

FALL 2018

# Sheet Metal Journal

[www.sheetmetaljournal.com](http://www.sheetmetaljournal.com)

Western Washington

## CODE CHANGES

*Also in this issue:*

**Communication Reform**

**Southport Hotel**

**Lean Your Office**



# OUR CONTRACTORS SET THE STANDARDS FOR THE INDUSTRY



SMACNA-Western Washington is a trade association and a Local Chapter of the Sheet Metal & Air Conditioning Contractors National Association (SMACNA), which is located in Chantilly, Virginia.

SMACNA Contractors are heating, ventilating, air conditioning (HVAC), and sheet metal experts. They are your assurance of quality in the fabrication and installation of ductwork and air handling systems.

SMACNA contractors are also skilled professionals in:

- Architectural sheet metal
- Industrial sheet metal
- Kitchen equipment
- Specialty stainless steel work
- Manufacturing and custom fabricating
- Repair services
- Siding and decking
- Flow testing & balancing
- Energy management & maintenance

Well known and respected within the construction industry, SMACNA contractors provide the highest quality workmanship, professionalism, and service to their customers. They care about the life cycle of the project, not just the winning bid.

You'll find SMACNA contractors working in all areas of construction whether industrial, commercial, institutional, or residential.

SMACNA contractors developed the technical manuals and standards that today are accepted worldwide in the construction community. As leaders in their industry, they continue to adopt and apply the latest technologies to HVAC and sheet metal work. Everything from duct construction and installation to air pollution control, from energy recovery to roofing, from seismic restraint to welding... they do it all!

## STATEMENT OF PURPOSE

The ultimate goal of SMACNA - Western Washington, Inc. is to achieve and maintain the following principles and programs for the sheet metal industry:

1. To establish advertising, publicity, and promotional activities that advise the public of the nature, extent, and availability of services performed by the industry.
2. To promote educational programs to formulate high quality standards of sheet metal construction.
3. To aid in the formulation of uniform sheet metal specifications and improvement of state and municipal codes.
4. To expose fraudulent or misleading advertising or representations intended to deceive the public.
5. To encourage and promote trade practices that will eliminate unfair competition or exploitation of the sheet metal industry.
6. To encourage and promote the establishment of a uniform pattern of payments by customers during the progress of jobs to avoid inequitable payment delays and economic penalties.
7. To provide a forum for the discussion of the common interests and problems of labor and industry, and to encourage and promote harmonious relations between labor and industry.
8. To encourage any proper activity that will increase the efficiency of the industry and its ability to serve the public.



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Ineffective communication hinders relationship building, collaboration, and your company's bottom line. It is time to reform communication and make it work for you.

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## LEAN YOUR OFFICE

With the Seattle area looking at another upswing in activity, finding meaningful ways to improve productivity and efficiency in the workplace, particularly your office, should be a top priority. Anyone working in a group situation with a multi-tiered working environment and an office component can stand to take a page out of the manufacturing sector's book and implement some basic lean principles. Leaning can be a complicated restructuring of key management functions and operational processes, but for the purpose of this column, we will focus on improving basic individual work habits so each person is as efficient and productive as possible, irrespective of the overall company functioning, by providing some cleaner, more streamlined operational focus.

First of all, beware of over-management and out of control bureaucratic systems in your overall process. Keep it relevant and simple and avoid chronic interruptions. The human brain needs an average 23 minutes and 15 seconds to delve deeply into a subject after an interruption, which means every time someone knocks or an email pings, an employee loses a great deal of potential productivity. Do the math on the three to 20 people who function in a typical office environment, and it is easy to see how work piles up, deadlines slip, and a sense of overwhelming pressure can take over and leave people feeling like they have no control over their jobs.

Meaningful change begins with small, but specific changes. Every employee must keep their workspace clean, organized, and in order. This means everything has a place and there are no superfluous items, like dead pens, scrap paper, or packaged condiments, taking up valuable space. Move employees away from cramming papers into file cabinets and overfilling drawers by providing visible and clearly labelled storage systems and by encouraging the elimination of useless items.

The same goes for email: studies say about 95% of email lurking in inboxes is irrelevant, which means removing it can provide a streamlined, direct connection to information and keep the productivity pathways open and flowing. One way to organize items is into active, reference, and archive sections, which can save around 35% of time spent looking for material.

When people are unable to focus or when they feel overwhelmed by an inefficient process, they tend to do a little of this, half of that, moving papers and projects around, but never really finishing any one thing. The overwhelm created by this pile of unfinished tasks is, well, overwhelming at best and can cause bottlenecks in the company process.

Step two in leaning your office space is refocusing people's efforts on keeping the office processes moving but encouraging them



By / Julie A. Muller-Neff, Esq.  
Executive Vice-President, SMACNA-WW

to deal with each item they encounter – memos, conversations, emails, calls, or projects – by taking one of four actions: do it, delegate, designate specific time to it, or dump it. When applied diligently and with discipline, nothing goes half-completed and every individual contributes to the process moving forward. One study that implemented this strategy saw a 40% reduction in the amount of time spent working on the backlog and a 25% reduction in time spent managing email.

Most offices are places for collaboration and idea-sharing; it is rare that people work completely independently in this type of environment. How, then, can employees be expected to escape the interruption monster that threatens productivity? One lean implementation in New York City created “meeting corridors” in a busy office; that is, it created times each day or week that all employees were available for meetings or conversation. Employees identified their high-value tasks and prioritized them by scheduling them outside of meeting times. Tasks like answering and sending email can be blocked into specific time slots, rather than tended to all day and feeding the need for instantaneous replies. The leanest offices accept that single-tasking is far more effective than multi-tasking and can actually lead to a 35% savings in time lost to interruptions, and a 35% decrease in overtime.

Thirdly, once you get started on the leaning process, be mindful of how you deliver the message. Yes, the objective is to be more productive but if that translates into simply “working faster” mistakes will abound and the time it takes to correct them will negate the purpose of the exercise. Since getting it right the first time is best time-saver of all, promote a quality-first message and allow staff time to fix their mistakes and evaluate their processes. It never hurts to provide training exercises on practical and soft skills—this kind of investment in employees increases morale, improves productivity, and guarantees consistency.

Whatever you decide, you must take your time in deciding what will change, involving as many as possible in the decision-making process. Like all change, leaning your office will be most successful if born of collaboration and consensus. Once the new system is agreed upon, move quickly to implement it. ■

## MEET THE BOARD: NED GEBERT

Ned Gebert has been on the SMACNA-Western Washington board of directors for approximately five years, and was elected to the secretary/treasurer position in 2017. Throughout this time, he has also served on the Labor Management Committee. Outside of the board, his community activities are plentiful—he has participated in contract negotiations for Sheet Metal Workers' Local 66 and Local 32 Plumbers and Pipefitters, and has served on the board for the Northwest Chapter of the National Multiple Sclerosis Foundation.

As a professional certified civil engineer for McKinstry Co., Gebert has worked on a number of high-profile energy management and design-build mechanical and electrical projects, as well as architectural metal work projects. He entered the industry because, as a graduate civil engineer, he was drawn to the construction industry out of a pure attraction to helping to build.

“I started my career with Wright Schuchart Harbor, providing structural support for projects up in Prudhoe Bay, Alaska,” he says. “These projects were predominantly piping related, which piqued my interest in the mechanical construction field. I joined McKinstry Co. in 1984, and have been with them ever since.”



Ned Gebert  
Secretary/Treasurer, SMACNA-WW

After 36 years in the industry, Gebert has seen a great number of opportunities and challenges unfold. “The construction industry has lagged behind the manufacturing sector in terms of productivity and efficiency,” he says. “Our biggest opportunity is to think and act more like the manufacturing sector and maximize supply chain management and offsite pre-fabrication.”

Safety has presented one of the industry's greatest challenges and most important areas of change over Gebert's career. Construction has come a long way, he says, but still has work to do.

“The construction industry is inherently dangerous and it is a constant challenge to make sure our employees have a safe place to work and can return home to their families at the end of the day,” says Gebert.

“Just as it has been our biggest challenge, I am proud of how much positive change there has been in the area of safety,” he adds. “Comparing our projects today to those of 35 years ago, the change is monumental.”

