

WINTER 2017

Sheet Metal Journal

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British Columbia

SECTOR HEATS UP FOR 2017

**ASHRAE President
Tim Wentz:**
Adaptation on the Horizon

**Architectural Sheet Metal
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**Fixing For a Refund
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SMACNA-BC is a member-driven association representing unionized sheet metal contractors in the Mainland of BC, and suppliers to our industry. It promotes the growth and stability of the members and industry.

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- To promote harmony in labour relations
- To exchange technical, professional, and educational information with other contractor associations in the sheet metal industry and its allied trades in Canada and other countries
- To affiliate as a Chapter with the Sheet Metal & Air-conditioning Contractors National Association, Inc.



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WELCOME TO 2017

SMACNA-BC recognized the 2015 activity produced by the Rio Tinto project in Kitamat would result in inflated hours, and subsequently budgeted for a flat year in 2016. The same expectation extends into 2017, with a noted upturn in the commercial market, but no large projects on the books. Industrial projects are on the horizon, including a mill rebuild in Quesnel, but otherwise contractors can expect more of the same moving forward from last year.

Projected increases in steel prices could weigh on the industry, though marginal fluctuations over the years have yet to have a major impact on the trade.

On the labour front, there are just under 400 apprentices at the moment, and manpower is an issue because everyone is busy—at the time of this writing, there were only about 20 unemployed sheet metal workers in the province.

The SMACNA-BC office continues to assist specifiers in sorting through specification and workmanship issues. The office also hopes to engage more members with its technical program in 2017, bringing contractors up to date



by / Jessica Kirby, Editor

on specification changes, news and improvements within SMACNA, and ways to engage new graduates with an in-depth practical understanding of SMACNA standards and their appropriate application.

Overall, SMACNA-BC's primary objective is to ensure SMACNA contractors doing work in BC and beyond have the resources and the association to back them; and, to ensure owners and specifiers understand the benefits of working with SMACNA contractors and know that in doing so, the customer will always get what they pay for. ■

UPCOMING SMACNA-BC EVENTS

February 14

SMACNA-BC Board of Directors Meeting

February 16

Lower Mainland Dinner Meeting and Young Executives Committee Meeting

February 28

SMACNA-BC Joint Conference Board Meeting

March 14

SMACNA-BC Board of Directors Meeting

March 16

Lower Mainland Dinner Meeting and Young Executives Committee Meeting

April 11

SMACNA-BC Board of Directors Meeting

April 20

Lower Mainland Dinner Meeting and Young Executives Committee Meeting

April 25

Joint Conference Board Meeting

May 9

SMACNA-BC Board of Directors Meeting

May 11-13

48th SMACNA-BC AGM & Convention
Westin Resort & Spa, Whistler, BC

May 30

Joint Conference Board Meeting

June 13

SMACNA-BC Board of Directors Meeting

June 15

Lower Mainland Dinner Meeting and Young Executives Committee Meeting

June 20

Joint Conference Board Meeting

Events from July to September 2017 will be included in future issues of *Sheet Metal Journal*.

G3 TO BUILD NEXT-GENERATION GRAIN EXPORT TERMINAL AT THE PORT OF VANCOUVER, BC

G3 Terminal Vancouver, an affiliate of G3 Global Holdings (G3), is pleased to announce that it will build a state-of-the-art grain export terminal in North Vancouver, British Columbia, the first new grain terminal constructed at the Port of Vancouver since the 1960s.

G3's Vancouver terminal will feature a rail loop track that will be capable of holding three 134-car trains, unique to grain exporting terminals in Canada. The terminal includes over 180,000 metric tonnes of storage and will be able to handle cereal grains, oilseeds, pulses, and special crops, much of which will be supplied via a throughput agreement with G3 Canada Limited. This will allow trains to travel to Vancouver, unload while in continuous motion, and travel back to G3 Canada's primary elevators, including four recently constructed primary elevators, without detaching from their locomotives—critical to increasing supply chain efficiency.

In addition to improved rail efficiency, G3's Vancouver facility was designed with a focus on high velocity receiving, shipping, and best-in-class environmental and safety standards, representing the next generation in grain terminal design.

The development of G3's Vancouver terminal will be led by Bill Mooney, who has extensive Vancouver grain terminal management experience, together with G3's team of experienced project engineers. Peter Kiewit Infrastructure Co. has been selected as the design-build contractor for the project. Construction will commence in March 2017, subject to final notifications, with the terminal slated for completion in 2020. ■

BC CONSTRUCTION ASSOCIATION REPORTS HEALTHY WORKFORCE TRENDS IN AN INDUSTRY UNDER PRESSURE

The BC Construction Association (BCCA) is reporting better than expected results for BCs skilled workforce, in key figures released in December for the province's industrial, commercial, and institutional construction sector.

One of the biggest gains comes in the ratio of BC high school graduates entering construction trades training programs within one year of graduation. When the BCCA first began calculating this number in 2013 it estimated that 1/93 students went from grade 12 into trades training. In 2016 that number has improved by 35 per cent to 1/69.

Continued on page 23



British Columbia Sheet Metal Association (SMACNA-BC)

Providing products and information related to the Sheet Metal Industry, including technical manuals and guidelines.

The unmatched technical and managerial expertise of SMACNA-BC Contractors is enhanced by the talent and skills of the workforce they employ. SMACNA-BC Contractors employ only Red Seal Certified Sheet Metal Journeymen and Registered Apprentices.

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SECTOR HEATS UP FOR 2017

Driven by Public Infrastructure Funding, Potential Capacity Challenges Loom

by / Blake Desaulniers

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To say president of Canadian Construction Association Michael Atkinson is stoked about prospects for the Canadian construction sector in 2017 would be an exercise in understatement. Where the industry saw softer years in 2015 and 2016, the coming year shapes up to be a return to near capacity engagement, a turnaround due mainly to announced federal and provincial infrastructure program spending.

“After seeing weaker conditions, especially with low oil prices and the fire in Fort McMurray, we’re hoping to see a lot of the huge commitments to infrastructure hit the street in 2017,” Atkinson says.

