

WINTER 2019

# Sheet Metal Journal

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British Columbia

## CONSTRUCTION OUTLOOK 2019

*Also in this issue*

**Commitment to Excellence: Craig Benson**

**Sheet Metal Industry Survey Results**

**Assignment of Design to Constructors: Part II**

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# PROMOTING GROWTH AND STABILITY IN OUR INDUSTRY

Formed in 1969, the British Columbia Sheet Metal Association (SMACNA-BC) was the first international chapter of the Sheet Metal & Air-conditioning Contractors National Association (SMACNA). Founded in 1934, SMACNA traces its history to the National Association of Sheet Metal Contractors established in 1910, and has 2,300 members worldwide.

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- To improve the financial stability and business conditions of the sheet metal industry, and to develop and promote methods to improve managerial proficiency
- To improve quality, efficiency and productivity of this industry, and to implement high standards of work
- To establish and maintain high ethical standards of conduct between members of the Association, and between members and owners, architects, engineers, other contractors, and the public
- To study and help in the development and enforcement of governmental codes and regulations, and such legislation as may be necessary for the best interest of the public and the sheet metal industry
- 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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**TEAM LEADERSHIP**

We’ve seen a strong trend in leadership over the last decade that continues to gain momentum, and that’s the shift from a singular leader to a team of leaders.

As I began considering a succession plan for the team I’ve led for (almost two decades), I determined that our work was too important and becoming too complex to create an ongoing dependency on a single individual. That’s why I pulled together a team of five, high-capacity next-generation leaders to make sure our best days are ahead, and not behind. Their collective horsepower is inspiring me to stick around and be part of their team for a while before I ride off into the sunset.

Some folks have a less than positive mental image of team-building—an afternoon off-site doing trust falls or singing “Kumbaya” around the campfire. Maybe there’s a place for that, but that’s not where we see teams coming together to accomplish great things.

Here’s an overview of the factors we’re finding are essential for any team to achieve their peak performance.

Developing a team purpose is foundational to a leadership team becoming the catalyst for organizational health and growth.



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

When a group of senior leaders get a glimpse of what can happen when they focus their energies around strategic initiatives, stretch goals, and creative solutions to chronic problems, it’s a game-changer. A clear purpose is how you keep on track, and guard against spending all your time on important but less strategic objectives.

A team becomes aligned when they establish agreements for how they will treat one another, and clarify each member’s role so everyone is clear on who’s doing what. While this seems like common sense, it’s often the least obvious dysfunction of a team, as well the easiest to fix.

Synergy (when the group result is greater than the sum of individual results) can be a corporate buzz word, but we can’t think of a better descriptor for what happens when a team is firing on all cylinders. Rowers call it “swing,” that effortless feeling when near-perfect synchronization of motion occurs in the shell, accelerating both performance and speed. Synergy occurs much more frequently when team members learn to manage conflict, build trust, communicate effectively, and promote real-time feedback.

The great leadership teams focus on what’s strategic, not just the usual operational staff meeting agenda. They can become the collective foot on the accelerator, creating rapid progress as they learn to make great decisions and set strategic goals collectively.

To paraphrase the philosopher G. K. Chesterton, “[Team leadership] has not been tried and found wanting. It has been found difficult; and left untried.” Our point of view is that the benefits are absolutely worth the effort. ■

*Reprinted with permission from SMACNews, January 2019, Vol 52 No 1. Read more at <https://www.smacna.org/news/smacnews/issue/smacnews-december-january-2019---contractors-preview-the-year-to-come>*

**SMACNA-BC MEETINGS & EVENTS**

<b>March</b>	<b>12</b>	Board of Directors Meeting
	<b>21</b>	Young Executives Committee Meeting
	<b>22</b>	Lower Mainland Dinner Meeting
	<b>26</b>	Joint Conference Board Meeting
<b>April</b>	<b>9</b>	Board of Directors Meeting
	<b>18</b>	Young Executives Committee Meeting
	<b>30</b>	Joint Conference Board Meeting
<b>May</b>	<b>9-11</b>	50th SMACNA-BC AGM & Convention Kelowna, BC
	<b>14</b>	Board of Directors Meeting
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	<b>June</b>	<b>11</b>
	<b>21</b>	Young Executives Committee Meeting
	<b>20</b>	Lower Mainland Dinner Meeting
	<b>25</b>	Joint Conference Board Meeting
<b>October</b>	<b>20-23</b>	SMACNA National Convention

## NORM GRUSNICK JOINS THE BCICA AS QAC TECHNICAL DIRECTOR

The British Columbia Insulation Contractors' Association (BCICA) has hired Norm Grusnick, P. Eng. as its Quality Assurance Certificate (QAC) technical director, effective January 1, 2019. Grusnick joins the BCICA with the prime objective of creating greater awareness of the QAC among British Columbia's engineering community.

“Hiring Norm is an investment by BCICA in a long term-growth strategy that focuses on the value that a QAC offers to specifiers of mechanical insulation,” says Brian Hofler, a consultant to BCICA. “The board of directors is eager to see what Norm can do to assist with the program's development and has confidence he will make important contributions to the program's success.”

Grusnick will be responsible for promoting the QAC to engineers on all new and retrofit projects that require mechanical insulation. He will present to various engineering firms and professional associations, including the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), outlining the advantages of registering projects with the QAC and of including the program in engineering firms' general specifications.

“Norm has worked for ECCO Heating Products Ltd. for the past 25 years, and during that time he has developed a strong understanding of the value of mechanical insulation and a significant network to draw from as he promotes the QAC,” says Hofler.

