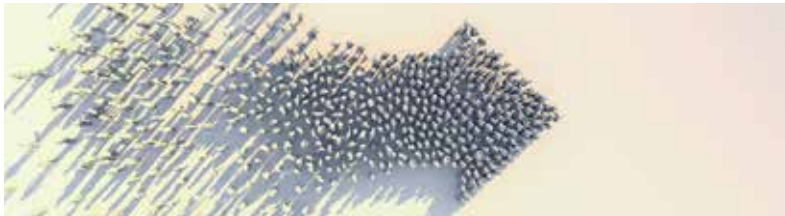
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LEADERSHIP

Ron Magnus

The Harder Work: Leading Toward a Preferable Future



It's unfortunate that a lot of useful business words and phrases get worn out from overuse — words like synergy, low-hanging fruit, getting granular, ideation — you've heard them all, too. Consultants are the worst. In my world, these buzzwords get sprinkled into conversations like too much salt.

One of those salty words is vision. Every celebrity CEO is introduced as a “visionary.” “What’s your vision?” is often used to simply mean, “How’s work going?”

The word has lost its currency. And that’s regrettable, because I believe vision, properly defined, is one of the most powerful tools a leader can wield.

A simple working definition of visionary leadership is “the ability to imagine, plan for and lead people toward a preferable future.” If everyone across the organization is clear about where we’re going, it’s amazing how much more consistently we move in that direction.

Some leaders do this intuitively and don’t even think of it as being visionary, while others use all the buzzwords and have the PowerPoints and spreadsheets but aren’t actually headed anywhere. As one leadership guru used to say, “He who thinks he’s leading but has no one following, is just taking a walk.”

If we look honestly at our industry, we would surmise that vision is not essential to being successful, at least in the short-term. Lots of companies achieve some financial success with an opportunistic approach to finding and executing work. Perhaps that’s one of the reasons that the majority of privately held businesses don’t survive beyond the founder’s generation.

We’ve seen that over the long-haul, those companies that do the hard work of identifying a preferable future and then drive toward it with relentless focus (taking detours when necessary), will almost always outperform their rivals.

Without a compelling vision, leaders often feel they are alone and on their own, the only one pedaling while everyone else is along for the ride. It can be crushing and leads to bitterness and resentment toward employees.

In contrast, visionaries build a loyal band of supporters who want to give their time and effort to something meaningful, something beyond a paycheck — supporters who will recruit others to join the cause. There is no more powerful way of tapping into that basic human desire to



THERE ARE COMPANIES WITHIN EVERY INDUSTRY THAT MOST PEOPLE WOULD LOVE TO WORK FOR. WHAT WILL IT TAKE FOR YOURS TO BE ONE OF THEM?

be part of something bigger than ourselves than casting a compelling vision.

I don’t think most people really plan to give their life’s work to doing the same old thing, year after year, until they die. But the initial catalyst for doing the work it takes to break out of the rut gets overshadowed by the urgency of the immediate.

Do you feel that itch to take your organization somewhere beyond where it is today? A new size, new market, new strategy, new identity? Why is it important to you? And just as important, why would it be important to anyone else? (If making more money is your only motive, don’t be surprised if other people yawn when you ask them to join you.) How could you create a mental picture of a future state that is so compelling, people are asking to join you on the journey?

There are companies within every industry that most people would love to work for. What will it take for yours to be one of them? ▼

Ron Magnus, managing director of FMI’s Center for Strategic Leadership, with Ed Rowell, CSL consultant.



FINANCIAL STEWARDSHIP

Ronald J. Eagar

Is an ESOP the Right Succession Plan Option for Your Company?

When planning the succession of your construction company, one of the first questions to ask is 'How do I envision the company after my ownership exit? If your goal is keeping the company intact — and possibly retaining your leadership position — relinquishing control to a third party is not an option.

Owners with this vision may find an Employee Stock Option Plan (ESOP) an attractive choice. An ESOP is a type of employee benefit plan in which ownership of the company is sold to the employees. The ownership is held in a trust on behalf of the employees, and the trust typically borrows money from a financial institution or the owners to complete the purchase.

