IIBEC-WCC TELEGRAM

WELCOME TO SUMMER 2020!

International Institute of Building Enclosure Consultants (IIBEC)

Western Canada Chapter

Hello fellow IIBEC-Western Canada Chapter Members! As we all slowly emerge from our captive Covid states in varying degrees we assess the new landscape we gaze upon. The new normal as they say, but daily changes and updates are still underway. The Summer of 2020 is unlike any we have known before, the panic of the spring has left as we settle into our new normal.

Our province's response and buy in by our citizens, thanks to the sage advice and calm demeanor of Dr. Bonny Henry, has fared better than most other jurisdictions in Canada and North America. This success in dealing with the outbreak has translated into better financial indicators for our province compared to other provinces. We have seen scaled back indicators in non-residential construction, and challenges to the housing market as well with changing mortgage regulations and reduced immigration due to the pandemic, however there is a healthy capital spending plan on the books for 2020/21 that will help ease the blow.

The normal IIBEC summer newsletter announcing the Annual IIBEC Golf tournament, award winners and success of recent seminars is lacking some of the usual accoutrements. Our golf tournament has been cancelled for this year. Our spring seminar had also been cancelled due to the pandemic. F@#$@# COVID!!

That being said, I know that everyone's biggest (or at least top 5) worry since the start of the pandemic has been…" How the heck am I going to get my IIBEC credits?!?!". Worry no longer friends, we have you covered, with our first Covid induced ALL VIRTUAL SUMMER SEMINAR!

IIBEC WCC WEBINAR

Wednesday August 12, 2020 8:30 am to 12:00 pm – REGISTER NOW

Stay at your desk or on the comfort of your couch and join us for our very first **ALL virtual** half day session. Taking this course **Qualifies for 4 IIBEC CEH's, & 4 AIBC CEH's** you **REGISTER HERE**

We have a line up of three excellent speakers who will be giving their presentations from a Top Secret secure location…and for the amazingly awesome price of only $50.00! Now that is bang for your buck!

Our lineup includes:

8:30- 9:45 am - **Gord Rajewski**, of **Pinchin Ltd** – Who will be presenting on "**Resilience for Existing Buildings in the Face of Climate Change**"

9:45-11:00 am - **Keith Calder**, of **Senez Consulting Ltd** - Who will be presenting on "**Understanding Fire Safety requirements for exterior walls and roofs**"

11:15 am-12:15 pm - **James Clapp**, of **Wilson Beck Insurance** - Who will be presenting on "**Surety Bonds and Insurance 101**"

There will be a 15 minute break at 11:00 am, and sorry but our usual delicious lunch, breakfast, and excellent company will not be available for this presentation so make sure to pre-order through one of the all too convenient food delivery we have all come to know so well!

WHAT'S BEEN HAPPENING AT YOUR LOCAL CHAPTER?

Well…. just before the pandemic knocked us all back a step or two…we hosted two one day ROOFTOP QUALITY ASSURANCE courses for the aspiring RRO's in our midst. Both seminars were well attended and reviewed. Thank you for our industry instructors who took time from their busy schedules to help distribute their knowledge to others in the industry. Thanks also to all of those that attended the courses, and for supporting our local chapter!

Your local IIBEC Western Canada is continuing to work on new ways to bring you the excellent speakers and programs that you have come to expect. The new landscape does present some challenges in this regard, but as we all become more accustomed to this moving landscape, these will evolve!

FROM YOUR TECHNICAL COMMITTEE:

Corrosion Resistance of Fasteners in a Coastal Environment

By Doug Wells, RRO, RCABC Technical Advisor

Questions have been posed to about what corrosion resistance is required "*by Code*" or "*by RCABC*" and there is no straightforward answer. Corrosion resistance is required by BC Building Code 2018 and RCABC RoofStar Guarantee Standards without stating what that resistance is or providing a service life expectation. So, what is a corrosion resistant fastener?

Understanding metal corrosion is critical: corrosion is a deterioration of metal caused by chemical reaction to its surrounding environment. Corrosion can be accelerated via galvanic reaction or exposure to a harsher surrounding environment such as salt laden air, may include dissimilar metal contact, excessive building humidity, corrosive chemicals within components of the assembly, or corrosive elements provided within or without of the building envelope, etc. So, while there are multiple factors to consider; three stand out.

Most Cathodic / least likely to corrode
Platinum
Gold
Graphite
Silver
316 Stainless steel (passive)
304 Stainless steel (passive)
Monel
Inconel (passive)
Nickel (passive)
70-30 cupro-nickel
Silicon bronze
Copper
Red brass
Admiralty bronze
Admiralty brass
Yellow brass
Hastelloy C (active)
Inconel (active)
Nickel (active)
Naval bronze
Muntz metal
Tin
Lead
316 Stainless steel (active)
304 Stainless steel (active)
400 Series stainless steels
50-50 lead-tin solder
13% Cr stainless steel (active)
Ni—resist
Cast iron
Wrought iron
Mild steel
Cadmium
Alclad
Aluminum
Aluminum 2024
Aluminum 3003
Aluminum 6053
Galvanized steel
Zinc
Magnesium alloys
Magnesium
Most Anodic / likely to corrode

Factor 1: Metal Type

Electrochemically dissimilar metals are a common cause for corrosion in sheet metal roofing materials. Metals that are farther apart on the galvanic scale will corrode faster, so metal higher on the scale are more resistant than those lower on the chart. Magnesium is the most anodic, meaning it is the most likely to corrode, and that other metals will consume it. Most construction fasteners are carbon steel wire (galvanized steel on the scale) which are then coated through various means. A common coating for roofing fasteners is zinc, very low on the scale and intended as a sacrificial metal to protect the galvanized steel beneath.