Grusnick will also co-ordinate with the BCICA's technical committee to review the association's *Quality Standards for Mechanical Insulation Manual* – a key component of the QAC – to ensure it is up-to-date and used extensively by engineering firms when developing mechanical insulation specifications.

Grusnick says the QAC is an exciting prospect because it will help restore quality installations and assure clients that the mechanical insulation portion of their projects is done correctly and to spec.

“I have been in an engineering sales function for almost 40 years—assisting engineers with their specifications is a large part of what I have done in my career,” he says. “Engineers have so much on their plates, they need assistance in making sure their specifications reflect their design intent and their needs.”

Grusnick's main initial objectives will be to study the QAC program and assemble files of all engineers' existing specifications so he can constructively suggest ways to streamline and improve individual specifications.

“Engineers – like all people – don't proceed quickly to change the status quo,” says Grusnick. “The challenge will be to point out to their clients the many advantages of the QAC program,

because with better installed insulation, the clients can expect more energy savings in the long run.”

The QAC has been in operation since 2014. Under the program, project owners or owners' representatives register the insulation portion of a commercial, institutional, or industrial job with the BCICA, which in turn assigns a designated third-party insulation inspector to the job to ensure it meets the standards set out in the BCICA's *Quality Standards for Mechanical Insulation Manual*.

The QAC grew to 50 projects in 2018 with a contract value of over \$5 million.

“Interest is growing as more and more engineering firms specify the QAC on their projects,” says Hofler. “Building owners, government agencies, and energy conservation stakeholders are recognizing the value that the QAC brings to the energy conservation equation. Specification of the QAC assists with lowering greenhouse gas (GHG) emissions and delivering a faster ROI to the building owner or investor, as well as lower long-term operational costs for building owners. This is a significant indicator of ‘saving energy for the future’—a motto BCICA is proud to share.”

For more information about the BCICA or the QAC, please visit [bcica.org](http://bcica.org). ■

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# Construction Outlook 2019

By / Jordan Whitehouse

**T**he next decade likely won't be like the last. After about 20 years of solid growth that saw the doubling of Canada's construction workforce, one quarter of a million people are now expected to retire from the industry by 2027. And while construction activity is slowing slightly overall, that's still too many retirements to keep up with demand, says Bob Blakely, Canadian operating officer at Canada's Building Trades Unions (CBTU).

"We have to understand that for every person that we're going to graduate through the trades training system, we have to get slightly more than one extra person to start," he says.

Over the next few years, a significant number of them will continue to head to Ontario and British Columbia, where growth is still peaking and where in BC alone the need for non-residential workers may increase by 25 per cent. In

the east, though, demand will likely weaken, especially in Newfoundland and Labrador, which could see employment contract a further 20 per cent until 2024. Resource-driven Alberta is on shaky ground too, of course.

Despite the approach of a plateau, the industry won't be contracting by 250,000 jobs. And finding the people to keep up with demand is going to take some innovation, especially when looking for science, engineering, technology and math (STEM) workers, says Mary Van Buren, president of the Canadian Construction Association (CCA). "STEM workers are in increasing demand, but finding talent is a challenge because construction is not always seen as technology-forward."

This is one reason organizations like the CCA and the industry in general are trying to widen their typical demographic target

*Despite the approach of a plateau, the industry won't be contracting by 250,000 jobs. And finding the people to keep up with demand is going to take some innovation, especially when looking for science, engineering, technology and math (STEM) workers.*

pool to better include women and Indigenous peoples. The CCA, for instance, released an Indigenous Engagement Guide in 2016 to help the industry engage more effectively with Indigenous companies and communities in Canada. More recently, the group has asked the federal government for 1,000 co-op placements in STEM fields that target women, Indigenous peoples, and new Canadians.

"We believe that if they have a taste of construction, then they'll see the connection that they can have to Canada's infrastructure," says Van Buren. "These are tangible things that people can see, touch. But they need to be exposed to it, because it's not top of mind."

There is also going to have to be a culture change if the industry is going to attract – and retain – more women in particular, says Blakely. "You talk to people in the C-suite, and they will tell you that their places of businesses are proper, respectful workplaces. You talk to the middle managers, they don't say much, just look at their feet. But if you talk to the bright young women who just started working there, they're going to tell you that it isn't quite the caring and sharing workplace that the people in C-suite think it is. So how we handle that piece is incredibly important."

That culture change will have to extend to the millennial generation as a whole, agree Blakely and Van Buren, a generation that's just starting to take on more leadership roles. Millennials tend to bring a collaborative style to the workplace and they demand respect in that workplace. "When I was an apprentice, it was okay to train by fear, to train by being mean to people, to train by ridicule and by sarcasm, to learn by failure," says Blakely. "The idea was that this was the way that we get rid of the weak ones, the ones who weren't going to cut it. Well, that was a lie. We got rid of the smart ones, in some cases. We can't afford to do that anymore."

They also can't afford to let investor confidence continue to slip, which has been due, in part, to an unfavourable tax climate relative to the US and the ongoing trade wars, says Van Buren. That's why, in November, the CCA said it was happy with the federal government's fall economic update, which included commitments about prompter payment, accelerated

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depreciation, support for attracting under-represented segments into construction, as well as for increased funding for infrastructure and innovation.

That innovation piece is really important, says Van Buren. “The industry is not as productive as other leading countries, and so the government’s announcement of adding more funding [\$800 million] to the Strategic Innovation Fund is good news. We’ll definitely be looking to access some of that.”

