Critical Canadian
Building Science
Webinar Series

Mark Rosen
Building Knowledge Canada

Frank Lohmann
CHBA

Mike Memme
Mountainview Homes

What's New in NBC 2025: Key Code Changes Shaping Residential Construction

March 11, 2026 | 11:00 AM - 12:30 PM EST

BUILDING KNOWLEDGE CANADA INC.

ENBRIDGE
Life Takes Energy

Agenda

- Welcome from Enbridge
- Introductions
- Housekeeping
- What's New in NBC 2025:
  - Host: Mark Rosen, BKC
  - Expert/Guest Speaker – Frank Lohmann, CHBA
  - Expert/Guest Speaker – Mike Memme, Mountainview Building Group
- Q&A

BUILDING KNOWLEDGE CANADA INC.

Mark Prociw
Manager, Mass Market Strategic Accounts
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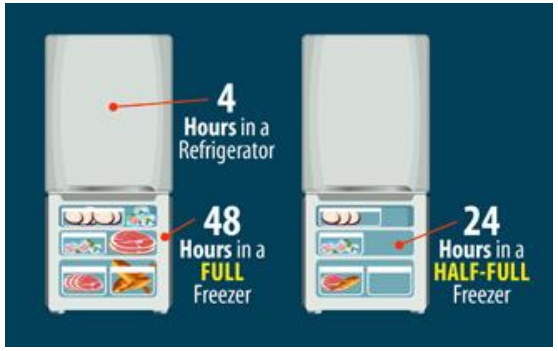
Traditional Acknowledgement

Power Outage Protection – Prioritize Safety!

Power outages can occur at any time of the year – being prepared ahead of time is key to protecting yourself, your family and your community.

Tips:

- Keep refrigerators and freezers closed.
- Disconnect sensitive appliances and electronics.
- Use generators ONLY outdoors and away from windows.
- Plan ahead for medicines and power-dependent medical devices.
- Do NOT use gas stoves or ovens to heat your homes.
- If safe, go to an alternate place for warmth.
- Check on neighbours, especially seniors and vulnerable households.

