SPRING 2014

- Passive aggressive
  World’s toughest standard
  challenges BC window makers

- Glazing champs
  Windows define
  award-winning homes

- Testing doors
- Safety glass
Can your current supplier offer anodized extruded aluminum in a week?

Apex Aluminum Extrusions offers the tightest colour control and shortest lead-times in anodized extruded aluminum.*

Watch how we do it at one-week.ca

30 foot anodizing tanks to meet all specifications

APEX
ALUMINUM EXTRUSIONS LTD

Schedule a tour today or request a quote.
Visit us at one-week.ca or call 1.866.970.5804

*Once we have extruded your product we will anodize it within a one-week time frame.
in this issue...

Features

A close look at NFRC labels
National Fenestration Rating Council certification has been the North American standard for 25 years ............ 8

Testing doors – and prehangers
“The biggest change to the BC Building Code in 33 years” is transforming the industry ......................... 6

Passive House challenge
The world’s toughest standards for windows; both an energy source and insulation product ............... 10

Award-winning homes
The best new houses built in BC: high-performance, high-style windows and doors ............................. 14

Glass wall system for new offices
Microsoft building glass-sheathed campus in downtown Vancouver ................................. 18

Safety glass
How safe is safe? .......................................................... 20

On the cutting edge
What’s new in windows, doors and glass ....................... 22

World’s weirdest door
No hinges, no handles, no problem ......................... 23

Association

From the chair
Province wide consistency needed with NAFS .................. 4
NFRC chair addresses Fen-BC technical meeting .................. 4
Fen-BC, FES-BC start training program ......................... 4

Industry News

Vancouver bylaw rebooted
Energy enforcement deadline extended .................... 19
New “V4” LEED rolling out .......................................... 19
New rain sensor closes vents and windows .................. 19
Commercial construction permits rise .................... 21
Window retrofitters warned of asbestos .................... 21
KP buys Farley ............................................................ 21
Window trends spotted at Fensterbau/frontale ................. 24
NFRC calls on student filmmakers .................................. 25
Ply Gem buys Gienow ................................................. 25
NFRC calls on student filmmakers ............................... 25
Hartung celebrates 90 years ................................. 25
Bloedel Conservatory to get re-domed ....................... 25

Columns

Legal View
Walking out: Employee given working notice can refuse to work and will not lose the right to sue ............. 21

Contribute to the community. Share your ideas, experiences and opinions.

Fenestration West is published quarterly on behalf of the Fenestration Association of BC (Fen-BC) by Market Assist Communications Inc.

Publisher ............................... J. Michael Siddall 604.740.8369  . publisher@fenestrationwest.ca

Editor ............................... Frank O’Brien 778.996.2411 . editor@fenestrationwest.ca

Art Director .......................... Paddy Tennant 604.507.2162 . graphics@fenestrationwest.ca

Assistant to the Publisher .......................... Peg Neilon 604.989.3452 . admin@fenestrationwest.ca

Fen-BC Executive Director ......................... Zana Gordon 604.855.0245 . zgordon@fen-bc.org

Editorial Consultants
Terry Adamson ...... Westeck Windows Mfg Inc. 604.792.6700 . terrya@westeckwindows.com
Debra Dotschkat ... GC Glass Canada Inc. 250.454.9923 . debraglasscanada@shawbiz.ca
Al Jaugelis .......... RDH Building Engineering Ltd. 604.873.1181 . ajaugels@rdhbhe.com
Leonard Pianalto ... RJC 604.738.0048 . lpianalto@rjc.ca
Katie Wilkinson ... Stella Custom Glass Hardware Inc. 604.231.5892 . katie@stellassemblies.com

Contributing Writers
Ray McGowan • Robert Smithson

PUBLICATIONS MAIL AGREEMENT NO. 42594527
RETURN UNDELIVERABLE CANADIAN ADDRESSES TO:
Fenestration Association of BC
PO Box 595, Abbotsford, BC V2T 6Z8

Fenestration West is printed on Pacesetter Dull 70lb text; 10% post consumer waste; Elemental Chlorine Free (ECF); Acid Free, FSC Certified

While information contained in this publication has been compiled from sources deemed to be reliable, neither the publisher nor the Fenestration Association of BC (Fen-BC) will be held liable for errors or omissions. The opinions expressed in the editorial and advertisements are not necessarily those of the publisher or Fen-BC.
Province wide consistency needed as NAFS rolls out

Spring has sprung, the grass has riz; we wonder where the inspector is.

It’s true we still have a long way to go before everyone understands the intricacies of the North American Fenestration Standard (NAFS). It seems like there are weekly seminars, webinars, and lunch-and-learns being delivered by Fen-BC, and others. Inspectors are asking many good questions, and some jurisdictions have done excellent work in clarification of the rules. For an example, see the building department bulletins from the City of Penticton. So NAFS is here. Now if we can develop some consistency in how it is handled across the province, everyone that is on board will benefit. Those that aren’t? Well, good luck.

Perhaps we can turn our focus to other important topics.

Fen-BC, through the Fenestration Education Society of BC (FES-BC), is developing a hands-on training program for fenestration product installation in new and retrofit construction. This program will be delivered at the FES-BC school in Langley where the Red Seal Glazier Certification Program is currently taught. We are in the early stages but hope to develop the curriculum quickly and offer the program later this year.

The retrofit section is based on the details in the Best Practices Guide for Window and Door Replacement released late last year, while the new construction details will come from a group of industry players providing their expertise in all facets of the install process. It is a common concern of manufacturers that their products are often installed with little direction or consideration for long term performance. We expect that once the program is launched many manufacturers will turn to it as the go-to solution. Some may require their products to be installed under the guidance of a FES-BC trained fenestration installer.

Our technical committee is also moving on to new items.

The Glazing Systems Specification Manual is being updated to incorporate changes from the 2012 National Building Code. The committee is also looking at the coming energy requirements for commercial glazing in order to provide information on what the impact may be to Part 5 and Part 3 projects when these changes take effect.

This industry needs time to adapt, and the tech committee will attempt to provide some insight early in the process to provide the time needed for change. Our committee is also looking into developing and writing other industry relevant publications that can inform, support and assist the Fen-BC membership.

If there is a topic you feel should be addressed please contact our Executive Director, Zana Gordon to discuss.