No doubt a big part of that innovation will happen in big data, adds Van Buren. As technology gets further embedded and connected in our cities, all of that collected information could be very powerful to people. “Privacy is an issue, of course, but people may be will be willing to exchange some data in

order to get a benefit, such as when the next train will arrive. So it’s going to be a whole new area of interest in how we manage all of that big data that’s going to be collected from our infrastructure.”

Which brings us back to that need to attract more workers to those STEM positions, in particular, and to the construction industry in general. It’s an issue that continues to be top of mind across the country and across the industry. It’s still unclear how it will all play out.

“The baby boom generation has been building Canada for the last 50 years, and though it’s a surprise to them as anybody else, they’re retiring,” says Blakely. Simply put: “We have to find some way to incorporate a quarter of a million people.” ■



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## Second Annual *Sheet Metal Journal* Construction Outlook Survey sees contractors are optimistic and proactive; 2019 numbers steady but hold promise

By / Jessica Kirby

The results of *Sheet Metal Journal's* 2019 Construction Outlook survey are in, and spirits are high looking at the year ahead. As anticipated, labour and government action remain at the top of this list of possible challenges, but more contractors than not are looking at positive solutions, which include investments in education, training, and expanding to new market sectors.

In terms of pressing issues the BC sheet metal industry can look forward to in 2019, 76% of survey respondents list developing and retaining a skilled labour shortage as the top concern. Competitive pricing and economic climate fall in tied for second place, but the majority of respondents anticipate their numbers going up this year, so the challenges may not be insurmountable.

Although 78% of respondents see their businesses' performance at the same, slightly up, or much better for compared to 2018, nearly half of respondents feel the industry overall will sit flat, mimicking last year's numbers. This points to individual action plans for boosting businesses' bottom line. Some of these include investment into training and education as well as market expansion plans targeting niche markets and broadening geographic reach.


Contractors also see the coming abundance of work and opportunities for greater profit margins as good places to start. The market is vast and opportunities exist if companies are willing to price fairly and can retain the workforce necessary to maintain quality standards. In practical terms, LNG might be the province's biggest opportunity moving forward, but at least one company feels progressive business owners with a solid plan and the capacity for productivity will flourish regardless of what 2019 holds in store.

Nearly 89% of contractors who responded to the survey indicated some form of business investment is in the works. (Eleven percent said they had no plans to invest in their companies). Workforce retention and education and training will see 33% and 25% of investment dollars, respectively, with technology and company expansions also seeing a significant portion of spending moving forward.

Of course, business can only respond to certain factors outside the sheet metal industry. Nearly half of respondents reported government action would be a major factor affecting the industry in 2019, while another 25% said the global marketplace was consideration-worthy. Causing minor alarm are access to materials because of trade and pricing issues and other trades' poor workmanship, the effects of which can bleed over into the sheet metal trade. Staying competitive in 2019 and beyond will be a matter of retaining labour, pricing competitively, and staying "right-sized" to mitigate market fluctuation and outside factors.

Moving forward, 33% of contractors surveyed will expand new markets, 22% will expand or move geographically, and 22% will retire, leaving plenty of opportunities for new recruits and seasoned business owners in the years to come.


Contact SMACNA-BC for information on training programs, education opportunities, and general business advice. ■



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# Commitment to Excellence: Craig Benson

## One Man's Legacy to the Sheet Metal Industry

By Deb Draper

*Photos courtesy of SMACNA-BC*

It takes a great deal of hard work and perseverance to build and maintain a successful business. Contributing countless time and energy to help build the strength of an entire industry is nothing short of astounding. Yet these accomplishments are exactly what Craig Benson, owner of Paramount Sheet Metal Ltd. in Port Coquitlam, BC, has achieved through almost four decades in the sheet metal industry.

In December 2018, Benson retired from that business, but all that he brought to the industry will continue into the future.

In an video interview from the 75th annual SMACNA Convention in October 2018, Benson recalls how he found his life's work in the industry almost accidentally when helping out a friend turned into working every weekend as a materials man while finishing high school. "I became an apprentice and then went on to journey person," says Benson in the interview. "I realized that sheet metal was a great business to be in, and knew that one day I wanted to be my own boss."

Thirteen years later, in 1989, he saw his chance when he learned of an opportunity to buy into Paramount; that's also when he met what he describes as his biggest hurdle—getting the bank to give him enough credit to make it happen, using savings, credit cards, whatever it took until finally he managed a small line of credit.

That first year as a contractor, he pushed himself further and went to his first SMACNA-BC meeting. "I remember how friendly they were," says Benson. "There I was, meeting guys who were like sheet metal 'gods' to me. But I got to know them, and some became my good friends for life. And they taught me a lot."

Jim Paquette, business manager and financial secretary-treasurer at Local 280 knows Benson as a strong member of the sheet metal industry on all levels. "He started out very small, grew his company to a size he was comfortable with, and has kept his crew working for many, many years," says Paquette.

As a contractor, Benson was always conscious that people depended on him, and he took that very seriously, right away taking a place on the SMACNA-BC Negotiating Committee. In 1992, he was elected to the Board of Directors where he continued to serve in one capacity or another – including three times as president – until his retirement.

He also became a management trustee of the SMACNA-BC/SMWIA (later to become SMART) Local 280 Health Benefits & Pension Fund. This medical and pension plan is jointly managed by three Trustees from labour and three Trustees from management, responsible for making all the decisions and Plan provisions, and ensuring that everything, including investments, is being run properly.

