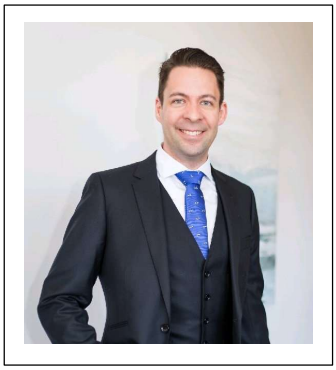
VANCOUVER CHAPTER
E-SPECIFIER

IN THIS ISSUE

CHAIR'S MESSAGE



It's been a busy few months for the chapter with the holiday social curling event in December, our January luncheon Five Common Mistakes made in the Façade Industry, Buildex walk through and finally in March with Bryce from Vitro Glass and Understanding Embodied Carbon in Glass. I would like to thank all those who have participated in our luncheons and our presenters for the great topics we have had this year. It's great to see some new and familiar faces again and we continue to transition to this new hybrid work style.

A special thanks to Ismael for running our educational program the past year and for the extra work put in to organize and introduce most of us to curling. If there are any topics you would like to see, please reach out to the board with your ideas.

If you haven't had a chance to join us yet for one of our luncheons this year, we have a new location at the Hotel Le Soleil on Hornby Street and I invite you to our April luncheon put on by Enzo at Div7 who will be discussing Firestop Assemblies.

The Executive Committee would also like to welcome Johnson Teodocio from Tormax would has taken over the responsibilities of the Specifier Newsletter. We would like to thank Tammy for all the hard work she did running the newsletter and look forwards to Johnson continuing on the work.

As a reminder, its membership renewal time so if you haven't received your notice, please reach out to myself or Nick at National to have this addressed.

We look forwards to seeing you at our April luncheon and in May at our National Conference in Calgary. Don't forget to bring your favourite Yellowstone attire.

Chapter Chair, John Alley, john.alley@cbpmail.net

A MESSAGE FROM THE DIRECTOR

Directors Report March 2023

While all Directors were scheduled to be back in Toronto from March 3-5 for the Directors meeting, many of them didn't make it, including myself. Thursday afternoon, I received a text from Air Canada saying they were cancelling my flight due to weather (a storm in Toronto). While I did manage to get on an earlier flight, it was also cancelled that night, leaving me without any other options. This was the same for most of the Directors on the West Coast as much of the inbound planes were cancelled. However, the Directors who couldn't attend in-person were able to log in remotely and participate over Zoom. While this took some juggling to coordinate last minute from the Association Office, it seems were now accustomed to using Zoom/Teams when in-person isn't possible. At the meeting we had 3 presentations for Conference 2026…. Regina, Winnipeg, and Edmonton all submitted plans to hold the conference. Voting did occur and the winning Chapter will be announced soon. We also had an update from Klavis. Klavis is responsible for the marketing of CSC from the National level, much of their focus has been Twitter so far, but the plan is to include other platforms as we progress. The Swag shop is still not on the website as they have had some roadblocks in terms of which products to make available and quantities. There was also a discussion around a "volunteer agreement" which will be coming out soon to ensure everyone is aware of what is expected. Lastly, I strongly recommend our members make an effort to attend the National Conference in Calgary in May. Especially, if you haven't been to one before, they really are a chance to meet industry people from around the country and every Conference I have attended has been amazing!!

Todd Gerrard, CTR
Chapter Director

Article

Five Common Mistakes made in the Façade Industry

Written by: Jeff Ker

Senior Technical Director,
Engineered Assemblies Inc.

With an impressive 28 years of technical facade and building envelope experience, Jeff Ker heavily contributes to the field of building science in any project he undertakes. For over a decade in the Eastern-Canadian market, and for two years in the West-Coast market, Jeff has represented many different RVRS systems. Along with an extensive background in technical sales and project management in the construction industry, He enjoys a tireless passion with matters of a technical nature in his personal and professional life.