Terry Adamson, Chair, Fenestration Association of BC

Fen-BC, FES-BC start training programs

LANGLEY – The Fenestration Association of BC (Fen-BC) and Fenestration Education Society of BC (FES-BC) board of directors have agreed to start the development of two training programs shortly. One program will deal with training for the proper installation techniques for replacement windows and doors, and the other will address the proper installation techniques in new construction.

Neither of these training sessions are meant to conflict with the current Red Seal Glazier program. These programs are meant to support and complement the journeyperson training and add another level of expertise.

The goal is to have a program completed by this summer and delivered by this December, said Zana Gordon, Executive Director of Fen-BC.

Readers with resources, written material, instructions or guidelines to share with Fen-BC for reference are invited to email zgordon@fen-bc.org.

NFRC chairman addresses Fen-BC

SURREY – Jeff Baker, the first Canadian named as chairman of the National Fenestration Rating Council (NFRC), notes that BC window and door companies will lead Canada in the implementation of the North American Fenestration Standard.

“BC is the first,” Baker told the technical meeting of Fen-BC in Surrey, on February 26.

Baker, of WESTlab, was named NFRC chairman this January at the Council’s meeting in Texas.

Baker added that the NFRC will celebrate its 25th anniversary this September at its conference in Victoria. This is fitting, as the impetus for the formation of NFRC began at an ASHRAE meeting in Vancouver in 1989.

Soon after, with help from the U.S. Department of Energy, NFRC was founded in the United States to serve as a non-profit, third-party organization to rate and label fenestration energy performance.

Baker, who is also the technical consultant to Fenestration Canada, noted that the NFRC label is recognized in both the U.S. and Canada.
Your success has a permanent address at Performance and Durability:
Cardinal’s new Endur IG™ with its redesigned stainless steel spacer increases sightline temperature by 1 to 2 degrees and can improve window U-Factor up to 0.005—important for energy code compliance. Performance is at its best when utilizing Cardinal coatings like LoE-366® in any climate while adding LoE-i89® in colder environments. Durability? Cardinal IG units have a miniscule failure rate of 0.2% over 20 years, the industry’s lowest. No coincidence that we offer the industry’s only comprehensive 20-year factory warranty. Visit our permanent address at cardinalcorp.com.
Pre-hangers face a whole new world of regulations under NAFS-08

By Frank O’Brien

The biggest change to the BC Building Code in decades is having its greatest impact on the door industry.

“This is massive. It’s huge,” said pre-hanger Jarret Babuin, second-generation owner of Tantalus Doors in Squamish. “It is the biggest change we have seen in the door industry in 33 years.”

The Code, which came into effect for installations on December 20, 2013 but has seen staggered enforcement in differing municipalities, has introduced the 2008 North American Fenestration Standard (NAFS-08) and applied it to the testing and performance rating of windows, doors and skylights.

BC is the first jurisdiction to embed NAFS-08 into the provincial building code. Also for the first time, residential door manufacturers (pre-hangers) must deal with the sophisticated testing that has been routine in the window and skylight sectors for years.

As well, the 2014 Vancouver Building Bylaw, which comes into effect July 1, will follow the code changes.

In addition to NAFS and the Canadian supplement to it, the new Vancouver bylaw introduces new accessibility requirements to exterior and interior building doors on all types of residential construction in both new projects and major renovations.

For side-hinged door makers, the new performance and testing requirements are profound and, to many, confusing.

“What the hell is a nomograph?” a Langley pre-hanger wondered after sitting through a jargon-laden seminar discussing the new Code.

There are many other terms pre-hangers are getting used to hearing; terms like “rough terrain”, “gateway requirements” and “jobsite testing.”

And “financial penalties.”

“Doors installed that do not show the required NAFS certification will be rejected and will be required to be replaced,” intones a bulletin from one BC municipal building department, reflective of the stance in most areas of the province.

Costs for non-compliance

The new performance-based standard requires physical testing of the air-tightness, water-tightness and wind load resistance of door products.

The water tests are perhaps the most contentious and confusing, since it depends on whether the door is protected or open to the elements. For protected doors – for instance some residential front doors that are beneath an overhang – a Limited Water rating is acceptable, which means the door must simply repel water. However, doors installed in most multi-family or commercial projects need to have the same water tightness ratings as the windows.

There is no code requirement for on-site water testing, but Kevin Saito of QAI Laboratories in Coquitlam said it is common for inspectors to request such a test on Part 3 buildings, a legacy perhaps of BC’s leaky condo crisis. And this is a tough test to pass on site, Saito explained. The door is subject to both air pressure inside and water spraying on it from the exterior to simulate wind-driven rain. If any water gets inside, the unit has failed.

“There are huge costs associated with failing water tests on the jobsite,” confirmed Al Jaugelis, a fenestration specialist with RDH Building Engineering Ltd. who conducted a code seminar at Buildex Vancouver this year.

Such failures on a large project can have a cascading – and costly – effect.

“When products fail a site test, they have to be repaired and retested,” Jaugelis said.
“Then the general practice is to test more. If the original requirement was to test five, a failure could lead to tests of five more.”

The extra tests are at the door manufacturers’ cost. Every failure needs to be repaired and retested, and every failure leads to more tests.

“Pre-hangers need to be prepared for the substantial financial risks associated with jobsite water testing if they are going to supply side-hinged doors to multifamily or Part 3 buildings,” Jaugelis said.

A current problem is that testing agencies like QAI are backlogged so many pre-hangers are waiting in line to complete their laboratory testing. “A lot [of pre-hangers] waited too long to get tested,” Saito said. “Really, they should have started getting ready for this two years ago.”

One door manufacturer said he was told he couldn’t have his double door line tested until May. Others don’t expect to have all their products certified for months.

**Subjective**

Some aspects of NAFS-08 remain open to interpretation, which further clouds the testing and compliance environment. Examples include the status of folding doors, which do not have a performance class and must be tested as specialty products.

There are also the conflicting definitions of “rough” or “open terrain” which can affect the performance requirements.

Open terrain is level terrain with only scattered buildings, trees or other obstructions, as well as open water and shorelines where a building is fully exposed to the wind, which naturally requires more robust doors and windows. Rough terrain is suburban, urban or wooded terrain extending “upwind from the building uninterrupted for at least 1 kilometre or 20 times the building height, whichever is greater.”

