

Sheet Metal Journal

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British Columbia

FALL 2018

Assignment of Design TO CONSTRUCTORS

Also in this issue

SMWTC Contests

SMACNA-BC Golf

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Official Journal of
Record for SMACNA-BC



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.

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.

OUR MANDATE

- 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.



[BC Sheet Metal Association \(SMACNA-BC\)](#)

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NEW HORIZONS FOR SMACNA-BC

It's been a busy fall here in the land of SMACNA-BC: new website, new software system, finally received the building permit for the new SMACNA-BC office, annual golf tournament, SMACNA National Convention in San Diego. All of this, along with a shortage of manpower, curve balls from the NDP government, such as downloading MSP costs to contractors, is part and parcel added to the regular everyday activities of the association.

Let's start with the new office. We will be out of our Guildford location by December 31, 2018. Our new address is: Suite #705 – 9639 137A Street, Surrey, BC V3T 0M1. Due to a lengthy wait for a building permit and few other extenuating circumstances, we will be moved in; however, the final touches won't be complete until February.

SMACNA-BC Golf Classic September 14 Northview Golf & Country Club, Surrey

Once again, 144 players got lucky with the weather. It was a spectacular day for the SMACNA-BC Golf Tournament at Northview Golf Course, including a host of activities and prizes thanks to all our generous sponsors.

With the 50/50 draw, the air cannon, and the Beat the Pro hole, we were able to muster up donations of just under \$2,500. The SMACNA-BC Board of Directors agreed to match the amount of donations collected, so I am happy to say we were able to cut a cheque for \$5,000 to the Prostrate Cancer Foundation.

SMACNA's 75th Annual Convention, San Diego, CA

We had 44 SMACNA-BC members at SMACNA's 75th Annual Convention October 14-17. This was SMACNA National's premier event that blended exceptional education with world-class networking and social events.

The opening reception on Sunday evening took place on the flight deck of the U.S.S. Midway Museum, one of the longest-serving and most famous aircraft carriers in U.S. Naval history. Everyone was talking about this event, all I heard was, "This is the best one ever". It was a treat to be able to venture into some of the planes and helicopters on the flight deck and to hone your flying skills in the flight simulators, but the capper were the three skydivers at dusk, all lit up and each one flying a flag—one US flag, one Canadian flag, and one SMACNA flag.

Other highlights of this year's convention were Craig Benson of Paramount Sheet Metal being inducted into the SMACNA College of Fellows. Craig was also recognized for completing his four-year term as Canadian Representative on the National Board of Directors.

Aaron Smith of Smith Sheet Metal Works Ltd. was elected to



By /Bruce Sychuk
Executive Director, SMACNA-BC

a four-year term as Canadian Representative on the National Board of Directors.

Congratulations and thank you to both Craig and Aaron, and their families, for generously devoting time and effort to joining the rest of the National Board in keeping SMACNA and its Chapters leaders of contractor associations.

Project Managers Institute November 5-7 Civic Hotel, Surrey

Experienced SMACNA contractors know their best project managers take ownership of their projects. This concentrated 2½-day program sought to build upon existing project management skills and strengthen proficiency. Twenty-three project managers from all over the province attended this program and definitely were handed the tools to enhance their current skill set.



Some of the topics covered in the program were management, leadership, project planning, customer-focused construction, time management, change order management, financial management, and standards/best practices.

Attendees also learned to plan projects to maximize profits and customer satisfaction; develop and maintain profitable customer relationships; build and lead powerful, integrated project teams; and, understand and master financial control of projects.

A big shout out to the two instructors of this intense program, Brian Dwyer and Andy Patron of FMI. Congratulations on presenting what has been rated the very best program SMACNA-BC has ever hosted. Kudos to you, gentlemen.

Welcome New SMACNA-BC Associate Members

WesternOne

WesternOne provides aerial equipment, heat services, temporary power, fueling services, and operator training to businesses in the institutional, commercial, residential, oil and gas, and infrastructure industries, as well as contractors and trades across many industries in Western Canada. The experts at WesternOne take time to learn your business and unique worksite requirements in order to recommend the right solution. They are dedicated to working safer, easier, and smarter.

Account Manager: Scott Fenton, scott.fenton@westernone.ca
Website: www.westernone.ca

Canadian Western Bank

CWB's founders, Dr. Charles Allard and Eugene Pechet, decided to start a bank headquartered in the West for the West. They envisioned a bank that would provide levels of service unheard of at other financial institutions. Management practices would be nimble and non-bureaucratic, with local decision-making based on prudence and common sense. The overall goal was to achieve continuous, sustainable growth. Since then, they have come a long way as an organization, but share those same fundamental ideals. They have broadened their financial service offerings—now providing service in banking, trust

services and wealth management—and have expanded their reach across Canada.

