

Specifier

February 2020

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Have an IDEA for the

Specifier?

We would love to hear from you!

Announcements, upcoming events, or technical articles are welcome and encouraged!

Any submissions for the Specifier can be emailed for review and we will do our best to get it into print. Deadlines are the last Friday of the month for the following month's newsletter.

Share your knowledge — this is YOUR industry!

Randy Smith Newsletter Editor

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2019-2020 PROGRAM

JULY 14 Fort Langley Golf Club	CSC SPEC GOLF 2019		
SEPTEMBER 12 11:30 am Lunch Sandman Hotel, Vancouver	BCBC Changes Andrew Harmsworth, GHL Consultants		
OCTOBER 22 3:00 pm - 7:00 pm Italian Cultural Centre, Vancouver	Transforming Building Systems & Innovations in Energy Upgrades in Multi Family Renewals, Planning & Design Tony Gioventu, Executive Director of CHO		
NOVEMBER 14 11:30 am Lunch Sandman Hotel, Vancouver	CSA A123.21 Updates for Dynamic Wind-Uplift Requirements James Klassen, RCABC		
DECEMBER 12 11:30 am Lunch Sandman Hotel, Vancouver	Understanding Fire Safety Requirements for Exterior Walls Keith Calder, Calder Technologies		
JANUARY 9 11:30 am Lunch Sandman Hotel, Vancouver	Roles & Responsibilities of Consultants and How to Mitigate Liability Taymaz Rastin & Stephanie John, Jenkins Marzban Logan LLP.		
FEBRUARY 13 11:30 am Lunch Sandman Hotel, Vancouver	Lightweight Insulating Concrete in Relation to Sustainable Building Design John Rose, Siplast		
MARCH 12 11:30 am Lunch Sandman Hotel, Vancouver	Importance of Air and Vapour Barriers in Specific Interior Conditions: Observations from the Field Guillaume Vadeboncoeur, P.Eng, WSP		
APRIL 9 11:30 am Lunch Sandman Hotel, Vancouver Chapter General Meeting 12:00 pm	Prefab Panels and Modules in Construction. Brian Hubbs, RDH Building Science		
MAY 14 11:30 am Lunch TBA	Building Tour, Location to be Announced		
MAY 20 - 24 Montreal	CSC National Conference 2020		

** IF ANYONE HAS A PRESSING/DESIRED TOPIC OR SPEAKER, PLEASE REACH OUT TO EITHER TODD, JOSH, OR BRENT.

CSC Mandate: Construction Specifications Canada (CSC) is a national, multi-disciplinary, non-profit association dedicated to the improvement of communication, contract documentation and technical information in the Design & Construction Industry.



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WORDS FROM THE CHAIR

I don't know about you but I am personally done with the Winter and looking forward to the Spring.

So many days of heavy rain and snow this year ...



"Snow is nice to look at but it belongs in Whistler where we can ski on it!"

I wish you all a bright and beautiful spring season.

Look for new growth and get your gardens ready for an early spring (according to the reliable Groundhog).

— Chapter Chair, Brian Maher, CTR





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THANK YOU TAYMAZ!

On Thursday, January 9, 2020 Taymaz Rastin a lawyer at Jenkins Marzban LLP presented on the roles and responsibilities of the various types of consultants in restoration and new construction. His presentation explored their roles and responsibilities and what



Thank you Taymaz for your in-depth presentation. To see the full CSC Educational Series Luncheon schedule visit www.csc-dcc.ca/ chapter/Vancouver

THANK YOU PETER!

The guest speaker for our CSC Educational Series in February was Peter Gross of Siplast.



Peter shared the features and benefits of using Light-Weight Insulated Concrete Systems. The discussion included Energy efficiency, sustainability and environmental responsibilities.

Thank you Peter for speaking. We looking forward to seeing everyone at the March 12 educational presentation.



An Introduction To Thermal Bridging

Courtesy of IKO Industries Ltd. https://www.iko.com/

A thermal bridge is a pathway that heat uses to get in or out of a building, bypassing the insulation layer. For example, your roof may be well insulated, but a metal plumbing vent that passes through the roof and its insulation can carry heat in or out of the building. Heat moves not just through the air space in the vent, but through the metal itself. If it's winter and you're trying to keep your building warm, a cold plumbing vent will let heat escape outside. This reduces your building's energy efficiency, makes it colder and forces the occupants to increase their heating to compensate.



The heat escaping out of the building through the metal pipe, could produce condensation with the temperature change.

Depending on whether you're trying to keep heat in or out of a building, a thermal bridge might be referred to as a cold bridge, heat bridge, or a thermal bypass. No matter what you call it, anyone who owns a building or works with the building envelope must account for thermal bridging. If you can reduce thermal bridging, your building will be more energy-efficient, will keep conditioned air inside longer and will cost you less in heating or cooling.