Most urban BC municipalities are declaring their terrain to be “open” even when substantial parts of it may be characterized by dense suburban development. As one door manufacturer remarked at the recent Fen-BC technical committee meeting, “I could spend $70,000 on testing and still not be able to install the doors,” because of a local ruling on open or rough terrain.

Some believe it may be wise to test doors only for the more demanding open terrain environments.

---

**Questions**

One can appreciate that questions are still swirling around NAFS-08 and it is not just door pre-hangers asking them. Many architects, home builders and even building officials are also feeling their way towards understanding exactly how the new *BC Building Code* has changed the fenestration market.

But Fen-BC pre-hanger members like Babuin say it is time to get over the griping and get on with compliance.

Tantalus, which manufacturers for Part 9 construction, is having its products tested as quickly as possible and is already shipping NAFS-08 certified products.

“Nobody likes it, but we have all known about this for two years,” Babuin said. “We are past the denial stage. There is no going back. If this is what we have to do, then this is what we have to do. We are either going to sell doors or we’re not.”
NFRC certification has been the North American standard for 25 years
By Ray McGowan

As provinces update their building energy codes or adopt other energy-saving legislation, it is becoming more important than ever for manufacturers to demonstrate the energy performance ratings of their windows, doors, skylights and other fenestration products.

Even though energy codes for fenestration vary by province, manufacturers can use the National Fenestration Rating Council's independent energy performance ratings to show that their products perform as advertised. It is a label you can trust.

Canadian consumers, architects and builders rely on NFRC ratings to compare product performance, specify products, and demonstrate energy code compliance, while window manufacturers certify products through NFRC so they are eligible for the Energy Star program for residential windows.

Code officials rely on NFRC's certified ratings to confirm that building energy codes for fenestration are met. NFRC's residential label and commercial label certificates used in the United States are the same as those in Canada, except that with labels/label certificates in Canada, the U-factor and Air Leakage ratings are provided in imperial and metric units. Solar Heat Gain Coefficient and Visible Transmittance are dimensionless indices varying from 0 to 1.0.

NFRC provides the procedures that more than 750 residential manufacturers use to rate and label nearly 8,000 product lines and more than nine million fenestration product options.

In Canada, NFRC labelling and rating involves computer simulations and physical tests, but residential and commercial products face different procedures.

Residential
Residential manufacturers must go through a series of well-defined steps to certify a product.

First, a window manufacturer sends product drawings and specifications to an NFRC-accredited simulation laboratory that uses energy...
simulation software to calculate energy ratings. The manufacturer then selects a product and ships it to an NFRC-accredited testing lab for physical testing. If the ratings from the physical test are within the required tolerance of those from the computer simulation, NFRC considers the ratings valid.

The simulation and testing labs send their results to one of four NFRC-accredited inspection agencies (IA) for review. The IA confirms the simulation and physical testing comply with NFRC procedures. The IA inspects each manufacturing facility once a year to make sure the products submitted for testing are the same as those being produced and all NFRC procedures are being followed.

Commercial

NFRC uses a different process for commercial windows, curtain walls, doors and other fenestration that is assembled on the project site. NFRC’s Component Modeling Approach (CMA) uses ratings for pre-approved components (frames, glazing, and spacers) to generate whole-product performance values. Unlike the residential program, where manufacturers attach a temporary NFRC label to a window, the CMA program issues a Label Certificate, a multi-page document listing ratings for all NFRC-certified fenestration to be used in a specific building or project. In addition, commercial manufacturers’ rated components may be used over and over on numerous projects, greatly reducing the testing requirements present in the residential program.

CMA ratings are project-based, enabling code officials to review fenestration ratings for an entire project on a single Label Certificate. Label Certificates are posted on NFRC’s public website and may be downloaded at no charge at any time. NFRC’s commercial and residential programs use the same ISO15099-based procedures to rate and certify the energy performance of fenestration fairly and accurately, which manufacturers have trusted since 1989.

Ray McGowan is NFRC’s senior program manager. He also serves as the vice-chair of ASHRAE’s Fenestration Technical Committee (TC 4.5) and the chair of its Research Subcommittee, and is a member of SSPC 90.1/Envelope Subcommittee.

The NFRC administers an independent, uniform rating and labeling system for the energy performance of fenestration products, including windows, curtain walls, doors and skylights.

The National Fenestration Rating Council

In 1989, NFRC was founded in Vancouver, BC, the result of window manufacturers recognizing the need to protect the consumer through independent, third-party certification of fenestration products.

For information about getting your residential or commercial products certified and NFRC’s member-driven rating processes, visit www.nfrc.org, phone 301-589-1776 or email info@nfrc.org
Passive House proponents throw down a challenge to BC window manufacturers
By Frank O’Brien

Passive House, the German-born program promoting the world’s most energy efficient construction, ranks windows not just as energy savers but as a prime energy source.

It is the most aggressive fenestration stance taken amidst the myriad of residential energy-saving initiatives – from Equilibrium homes and R-2000 to BuiltGreen and Net-Zero – that have helped shape Canada’s home building in recent years.

Windows could be the defining characteristic of Passive Houses, of which 20 are either built, under construction or proposed in British Columbia.

In a presentation this year at Buildex Vancouver, Canadian Passive House Institute founding director Guido Wimmers explained the houses rely on the ability of high-performance glazing and frames to turn windows into “solar heat collectors.”

A thickly insulated Passive House could be heated all winter with just the windows and the appliances, he said. A 3,600-square-foot Passive House built in Whistler in 2010 posts an electric heating bill of just $10 a month, Wimmers noted.

Windows in Passive Houses must have a U-value no greater than 0.80 W/m²-K, which is more stringent than the tough new Vancouver Building Bylaw requirement of 1.4 W/m²-K and well below the Canadian average of 2.1 W/m²-K. Passive House windows also usually have a solar heat gain coefficient (SHGC) higher than 0.50 for south facing windows and 0.40 for north facing windows. Windows with such a high rating – allowing more solar heat into a building – are desirable in cold climates, like Canada and northern Europe. In part, that’s the meaning of the term “passive” in Passive House.

Most BC window manufacturers could reach the Passive House requirements with the use of thicker frames, triple-pane glazing, argon gas and low-E coatings.