SMACNA has an important role to play in moving the industry into a more secure future by providing support to its contractors.

“Construction can be a very difficult and risky business,” says Gebert. “SMACNA can help contractors navigate those areas of risk—safety, labor management, and financial management.”

As part of his term objective, Gebert fully supports the board's initiatives in building a strong relationship with its labor partners at SMWIA. “Labor and management need to behave as one entity in order to be successful and compete both locally and globally,” he says, reflecting on his favored words to live by: “Take responsibility. If something needs to get done, find a way.”

Learn more about McKinstry Co. at [www.mckinstry.com](http://www.mckinstry.com). ■

### UPCOMING NATIONAL EVENTS

**Oct 14 - 17, 2018**

2018 SMACNA Annual Convention  
San Diego, CA

**Dec 02 - 04, 2018**

2018 December Council of Chapter  
Representatives Miami, FL

**Jan 27 - 29, 2019**

2019 Chapter Executive Institute  
Austin, TX

**Mar 03 - 07, 2019**

2019 Business Management University  
Tempe, AZ

**Oct 20 - 23, 2019**

2019 SMACNA Annual Convention  
Austin, TX



### SMACNA-WESTERN WASHINGTON ANNUAL GOLF TOURNAMENT A SUCCESS

In early August, 139 SMACNA members and their guests gathered at Washington National Golf Club in Auburn, WA for the association's much-anticipated annual golf tournament. The day began cool and crisp and blossomed into a beautiful afternoon for everyone.

Some of this year's highlights were the stunning Tommy Bahama shirts given out as tee gifts and various hole entertainments, including the fabulous photo booth sponsored by Trane and the golf ball cannon.

Nothing compared to the new and exciting, first ever, ball drop via helicopter, compliments of ACI Mechanical & HVAC Sales. SMACNA-Western Washington's president, Brian Fluetsch, was honored with taking the ride and performing the actual ball drop.

Throughout the day golfers visited the massage cabana and hit a few range balls. Everyone enjoyed mouth-watering street tacos compliments of Performance Contracting, Inc. and Hudson Bay Insulation. Of course, the crowd favorite tacos made the perfect meal when accompanied by some delicious margaritas. The beverage carts were sponsored by Gensco.

And the end of a long and fun day, guests finished up with an incredible BBQ steak dinner, raffle drawing, and contest announcement. SMACNA-Western Washington would like to send a big thank you to its golf committee: Marshall Nichols, Carrie Grage, Mike Reichert, Troy Hendricks, John Whalen, and James Miller. It would also like to give an enormous thank you to all of the event's sponsors. Their contributions helped make this a fabulous and memorable tournament.

Be sure to mark your calendar for the 2019 SMACNA-Western Washington golf tournament, scheduled for Friday, August 2, 2019.





SMACNA members perform work in industrial, commercial, institutional, and residential markets. They specialize in heating, ventilation and air conditioning, architectural sheet metal, industrial sheet metal, kitchen equipment, specialty stainless steel work, manufacturing, siding and decking, testing and balancing, service, and energy management and maintenance.

## CONTRACTOR MEMBERS

ACCO Engineered Systems	Holiday-Parks, Inc.
Air Handlers, Inc.	Holmberg Mechanical
AIRTEST Co., Inc.	Johansen Mechanical, Inc.
Apollo Mechanical Contractors	L & M Sheet Metal Fabricators Inc.
Argo Blower & Mfg. Co., Inc.	MacDonald-Miller Facility Solutions Inc.
Auburn Mechanical, Inc.	McKinstry Co., LLC
Ballard Sheet Metal Works, Inc.	Miller Sheet Metal, Inc.
Bellevue Mechanical, Inc.	Miller's Smith & Losli Sheet Metal, Inc.
Capital Sheet Metal Inc. dba Capital Heating and Cooling	Neudorfer Engineers, Inc.
D/B Solutions, LLC	Olympia Sheet Metal, Inc.
Delta Technology Corporation	Phoenix Mechanical, Inc.
Distribution International	Pinchiff Mechanical LLC
Eckstrom Industries, Inc.	PSF Mechanical, Inc.
Emerald Aire, Inc.	PSR Mechanical
ENVIROMECH	Schmitt's Sheet Metal & Roofing
Evergreen State Heat & AC	Scott & From Co., Inc.
GB Systems, Inc.	Shinn Mechanical, Inc.
Genso, Inc.	Sunset Air, Inc.
H & R Mechanical Systems, Inc.	Temp Control Mechanical Services Corp.
Hermanson Company, LLP	University Mechanical Contractors, Inc.

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ECCO Manufacturing	Star Rentals Inc.
Edge Construction Supply	Sunbelt Controls
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General Insulation Company, Inc.	York NW Factor Direct
Gripple, Inc.	

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### WOMEN'S NETWORKING EVENT - WITH GUEST SPEAKER STEPHANE MCSHANE

On August 30, SMACNA-Western Washington hosted its first ever all-women's networking event titled "Being a Woman in the Industry". It was a total success.

Stephane McShane, author, teacher, and director with Maxim Consulting, presented on "Critical Communication Skills for the 21st Century Construction Industry." Stephane began her career in the field as an apprentice, electrician, and foreman, and worked her way through each operational chair within a successful electrical construction firm. This experience and talent are what make her effective at operational and organizational assessments in today's construction industry. In her talk, Stephane discussed communication styles (our own and other's) and the way communication must be strategic and delivered with intent if it is to be used as a meaningful business tool.

The presentation received an overwhelming response with approximately 70 women attending, all of whom were grateful for the event. Several have requested the association continue with women's networking events. Anyone who was unable to attend is welcome to contact Carrie at the SMACNA-WW office via email at [cheinrich@smacnaww.org](mailto:cheinrich@smacnaww.org) for a copy of the presentation handout. Ideas for topics that would be beneficial for women in the industry can also be forwarded to Carrie. ■



## WE'RE ON YOUR TEAM!

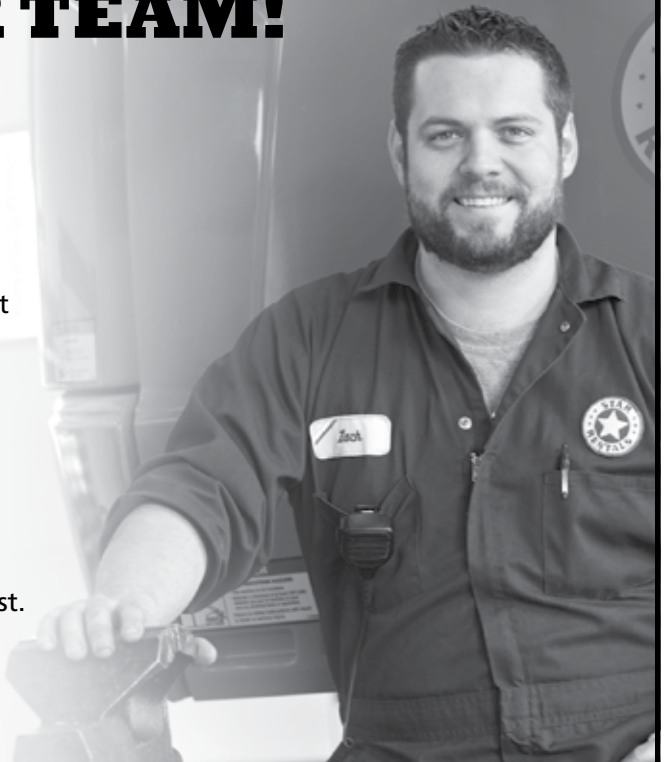
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## CONSTRUCTION IN SEATTLE ON THE RISE ONCE AGAIN

Although construction rates still lag behind 2017's peak levels, the industry has experienced a definite upswing over the past couple of months. A year ago, project tallies in the region spanning South Lake Union to Sodo equalled 74; the number fell to 57 in March of this year but has since rebounded to 65.