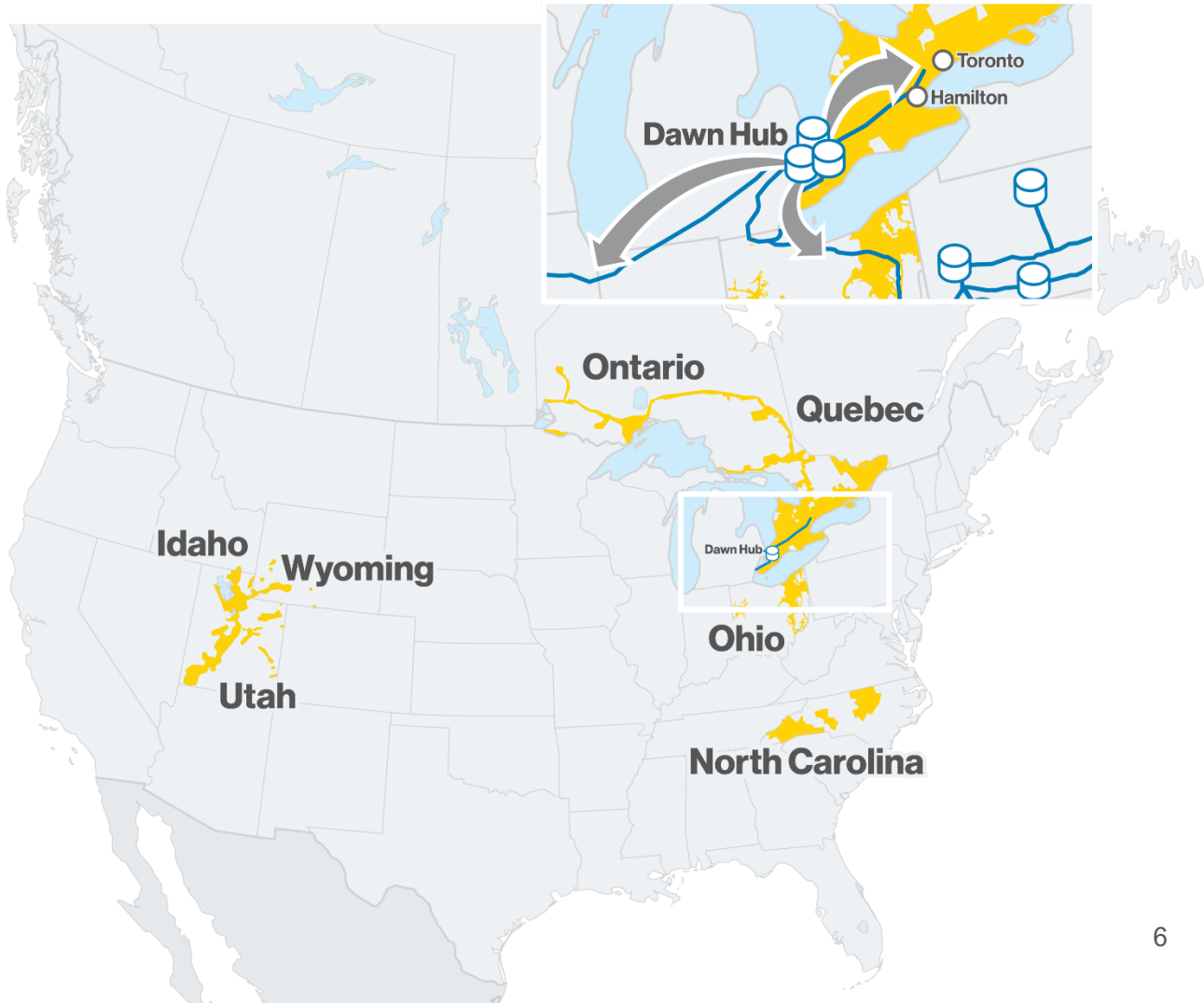


Enbridge Gas

North America's largest natural gas distribution and storage company

We deliver the energy that enhances people's quality of life.

- **Values:** Safety, Integrity, Respect, Inclusion, High Performance.
- **Ambition:** To be your first-choice energy delivery company.
- **Distribution business:** Five natural gas utilities provide safe, affordable and reliable energy to 7 million customers in Ontario, Quebec, Ohio, Utah, Idaho, Wyoming and North Carolina.
- **Gas supply:** The Wexpro Company develops and supplies a portion of natural gas supply to Enbridge Gas in Utah, Wyoming, and Idaho.
- **Storage:** 351.6 Bcf of natural gas storage, largely at the Dawn Hub, Canada's largest integrated underground storage facility and one of the top gas trading hubs in North America.



Mark Rosen

HOST

MEA, OAA, AIBC

Director of Building Science

Mark Rosen is a professional architect, CACEA Master Energy Advisor, and nationally recognized building science leader. As Partner and Director of Building Science at Building Knowledge Canada (BKC), Mark leads the integration of building science, energy modeling, and systems innovation across residential projects nationwide.

With over 18 years of experience in high-performance housing, Mark serves on multiple advisory committees and contributes to national discussions on building codes, energy policy, and sustainable housing. He was named Ontario's Energy Advisor of the Year in 2013 and 2018 for his leadership and technical excellence.

He is driven by a commitment to advancing practical, scalable solutions that improve building performance, resiliency, and environmental outcomes.

SPEAKER

Dan Sandink

Senior Director, Resilience Programs, ICLR

Frank started his career in residential construction 40 years ago. After earning a Building Physics degree, he worked for 23 years at the National Research Council. First in research and then on developing national construction codes. In 2020, Frank left the government and is now Senior Director, Building Science at the National Office of the Canadian Home Builders' Association where he and his team make sure CHBA's member interests are represented on national codes committees.

Mike Memme

SPEAKER

Operations Manager, Mountainview Building Group

Mike Memme is the Operations Manager at Mountainview Building Group in the Niagara Region. They have been building low rise homes in the Niagara Region since 1979 and over the last seven years have branched into the midrise market as well. Mike has a Civil Engineering degree from the University of Waterloo, has been president of the Niagara Home Builders' Association, and Chair of the Ontario Home Builders' Association and is currently an Ontario Home Builders' Association board member. Mike was previously Chair of the OHBA Tarion Liaison committee, Building Code Committee, and Builder Developer Council, and has contributed to the development of the Tarion Construction Performance Guidelines.