Niche market

The challenge is that the domestic Passive House market is so tiny – only 42 Passive Houses have been built in Canada – that each window would be an expensive, custom creation.
Sunlight brightens and heats the Bernhardt Passive House in Saanich. Windows boast low U-values and high solar heat gain to turn windows into a heating source. The EuroLine windows boast a hybrid fiberglass/UPVC frame with Cardinal 180 triple-glazing and Edgetech Superspacers.

Guido Wimmers, founding director of the Canadian Passive House Institute. Windows can be a primary heating source.

Photo: Fenestration West magazine.
Still, Passive House proponents throw down a challenge to Canadian window makers to match an energy standard that has been common in Europe for years.

Aside from hundreds of houses, European hotels, schools, apartment buildings and even a high-rise office building have been completed to Passive House energy standards – and there are scores of European window makers who compete for Passive projects.

Victoria contractor Robert Bernhardt, who has completed a Passive House in Saanich and is building Canada’s first multi-family project under the program, notes that Delta-based EuroLine Windows Inc. is the only Canadian company with a production-line window that meets the International Passive House standard.

Bernhardt has used EuroLine’s triple-pane ThermoPlus – U value of 0.73 and a SHGC of 0.567 – in his projects.

Other Passive House builders in BC have imported high-performance windows – some with wood frames – primarily from Germany. Wimmers concedes that the environmental optics of shipping a window thousands of miles to save energy is not ideal.

Passive House builders face a number of hurdles as they seek to gain traction in BC. The extra-thick walls needed for the heavy insulation eat into the sensitive cost-per-square-foot calculations of new homes. The need for southern orientations can restrict location and the initial costs for construction are higher than conventional construction. The fact that Passive Houses will eventually pay back the original costs many times over in lower energy use may not be enough to convince buyers in Canada’s most expensive real estate market.

As Wimmers notes, “It is one thing to recommend something. It is another thing to get people to use it.”
Left: In Vienna, the RHW.2 high-rise is the first office tower built to Passive House standards. Completed last year, the all-glass, triple-glazed façade has high R-values, low U-values, and no thermal bridges. Most heat comes from the sun, building occupants and equipment.

Right Cutaways of windows designed to meet the Passive House standard, at Buildex Vancouver. The unit on far right was designed by BC’s Red Door Energy Advisors. Photos: Fenestration West magazine

Passive House projects in BC

After checking with members of the Canadian Passive House Institute we are aware of the completed projects in BC listed below which are either certified Passive House or capable of being certified. Some are going through the certification process at this time:

- Lost Lake Passive House, a public recreation facility, Whistler
- Rainbow Duplex, Whistler
- Bernhardt Passive House, two-family residence, Saanich
- Kenworthy residence, Langley
- Bedford Roadhouse Triplex, Nelson
- BC Passive House Ltd. administrative offices, Pemberton.

In addition there are approximately 10 projects that have started construction or are being designed in BC including a multi-family rental building, a municipal building and a school.

Bernhard Contracting is building this multi-family Passive House project in Saanich.
It is award season in the home building industry and recent projects – both winners and finalists – reveal how important fenestration is to delivering high-quality homes in British Columbia.

High-performance, stylish windows helped Alchemy Construction capture a 2013 Georgie Award from the Canadian Home Builders Association of BC and two awards in the 2013 Ovation Awards from the Greater Vancouver Home Builders Association.

Alchemy’s four-plex project in North Vancouver took the Ovation’s Fortis BC award for excellence in energy efficiency – it was the only finalist in the category – partly due to its window selection.

All windows in the two-building development feature double-pane, low-E “cubed” from Cardinal (Cardinal LoE®) in vinyl framed products from Fen-BC member Oasis Windows of Surrey. The homes are rated at EnerGuide 80, according to architect and home energy expert Richard Kadulski who consulted on the project. Opening skylights provide natural ventilation and lighting, while extended roof-overhangs on the southside – along with the low-
Vancouver custom house by Frits deVries Architect includes a 150 square foot window with Hurd Ultra-R glazing in wood windows with exterior aluminum capping from Westec Windows & Doors.
Photo: Frits deVries Architects
solar heat gain coefficient glazing – keep the rooms comfortable in summer. Inside, the home is brightened by a profusion of windows and skylights.

There are also two finalists in the Ovation awards which take full advantage of the aesthetic and energy performance of modern fenestration. The Ovation winners included entries that we feel deserve special mention for their glazing and how it can be used as a design and energy-saving feature.

The first is a Heather Street house in Vancouver by Frits deVries Architect Ltd. with D. McLean Construction.

The 2,755 square foot tri-level house is a finalist in the Ovation awards’ $750,000 - $1.5 million category. The house is equipped with large Hurd Windows – the biggest is 10 feet by 15 feet – supplied by Fen-BC member Westech Windows & Doors Ltd. of Langley. The wood windows are capped with aluminum on the...
exterior and sport Hurd’s multi-cavity, multi-coated Ultra-R glazing. Hurd uses coated films suspended inside a premium double-paned low-E unit to create as many as four super-insulating, gas-filled cavities.

A stunning West Vancouver custom house by Delta-based Best Builders Ltd. uses clear fir-framed windows and doors to both save energy and capture sweeping ocean and city views. The house is a finalist in Ovation award’s $1.5 million category. The low-E, double-paned windows are from Builders Door and Window of Coquitlam, which also provided interior windows that separate space and bring light and views into every room of the 6,800-square-foot house.

**ADVANCED FENESTRATION SOLUTIONS FOR ENHANCED PERFORMANCE**

For more than a century, Kawneer has been the leading manufacturer of architectural aluminum products and systems for commercial construction. And, for the past 30 years, we have proudly served western Canada with quality products from our Lethbridge, Alberta facility. A dynamic product portfolio including curtain wall, windows, entrances, storefront framing systems and sun control, delivers enhanced performance and superior results. From thermal efficiency and water ingress resistance, to sustainability and blast/impact resistance, Kawneer is committed to providing western Canada with products and systems that not only meet, but exceed, the stringent design and performance requirements of this region.