With new commitments from the federal government, planned infrastructure spending now totals \$146 billion over 12 years. Additionally, two new pipeline projects announced late in 2016 will further boost capital spending.

“It’s certainly a tidal wave of money, and it’s very encouraging, looking at the federal government commitment alone,” says Atkinson. “The new government doubled planned spending when it took office. Ontario is making an unprecedented commitment. And there are others.

“In past, governments have been focused on spending cuts. Now there’s an understanding that fiscal debt management is useless unless you invest in growth,” he says.



infrastructure spending program, a massive sum that, along with Canada's stimulus spending, could strain available North American resources going forward.

Also of concern to Atkinson is the recent trend toward protectionism—as in the Brexit vote and in rhetoric from the incoming US administration. “We’ve worked hard to bring down trade barriers. We’ve put effort into improving labour mobility and getting inter-provincial recognition,” he says.

That having been articulated, it's worth noting that a possible renegotiation of NAFTA could work in Canada's favour. “We were hung out to dry under the Obama administration, because the funding came down to the state level,” Atkinson says. Unlike the federal administration that must open bidding opportunities to NAFTA signatories, individual states are under no such obligation.

“Any changes obviously remain to be seen. Hopefully cooler heads will prevail and understand that protectionism doesn't lead to a better outcome,” he says.

President of the Independent Contractors and Businesses Association of BC (ICBA), Phil Hochstein, also expresses optimism looking ahead.

On Vancouver Island, major public projects have the sector humming. With the John Hart dam replacement project, two

Canada's low debt/GDP level and current low borrowing costs combined create “a perfect storm for reinvestment,” Atkinson notes.

Much of Canada's infrastructure was built 40 to 50 years ago, and has reached the end of its useful life. Spending on new infrastructure is expected to directly return a dollar-and-a-half for every dollar spent. The stimulative impact can also be expected to boost private sector confidence and spur further expansionary spending by business.

Another important government factor, an increase in immigration will also drive demand in the construction sector. Immigration Minister John McCallum recently boosted the base number of immigrants allowed into Canada next year to 300,000, to help drive economic growth as the country grapples with an aging demographic.

Rising demand, however, could be a double-edged sword. It's worth noting that the US now plans a trillion-dollar

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▪ Sector Heats Up For 2017

hospitals, and seismic upgrades all going on at the same time, construction resources are stretched to near capacity.

“The activity at the north end of the Island is at a level we haven’t seen in years,” Hochstein says.

He notes a hot market in Nanaimo residential and unprecedented activity in downtown Victoria.

“Private sector development is the highest I’ve seen in 14 years,” he says. “Within a six-block circle around the legislature buildings, there is \$4.5 billion in work going on.”

Most of the construction is commercial, office, and high density residential.

“Large chunks of the city are up for redevelopment—areas of one or two square blocks,” says Hochstein. “Demand for multi-storey residential is clearly there. It’s kind of coming to a peak after bottoming out in 2008. Single family home prices are very high. But people can get into smaller spaces for \$350,000 to \$400,000. We’ve also got low interest rates. Money is cheap for buyers and for developers.”

Housing has also come back in the southern interior of the province. Kelowna and Kamloops are reported to be very busy.

The only soft spot in BC, the northern part of the province, still lags due to a lingering bear market in commodity prices.

There are projects on the boards awaiting final investment decisions.

In Vancouver, activity is accelerating around Canada Line nodes. Residential towers now occupy all four corners of the station at Cambie and Marine. The Oakridge project is on the boards further north at 41st. “The area between Oakridge and Marine Drive along Cambie will continue to fill in,” says Hochstein.

Overall the provincial picture shows \$329 billion in projects upcoming over the next eight years.

The promised infrastructure spending, Hochstein observes, will have an effect he likens to tossing gasoline on a roaring blaze. The money is welcome, but there are going to be challenges.

“If we have a challenge in the province, it’s getting qualified labour,” he says. “We have about 210,000 people working in the sector now, that’s 10 per cent higher than last year. Two-thirds of our workforce is over 45. Some people have come in from Alberta, but we’re still forecasting a long term shortage of 15,000 workers in the sector.”

“Prior to 2008, owners had a hard time finding contractors. Capacity had been reached. We’re starting to see some of that now,” he says. ▪

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HVAC IN AMERICA—A SNAPSHOT OF TRENDS WITH POTENTIAL IMPACT IN CANADA

In 2016, the New Horizons Foundation published an update to the 2012 *HVAC and Sheet Metal Industry Futures Study* outlining research by the Continuum Advisory Group validating the 2012 information and describing how the next 5–10 years are expected to unfold for the industry.

Sheet metal contractors, HVAC equipment manufacturers, and other industry professionals participated in interviews, SMACNA Chapter Leaders took part in an interactive workshop, and building owners, facilities managers, mechanical contractors, and HVAC contractors contributed more than 300 responses to a quantitative survey—all as part of the research that defines the 2016 update.

According to the update, several of the trends identified in 2012 have been slow to emerge, and some of those anticipated over the next decade will rely on underlying factors that are different from those identified in 2012.

As an example, energy costs are not currently driving an increase in the demand for HVAC services; however, new research suggests building codes and energy regulation implemented by government will drive progress in the industry moving forward. Regardless of energy costs, building owners and operators will be mandated to improve overall efficiencies in their structures.

Integration at various facets of the HVAC supply chain may not have come to fruition; however, the rise of intelligent equipment and The Internet of Things will likely drive OEMs, engineering firms, and energy service companies into the service end of the supply chain.

Over the next 10 years, trends in prefabrication and modularization, which held steady in 2016 thanks to the gradual rebound of the construction industry, will play a bigger role in large industrial and commercial jobs and be fuelled by building information modelling (BIM).