Why is Thermal Bridging Important?

Thermal bridging is a fundamental concept of heat transfer, and it has certainly affected buildings for decades, so why has there been so much emphasis on thermal bridging lately? As building insulation becomes more efficient, thermal bridges become more significant obstacles. Previously, heat would seep out of a building's walls as well as any thermal bridges. Now that walls are more adequately insulated with interior insulation, the heat has no choice but to find and use bridges instead.

This is very unfortunate for passive buildings and energy-efficient buildings. While the insulation used in the building has a specific R-value, a thermal bridge will reduce the actual R-value the building (as a whole) achieves. As a result, many energy efficient and green building standards have started to call for a building's actual R-value, called the effective R-value, rather than assuming the building automatically achieves the insulation's R-value. This is a more demanding standard to achieve.

What are the Impacts of Thermal Bridging?

It's not just green building owners who will be affected by thermal bridging. Instead, this phenomenon has several impacts on the overall quality and longevity of any insulated structure.

1. Loss of conditioned air: The primary impact of a thermal bridge is that it will allow conditioned air to leave the building, losing heat in cold weather and gaining heat in hot weather. This may have a significant impact on the comfort of the occupants, not just in the overall temperature they experience, but also when they touch colder or hotter than average walls and floors. If your building must maintain a certain temperature, whether it's room temperature for people or a specific temperature for stored goods, a thermal bridge can make it more expensive to maintain that temperature.

2. Loss of energy-efficiency: A building that relies on insulation to achieve its energy-efficiency standards may be thwarted by thermal bridging. Design and construction choices that encourage thermal bridging may cause the building to fail to qualify for energy standards, achievements, and awards.





3. Increased condensation: As thermal bridges allow for warm air to mingle with colder air, they frequently encourage condensation. This effect is more pronounced in areas with high humidity than in areas with low humidity. When condensation occurs in a building, it has many impacts on air quality. It may allow for mold growth and negatively impact the health of building occupants, especially those with breathing problems. Constant dampness may also cause damage by ruining drywall, furniture, and other items.



4. Interstitial condensation: Condensation from a thermal bridge may not end up on the interior of the building. Instead, it may collect in between the walls and other building elements. This is called interstitial condensation. It has serious impacts on the longevity of the building in question. Wherever moisture collects, rot and rust may follow. If you cannot see the condensation, because it is in the walls or pipes, you will not fix the damage it causes. When left unchecked, rot and rust can cause damage to your building.





ROOFING CONTRACTORS ASSOCIATION OF BRITISH COLUMBIA

Laurence Matzek Director, RoofStar Guarantee Program laurence@rcabc.org 9734-201 Street, Langley, BC V1M 3E8 Tel 604 882 3427 rcabc.org **5.** Reduce insulation effectiveness: If you purchase high-end insulation, you want to make the most out of it. However, serious thermal bridging problems can interfere with the effectiveness of new insulation, unless that insulation blocks the bridge. As a thermal bridge is more heat conductive than the insulation you place next to it, the heat will continue to use the bridge. You will likely see diminished returns from new insulation unless you correct the underlying thermal bypass.

Where can Thermal Bridging Occur?

The impacts of thermal bridging are quite important. Naturally, you'll want to discover if your building is suffering from it. A professional equipped with a thermal imaging camera can capture a map of where heat is escaping or intruding in your building.

Where will the thermal bridges be? Anything that penetrates the building envelope can offer heat a bridge out or in. You may find a thermal bridge in any of these areas:

- Spots where the roof and wall connect.
- Spots where the floor and wall connect.
- Pipes, cables, and vents that puncture the building envelope.
- Window and door openings or framing.
- Steel wall ties & other metal fasteners.
- Balconies and their supports.
- Wall studs, whether wooden or not.

After making a heat map that exposes these thermal bridges, a professional can also calculate your building's thermal bridge coefficient. This value measures how significant your thermal bridging is. However, it is quite unlikely you'll have no thermal bridging at all. Instead, a coefficient value of 0.01 means that your building is about as thermally secure as it can be.

The Types of Thermal Bridges

The severity of your thermal bridging isn't just about location, it's also about type. Thermal bridges can be classified into three main types, each with a different impact on your building.





The three types of thermal bridges are:

1. Linear thermal bridges: The impact of a linear thermal bridge is larger, the longer the bridge is. This type of thermal bypass occurs where two linear parts of the building intersect, including at corners, parapets, etc. The example below shows a balcony slab intersecting the wall of the building. This will cause a linear thermal bridge.