Relationship Manager, Commercial: Darryl Stickler, Darryl.Stickler@cwbank.com
Website: www.cwbank.com

Mark your Calendars: SMACNA-BC Annual Christmas Party

Friday, November 30, 2018

Oceans 999 (Atrium Area) Pan Pacific Hotel Vancouver

Major Sponsors: Crossroads C&I

A Very Special "Mark Your Calendar": SMACNA-BC 50th Annual Convention

May 9-12, 2019

Delta Hotels by Marriott Grand Okanagan Resort, Kelowna, BC

Calling all past-presidents, board members, and committee members. We want you to be there to celebrate SMACNA-BC's 50th Anniversary. Please contact Michelle Rodford in the SMACNA-BC office via email or phone at smacnabc@smacna-bc.org / 604.585.4641. ■



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SMACNA-BC GOLF TOURNAMENT SUPPORTING THE PROSTATE CANCER FOUNDATION OF BC

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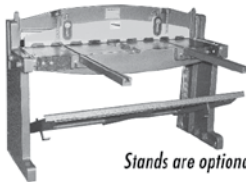


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MEET THE BOARD

by / Jessica Kirby

Name: Dan Taillefer

Board Position: Director

Length of Term: Three Years

Previous involvement in SMACNA-BC Board: Negotiating Committee

Other Professional Affiliations: Mechanical Contractors' Association

Company Name: Viaduct Sheet Metal Ltd.

Company scope and specialty: Manufacturing, commercial, institutional, and residential high-rise

Number of years in the industry: 32



Why did you get into this industry?

Great advice from my dad. After graduating from high school he said "Go get a degree or get into a building trade apprenticeship. Do not burn up the next four years of your life wondering what to do!"

I started a pipe-fitting apprenticeship and at that time I had no idea what opportunities were connected with this. After completing my apprenticeship I started out as a junior estimator /project co-ordinator. I soon found my passion was the pursuit and successful completion of projects.

Professional philosophy or "words to live by":

Integrity is doing the right thing even when no one is watching.

Greatest challenge the industry has faced over the years:

Labour shortage, attracting and training new talent. We regularly reach out to local high schools and connect with students to promote the sheet metal trade and our company.

Biggest change in the industry over the years:

The speed of decision making from technology advancements.

Biggest opportunity in the industry for the future:

Large scale projects.

What is SMACNA's most important role in the industry? Promoting and maintaining a high level of industry standards.

Learn more about Viaduct Sheet Metal Ltd. at www.viaductsheetmetal.ca.

Learn more about SMACNA-BC at www.smacna-bc.org. ■



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SMACNA NATIONAL BOARD OF DIRECTORS: NEW & OLD

The SMACNA membership elected five members to serve 4-year terms on the association’s Board of Directors at the Annual Convention, Oct. 14-17, in San Diego, California. They include:

- Steven Benkovsky: Triple S Air Systems Inc., Ronkonkoma, New York
- Chad Bunting: Schoppe Company Inc., Salt Lake City, Utah
- Randy Pagel Sr.: Bumler Mechanical, Sterling Heights, Michigan
- Joseph Samia: Central Consolidated Inc., Wichita, Kansas
- Aaron Smith: Smith Sheet Metal Works Ltd., Port Coquitlam, B.C. Canada



The 2018 retiring board comprises Anthony Kocurek, Carol Duncan, 2017-18 SMACNA President Jack Knox, Todd Hill, Craig Benson (absent: Kevin Jones). Special thanks and appreciation were given by all in attendance to those board members retiring from their position. The five stepping down included:

- Craig Benson: Paramount Sheet Metal Ltd., Port Coquitlam, B.C. Canada
- Carol Duncan: General Sheet Metal, Clackamas, Oregon
- Todd Hill: Ventcon Inc., Allen Park, Michigan
- Kevin Jones: Richards Sheet Metal Works Inc., Ogden, Utah
- Anthony Kocurek: Energy Balance & Integration LLC, Albuquerque, New Mexico ■



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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| Ames Metal Fabricators 82 Ltd. | Northwest Sheet Metal Ltd. |
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| Envirotech Air Inc. | Wm. P. Somerville 1996 Ltd. |

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Sheet Metal Apprentices in the Spotlight

Sheet Metal Workers' Training Centre Showcases its Best

The Sheet Metal Workers' Training Centre hosts and sends apprentices to sheet metal contests at home and abroad, offering opportunities for its young charges to showcase their talents and receive feedback on national and sometimes international stages. While not a requirement of the training program, competing is a fast-paced, technical, and creative forum for students to test their skills, think under pressure, and connect with competitors from other regions.

Canadian Council's Sheet Metal Apprentice Contest – Victoria, BC

In conjunction with the 43rd annual convention of the Canadian Council of Sheet Metal Workers and Roofers, the Canadian Council's Sheet Metal Apprentice Contest brought 11 competitors from across Canada to the Delta Ocean Pointe Resort in Victoria, BC in June. This two-day contest tested apprentices in layout, theory, and fabrication skills. A binnacle, the housing for a ship's compass, made from copper and brass was the shop project fabricated in a public space near the shoreline at Ship Point where curious tourists and other passersby were provided a rare public demonstration of these hand skills. Congratulations to Kyle Wellman of Ames Metal Fabricators, winner of the 2017 Level 4 SMWTC Contest, as he was the SMART Local 280 and SMACNA-BC's representative. Wellman will be awarded the Alex Donaldson Award –the annual top apprentice award – at the SMACNA Christmas Party in November.