He is a regular technical article contributor to:

- AWARD
- Construction Canada magazines

Regular Speaker Construct Canada, including speaking engagements at:

- Contech (Montreal)
- CEBQ(Quebec)
- World Design Summit
- Toronto CSC Building Expo
- Buildex Vancouver
- CSC Halifax
- and many other installation seminars

Jeff has recently led a CSC presentation in January, and highlighted an article he had written:
"Five Common Mistakes made in the Façade Industry."

Jeff has posted this article in the Construction Canada magazine on October 2020.

A portion of this article is being shown below.

Mistake #1: Inadequate ventilation

All facade solutions benefit from good ventilation. Yet, the industry continually witnesses systems going up without it. Ventilation has two principle benefits. It helps dry the envelope when there is moisture intrusion, a significant factor affecting the durability of a building envelope. Building moisture can cause mould, corrosion, decay, freeze/thaw damage, and other moisture-related deterioration.2
Early research in Norway in the 1960s revealed rainscreen systems are effective in managing moisture intrusion. Manufacturers of various systems might claim to be a 'rainscreen,' as there are many definitions for it. The one system definition consistently delivering high performance is that of DIN standard 18516, Cladding for external walls, ventilated at rear – Part 1: Requirements, principles of testing. This particular design is unique as it prescribes a vertical active and uninterrupted cavity. The continual ventilation cavity works with the natural flow of air. Hot air rises, so in the warm months, air naturally in the cavity flows. The cavity is typically 25 mm (1 in.) deep with an opening at the top and bottom. As the air flows through the cavity upward through single or multiple storeys, a vacuum is created. The vacuum is a natural and highly beneficial phenomenon largely due to the stack effect, which conveniently pulls and draws moisture, exhausting it as vapour from the assembly. This method of ventilation is superior to an interrupted system relying on an unnatural horizontal flow.

Proper ventilation will keep the envelope dry and exhaust heat energy.

There is also another benefit of this vertical active cavity. It is the ability to exhaust heat energy. In summer, when solar heat gain is bearing down on the facade, energy will naturally radiate inward. In an effort to keep the heat away from the core of the building and raise the interior temperature, it will be exhausted upward, out of the facade assembly and away from the building. The 25-mm active ventilation cavity is, in fact, a microclimate. This benefits insulated and non-insulated envelopes, but for the purpose of this article, the envelope will have some form of continuous outboard insulation. This microclimate is neither the temperature outboard of the cladding nor the temperature within the insulation plane, or the interior of the building.

The microclimate assists in stabilizing temperature fluctuations. It reduces the facade skin thermal stress. It limits solar heat gain from taxing the interior climate.

Designing for the coefficient of expansion and contraction will prevent cracking by allowing for movement (floating points) properly located on each panel.

A part of the assembly involves a weather membrane directly in front of the insulation, but behind the 25-mm plenum. This membrane performs the function of a secondary drainage plane. When precipitation enters through the open joint system often found in facades, the weather membrane will prevent the liquid moisture from entering the insulation plane.

These membranes can withstand a head of water. These membranes should ideally be ultraviolet (UV) stable and must be placed directly against the insulation to prevent buffeting, to counteract some of the ill-effects of wind load. If ambient moisture through condensation finds its way into the protected insulation plane, it can be drawn outward through the membrane as vapour through the vacuum created by the upward movement of air in the active plenum. This whole prescription and process helps address and respect the Ontario Building Code (OBC) division B Part 5 Environmental Separation and Part 9 of Housing and Small Buildings (particularly A-9.27.2).

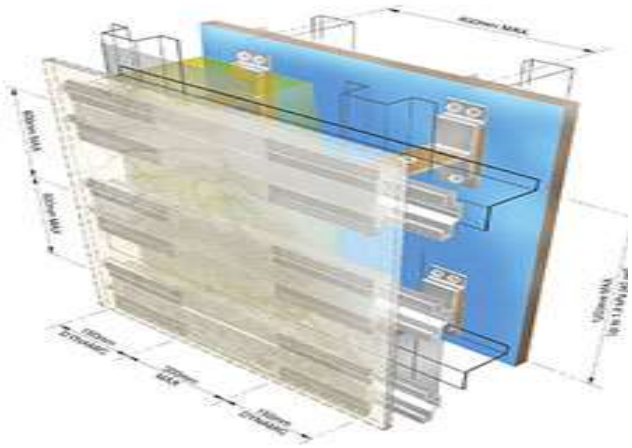
To summarize, ventilation through the 25-mm active cavity encourages the envelope to dry. Lastly, there is a thermal benefit from the cavity and microclimate. Engineering firm Morrison Hershfield found through finite analysis exploring a proprietary thermal clip in 2012 the 25-mm cavity offered as much as 0.7 R-value.