***“And don’t be afraid to try something outside your comfort zone,” says Benson. “But most of all, believe in yourself, even if others are doubtful.”***

“Craig has been a long-time trustee on our Health Benefit Plan Board,” says Paquette. “All the personal time involved in keeping up to speed on health issues, attending the meetings and then bringing that knowledge to our plan... it’s incredible, the commitment he has shown.”

Never forgetting how he got his own start in sheet metal, Benson took a place on the Sheet Metal Industry Training Board, also a joint board of SMACNA-BC and Local 280 and responsible for administering the Sheet Metal Workers Training Centre Society. Funded through local collective bargaining agreements and training contracts with the Industry Training Authority, the Centre strives to provide the highest quality of training and upgrading to sheet metal apprentices and journeypersons in the province.

“I’ve been dealing with Craig forever,” says Bruce Sychuk, executive director of SMACNA-BC. “In partnership with another management trustee, he facilitated purchase of the building for our hugely successful Training Centre in Surrey.”

As Benson said in the SMACNA video, “Getting the workforce needed is an ongoing challenge for the sheet metal industry in BC, and our local apprenticeship program helps. As it is right now, we’ve never seen so many apprentices going through our school.” He notes that they plan to add another two weeks of school to the program, and that means looking for a larger space.

Wherever he could, Benson put his commitment to bringing new workers into the sheet metal trade into action—such as serving on the International Training Institute’s apprentice contest committee until it was discontinued after the final competition in 2017.

“It’s more a question of what Craig hasn’t been involved in,” says Paquette. “From my perspective, he’s been active on just about every level of the sheet metal industry.”

Throughout his career, Benson never hesitated in his commitment to strengthening and improving that industry. He also served on the National Joint Apprentice and Training Committee, the SMACNA-BC Nominating Committee, Partnership Committee, and SMACNA’s Duct Cleaning Task Force.

In September 2014, SMACNA National elected Benson to

serve a four-year term on its Board of Directors where he could continue in his desire to find solutions to industry issues and challenges.

“Craig has done so much for the sheet metal industry, locally and nationally,” says Sychuk. “And even though he’s now out of the industry, we still want him to represent us. At the 2018 annual SMACNA-BC convention, in recognition of his distinguished service, he was inducted into the SMACNA College of Fellows. This is a lifetime membership, a very prestigious position for top industry professionals who have made significant contributions to advance the sheet metal industry.”

Although Benson has now retired from active involvement in business, he will continue in his position on the Health and Pension Benefits plan.

When asked what he would say to new contractors looking to succeed in sheet metal, Benson advises that they get involved in their industry and in SMACNA to network and find new ideas.

“And don’t be afraid to try something outside your comfort zone,” he says. “But most of all, believe in yourself, even if others are doubtful.” ■

## **SMART Local Union No. 280 / SMACNA-BC Partnership**



*Left: Jud Martell Local Union No 280 President.  
Right: Aaron Smith of Smith Sheet Metal Works Ltd., SMACNA-BC President.*



***Labour & Management  
“Embracing the Challenge”  
- B. Flaherty, Cornell University, Syracuse, N.Y.***



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# Assignment of Design to Constructors: **CONTINUING THE DISCUSSION**

By Keith Robinson, RSW, FCSC, FCSI, Cameron Franchuk, PE, and Gerald Murnane

As discussed in Part I of this series, recent changes such as downward pressure on professional fees have resulted in transfer of responsibility for many design solutions to the constructor. This means design responsibility is delayed or deferred until the construction phase of the work.

The construction community has identified the need for explicit communication to contractors from architectural and engineering firms, clearly and completely describing design requirements presented within specifications that do not form a part of the standard services for engineering and design. Full acknowledgement of deferred design components is the responsibility of the architect/engineer of record (ie; the registered professional of record [RPR]), giving full disclosure to clients relating to transfer of responsibility for design solutions to the constructor.

## **Why attention to deferred design matters**

Contractors are raising concerns about the level of detail and direction on drawings and specifications associated with

*Deferring design works best when final design of specific elements is resolved as a component of construction deliverables, rather than a detailed portion of the construction document set.*

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deferred or collaborative design responsibilities they are expected to undertake. They believe they are being tasked to interpret intent of the design professional without clear direction, to complete coordination across several discipline-specific document sets, and sometimes to undertake actual engineering of those components. In these authors' experience, contractors define this apparent lack of direction and coordination as "defective plans and specifications," going as far in their claims as to say deferred or collaborative design is design avoidance.

Recently, the Canadian Construction Association (CCA) initiated a national conversation about the quality of documents. The discussions arising from this initiative were derived from the full spectrum of construction participants (contractors, registered professionals, and owners). During these sessions, some contractors indicated they mitigate design risk by adding cost to their bids, increasing the number of requests for interpretations (RFIs), tracking additional costs through separate change record processes and multiple requests for delay of work, and using other strategies designed to 'kill a project.' These approaches intentionally create a punishing regimen of documentation to overburden the design professional in an attempt to claim costs from the owner by undermining the authority of the architect or engineer of record.

Fortunately, most participants in these sessions recognized this combative approach was inappropriate. They identified potential reasons deferred or collaborative design has normalized over the last couple of decades. Prime reasons for transferring design responsibility were determined to result from reductions to professional fees, with corresponding reductions in time to:

- adequately research solutions;
- fully design and engineer components;
- co-ordinate design intent between disciplines; and
- write, co-ordinate, and proofread documents.