**BRITISH COLUMBIA**
Chris Lambert, 604.552.4202, chris.lambert@alcoa.com
Dave McCannell, 604.469.6342, dave.mccannell@alcoa.com

**ALBERTA**
Paul Gulkiewich, 403.485.6505, paul.gulkiewich@alcoa.com

**MANITOBA / SASKATCHEWAN**
Mike Washnuk, 204.257.0177, mike.washnuk@alcoa.com

**kawneer.com**
Architectural Aluminum Systems
Entrances + Framing
Curtain Walls
Windows

© 2013 Kawneer Company, Inc.
VANCOUVER – Tech giant Microsoft is opening a new 150,000-square foot campus in downtown Vancouver in the remade Sears Centre, where Cadillac Fairview is installing an extensive glass wall system as part of a multi-million dollar makeover.

Microsoft says it will spend $90 million on the new Canada Excellence Centre, which will offer training to employees who work at the company's applications and services group. Microsoft will start hiring for the centre later this summer and it could grow to hold up to 400 employees.

Meanwhile, Cadillac Fairview is completing the transformation of the old Sears Centre at Robson and Granville Streets. U.S.-based Nordstrom will be the retail anchor for the project.

The biggest structural difference on the building’s upper four floors will be two giant glass-sheathed atriums punched into the centre of the building.

Each of those two atriums will be 2,800 square feet, or the size of a tennis court. They will be lined with glass and “living walls” featuring native plants, and will stretch from the fourth floor up past the fifth, sixth and seventh floors, said Tom Knoepfel, Cadillac Fairview’s senior vice-president and portfolio manager for Western Canada.

Cadillac Fairview hired James Cheng Architects principal James Cheng to design the structure.

The structure is being built to LEED gold standards – a standard that required

Cadillac Fairview to recycle or reuse the 6.8 million kilograms of waste generated by the construction. For example, all of the 473 exterior white panels, which formerly lined the structure, were sent to Langley Regional Airport to be used in road building, Knoepfel said.

The curtain wall windows stretch 12 feet from base to top, allowing in lots of light.

Glass walls are being used extensively in the 290,000 square feet of offices. Most offices are being constructed of glass or other transparent materials to allow in natural light, according to the architects.
**Vancouver Building Bylaw extended**

VANCOUVER – The City of Vancouver has extended the effective date of the *City of Vancouver Building Bylaw* to July 1, 2014 after intensive lobbying from the home building and fenestration community.

Mark Hartman, Green Building Program Manager, City of Vancouver, explained the extension during an address to a meeting of the technical committee of the Fenestration Association of BC. Only building permits submitted after June 30 will be required to comply with the new *Building Bylaw* which includes updates to windows, insulation, heating systems, and accessibility, Hartman confirmed.

The energy requirements for one- and two-family dwellings to take effect on building permit applications as of July 1 include:

- **Windows and Sliding Glass Doors**: An average U-value of 1.4 W/m²·K (previously 2.0 W/m²·K). Also, must be tested and labelled to comply with the *BC Energy Efficiency Act* (guidance document under development). Can use whole-home “average” U-value of 1.4. Window labels will be verified prior to insulation inspection (must submit schedule of windows).
- **Skylights**: Must be tested and labelled to have U-value of 2.4 W/m²·K or less and included in the window schedule.
- **The EnerGuide For Houses** (EGH) test is administered by Natural Resources Canada through third-party Certified Energy Advisors (CEAs).
  
  A: It uses a “Hot 2000” model to test the homes efficiency and provide an air leakage number and well as a rating from 0-100 (100 is a highly efficient house);
  
  B: An initial EGH report based on the house plans (called a P-file) is required at the time of building permit;
  
  C: A final EGH report based on as-built construction and air leakage test is required at the time of final inspection.

**New “V4” LEED rolling out**

The U.S. Green Building Council has launched its new Version 4 or “V4” of LEED (Leadership in Energy and Environmental Design).

V4 is a result of five years of development and 22,000 public comments, according to the council. Nearly 90 percent of council members voted in favour of the new standards. An estimated 100 projects around the world have registered for V4 certification.

There are 20 large LEED projects complete in BC and at least two dozen under construction, potentially including all of the biggest new office towers being built in downtown Vancouver.

In V4, several LEED categories have been altered and nearly all the forms, documentation, website and reference guide have new information and a new look. Some aspects have been simplified, such as LEED re-certification, which under V4 requires only submission of performance data.

LEED V4 also introduces a new rating system for neighbourhood development and asks for planning and metering of energy and water use.

Another area of V4 demands information on waste management and how much materials have been diverted from landfills, both during construction and after occupancy.

Building owners and developers have until June 1, 2015 to register under the V4 LEED banner.

**Rain sensor controls windows**

MINNEAPOLIS, MN – A new rugged rain sensor that can automatically close vents and windows has been introduced by the Hydreon Corp. of Minnesota.

The RG-11 Optical Rain Gauge is an optical sensor, and is sensitive to even tiny amounts of rain. In contrast, rain sensors used in irrigation do not detect rain until several millimeters have already fallen. That is far too insensitive for most window-closing applications, according to Rein Teder, president of Hydreon.

“Further, the RG-11 stops sensing rain when the rain stops. It does not need to wait for the water to evaporate.”