Last year's record topping numbers in office construction were accounted to Amazon building 10 million square feet of office space in Seattle—Google and Facebook also contributed to the rising numbers. Burgeoning office space means the people working there need places to live, which is the impetus behind growing levels in the housing market, primarily rental apartments. With 6,880 housing units under construction now and 6.5 million square feet of office space still under construction, the market is expected to sustain for the next several months. Together, office and rental stock represent 19 and 56 percent growth, respectively, over 2010 numbers. And let's not forget hospitality—a record 2,192 hotel rooms are ready to open before the end of 2018.

Moving forward, there are currently 34 projects ready to start or recently started, and 125 in the early planning stages. ■

## LEARNING TO FINE-TUNE ONE'S LEADERSHIP PRESENCE

Leadership presence is the intangible that can make a clear difference for long-term personal and professional success.

SMACNA's Women in Construction Leadership Council is bringing a much-anticipated session to the convention this year titled "Fine-Tuning Your Leadership Presence by Aligning Your Competency with Your Confidence."

"This interactive session will provide a framework for participants to align their competencies in their work, to internalize their success and externally communicate it," said Carol Vernon, a certified executive coach who has worked with more than 1,000 women leaders at the World Bank, U. N. Foundation, U.S. Chamber of Commerce, and others.

"Once these elements are truly aligned," she said, "individuals can demonstrate their strongest leadership presence through their words, voice, and body language as well as their actions to meet and even exceed their goals."

Vernon will explain how her four-step framework of the "four Rs" including reputation, relationships, results, and resiliency, supports this alignment. Participants will learn how to use the framework for ongoing success and will take home action steps they can use to create their own stronger leadership presence.

Learn more at [www.smacna.org/annualconvention](http://www.smacna.org/annualconvention). ■

## US CONSTRUCTION SPENDING CLIMBS 1.0 PERCENT

July saw an increase in national construction spending led primarily by public projects, like highways and schools, and by increased activity in the housing sector. Public projects rose 0.7 percent, with school construction increasing 2.1 percent and a 0.4 percent rise in highway and road construction. The overall increase represents a seasonally-adjusted annual rate of \$1.32 trillion, which is a 5.8 percent increase over last year.

On the downside, commercial and some small industrial sectors fell 0.3 percent in the same month. U.S. economic growth, however, expanded by 4.2 percent in the second quarter, which almost doubles the GDP growth rate for the first three months of 2018. During that same time, the private sector contributed a 2.1 percent rise in the GDP. ■

## ANNUAL SMACNA CONVENTION OCTOBER 14-17, 2018 SAN DIEGO, CA

SMACNA's Annual Convention is its premier event that blends exceptional education with world-class networking and social events—and this year is no different as we journey to the Marriott Marquis San Diego Marina for the 75th Annual Convention, October 14-17, 2018.

The opening reception on Sunday evening takes place on the flight deck of the U.S.S. Midway Museum, one of the longest-serving and most famous aircraft carriers in U.S. Naval history. This event promises to be a breath-taking, life-long memory that you and your family won't soon forget. ■

### UPCOMING SMACNA-WW EVENTS



**October 14-17**

**SMACNA National Convention, San Diego, CA**

**November 8**

**Membership Meeting - Michael Geraghty "Key Secrets of Master Communicators," Seatac Marriot**

**December 7**

**SMACNA-WW Annual Holiday Gala, Seattle Marriott Waterfront**

## 2018 SAFETY SURVEY PROFILE STATISTICS NOW AVAILABLE

Each year, SMACNA's Safety Excellence Award Program attracts a rich collection of entries from many qualified safety programs. A byproduct of these submissions is that SMACNA collects important safety and health data, which in turn becomes SMACNA's Safety Statistics Profile.

This year submissions increased by 22 percent, setting a record number of respondents to SMACNA's 2018 Safety Survey. The results of this year's study are compiled in SMACNA's detailed 2018 Safety Statistics Profile, now available on SMACNA's Safety web page.

### Highlights of this year's key findings include:

The reported average OSHA incidence rate was 2.25. An OSHA incidence rate is a mathematical calculation of recordable injury and illness incidents per 100 full-time employees during the year. While it is slightly higher than 2017 (2.22), it still reflects the very low incidence rates of members' successful safety programs compared to the industry average (>5.00).

The average reported Experience Modification Rate (EMR), the insurance industry measure of injury and illness occurrences, was .79, an improvement over last year and on par with historically low EMR results from prior survey years.

SMACNA started recording lost workday cases in 2013 to evaluate the severity of injury and illness cases. This year, the average lost workday case was 0.97, which was the lowest in three years.

The findings of a combined low EMR and low lost workdays indicates that most cases do not result in significant time away from work.

As in prior years, 99 percent of contractors reported that they have written safety and health programs and that most conduct regular safety inspections and use Toolbox Talks during weekly safety training sessions.

In addition, OSHA 30-hour training is growing in popularity as 60 percent of companies reported providing this level of training, an eight percent increase over last year (52 percent). This is not surprising as more owners and general contractors are looking for a highly trained workforce.

Once again this year, drug and alcohol policies proved important to safety and health programs' success. Companies without such policies had a 39 percent higher OSHA incidence rate than companies that did have drug and alcohol programs.

Winners of the United States and Canadian Safety Award Programs were announced earlier this month. First-place winners

will be recognized at SMACNA's 75th Annual Convention in San Diego in October.

SMACNA is grateful to all the members who participated in the 2018 Safety Excellence Award Program. For more information, contact Mike McCullion, director of market sectors and safety, (mmccullion@smacna.org / (703) 995-4027). ■

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## NEW CONSTRUCTION CONTRACTS WHITE PAPER EXPLORES THE PROS AND CONS TO ALTERNATIVE DELIVERY METHODS

At the beginning of most projects, contractors have a strong bargaining position and can dictate the terms of the contracts. Understanding how these different contract models operate from the outset allows contractors to decide whether it makes sense to pursue a project, develop the "best" price in a competitive manner, and manage the risk associated with these alternative methods.

SMACNA's new white paper, "Construction Contracts: Alternative Delivery Methods" on alternative delivery methods serves as a primer for contractors interested in providing services outside of the traditional design-bid-build model.

"Construction Contracts: Alternative Delivery Methods" is the latest addition to SMACNA's *Contractor Operations Manual*. It describes, in detail, the advantages and disadvantages to lump sum contracts, guaranteed maximum price contracts, cost reimbursable contracts, design-build, and integrated project delivery.

SMACNA's *Contractor Operations Manual* covers the nonfinancial aspects of operating a contracting business and is available free to SMACNA members only.

The collection of books currently in the *Contractor Operations Manual* include:

- Construction Contracts: Alternative Delivery Methods
- Establishing Overhead and Burden in a Sheet Metal Business
- Guideline to Information Technology
- Materials and Inventory Management
- Principles of Job Costing
- Personnel Policies and Procedures

Learn more at [www.smacna.org](http://www.smacna.org). ■

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## SMART HEROES TO GRADUATE VETERANS INTO WORKFORCE

Fifteen members of the United States military graduated as the sixth class of the SMART Heroes program August 27 at the Western Washington Sheet Metal training center, located at 2725 Williamson Place, Suite 100, in DuPont, Washington.

The class is made up of 13 current members of the Army and Air Force who will transition to civilian life in the next four months and two recent veterans.

They are Staff Sgt. James Anderson, Air Force; Staff Sgt. Jason Dye, Army; Spc. Brandon Glenn, Army; Spc. Albert Grillo, Army; Spc. Colton Hykes, Army; Spc. Trevyr Kerscher, Army; Spc. Zachary Malecha, Army; Spc. Everett McFarlane (veteran), Army; Sgt. 1st Class Marco Orihuela (veteran), Army; Sgt. Drew Russell, Army; Senior Airman Joseph Sanchirico, Air Force; Staff Sgt. Andrew Schwartz, Army; Spc. Samuel Sylvester, Army; Spc. Joshua Taylor, Army; and Spc. Johnathan Williams, Army.

In order to graduate, veterans completed a seven-week course to earn the equivalent of their first-year sheet metal apprentice training (224 hours). Upon discharge from service, these graduates may choose to enter any of the 150-plus SMART apprenticeship programs in the United States and be provided direct entry and advanced placement as a second-year sheet metal apprentice, including a high probability of obtaining second-year apprentice wages and benefits.