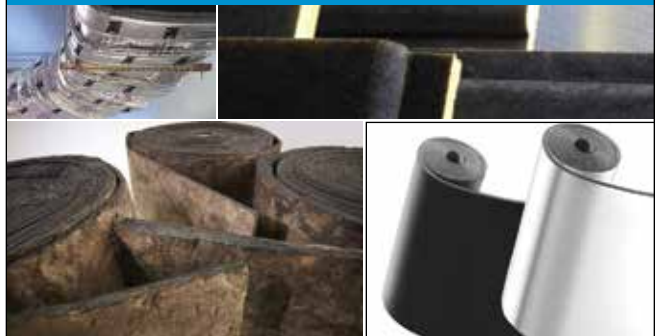
BIM, predicted in 2012 to drive disruption of the mechanical trades and blur the lines between and among trades, equipment, and systems, did mature in 2016, but had a different effect. Accessibility and prevalence of BIM in all sizes of HVAC firms has negated larger firms' ability to leverage the technology as a competitive advantage. As BIM continues to mature, there is the sense that integration with other systems and additional factors could lead to convergence of trade categories, equipment suppliers, and solutions. There is no doubt opportunities exist for businesses to leverage BIM as a way to capitalize on new business models to enact a competitive advantage.

The US HVAC market enjoyed a strong recovery in 2016, with improvement occurring across the country in most locales. Moving forward, growth is expected in health care, infrastructure, residential, and high tech. Demographic, migratory, and industry lifecycle trends will also drive growth in certain geographies, mainly the south and west. ■

The information in this summary was taken from "Providing Vision and Leadership for the Future of the HVAC and Sheet Metal Industry: The HVAC and Sheet Metal Industry Futures Study Update 2016." To view the full text, please contact SMACNA-BC at smacnabc@smacna-bc.org.

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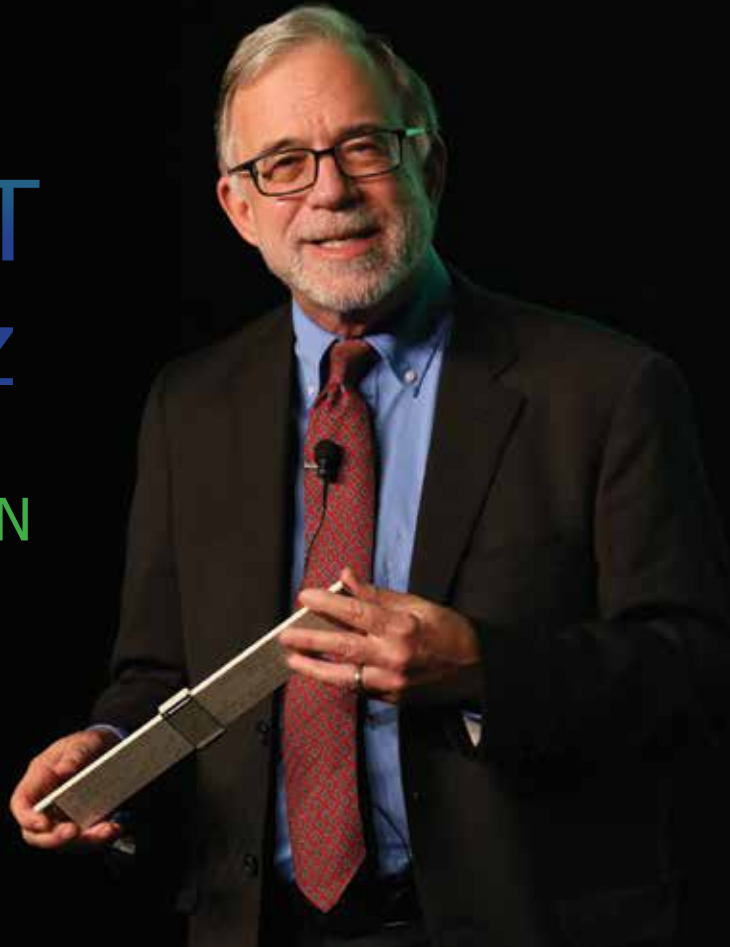
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ASHRAE PRESIDENT Tim Wentz

ADAPTATION ON THE HORIZON

by / Jessica Kirby
Photos courtesy of ASHRAE



ASHRAE PRESIDENT

for 2016-17, Tim Wentz, hinged his presidential theme on the absolutely critical need for adaptation in today's rapidly changing building design and construction landscape.

Kicking off his presidential theme speech wielding a slide rule – once an essential part of his life and later the catalyst for change – Wentz moves through ASHRAE's main directives for his term, and the initiatives that will back them, coming back time and again to the need for adaptation.

“The greatest risk we face is resistance to change,” he says. “Our ability to shape tomorrow is borne out of our willingness to adapt today.”

Sheet Metal Journal caught up with Wentz with interest in how the need for adaptation translates into success for contractors, and to discuss challenges and opportunities the globally changing future will bring to the industry.

Wentz is an associate professor in construction management at the University of Nebraska - Lincoln. He earned a Bachelor of Science in Mechanical Engineering and a Master's in Business Administration from the University of Nebraska. When he joined his family's mechanical contracting firm, he developed expertise in mechanical design, estimating, and construction management over 19 years in the industry.

He knows what he is talking about when he says the construction industry has historically been slow to change—a real dilemma for integrating the concept of adaptation, since it hinges on the willingness to evolve.

“In my mind this is such a paradox because contractors are risk takers,” said Wentz. “They know how to take a risk; that is what they do with their lives.”

As a fourth generation contractor, Wentz knows the drill, and understands

the reticence to adopt new technology. “We are a very traditional industry,” he said. “Tradition weighs heavily with us—more so than it should.”

The other driver for resistance to change is the industry being populated by smaller firms, which tend to look at the costs associated with change. How, then, to express the absolutely critical need for adaptation?

“My grandfather was fond of saying, ‘In business, there are two states of being: growth and decay. That is it,’” said Wentz. “I think he was 100 per cent right. We have to convince our fellow contractors that the rate of change is expanding and unless they expand with the change, they will be left behind.”

The same is true of ASHRAE, of course, and of all professional associations—a message Wentz consistently tries to get out to audiences.

“I often ask them to think of Uber and how it completely changed the

landscape,” he said. “The question becomes: who is your Uber? They are out there. We all know it. How will that change the way you do business and can you adapt?”

He reiterates from his theme speech, “The greatest risk we face is resistance to change. We just need to convince our fellow contractors they are really good at handing risks and they can handle this risk, too.”