The Hydreon RG-11 is based on the same principle used in automotive windshield wiper control system, Teder explained. The device may be set as a simple on/off “it’s raining” indicator, or used to emulate a tipping bucket where qualitative measurement of rainfall rate is desired. Interfacing is through simple relay contacts. The RG-11 costs US$49.00 each when three or more are purchased, according to the company.
The first use of glass in buildings reportedly dates back to the 1st century in Rome. At that time the use of glass was limited to buildings with great significance. However, in modern architecture glass has become ubiquitous. As designers become more daring in the use of glass, structural engineers struggle with establishing a consistent level of safety that we all have come to expect from the buildings we occupy. We have become accustomed to living and working in buildings made from concrete, wood, steel, stone and masonry. And rarely do we see any of these materials collapse or fail. However, the sight of broken glass is not unfamiliar. As a structural material, glass is distinct in that it is brittle and can fail unexpectedly. Other materials are more predictable and forgiving. This does not mean that glass cannot be used safely. However, it does mean that there are special considerations that architects, designers, and structural engineers must make when using glass in applications such as guards, skylights and glass floors where public safety is an issue. This was one of the main topics of discussion at the February 26 technical meeting of Fen-BC. Leonard Pianalto, a professional engineer, an Associate with Read Jones Christoffersen and chair of the professional practice committee of the Structural Engineers Association of BC shared his experiences with using glass in structural building applications. The most dramatic test results he presented showed how a tempered and laminated glass canopy might catastrophically fail at a moderate level of snow accumulation. The test case was a fairly typical glass assembly comprised of a square glass panel supported by bolt fittings through holes in the four corners of a square panel. It was shown that the glass panel could tear away from the supports when both layers of glass in the laminated assembly were broken. Pianalto stated that such a condition would be very rare; however, not so rare that it should not be a consideration for the way we design overhead glass canopies. At the same time, these types of canopies can be seen skirting many commercial buildings in the Lower Mainland. There has been considerable advancement in safety glazing technology. Unfortunately, North American codes have been slow to catch up. For example, the Canadian General Standards Board publishes the design standard for the use of glass in structural applications and this standard has not been updated since 1989. One significant advancement in laminated glass technology is the advent of a proprietary material produced by Dupont known by the trade name Sentry Glass Plus™ (SGP). This material has a significantly greater tear strength than the traditional vinyl material that is commonly used in laminated glass. The use of more modern materials such as SGP greatly improve the post-breakage performance of laminated glass and will develop reliability levels that are more consistent with those of other building materials such as wood, steel and concrete. Another significant factor to consider with regards to safety and reliability is with the use of tempered glass. Tempered glass is almost exclusively used in structural glass applications. While tempered glass is four times stronger than regular glass, it has an Achilles heel. There is a rare flaw in glass that can cause spontaneous failures of the glass to occur in tempered glass. Nickel sulphide failures The manufacturing flaw is known as a nickel sulphide inclusion. All glass will contain nickel sulphide impurities to some extent. These come in the form of small crystals invisible to the naked eye. As glass is heated during the tempering process these impurities change state, creating a flaw in the glass. However, only the largest impurities will cause failure and only then if they are within the core tensile zone of the tempered glass. The flaws can cause spontaneous breakage of the glass, even beyond five years after installation. Nickel sulphide failure rates are not well reported, however, one study reports that it would not be abnormal for one pane in every four tonnes of glass to be affected. Pianalto estimated that for one 20-storey high-rise commercial building in downtown Vancouver with floor to ceiling curtain wall, there might be 30 windows failing due to nickel sulphide over the life of the building. In one case, he said, a building owner suspected the night cleaning crew was breaking windows. However, nickel sulphide failures have a characteristic shatter pattern that proved it was in fact nickel sulphide. The flaw can be identified through a process known as heat soaking, Pianalto said. Currently there are two local glass fabricators that have the necessary equipment; Garibaldi Glass Industries Ltd. and Vitrum Industries Ltd. Heat soaking will not totally eliminate nickel sulphide failures but dramatically reduces its potential for in-situ failure. Ontario, which experienced a series of tempered glass failures in high-rise balcony guards, legislated heat soaking in 2012 for some specific circumstances. However, no such regulations exist anywhere else in Canada.

Safety glass options

- **Tempered glass**: Tempered safety glass is float (annealed) glass which is heated to a temperature of approximately 600°C and then subsequently cooled rapidly by cold air. If broken, tempered glass tends to shatter into small fragments. Tempered safety glass cannot be cut, ground, or drilled after it is tempered. During manufacture, the heat treatment causes the nickel sulphide (NiS) inclusions in the glass to change size. When cooled rapidly, the NiS inclusions are unable to change completely back to their original form. Over a period of time (anywhere from a few months to a number of years), the NiS inclusions will slowly convert back to their original form but will increase in volume. That increase in size can cause breakage. However, the mere presence of NiS impurities in a glass panel does not mean that the glass is doomed to break.

- **Heat soaked tempered glass**: Heat soaked tempered glass is tempered glass that has been treated in a chamber by raising the temperature to approximately 290°C to accelerate the expansion of NiS inclusions. This causes glass containing NiS inclusions to break in the heat soak chamber, rather than on-site. The heat soaking process is not 100 percent effective and increases the cost of the glazing.

- **Laminated glass**: Laminated glass is a combination of two or more glass sheets laminated to one or more layers of plastic foil under high temperature and pressure. In case of breakage, laminated glass does not shatter into small pieces. It will break, but the glass pieces remain bonded to the foil.
Asbestos a concern when replacing old windows

As the Fenestration Association of BC rolls out its training program for window replacement, installers are reminded that asbestos and even mould can arise as issues when retrofitting older buildings.

Asbestos can cause four main diseases, including mesothelioma which is always fatal, and WorkSafeBC ranks asbestos disease as the number one killer of workers in BC.

“We are seeing claims relating to replacements of older windows which quite often have asbestos surrounding them,” said Terri Williams, vice-president of Burnaby-based Wilson M. Beck Insurance Services Ltd.

Asbestos, which is now banned, was once widely used in window putty. If the putty is cracked, drilled, sanded or otherwise disturbed, it could result in the release of asbestos fibers into the air, presenting a health risk.

Asbestos could be present in any building that was built or refurbished before 1990. Aside from window putty, it is found in old tile floors, some insulation and even in drywall tape and exterior stucco.

In one case cited by Williams, a general contractor damaged the interior windowsills during a large-scale window replacement project on an older residential condominium building. It was later discovered that the sills contained asbestos insulation and, during removal of the windows, asbestos fibres became airborne, entered the HVAC system and spread throughout the building. The building was evacuated and the project was put on hold to implement an abatement program. “The building and unit owners filed claims for delays and loss of use. The cost of this claim exceeded $150,000,” Williams noted.

In another case, a contractor was sued because the insulation and drywall surrounding a replacement window had become wet and produced a toxic mould.

Asbestos and mould are routinely excluded from commercial general liability insurance policies. “As general contractors may hire subs to replace windows, this loss would generally flow down to the sub-trades responsible,” Williams explains.

Like other commercial insurers, Williams recommends contractors opt for an environmental liability policy that does not exclude asbestos and mould. While the coverage costs a bit more than standard insurance, she notes, “it is not high compared to an uninsured loss.”

KP buys Farley

KP Building Products Ltd. has bought substantially all of the assets of Farley Group Inc., a manufacturer of GreenView brand PVC and aluminum-hybrid windows and patio doors.

KP is a subsidiary of Kaycan Ltd., based in Montreal.

