

WINTER 2018

# Sheet Metal Journal

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Western Washington



**Project:  
Johansen Mechanical, Inc.**

*Also in this issue:*

**Construction Outlook 2018**

**Scheduling Benefits**

# 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:

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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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## PUBLISHED QUARTERLY BY

Point One Media Inc.

Sheet Metal Journal - Western Washington  
P.O. Box 11, Station A Nanaimo, BC V9R 5K4  
Toll-free: 877.755.2762  
www.sheetmetaljournal.com

While information contained in this publication has been compiled from sources deemed to be reliable, the publisher may not be held liable for omissions or errors.

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Printed in the USA.  
Postage paid at Aberdeen, SD.

To update or cancel subscriptions please call 1.877.755.2762, email circulations@pointonemedia.com, or visit www.sheetmetaljournal.com

Official Journal of Record for  
SMACNA - WW



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The incredible Stillaguamish administration building was designed to resemble a canoe when viewed from above, to recognize Stillaguamish River People heritage.

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**GREEN IS THE NEW BLACK**

These days, all the cool kids are green, and by green I mean environmentally focused, willing to innovate, and striving towards sustainability. At this stage of the game, the added cost of materials and practices that give a building a longer life, fewer operating costs, and a lucrative business case for the owner are par for the course. No one is shocked when a LEED building costs more, nor are they wide-eyed with wonder when low-flow fixtures, no-VOC paint, or HRV systems show up in the truck. The landscape has officially changed for the better.

Though materials often steal the limelight, technology is another area that can improve sustainability on a project by improving productivity, shortening lead and building times, helping account for labor, and assisting to avoid costly errors.

The complexity of projects and the Era of Fast-tracking require the type of organization and co-operation BIM provides. Collaboration across disciplines, cloud-based access, and realtime updates are the saving grace of many projects (the larger, the more so), and the ready integration of outside data and software make the process almost seamless.

I say “almost” because there is the matter of learning curve—even in the age of smartphones and Pokemon Go, there are still people not entirely comfortable with digital project management and software evolution, and fair enough—with innovation comes a flooded market and in most respects it is hard to ascertain what is truly valuable and what is not. The good news, however, is twofold: most BIM providers are creating their interfaces with simplicity and first-time users in mind; and, the market is flooded with tech-savvy graduates dying to get their hands on some piece of software on a day-to-day basis, so hiring someone isn't impossible.

Overall, the ROI is outstanding. Streamlining the process and saving time normally spent manually sharing information with 17 different people are obvious money-savers, but BIM also offers the opportunity to see material and labor choices on screen before committing. Testing construction techniques, modeling material selections, and eliminating design errors all contribute to a successful ROI and to sustainability, too, while we are on the subject.



By / Jessica Kirby, Editor

SMACNA National has produced a paper called, “The Business Case for BIM,” authored by David E. Quigley, managing director for Emerson Research, under the direction of the SMACNA HVAC Contractors' Council Steering Committee.

The paper is a summary of research into why contracting firms use (or don't use) BIM, the benefits, the challenges, and ultimately, the business case for using it. According to the paper, the committee discovered three important things: 1. everyone in the industry has a different definition of BIM 2. the majority of sheet metal and HVAC companies with annual gross incomes of \$8 million or more, working on mid-sized to large HVAC commercial construction projects, that have not integrated BIM into their practice are further ahead than they realize, and 3. BIM has evolved from “intelligent 3D CAD objects and systems within a virtual model used for spatial co-ordination ... to any process or activity in a construction workflow that involves the reuse of data to improve efficiency and productivity.”

Ultimately, the benefits of BIM for all sized businesses are vast and worth a read. Members can download the paper at [www.smacna.org](http://www.smacna.org).

In the meantime, read up on BIM options, construction technology news, and sustainability through digital construction management. You'll be glad you did, and by glad I mean rolling with the cool kids on the road to prosperity.

Happy New Year, everyone! ■



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## WELCOME 2018

Welcome to the new year! 2017 was a great year for SMACNA-WW and member firms, filled with prosperity and strong business activity. The great boom continues in Seattle, and we expect it will continue into 2018, offering plenty of opportunity and growth for all.

Moving into this year, it is a great time to look at making small changes that will make a big impact on your business. Whether you call them resolutions, experiments, or just common sense, here are some ideas to help you kickstart your business new year.

One of the most important steps contractors can make is pursuing advanced education opportunities. Doing so helps workers keep abreast of new methods, technology, and processes, and it also sets an important tone in the company—that employees are valuable and so is education.

Don't forget to make safety a top priority. Yes, it is important to implement, review, and update safety protocol and equipment, but even more so, it is a fantastic principle around which to rally team support. Since no one wants to be hurt at work, no one can turn away from an employer's focus on building a safety culture in the workplace. Invest in training, know regulation changes, hold regular safety meetings, and make sure safety gear is available and in good shape. If it is a group effort, it will stick.

Everyone knows labor is the talk of the town—how will the industry continue to recruit and, most importantly, how will it retain the knowledge experienced workers bring to the table once those workers retire? Decide how to deal with that now. Find ways to collaborate and bring to youth the message that construction is an incredible career option. Consider a



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

mentorship program to help deliver skilled knowledge to new recruits. Now is the time to make these connections.