Shares are allocated to employees as the loans are paid off. Similar to a pension, the terms of vesting are customizable but usually based on annual compensation. Generally, all vested full-time, non-union employees are eligible.

BENEFITS OF AN ESOP

Benefits of an ESOP for owners means they can retain leadership positions and be an integral part of the company's future, although they cannot participate in the ESOP themselves. Taxation of the gain can be deferred under Section 1042 of the IRS code. Owners can also benefit from "synthetic equity," which grants them a percentage of the business if it gets sold or goes public in the future.

Employees benefit from the low risk associated with ESOPs. Because no personal funds are used to make the purchase, they can never lose more than they put in. They are not taxed on any company contributions made to the ESOP until they withdraw the value of their shares upon leaving the organization, and even then, they can roll the funds into another retirement plan to continue the tax deferral.

The ESOP can be structured as a tax exempt entity, which is advantageous in bidding work, and ultimately in paying back debt. Employee retention is another plus. Having a financial interest in the company is a proven motivator for employees to stay long-term and engage in its success.

ESOP CONSIDERATIONS

Even with these advantages, ESOPs are not the right option for everyone. Corporate culture is a big consideration. ESOPs are best for companies run like true businesses, where matters are well-documented and handled at arm's length. A family business, where this may not be the case, would have to adjust to becoming responsible to the ESOP/trustee and annual reporting requirements.

Existing debt and financing options should be considered. Most ESOPs take on some debt to cover the purchase, and bank financing needs to be secured. The ESOP must be able to meet bank or surety covenants that were entered into before the sale.

There are many upfront and ongoing expenses as well. You will need to hire many more professionals than in a traditional sale, including an ESOP consultant, attorneys, a valuation professional, a third-party administrator (TPA) and a trustee to represent the employees.

If the ESOP has more than 100 participants, it will require an annual audit on top of the company's general audit and 401(k) audit. There is also the need for a TPA to administer the plan benefits and for a Form 5500 to be filed annually.

MITIGATING RISKS

Although an ESOP involves considerable upfront expenses, which are tax-deductible, you can mitigate risk by selecting the right advisors to guide you from the start. During the negotiation process, your CPA can help you determine the purchase price, negotiate interest rates, determine repayment terms and advise on other deal details and strategies to minimize risk.

For the right owners, employees and companies, ESOPs are a powerful tool to satisfy the interests of everyone involved. But like any well-planned exit strategy, it takes ample time and communication with your advisors to plan a seamless transition and make any necessary adjustments along the way. ▼

Ronald J. Eagar, CPA, CCIFP is a construction partner and COO at Grassi. He can be reached at reagar@grassicpas.com.



TECHNOLOGY

David Sombrio

5 Ways to Reduce Administrative Burden for Office, Shop and Field Employees

Redundant work, convoluted processes and inefficiencies do more than cause frustration, they waste time and money, ultimately negatively affecting your business's bottom line. Implementing construction technology to improve operations reduces administrative burden, freeing employees to focus on their key job functions.

It can be intimidating for companies to know where to begin. Here, we'll explore some current technology upgrades that alleviate double-work, maximize productivity and increase profits for construction companies.

COLLECTING, REVIEWING AND PROCESSING EMPLOYEE TIMECARDS

Employee time is one of the largest business expenses.

How a company records employee time heavily impacts accuracy and how readily payroll is disbursed. While multiple methods of time collection can be convenient for employees, it adds unnecessary strain on accounting personnel, foreman and project managers when it comes time to review, approve and process timecards.

By consolidating collection and review to a single software application that integrates with the business' accounting software, companies drastically reduce administrative burden and improve the quality of data collected.

CONDUCTING AND AUTHORIZING DAILY REPORTING

Switching from keeping reports in logbooks, journals, or Excel spreadsheets to modern project management software saves time and money. Still, many construction companies have not upgraded to full digital reporting.

A superintendent or foreman's daily report goes beyond contractual requirements. Daily reports contain valuable information for tracking productivity and trends, and also help protect the business from potential lawsuits. Daily reporting software increases convenience by allowing field supervisors to collect information on their cellphone or tablet and take photos on the jobsite.