Housekeeping – Rules of Engagement

- Have questions? Please place them **ONLY** in **Q&A.**
- Be considerate, thoughtful, and respectful in the CHAT.
- The BKC Admin team is ready to help with tech concerns or general inquiries.
- This webinar is recorded and available after the presentation.
- Please complete SURVEY MONKEY following presentation!
- Links, presentation materials - all will be sent out to attendees following the webinar.
- The Chat is not meant for advertising product or for solicitation. Your messages will be deleted. Thank you for your understanding.
- Closed Captioning is enabled if you require a live transcript while the hosts are speaking. It's between Record and Reactions at the bottom of most screens.

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POLLS!

Where are you from?

What keeps you busy?

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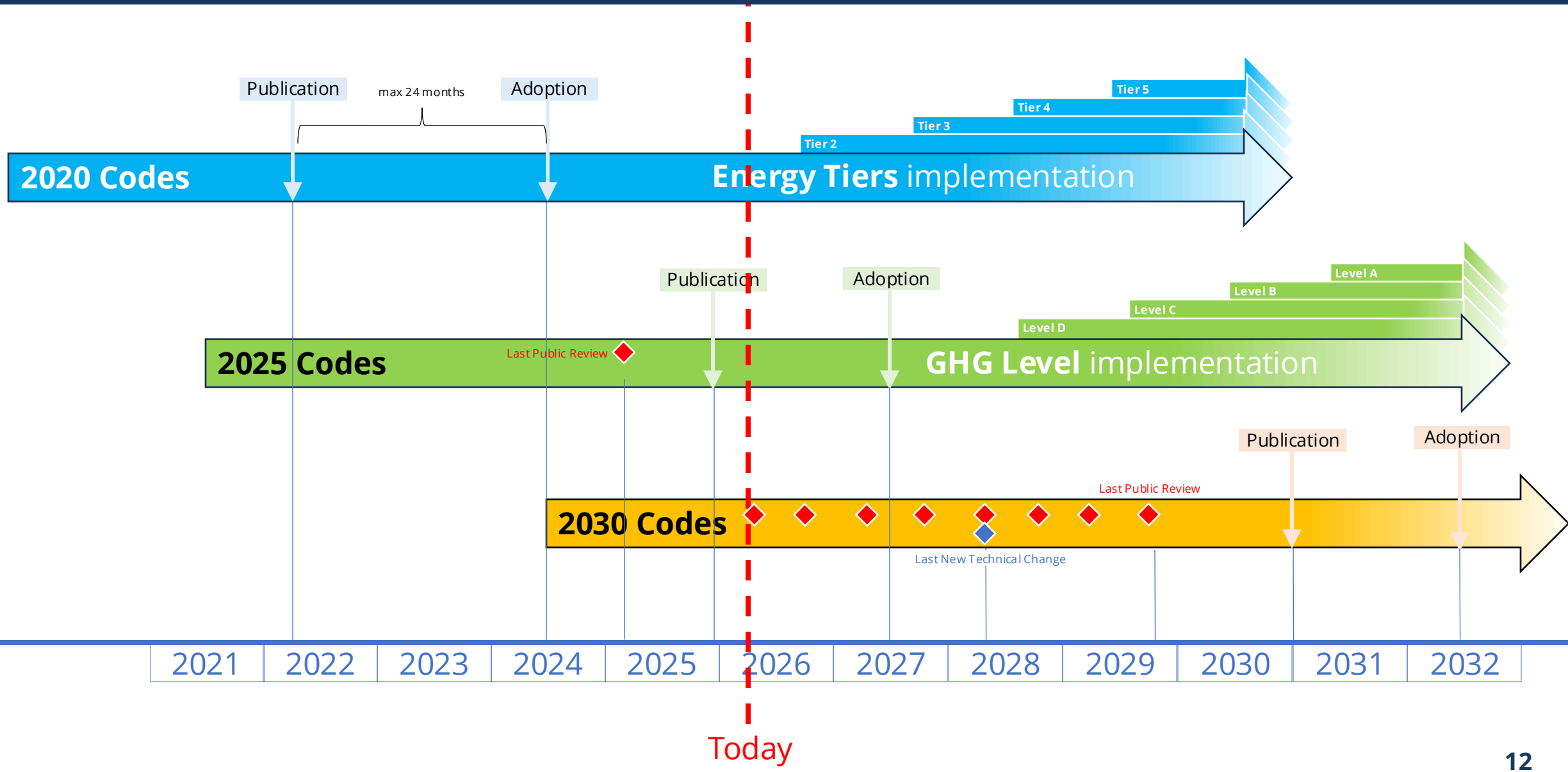
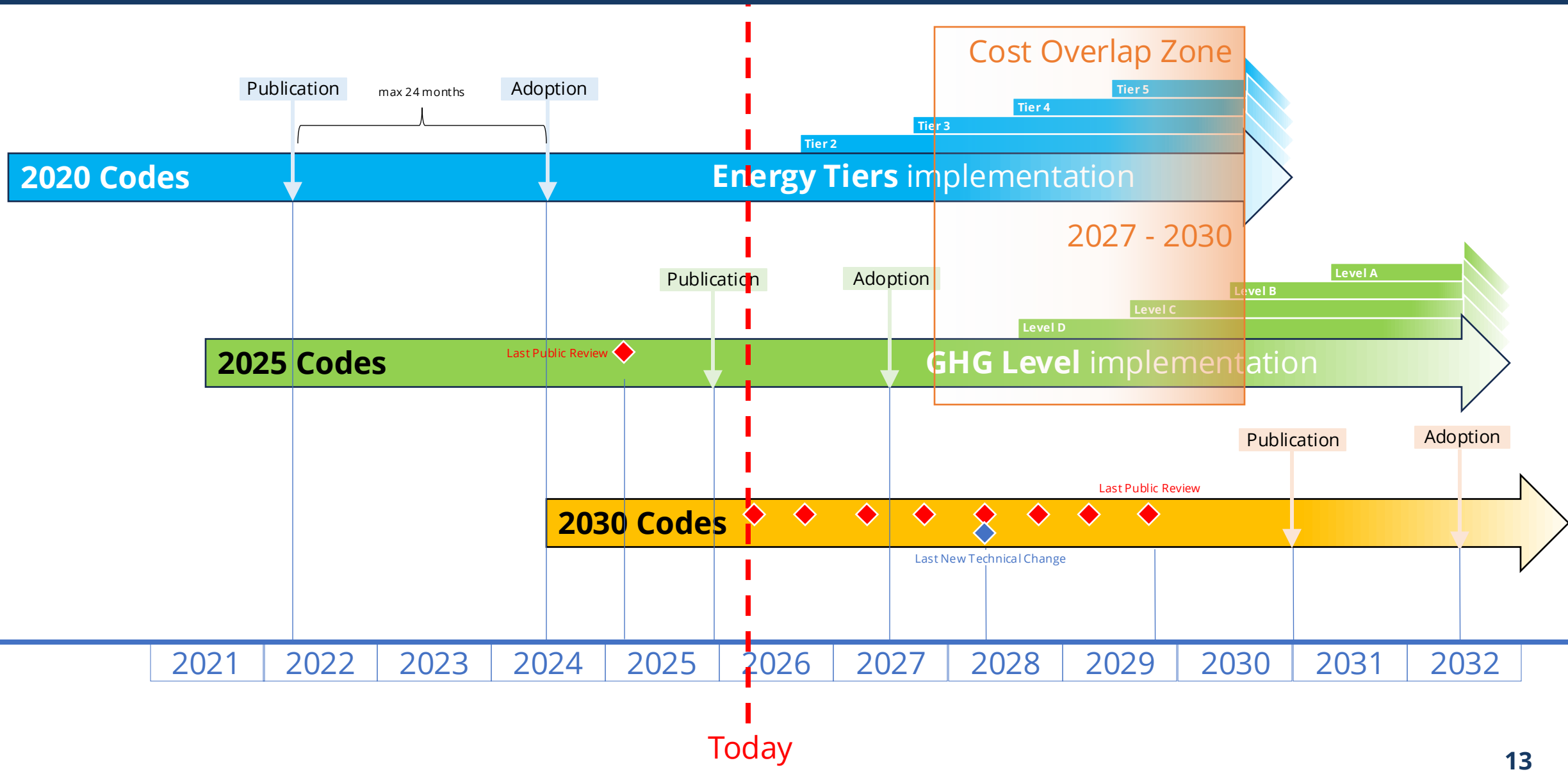
CODES TIMELINES