Congressman Denny Heck addressed those present along with Gary Olson, of the Career Skills Program at Joint Base Lewis-McChord, and dignitaries from the International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART) and the International Training Institute, which together with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), created the program in collaboration with SMART Local 66, SMACNA-Western Washington, Western Washington Sheet Metal JATC, and Helmets to Hardhats.

Launched in August 2018, the SMART Heroes Program was established to provide free sheet metal industry training to enlisted U.S. Military men and women who plan to enter the civilian life within the year, thereby assisting in a successful transition into the civilian workforce. Adjacent to Joint Base Lewis-McChord, the Western Washington Sheet Metal JATC seemed the ideal host for the inaugural SMART Heroes class.

For additional information on SMART Heroes, visit [www.smart-heroes.org](http://www.smart-heroes.org) or call the International Training Institute at 703-739-7200. ■

## INFECTION CONTROL AWARENESS CERTIFICATION EARNS ACCREDITATION

The sheet metal industry's International Certification Board/Testing, Adjusting and Balancing Bureau's Infection Control Awareness (ICA) Certification Program for construction workers in healthcare facilities recently earned accreditation from the American National Standards Institute (ANSI).

The ICA program focuses on the realities of construction within today's health care facilities and was created due to market demand. The program joins ICB/TABB's HVAC Fire Life Safety and Testing, Adjusting and Balancing programs on the list of ANSI-accredited certifications. This sets up ICB/TABB in a secure position as the industry leader in developing and implementing a comprehensive set of certification programs for the HVAC industry.

A certification by ICB/TABB demonstrates the highest level of professional expertise in a specific field.

With the ICA and HVAC Fire Life Safety certifications, ICB/TABB certifications meet leading industry best practices for a complete infection control awareness program:

- Construction in health care facilities
- Construction risk assessment
- Infection control and prevention
- Infection control risk assessment
- Non-infectious environmental risks
- Construction practices in health care facilities
- Life safety and fire safety
- Interim life safety measures
- Utility system shutdowns
- Project closeout and transition to occupancy in health care facility construction

These certifications are an assurance of the quality advantages of employing persons certified by ICB/TABB under an ISO/IEC 17024 ANSI-accredited program.

ICB/TABB is the first program to gain ANSI (American National Standards Institute) accreditation for certification in the testing, adjusting, and balancing industry. Certification is a statement that the technician, supervisor, and contractor demonstrate the highest level of professional expertise.

For more information, contact Duane Smith, director of certification, at 703-739-7100 or [dsmith@icbcertified.org](mailto:dsmith@icbcertified.org). ■

# Energy Codes EXPLORED

## Impacts on SMACNA-Western Washington Partners

By / Peter Boileau

© Can Stock Photo / Ignoporn

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Washington's Energy code updates are driven by the Northwest Energy Efficiency Council (NEEC), representing Washington, Oregon, Idaho, and Montana. This council is tasked with leading cities, counties, and states in how to reduce energy consumption in the construction of buildings in the future.

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Starting with the 2009 energy code, NEEC's Washington State energy efficiency target is to reduce energy consumption on new residential and commercial buildings from 2006 code levels by 70% by 2031. This will be implemented in eight code updates every three years starting in 2009 and ending in 2030. This ambitious goal means an average of 14% reduction for each code update, compared to the previous code's requirements, to meet the 70% target.

Energy efficiency goals will be met by multiple methods, such as increasing building envelope insulation, improving thermal performance of glass, and reducing and controlling lighting energy. In addition, the 2015 code now addresses requirements for providing renewable energy and "solar readiness" for new buildings constructed under this code.

For the sheet metal industry, energy required for heating and cooling buildings is a significant component in overall energy use, and therefore our systems are targeted for some of the most radical changes in allowable system types, installation, and operation.

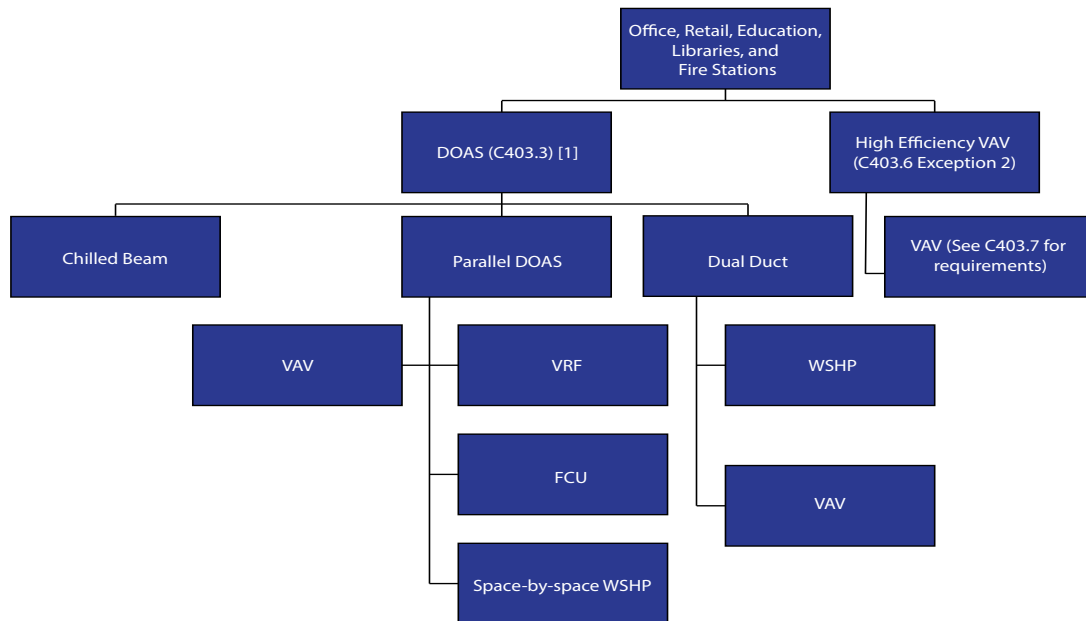
Past energy codes have allowed mechanical system designs to comply with one of two paths—a "prescriptive path" (typically used for simple systems) or a "total performance path," based on modeling annual energy use of a proposed design and

comparing it to energy use modeled using prescriptive path requirements for the same building. This second method allows trade-offs in building envelope components, lighting and power energy, and mechanical system energy. To be code compliant with a total performance path, your design must demonstrate via this computer model that it will use less energy than the prescriptive path model.

With the 2015 energy code, a third option has been added. This option, called "target performance path," sets maximum annual energy use allowed for different types of buildings but does not dictate how a building must be designed to comply. Instead, this code path utilizes energy metering of the completed building by the code jurisdiction to ensure it uses less energy than the maximum allowable energy target. If the project uses more energy than this target the building owner (and likely the design and construction team) faces significant monetary penalties and continuing remedial work to bring the project into compliance.

The 2015 energy code also contains a new system that deals specifically with existing buildings that are "substantially altered" or upgraded. If your existing building project meets the code definition of a substantial alteration, you will be required to upgrade this existing building, including all envelope, mechanical, and electrical systems, to meet 2015 codes.





2015 energy code preference for use of DOAS systems to provide ventilation. Numerous choices for distributed HVAC systems compared to the limited high efficiency VAV system path are shown on the right-hand side of the chart. Submitted by Peter Boileau.

One of the biggest targets for energy reduction in the 2015 code is the use of large, medium to high pressure central fan systems, which have been installed for decades, typically in variable air volume HVAC systems. In the past the use of large fan systems has accounted for up to 25% of the total energy used in a building, and as such is now in the center of the energy reduction target goals. This type of system is still allowed but is now defined in the energy code as a “high efficiency VAV” system. This new definition not only requires higher efficiency cooling and heating source equipment (chillers, boilers, etc.); it also mandates that chilled water systems must be used for cooling if electric heat is desired, and conversely if direct expansion (DX) packaged cooling units are desired, heat must be provided by hydronic boilers. In addition, the 2015 energy code for this type of system requires enhanced controls to measure and at times limit outdoor air cooling and primary supply air temperatures.