A second key directive of Wentz’s presidential theme is the need to “be in the room”—that is, participate in industry associations, meetings, networking events, and other gatherings where specifiers, suppliers, the competition, and other industry associates will be.

Wentz said three main trends in the industry are making it essential that contractors “be in the room”.

First, there is a change in technology coming down the pipe that will transform the way buildings are designed and constructed. Once the technology change occurs, for the first time the industry will actually be able to do integrated design—something that isn’t currently done particularly well or often enough.

“We don’t really have the technology yet to optimize that process,” he said. “When the technology comes, integrated design will be the way we do things in the future.

“The heart of integrated design is having everyone at the table during the design and construction process, including sheet metal, plumbing, and heating contractors, operations and maintenance people, owners, architects, and engineers,” he said. “The whole lifecycle of the building needs to be represented if we are to produce an integrated design.”

Once the technology and integrated design are in place, designers will design and build buildings based on



**The question becomes: who is your Uber?
They are out there. We all know it.
How will that change the way you do business?**



performance, which is completely different from the current method.

“Previously, we have done things in a prescriptive manner, referring to building codes and standards to achieve specific efficiencies,” said Wentz. “That will all go away. It is going to be a much more systems approach based on how the building performs to meet clients’ expectations.”

This process will lead to what Wentz refers to as The Golden Age of the construction industry, something he believes is well on its way.

“That is why contractors have to be in the room,” he said. “And, it’s not just to develop networks and to be on

these teams, but also to make their expertise available so the project can be successful.”

Although there is no denying the advantage of greener building systems, in some cases sustainability measures change the landscape in ways that demand adaptation. Smaller systems, ductless systems, and pipe and duct reconfiguration can actually shrink the traditional sheet metal scope, opening up room to fail or opportunities to evolve and grow.

“To write the word *crisis*,” said Wentz, “the Chinese take the pictogram for danger and write it with the pictogram for opportunity. I think that is a perfect description of crisis.



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“Successful contractors and engineers focus on the opportunities, and not the danger.”

The evolving landscape will indeed bring change—particularly in the form of global initiatives meant to lower our buildings’ impact on the environment.

“That will create stress and a great opportunity,” he said, citing the opportunity to hone the high-performance operations model needed to complete the building efficiency cycle.

“We spend a great deal of time figuring out how to do high-performance design and quite a bit on how to do high-performance construction,” said Wentz. “The missing piece is high-performance operations and maintenance. [Without these] it will never be a high-performance building.”

Another area is changing weather patterns and the opportunity to study

how buildings respond to and recover from unusual weather events.

“It is never discussed, so it is an area of great opportunity,” he said. “There are other emerging areas like integrated design, building information modelling (BIM), and The Internet of Things—all of these things will create opportunities for our contractors.

“I’m excited about it. I understand risk is there, but the opportunity is really great.”

Into the future, regulatory and code issues will challenge contractors and demand the need for adaptation.

ASHRAE is currently researching flammable refrigerants, which have raised some concerns, but have proven lower in global warming and ozone depletion potential, while being more efficient than the refrigerants currently in use.

“We have to figure out how to use them and how to maintain them to building

owners’ satisfaction so we can provide a safe environment and one that impacts our environment less and creates more efficiency,” said Wentz.

“These are just a few challenges on the board—these and others will create opportunities where contractors and engineers have to adapt and adapt quickly. They can’t be the last person to the table because there may not be a chair there.”

ASHRAE sees these same trends and its members are working hard to make “the room” bigger.

“Engineers, contractors, and architects have not done a great job in collaborating and we are trying very hard to make the room bigger so all three of us are better able to adapt as changes manifest,” said Wentz.

Read the full text of Wentz's theme speech or watch the video at www.ashrae.org/Wentz. ▪

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The QAC is an initiative of the BC Insulation Contractors Association.

A photograph of the Sport Chek store exterior. The word "SPORTCHEK" is displayed in large, metallic, three-dimensional letters mounted on a red horizontal bar. Below the letters is a large, curved red architectural element. The building has a glass facade reflecting the sky and trees.

SPORTCHEK

Architectural Sheet Metal Enlivens Sport Chek

by / Jessica Kirby
Photos Horizon Metal Systems

Project : Sport Chek, Robson Street, Vancouver
Sheet Metal Contractor: Horizon Metal Systems / Horizon Cladding
Architect: Kasian Kennedy
General Contractor: Tkachuk Contracting



Horizon Metal Systems provided full service architectural sheet metal services on the Sport Chek panel installation on Robson Street in Vancouver.

The company completed product fabrication, including system design. As part of its typical process, Horizon Metal Systems' AutoCAD detailers create shop drawings that are presented to the architect for colour and design detail approval. Once the panels are fabricated, a related company, Horizon Cladding, co-ordinates the fieldwork, including installation of membranes, insulation, thermal subframing, installation of the panel system, and tie-in to other subtrades' materials.

On the Sport Chek installation, 3,000 square feet of Reynobond composite aluminum panel was installed in an engineered dryjoint panel system on an entry canopy roof, fascia, and soffit, both exterior and interior. Horizon Metal Systems did the design of the attachment system and fabricated the panels



"Ellipses are a constantly changing radius so not only did we have to make the product curve in two directions, the amount of curve was never the same."

to sizes required, while Horizon Cladding co-ordinated and installed the panels on site.

Neil Deppièse, company president, said the project's main challenge was the canopy's design, which was curved in plan and an ellipse in elevation.

"Ellipses are a constantly changing radius so not only did we have to make the product curve in two directions, the amount of curve was never the same," he said. "There was a lot of time spent with the structural steel trade trying to understand what dimensions could be counted on to fabricate from, but in the end it came down to more of the field crews determining some benchmarks to give the shop for key dimension points to follow."


The aluminum composite material is pre-finished prior to fabrication, so all cutting, rolling, and forming had to be performed without any harm to the high-gloss red finish. In addition, Horizon was typically the last trade on site before opening, and the congested site on Robson St. was not allowing any laydown.

"Our schedule timeline had already been cut in half due to delays by others, but the store did officially open one day later than scheduled," said Deppièse.

Typically, Horizon likes to have four weeks' lead time on fabrication and approximately four to five weeks' installation time.