2. Assembly thermal bridging: Also called clear wall thermal bridging, these thermal bridges are part of the flat wall, not the corners or junctions. They may include framing or other parts of the assembly. The example below is a thermal image of metal wall framing. Assembly thermal bridging is usually accounted for when buildings are being tested for their energy code compliance.



3. Point thermal bridges: These are thermal bridges that occur at small points, such as an improper insulation fastener. Point thermal bridges may sound the least harmful, but size is not the most important thing about a thermal bridge. Think of a thermal bridge as a hole in a balloon, it may be small, but it will let out a lot of air. Small thermal bridges allow for a lot of heat transfer, especially when they are repeating. The image below shows improper insulation fasteners acting as thermal bridges.



All three thermal bridge types may be repeating or nonrepeating. A repeating thermal bridge will be found regularly throughout the building, such as the framing. Non-repeating thermal bridges don't appear in a regular pattern throughout the building. Windows and doors are a simple example. We'll discuss the strategies you can use to reduce all three types of thermal bridging below.

How to Prevent Thermal Bridging

Preventing thermal bridging starts with your architect. Certain design decisions can prevent common thermal bridges in the first place. Architects must consider shelf angle, structural choices about how to mount the windows and doors and whether to include parapets and other potential heat-bridge features. It's wise to talk to your architect about their experience and how they plan to reduce thermal bridging. You may also consult with a dedicated energy efficiency expert. You can find these professionals through Energy Star[®].

If you're concerned about an existing building, you may find it a challenge to reduce thermal bridging. Especially in multi-level buildings, thermal bridges are often repeating, which means it will take significant work to fix them all.

Though it may be challenging to reduce thermal bridging in a preexisting building, there are several solutions you can implement to do so. Options include the placement and type of insulation and fixtures. Before you consult with your experts and decide which strategy is best for your building, it's important to understand all of your options to stop thermal bridging.

Thermal Breaks & Thermal Bridging Solutions

Imagine a thermal bridge as the Brooklyn Bridge and the heat as the cars on the bridge. If so, a thermal break is a toll booth on that bridge, a toll booth that's always closed. In construction terms, a thermal break is a layer of insulating material (or just a material with better thermal resistance) in an object or building feature that might otherwise act as a thermal bridge. For example, thermal bridging in windows is common, and the glazing is a thermal break intended to reduce the travel of heat from one pane to another.





Thermal breaks can be installed during construction or afterwards. Recently, building owners have begun to install thermal breaks in parapets. Parapets are the low walls along the edges of roofs. Usually, these walls act as linear thermal bridges, pulling heat out of building below. You can see in the thermal image below that the presence of a parapet reduces the temperature of the interior of the building, where there's yellow.



To break this thermal bridge, you must install a layer of installation not inside of the building, but into the parapet where it joins the roof face. This way, the bridge is blocked and significantly less heat can move through it. The image on the right shows how well the heat is retained after the thermal break is installed. The break was installed where the image shows new dark blue.

Thermal Bridging Insulation & Installation

If your building has a poor U-value, improperly installed installation, or inadequate insulation, may be contributing. Gaps between the insulation, poor fastener choice, or poor choice of tape, can allow for thermal bridges between the sheets of insulation.

In our insulation fastener guide, IKO recommends using thermally broken plastic washers to help reduce the effect of thermal bridging through the fastener. You may also choose a fastener that is itself thermally broken. Lastly, the tape your contractor uses to hold the sheets together can also be thermally broken.

Continuous Insulation

As thermal bridges can occur throughout the building envelope, one strategy to combat them is continuous insulation. This is not just your standard procedure of cutting insulation tightly to fit into the walls and taping them together, though that is important to ensure an insulation's effectiveness. Instead, continuous insulation is installed on the exterior side of the walls, so it isn't broken up by wall components, except service openings and fasteners.



Placing insulation on the exterior of the wall doesn't seem like it would make a significant difference, but testing reveals that it does. The image above shows the difference in heat retention between two walls. On the left, the insulation pressed against the internal sheathing. On the right, the insulation pressed against the exterior gypsum.

Just as with the parapet, it's desirable to cut off the thermal bridge at the most exterior point available in the wall. It's best to keep the cars from getting on the bridge, rather than allowing them to collect at a blockade on the other end.

In a multi-story building, interior insulation cannot be continuous. In order to meet building code standards that require continuous insulation, as many local codes now do, the insulation must be installed over wood studs and before sheathing.





Exposed slabs can act as thermal bridges that can increase a building's U-value by 71 percent, especially when repeating. Continuous insulation is the best strategy to combat this.