Business owners can think professionalism—great leaders are skilled at identifying and addressing their limiting factors, so what are yours? This year pick on area you can improve on and do one thing each week that turns that weakness into a strength. Be it communication skills, time management, delegation, accountability, or something else, committing to making this kind of change will both improve your presence in the office, and demonstrate to workers it is okay (and preferable) to identify and improve limiters.

Finally, keep an eye on trends. The world is a busy, ever-changing place and while activity in the built environment is growing, the ability to communicate, trade, and share information is shrinking the time and cost of effective business practices. Keep an eye on industry-specific and overarching business trends in technology, process, labor retention, equipment, law and contracts, and health and safety to make sure your business is keeping up and staying strong. I wish you all a warm and prosperous 2018. ■





## SEPTEMBER MEMBERSHIP EVENT

SMACNA-WW held its September Membership Event at the Chihuly Garden and Glass at the Seattle Center this past fall. Members enjoyed an evening touring the galleries, glasshouse, and garden as well as a visit to the Space Needle Observation deck.

Lulling melodies were provided by musician Ethan Tucker, who wowed the crowd with an incredible performance, and a flameworking presentation brought awe to the guests' faces. Stunning décor and fabulous food rounded out a night to remember. For more information about future events please contact the SMACNA-WW office. ■



**Do you have an article idea you'd like to share? Great!**

**Please reach out to our editor, Jessica Kirby, to table your suggestions for a future issue of *Sheet Metal Journal - Western Washington***

**Contact Jessica at:  
250.816.3671 or email [jkirby@pointonemedia.com](mailto:jkirby@pointonemedia.com)**

**CRAB FEED FEBRUARY 2, 2018**

Mark your calendars! SMACNA – Western Washington will hold its 55th Annual Crab Feed Friday, February 2, 2018 at Ocean Shores Convention Center, 120 W. Chance A La Mer Ave., Ocean Shores, WA.



Doors open at 6:00 p.m. and the Pirate Buffet begins at 7:00 p.m. Don't miss the after party, which means music and dancing starting at 9:00 p.m. The band Ready or Not is back for another amazing evening of fun and frolic, and will have members up and dancing the night away once again. Join us for a wonderful night and be sure to doll up in your best mermaid or pirate costume, because there will be prizes for the best ones.

Check your email and USPS mail for complete details! ▀



**UPCOMING SMACNA-WW EVENTS**

**February 2, 2018**  
SMACNA-WW Crab Feed / Ocean Shores Convention Center

**December 7, 2018**  
SMACNA-WW Annual Holiday Gala / Seattle Marriott Waterfront



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                      |
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| Evergreen State Heat & AC                                   | Scott & From Co., Inc.                   |
| GB Systems, Inc.  | Shinn Mechanical, Inc.                   |
| H & R Mechanical Systems, Inc.                              | Sunset Air, Inc.                         |
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- |                                  |                               |
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| ACI Mechanical & HVAC Sales      | Gensco, Inc.                  |
| Air Control, Inc.                | Gripple, Inc.                 |
| Air Reps LLC                     | Hudson Bay Insulation Co.     |
| AIREFCO, Inc.                    | ISAT Seismic Bracing          |
| ArmaceLL LLC                     | Industrial Air Systems, Inc.  |
| Automated Controls               | Johnson-Barrow, Inc.          |
| C.M. Hoskins Company             | K-Solutions Law               |
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| Cole Industrial, Inc.            | Milwaukee Tool                |
| Dorse & Company, Inc.            | Pacific Product Sales, Inc.   |
| ECCO Manufacturing               | Performance Contracting, Inc. |
| Edge Construction Supply         | Star Rentals Inc.             |
| FBM SPI                          | Sunbelt Controls              |
| Ferguson Heating & Cooling       | Trane                         |
| General Insulation Company, Inc. | York NW Factor Direct         |

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### 2017 SMACNA–WESTERN WASHINGTON'S HOLIDAY GALA

SMACNA–Western Washington celebrated its 2017 Holiday Gala in a masquerade-style ball at the beautiful Seattle Waterfront Marriott.

Members were greeted with an open reception, where they enjoyed the talented opera singer Philip Fryer accompanied by pianist, Patrick Stevens.

The ballroom décor was a stunning collection of sparkle and frill, with music and masquerade accents to bring the theme together and enchant every imagination.

Executive vice-president, Julie Muller-Neff, thanked everyone for coming and welcomed president, Brian Fluetsch, to kick off the evening. The current Executive Committee & Board of Trustees were intruded along with SMACNA–WW's newest Board of Trustees: BJ Giri of Holaday-Parks, Inc., and Keith Johansen, Johansen Mechanical, Inc.

Doug Happe of Emerald Aire, Inc. was honored with the Distinguished Years of Service, and Life Member Award.



Dean Fox of Hermanson Company was honored with a Distinguished Years of Service Award.

Members danced the night away to the outstanding Hall Pass Band and enjoyed a fantastic evening of camaraderie and holiday joy.