The biggest change to this system type (and the biggest impact to our industry) is the limitation on fan energy used in these systems. The limited fan energy requirement includes all fans used in the system (supply, return, relief, and fan-terminal units). This results in duct systems needing to be slightly larger to reduce duct friction to save fan horsepower, but also reducing the pressure class of most primary air duct systems from 4-6” water gauge pressure class to 2-4” pressure class to again save fan horsepower. The net result is typically fewer pounds of ductwork per system when compared to previous code requirements.

The current code now prefers the use of “dedicated outdoor air systems” (DOAS) for providing ventilation and discourages the

use of outside air economizers for ventilation and cooling due to the high energy/fan horsepower requirements for delivering large amounts of outside air into (and out of) buildings. DOAS systems provide minimum ventilation required for occupants but do not heat or cool the building. With some exceptions heating and cooling are provided by small “distributed” zone level HVAC equipment such as water-source heat pumps, variable refrigerant flow (VRF) systems, fan-coil units, sensible-cooling terminal units, or chilled beam systems. Again, with an eye to reducing fan horsepower these systems use piped systems instead of ducted systems to provide heating and cooling to each area of the building. This results in less ductwork required for a building using these systems, and the ductwork provided is typically smaller in size and lower in pressure class, again impacting our business, as we will be fabricating and installing less ductwork on each project as piping system work increases to meet current and likely future energy codes.

Included above is a simple flow chart that demonstrates the 2015 energy code preference for use of DOAS systems to provide ventilation and the numerous choices for “distributed” HVAC systems when compared to the limited high efficiency VAV system path shown on the right-hand side of the chart. The example below is for 2015 energy code compliance for certain building types as noted below and includes references to the Washington State Energy Code chapters as appropriate. Use these references for further details on how to apply these systems to your project. Also, please note that this article represents my personal understanding of the current code, including several personal opinions on potential impacts, and should be viewed as such. ■

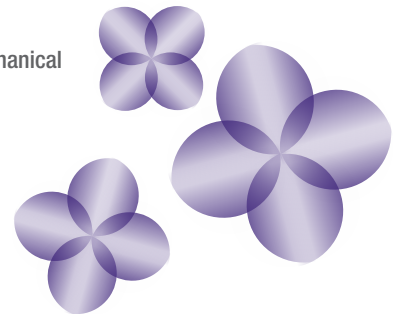


# SOUTHPORT HOTEL

## Holmberg Mechanical

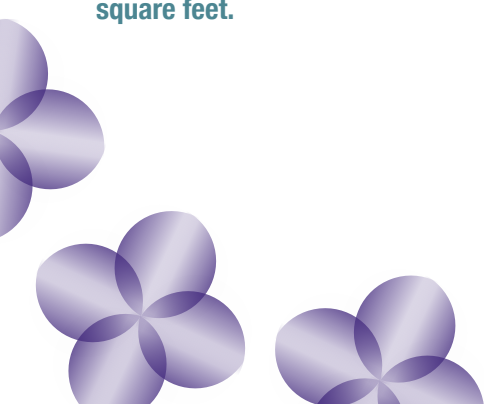
Project: Southport Hotel  
Location: 1053 Lake Washington Blvd N, Renton, WA  
Owner: Seco Development  
General Contractor: Sellen Construction  
Sheet Metal Contractor: Holmberg Mechanical  
Total Building Area: 350,000 square feet  
Total Construction Cost: \$18,000,000

By / Jessica Kirby  
Photos courtesy of / Holmberg Mechanical



**The Southport Hotel project is a stunning, four-star Hyatt hotel adjacent to the south shore of Lake Washington. The 12-storey hotel features a nine-level tower positioned over a podium housing the first three levels. Three hundred forty-seven guest rooms and 43,000 square feet of convention space are spread over 350,000 total square feet.**

Holmberg Mechanical was contracted to complete pre-construction detailing and install the plumbing and mechanical systems. Installation of the full plumbing system included water distribution, domestic water piping, sanitary storm, facility storm drainage, plumbing fixtures, gas hot water heaters, a spa area with a saline pool, facility natural gas piping, and plumbing insulation. The project is served by a variable refrigerant flow (VRF) HVAC system with condensing units on the roof serving guest rooms on levels 4 to 12. Condensing units on level 2 serve the podium levels 1 to 3, and two large AHUs serve the grand ballroom, with additional MAUs and HRUs on multiple rooftops.







At its peak, the project employed 40 individuals completing plumbing, fitting, VRF, and HVAC scopes.

Holmberg participated in pre-construction BIM design and detailing as part of the design-assist, and worked with other MEP trades, the engineer, architect, owner, and general contractor to finalize the design, coordinate/clash resolution, and generate final drawings for construction using Revit software. The design-assist mechanical format allowed Holmberg to work with the engineer of record during the design and pre-construction phase of the project to provide added value. The early involvement allowed Holmberg to provide design recommendations, value engineering, budget adjustments, and constructibility reviews, and assist with making equipment selections, provide schedule input, and participate in early coordination of shop drawings and 100% prefabrication of the piping and ductwork.

With limited laydown area, Holmberg used its fabrication shop facilities in Renton and Bellevue for full integration of BIM Support-generated shop drawings from fabrication to delivery and install in field.

Like every project, this one had its challenges, including changes to the design and room layouts once construction had begun. Holmberg's team worked closely with the owner,

architect, and engineer of record to minimize the impacts brought on by change orders.

As well, grease duct routing and install for kitchens on three levels presented a challenge, but working with the general contractor in the Revit model assisted the team in identifying the best routing and coordination with other trades.

The VRF was installed on an accelerated schedule, and to manage the time constraint it was detailed using the three-pipe system routing in Revit, resulting in a fully coordinated and efficient installation.

Holmberg used a number of proprietary construction techniques to make the project a success. It also developed spool sheets and fabricated pipe and duct offsite for a more efficient installation process.

The project was constructed to meet LEED Silver energy efficiency requirements. On the HVAC side, Holmberg was very diligent with quality assurance and quality control of keeping the ducting clean throughout the duration of the project prior to startup.

Holmberg is proud of its contribution to this beautiful finished product. ■



© Can Stock Photo / dagadu

By / Shephane McShane

*This article was republished with permission from its original source: Partners in Progress magazine, volume 12 issue 2 May 2018. Read more at [www.pinp.org](http://www.pinp.org).*

**THE CONSTRUCTION MARKET SEEMS TO BE EVOLVING** at a speed unmatched in previous history. The demands for collaboration, problem solving, and rock solid planning processes are driving changes in current communication means. It is critical that the cultural and operational hurdles created by ineffective communication and conflict resolution skills that can hinder the forward progress of your organization be addressed.

Today's construction industry and the clearly defined path forward include pull planning, multi trade design and fabrication, modularization, and increasingly accelerated schedules. All of these items have one core value in common: Collaboration. The industry is demanding that the trades work together to solve problems more rapidly in order to accelerate the schedule. The era of the dictatorship model where the general contractor openly orchestrates every move are coming to an end in favor of the lean, team-engaged environment. This model thrives where input and active participation are held as paramount. That said, it begs a question. How can we deliver a fully collaborative product to our external clients (those outside of our walls) if we don't have that same level of collaboration occurring with our internal clients (those inside our walls)?

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Consistency in business practices has everything to do with standards. Standards range from the soft skills such as how we do business, how we treat our clients (both internal and external), and what we stand for in the industry, to the hard skills of having defined systems and processes that set the stage for consistency and productivity.

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In the world of construction, the lack of clear communication between positions in management, staff, and field is still very often seen. The reason for its continuance cannot be that, “It’s been that way for years.” As quickly as we are seeing the delivery methods, design strategies, and operational plans evolve, so does the need to become very agile internally and leverage the strengths of many parties in order to meet the common goal of timeliness, safety, and profitability.

So what causes a serious breakdown in communication and, ultimately, productivity and profitability? It could boil down to three very important factors: Lack of defined roles and responsibilities, inconsistency in business practices, and poor culture.