For thermal bridging insulation, Polyiso rigid foam insulation is best. IKO's polyiso rigid foam products include Ener-AirTM & Enerfoil® Wall Insulation. Both are designed to be on structural sheathing with high thermal R-values, precisely what you need to limit thermal bridging. Both products may also be retrofit into existing buildings, see the insulation installation guide for more details.

If your building calls for masonry, you must also install masonry ties. Both of our insulation types are suitable for masonry ties. Further, choosing a tie with as low a thermal transmission rate as possible will help reduce thermal bridging.

Insulated Building Slab

The building envelope doesn't just go up to the roof, it also goes into the slab. Concrete slabs can act as thermal bridges. Many cold-weather areas, particularly in climate zones four and higher, require you to insulate your building slab. It's also best if the continuous exterior insulation and building slab insulation come into contact with one another, so no thermal bridge can develop in the gap between them.



This way, you'll have entirely continuous insulation, and the best protection from thermal bridging available, at least for now.

Building Codes for Thermal Bridging

When it comes to thermal bridging, building code change has been slow. It is often challenging to measure the effect of thermal bridging, which makes it challenging for professionals to make standards around them. In fact, before the advent of 2D and 3D computer models, it was almost impossible to analyze where thermal bridges were and what effect certain construction decisions may have on them. For now, the International Energy Conservation Code (IECC) requires continuous insulation and thermal breaks on new buildings. These changes should help buildings meet the IECC's new minimum U-Factor. The U-Factor is the measure of how much heat flow can transfer through the building as a whole. It's a cumulative R-value. New techniques for measuring U-Factor are better at accounting for thermal bridges.

Your local codes may be more specific about how you should combat thermal bridging. You'll also find that codes differ by nation. The likelihood of winter humidity over 35 percent in Canada is quite low, meaning it is a challenge for thermal bridging to create much condensation. Thus, the local building codes in the country generally have less stringent thermal bridging codes as compared to areas in the United States with higher levels of humidity.

Even if you have met your local building code obligations, these strategies may not be enough to meet your personal goals for your building.

The Future of Thermal Bridging

Thermal bridges are becoming ever more important aspects of building construction. You can be sure that building codes will continue to change to take them into account. Reducing thermal bridging will continue to challenge architects, manufacturers, and everyone involved in the building envelope.

Reducing your building's thermal bridging will help you maintain air quality, keep energy costs low, and increase environmental efficiency.

Article courtesy of Iko Industries Ltd www.iko.com





AWARD NOMINATIONS

As you are no doubt aware, the lifeblood of our association is volunteers lwho donate valuable time and effort for the betterment of Construction Specifications Canada.

Earlier this month the Vancouver Chapter nominated the following members for extraordinary efforts.

Tony Martinelli, Pinchin Ltd.

We proudly select Tony Martinelli as our 2020 Nominee for Chapter of Merit award winner.

Tony has been a committed member of the CSC Vancouver Chapter for many years. Always attending every event and showcasing his support for new projects as well as keeping us on track for our regular business. Tony has been instrumental in bringing better education programs. Tony teaches educational programs when needed. In addition to his role as Education Officer, he serves the Chapter adding value to Educational Luncheon Series Program. He often secures Guest Speakers and trade articles for our monthly newsletter.

John Alley, Custom Building Products

We proudly select John Alley as our 2020 Nominee for Chapter of Merit award winner.

John has been a committed member of the CSC Vancouver Chapter for many years. Always attending every event and showcasing his support for new projects as well as keeping us on track for our regular business. John keeps our accounting clear and concise serving as the Chapter Treasurer. John also asks vital questions that help to guide the team. We greatly value his contribution.

Brian Maher, Rhino Flooring

We proudly select Brian Maher as our 2020 Nominee for Chapter of Merit award winner.

Brian has been a committed member of the CSC Vancouver Chapter for many years. Always attending every event and showcasing his support for new projects as well as hosting our monthly meetings. Brian has great ability to plan and execute projects and lends this skill to all of our annual projects. He keeps us on schedule and on track!

Brian leads the Vancouver Chapter as the Chapter Chairman. He has been very active in bringing the Chapter new ideas and has visionary leadership approach which is very exciting!

CSC VANCOUVER MEMBERSHIP

We're up to 165 members! Help us break the 200 member goal this year: let's talk about how we can maximize the benefits and work together to get them!

New and returning members growing our community last month:

Amy Roberts, PFG Glass Industries Keith D'Souza, PAPI Lincoln Mohammed, Sherwin-Williams Paints Alvin Luke, Engineered Assemblies Darren Smith, Engineered Assemblies Andrew Dennis, TIGER Drylac Powder Coatings

Focusing on new endeavours:

Ms. Melodie Pike, CTR – Thank you for your years of service to the CSC and your energetic positivity! Enjoy your free time, finally!