"On this project, while the proper durations were originally scheduled, we had one week to start getting product on site for field installation and had to have the installation complete within three weeks," said Deppièse. "We had a crew of four men on site, which was close to the originally planned manpower as you have to build this sequentially. So the field forces worked a fair amount of overtime to complete it in the compressed time frame."

For more information about Horizon Metal Systems and Horizon Cladding, please visit <http://horizonmetalsystems.com>. ■



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FIXING FOR A REFUND on your tax return

words and photo by / Canada Revenue Agency

As a skilled tradesperson, you build the houses where families live, skyscrapers where people work, and the roads and bridges that get everyone where they need to go. The work that you do benefits all Canadians. But did you know the Canada Revenue Agency (CRA) wants you to benefit, too, when you do your taxes?

No matter what your trade is, you need to make sure you have the right tools for the job.

If you bought new ones for work this year, you may be able to claim the tradesperson's tools deduction, a deduction of up to \$500. To claim the deduction, you will need your employer to certify the tools were bought by you, for you, to be used directly in your work. You may also be able to get a rebate on the goods and services tax/harmonized sales tax (GST/HST) you paid. For more information on deducting the cost of eligible tools, go to cra.gc.ca/trades.

Are you part of a trade union?

If you pay dues for your membership, hold on to your receipt. You may be able to deduct the amount paid on your tax return, including any GST/HST you paid as part of your dues. For more information, go to cra.gc.ca and search for "Line 212 - Annual union, professional, or like dues."

When someone questions "Who's the boss?" you take pride in responding, because well... it's you!

If you're self-employed, you may be able to deduct other reasonable expenses you paid to earn income, such as vehicle

costs, supplies needed to complete a job, and office space expenses. Have you converted part of your garage from a storage room into a workspace for your business? When you use part of your home for business, you may be able to deduct a portion of your maintenance costs such as heat, home insurance, electricity, cleaning materials, and more. To find out more, go to cra.gc.ca/selfemployed and select "Report business or professional income and expenses."

No one has to tell you that the demand for skilled tradespersons never seems to slow down. You recognize that every day. As your project schedule starts filling up, it might be time to consider registering for a GST/HST account. Generally, you are required to register for the GST/HST once your business income exceeds \$30,000 in four consecutive calendar quarters. Even if you aren't required to, registering could let you claim input tax credits on the GST/HST you paid on your business purchases and expenses. This is an important benefit of owning a business and could put more money in your pocket to re-invest for the future. For more information, go to cra.gc.ca/gsthst. If your business is located in Quebec, go to revenuquebec.ca.

You learned (almost) everything you know about your trade spending countless hours as an apprentice. Now you want to pass that knowledge on to the next generation of tradespersons. If you hire a qualified apprentice working in an approved Red Seal trade, you may be able to claim the apprenticeship job creation tax credit. For each eligible apprentice, you can claim \$2,000 or 10 per cent of the eligible apprentice's salary and wages payable in the year, whichever is less. Don't need

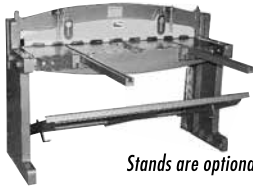
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Left: Jud Martell Local Union No 280 President. Right: Mark McLaren, Ridge Sheet Metal Co., SMACNA-BC Immediate Past-President. Photo by Bob Pascuzzi (SMWTC).



Labour & Management
“Embracing the Challenge”

- B. Flaherty, Cornell University, Syracuse, N.Y.

to use the whole credit amount this year? Carry the unused amount back three years or forward up to 20 years. For more information on the apprenticeship job creation tax credit and other investment tax credits, go to cra.gc.ca/smallbusiness and select “Investment tax credit.”

Tax returns for most Canadians are due on April 30, 2017. However, since this date is a Sunday, the CRA will consider your return as filed on time and your payment to be made on time if it receives your submission or it is postmarked the next business day. Self-employed individuals and their spouses or common-law partners have until June 15, 2017, to file their returns. But if they have a balance owing to the CRA, the amount is still due no later than April 30, 2017.

This year, you can file online as early as February 20, 2017. Last year, more than 84 per cent of individuals filed their returns online. To file your personal return online, you can prepare it using certified tax preparation software or a certified web application. The CRA has a list of certified tax preparation software on its website, including some that are free. To find out more, go to cra.gc.ca/netfile.

Unfortunately, not every year can be a winning year. If your business is facing cash flow problems, you may be able to pay off your tax debt in more than one payment. You can set up a payment arrangement by making a pre-authorized debit agreement through the CRA’s My Business Account or My Account service or by calling 1-888-863-8657. To learn more about your payment options, go to cra.gc.ca/payments.

Even with all of your training and credentials, it’s still important to be vigilant and not find yourself swayed into participating in the underground economy. If your clients suggest you do a job “under the table,” know that by avoiding taxes, you are putting yourself at risk. If you are caught evading taxes, you could face penalties and jail time, and you could even lose your business. It’s that simple.

Under-the-table deals undermine the integrity of Canada’s tax system and deprive Canadians of funds for vital programs that benefit everyone, including children and seniors. On the other hand, as the boss, if you pay your employees under the table, you are robbing them of the benefits they are eligible for, like employment insurance, Canada Pension Plan payments, and workers’ compensation coverage. For more about the underground economy, go to cra.gc.ca/undergroundeconomy.

If you have ever made a mistake or an omission and would like to correct your tax affairs, you can find more information about the CRA’s Voluntary Disclosures Program at cra.gc.ca/voluntarydisclosures.

You can also stay on top of the latest CRA news and tax tips by following @CanRevAgency on Twitter. ■

HEAD INTO 2017 WITH A NEW APPROACH TO ESTIMATING

Digital project plans are all but the norm these days in mechanical and HVAC contracting. So shouldn't your estimating methods parallel this change in plan format that has occurred over the past several years?

With FastEST, Inc., and its line of easy-to-use and accurate estimating software programs, you can increase the accuracy and output of your HVAC, plumbing, and mechanical insulation bids. With FastDUCT® for HVAC ductwork and industrial sheet metal, FastPIPE® for plumbing, mechanical, and site utilities, and FastWRAP™ for piping and ductwork insulation, FastEST has an estimating solution for all types of mechanical, plumbing, and insulation contractors.