### Defined Roles and Responsibilities

Highly successful and progressive contractors understand the need for defined roles. In order to create a scalable, replicable model, each person in the organization must understand what their role is in order to generate a predetermined deliverable. For example, if you took a hard look at your process that ends in a prefabricated assembly, skid, or product, how many people in your organization would be involved in the success or failure of that product being done correctly, per design, on time, and on budget? In order to have any sort of predictability of cost and timeline, it becomes necessary for each person in this chain of events to understand what information or product they receive, what they do with it, and what the expected outcome from them would be. If we have variances in the roles of those handling the submittal, purchasing, design, fabrication, logistics, or installation processes, neither the cost, the quality, nor the timelines of the product would be predictable. In this particular instance, the use of value stream mapping involving those parties who create or use the product (management and labor) would be recommended in order to define the process, including the end result of documentation of each role and deliverable needed by each position identified in the workflow, to create

the standardization, clarity, and lean transformation that most organizations seek.

### Consistency and Discipline

Consistency in business practices has everything to do with standards. Standards range from the soft skills such as how we do business, how we treat our clients (both internal and external), and what we stand for in the industry, to the hard skills of having defined systems and processes that set the stage for consistency and productivity. An example of a lack of standards and consistency came from a consulting client that was creating installation drawings utilizing the skill set of the foreman running the job as the barometer to dictate how much detail to place on those drawings. So, literally, each job was designed to a completely different standard. This is in stark contrast to those firms who have design levels standardized with specific detail as to what is contained on the backgrounds, what extraneous information is removed, what level of information is created for field use in installing, and how this information flows through to fabrication. In order to determine what this process should look like, those involved in creating and utilizing the information, both staff and labor, should be teaming up to define best practice. Only with consistency in standards, and the discipline to ensure standards are followed, can we reduce the friction and delays that come from the inconsistencies that exist in the organization.

### Positive Culture

Culture plays a key role in the success of communication within a firm. The common pitfalls to culture are lack of structure, micromanagement, poor leadership, and lack of discipline. For example, working on improvement initiatives with a company with positive, energetic, supportive culture allows those changes to become adopted and accepted at a significantly higher rate than those firms with a negative or distrustful environment. Trust is the cornerstone of culture and it must be seen at every level in the organization and exist



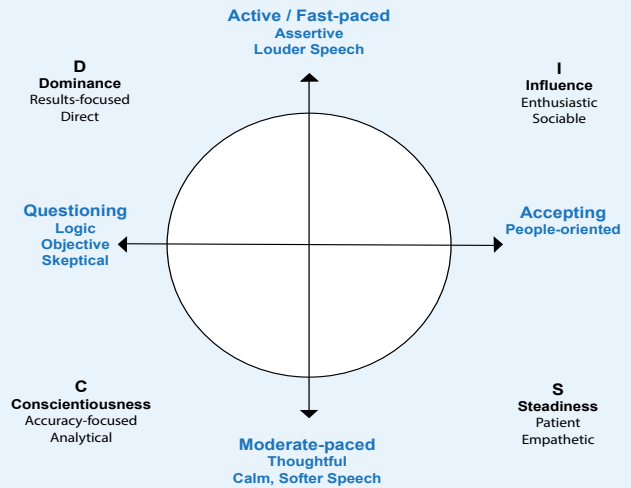
The battle lines in the sand between departments, or “silos” within the organization should not exist.

between work groups. A simple way to explore the overall culture of an organization is to test the relationship and trust that exists between project management, superintendents, and field foremen. If that relationship displays trust, aligned vision, shared ambition, and a team spirit, then it is likely the culture of the firm is well intact.

It might be said that this level of utopia does not exist in our industry. Perhaps perfection isn’t the goal. The target moves daily, and organizations must be agile enough to respond. The goal of any organization should be to ensure that its members are engaged, aligned in the vision of success for the company, and productive in working together to solve the many challenges ahead. The battle lines in the sand between departments, or “silos” within the organization should not exist. Management, labor, and staff should be focused in their efforts to attain common goals that support all parties. As an industry, we face ongoing pressures regarding schedule, quality, and cost. The solution lies in a coordinated effort of defining roles, creating consistent deployment of business practices, and a positive, supportive culture to ensure success for all. You cannot change an organization. You CAN positively change the culture and processes to benefit the people within the organization to gain the results desired. ■

*Stephane McShane is a director at Maxim Consulting Group in Denver, CO, where she is responsible for the evaluation and implementation processes with the company’s clients. Stephane works with construction related firms of all sizes to evaluate business practices and assist with management challenges. Visit [www.maximconsulting.com](http://www.maximconsulting.com) for more information.*

### DiSC: A Mental Model for Improving Communication in the 21st Century



Stephane McShane, director with Maxim Consulting, recommends a simple, four-factor cognitive map called DiSC for understanding and managing behavior—our own and others’. This mental model allows us to identify and quantify communication types and differences in ourselves and others and use that information for developing strategic and effective solutions to character clashes.

DiSC identifies the defining characteristics of particular communication styles—dominance, influence, conscientiousness, or steadiness. Each style is associated with specific personality traits, the understanding of which allow others to predict the kind of communication an individual will use and respond to.

No matter who we work or communicate with, everyone deserves fairness, clarity, and honesty in our communications. More important than what we say is how we listen—listening well might be practical, but it also sets the tone for the other party feeling acknowledged and respected. This state of mutual respect breeds trust, the most important value of all. Learn more at [www.maximconsulting.com](http://www.maximconsulting.com).

## Contractors and Suppliers: Submit your news, story, or photo idea



SMJ-WW is on the lookout for interesting HVAC, architectural sheet metal, testing & balancing, and industrial / specialty news and feature topics. If you have a great idea, notice an industry issue that needs addressing, or want to weigh in on a technical subject, we would love to hear from you.

We also need great pictures – current and historical – of people working in all aspects of the sheet metal industry. If you have something to share, please email it to our editor, Jessica Kirby, with a caption about what is going on in the photo.

Questions about how else to get involved in a future issue of *Sheet Metal Journal*? Reach out to [jessica.kirby@pointonemedia.com](mailto:jessica.kirby@pointonemedia.com) or 250.816.3671 and get the scoop.

## HONORING THE FIELD

This article is dedicated to the men and women who work in the field. Yes, contractors in our industry take 100% of the risk, but they can do nothing alone. It takes the combined effort and integrity of the tens of thousands of dedicated craft workers who together build our communities, our states, and our nation. They deserve respect and should be honoured for their efforts every day.

It angers me that sometimes those who work in our industry do not get the recognition for the expertise they bring to their jobs—not to mention their work ethic and the sacrifices they make pulling two or even three-hour commutes each way to support their families. Success is not a cubicle and a keyboard for everyone. Our craftsmen and women create things of lasting value with their heads, hearts, and hands—and often make a very good living doing so. Some people simply can't appreciate the fact it might not fit their ideal of what "success" is today.

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"Those who work for union companies receive some of the highest pay and best benefits in the nation, and they know that is something to live up to."

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My dad was a union carpenter and went on to become a union contractor. My grandfather and great-grandfather were blue-collar Italians who went on to become builders in San Francisco. They all worked their asses off. Their work ethic was legendary. It was their example – not my college GPA – that made me who I have become. The roots of America were forged by working people. And construction, most interestingly, has been the economic ladder used for more than a hundred years by those who wanted a better life. First the Irish, Italians, Chinese, Eastern Europeans, and African Americans climbed that ladder. Now Mexican and Central American craftworkers are doing the same. Some were discriminated against or looked down upon at first, but they kept going, fuelled by their total commitment to their own potential, their families, and their future. They chipped away enough to create a handhold on the American Dream. They deserve honour and respect for their hard-won success against so many odds.

In today's society, young people often admire those who have made fortunes by creating ideas. Yes, we are in the "idea economy" today, and to a lot of young people it looks easy and accessible. But the world doesn't operate solely on a fast-money digital platform. Working people still form the backbone of what makes America great. I have tried hard in my parenting to pass that message on to my children. The lady at McDonald's in her



By /Mark Breslin  
Breslin Strategies, Inc.

paper hat; the maid at our hotel; the truck driver in that rig; the janitor at your school; the waitress at Chili's—they are not there to serve you. They are there because that is the best job they can get to take care of their families. And they may have another job on top of it. And you, I tell my children, will pay attention; you will stop and appreciate them. And you will not take for granted any advantage life provides for you. Working people work hard, and they will be respected for it.