For More Information on Membership:

- Call your friendly membership guy, JP LeBerg P: 778-866-4993 | E: jp.leberg@ardexamericas.com
- 2. Visit our Chapter website at http://vancouver.csc-dcc.ca
- 3. Attend one of our luncheon meetings and meet happy attendees

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BUILDING COMMISSIONING

Courtesy of Pinchin Ltd. - www.pinchin.com

In this article we will go through the basic questions on Whole Building Commissioning and the value it provides to building Owner(s).

What is Commissioning?

Commissioning (Cx) is a systematic process that documents the construction process via a series of construction checklists, issue logs, and functional tests. It is a process developed by the project team to ensure that the building is functioning as intended. If this sounds like an obvious requirement for a building, you would be surprised how often this process is missed.

Building Commissioning is rapidly being embraced by public and private organizations because of its benefits to the building envelope and it provides improved project delivery results.

Traditionally, the mechanical and electrical systems of a building were commissioned. Mechanical systems include, ductwork balancing, temperature and relative humidity (RH) control, building automation system (BAS) control valves, steam traps, pumps, boilers, etc. There is currently more emphasis on the commissioning of the building envelope. Building envelope systems, such as, glazing systems, wall assemblies (pre and post construction), roofs, whole building air barriers, and waterproofing systems can also be tested and commissioned. Below are some examples of building systems that can be commissioned:

- Window assemblies for air and water leaks.
- HVAC systems, pumps, air balancing.
- Lighting measurements and controls.
- Wall assembly simulations. Will there be condensation under unique indoor/outdoor conditions.
- Whole building air tightness has a huge effect on HVAC system loads and energy costs.
- Ongoing measurement tools (ie. water sub-meters, gas meters, BAS)
- Training and how to properly operate the building.
- Indoor air quality and filtration system.

Why is it necessary?

The Cx process ensures that all building systems are installed, calibrated, and perform in synergy according to the Owner's Project Requirements (design intent) and Operational Needs. It is simple enough to design a building that appears to meet the owner's needs but the true test is whether or not if performs as expected. Do the HVAC systems maintain temperature and RH between set-points, do boilers and pumps switch from lead to lag, do windows and walls keep the rain out, is the air barrier system performing as expected? These are all items that get confirmed and addressed during the Cx process.

As building owners evolve and as the building code officials (may or may not) become more stringent on energy use for new buildings, the actual performance of a base building system will matter more than ever. The performance of the building systems has a direct relationship with the overall operating costs. Operating costs have the tendency to re-occur each and every month over the life of the building and must align with the owner's portfolio performance expectations.

The building envelope interacts with the environment to provide heating or cooling load to the HVAC system. The performance of the building envelope has a direct effect on the HVAC equipment size, operation cost, and the occupants' comfort. The commissioning of the building envelope should also include the review of the overall projected life of the systems and each one of their components. Installing a 10-year screw in a 25-year cladding system tends to lead to premature replacement costs and avoidable headaches.

Who is on the Cx Team?

All members involved in the construction process will at some point play a role in the Cx process. This includes everyone from the Owner(s), Prime Consultant/Architect, Structural Engineers, Mechanical and Electrical Consultants, Building Envelope Consultants, Developer, General Contractors, Sub-Contractors, and Maintenance Staff. The Project's Commissioning Agent (CxA) does have a role, but significantly leans on the designers and installers to complete many of the Cx tasks. A CxA and Owner(s) should also strongly consider an Energy Manager be included on the Cx team.

The stakeholders also have a critical role in the Cx process. They need to develop, with the help of the Cx Agent and designers; what is known as the Owner's Project Requirements (OPR), which will dictate much of how the building is designed by the various consultants.

Based on ASHRAE Guideline 0-2013, the OPR should include:

- Overall Project goals.
- Measurable performance criteria for each system. If you cannot measure it, how do you know it is performing? When evaluating the installed system, it must either pass/fail (i.e. lights turn on when someone walks into a room), or meet a threshold of acceptable performance, (i.e. maximum acceptable air changes per hour for the building envelope).
- Cost considerations.
- · Identify success criteria.
- Supporting information to justify design choices and system performances.

When do you undertake Commissioning?

The Cx process starts in the concept phase and continues beyond the warranty period of the building. The process starts with the CxA and Owner(s) developing the OPR prior to the



design process. It should be clear to all designers what the Owner(s) is expecting from the building before the design process begins. The designers need to understand what type of performance is expected. Performance requirements vary depending on the Owner(s), occupancy, and use. Performance requirements may be based on total energy usage, greenhouse gases (GHG) (not all energy is created equally and have different GHG footprints and costs), occupancy comfort, lighting requirements, indoor air control, etc.