Supervisors can save hours per week in writing reports, uploading photos and calculating productivity by using daily reporting software and apps. Most daily reporting

apps seamlessly share the daily report with operations executives and clients, saving field supervisors hours per week writing reports, uploading photos and calculating productivity.

REFINING INVOICE ROUTING AND APPROVAL

Routing, approving and processing invoices is tedious and distracting from necessary everyday work. In many cases, accountants are busy with reviewing and approving invoices. Fortunately, accounting or ERP (enterprise resource planning) software make digitizing and routing invoices simple, fast and accurate.

Accounting tools reduce administrative burden and allow for additional visibility on the status of invoices.

EXPEDITING CERTIFICATES OF INSURANCE COLLECTION AND TRACKING

The convenience and time-saving impact of COI software can prove priceless to companies!

Collecting COI (Certificates of Insurance) from vendors and subcontractors can be very time-consuming process. When subcontractors or vendors haven't submitted their required documents or don't have sufficient insurance limits, contractors waste time using email and phone calls to request and collect certificates.

The method of manually submitting, reviewing and storing COIs on a shared drive with an Excel document is approaching extinction. COI software helps businesses automate the collection, review and storage of certificates, then automatically requests updated documents when an expiration date is approaching.

INTEGRATING SOFTWARE LIMITS MANUAL DATA TRANSFER

The lack of software integrations cost companies employee time.

Manual transfer of data is not only time consuming, storing the same information in multiple platforms (a common practice among construction companies) is an unnecessary redundancy. The initial cost of implementing integrated software may put some leaders off. However, ROI is quickly recovered with automated data transfer in

the form of fewer employee hours and other resources spent on manual transactions. Software integration are available “out of the box,” but sometimes require some custom development.

TECHNOLOGY REDUCES ADMINISTRATIVE BURDEN

Whether it occurs in the field, shop or office, administrative burden impacts more than a company’s bottom line. Outdated processes and tedious paperwork affect employee morale and can lead to higher turnover rates among frustrated employees who desire to work in a more modern workplace. High turnover rates cost a company money while further contributing to low morale.

These five simple steps to relieve administrative burden will help improve your operations, your bottom line and your employee satisfaction:

- **Utilizing** a single payroll software to improve efficiency
- **Automating** daily reporting and photo capture
- **Improving** COI tracking with software
- **Expediting** the invoice process with new technology
- **Reducing** time wasted duplicating with software integrations

Modern methods and software reduce the burden of manual processes and positively impact profitability. Now is the time to make changes to improve your company. ▼

David Sombrio is a senior consultant at JBKnowledge.

Welcome New SMACNA Members

Skogen Mechanical LLC	Mankato, Minn.
Almabani General Contractors	Jeddah, Saudi Arabia
AR Mechanical LLC	Albuquerque, N.M.
Area Mechanical Inc.	Rockford, Ill.
Berkel Sheet Metal Co. Inc.	St. Louis, Mo.
BIM Designs, Inc.	Phoenix, Ariz.
Cal Pacific Systems	Brisbane, Calif.
D.A. Dodd, LLC	Rolling Prairie, Ind.
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Kindle Heating and Cooling	Fenton, Mo.
KMB Mechanical	St. Charles, Mo.
Meinershagen Roofing & Sheet Metal	Farmington, Mo.
Miller Certified Air, Inc.	St. Louis, Mo.
Rocque Mechanical Contracting Inc.	Stittsville, Ont., Canada
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JULY

Jul 21
CEA National Issues Conference
Virtual

SEPTEMBER

Sep 23-24
National Joint Adjustment Board
Pittsburgh, PA

OCTOBER

Oct 24-27
2021 SMACNA Annual Convention
Maui, HI

DECEMBER

Dec 5-7
Council of Chapter Representatives
Dana Point, CA

2022

January 24-26
2022 MEP Innovation Conference
Tampa, FL

Mar 1-2
Partners in Progress Conference
Las Vegas, NV

Mar 13-17
Business Management University
Tempe, AZ

March 24-25
SMACNA Association Leadership Meeting
Las Colinas, TX

Apr 3-6
Project Managers Institute
Raleigh, NC



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