Mark your calendars for our 2018 Holiday Gala, December 7, 2018. ■







*Happy Holidays from the SMACNA-WW  
Executive and Board of Directors*



**JULIE MULLER-NEFF IS CHAPTER EXECUTIVE OF THE YEAR**

Julie Muller-Neff, executive vice-president of the SMACNA Western-Washington chapter, received the Petersen-Dunn Award as Chapter Executive of the Year at the annual convention in Maui.



“Julie Muller-Neff has a stellar reputation. In fact, she elevates this award to a whole new level,” said 2017 President Lansdell. “Julie has actively addressed the industry’s workforce needs by creating an intern program to help bright young people find their way to deserving contractors.

“She has worked with her labor partner to help those transitioning out of the military find a place in the sheet metal industry. This program just graduated its first SMART Heroes class in October.

“She has also worked with her peers to establish the Women in Construction Leadership Council, where she continues in a leadership role.”

Staff and membership at SMACNA – Western Washington would like to wish Julie heartfelt congratulations and appreciation for her dedication and leadership. ■

**INTRODUCING SMACNA-WESTERN WASHINGTON'S NEW 2018-2019 EXECUTIVE COMMITTEE AND BOARD OF DIRECTORS**



**Executive Committee**

- *President*, Brian Fluetsch, Sunset Air, Inc.
- *Vice President*, Tom Montgomery, ACCO Engineered Systems
- *Secretary/Treasurer*, Ned Gebert, McKinstry
- *Company Chapter Councilor*, Jim Reynolds, Auburn Mechanical

**Board of Trustees**

- BJ Giri, Holaday-Parks, Inc
- Rick Hermanson, Hermanson Co.
- Keith Johansen, Johansen Mechanical, Inc
- Russ Kimball, Evergreen State Heat & AC
- Mark Webster, MacDonald-Miller Facility Solutions ■

**SMART HEROES PROGRAM: PROUD TO HONOR ITS FIRST GRADUATES IN WASHINGTON STATE**

The first graduating class of SMART's new Heroes Program received their diplomas before a distinguished audience of military representatives, politicians, and SMACNA and SMART leaders. Six graduates were from the U.S. Army, one was from the U.S. Navy, and one from the U.S. Air Force.

Also in attendance were SMACNA members, SMACNA – Western Washington executives, and representatives from SMART Local 66 and Local 104 and the Western Washington Sheet Metal JATC.

The SMART Heroes Program is a dynamic recruitment and training program designed to attract highly qualified

**UPCOMING NATIONAL EVENTS**

**Jan 22 - 24 , 2018**  
2018 AHR Expo  
Chicago, IL

**Jan 28 - 30 , 2018**  
2018 SMACNA Chapter Executive Institute  
San Diego, CA

**Feb 13 - 14 , 2018**  
Partners in Progress Conference  
Orlando, FL

**Feb 25 - Mar 1 , 2018**  
2018 Business Management University  
Tempe, AZ



candidates to the unionized sheet metal industry. It also is sponsored by SMACNA, the International Training Institute, and Helmets to Hardhats.



SMACNA President Joseph Lansdell was one of many dignitaries invited to share his thoughts during the graduation ceremony. “This fantastic training program is a way for us to help people who have helped our country. I am very proud of that,” Lansdell said. “Many of SMART’s members and SMACNA contractors are veterans. Supporting this program has captured their hearts.”

Attracting and retaining a quality workforce is an ongoing goal for SMACNA. “We are excited that the SMACNA Western Washington Chapter, SMART LOCAL 66, and the Western Washington JATC have gotten this program off on such solid footing,” said Lansdell. “We are confident it will be a success and spawn other programs just like it.”

The SMART Heroes Program provides seven weeks of sheet metal industry training equivalent to first year apprenticeship training to enlisted men and women prior to their discharge from the military. ■

## SMACNA MAKES IT EASY TO ADDRESS OSHA RULES ON CUTS AND EYE INJURIES

Cuts and eye accidents are the leading cause of injuries on the job, according to the SMACNA contractors who participated in SMACNA’s annual Safety Excellence Awards program.

Although these injuries are often not serious, they are all too frequent and preventable by using personal protective equipment (PPE).

The federal Occupational Safety and Health Administration (OSHA) has two different standards for PPE: one for the construction industry and one for general industry (shops, warehouses, service work, etc.).

To make it easier for members to meet the OSHA requirements and to address PPE related injuries, SMACNA has developed two separate PPE model programs—one for construction and one for the general industry—that your company can tailor to your own needs.

Both PPE programs emphasize the necessity for hazard assessments to identify related work tasks including chemical use, welding, and using hand tools.

Both of these documents are editable and are available free to members only. Download “SMACNA Guide to Safety Procedures, Policies, and Model Programs” on SMACNA’s safety webpage.

For more information, contact SMACNA’s Director of Market Sectors and Safety Mike McCullion ([mmccullion@smacna.org](mailto:mmccullion@smacna.org) / (703) 995-4027). ■

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# Sheet Metal Journal

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# CONSTRUCTION OUTLOOK 2018







## 2017 in Review

Downtown Seattle took the construction industry by storm this summer, as a record number of cranes dotted the horizon with no end to the activity in sight. According to the *Seattle Times*, “from South Lake Union to Sodo, the number of projects getting built has doubled in the last five years.”