When discussing documentation, the biggest misunderstanding between contractors and RPRs arose because of contractors' use of the words "insufficient details," describing deferred design in the drawings and specifications. Further discussion revealed architects and engineers responded to this criticism by providing many more details than in the past. However, this did not resolve the contractors' concerns over document quality.

Deferred design must be clearly identified using explicit statements addressed to the constructor, indicating the design responsibilities of the supporting registered professional or other competent individual when engineering acumen is not required as part of the design solution. This way, the costs

and time associated with the elements of deferred design can be accounted for without requiring extensive review of the full document set during the bid period. Currently, design professionals indicate 'design intent' within various components of the document set, which has the effect of making identification of the deferred design components explicit.

It is the RPS's responsibility to identify information for the constructor to quickly and easily address deferred design solutions—in other words, to make the information explicit. Contractors only deal with what they can see and interpret from the contract language. Poorly co-ordinated or overly detailed components requiring deferred design solutions from constructors, which do not contain full identification of their responsibilities to provide design solutions, are considered implicit.

Design professionals are often remiss in their understanding of their role in describing deferred design responsibility to the constructor. This lack of knowledge leads some RPRs to believe they are removing liability from their own design language through the act of deferred design. Contractors are pointing out when deferred design is not described completely, the resulting gaps in co-ordination between technical solutions controlled by the constructor and the aesthetic and performance attributes directed by the design professional force the constructor to take on engineering responsibility for a part, which conflicts with the requirements of professional conduct and applicable building codes.

### **Traditional roles for deferred design performed by the constructor**

Describing the contractor's design obligations is not a new or unique concept. Design professionals have deferred aspects of design responsibility to contractors as long as there have been architects, engineers, and contractors. Deferring design works best when final design of specific elements is resolved as a component of construction deliverables, rather than a detailed portion of the construction document set.

The constructor has traditionally been responsible for design solutions associated with constructability (means and methods). There are cost benefits to the project when deferred design components form a part of the constructor's solution that fits within their responsibilities for means and methods

through effective scheduling and elimination of potential rework. For example, the RPR may provide the engineering information associated with connections between steel members or accumulated building load paths required for design and foundation components (piles, piers, and similar structures), while the constructor provides shop drawings containing the final design solutions. These solutions are prepared by a supporting registered professional to meet building code requirement for design responsibility, but the supporting registered professional does not take responsibility for the engineering of those components (which remains with the RPR).

The increasing complexity of construction through the latter half of the 20th century means it is becoming more common for design components to be described as forming a part of the constructor's design contribution. This includes design of building elements not strictly associated with engineered outcomes of construction methodology. These components are typically pre-engineered (ie; not requiring site-specific engineering) or require specialist contributions RPRs do not have with their knowledge base or experience.

There is increasing responsibility for building envelope and fire-protective solutions, conveying systems, and other pre-engineered elements forming a part of the deferred or collaborative design assigned or delegated as part of the contractor's project deliverable. These form the basis for discussion in this practice guide.

### Avoid deferred engineering

Deferred design is not intended to defer engineering. The RPR is fully responsible for indicating required performance and engineering within the documents provided to the constructor. As indicated in part one of this article, the concept of 'design' versus 'engineering' is critical in communicating what responsibility is being deferred to the constructor.

One example of inappropriate deferred engineering could occur if a structural engineer unintentionally omits critical annotations fully describing the size of steel members and the loads and eccentricities associated with connections between them. The final delegated design requirement from the constructor is the connection solutions provided by the steel fabricators based on the engineering information within the documents supplied by the structural engineer.

If information is omitted, the steel fabricator may become responsible for confirmation of the sizes of steel members. However, this should not be the fabricator's responsibility unless clear direction for that component is also provided through identification of any relevant engineering requirement in the specification documents.

Engineering (building code compliance) cannot be delegated. However, many professional design practices have inadvertently delegated engineering through the improper application of notes on drawings indicating a delegated design requirement without or with incomplete engineering direction, causing professional responsibility to the project to be questioned by contractors. Often, the 'delegated design' annotation is written on a drawing set by a well-meaning technologist that did not confer with the RPR. The RPR responsible for that component of engineering is the only person who can direct the need for delegated design.

### Delegated design example

The following example shows even the best of intentions are not generally good enough when it comes to who decides what gets delegated.

In one case of unintentional delegated design arising from these authors' own drawings, no loads were provided for the design of lightweight steel framing to support an aluminum storefront. When the constructor's supporting design



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professional questioned the lack of engineering information, they were instructed to proceed based on their own design assumptions.

This essentially meant the RPR relinquished its commitment and assurance for compliance submitted to the authorities having jurisdiction (AHJs), an offence that could have resulted in loss of professional status for the licensed designer if a continued pattern showed failure to provide necessary information for the constructor. This could have been far worse if the structure had subsequently failed and caused harm to an individual.

Most registered architects and licensed interior designers continue to provide components as delegated engineering for items such as handrails and guards, tall partitions, and supporting metal fabrications, a practice that has become commonplace within the design community. However, this illustrates a similar lack of the engineering information necessary to complete the assignment of design responsibility to the constructor. These components are viewed as aesthetic and do not receive the engineering input required to appropriately delegate.

Aesthetics cannot be delegated. Although this is not a building code compliance issue, there are similarities in this part of the discussion that will become more apparent when discussing assigned design in part 3 of this series. When it comes to aesthetic components requiring input from a supporting registered professional, the RPR has an obligation to indicate the path for loads applied to these components, meaning details must contain information providing plausible sizes of members subjected to those loads. There must be clear indication of the expected level of finish contained on the drawings (showing extent, location, and sizes) and in the specification (describing quality of products and workmanship).