“We are very excited with this acquisition” said Lionel Dubrofsky, Kaycan Ltd.’s president, in a statement. KP makes vinyl, aluminum and engineered siding, trim coil and rain carrying products. Adding Farley’s PVC windows and patio doors “will help us provide an unprecedented product mix and level of professional support,” he said.
A European manufacturer has proven that aluminum frame windows can meet or even surpass the lofty energy requirements of the Passive House standard. Sapa Building System claims its Avantis 95 is a state-of-the-art window system certified by Passivhaus (as it is known in Europe). The product is one of the slimmest Passivhaus windows on the market, creating a sleek, contemporary look that balances performance with design while still being inherently robust, allowing vent weights of up to 170 kg. It is available in a wide range of applications – turn, tilt and turn, bottom hung and fixed, all in a range of colours.

Its outstanding performance includes water tightness over three times greater than the maximum level within current European standards, and a U-value equal to 0.80 W/m²·C, qualifying it for Passive House use.

Victoria Passive House builder Rob Bernhardt was surprised. “I had not heard of a [Passive House] aluminum window before. This is impressive. It appears to be an aluminum cladding/structure interior and exterior, with a 65 mm thermal break between the aluminum cladding.” The frame is insulated with polyurethane, polyethylene and foamed EPDM. The gasket is made of EPDM.

Crispin Jedrzejewski, product manager at Sapa Building System, said: “Sapa has created a window that not only meets the highest standards set out under Passivhaus, but that also has aluminum’s slim, aesthetically pleasing sight lines. This combination means the Avantis 95 is ideal for architectural projects where high levels of energy efficiency are specified.” He claims the triple-pane window tested to an extremely low air filtration rate, “10 times better than the most stringent European test requirements.”

Bendable spacer

Coniston Products Ltd. of Delta, BC has partnered with Technoform Glass Insulation to offer what Technoform claims is a brilliant new spacer for window systems that can be used for odd shapes.

The TGI*-Spacer is a bendable warm edge spacer bar that combines a high performance synergy of stainless steel and polypropylene. The TGI-Spacer allows only a very low heat transfer while offering the highest levels of resistance against gas leakage and humidity, the company claims. It also has low conductivity at the glass edge, improving U-values and overall window energy ratings, regardless of the frame material used. TGI*-Spacers can be processed on all standard bending machines.

The TGI-Spacer, which comes in six colours, can be bent to form the shape of almost any frame design, and with only one joint. By removing the extra joints there is far less chance of gas escaping from the unit, meaning the manufacturer can use much less sealant. The bendability also benefits installers since bending the spacer bar – rather than cutting and corner-keying – reduces the risk of moisture penetrating the sealed unit, a factor that can cause the unit to fail.

“We’re looking forward to working with Coniston to reach more Canadian customers,” says Brian Stephens, TGI NA’s market team member. “We see significant opportunity for our TGI spacers in both residential and commercial buildings.”

Have a new “cutting edge” fenestration product?

Send the information in to Fenestration West magazine at editor@fenestrationwest.ca
European artist and inventor Klemens Torggler has developed what he believes is a “revolutionary door system.” Pre-hangers, take note.

The door is certainly different – no hinges, no rail, no door leaf, as you would normally have expected from a door. Instead, like a light airy sail, squares swing apart, fold and open with a mere touch.

Torggler used the force of gravity for the mechanism of his door. “The key principle is similar to a balance in the vertical position. In a door consisting of two parts, gravity causes one half to rotate. The physical work is redirected and causes the second, equally heavy door-half to move against gravity,” he explained. “To open and close a gentle touch is all that is needed. After that physics takes over.”

Vienna-based Torggler said the idea for the door, which has attracted international attention, came about during a renovation of his apartment. He was faced with the challenge of developing a door for an opening with an arched lintel.

“A sliding door seemed to be the only option, but I could not quite get used to the door rail that went with it. It would have disturbed my aesthetic sensibilities.”

He said a Torggler door can be installed indoors in ordinary frames, but can also be used for large openings. Safety aspects are taken into account with an anti-jamming protection.

The Torggler doors are available in a wide variety of designs, he added.
European-inspired windows and doors are widely recognized as global trend setters, so a peek inside the giant 2014 fensterbau/frontale trade show in Nuremberg gives some idea of what is heading our way. The show drew nearly 800 exhibits from 300 companies.

Energy saving and environmental awareness is more pronounced in Germany and across Europe as more stringent codes and regulations come into effect (see the “Passive Aggressive” article in this issue). Judging from the exhibits, triple-glazed windows with very low U-factors are taking a much larger share of the European market.

Fensterbau/frontale exhibitors also showed a trend towards large door systems, particularly in glass patio doors. Some of the sliding doors measured 20 feet wide and 10 feet high. Ventana USA, which also showed large circular vinyl windows with tilt-and-turn frames, predicts that the larger door systems are coming to North America soon.

Renovation projects, where old white vinyl windows are being replaced, is apparently creating a trend towards coloured window frames. One example from the trade show was an aluminum cladding in various colours that can be mounted on vinyl frames without the need to replace an entire window.

In summary, the European window trends are bigger, greener, more colourful and moveable. ■
NFRC calls on student film makers

OTTAWA – The National Fenestration Rating Council is celebrating 25 years of service by calling on students to submit an original short film exploring the important role windows, doors, and skylights play in everyday life.

Entries are due by August 1, 2014. A panel of NFRC members will view and judge the submissions. The top three entries will be screened at NFRC’s fall membership meeting on September 22 in Victoria and posted to NFRC’s website.

First prize is $1,500; second is $750 and third prize is $500.

“This is an exciting new undertaking for us and will be a great way to engage students in the work we do,” said Jessica Finn, NFRC membership coordinator. “We hope participating students will see their films as an important element in promoting energy efficiency and environmental responsibility.”

For contest rules and registration, interested students should visit https://nfrccommunity.site-ym.com/?Filmcontest.

Hartung Glass turns 90

Hartung Glass turns 90 this year. The company, which started and is still headquartered in Seattle, has manufacturing and distribution facilities in Coquitlam and Langley as well as across the U.S. Throughout its long history, Hartung Glass has forged a name for itself synonymous with quality, service and innovation, such as its moves into laminated glass, switchable glazing and glass etching.