The demand for housing and office space in Seattle's core continues to climb and as of early fall, 74 projects were on the docket—the most recorded by the Downtown Seattle Association since 2005. These numbers indicate a steady increase from a record 68 at the beginning of 2017, and a previous record of 65 just over a year ago.

South Lake Union is the neighbourhood experiencing the most growth, with First Hill and Denny Triangle following close behind. The downtown waterfront, Sodo, and International Districts trail in development numbers, but that is expected to shift over the next 24 months.

## Coming up Next Year

Moving into 2018, there are about 150 projects on the books or coming down the pipe. According to *Seattle Construction News*, Hotel Interurban, a 19-storey hotel and Tukwila's tallest building; Mercy Magnusen Place, with 148 new affordable apartments; and New One88 Bellevue tower are just a handful of stars on a full construction roster for 2018.



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Of course, Amazon (10 offices completed in 2017 or set to begin shortly); Google and Facebook (with new offices planned); and 2,875 hotel rooms under construction (nearly half of them in R.C. Hedreen's Hyatt Regency) are leading with way volume-wise. The \$50-million F5 Tower and 58-storey Rainier Square office and residential tower at \$600 million are also bringing a large portion of work to the table.

Reports in November indicated a three per cent drop in residential demand moving into next year, but it is important to note that as of fall, there were 67,507 apartment units in various stages of construction and planning. They spread across the region with 58% in Seattle, 24% on the Eastside, and 9% in both Snohomish County and South King County.

According to Business Insider, there is no end in sight for the region's construction boom. The publication is tracking 14, 293 units scheduled to wrap up in 2018, and 7,053 on the books for 2019—a number that is expected to rise later in 2018.

“The last three years have seen near record-breaking levels in excess of 9,000 units per year,” said Business Insider. “2018 appears to be a monster year for new construction.”

## Business Trends for 2018

As the general US construction industry looks strong for 2018-19, it is important to keep an eye on some important trends economists are recommending for the next couple of years. For one, brand-building is going to be more important than ever, especially for the 82.7% of the business employment share taken up by small businesses. Committing time and energy to branding clothing, safety products, and



“The last three years have seen near record-breaking levels in excess of 9,000 units per year,” said *Business Insider*. “2018 appears to be a monster year for new construction.”

promotional items will be key in helping businesses stand out among a sea of contractors.

Increased focus on safety is hardly a trend and more a reality but the focus will be in innovative ways to engage workers in a safety plan and integrate health and safety as part of the workplace culture. Small companies don't always have the same resources to commit to this area, but also have the advantage of fewer employees to get on board. The keys are modelling safety, making it the unspoken norm, and talking about anything but safety at safety meetings. Check out Kevin Burns' blog and resources for some convincing and subtle ways to rally your workforce behind this most important operational principle.

We can't say enough about the importance of keeping abreast of new technologies and how they can improve productivity, cost savings, and operational efficiency. Virtual and augmented reality, 3D modeling, and drones are changing the face of building project development and you don't want to be left behind. Employee management software can save companies thousands each year—no kidding.

Sustainable building is on the minds of some companies, with the general industry taking note when the benefits have financial implications. As an industry, construction is shifting its attention in this direction—how to implement environmental principles that improve a project's bottom line. Now is a good time to investigate these and think about how to implement them in the coming year and beyond.

In its typical cycle, the construction industry is facing cost increases as materials costs rise and labor availability drops. Currently, costs are outpacing inflation, but the trend can't last forever. Dedicating time to labor retention, employee education, and productivity incentives, along with some strong research into material innovations will be key in 2018. ■





# Scheduling for Success:

## If Time Is Always of the Essence, Where Does that Leave Schedules?

by John Owens, C.E.T., P.M.P.  
Revan and Associates Limited, Ottawa

### It Was Not Until The First World War

that simple bar charts were employed by the British army for planning military exercises. The construction of the Empire State building (which began in 1930, well before the invention of modern scheduling techniques) was a marvel of scheduling excellence. The site in downtown Manhattan was so congested there were virtually no lay down areas. Expeditors at the materials' source had to arrange for delivery to coincide precisely with installation. The building's 58,000 tons of structural steel were erected in six months at the remarkable rate of 4.5 floors per week, all without the aid of a critical path method (CPM) schedule or a computer.

With the development of cheap, powerful computers, scheduling entered a new era. Today's project schedules can usually be handled by one person and result in sophisticated graphical output. A word of caution, however: a schedule that is produced by one person in a vacuum, without input from those who will actually build according to the schedule, will be absolutely useless.

### The Need for Construction Schedules

Owners and contractors agree that completing a project as quickly as possible is a common goal, although for different reasons. And with different expectations. Contractors will use the schedule as a planning and management tool that determines the overall approach to the job, organizes and plans labour and equipment, and helps organize materials purchasing and deliveries, sub-contract awards, and shop drawing submittals.

Owners will use the contractor's schedule to monitor progress and see when the job will be completed. The schedule will help to plan and monitor cash flow requirements and determine when owner-supplied materials and equipment must be delivered.