CODES TIMELINES

Canadian Home Builders' Association



CHBA COMMENTARY

- … a few words to frame CHBA's commentary:
  - As many of you likely know, CHBA is advocating for a pause on national codes
  - There is more to it than 'the 2025 technical changes add cost' (although most visible)
  - **System issues**
    - CHBA has observed many issues with the national code system over the years that impede housing affordability and building more housing supply
      - Governance is being changed
      - Process is being changed
      - Local differences in interpretation
      - No cost limit to changes – affordability is not a topic in code development
      - Industry voice is being marginalized
  - **Not today's topic, but my commentary on today's subjects will explain which changes we think should go ahead and which are problematic and should be revisited**

NBC 2025 Code Changes

Radon Passive Stacks

PCF 1713

Radon and Soil Gas Mitigation

- Radon is a colorless, odorless radioactive gas coming from soil gas that can infiltrate homes (basements, crawl spaces, etc.).
- About 7% of homes exceed the Health Canada guideline of 200 Bq/m^3, but many radon-induced lung cancers occur at levels below that threshold.
- Radon is the second leading cause of lung cancer in Canada (after smoking), accounting for ~16% of lung cancer deaths (~3,200 per year).
- **Existing NBC provisions** require an **air barrier** between conditioned space and ground and a **rough-in** for future radon extraction.
- A **passive stack** subfloor depressurization system, installed during construction, is shown to reduce radon levels by 40 % to 90 %, which is more reliable and cost-effective than retrofitting later.

Radon and Soil Gas Mitigation

Required elements (9.13.4):

- Air & soil gas barrier equivalent in performance to 6mil poly (NBC 2020)
- Rough-in for sub floor depressurization: gas permeable layer, inlet/outlet, pipe (NBC 2020)
- **NEW:** Passive vertical stack