Construction unions and associations have a similar philosophy. They support and serve union contractors who are committed to providing their workers what they need and deserve. Those who work for union companies receive some of the highest pay and best benefits in the nation, and they know that is something to live up to. There are cheaper ways to do contracting, but it is often on the backs of those who do the work. These contractors (many of whom carry frayed union cards in their wallets) understand their people and have a kinship with them that transcends the paycheck. They understand the importance of working people, and no matter their own success, they know that without those willing and loyal craft workers, there can be no industry.

Honor the field – it's the right thing to do. ■

*Mark Breslin is an author, speaker, CEO and influencer at the highest levels of business in North America. His five bestselling books have sold hundreds of thousands of copies and have improved leadership, accountability, profitability, innovation and engagement for organizations and individuals. [www.breslin.biz](http://www.breslin.biz).*



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## NOVEMBER ELECTIONS: KEY STATE RACES AND HOT TOPICS

The November 6 general election is just around the corner. There is a lot of speculation about the outcomes of these elections with many predicting a “blue wave” that will change the balance of power. At the state level, that could be partly true. The results of the November election are not likely to change the Democrat’s control of the Legislature, but the number of seats the Democrats gain will influence the issues they will tackle in 2019. What is harder to predict is whether the four initiatives on the ballot will bring out voters who would otherwise not engage and if this will make a difference in legislative races.

### State Legislative Races

All state legislative House members and half of the Senate are up for election. Currently, Democrats control the Washington State Senate and House by narrow margins. In the Senate, Democrats have a 25 to 24 majority and in the House they have a 50 to 48 majority. (In the Senate, an independent Democrat caucuses with the Republicans and is included in the 24.)

The August primaries showed a “blue wave” for House Democrats in several of the swing districts with Republican incumbents. In nearly 20 races the Democrat challenger finished close behind or ahead of the Republican incumbent. In several of those races turnout was a factor, but it is clear that the Democrats will pick up more seats in the House. Even ten more seats would create a formidable Democrat House majority that will drive a more progressive agenda.

In the State Senate, there are fewer races in play that would change the balance—probably only four. But all the key races, like the House, are in districts that are currently held by Republicans. If the Republicans hold onto their seats, the margin will stay at 25 Democrats, 24 Republicans. If a Democrat challenger wins in two or more of the key races, the Senate Democrats will have an easier time moving their agenda.

### Issues in 2019

Education funding will continue to be part of the 2019 discussions. In 2018 the Legislature adopted a “McCleary” fix that realigned state and school district funding through property tax and school levy adjustments. The goal was to shift the responsibility for basic education funding to the state. The Supreme Court agreed with the solution and suspended its oversight. But some school districts are saying they did not get sufficient state funds and there are still inequities. Plus there is some “sticker shock” from state property tax assessments. Many legislators are saying they will revisit the education funding in 2019.

Another issue for 2019 could be new tax revenue. Although the economic picture at the state level is still positive, demands for



By / Kathleen Collins,  
SMACNA Legislative Consultant

increased spending on education and mental health, among other things, could make proposals like a capital gains tax on high income earners more of a reality. This capital gains tax is one some Democrats have actively promoted for the last few years. Also, proposals on employee protections and rights are likely to reappear in 2019 and will be easier to pass with enhanced Democrat majorities. On the other hand, prevailing wage laws should not be threatened.

### Ballot Measures

There are four initiatives on the November ballot. Three of them will not have a direct impact on the business side for SMACNA contractors. Initiative 1631 will impact the business side for contractors.

#### Initiative 1631 – Concerns pollution

Initiative 1631 would collect a fee on use of fossil fuels from selected large businesses, electricity, and vehicle fuels. The money would fund pollution reduction and clean energy projects under the oversight of a series of citizen committees.

The positive side for SMACNA businesses is there would likely be increased money spent on energy efficiency. The negative side for SMACNA contractors is the price of gas will increase, initially by an estimated 14 cents a gallon and increasing by two and half times that amount by 2035. Also the price of electricity and natural gas used in homes and commercial businesses will increase as a result of the fees. The Building & Construction Trades Council has concerns about I-1631 because of the cost impacts, particularly the increased cost of vehicle fuel.

Two of the criticisms of I-1631 are that it is imbalanced and complicated. The initiative exempts several large carbon pollution emitting businesses as well as the state’s only coal-fired electric generation plant from paying the fee. It sets up a complicated system for getting the money out to projects that will require review and endorsement by several citizen committees and tribal entities. Overall, proponents say it will reduce carbon pollution and opponents say there are better ways to get that job done. If passed, the carbon fee would be the first in the nation.

*continued on page 23*



## SIX NEW LAWS MAY AFFECT YOUR EMPLOYMENT POLICIES

Six new laws took effect in June 2018 and may impact employers in Washington State. Check out these updates and review your employment policies to make sure you are in compliance with these new regulations.

### “Ban the Box” Employers are bound by additional protections for individuals with criminal convictions during the hiring process

House Bill 1298 or the “Fair Chance Act,” also known as “Ban the Box,” prohibits employers from asking applicants about arrests or convictions before a determination has been made about the applicant’s qualifications for the job. Specifically, the employer may not:

- Advertise open positions in a way that excludes people with criminal records (e.g. can’t say “no felonies”).
- Include application questions about criminal history or background.
- Automatically disqualify applications based on criminal record.
- Reject or disqualify an applicant for failure to disclose a criminal record.

This law applies to all employee applicants except:

- Applicants who will have unsupervised access to minor children or vulnerable adults;
- Applicants to financial institutions;
- Applicants for law enforcement or criminal justice agencies;
- Applicants to an entity that requires compliance with a self-regulatory organization.

### Equal Pay Opportunity Act

House Bill 1506 is an update to existing state law and requires that employers pay “similarly employed” workers equal compensation and provide equal opportunities for career advancement regardless of gender. The EPOA prohibits discrimination in compensation between “similarly employed” employees. Individuals are similarly employed if: 1) they work for the same employer; 2) the performance of the job requires similar skill, effort, and responsibility; and 3) the jobs are performed under similar working conditions. Job titles are not determinative.

Discrimination does not include differences in wages based in good faith on bona fide job-related factors such as: education, training, experience, a seniority system, a merit system, a production-based earning system, or regional differences in compensation. However, an individual’s previous wage history is not a defense.



By / Karen Galipeau Forner

### Employers may not discriminate against victims of domestic violence, sexual assault, or stalking

House Bill 2661, prohibits employers from discriminating against employees or from refusing to hire candidates who are victims of domestic violence, sexual assault, and stalking. The Bill also requires that employers provide victims of domestic violence, sexual assault, and stalking reasonable safety accommodation.

### Sexual harassment or assault in nondisclosure agreements is prohibited

House Bill 5996, prohibits employer from requiring employees to sign nondisclosure agreements that include discussions of sexual harassment or assault occurring at the workplace, at work events or in any other way between the employer and employee. The new law does not prohibit settlement agreements relating to workplace sexual harassment or assault from having confidentiality provisions.

### Employers may not require employees to waive their right to pursue claims of discrimination or require dispute resolution for those claims

Senate Bill 6313, prohibits employers from requiring employees to waive their right to file state or federal discrimination claims. The Bill also prohibits employers from requiring employees to agree to resolve discrimination claims through dispute resolution.

### Model sexual harassment policies and best practices for employers

Senate Bill 6471, directs the state Human Rights Commission to convene a stakeholder work group to develop model policies and best practices to keep workplaces safe from sexual harassment. The purpose of this bill is to encourage employers to adopt and implement policies making workplace reporting safe, without fear of retaliation, loss of status, or loss of promotional opportunities. Aspects of this law must be met and adopted by January 1, 2019. Employers should review and revise their sexual harassment policies for compliance with this policy before the 1st quarter 2019 implementation.

*continued on page 23*

# ALL DUCTS SYSTEMS ARE NOT CREATED EQUAL

Let us look at a typical variable air volume (VAV) supply air system as laid out in Figure 1. It requires 20,500 cfm at 3 inches w.g. static pressure, which includes 400 cfm or 2 percent estimated duct air leakage. The VAV boxes need a minimum of 1 inch w.g. at the box inlet. Rectangular and flat oval duct aspect ratios cannot exceed 3:75 to 1. Ductwork shall be sealed as per SMACNA Seal Class B for 3 inch w.g. and Class C for 2 inch w.g. construction pressure classifications. All elbows will have R/D = 1.5, transitions = 30 degree slope, branch taps = 45 degree angle with 45 degree elbows, and wye fittings = 45 degree angles with 45 degree elbows. All duct branches to VAV boxes have balancing dampers. All ductwork will be galvanized steel with gauges and reinforcements as per SMACNA HVAC Duct Construction Standards-2005 edition.