“That is one of the things about this contest,” says Jud Martell, training co-ordinator with SMWTC. “They try to put everyone

in red shirts and make them visible so the public can see what is happening and see the work. The projects are substantial that they demonstrate some important skills, but they are also designed to be robust and fit a variety of skill levels.”

Martell says Wellman's mannerism before and after the competition was dramatically different, a testament to one benefit of participating in contests.

“What you saw before was a good sheet metal worker who won our local fourth year competition. After the Canadian competition, he became a spokesperson for the trade and his fellow workers. It is one thing to put some copper together, but it was that change in his confidence and enthusiasm and ability to motivate people that was fantastic.”





That's what this contest does, says Martell. "It is more than a competition. It is creating 11 new spokespersons across Canada who will go back and help their Locals. This is why it is the longest running competition and has always been a top shelf organization."

2018 SMWTC Annual Apprentice Contest November 24, 2018

The local competition is set to run with up to ten competitors in each of four levels corresponding with the four apprenticeship years. It is held at the training centre in Surrey and always draws a crowd from across the Lower Mainland and beyond.

The contest begins with 7:30 a.m. orientation. Contestants in each level will compete for seven hours, which will include a theory exam, layout drawing, welding, and shop project. The projects will be based on curriculum from each level.

Participants will receive coffee, donuts, lunch, and a prize. Winners in each level will receive additional prizes. Martell says, "We invite contractors, union workers, and parents alike to join us. Please come by to show support to the training centre and fellow apprentices, have a coffee, and see apprentices show off their skills."

The fourth year apprentice who wins the local competition will attend next year's Canadian contest and the third-year winner will go to Skills Canada – BC.

"It's a great opportunity to see the top people in the trade," says Martell. "And, there is a great set of prizes. Usually each participant goes home with a \$200 prize."

Learn more at www.smwtc.ca or search Sheet Metal Workers' Training Centre on Facebook to see photos and discussion of previous years' competitions.

Watch the winter 2019 issue of *Sheet Metal Journal* for a list of winners, contest review, and photos of the apprentices who competed and their projects. ■



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**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.*



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



Assignment of Design to Constructors

Discussion and direction: Part 1

By / Keith Robinson, RSW, FCSC, FCSI, Cameron Franchuk, P. Eng, and Gerald Murnane

This article is published in two parts. The first part deals with the identification of issues and concerns in communicating the need for design solutions during construction. The second part deals with different approaches to describing how to manage the deferred design process. Both articles draw attention to the “elephant” in the room and issues causing disruption and disagreements in executing this requirement.

The concepts identified are not new. Complexity of design is driving an increase in the quantity of specifications dealing with the deferred design process. The authors recognize experience of design professionals varies greatly and may be contributing to confusion, misconceptions, and inconsistency for those parties involved with providing design solutions identified by the deferred design process. Recent changes to professional design services and construction procurement have put more pressure on expectations for completeness of construction documentation. Downward pressure on professional fees translates directly to a reduction in design effort to fully describe construction, and consequently, a transfer of responsibility for many design solution to the constructor, essentially delaying or deferring design responsibility to the construction phase of the work.

This deferral of design occurs separately from the production of construction documents and is typically finalized by an entity other than the registered professionals of record (RPR).

The Canadian Construction Association (CCA) recently identified disturbing trends indicating the professional design community in Canada is failing in its responsibility to provide complete and appropriate design solutions to the constructor.

The critical outcome of the CCA recommendations is a need for explicit communication to constructors from the RPR clearly

describing solutions presented within specifications that do not form a part of a firm's standard services for engineering and design. Full acknowledgement of deferred design components is the responsibility of the RPR.

The CCA identified several reasons leading to the increased number of concerns associated with this practice, including a substantial decrease in design budgets, a lack of appropriate time to complete the design, and a reduction of the specialty design knowledge that does normally form a part of traditional professional design responsibilities.

CCA indicated that the subsequent decrease in quality of documents is not directly related to the quantity of effort to create extensive drawings and specifications from design professionals; rather, it is a problem of the quality of communication within the whole of the construction documents. The association also indicated the use of computers and processes such as building information modelling (BIM) are implicated in the decrease in quality of documentation as users rely on imported information rather than creating project-specific content.

References in this article to Canadian construction groups and concerns for deferred design are similar in the United States.

There is an opportunity for the community of design professionals to take leadership on this issue and to act on necessary improvements to communications with the constructor within documentation by identifying appropriate risk appropriation and managing that risk to the benefit of the project and the owner. Ultimately, this controls exposure to liability arising from the responsibilities of the RPR. The authors believe concepts in this article can establish a standardized national understanding of issues surrounding deferred design and an approach to reduce

DEFERRED DESIGN			
Supporting Professional Engineer - or - Supporting Certified/Qualified Contributors	Supporting Professional Engineer	Supporting Certified/Qualified Contributors	Constructors' Professional Engineer
COLLABORATIVE DESIGN	DELEGATED-DESIGN	ASSIGNED-DESIGN	TEMPORARY WORKS
DESIGN-ASSIST	COMBINED		
Pre-Bid Post-Contract			

Figure 1: This table lists several forms of deferred design and the professionals involved.

exposure to risk for design professionals and the construction community.