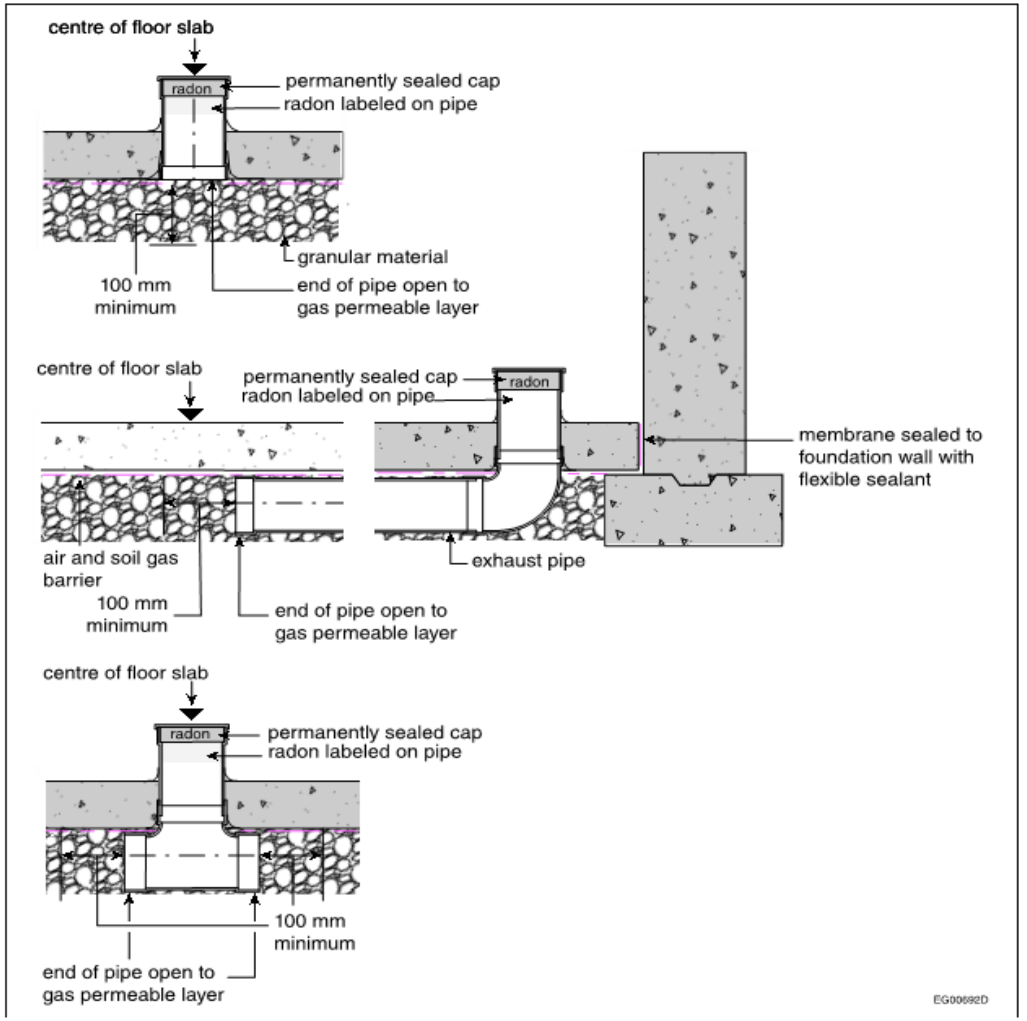


Figure A-9.13.4.3.(2)(b) and (3)(b)(i)
Acceptable configurations for the extraction opening in a depressurization system

CHBA COMMENTARY

Canadian Home Builders' Association

- Sealing of overlapping joints in soil gas (air) barrier is positive change
- Why radon requirements remain problematic
  - Need code language clarifying that measurement and acceptable concentration is homeowners' responsibility (passive stack creates false sense of security that radon concentration is acceptable)
  - Passive Stacks
    - Are not possible in all homes – need other options
    - Will not necessarily lower limits below Health Canada's Limit
    - Pipe insulation with extremely high RSI values for unconditioned areas and durable options for above the roof may not exist
    - Activation of stacks could lead to condensation
  - Other Acceptable Methods are missing
    - Capped & labelled side wall vent
    - Active Mitigation Systems commonly installed by radon mitigators are not permitted
    - The 2030 proposed change for "active light" (14-28 l/s) radon mitigation system is not a feasible option
  - If time allows, a word on radon statistics …

NBC 2025 Code Changes

Protection of Rough Openings

2nd Plane of Protection, PCFs 1950 and 1951

Risky Construction Practice On A Home: Full FACE-SEALED windows and Doors

- **Do NOT tape /close-off the bottom of the window-to-WRB** (unless explicitly required by window manufacturer or appliance spec)

- Water will get into the opening. Let is DRAIN BACK OUT

PCF 1950: Protection for Rough Openings

- **Points to CSA A-440.4** with fewer exceptions
- Includes a requirement for **sill protection** for combination units (ie. mulled)
- 9.27.2.3.(c) the protection provided by the first and second planes of protection shall be maintained
  - **[i] at the rough opening sills of windows and doors,**
  - [ii] at wall penetrations created by the installation of components and services such as ~~windows, doors,~~ ventilation ducts, piping, wiring and electrical outlets, and
  - [iii] at the interface with other wall assemblies.

PCF 1950: Protection for Rough Openings

- **Extended Appendix Note A-9.27.2:**

...For **windows or doors**, the rough opening that penetrates the cladding system plays a crucial role as part of the concealed barrier assembly or **second plane of protection**. Incidental water may penetrate the first plane of protection or may enter from areas above or around a window or door (e.g., as the result of a failed window or door unit). Extending the second plane of protection into the rough opening at the sill, as shown in Figure 9.27.2.-A, ensures that this incidental water is collected and diverted back to the exterior over the protected sill. Thus, the rough opening, as a distinct feature, contributes to the effective management of water ingress and enhances overall performance. These characteristics are particularly important as **insulation and airtightness levels increase** at higher energy performance tiers, since higher levels reduce drying potential in the event of unintended water ingress.