Construction projects continue to increase in size and complexity. So does the demand to build more quickly and economically. In 1982 (reprinted in 1992), The Business Roundtable issued a report entitled "Modern Management Systems, A Construction Industry Cost Effectiveness Project Report" in which the authors state -



*While there are obvious benefits to proper scheduling – and potentially saving money is a pretty compelling reason – why do many contractors not want to provide owners with a schedule?*

“The construction industry has been criticized, to a large extent justifiably, for its slow acceptance and use of modern management methods to plan and execute projects. Many people both inside and outside the industry view this as the primary cause of serious delays in schedules and large cost over-runs that have plagued the construction industry in recent years. Yet there is no lack of modern, cost effective management systems that provide project managers with all the controls they need. But many owners do not seem to be aware of the economic payoff from the appropriate use of modern management systems, and therefore are unwilling to incur the costs of operating the system.”

While there are obvious benefits to proper scheduling – and potentially saving money is a pretty compelling reason – why do many contractors not want to provide owners with a schedule? Why do owners not seem willing to pay for the scheduling from which they will ultimately benefit? Over the years, we have heard many reasons like high expense, lack of usefulness, too much effort required, and, “We’ve only been on the job for six months and the owner says we’re seven months behind schedule. How can that be?”

This final example illustrates a fundamental lack of knowledge about how to read and understand the schedule, and demonstrates a frequently encountered problem. There is generally a lack of proper training in the preparation, understanding, and use of schedules in the construction industry. This is apparent not only in contractors but also owners, architects, and engineers. The other issues listed above are more challenging to resolve, but there are solutions.

### Training

Today, many universities and technical colleges offer scheduling courses, and many excellent books have been written on the subject. There are also companies that provide customized in-house training in scheduling.

Construction companies require sufficient sales volume to justify employing a full time scheduler. Unfortunately, this is often an entry-level position for a recent graduate who may know

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how to manipulate software but knows little about construction. In most small and medium sized firms, the project manager is often the scheduler. Having a project manager who has been properly trained to create schedules makes good fiscal sense; the benefits will ultimately far outweigh the cost of training.

### The “Partnered” Approach to Scheduling

A partnered project is one where all the project stakeholders – owner, contractor, architect, engineer and consultants – get together and agree to work together to successfully achieve the common goals of the project. A dispute resolution process or ‘ladder’ is established clearly, setting out the method, roles, and responsibilities of each party. The basic principles of partnering can be applied to assist project teams in working together to plan and schedule complex projects.

A case in point was a complex bridge rehabilitation project running behind schedule due to weather and an extreme shortage of skilled labor. The owner was also anxious to make up the lost time and accelerate the work to achieve an early completion. Rather than argue about who was responsible for the delays and their associated costs, the contractor and owner held joint or ‘partnered’ schedule update meetings. During these meetings, detailed discussions were conducted regarding the previous month’s progress and the issues to be dealt with by the stakeholders. Having the computerized schedule projected on the wall during the process allowed the participants to examine the issues and study the matter, generating good constructive dialog. Both parties had time to present their concerns and to ask questions of the other. Delays were noted and agreement was usually reached on responsibility for the individual delays. This approach requires goodwill and an honest attempt by all parties to progress the job, save cost, and avoid litigation. It may not be easy to achieve, but it can and has been done very successfully.

### Resource and Cost Loaded Schedules

The critical path of a schedule is usually defined as the sequence of activities that will take the longest time to complete, and is calculated by summing the duration of each activity falling on the critical path. To be useful, the duration of scheduled activities must be based on factual data and not guesswork or the use of horoscopes and crystal balls.

For example, if we know one crew can install 10 widgets in a day, there are 100 widgets to be installed, and only one widget installation crew is available, it will take 10 days – no less – to install all the widgets. The critical path is often driven by the resources available to complete activities that lie on the critical path. In other words, the critical path flows through the resources.

A simple illustration would be a high-rise apartment building with one tower crane. The project schedule may call for pre-cast concrete panels to be installed externally on the tower, at the same time that formwork is to be relocated on the adjacent underground parking structure, and the elevator rails are to be



lifted into the elevator shaft. Clearly one tower crane cannot perform these three tasks simultaneously. If at the outset of the project the schedule had the tower crane defined as a resource and scheduled accordingly, the conflicting resource usage would have been detected and the work rescheduled.

This is known as resource loading the schedule. The properly resource loaded schedule allocates all resources, including labour and equipment, for each activity on the schedule, allowing the project manager to plan the most efficient and effective use of the resources available and to monitor productivity. It also records the planned sequence of events and the logical relationships between them.

### Computerized Schedules vs. Squared Paper

Built in the 1930s, the Empire State Building was obviously planned and scheduled without the aid of powerful computers and modern scheduling software; it was most likely scheduled using squared paper and a pencil. The success of the project is testament to the power of such a 'primitive' scheduling system.