Collaborative or deferred design?

Collaborative design requires the involvement of a supporting registered professional or supporting certified/qualified contributor for elements of design:

- the RPR does not have in-house;
- required to form a part of the construction documentation; and,
- required to provide a complete solution to the constructor.

Collaborative design can be delivered using design-assist process before bid through pre-qualification or after bid as a cash allowance. (Figure 1).

Design-assist before bid is typically obtained using a request for proposals (RFP) process in which the building elements and components are clearly defined by non-product-specific performance attributes with a stated intent to form a contract with the successful collaborative design-assist partner, and which incorporates a methodology to return to open bidding opportunity if the design solutions process was not beneficial to project outcomes. The process is administered by the design professional and may entail early payment by the owner for design solutions that would otherwise occur during the construction period.

Design-assist after contract award can also be obtained through the RFP process during construction using similar documentation as described for the before-bid process, but administered through a cash allowance to recognize contractual obligation to identify design solutions that are not complete, and that will be determined during the construction period and administered by the constructor.

Deferred design is any design not completed in-house and represents specialist contributions not forming a part of the expertise of the RPR. Deferred design may involve solutions requiring engineering support from a registered professional (delegated-design) or non-engineering solutions from a supporting certified/qualified contributor (assigned-design).

Delegated-design solutions require specific input from a professional engineer retained by the constructor, supplier, fabricator, or manufacturer. They do not require input from a professional engineer. There are components in the deferred design process that may require aspects of delegated- and assigned-design. These must be identified in the documents.

The deferred design process can include aspects of actionable and informational review of submittals, depending on the allocation of delegated-design or assigned-design, and which design profession discipline is involved with the aspect of the review. Deferred design may require the application of multiple submittal review stamps where two or more design professionals are involved with the review.

Managing the design process

Deferred design is completed by supporting registered professionals or supporting certified/qualified contributors who can provide supplementary supporting engineering, knowledgeable contributions, or architectural services for components of a defined discipline's contribution during the construction phase of the project, provided they can submit appropriate assurances of their ability to design these components based on engineering provided by the design professional of record.

Collaborative design is similar in concept to deferred design, but occurs during production of the construction documents, where the supporting registered professionals' contributions are fully incorporated by the RPR prior to the construction phase.

Building codes allow registered professionals of record to defer or assign design solutions for building components to "others" using appropriate delegation or assignment language through the contractual language and specifications. Transparency by the RPR is required to keep the owner fully informed regarding what design will be performed by themselves and what will be performed by others.

The one limitation under state licensing guidelines is the coordinating professional of record and the registered professionals of record are not permitted to defer, delegate, or assign their responsibilities for compliance with the building codes; the

Deferred Design	Delegated Design	Assigned Design	Combined Design
<p>Deferred design occurs during construction and describes elements of design assigned to the constructor for solutions consistent with means and methods defined within their contract language. It includes design of permanent components of the project.</p>	<p>Delegated design is deferred design requiring solutions from a supporting registered professional. It is associated with building elements necessary for Building Code compliance and includes items such as load-bearing building components, custom stairs and guards (not pre-engineered), fasteners and connections, and fire suppression systems that cannot be fully designed as a component of the construction documents.</p>	<p>Assigned design is deferred design requiring solutions from a supporting certified/qualified contributor. These solutions may be associated with building elements necessary for code compliance that do not require signatures of a registered professional. This includes items that cannot be fully designed as a component of the construction documents, such as pre-engineered assemblies, roofing membrane uplift resistance, and door hardware and building security systems.</p>	<p>Deferred design components may require a combination of delegated design and assigned design where pre-engineered components require fastening, anchorage or seismic restraint. The pre-engineered components will be identified in the specifications as assigned design, and the fastenings to structure as delegated design. Combined design would include components where the assembly is assigned and attachment to structure is delegated, such as opening protectives and guards, fall arrest assemblies, cable trays, building duct work, or curtain wall assemblies.</p>

responsibility for deferred or collaborative design remains with the co-ordinating professional of record.

Design intent versus design

The phrases “design intent” and “design” are often used synonymously by registered professionals, as if they have the same meaning. Discussions arising from the concepts of deferred

design require recognition of two separate functions associated with design intent and design.

Design intent represents the responsibility of registered professionals of record to the public regarding safety, and responsibility for incorporation of functionality and aesthetics described by the owner's stated performance requirements. Design represents the solution or outcome derived from the design intent. These words are used within this discussion to represent these two aspects and to maintain a clear distinction between the design intent responsibility of the design professional and the design solution responsibility of the contractor.

The players and influencers

Most readers of this magazine are well aware of the traditional roles of constructor (contractor, construction manager, or design-builder) and the architect/engineers (design professional, co-ordination registered professional, or RPR).