Whether you currently estimate by hand, with a spreadsheet, or with some other software product, the transition to using FastEST estimating software has been a tried-and-true success story for hundreds of current FastPIPE®, FastDUCT®, and FastWRAP™ customers.

What makes the switch to FastEST so beneficial for contractors? Seamless, flexible technology backed by exemplary technical support. Here are just a few examples:

Digital plan import

One of the cornerstones of the FastEST suite of estimating software programs is the award-winning On-Screen Digitizer feature. Included with all systems, users are able to import PDF and several other digital plan formats directly into their estimate. From there, they can set the scale and start their takeoff right on their computer monitor. Takeoffs speeds and accuracy are increased greatly, plus time and money can be saved, by avoiding the need to print or borrow hard copy plans just for the bidding process.

Estimate jobs of all sizes and scopes

Another great aspect of the FastEST programs are their ease-of-use and flexibility. Customers range from one-man shops to some of the largest mechanical contractors in North America, running 50 or 60 stations of the software. The programs can handle anything from small change orders to National Football League stadiums with ease (one of FastEST's long-time customers estimated the mechanical piping and ductwork on Levi's Stadium, home of the San Francisco 49ers, back in 2011). Regardless of job size or scope, plan takeoff and report calculations still only take mere seconds.

Fast, easy setup

All FastEST programs come ready-to-use right out of the box. Each new customer can start using the program as soon as they open it, with pre-loaded job templates filled with comprehensive specifications, job items, and assemblies. Then, each customer can customize the programs to be



tailored to their particular estimating situation, with assistance from FastEST's knowledgeable, reliable support staff.

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As mentioned above, FastEST prides itself on unmatched, dependable customer support. A great majority of FastEST users say that is one of the top reasons they are satisfied with FastEST's estimating software programs. Technical support and online training are just a phone call, email, or website visit away.

Find out more about FastEST, Inc. and its programs by visiting <https://fastest-inc.com>. ■

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ASTRONAUTS MAY HAVE ICE HOMES TO LOOK FORWARD TO ON MARS

Researchers at NASA's Langley Research Centre in Hampton, Virginia have decided on an unconventional building material for housing long-term resident Mars astronauts: ice.

Astronauts may spend months on the Red Planet. Extreme surface temperatures and inadequate atmospheric protection from high-energy radiation calls for shelters that are resilient, durable, and safe.

The Space Technology Mission Directorate's (STMD) Center Innovation Fund hosted a competitive selection of projects that encourage creativity and innovation within NASA, while addressing technology needs. The Mars Ice Dome, developed by a research team that comprises NASA experts, designers, and architects who worked together at Langley's Engineering Design Studio, was just one such project that proposes a solution for sustainable living in the harsh Martian environment.

The concept involves enveloping a large, inflated circular-shaped liner – the shape is called a torus – with a water ice shell. This simple, lightweight design can be easily transported and relocated, can be deployed by robotics, and is filled with



water before astronauts arrive. A key feature is its ability to double as a fuelling station as the water could be converted to rocket fuel to power the Mars Ascent Vehicle and replenished for the next crew.

The water used to structure the Mars Ice Home would be extracted from Mars, which has abundant water ice below the surface. Because it is a hydrogen-rich material, it shields from galactic cosmic rays, which equate to high-energy radiation and can cause long-term cancer or radiation sickness. Exposure to the rays is one of the most potent risks of extended stays on Mars.

Other research projects into protecting visitors from radiation propose building structures underground—a concept that would require machinery and materials to be delivered and deployed before humans could arrive to do the work.

The Mars Ice Home negates this problem, but is dependent on sufficient extraction of underground water ice and the selection of construction materials able to withstand years in the harsh environment where UV and charged-particle radiation, perchlorates, atomic oxygen, and dust storms are the norm.

The research team suggests it would take roughly 400 days at one cubic meter per day to fill the Mars Ice Home—a rate that could increase with more effective extraction technology.

Temperature inside the home will be controlled via a layer of carbon dioxide gas used to insulate the living space and the exterior layer of ice – carbon dioxide is also available on Mars – and the habitat's success would be contingent on spacious, flexible workspace in which people could service robotics and other equipment indoors without the need for a pressure suit.

For more information about the Mars Ice Home and to view other design considerations for life on Mars, please visit NASA online at www.nasa.gov. ■



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LOUVER DESIGN CONSIDERATIONS AND DETAILS

Louvers are a basic and simple part of many HVAC systems and buildings, but they are often overlooked or not given the proper amount of design time and consideration. After selecting a louver model that best meets an application, system designers need to consider certain characteristics. In this article, characteristics that affect water penetration, pressure drop, and louver installation will be reviewed. From the following suggestions, designers will maximize louver performance and ensure selected louvers meet the needs of their specific application.

First, let us consider sizing louvers to minimize water penetration. Standard louvers are often used even though wind-driven rain louvers can significantly reduce or even eliminate water penetration. To keep rain from penetrating standard louvers in storm situations, size the louvers so their operating free area velocity is less than the maximum Air Movement Control Association (AMCA) beginning point of water penetration. While there is not an industry standard design safety factor, most experienced designers reduce the AMCA velocity by 15-20 per cent, depending on conditions. The benefit of using a wind-driven rain louver is that it is tested in driving rain conditions and you can safely use the published design velocities.



Another sizing consideration is the effect of bird or insect screens on louver pressure drops. All screens add pressure drop, but some designs are more restrictive than others. Standard 1/2-inch mesh (approximately 75 per cent free area) adds about 5-8 per cent to a louver's pressure drop. If pressure drop is a ruling factor in your louver selection, accounting for the additional pressure drop should be considered. For insect screens (approximately 65 per cent free area) they add about 18 per cent to louver pressure drop. Also, insect screens tend to clog frequently with debris.