PCF 1950: Protection for Rough Openings

Figure [A-9.27.2.-A]
~~Rough opening s~~Second plane of protection maintained into the rough opening

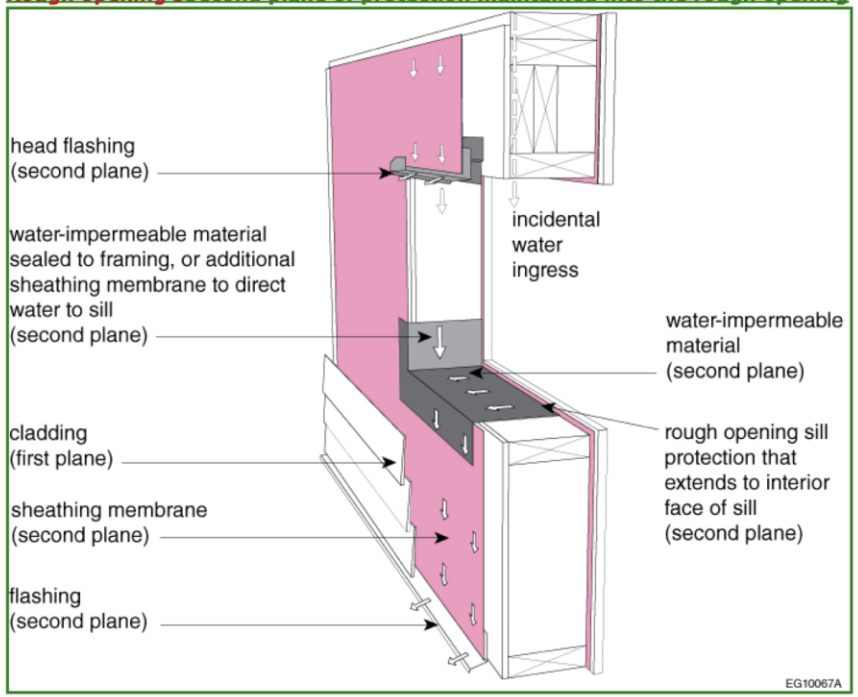
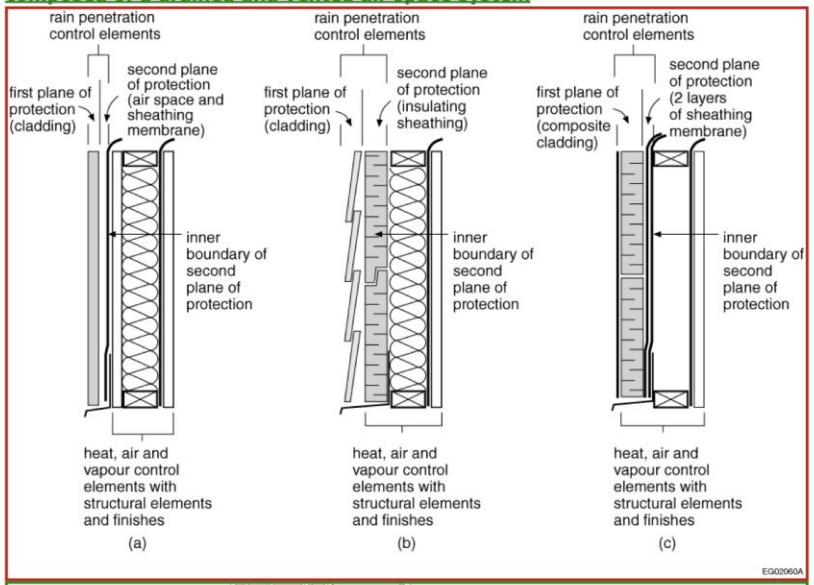


Figure [A-9.27.2.-B] A-9.27.2.
~~Generic r~~Rain~~screen~~ control assembly~~ies~~ with second plane of protection composed of a drained and vented air space system