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HISTORY OF COLLABORATION

Prior to the middle of the 19th century, there was a single role encompassing the builder and designer. The separation between engineers, architects, and constructors evolved to what is now associated with modern construction practice: the arrangement of design responsibilities between licensed design professionals (architects, engineers, and interior designers) and constructors (contractors, construction managers, and design-builders). Design professionals were respected and trusted to deliver on the full extent of the owner's design brief. Constructors understood their contributions, using craftsmanship and intrinsic trade knowledge to provide expertise in interpreting the requirements described by the design brief.

The “other design entities” within the arena of professional involvement arising from the deferred or collaborative design process used to deliver deferred submittals during the progress of the work are not defined. Examples of these contributors have already been introduced as the supporting registered professional and the supporting certified/qualified contributors.

Supporting registered professionals are not mandated by the building codes, but delegation of design responsibilities to supporting registered professionals is a recommended mechanism—by most engineering associations—for the RPR to receive assurances from other registered professionals, which do not form a part of the project team and who can provide appropriate design solutions. Various professional associations at the provincial and state levels provide written guidance supporting the role of supporting registered professionals. The term used in this article may not match the definitions of those associations, but the concept of transference and acceptance of responsibilities is clearly described.

The term “supporting certified/qualified contributors” is the “someone else entity” for deferred or collaborative design solutions not requiring participation by a registered professional. This term accounts for contributions from certified or qualified individuals to specialty components or specialist knowledge that does not form a part of the co-ordinating registered professional's or RPR's range of experience.

Contributions by the supporting certified/qualified contributors include design services associated with the firestop design covered by a certified fire protection specialist (CFPS) and door hardware schedules and specifications provided by a door and hardware specification consultant (DHSC). This group may also include other certified individuals having specialty knowledge.

State engineering associations only address:

- professional practice;
- how registered professionals respond to design requirements within and outside of provincial borders; and,
- how the RPR incorporates contributions from supporting registered professionals.

The relationship between the RPR and assigned-design contributions by supporting certified/qualified contributors is not specifically described, although the concept is the same as required by the supporting registered professional.

Most architectural associations are silent on the concepts of supporting registered professionals and supporting certified/qualified contributors. This is the probable reason behind inappropriate or incorrect deferred design within the architectural project documents.

Deferring design must not be used to transfer design intent



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responsibility to the constructor because the RPR does not have sufficient time or budget to complete the design. Deferring design should only occur when the RPR does not have the necessary skills to complete the work, and the owner is informed and has accepted the need for deferral.

Owners have expectations of the RPR based on the fees paid; an expectation the RPR will provide a complete design, meaning any exclusions to the owner's stated requirements are clearly identified prior to signing a contract with the owners.

Responsibilities of the constructor

Design intent of temporary facilities has always been the responsibility of the constructor, including any engineering of temporary structures and safety systems not part of the primary building work. This responsibility does not form a part of the deferred design discussion; this is simply work the constructor does as part of their contract deliverables. The design professional may ask to review these design components in an informational submittal, but responsibility stays with the constructor for these components. Engineering of temporary

DEFINITION OF ROLES

Registered professional: The entity defined by building codes as having responsibility for architectural, engineering, or interior design, and defined by state-level regulations and statutes as having professional responsibility for life and health safety for construction.

Co-ordinating professional of record: The entity responsible for engaging and co-ordinating the various registered professionals of record for design solutions required for the project, as defined by building codes.

Registered professional of record: The entity responsible for providing integral design and review of work specific to their area of discipline expertise, contributing to the whole of the project under the supervision of the co-ordinating professional of record.

Supporting registered professional: Similar responsibilities as the registered professional of record. Services are obtained as a component of construction deliverables to provide professional engineering design solutions for components of work not part of the in-house expertise of the co-ordinating registered professional or the registered professionals of record.

Supporting certified/qualified contributors: Non-professional certified or qualified contributors providing specialist design solutions obtained as a component of construction deliverables. These contributors provide design solutions for components of work that do not form a part of the in-house expertise of the co-ordinating registered professional or the registered professionals of record.

facilities is specifically excluded from the services provided by the RPR under normal contract requirements.

Form of collaborative design

Collaborative design typically occurs during production of the drawings and specifications, but it can occur as a cash allowance component during the construction phase. It is generally incorporated as a component of the information contained within the construction documents, and requires no further delegation of design responsibility to the constructor.

Obtaining design solutions using a design-assist approach without compensation to the supporting certified/qualified contributors or supporting registered professional demeans the value of those services and opens the RPR to scrutiny from peers if the design solutions fail to recognize the complexity of the project.

Collaborative design carries a responsibility for the RPR to maintain a competitive procurement process as well as recognize the professional's responsibilities to the performance of the building as the co-ordinating professional of record/RPR.

The adage “you get what you pay for” is apt when obtaining design solutions from supporting certified/qualified contributors. The more complex the project requirements, the greater the need to pay for design-assist services.

Design-assist

Collaborative design is identified as design-assist within many specifications prepared by the design community. It is similar in execution to delegated-design and assigned-design with respect to the requirements for letters of commitment and compliance. It is also similar in concept to what some describe as design-build. However, that description associates closely with a contractual condition, and should not be used to describe the actual approach to design-assist used for a project.