Mistake #2: Not designing for the coefficient of expansion and contraction

Facade materials expand and contract. Every building material has a unique value for coefficient of expansion/contraction. A critical design failure is ignoring of these fluctuations in façades and their substructures. Both systems engage in a dynamic dance with one another, and this is largely attributed to changes in temperature and humidity. Over the last 10 years, the author has witnessed façade cracking, warping/oil canning, and fastener failures. As the global climate changes, higher frequencies of extreme weather are placing greater stress on buildings, and, specifically, facades that are at the frontlines 100 per cent of the time.
This all points to designing dynamic building envelopes that can expand and contract with the environmental fluctuations facing it. Facade materials can be hung on a substructure in two ways: exposed or concealed fastening. Both of these methods can address the dynamism required to thwart failure. Proper design and installation of the systems is critical.
Taking a look at a typical face fastened (exposed) system, which is less expensive than concealed, fixed and floating points of fasteners are required to hold the facade skin to the substructure. This method ensures the facade skin is held back sufficiently to the substructure, but the nature of the floating points allows the panel to respond to expansion and contraction without locking up and binding. The fixed point(s) positions/locates the panel, where the floating points make up the majority of the fasteners. Floating points are created by over-drilling the fastener hole diameter by only a few millimeters larger than the fastener diameter. The amount of fluctuation is rather small in comparison to the overall size of the facade skin module, but repeated stress between the fasteners and the panel without the float compromises both the facade skin and fastener.

This is a very simple and affordable procedure, as well as an empirically proven methodology addressing an unavoidable condition, given the materiality in contemporary facades, typical building practices in North America, and the environmental conditions structures are subjected to.

Overtightening of fasteners is a detrimental, easily avoidable issue, and is essentially the equivalent of increasing the number of fixed points and removing float. With the help of available accessories (cordless rivet guns and rivet setting adapters), rivet assemblies have proven to be the easiest to moderate and the most promising for success. Emphasis on cordless rivet guns is key. The use of pneumatic guns and compressors drives the rivets with far too much force and creates overtightening. The use of threaded fastening solutions (screws) is another option to the rivet but it leaves the fastener tension in the hands of the installer and the impact driver. Impact drivers do not have clutches, so the tension is completely arbitrary. This can be disastrous. While many facade skin manufacturers endorse the use of threaded fasteners, the assumption is installation crews will use ‘all means necessary’ to modulate fastening tension so the ideal conditions are met. While this introduces a subjective element, it is this author’s opinion this is an unrealistic and unfair expectation of installers who are usually under time constraints or, in some cases, battling adverse weather conditions of either extreme cold through the winter or heat through the summer.



Proper substructure design and installation will extend the lifespan of the facade and give superior results.

Concealed fastening systems inherently have a design allowance for expansion and contraction. They also cost more than exposed fastener systems. At a premium of roughly 30 per cent upcharge (relative supply and installation cost) for concealed systems, the exposed fasteners, with the proper installation methodology, are economical and promise success.