Ply Gem buys Gienow

U.S.-based Ply Gem Holdings Inc. has bought Canadian window and door fabricator Gienow Window & Doors Ltd. from VRK Holdings of Denmark.

Gienow runs a 350,000-square foot plant in Calgary to serve western Canada, producing vinyl, clad-wood, and metal-clad vinyl windows and doors.

Ply Gem paid about $21 million for Gienow.

“We will continue to run both operations, and both brands, independently,” said John Wayne, Ply Gem Executive Vice President and COO, adding that Gienow offers products and operations that are similar and complementary to Ply Gem in Canada.

“This acquisition allows the opportunity for Ply Gem to expand its existing product portfolio and distribution network in western Canada. Both Ply Gem and Gienow’s customers will continue to be serviced through their existing dealers and distributors,” he added.

Ply Gem, headquartered in Cory, North Carolina, is a $1.5 billion manufacturer of vinyl windows and doors, siding, fencing and other PVC building materials. Ply Gem has 5,000 employees in North America.

Ply Gem also bought vinyl siding maker Mitten Inc. of Paris, Ontario, from Graham Partners Inc. Ply Gem paid about $82 million for Mitten, according to that prospectus.

Spectrum Skyworks to re-roof domed landmark

VANCOUVER – Spectrum Skyworks of Port Coquitlam, a Fen-BC member, has been awarded the contract to replace the clear acrylic roof on the Bloedel Conservatory in Queen Elizabeth Park.

The $2.3 million project is being done in two phases and will complete at the end of this year.

While the triodetic domed roof is still strong, it is 45 years old. Some individual roof panels need replacing because they have cracked and now leak.

This is a large and unique retrofit as the dome structure has more than 1,400 individual “bubble” panels of 32 different sizes, each one needing to be custom made and individually installed.

The summer issue of Fenestration West magazine will carry a full report on this stunning project.
Employee given working notice can refuse to work and will not lose the right to sue

Walking out on notice

by Robert Smithson

Most employers likely believe that an employee given working notice of termination and who refuses to keep working has forfeited any legal claim to damages. They likely would have been correct in that belief, until now.

British Columbia’s Court of Appeal has issued a judgment stating that – in some circumstances – an employee given working notice can refuse to work and will not lose the right to sue for wrongful dismissal. This is a bit of a complicated matter that seems to tilt the playing field somewhat in employees’ favour.

The basis of the law of wrongful dismissal is an employee’s right to receive reasonable working notice of termination. Unless an employee’s rights have been properly altered by contract or there is just cause for summary dismissal, the employer must provide reasonable working notice of termination.

What is “reasonable” depends on the circumstances. Courts take into account factors such as the employee’s age, tenure of employment, position, extent of managerial responsibilities, and likely difficulty in finding new employment.

When an employer fails, or refuses, to provide reasonable working notice the employee can sue for damages for wrongful dismissal. The “wrongful” part is the employer’s failure to provide the required amount of working notice and the damages the employee can obtain are the monetary equivalent of that lost notice period.

In return for reasonable working notice, employees have historically been required to continue to perform their usual tasks and duties during that notice period.

If they resigned their position – by walking away – during the working notice period they were treated as having forfeited the right to claim damages for wrongful dismissal.

So, the employer is obligated to give reasonable working notice and the employee is obligated to keep working. Seems sensible, right? Not always, according to the BC Court of Appeal.

Raymond Giza, 61, had been a bus driver for the Sechelt School Bus Service Ltd. for five years. In 2009, his employer gave him approximately five weeks’ working notice of termination.

In response, Giza drove to the bus terminal, parked his bus, left his job, and didn’t return. He then sued for wrongful dismissal. At trial, the BC Supreme Court did what employers would expect – it rejected his claim on the basis that, by walking away from his job, he had disqualified himself from receiving damages.

Decision reversed

The Supreme Court stated, “There is no reason why Mr. Giza could not have continued to work through the period of reasonable notice. Mr. Giza failed to do so, and as a result, quit his employment before it ended. Therefore, he is not entitled to damages for wrongful dismissal.”

His appeal of that decision produced a different, and perhaps puzzling, result. It determined that, although Giza failed to work through the working notice provided to him, he was not prevented from suing for damages.

The Court of Appeal stated, “In classic terms, [Giza] evidenced an intention not to be bound by the contract, but that did not deprive him of his right to damages for the respondent’s breach of contract in giving him inadequate notice.”

The critical element seems to have been that the five weeks’ working notice given to Giza was clearly insufficient. The two Courts agreed on that point.

In all of the circumstances, Giza was entitled to working notice in the range of six months. The employer’s error was, apparently, in thinking it only needed to provide him the five weeks’ notice mandated by BC’s Employment Standards Act.

The Court of Appeal found that Giza’s “right to damages in lieu of reasonable notice had accrued when he was given inadequate notice.” His repudiation – by walking away – apparently did not take away that right. This would seem to be the judicial equivalent of pointing at the employer and saying, “You started it!”

In the end, Giza took away his damages in lieu of reasonable notice. The employer took away the lesson that, when contemplating giving working notice of termination, it should seek advice about what is reasonable in the circumstances.

Robert Smithson is a labour and employment lawyer, and operates Smithson Employment Law in Kelowna, BC. For more information about his practice, visit http://www.smithsonlaw.ca. This subject matter is provided for general informational purposes only and is not intended as legal advice.
glazier journeyperson training
possibly the most important investment you’ll ever make
EuroLine Windows Inc. manufactures premium, custom-built, European-style tilt & turn windows; casement windows; elegant entry, patio and French doors that come in a wide range of colour, design and accessory options.

EuroLine’s new ThermoPlus™ window and door system reduces energy loss and operating costs in both new construction and building upgrades and has been used in Passive House projects across Canada and the US.

ThermoPlus uses Passive House Institute certified GENE® window and door profiles — manufactured with high-tech RAU-FIPRO®, a hybrid of fibreglass and vinyl — to provide superior thermal comfort, reduce operating costs and energy loss, offer greater design flexibility, and allow for larger window areas.

For more information,
go to: www.euroline-windows.com
1.800.337.8604 • 604.940.8485
info@euroline-windows.com

Visit our showroom:
7620 MacDonald Road, Delta, BC V4G 1N2
Monday - Friday: 7:30am to 3:30pm
Saturdays by appointment - closed Sundays and holidays

The Window of the Future — Today