Design-assist is a procurement method by which, prior to completion of design, a construction contract may be awarded on a best-value basis, in which a specialty constructor provides design assistance to the design professional of record using a registered professional or supporting certified/qualified contributor retained using a RFP process.

Design-assist can be delivered using the constructor as a procurement entity when working with construction-managed or design-build methods of contract delivery.

Pre-construction design-assist is a fee-for-service approach to design solutions obtainable through a pre-qualified or RFP process. It provides for competitive procurement, with the final design solution forming a part of the construction documentation as either a “single-sourced with no substitutions” specification

where design, products, and installation are included as an RFP requirement, or as basis-of-design products allowing for substitutions when only design solutions are provided (with a clause stating the design-assist entity will review proposed substitutions for conformance to the design during construction).

Post-construction design-assist requires the specification to be written in the form of an RFP, with expected construction costs managed as a cost allowance. The perception is market pricing will apply competitive influence on the outcomes, but experience shows post-procurement design-assist requires additional changes to adjacent assemblies because of the design solutions not being fully integrated or co-ordinated with the project.

Design-assist is a collaborative process for developing acceptable shop drawings as a component of the construction documentation phase of the work. It follows a simple process: suggest » detail » refine (repeat until solution is derived) » implement » accept » construct.

The design-assist participant will be responsible for:

- various delegated- or assigned-design contributions;
- submission of construction documentation (eg, drawings and specifications);
- mockups, and;
- samples.

Shop drawings form a part of the construction documentation when prepared during the pre-construction phase. When

prepared during the post-construction phase, full shop drawings are generally co-ordinated with construction documentation.

When properly executed, design-assist reduces design risk to the registered professionals of record, the supporting registered professionals, and the constructor, while providing price assurance to the owner.

The RPR retains responsibility of design in the design-assist process, similar to when working with other sub-consultants to form a part of the total design work required for the project.

Conclusion

The authors hope the concepts in this article may contribute to an understanding of the issues surrounding deferred design. Now that some roles and duties have been defined, the authors will embark on a deeper discussion of responsibilities, engineering, submittals, and contract administration as they relate to deferred design in the next issue of *Sheet Metal Journal*. ■

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WHAT DESIGN ELEMENTS CAN BE DEFERRED?

Design solutions for engineered components are considered delegated-design. In these cases, a contribution by a registered professional is required in order to complete the deferred design component, or the component is directly associated with the building code compliance. This category includes items such as:

- structural steel connections;
- steel decking;
- composite steel (open web steel joist [OWSJ], heavy truss);
- wind load-bearing studs;
- light gauge load-bearing cold-formed framing;
- stairs;
- guard and handrail anchors to structure;
- custom guards and handrails (non-pre-engineered systems);
- composite wood (trusses, mass timber, glued-laminated [glulam] timber);
- curtain wall anchors to structure;
- custom curtain wall-themed or non-pre-engineered systems (this would be better forming a part of the pre-construction design assist category);
- fall arrest anchors to structure;
- fire suppression systems, and;
- seismic restraints for non-structural systems.

The list is not intended to be all-inclusive, and additional content will need to be considered for future development of delegated-design components.

Design solutions for specialty components are considered assigned-design. A contribution by a registered professional is not required for code compliance, but certification or confirmation of properties is required. The category includes items such as:

- concrete mix design;
- skylight;
- pre-engineered guards and handrails;
- fall arrest systems (this would be better forming a part of pre-construction design-assist category, but it is often dealt with as a post-construction design-assist contribution);
- standard pre-engineered systems;
- custom canopies;
- pre-engineered structures; and,
- integrated security systems (this would be better forming a part of pre-construction design-assist category). ■

FASTEST, INC. ANNOUNCES NEW VERSION 18 OF FASTDUCT® ESTIMATING SOFTWARE

By / Mike Postiglione, FastEST, Inc.

In mid-November, FastEST, Inc. officially released its newest versions of the company's award-winning mechanical estimating programs. Besides the HVAC and sheet metal-centric FastDUCT® estimating program, the FastPIPE® program for estimating plumbing, mechanical, and site utilities piping, and FastWRAP™ for mechanical insulation estimating were also fully upgraded and improved.

Version 18 of the FastEST programs offers numerous new features and improvements, a few of which are touched on below.

Faster Program Operation, Calculations, and More: Version 18 is designed for faster program navigation, quicker calculations of job reports and totals, and crisp graphics rendering not only in the takeoff screen but throughout other menus and areas of the software. Even better, customers who operate over a network, VPN, or other remote connections will have a seamless and fluid experience operating in a network environment.

Even Easier and More User-Friendly: Though customers already find the software to be some of the most user-friendly




estimating software on the market, Version 18 has a new higher-resolution display (equipped to be compatible with UHD and 4K monitors and televisions), along with being single or dual-screen operational, as always. The new versions also have an optimized takeoff screen layout for faster and easier takeoffs, along with a modernized and familiar look and feel that somewhat mimics the Windows® 10 theme.