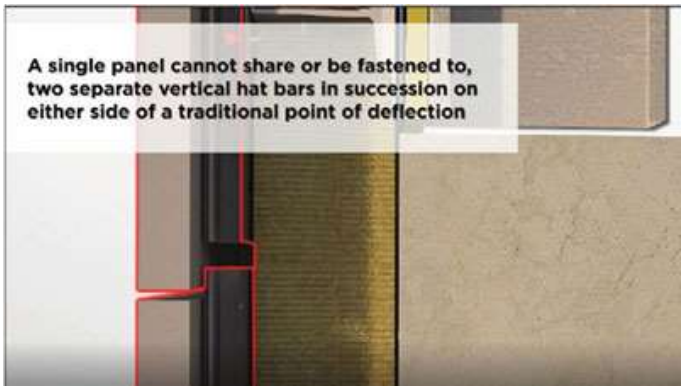
Mistake #3: Substructure design omissions and installation shortcomings

Facade systems are suspended outside of the superstructure. In Canada, the substructure facade skins are typically fastened to are 18-ga galvanized, which is light when compared to structural steel. The challenges faced here are many fold.

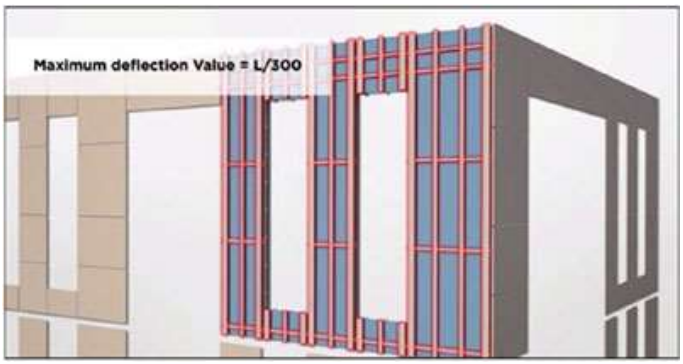
As mentioned earlier, a vertical cavity should exist directly behind the panel for good ventilation. Working from the panel back there should be a vertical 'hat bar' to support the panel. A horizontal plane of a Z bar, or equivalent will support the hat bar and insulation (assuming there is outboard insulation). In many cases, specific RSI values will be required, thus demanding the implementation of a thermal clip. The clip should be a part of the horizontal member, and best-case scenario would be for the product to be adjustable for sub wall misalignment. This results in a grid of relative lighter gauge metal (18 ga). One of the principle mistakes made in substructure design and installation occurs at slab edges where the vertical hat bar is extended over traditional points of deflection. It is best to think of it this way. The superstructure is wrapped in a light-gauge steel cage and has traditional points of deflection. The 18-ga net is left to bear the energy/force of this deflection. The outcome is the substructure gets torn apart or buckles, and the facade skin cracks or bows. Vertical members within the substructure must stop and start at each floor slab and respect all other points of deflection in a building.

They also require a gap between each other. This has been witnessed where lengths of vertical members—up to 8 m (25 ft) long—are stitched together with fasteners to climb the height of a building and cross over every floor slab. Too many times a lightweight facade skin will fall victim to this condition, crack or bow, and the skin material is assumed to be the issue.

When cracks occur in masonry walls, one assumes the building settled or shifted, and the blame is directed toward the 'settling of the structure,' and not necessarily the masonry. Lightweight façade systems are also at the mercy of this settling, shifting, and deflection phenomenon, and can experience failure just like masonry. However, these are often characterized as a 'material failures'. Lightweight facade systems can manage the movement with ease when the proper principles are adopted and implemented.



Hat bar must stop and start at traditional points of deflection.



Facade systems should be engineered for a deflection limit of L/300.

Another item to consider is when vertical members have joints, a singular façade panel should never cross the gap when being fastened to separate vertical girts in succession. As the substructure expands, contracts, and responds to the points of deflection, girts move independently and not always in the same direction or at the same rate. The panel modules should stop and start as the vertical members supporting them do. This principle also applies to expansion joints, though specific superstructure expansion joints will require a detail for far greater movement. Horizontal members in the insulation plane cannot be continuous either. A gap should be present when these members stop and start in succession. While movement along the horizontal members is not as common, notwithstanding expansion and contraction, they need to respect these basic principles as well. Girts, regardless of their configuration (Z, hat, exterior/interior corner) can all be ordered in various sizes to suit the specific project, and this can be determined during the shop drawing phase.
As discussed in the previous section, the opportunity for expansion and contraction of all components in the façade system is always present and when married with the traditional points of deflection in a superstructure, the big picture is quite dynamic. Designing and assembling a high performance substructure is not difficult, but the outcome of a poorly designed and installed one is.