The extent of delegated design for these component types is usually restricted to design of the fastenings to structure (and seismic restraint in areas subject to earthquake loads). Comparatively, deferred design relating to pre-manufactured or pre-engineered components is covered under assigned design and design solutions provided by a supporting certified/qualified contributor. Handrail and guard loads are described in the building code and can be referenced as part of true delegated design, but the sizes of the members and path for transferring the loads shown on the drawings must be constructible while allowing for a design solution.

## Conclusions

Contrary to many contractors' opinions, deferred design is appropriate professional conduct and a normal course for provision of design solutions using integrated production



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***Deferred design is applicable to all forms of contract delivery, including traditional design-bid-build, construction management, and design-build.***

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of construction documentation in addition to delivery of constructible solutions.

Essentially, a design professional can delegate through (as an RPR) or accept delegation from (as a supporting registered professional) a constructor for the design of ancillary building components, systems, or elements. Items being delegated that involve the design services of a registered or licensed professional—be it an engineer, architect, or interior designer—must be clearly stated with respect to the design solutions required and the fact that those solutions require involvement of a registered professional.

The RPR is required to review and determine whether the deferred design component is in general conformance with the overall project design requirements and can be integrated into the project as an informational submittal. Other members of the design team managed by the co-ordinating registered professional (CPR) can provide comments on the design solution as an action submittal<sup>2</sup>. The RPR must provide written notification of any decisions or modifications required to match performance with project design requirements. Modifications to any submittal cannot alter the inherent design provided by the supporting registered professional, particularly where that direction adds requirements not clearly supported by the drawings or specifications. The RPR can reject the design solution provided by the supporting registered professional if clear explanation is provided to justify the rejection (such as insufficient detail or solution changing the fundamental design of the project).

Deferred design is applicable to all forms of contract delivery, including traditional design-bid-build, construction management, and design-build. It is a key component of the integrated project delivery process and building information modelling (BIM). It also cannot happen without substantial participation of the RPR. The fact that this entity does not have the requisite skills or knowledge to perform the design in-house does not lead to a blank statement of deferred design. RPRs must retain their roles for key decision-making responsibility as defined within their individual areas of discipline practice. Deferred design must only happen at their direction. It cannot be instigated by others that may be working on document presentation without the knowledge and acceptance of the component affected by deferred design by the RPR.

The RPR is responsible for describing deferred design requirements using clear, concise, and correct language that creates an explicit instruction to the constructor for the responsibilities and limitations associated with providing design solutions. The RPR cannot assign professional responsibility for completeness of design through the deferred design process, nor reassign responsibility for design to the constructor.

Content of deferred design must comprise outcomes that do not form a part of the normal practice or reasonable knowledge of the CPR that could have been completed by obtaining specialist design input from other RPRs during the production of construction documents and constructibility reviews. It must also consist of design solutions that enhance construction co-ordination and project outcomes as a result of responsible deferral to the constructor, particularly where final configuration, connections to adjacent construction, and scheduling are highly influenced by the contractor's contractual requirements and project deliverables.

Deferred design and any loads or engineering guidance must be clearly described within the drawings and specifications prepared for the project. The RPR cannot simply rely on general notes on drawings or blanket statements within the specifications to satisfy the requirements for appropriate communication to the constructor.

Further, deferred design communication and documentation must be achieved using a performance-based specification approach instead of prescriptive or proprietary specification. The difference between these two approaches is critical to the explicit communication required by the constructor.

Proprietary or prescriptive specifications establish detailed material descriptions and the manner in which the work is to be performed. They often include lists of acceptable products or single basis-of-design products, which the constructor is required to follow without deviation except where specifically accepted by the RPR through a formal substitution process. These specifications also contain an implied warranty: if followed, they will provide an acceptable result for the project, which remains the responsibility of the RPR.

Performance specifications establish the objective or standard necessary for the component outcome, requiring the constructor to exercise ingenuity in achieving the stated standard of performance and fulfill contractual obligations in selecting means and methods. The corresponding responsibility for selection of the design solution is deferred to the constructor, which essentially assumes the role of the designer with respect to the deferred design elements or components described. This is the key reason for reliance



statements as a submittal indicating the constructor's ability to undertake the deferred responsibilities.

Deferred design does not improperly shift the design responsibility to the constructor as long as the documentation provided by the RPR states clearly the limits of the design involvement and describes the required design solution using explicit language. The constructor is not a design professional and must obtain the services of appropriate supporting registered professionals or supporting certified/qualified contributors early in the construction phase of the project to allow for appropriate communications and co-ordination with the RPR. The constructor also remains responsible for promptly identifying any errors, inconsistencies, or omissions within the contract documents once the supporting registered professionals or supporting certified/qualified contributors are engaged, but does not assume the RPR's design responsibility by providing design review or constructibility analyses.

It is the contractor's responsibility to perform co-ordination between components forming deferred design content and the construction documents provided for the project, and to obtain interpretation where ambiguities, disconnects, errors, or omissions within the information provided make interpretation of the RPR's design requirements unclear.

Further, the constructor is responsible for including costs and risks associated with any deferred design within the construction documents issued for bid and confirming design requirements contained within the specifications are appropriate for the risks being taken on under contract.