The Phases of a Commissioning Project

- I. Commissioning planning phase (Includes Pre-Design and Design Phase), construction phase, occupancy, and operation phase.
- 2. Design phase (verify the basis of design document with OPR, develop construction check list, develop system manual, define training requirements, commissioning focused design review).
- 3. Testing phase.
- 4. Preventative maintenance and benchmarking performance. Creation of a detailed maintenance program. Maintenance is a key part of energy efficiency. In order to confirm everything works accordingly, the building operations will be reviewed six (6) to ten (10) months after substantial completion.

Commissioning Examples:

Air Assessment: Air assessment (e.g. to verify if the system behaves as intended) is part of the commissioning process; one of the tasks is to check the equipment conditions. Verifying that the fans in the rooftop units are correctly installed should be part of the maintenance program. This requires little or zero investments. Proper maintenance of air-handling equipment can prevent energy waste and help to ensure the comfort of building occupants.

Whole Building Air Leakage Testing: Whole building air leakage testing has gained traction in recent years and is a great way to test the air barrier system of a building as a whole. The process allows the Cx team and Building Envelope Consultants to test the performance of the air barrier and identify and rectify any deficiencies. Various standards and performance requirements can be specified for the air barrier and should be determined early in the design process. The Owner(s) and Prime Consultant typically work with the Building Envelope Consultant to determine a specific air barrier performance criteria that works for all parties or that have been mandated by a jurisdiction having authority. A tighter air barrier system may require changes to the building envelope design and could potentially increase construction costs. During testing, all intended openings should be sealed. Re-testing without seals at these openings can be performed to test performance of the dampers. In high rise buildings that are already occupied, testing of one floor at a time can be completed if maintaining a zero pressure difference between adjacent floors.



Roofing Preventative Maintenance: Preventative maintenance on the roofing system should be considered during the Retrocommissioning or Re-commissioning of an existing building. As with any Cx, Retro- and Re-commissioning are processes to ensure building systems are operating optimally to meet current occupant needs (CanmetEnergy, Natural Resources Canada, 2008). Most roofing issues do not happen overnight and can be addressed if regularly reviewed. Often issues are easily fixed and caused by blocked roof drains. Typical deficiencies may include: membrane blisters, membrane ridges, wind scouring effects, membrane shrinking/tenting, debris, blocked drains, unsealed penetrations, degranulation, "oil-canning" of metal panels, open seams, and punctures. Even a simple visual review of the roof with a checklist to note severity of degradation can be part of the Cx process. Reviewing the drying patterns can provide valuable information on the performance of the roof drainage system. Replacement specifications can include a maintenance protocol and may have been part of the design requirements highlighted early on in the process. Frequency of maintenance depends on the age of the roof, building size, usage, and type of roof. A visual review of the roof should be completed at a minimum of twice per year. Thermographic analysis of the roofs should be completed every five years. The above mentioned should be part of the Preventative Maintenance (PM) plan and part of the Cx plan because it ensures that the roof system is performing as intended. It should also be highlighted that the roof system may consist of many other systems such as the air barriers, weather/water barrier, vapour barrier, and thermal barrier.





Sub-Soil Gases: Some jurisdictions are now mandating sub-soil gas mitigation systems in their new buildings. The design and construction of these systems can be completed with little investment, compared to the overall cost of the building, but can have a huge effect on occupant health. Radon, for example, can be easily mitigated by using a few small fans, perforated piping, and gravel. For more information on Radon, see Pinchin's article in Pushing the Envelope's Spring 2017 edition "Recognizing Radon in the Building Envelope: How to Control it & Protect Yourself". It is no longer acceptable to install the system and assume that it is working properly. Testing for Radon is required before and after activation of system to ensure that it is actually performing and maintaining Radon levels within acceptable levels. Similar to many other systems, testing should be completed to ensure the system is working as intended and there is no way of knowing this until the building is constructed and system is operating.

HVAC/Controls: The Cx Agent will review the overall designs to ensure they meet the OPR. During the review process, the Cx Agent observed that the garbage room in the basement of a new mid-rise construction was designed with two independent HVAC systems. The heating was provided by a hydronic unit heater and cooling via an air-handing unit and direct expansion coil. This would not necessarily be an issue other than the fact that two independent thermostats controlled each system and are not communicating with each other. During the warm summer months, it is conceivable that the building operator would decrease the temperature set-point for the air conditioning. If the temperature set-point is not re-adjusted during the winter months, and there is no buffer between the heating and cooling, both systems may be operating at the same time, and fighting each other to maintain their set-points. In this case, the Cx process was able to avoid excess wear and tear on both HVAC systems and likely had a positive impact on; ongoing operating costs, maintenance, premature equipment failure, warranty callbacks, and occupant comfort.