Mistake #4 – Poor deflection limit of substructure

In the author's experience, substructures for lightweight façade systems should be engineered for a deflection limit of L/300. Girts and panels expand and contract. The superstructure will exercise some deflection, and in some cases/places, take the substructure with it. However, the substructure should not be experiencing an out-of-plane deflection of more than L/300.
Typical façade skin materials, such as panels of porcelain, high-density fibre cement, phenolic, ceramic/terra cotta, promise great performance and longevity when designed and installed correctly. When a substructure has more deflection in out-of-plane conditions, it will place unnecessary stress on panels and the fastening system, resulting in panel cracking and distortion. For many Canadian scenarios, designing a substructure with 18-ga girt systems is a great start to achieving a limit of L/300.
Spans between the members and the respective fastening points will play a large role in determining this deflection limit, but there are other key factors as well. For example, 'hat bars' are being used for the vertical members directly behind the panels.
These are sometimes called 'omega' channels. Hat bars, due to their shape, have higher deflection resistance than a Z bar of the same size and gauge.
Designing a substructure that suits the products fastened to it and engineered to confront the dynamic conditions surrounding it of not only today, but tomorrow will give the 'frontline systems', the advantage they require to deliver the required performance.

Mistake #5 – Inadequate shop drawings

The Collingwood Firehall in Ontario features a wood veneer façade used with rivets whereby one of four exposed fasteners are fixed and the other three are floating points to allow for the coefficient of expansion and contraction. Project team includes MCL Architects and GRC Contracting.

In the Collingwood Firehall project, superior shop drawings clearly outlined that no two panels would be fastened to two girts in vertical succession.

It will present a 'system drawing' that could be a few pages long depending on the project's complexity, and illustrate the fundamental principles of fastener spacing, ventilation cavity in sections and plan view, and the substructure assembly for quick reference at any time during the façade installation. The shop drawings should also detail the fixed and floating points of fasteners (for exposed fastener conditions) as well as the components and placement of concealed fastener systems when applicable. An elevation view of substructure layout is also common. Concluding the shop drawings should be general notes itemizing in detail all the components going into the façade assembly (fasteners, girts, membranes, panel manufacturer and makeup, etc.). The main body of the shop drawings will present elevation views of all applicable areas for installation of the façade and a comprehensive panel layout. Details in section view will be provided showing how the façade system assimilates with windows, flashings, adjacent materials, roof, exterior/interior corner conditions, horizontal/vertical joints between façade skin, and expansion joints in superstructure.

While the content of shop drawings is plentiful, and the time and effort to complete them is significant, the value is unquestionable. Everyone including designers, constructors, and end-users benefit from complete, high-quality shop drawings. The complexity of construction has increased in recent times to embrace more sophisticated assemblies with higher thermal performances to address the challenging effects of climate change. With this added complexity and the need for more resilient structures, it seems logical to eliminate the unnecessary variables (*e.g.* shop drawings) diminishing the quality of façades.

To view the full article, click here:
https://www.constructioncanada.net/publications/de/202006/

MEET YOUR NEW SPECIFIER EDITOR

Johnson Teodocio is a CTR and a CSC member since 2019.
In 1995 he completed his Bachelor of Science in Mechanical Engineering in Manila.

For more than 20 years, he's been working in the construction industry with project coordination, management, and estimating. He works currently as a Senior Sales Engineer and as an Architectural Rep for TORMAX Canada Inc.

He is currently an active member of the Canadian Healthcare Engineering Society, CHES, and the Vancouver Regional Construction Association, VRCA. His passion and commitment to the construction industry motivates him to have a CSP designation and is aspiring to take the course soon.

Winter, spring, summer, or fall, when out of office, he does his car maintenance in his garage and helps his three adult children as well hoping they'll pick up the learnings. He also enjoys doing home chores, building anything around the house, or working in their backyard in Maple Ridge, BC.