Louvers are available in a variety of round, triangular, and semi-round shapes. However, these special shapes do not provide the same performance as rectangular equivalent



by / Norm Grusnick, P. Eng.
commercial products manager, ECCO Supply
photos courtesy of Ruskin

shapes. Two things to consider for these special shapes are free area and velocity. Shaped louvers often do not prevent water penetration as well as rectangular units with the same blade style. To lessen the potential for water carry over, it is good practice to reduce velocities through specially shaped louvers. Special shapes also negatively impact the free area versus louver free area percentage as the top and bottom usually have to compromise blade spacings.



Designers can simplify contractors' lives by sizing louvers in dimensions that require the fewest sections. Louvers that are larger than their maximum single section sizes are shipped in multiple sections. A contractor must splice the sections together in the field to make the overall assembly. Splicing sections adds to the installation time. Refer to manufacturers' literature for maximum single and multiple section information. Sometimes, just slightly shifting width to height or vice versa by a fraction of an inch will make the difference between a single or multiple section. This can reduce both the cost of the louver and the labour to install it.

Stationary blade louvers may be provided with rear-mounted blade supports to reinforce blades for wind loads. Blade supports ensure minimal deflection of louver components under windy conditions. Blade supports enable louvers to be made in larger single sections with less visible mullions. It is important to remember that blade supports may add several inches to the louver depth. This can create interference

Continued on page 23

2017 SAFETY SURVEY NOW AVAILABLE

A good safety record makes your company more competitive in the marketplace and more attractive to clients. The SMACNA annual Safety Excellence Awards Program (SSEAP) allows SMACNA to recognize members for their outstanding safety performance and collect significant safety and health data. SMACNA members are encouraged to complete the 2017 annual survey at www.smaca.org/news. ■

ARCHITECTURAL SHEET METAL QUALITY ASSURANCE GUIDE

This guide was developed to provide guidance in the evaluation of exterior sheet metal building components – roofing systems, exterior walls, flashings, copings, etc. – during initial construction and for ongoing condition assessments and maintenance. The manual can assist owners/operators that may have limited knowledge and experience in the specifics of architectural sheet metal components, specification, fabrication, installation, or evaluation. The manual can also serve as a procedural inspection guide for experienced professionals who review architectural sheet metal systems regularly. For more information please contact SMACNA-BC at smacnabc@smacna-bc.org. ■

LOOK TO SMACNA'S NEW RESIDENTIAL STANDARD FOR UPDATED CODE REQUIREMENTS

This newly revised 8th edition of SMACNA's "Residential Comfort Systems Installation Standards Manual" (ANSI/SMACNA 007-2016) addresses three new areas: hydronic heating systems, multi-story HVAC systems, and residential commissioning.

Appendix chapters provide overviews of methods for including crawlspaces in the conditioned space and such HVAC accessories as UV lights, zoning, and advanced air filtering methods to enhance indoor environmental quality (IEQ) for occupants.

More detailed information and new concepts are included in the 278-page publication for earth energy heat exchanger methods and ground source heat pumps. Updated construction code requirements are reflected throughout the range of HVAC system types along with energy efficiency and sustainable practices.

Installation, operation, maintenance, and guidance for residential heating, ventilation, and air conditioning systems are also included. For more information please contact SMACNA-BC at smacnabc@smacna-bc.org. ■

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Financial Boot Camp, May 21-24, 2017

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For more information, contact Bridgette Bienacker, SMACNA's director of business management and membership at bbienacker@smacna.org. ■

SAFETY AS A MIRROR OF ENGAGEMENT AND FOUNDATION FOR SUCCESS

What is safety? A set of rules and practices? An organizational value? An individual responsibility? A set of metrics that indicate performance? Risk management and the costs and benefits? Probably all of those, but something a little less visible, I think. Safety is a reflection of the level of engagement your employees from top to bottom bring to the organization. It is, without question, the most common rallying cry that bonds and unites people in the construction workplace. But it is also the foundation upon which engagement is built. And the effort has some unusual roots based in the following case study.

In 1987 Alcoa Aluminum was in trouble. It was an organization that was underperforming at every level internally and suffering in the marketplace. Productivity was poor. Quality was poor. Clients were not happy. And the answers that had been enacted to date were ineffective. Along came a leader with a new set of ideas based on the idea that if you could find a rallying point for everyone, that intersection of belief and buy-in could serve as a cornerstone for progress in all other areas. The CEO Paul O'Neil sifted through recommendations of the many senior level executives and came away headed in a totally different direction. Instead of focusing on manufacturing processes, quality initiatives, or productivity enhancement, he decided the starting place would be safety. When he announced this, the market punished him and major brokerages all went to a Sell recommendation.

He had a vision of unifying everyone. Something that everyone could believe in. Something everyone could get behind. Something that benefited everyone and the company. Many were left scratching their heads wondering if this leader was crazy—a broken company is starting with safety to rebuild itself? But he was on to something powerful. One year after he made that speech to investors, the company hit record profits. By the time he retired 13 years later the company had increased profits 500 per cent. (See his YouTube presentation on Safety as the Keystone Habit.)

It turns out, having that common vision and objective was exactly what the company needed. It was the thing that bonded labour and management. It was a clear indicator by the company that they cared about their employees' health and welfare. It was a brilliant, simple, and effective foundation upon which to build. And build they did.



by / Mark Breslin
Breslin Strategies, Inc.

Alcoa, in a relatively short time, built a culture of safety, but also a culture of unity and belief. Most importantly though, it build a culture of engagement. Engagement in the workplace is what leads to buy-in and commitment. It is the door you have to open for your employees to voluntarily walk through. It is the opportunity to participate and, more importantly, contribute. It is this that we are achieving at a remarkable pace in our industry today.

Many safety award winners are firms that maintain flawless records. Many of my clients will work millions of man-hours without lost time incidents. These, at face value, are strong indicators of vigorous and effective safety programs and training. But what they really reflect, most of all, is the level of committed engagement evident in the workplace.

This lesson is vitally important as we continue our efforts to attract young people to our industry. Generation X and especially the Millennials are seeking engagement as a primary element of their workplace experience. Engagement, even more than money, is the currency of retention. It is the effort made by companies today to show they care and that they want and need input and participation by everyone in the workplace.