The constructor's supporting registered professional or supporting certified/qualified contributor assumes similar liabilities in creating design solutions through the process of submitting supporting documentation in the form of reliance statements and sealed and signed shop drawings. This establishes a similar relationship with the CPR as the other contributing RPR for performance associated with providing the design solution. There is no transference of project liability for design and engineering from the RPR—only an appropriate level of liability associated with providing the design solution based on the building component or element being deferred to the constructor. The RPR's review of design solutions provided by the constructor is only for general conformance to the required design or engineering for the project (informational submittal). The duty for correctness of the design solution stays with the constructor.

Deferred design having reliance on engineering or safety (delegated design) concerns must be performed by a supporting registered professional and submittals have to contain the seal and signature of a professional engineer, architect, or other

*Continued on page 22*



### British Columbia Sheet Metal Association (SMACNA-BC)

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

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By Mike Postiglione  
FastEST, Inc. Director of Marketing

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estimates—from the main menu to the takeoff interface to the reports and final spreadsheet layout. And with that uniformity comes the benefit that once an estimator becomes adept with one of the programs, they are inherently familiar with the other programs, as well. That said, if further training is needed, one advantage that comes with purchase or lease of any FastEST program is that it includes online training for any and all users.

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## BEGIN 2019 WITH THE SELF-KNOWLEDGE LEADERSHIP TEST

I have seen many leaders fall short of their potential because they simply could not be honest with themselves. They were unwilling to dig into the challenge of self-knowledge—and that’s understandable. We often find more things we don’t like about ourselves when we do it, but that’s precisely why we need to bite the bullet. The polite term is self-deception. The true description is bullshitting yourself.

Self-knowledge and management are the foundations for successful, long-term leadership capability. (They also impact our relationships, marriages, parenting, and more). You have to look at leadership as a long-term personal and professional evolution rather than a one-time event (like a promotion). Self-knowledge (the psychological mirror) is a tool to be used for this evolution. The hardest part is that the more successful we get, the less pressure there is to self-examine.

For leaders who work for me I have used many avenues to promote self-awareness and knowledge: 360 evaluations; executive coaches, Myers-Briggs, and even paid-for professional therapy. Simply put, if you don’t know yourself, you can’t lead yourself. If you can’t lead yourself, you cannot effectively lead others.

This list of questions is a good filter to help you and your leaders avoid rationalization and BS—and see the truly good, bad, and ugly that we must embrace to really grow.

- What is my “gift” as a person that makes me remarkable, do I own it, and how does it impact those around me?
- What is my fatal flaw, do I own it, and how does it impact people around me?
- Can I take brutally honest feedback in service of my advancement?
- Am I truly secure enough in myself to lead well?
- Do I lead more from strategy or emotion?
- Do I make decisions from instinct or logic?
- Am I a reactive person or a proactive person?
- What level of intuition do I bring to motivating others?
- How do I generally behave under stress and what does that look like to others?

Want to have a really authentic discussion with someone above or below you?



By /Mark Breslin  
Breslin Strategies, Inc.

Someone you trust enough to share the truth with? Try just two or three of these.

Remember, self-awareness and knowledge give you the most honest foundation possible for good leadership. Have the courage to make it a priority for yourself and those who need your guidance and help. ■

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

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## RADIAL FLOW AIR DIFFUSERS

Unlike typical office spaces where diffusers are spaced to promote even mixing and a uniform temperature profile throughout the room, laboratories need to supply large volumes of air at low velocities to disperse impurities and make up for exhaust air volumes without interfering with fume hood function. The airflow pattern is designed to produce a uniform pattern to prevent dead spots where contaminants can linger. Projecting into the space is necessary for the high degree of control offered by this configuration.

The most serious application problem to be considered is a high sensitivity to inlet conditions. These diffusers employ a deep back pan and internal baffles to minimize this effect. Also the radial face allows for a true radial pattern. This is required if entrainment is to be avoided. In the past, all available flush types of diffusers have a multi-jet, rather than a radial displacement, pattern. This results in induction, potential contaminant injection, and uneven room air velocities and temperatures.

All diffusers (including radial flow diffusers) have operational limitations. Radial flow diffusers are limited in terms of room-diffuser delta-T and max/min air flow rates. The radial flow diffuser with the curved blades and round shape has



by / Norm Grusnick, P. Eng

the broadest range of performance in terms of both flow and delta-T and its ability to maintain a radial flow pattern over a range of flows. Flush face designs are often more limited due to the compromises made in attempting to achieve radial flow from a flat surface.

The interaction of supply and induced airflows at the surface of a perforated metal face is very complex. A jet of air emerging from a hole in a flat surface tends to entrain air from the surrounding space. Once the jet becomes even slightly less than perpendicular to the surface, it tends to follow along the surface. This is due to the fact that any small orifice jet has negative static pressure. When near a surface, it tends to adhere to that surface. The radial flow diffuser maintains many jets, all perpendicular to the curved surface.

Why is radial flow important? Again, the goal is to minimize induction. When there is induction, the jet entrains contaminants from surrounding areas and changes in temperature. A true radial pattern will have nearly constant temperatures and will not contain any particles from surrounding spaces.