WELCOME Johnson!

A LOOK BACK AT THE VANCOUVER CHAPTER, YEAR-END SOCIAL …

CSC Vancouver Chapter hosted an end-of-the-year social at the Vancouver Curling Club last December 9th, 2022.

The logo was displayed at the event and on all social media posts. Bar top-sized tabletop display and verbal recognition during the event.

Registration for participants included a Curling session, in which a coach guided the players. The coaching includes curling basics (rules, slide & delivery) as well as a mini game at the end of the session.

Big thanks to the participants and John Alley for facilitating the event.

It’s always nice to spend time with the fellow CSC members and guests in celebration of the year-end as we look forward to the next!

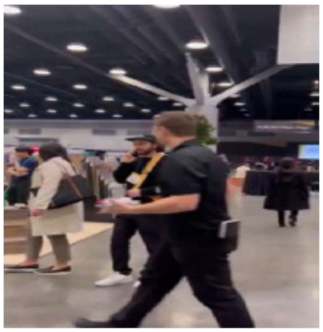
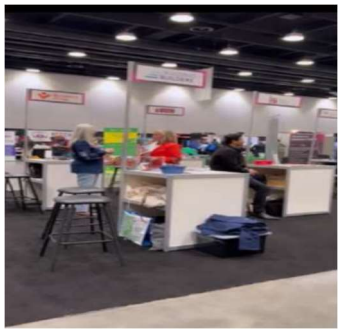
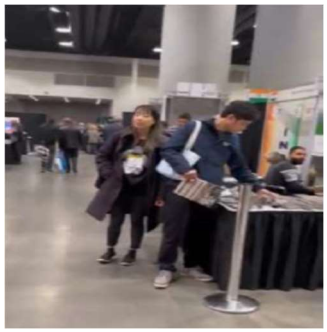
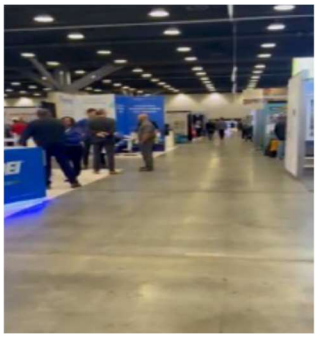
BUILDEX Vancouver 2023

The Buildex in Vancouver took place last February 15-16, 2023.

Engineering, Design, Construction, Architecture, Property Management professionals, and homebuilders & Renovators connect on this two-day trade fair event.
Visitors explore new products, services, materials, technologies, and the latest trends in the industry.
This event is also an opportunity to add new contacts to your network and exchange ideas with industry professionals and colleagues.
In addition, there are also scheduled AIBC-supported sessions with different building industry topics.

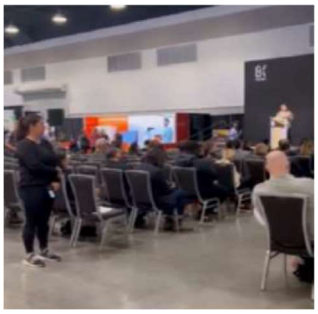








MARK YOUR CALENDAR:

IN-PERSON CHAPTER LUNCH MEETINGS:

April 13, 2023 -------- Firestop with Div7

UPCOMING EVENTS:

April 16, 2023 -------- SunRun
May 24-28, 2023 ---- National Conference Calgary
July 28, 2023 --------- Golf Tourney
October 19, 2023 --- Octoberfest Trade Fair

PROGRAM COMMITTEE

DO YOU HAVE A PRESENTATION IDEA?

Please feel free to reach out to me
.

Ismael Abreu, CTR
Program Officer

IKO Industries
Tel: 604 701 2859 N/A
ismael.abreu@iko.com

A NEW LOOK

Let us know what you think!

We are trying out a new format fo the Vanccouver Chapter E-Specifier, but it is a work in progress.

If you have comments or suggestions, or would like more information about the newsletter, please reach out to Johnson Teodocio at johnson.teodocio@tormax.ca

WE ARE CSC !!