New Features, Both Now and in the Future: FastDUCT®, along with FastEST's other programs, are now equipped with various new time-saving and cutting-edge features. For example, there are now scalable assemblies in the programs, which make assemblies even more versatile. Visual deducts are also a new feature. With visual deducts, users can calculate deductions on project addenda or change orders via mark-ups placed on the On-Screen Digitizer, which previously was not an available option.

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UNDERSTANDING THE “21 DAY NOTICE” PROCESS UNDER THE BUILDERS LIEN ACT

A builders' lien can be an effective tool for those in the construction industry, such as contractors, subcontractors, workers, and material suppliers to secure payment. A lien hinders owners from selling their property and can hold up project financing, providing a lien claimant with significant leverage in payment disputes.

However, there is a very strict time limit for filing a claim of lien. A lien must be filed no later than 45 days after a certificate of completion is issued with respect to a contract or subcontract, or if no such certificate is issued, within 45 days after the head (general) contract has been completed, abandoned, or terminated or the improvement (project) is completed or abandoned. In order to preserve a lien claim, a Supreme Court action must be commenced and a certificate of pending litigation registered against title to the property by the lien claimant no later than one year after the lien was filed.

Because of the significant impacts of a lien, owners will often take steps to immediately clear their title of liens after they are filed or force lien claimants to move their claims along in a timely manner. One way to do this is by providing notice to a lien claimant under the Builders Lien Act requiring them to commence their Supreme Court action and file a certificate of pending litigation within 21 days, rather than the default rule of one year.

A 21-day notice must be served personally on a lien claimant or delivered or mailed to the address for service contained in the lien claim. If sent by mail, the notice is deemed to be served eight days after being deposited with a Canada Post office anywhere in Canada. If the action to enforce the lien claim is not commenced (and a certificate of pending litigation registered) within 21 days of service or delivery of the notice, the lien is extinguished. The recent case of *Amplified Electric Inc. v. Husch, 2018 BCSC 969* highlights the importance of knowing how the “21-day notice” process works, both for lien claimants and owners who wish to address unwanted lien claims.

THE FACTS

In December of 2017, Amplified Electric Inc. (“Amplified”), registered a lien claim against the property of homeowners for which it had performed work (the “Owners”). The Owners sent a 21-day notice by registered mail to Amplified, requiring it to commence an action to enforce its lien claim and file the required CPL within 21 days. The notice was sent by registered mail on January 23, 2018 and signed for on January 26, 2018.

On February 16, 2018, 20 days after the notice was sent, Amplified filed its Supreme Court action, but did not register



by / Andrew Delmonico and Stephanie R. Driedger the required certificate of pending litigation (the “CPL”) until February 20, 2018. As a result, the Owners applied to court to cancel Amplified’s lien claim on the basis that the CPL was not registered within the required time limit.

The issue for the Court to decide was whether the CPL was filed in time. This turned on whether the 21-day period started on the day the registered mail was signed for on behalf of Amplified, or on the eighth day after the notice was deposited with Canada Post as deemed under the Builders Lien Act.

THE DECISION

In this case, the Supreme Court agreed with Amplified that the 21-day window for a lien claimant began eight days after the notice was deposited with Canada Post (if sent by mail), even if the notice had actually been received and signed for several days before. Luckily for Amplified, this meant it had filed its CPL in time, complied with the requirements of the Builders Lien Act, and was entitled to keep its lien on title.

LESSONS LEARNED

1. For owners: When serving a lien claimant with a 21-day notice, ensure it is done according to the process set out in the Builders Lien Act. If being sent by mail, this means the notice must be addressed to the address for service indicated in the lien claim and will not be deemed to be received by the lien claimant until eight days after being deposited with Canada Post.
2. For lien claimants: When served with a 21-day notice, make sure to file your certificate of pending litigation and commence your lien action as soon as possible. If the 21-day notice is sent by mail, the court has now clarified the 21-day time period starts from the eighth day after the notice was deposited with Canada Post by the person sending it. It is best practice, however, to not leave this to the last minute, as missing the deadline by even one day will mean losing your lien claim for good. ■

This article was written by Andrew D. Delmonico, lawyer, and Stephanie R. Driedger, 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. 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).

CULTURE & PURPOSE DRIVE TALENT DECISIONS

“Maybe the problem is not that Millennials don’t value meaningful work. Maybe they just define it differently than other generations.” – Kelly Pledger Weeks in *Harvard Business Review*

“Our research shows that Millennials who found 'special meaning' in their work were six times more likely to plan to stay at their workplaces.” – *Fortune Magazine*

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If the construction industry has a head, it is only in the last several years that it popped out of a very dark place. In the past, leaders in this business (which my family has worked in for four generations) didn’t care about culture. They cared about production. They didn’t care about “culture” when “authority” is what got the job done. They didn’t worry about retention, because the general idea was “If you can’t do it, I’ll find someone who can.” Well, the evolution of culture in construction is underway in a profound manner. And what is driving it is a simple formula. Here it is:

“In today’s market, talent will flow to where it is valued most.”