In conclusion, the radial flow diffuser offers the least compromise, most stable air delivery, and lowest entrained contaminants of any design assuring optimal performance for laboratories with VAV hoods and other critical environments. The radial flow ceiling diffuser system allows greater flexibility during installation by being the least sensitive design to inlet conditions. ■



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## A SMALL MISTAKE MEANS BIG COSTS FOR A NEGLIGENT SUBCONTRACTOR

General contractors take on significant legal exposure when agreeing to build a new home or even to renovate an existing home. For instance, general contractors may be liable for the negligent work of their employees or others engaged by them in connection with a construction project. The recent case of *Edwards v Parkinson's Heating Ltd.*, 2018 BCSC 593 addresses a general contractor's liability in relation to a subcontractor who was alleged to have negligently installed and/or serviced a fireplace, causing serious carbon monoxide poisoning to the homeowners.

### THE FACTS

The plaintiffs in this case hired a local general contractor (the "General Contractor") to renovate their two-storey detached home in Vancouver (the "Project"). The General Contractor, in turn, hired the defendant subcontractor (the "Subcontractor") to perform the mechanical, gas, and fireplace work at the Project.

In performing its scope of work at the Project, the Subcontractor removed, and later reinstalled, a fireplace to accommodate ongoing renovations.

After the renovations were largely completed, the Subcontractor was hired directly by the homeowners to service their fireplace, and did so on two separate occasions. Following the servicing of the fireplace, the plaintiffs began to experience concerning symptoms, including severe headaches, loss of balance, loss of concentration, nausea, and fatigue. The plaintiffs' friend suggested that there might be a gas leak. After inspection, it was determined that high levels of carbon monoxide – a colourless, odourless, and tasteless poisonous gas – were indeed emitting from the living room fireplace.

Upon further investigation, it was determined that the cause of the leak was a missing screw designed to secure the draft hood to the spill tube, which vents carbon monoxide and other exhaust gases from the fireplace. This caused a gap allowing carbon monoxide to vent directly back into the plaintiffs' home.

The Subcontractor ultimately replaced the screw, but the plaintiffs asserted that they had already suffered brain damage from exposure to carbon monoxide in their home. As a result, the plaintiff homeowners sued both the General Contractor and the Subcontractor for the negligent installation and servicing of the fireplace.

### THE DECISION

After a lengthy trial, the BC Supreme Court held that the Subcontractor, but not the General Contractor, was liable in negligence.



by / Andrew Delmonico and Matthew T. Potomak

The plaintiffs argued that the General Contractor and the Subcontractor each owed and breached an independent duty of care to the plaintiffs to install the fireplace in a reasonably competent and safe manner free from any latent and dangerous defects. However, the Court was unable to find persuasive evidence that either defendant was negligent in the original installation of the fireplace.

However, the Court did find that the Subcontractor breached a duty of care to the homeowners when it later serviced the fireplace and failed to note the missing screw, which would have helped to ensure the proper ventilation of poisonous gases (such as carbon monoxide).

The plaintiffs were ultimately awarded damages in excess of \$300,000. What could be argued was a small mistake by the Subcontractor in failing to install a screw resulted in both big losses to the homeowners, as well as a sizeable damage award against the Subcontractor.

### LESSONS LEARNED

1. Even though in this case the General Contractor was found not to be liable for the negligent work that caused the homeowners' damages, it should be remembered that a general contractor's duty of care to his or her clients generally includes a requirement to adequately supervise the work of employees and subcontractors. Given this liability and the overall importance of retaining qualified subcontractors, a general contractor may wish to include a term in its subcontract preventing subtrades from assigning their work to other subcontractors.
2. It is also desirable for subcontractors to carry their own general liability insurance to cover defective work, in addition to the insurance maintained by the general contractor. ■

*This article was written by Andrew D. Delmonico and Matthew T. Potomak, lawyers who practice 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 (Abbotsford) or 604-684-8668 (Vancouver).*

INDUSTRY NEWS

Continued from page 5

**SMACNA INSIGHT ON HIGH-PERFORMANCE AIR SYSTEMS**

A well-designed high-performance air system can provide a building with a cost-effective and efficient solution.

In almost all cases a high-performance air system (HPAS) will have the lowest installed first cost of systems commonly considered. In addition, they achieve and maintain comfort by providing engineers with data indicating where to place grilles, registers, and diffusers to ensure proper air distribution and eliminate drafts. This makes commercial building owners happy as dissatisfaction with indoor environment quality (IEQ) is the top reason why leases are not renewed. Lifetime maintenance costs are attractive as the unit requires only periodic maintenance at one location.

Learn more in the fall 2018 edition of the *AMCA inmotion Journal* cover story, co-authored by Mark Terzigni, director of engineering and technical resources at SMACNA at <http://www.amca.org/>. ■

**A NOD TO THE PAST, BUT FOCUSED ON THE FUTURE**

SMACNA unveiled a new multi-purpose video which was unveiled at the SMACNA Board meeting and simultaneously

at AHR Expo (2nd half of video only). The second half is a hard-hitting, fast paced roundup of various high profile projects showcasing SMACNA members at work as well as their finished products. The video was pretty easy to compile, so SMACNA encourages all members to consider shooting video (time-lapse or drone), taking pictures, and helping to tell the visual story of your industry. SMACNA members and chapters may show this video wherever they may like.

Watch here: <https://player.vimeo.com/video/313257257> ■

**ASSIGNMENT OF DESIGN TO CONSTRUCTORS**

Continued from page 17

licensed professional for the design solution. These submittals cannot alter the fundamental design requirements presented by the RPR without a formal request for interpretation or substitution. ■

Notes:

1. Part I “Assignment of Design to Constructors: A Discussion and Direction,” appeared in the Fall 2018 issue of *Sheet Metal Journal*.
2. Submittals (along with specifications, shop drawings, and other documentation) will be discussed in more detail in the third part of this article series.

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