Overall Philosophies

Earlier in this article we discussed the current emphasis on commissioning of the building envelope. Being the system that keeps the outside out and the inside in, it has the largest influence on the energy use of the building. With technology advancement, condensing boilers and furnaces are reaching higher efficiency ratings, the limits of energy efficiency are within sight. Instead of focusing on efficiency, the construction industry has wisely shifted its priority towards energy conservation.

Focusing on energy conservation from the early stages of design provides benefits throughout the life of the building. With a smaller energy requirement for indoor comfort, HVAC systems can be reduced in size, overall energy costs will be reduced, and equipment will have to cycle less frequently, reducing maintenance costs, and extending the overall life of the building.

Benefits of Commissioning

The benefits of a properly commissioned building will last the life

of the building ensuring that the Owner(s) receive the building they paid for and allowing it to operate at peak performance. Generally speaking, an issue discovered, resolved, and avoided during the commissioning process, pays for the Cx process itself.

- · Buildings and systems function as intended.
- Operators know how to operate the building in the optimal way.
- Improved occupant comfort.
- Reduction in energy consumption.
- · Extended life of building systems.

Resources

ASHRAE offers several resources to help guide your team through this critical phase of a construction project:

- · Commissioning Stakeholder's Guide
- FREE Strategic Guide to Commissioning
- Standard 202-2018 -- Commissioning Process for Buildings and Systems
- Guideline 0-2013 -- The Commissioning Process
- NEW Guideline 1.2-2019 -- Technical Requirements for the Commissioning Process for Existing HVAC&R Systems and Assemblies

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DATES & LOCATIONS:

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SPECIFIER (SP) COURSE

March 2 – 8, 2020 • Toronto

TR COURSE March 4 – 8, 2020 • Toronto

For other workshop locations and dates, please go to http://csc-dcc.ca/Education/ CSC+Education+Workshops+/

COST: (Members) \$1199 plus tax (Non-Member) \$1399 plus tax

Cancellation: A cancellation fee of \$250 plus tax applies if 21 days or more before the workshop. No refunds issued less than 21 days before workshop.

For additional information on courses please go to **csc-dcc.ca/education**.

COURSES:

Construction Contract Administrator (CCA)*

The course is designed for those individuals involved in construction administration, including Contract Administrators, Property Managers, Architects, Engineers, Interior Designers, Specification Consultants, Building Authorities, and Bonding and Insurance Agencies.

This course is a requirement for the Certified Construction Contract Administrator (CCCA) designation.

Course Outline:

- Construction Industry participants
- Bidding Requirements and Process
- Alternatives and Substitutions
- Standards and Regulatory Influences
- Site Activities
- Execution of the Work
- Certificate of Payment
- Changes in the Work
- Dispute Resolution

Technical Representative (TR)

The TR course will provide a better understanding of contract documents and bidding procedures, product representation, professionalism, and ethics, and will provide a new depth of understanding and explanation of concepts beyond what was previously introduced in the PCD course. The course is designed for the individual involved in the supply section of the construction industry such as manufacturer representatives, agents or distributors of products. The student will have successfully completed the PCD course.

This course is a requirement for the Certified Technical Representative (CTR) designation.

Course Outline:

- The Project Manual and Drawings
- The Technical Representative and Consultants
- Construction Product Selection Process
- Materials Selection and Substitutions
- Construction Product Representation
- Effective Technical Assistance
- Information Management and Product Literature
- Product Presentation Techniques

Construction Insurance

Construction Surety Bonds

Guaranties and Warranties

Field Services and Quality Control

Project Submittal

Clerk of the Works

Contract Close-Out

Definitions and Resources

Commissioning

- Contract Liability and Warranties
- Bonds and Insurance
- Material and Product Standards
- Workmanship, Quality, Codes and Standards
- Liens and Liens Legislation
- Contract Administration and Field Services

* The CSC Principles of Construction Documentation (PCD) is a pre-requisite. If you have not completed the PCD, you can challenge the exam prior to registering for this workshop.

> For information please contact Clafton Fiola at 416-777-2198 or clafton@on.aibn.com CSC, 120 Carlton Street, Suite 312, Toronto, Ontario M5A 4K2

Tel: 416-777-2198 Fax Toronto 416-777-2197 Canada 1-800-668-5684 Website www.csc-dcc.ca



Specifier (SP) Course (Combines SP1 and SP2)

The CSC Specifier course is a comprehensive overview of the construction specification profession in Canada. At the completion of the course, students will have a solid grasp of a specifier's role, legal issues including contracts, bidding and disputes, writing style used in the profession and how to close out a project. A wide range of professional scenarios are explained, often using real-life examples.