Notice I did not say where it is paid the most. Money is certainly a mandatory component of the workplace relationship. But I hate to break the news: if you have an employee leave you, most likely it is your fault.

Here’s why. Based on almost every study (and the younger the employee, the more accurate this is) people work at an organization (and stay there) because of two major drivers. Here they are in order:

1. CULTURE: what is the prevailing culture around employment? This constitutes elements such as:

- How much effort does the company and my boss make to emphasize my value?
- How much feedback do I get on my performance?
- How interested is my organization in developing my talent and career?
- Do my company and supervisor display the



By /Mark Breslin
Breslin Strategies, Inc.

commitment, ethics, transparency and work ethic that make me want to emulate them?

- Do they display trust and loyalty?
- Can I do my best work and be my best self in the environment?

Creating this kind of culture takes work. It means being open to change – driving change – and accepting that you have to meet people where they are, and not where you are. Or you can try to keep them by paying them more money until they leave anyway.

2. PURPOSE: a sense of purpose is now often cited as the number one priority for young talent, particularly as it relates to retention. Purpose sounds like this:

- Do I understand the real mission of the company and how I fit in?
 - Does the work I do matter? And how do I know that?
 - Are the plans and direction of our organization communicated to me effectively?
 - Am I given the freedom and autonomy to create the best outcomes?
- Am I listened to?

Purpose now vs. purpose before? As a Boomer, my purpose was pretty damn simple: Work hard, get ahead. Now people want and expect more, and most importantly, they can get it – if not from you, then from someone else.

Of all the things I do as a CEO, with hundreds of member companies and dozens of staff, two interrelated roles make all the difference. One is my role as Talent Picker and the other is Culture Creator/Protector. With the amount of attention paid to talent selection, the reputation of my employees is one of being “A” Players. Not every role, every year, all the time, but on balance for a small business, I hire for culture and fit — not skills. If I want a superstar, then I have to know they will thrive within the culture. It is no mistake that a good number

Continued on page 22

ALL DUCTS SYSTEMS ARE NOT CREATED EQUAL

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



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

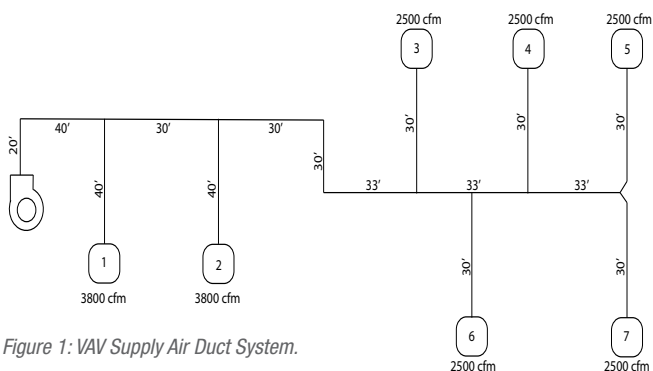


Figure 1: VAV Supply Air Duct System.

The system in Figure 1 was done in three different ways, each to have approximately the same static pressure drop. Firstly, round spiral duct in 32-inch diameter to 14-inch diameter flat oval and spiral 60" x 16" to 14" diameter and then rectangular duct 60"x16" to 12"x14".

Duct Construction

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

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

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

Duct Leakage Calculations

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

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

Duct Leakage Calculations

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

From the above calculations we can see that the rectangular duct exceeds the original estimated leakage of 400 cfm by an additional 487 cfm, so the sample duct section would now require 21,000 cfm from the supply fan. This increase in fan volume will cause slight increases in system velocities and static pressures. To be prudent, the designer should increase the initial rectangular duct pressure classification to 4 inches

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CONTRACTORS' ADVICE

Continued from page 20

of our “alumni” have gone on to CEO, SVP and other top jobs around the nation. We get ‘em. We grow ‘em. And they jump out of the nest with our encouragement. But for them to thrive, the culture is the platform for talent development and retention.

You note that I wrote not only Culture Creator but also Protector. That’s because it’s not enough to just set up the culture and expect it to thrive and support the best behaviors, growth and outcomes. No. Because people will always test it. People will bring habits from previous employment. People will fill in the blanks if you don’t have a firm framework and they will often be outside the lines. Senior management owns culture and must protect it with all they got. That’s it.

So in a hot talent market, or in an industry of unlimited upward mobility, these are the two starting places for your strategy — Culture and Purpose. The next time someone comes to you and says they got “a better offer,” put aside the money issue and ask yourself if you have put enough effort into these leadership priorities. Culture and purpose are the anchors, and money is often the excuse. What they don’t want to tell you is that you failed. Try not to get pissed at them until you have engaged in leadership self-reflection. It will be worth the time and effort; and not just now, but in your business and market strategy long-term. ■

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



*Happy Holidays! We wish you the a wonderful season and the best for 2019.
~ Jessica, Christina, and Lara, Sheet Metal Journal*

ENGINEER'S DESK

Continued from page 21

w.g. to allow for pressure increases that could occur with system balancing, as the calculated system static pressure drop was 2.98” w.g.

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

Table 4.1: Applicable Leakage Classes

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

References:

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

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