By / Norm Grusnick, P. Eng.  
Commercial products manager, ECCO Supply

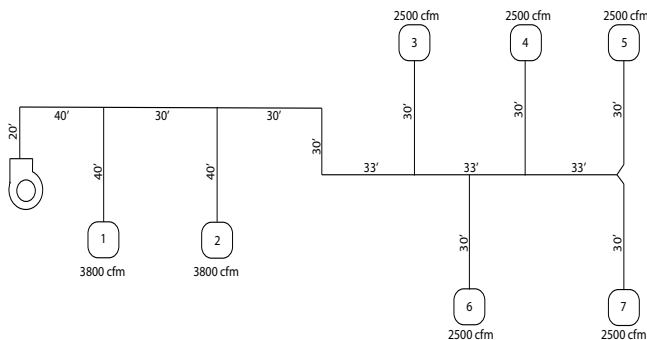


Figure 1: VAV Supply Air Duct System

The system in Figure 1 was done in three different ways each to have approximately the same static pressure drop. Firstly, round spiral duct in 32 inch diameter to 14 inch diameter, flat oval and spiral 60"x16" to 14" diameter, and then rectangular duct 60"x16" to 12"x14".

### Duct Construction

**Round:** 22 gauge spiral duct from fan to 28 gauge spiral duct for the end branch ducts. No extra reinforcement required with spiral coupler joints.

**Flat Oval:** 20 Gauge flat oval duct from the fan to 28 Gauge spiral round ducts for the end branch ducts. F-20 reinforcement used on 4 foot centres for only the flat surfaces.

**Rectangular:** 18 gauge duct from the fan with H-18 reinforcement plus F+Rod intermediate reinforcement to 22 gauge with no reinforcement.

### Duct Leakage Calculations

Duct system air leakage is based on the amount of total duct surface and leakage classes established by SMACNA/ASHRAE research (see Table 4.1). Round duct has the smallest perimeter per air volume. Flat oval and rectangular are larger in that order.

From the above calculations we can see that the rectangular

Duct Length	Size Inches	Round Sq. ft.	Oval Sq. ft.	Rect Sq. ft.	Average Pressure
90 Feet	32 or 60x16	754	1037	1140	2.5 in. w.g.
60 Feet	26 or 38x16	409	471	540	2.5 in. w.g.
66 Feet	26 or 38x16	449	518	594	1.5 in w.g.
33 Feet	18 or 20x14	146	164	187	1.5 in w.g.
80 Feet	16 or 16x14	336	336	400	2.5 in w.g.
150 Feet	14 x 12x14	550	550	650	1.5 in w.g.
Square Foot Totals @ 2.5 in w.g.		1499	1844	2080	
Square Foot Totals @ 1.5 in w.g.		1155	1232	1431	
Total Square Footage		2654	3076	3511	

### Duct Leakage Calculations

ROUND DUCT		
Class 6	1499 sq. ft. x 11 cfm/100 sq. ft. =	165 cfm leakage
Class 12	1155 sq. ft. x 15 cfm/100 sq. ft. =	173 cfm leakage
		Total = 338 cfm leakage
<b>388 cfm/20,100 cfm = 1.68% leakage</b>		
FLAT OVAL DUCT		
Class 6	1844 sq. ft. x 11 cfm/100 sq. ft. =	203 cfm leakage
Class 12	1232 sq. ft. x 15 cfm/100 sq. ft. =	185 cfm leakage
		Total = 388 cfm leakage
<b>388 cfm/20,100 cfm = 1.93% leakage</b>		
RECTANGULAR DUCT		
Class 12	2080 sq. ft. x 22 cfm/100 sq. ft. =	458 cfm leakage
Class 24	1431 sq. ft. x 30 cfm/100 sq. ft. =	429 cfm leakage
		Total = 887 cfm leakage
<b>887 cfm/20,100 cfm = 4.41% leakage</b>		

duct exceeds the original estimated leakage of 400 cfm by an additional 487, so the sample duct section would now require 21,000 cfm from the supply fan. This increase in fan volume will cause slight increases in system velocities and static pressures. To be prudent, the designer should increase the initial rectangular duct pressure classification to 4 inches w.g. to allow for pressure increases that could occur with system balancing, as the calculated system static pressure drop was 2.98" w.g.

Engineer's Desk

*continued from previous page*

Duct Class	1/2", 1", 2" wg	3" wg	4", 6", 10" wg
Seal Class	C	B	A
Seal Applicable	Transverse Joints Only	Transverse Joints And Seams	Joints, Seams, And All Wall Penetrations
Leakage Class			
Rectangular Metal	24	12	6
Round Metal	12	6	3

Table 4.1: Applicable Leakage Classes

The changes to a 4" w.g. rectangular pressure class would also reduce leakage by half because of the "A seal class". So it can be seen that different types of duct systems each come with inherent factors and the designer must look to find the best solution for the design at hand.

**References:**

- Spiral Duct Manufacturers Design Guide*. 2007
- SMACNA Duct Leakage Paper 12/92*
- ASHRAE Fundamentals Handbook* 2009

Legislative Update

*continued from page 20*

The other three initiatives on the ballot are:

**Initiative 940 – An act relating to law enforcement**

This measure would require more training for law enforcement to on how to handle violent situations and would change the legal standard for when a police officer's use of deadly force is justified. The Legislature passed a different version of the deadly force standard at the end of the 2018 session. The state Supreme Court found they should have passed the bill as an alternative ballot measure, so the Legislature's proposal was thrown out.

**Initiative 1634 – Concerning taxation of certain items intended for human consumption**

This measure would prohibit local governments from imposing taxes or fees on certain foods and beverages. This initiative arises out of the controversy over the City of Seattle's tax on

soda pop and sugary drinks. Most food items sold in grocery stores are exempt from state tax now. That does not include prepared food, candy, bottled water, and soft drinks. I-1634 would bar local governments from imposing a tax or fee on these items, but would not prevent local taxes on alcohol, marijuana, or tobacco and on non-grocery items. It grandfathers in the City of Seattle tax.

**Initiative 1639 – Concerning firearms**

This measure would require increased background checks, training, age limitations, and waiting periods for sales or delivery of semiautomatic assault rifles. It also creates a new criminal offence for unsafe storage of firearms. Opponents tried to keep this initiative off the ballot because of alleged flaws in the signature petitions, but the Supreme Court rejected their arguments. If the initiative passes, another challenge is likely. ■

*SMACNA will keep you updated on legislative issues as they evolve during session. If you have questions, please contact the SMACNA office.*

It's the Law

*continued from page 21*

Laws are changing. All employers should have a full handbook and policy review to ensure they is up to date with the ever-changing and expanding state and federal employment laws.

At K-Solutions Law, a typical handbook review takes approximately three to four hours of attorney time (time will vary depending on handbook length and missing content). Making this investment now will help you avoid or minimize disputes, distrust, and disruption in the future!

*Karen Galipeau Forner is the founder and managing member of K-Solutions Law in Bellevue, Washington. Karen represents employers in the areas of workplace safety, workers' compensation, administrative appeals, and employment law. She is a frequent presenter at continuing legal education seminars and to employer groups. Karen has over 25 years' experience defending and resolving a wide range of workers' compensation, WISHA, and employment law matters. Prior to starting K-Solutions Law, Karen worked as senior attorney at a law firm in Seattle and for the Washington State Attorney General's Office. She was the Program Advisor for the Industrial Insurance and Washington Industrial Safety and Health Act (WISHA) Discrimination Programs for more than 10 years and the Program Advisor for the Workers' Compensation Sren also litigated complex WISHA, Industrial Insurance, Third Party, and Crime Victims Compensation Act cases. She recently served on the Washington State Bar Association Character and Fitness Board.*

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