Skills acquired in this course include:

- Understanding legal contracts
- Understanding the function of the project manual ٠ and associated drawings. Developing the basis for good specifications.
 - ٠
- Improved writing skills
- Understanding the process of researching and selecting products.

The CSC Specifier course continues from where the PCD course ends and is a more in-depth education on the special techniques and skills required to write the procurement and contractual requirements of: Division 00; the administrative, procedural and temporary requirements of Division 01; and the technical specifications of Divisions 02 - 49.

Completion of this course is mandatory in the process of becoming a Certified Specification Practitioner (CSP). It also reduces the number of hours required to become a Registered Specification Writer (RSW).

Course Outline:

- Introduction
- **General Review**

٠

- Types of Construction Contracts and Project ٠ **Delivery Methods**
- **Procurement and Contracting Requirements**
- Lien Legislation, Bonds, Insurance and Dispute Mechanisms
- Specification Writing Basics: Grammar, Spelling and Conventions
- Specification Writing Getting Started
- Writing From a Master Specification
- ٠ Writing Original Specification Sections

Students should have:

- Experience reading construction drawings;
- Experience reading construction specifications;
- Experiences researching construction materials;
- Experience researching construction reference standards.

- Product Selection, Research and Assessment Codes and Standards
- Division 01 Administrative and Procedural Requirements
- Division 01 Temporary Facilities and Controls
- Division 01 Performance Requirements and Life ٠ **Cycle Activities**
- Relationships and Coordination Divisions 00, 01 and Technical Sections
- Specifying Quality and Performance Requirements
- Specifying For Special Requirements
- Or, Construction related Certification from a Technical College or University.

To find out more about course offerings email info@csc-dcc.ca or click on the website of the Chapter

For information please contact Clafton Fiola at 416-777-2198 or clafton@on.aibn.com CSC, 120 Carlton Street, Suite 312, Toronto, Ontario M5A 4K2 Tel: 416-777-2198 Fax Toronto 416-777-2197 Canada 1-800-668-5684 Website www.csc-dcc.ca



For other workshop locations and dates, please go to http://csc-dcc.ca/Education/CSC+Education+Workshops+/

Workshop Registration Form

Member Price: \$1199 plus tax Non-member Price: \$1399 plus tax							
I am a CSC/CSI Member. Member number:							
DATE COMPLETED) (INCLUDES ONLINE)		CHAPTER				
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CARD HOLDERS S	IGNATURE			DATE			
ancellation: A ca	ncellation fee of \$250 plus tax applies if 21 days or more befor	re the worksh	op. No refunds issued less that	n 21 days before the	e workshop.		

For course locations please go to: www.csc-dcc.ca



DESIGN TEAM

CSC offers members of the Design Team the opportunity to meet with other members and exchange information. It also affords you the chance to help improve technology and its management, and the means to improve ways in which your ideals are translated into clear, concise and complete documentation.

BUILDING TEAM

If you are a member of the Building Team, Construction Specifications Canada offers the opportunity to become involved in formulating specifications. Your valuable input into the programs can help generate time and cost savings as well as improve performance.

SUPPLY TEAM

The multi-disciplinary composition of the CSC allows members of the Supply Team to meet with other members of the construction team. CSC programs in data filing and information retrieval are geared to present convenient and concise information on your products for proper evaluation and specification.

THE STUDENT

If you are a student or architecture, engineering or construction technology, CSC will provide you with greater exposure to and a better understanding of the Construction Industry, giving you an excellent opportunity to plan a career in the construction field.

MEMBERSHIP IN CSC

In the construction industry's fast-paced environment, the need for and value of Construction Specifications Canada is greater than ever. CSC brings together individuals from all segments of he construction industry. All who have a vested interest in Canada's largest industry are invited to join CSC. When you join CSC you become a part of the only association that brings together professionals from all aspects of the construction industry.

ADVERTISING: NEWSLETTER & WEB

Advertising with us will provide you with the opportunity to reach readers within the industry through the newsletter and on the CSC Vancouver website.

Size	Members	Non-Members
1/4 page	\$45	\$60
1/2 page	\$80	\$100
Full page	\$140	\$175

You will receive advertising space on the second page of the Specifier and on the CSC chapter website. The ad will be placed in one issue of the Specifier and reside on the website for one month. Ads must fit on one page only and are not limited to copy content or visual features.

If you are not sure whether the Specifier would be an appropriate tool for you, please email me with your questions. If you would like to advertise, or have any questions, please let me know. All advertising content is subject to pre-approval by the responsible CSC Committee.