There are many situations today where a piece of paper and pencil are better and faster than using a computer. For example, a project manager may produce a so-called "fragnet" on site to plan a specific sequence of tasks to be performed in a short period of time. A 'squared paper' schedule may also be used to schedule the use of a material hoist or tower crane. The big advantage of a hand produced schedule in such cases is that a

computer and printer are not required and the schedule can be put to use immediately and is easily adjusted. The usefulness of a hand-drawn schedule should not be under-estimated, providing, of course, that the information contained in the schedule is accurate.

There can be no question, however, that computerized schedules have made the once daunting task of producing and updating large complex schedules much faster and easier. In addition, most scheduling software allows a project manager to examine alternate sequences of events by performing a 'what-if' analysis.

### Conclusion

The time and effort spent preparing a proper initial project schedule, and performing subsequent regular monitoring is well spent and pays dividends on the final result of the project. As stated by the Business Roundtable, "Owners are the ultimate beneficiaries of improvements in cost, schedule, and quality of their construction projects". Perhaps owners should give serious consideration to recognizing the importance of schedules and adding an independent bid item for scheduling. Since contractors will also benefit from properly prepared and updated schedules, consideration should be given to investing in schedule training and continuing education for key contractor employees.

Rest assured that, in construction at any rate, it is not a good idea to plan your project on the basis that "the sooner we get behind schedule the more time it gives us to get caught up." ■

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A photograph of a reflection pond with a white wall featuring tree cutouts. The pond is filled with water and large rocks, reflecting the sky and the wall. The wall is made of white panels, and several tree cutouts are mounted on it. The cutouts are in various colors, including black, brown, and gold. The background shows a line of evergreen trees under a clear sky.

# *Stillaguamish* Administration Building

By / Jessica Kirby

SMACNA – WW Member Firm: Johansen Mechanical Inc.

Designer: Womer & Associates / Johansen Mechanical

Materials used: Stainless Steel, Hot-Rolled Powder Coated Steel

*Caption: The reflection pond shown is located near the main entrance of the Stillaguamish Administration Building in Arlington, WA. Photo courtesy of Johansen Mechanical, Inc.*







The building was designed to resemble a canoe when viewed from above, to recognize the Stillaguamish Tribe's heritage as River People. From the ground, the 57,000-square-foot building features various natural textures and Indigenous elements utilized throughout the complex. Carved wooden eagles perch on the branches of a manufactured tree situated in an atrium between the first and second floors. The river reference appears among shades of blue on the atrium's bottom floor. In the middle of this river is an historic dugout canoe recently returned to the tribe by the Stanwood Area Historical Society. Railings showcase metal salmon and the walls are a stunning gallery of art from Northwest Indigenous Tribes. Warm woodgrain on the exterior complements the hues of the surrounding landscape and the interior material palette.

The \$13.8 million administration building is built on tribal trust land adjacent to the Stillaguamish Reservation, and will bring together previously scattered departments. ■

### About Johansen Mechanical, Inc.

Johansen Mechanical Inc. was established in 1983 by Allen Johansen, primarily as a sheet metal and HVAC construction company. The foundation of our success has been long-term social connections within our community and among our employees.

Today, Johansen Mechanical, Inc. has transitioned to a second-generation family owned and operated business that maintains the flattened structure to which it was established. Our company's structure enables management to have a shortened distance from the frontlines to effectively and efficiently deploy resources, which for our customers, translates over to a rapid response.

Our dedicated owners, Keith Johansen and Derek Holm spend a considerable amount of time establishing and maintaining personal connections between the families with whom and communities in which we operate. As a result, we have a deep knowledge of our ever-changing industry, partners, and suppliers, and most importantly ...our customers.

Maintaining slow, conservative growth has allowed us to build our customer base. Learn more at <http://johansenmech.com/>.

The featured image highlights a portion of the intricate architectural metalwork provided by Johansen Mechanical, Inc. on the Stillaguamish Administration Building in Arlington, WA. Completed in February 2016, the decorative finishes hold historical significance to the Stillaguamish Tribal members. The design expertise of JMI's team of metal artisans made it possible to coordinate with Womer & Associates in the design, build, fabrication, and furnishing of the interior and exterior architectural elements throughout the facility.



## SHORT SESSION PACKED WITH PENT UP EXPECTATIONS

On January 8 the Legislature will return to Olympia for a short 60-day session. But there has been a major change since they left town after a prolonged 2017 session six months ago.

The Democrats wrested away control of the Senate from the Republicans with a win in the 45th district special election in November. It has been six years since Democrats controlled both Houses of the Legislature and the Governor's chair. But the majorities will be razor thin in both the Senate and House. In the Senate the Democrats will have a 25 to 24 majority and in the House they will have a 50 to 48 majority.

Needless to say, the Democrat leaders will be dealing with pent up demands from their mainstay bases—labor and environmentalists—and from their own members. Since 2018 is an election year for the entire House and half of the Senate, they will have to manage the issues carefully to maintain control.

Senator Karen Keiser, a long time Democrat Senator from SeaTac and Des Moines, will chair the renamed Senate Labor and Commerce Committee. She has indicated she will be thoughtful in looking at the more controversial issues, but will take on some changes she thinks are needed right away. One of her priorities will be increasing the number of employees who would be eligible for overtime pay. A federal court overturned an Obama executive order dealing with this issue. She will also try to pass an equal pay bill, a bill backed by many technology companies.