I think there are lessons to be learned and applied here. There are many other areas of jobsite focus in which we can use our “safety engagement” expertise for great dividends. But those are secondary to asking the questions over and over again: “how do we engage our people? How do we obtain their buy-in and commitment? How do we tap their talent and discretionary effort? How do we build off of safety, precisely how Alcoa did, to reap long-term rewards?

Take a big picture look at safety, engagement, and culture. Think about how Alcoa bridged the safety focus to company performance. Ask yourself what are we doing that works amazingly well and how can we leverage it in other areas of our business? Engagement, once gained, is a powerful tool. Let's be visionary about how we build the industry of the future based on the hard lessons learned on our way to today's safety excellence. ■

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WINNING THE BID – THE IMPORTANCE OF FOLLOWING PROPER TENDERING PROCEDURES

British Columbia's competitive construction industry sees its fair share of intense bidding wars between contractors. To avoid the risk of underbidding, contractors may be tempted to submit their bids at the last possible second to include the latest quotes and ensure cost projections are as complete as possible. In doing so, however, contractors must still follow the proper tendering procedures. In the case of *True Construction Ltd. v. Kamloops (City)*, the BC Court of Appeal upheld an owner's decision to refuse a contractor's non-compliant bid, even though it was the lowest submitted.

The Facts

In this case, the City of Kamloops (the "City") issued an invitation to bid on the construction of a new fire hall (the "Project"). One of the tender requirements was for contractors to include a list of subcontractors to be used at the Project in an appendix to their bid. However, the contractor (the "Contractor") submitting the lowest bid initially failed to include the appendix containing this information. Although the Contractor later faxed the required appendix to the City, the City refused to permit faxed revisions to its bid. Ultimately, the City determined that the bid was defective. The contract for the Project went to the next-highest bidder and the Contractor sued the City for damages.

The Decision

The Court of Appeal agreed with the City that the bid was not tendered correctly. The list of subcontractors was found to be critical in determining the proper party to be awarded the contract for the Project.

The Court further held that the Contractor had taken advantage of the tendering process by faxing the appendix containing its list of subcontractors after its bid was originally submitted. This resulted in an unfair advantage to the Contractor, who was able to continue negotiating its subcontracts even after its bid was submitted. Because its bid was not legally capable of acceptance without the appendix, the Contractor was able to wait until the last possible moment to determine whether the Project would be profitable before finalizing its bid. If



by / Andrew Delmonico and John Wiebe

the price of its subcontracts turned out to be too high, the Contractor could simply withhold the appendix and refuse to finalize its bid. Those contractors who submitted a binding bid including their lists of subcontractors would not have the same option to walk away if the accepted price turned out to be too high. The court refused to allow the Contractor to gain an advantage by failing to follow the material terms of the City's tender.

In its decision, the Court focused on the need to uphold the integrity of the tendering process. Whether the Contractor actually did secure an advantage was seen as immaterial. The real issue was whether the Contractor's practice created a potential competitive advantage and undermined the integrity of the bidding process. Ultimately, the Court found that it did and the City's decision to exclude the non-compliant bid was vindicated.

Lessons Learned

When submitting a bid in a tendering context, be sure to follow all the requirements contained in the invitation to tender. Owners often reserve their contractual right to disqualify improper bids, even if they are the lowest. Even though bending the requirements of the tender might appear to create a temporary advantage, it might actually prevent you from winning the bid in the long run. ■

This article was written by Andrew D. Delmonico, a lawyer, and John Wiebe, an articulated student, who practise in construction law with the law firm of Kuhn LLP. This article is only intended as a guide and cannot cover every situation. It is important to get legal advice for specific situations. If you have any questions or comments about this case or other construction law matters, please contact us at 604.864.8877.



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INDUSTRY NEWS

Continued from page 5

“Our youth are getting the message that the trades can be a very rewarding and lucrative career path,” observes Manley McLachlan, BCCA president. “Even so, we would need 1/10 high school graduates to enter the trades in order to have enough skilled journey people for the jobs that are coming.”

Earlier this year, Buildforce Canada revised its estimate for BC's skilled worker shortage to 15,000 by 2025, which is 51 per cent lower than their 2013 estimate of 30,500.

“It's very important to understand that the main reason for the predicted skilled worker shortage is retirements,” cautions McLachlan. “If liquefied natural gas projects go ahead, the gap gets even bigger. Do not make the mistake of disregarding the worker shortage because of lack of progress on the LNG side. The workforce pressure is on regardless.”

Two thirds of BC's construction workforce is over the age of 45. Construction is the largest employer in BC's Goods Sector, with a total workforce of 210,000 in 2016.

BCs unemployment rate for youth (those aged 15-24) has dropped 14 per cent since 2013.

“These trends are all positive, but it's important to recognize that 11.1 per cent youth unemployment means more than 42,000 young people would like to be employed but can't find jobs,” says Chris Atchison, provincial manager of the Skilled Trades Employment Program (STEP). “When you compare that to the skills gap in our sector, the solution seems clear. But the problem is still a long way from being solved.”

Construction pays an average year wage of \$57,715, an increase of 3 per cent and second only to the average yearly wage in the oil and gas sector.

At 8.2 per cent of BC's GDP and with an estimated \$329 billion in proposed projects, trends in the construction workforce have a big impact on the provincial economy. For more information on these and other important statistics visit www.bccassn.com/stats/. ■

SAVE THE DATE: SMACNA-BC'S 48TH AGM & CONVENTION MAY 11-13, 2017 WHISTLER, BC

Keep an eye on your mailbox for full registration packages with information on SMACNA-BC's 48th Annual General Meeting and Convention, held this year at the Westin Resort & Spa in beautiful Whistler, BC.

Soon-to-come updates will include the agenda, reservation details, day outing and evening excitement information, entertainment you can look forward to, and all planned activities.

The SMACNA-BC AGM & Convention never disappoints and is by far the must-attend event of the year. Where else can you learn about association activities, network, and have the time of your life—all in one weekend? Watch your email for full details coming soon. ■

ENGINEER'S DESK

Continued from page 19

if items are located close to the back of a louver such as a damper. Manufacturers' websites or sales representatives can assist designers with additional information regarding blade supports and other design details. See, for example, www.leads.ruskin.com for an excellent selection assistance tool. ■

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