Factor 2: Substrate

Aside from salt spray, fasteners sometimes are driven into pressure treated wood (PTW). A common preservative is ACQ (alkaline copper quat), which appears a darker brown in colour. The key concern is the copper component, which will deteriorate uncoated fasteners. The Canadian Wood Council recommends a minimum electroplated G-185 designation coated fastener or hot dipped galvanized in accordance with ASTM 123 (replacing ASTM A153). This should provide a level of protection against the preservative treatment, however, add in exposure to salt spray and the recommendation increases to stainless steel Type 304 / 305 or 316 to offer the best service life. Note this also applies to any metals in contact with ACQ or copper azole (CA) PTW.

Fasteners installed into concrete have similar challenges, with the inherent moisture levels of concrete and various PH levels having an affect on the fasteners. In many cases, the resultant PH has a minimal effect, however the physical act of driving into the concrete can scrape some of the corrosion resistant coating.

Factor 3: Building Location

BC Building Code does not define where a coastal environment may result in salt spray or when greater levels of anti-corrosive fasteners must be used. The only reference is made in Division B in 9.26.2.3 Nails, sentence 1:

- *Nails used for roofing shall be corrosion-resistant roofing or shingle nails conforming to a) ASTM F 1667, "Driven Fasteners: Nails, Spikes, and Staples," or b) CSA B111, "Wire Nails, Spikes and Staples."*

A coastal environment for roofing entails exposure to sodium chloride, basically airborne salts. Although there are a number of coatings / protection systems for fasteners available on the market, in the roofing environment for attachment of sheet metal flashings we generally have a choice of galvanized {G-60 or G-90}, electroplating {G-185 coating} fasteners, or stainless steel {Type 304 / 305, Type 316}. The use of galvanizing / electroplating is more commonly seen in attachment of metal flashings for both ease of use and cost. Although coatings offer a high level of protection, they are prone to damage both from handling and from their intended use; being installed through layers of metal flashing and / or material that scrape or damage the coating off the screws. Storage of the fasteners is also important.

That standard test method is the ASTM B117 Salt Spray Method, and the result is determination of a time period before corrosion can occur. A coating is designed for "X" amount of exposure with a 5% salt spray environment. According to published Grabber Construction Products, they found on average the US standard is a 24-hour requirement, Germany is 48-hours, and Scandinavia is a 96-hour requirement.

This leaves it up to the Design Authority or the Contractor if there is no formal Design Authority involved with the Work, to identify if the Work will be occurring within a coastal environment subject to salt spray. If there is a reasonable expectation the Work may be subject to salt spray or any other corrosive environment such as within a Natatorium (aquatic facilities), a higher standard of corrosive protection must be selected. These requirements should be considered cumulative and each factor merits its own consideration.

In summary, the American National Standards Institute (ANSI) in conjunction with the Single Ply Roofing Institute (SPRI) published ED-1 2019, a Design Standard for Edge Systems used with Low Slope Roof Systems paper. Item 7.3 of that Standard describes a practical approach to materials used for mechanical attachment of sheet metal cap flashings and wind clips. Both designers and contractors should review this standard when discussing material selection. This standard is filling a need until Canadian standards can catch up.

In short, 7.3 describes that galvanically compatible materials are to be used, the presence of pressure treated components should be recognized, and the location / atmospheric environment of the materials has to be considered. It further identifies the Factors and recommended responses.

Besides the obvious and critical need for fasteners and metals to resist the wind and loading, the appropriate level of corrosion resistance should be considered to provide a long-lasting application. Until National Research Council Canada (NRC) / Canadian Standards Association (CSA) generates a Standard for this, American Society of Civil Engineers (ASCE)-7 provides a path to compliance for calculating design loads, and ANSI / SPRI ED-1 provides a path for material selection. If both of those paths are followed, compliance with BCBC 2018 and RoofStar Guarantee Standards can be addressed. – *February 21, 2020*

Recommended Further Reading:

- *https://www.fema.gov/media-library/assets/documents/3509*
- *https://www.spri.org/standards/#current-ansi-spri-standards*

References: Simpson Strong-Tie Company Inc, SFS Stadler, Leland Fasteners, Fastenal Company, Canadian Wood Council, RCABC RPM, American Society for Testing Materials, FEMA NFIP Technical Bulletin #8 June 2019, Marine Atmospheric Corrosion of Carbon Steel: A Review 2017, ANSI/SPRI ED-1 Design Standard Edge Systems, BCBC 2018.

Doug Wells, RRO
RCABC Technical Advisor
Doug has worked in the roofing industry for 30 years as a Roofer, Technical Representative, Roof Consultant and Technical Advisor. He has been a member of IIBEC (formerly RCI Inc). since 2007 and previously sat on the Board of Directors of the Western Canada Chapter for 5 years.

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WE NEED YOUR HELP!!

We are looking to add some content to our newsletter and are hoping to get some crowd participation!

- **PICTURES FROM YOUR OFFICE**: Everyday we are out and about our great province and city seeing some of the most interesting views you can see, best seats in the house as they say! See a spectacular view you would like to share with your peers? Send in your photos to sean@roofixinc.com and we can include them in the next issue. Winning submission receives a $25.00 gift card.

- **INDUSTRY ANNOUNCMENTS**: Did you or one of your colleagues get a promotion? Did something great happen at your firm? Is there a new hire you would like to acknowledge, or did someone receive their RRO? Send in announcements you would like to see included in the next issue of the IIBEC-WCC Telegram to sean@roofixinc.com.

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Formerly RCI, Inc.

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