There is a lot of national and local discussion on sexual harassment. Senator Keiser may introduce legislation a proposal that would allow a waiver to nondisclosure agreements that are typically used when sexual harassment cases are settled. Continuing with her efforts on the 2017



By / Kathleen Collins  
SMACNA Legislative Consultant

family leave law that she helped broker, the new Chair may explore a bill to allow portable benefits. Of particular interest to contractors, Senator Keiser wants to explore workforce development by using apprenticeships for occupations outside of construction. This is an issue SMACNA will watch carefully.

Despite the healthy economy, revenue will be a continuing topic of conversation. There will be proposals to do a tax on carbon emitters, a tax on capital gains, and an increase in local tax authority. All of these proposals will be difficult to pass due to the thin majorities and looming elections. It is possible that the Legislature may make some adjustments to the property tax part of the education-funding plan adopted in 2017. This is the plan to meet the McCleary court case mandate to fully fund basic education. ■

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

## Submit your news, story, or photo idea



## CONTRACTORS AND SUPPLIERS

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.



## WORKERS' COMPENSATION COSTS REMAIN HIGH IN WASHINGTON

Recently, the National Academy of Social Insurance (NASI) released its annual report on workers' compensation benefits and costs for each state using data from 2015, the most recent year available. Washington's workers' compensation benefits were the most expensive per covered worker at \$788.62 with California (\$751.70) and Alaska (\$719.93) as second and third, respectively. This marks the eighth consecutive year where Washington led the nation in this metric. In terms of benefit costs per covered wages, Washington was fourth at \$1.40 per \$100 of wages. This metric of benefits is most helpful in comparing costs across states.

The report also measures the costs associated with each state's workers' compensation system, and, for the first time, it includes the employee portion of premiums in this calculation. Employers may deduct these premiums from employee paychecks, and previous reports had failed to include these very real costs. For example, the 2016 report listed costs per \$100 of benefits for 2014 as \$1.34, but the 2017 report, which includes employee costs, gives the cost for 2014 as \$1.65 per \$100 of benefits. Because this metric does not control for the differences in the composition of industries within a state, it is less useful for comparing the systems of different states. Cost is best used for looking at Washington alone.

### Some Progress toward Rate Reduction

Since a high of \$1.80 per \$100 of covered wages in 2011, costs in Washington have declined. The Department of Labor & Industries projects a 2.5% decrease in premiums for the coming year, but the Department could reduce rates by 5.9% and still break even for 2018. The Department appears to be focused on ensuring robust reserves. The rate reduction is still good news for employers.

### Employers Must Aggressively Work to Lower Their Claims Costs

Although rates are projected to decrease in 2018, the costs of workers' compensation in Washington will remain high for employers. Every claim has the potential to be expensive, and the sum of a few bad claims can really impact an employer's rates. Accordingly, aggressive and proactive steps to control costs are needed to remain competitive and profitable.

A prudent first step for employers to ensure effective action on all claims is to designate an in-house employee as the point person responsible for workers' compensation. This



By / Karen Galipeau Forner

employee is frequently a person in the human resources or safety department who is well-positioned to address wage and return-to-work issues. Participation in a retro group is another good step, because it allows for refunds for the group and typically includes a third-party administrator for day-to-day claims management. This dedicated assistance minimizes the chances of issues slipping through the cracks and can resolve some more complicated claims. Finally, a skilled attorney is a great resource for claims that are problematic, costly, or likely to spiral out of control. If the attorney is retained early, she can limit the addition of questionable conditions or treatments as well as unnecessary time-loss payments. If you wait to retain an attorney until after the claim begins spiraling out of control, her services may be more expensive and the chances of success decrease. You should almost always have legal representation once issues are on appeal to the Board of Industrial Insurance Appeals.

### Summary

Washington remains one of the most expensive states in the nation for workers' compensation costs. Employers must be proactive on claims and assemble a strong defense team to keep claims costs down and remain competitive. ■

*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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# FAN INSTALLATION GUIDELINES

To ensure the proper fan performance as catalogued, caution must be exercised in fan placement and connection to the ventilation system. Obstructions, transitions, poorly designed elbows, improperly selected dampers, etc., can cause reduced performance, excessive noise, and increased mechanical stressing. For the fan to perform as published, the system must provide uniform and stable airflow into the fan.

The proper way of installing a fan is something very basic but quite often overlooked.

We know that a fan performance curve is a graphical representation of the operating capability of a fan, usually at a defined operating rotational speed. Also, this very same fan, if operated at a higher rotational speed, would have a higher output volume, higher pressure generated, and more power consumed. (This can be predicted from the FAN LAWS.)

Fans in our industry are tested and certified by AMCA – Air Movement and Control Association International – see [www.amca.org](http://www.amca.org). They are set up for testing with the best possible inlet and outlet conditions. As the fan is tested with the best airflow inlet and outlet conditions, the fan should also be installed on the job with equally good airflow conditions.

Surprisingly, a large number of contractors seem to fail to make this connection, or worse, simply ignore it. There are others still who say, “Yeah, but you don’t ever get ideal lab conditions in the field.” There is a logic fault in this kind of thinking. For a successful fan installation, a good, smooth flow of air in and out of the fan is essential if the fan is to deliver the desired performance.

Providing enough room for the fan and its connecting ductwork can be a problem if the designer has not allowed sufficient space. Unfortunately, lack of space for ductwork is a common oversight. If the problem were electrical it would be relatively easy to just reroute the wiring. When we try to move and re-align ducts, the situation is very different; every elbow, offset, and additional duct length creates resistance to airflow, resulting in an increased load on the fan system.

While it is true that installation space is very often a problem, it hardly seems sensible that the solution to a space problem is to simply cram the fan and its connections into whatever space is available. Every effort should be made to provide the fan/ductwork with the airflow conditions needed to do the job. The first step in providing good airflow for the fan is at the equipment selection stage of the design process, which means providing enough space in the mechanical rooms for the equipment that is to be installed. Cramming or shoe-horning fans and ductwork into too small a space is false economy



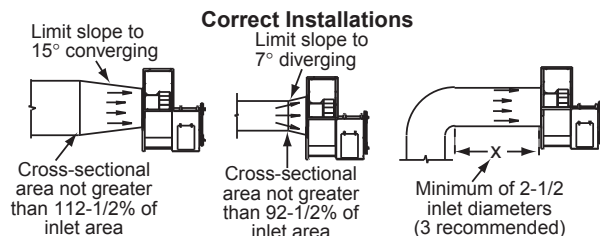
By / Norm Grusnick, P. Eng.  
Commercial products manager, ECCO Supply

when one considers the operational problems and associated costs that result; a poor installation is an inefficient installation for the owner.

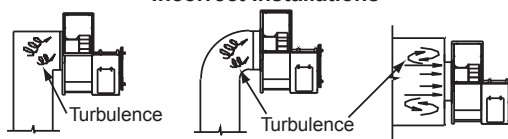
The price of an inefficient installation, even if it is able to function marginally, is a higher operating cost and operational problems with the fan equipment for the life of the installation. Figure 1 shows correct and incorrect fan installation guidelines for centrifugal fan conditions.

## Fan Installation Guidelines

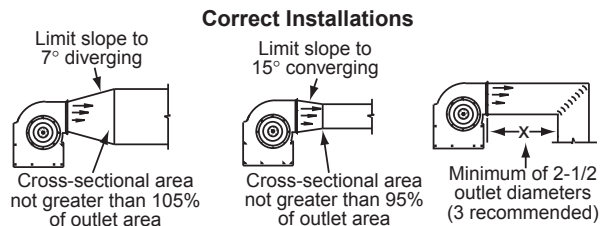
### Centrifugal Fan Conditions Typical Inlet Conditions



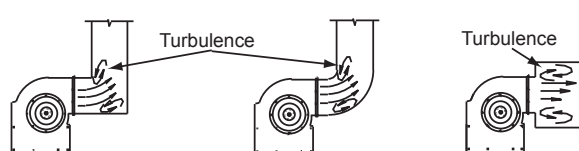
### Incorrect Installations



### Typical Outlet Conditions



### Incorrect Installations





ENGINEER'S DESK

*continued from page 22*

Let us assume that we are faced with a situation in which a fan is crammed into too small a space. What are we to do? Well, we are not powerless; there are several ways to cope with the problem. They are listed here in their order of effectiveness.

1. Make the necessary room. This is not always easy, but is best for all concerned.
2. Re-configure the inlet/outlet ductwork. If physically possible, rearrange ductwork to improve fan performance.
3. Provide guidance to the airflow inside the ductwork. This can be done using strategically placed turning vanes, splitters, and other such devices.
4. Rearrange the fan. This is most costly, but long-term, improved operating and maintenance costs may justify this solution.

The best solution is to allow for sufficient space in the design/layout stage to have the fan and related ductwork perform at their best. ■

INDUSTRY NEWS

*continued from page 11*

**SMACNA ELECTS NEW MEMBERS TO BOARD OF DIRECTORS**

The Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) elected four members to its Board

of Directors at the annual business meeting on Oct. 25 at SMACNA's 74th Annual Convention. Four directors will serve four-year terms beginning on Oct. 25 at the close of the convention. One director appointed mid-year is serving a two-year term.

The newly elected directors serving four-year terms are:

- **Kyle Bellmon** - United Mechanical Inc., Oklahoma City, Okla.
- **James E. Hall** - Systems Management and Balancing Inc., Waukee, Iowa
- **Gary G. Luthe Sr.** - Luthe Sheet Metal Inc., Cherry Hill, N.J.
- **Thomas E. Martin** - T.H. Martin Inc., Cleveland, Ohio

The recently appointed director serving a two-year term is:

- **James Morgan** - Worcester Air Conditioning, Ashland, Mass.

Visit [www.smacna.org](http://www.smacna.org). ■

**Do you have an article idea you'd like to share? Great!**

Please reach out to our editor, Jessica Kirby, to table your suggestions for a future issue of *Sheet Metal Journal - Western Washington*

Contact Jessica at: 250.816.3671 or email [jkirby@pointonemedia.com](mailto:jkirby@pointonemedia.com)



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