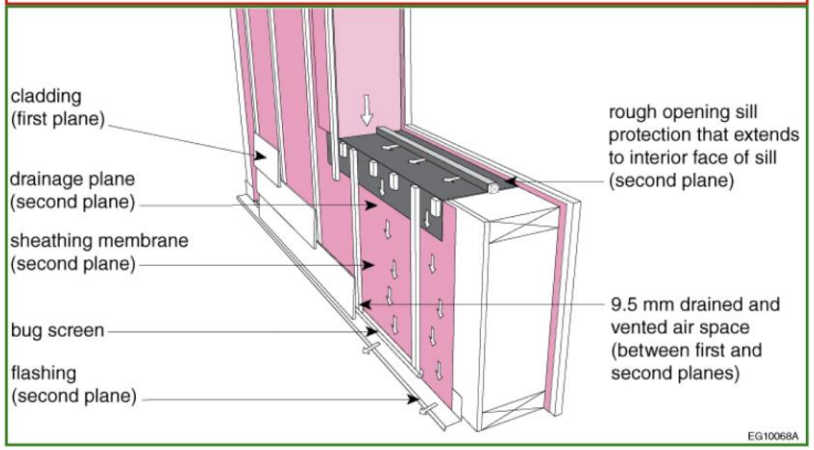


Figure [A-9.27.2.-C]
Rain control assembly with second plane of protection composed of insulating sheathing

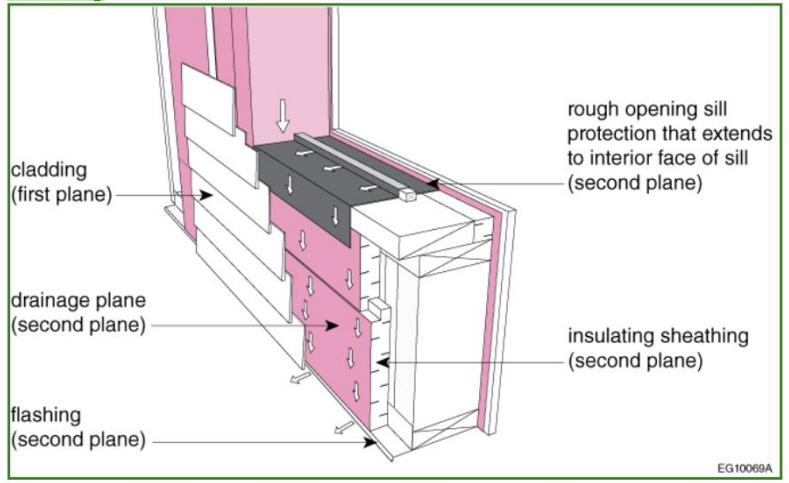
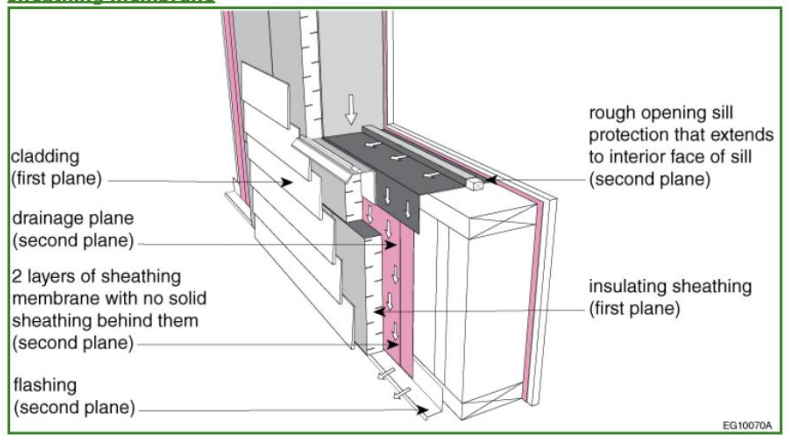


Figure [A-9.27.2.-D]
Rain control assembly with second plane of protection composed of 2 layers of sheathing membrane



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PCF 1951: Continuity of Insulation

- **Continuity of Insulation – 9.36.2.5.**

…allows **lower insulation levels in the rough stud opening (RSO) and no insulation at the sill to allow for drainage of the RSO** (PCF 1951)

Appendix note:

"*Any solution employed to meet the effective thermal resistance and air barrier requirements for the rough opening gap around windows, doors and sills should ensure that proper drainage to the exterior is not compromised.* ***Installing the insulation (where required) and the air barrier at the interior perimeter of the window or door*** *will facilitate positive drainage back to the exterior at the sill.*"

CHBA COMMENTARY

Canadian Home Builders' Association

- Since 2014, CHBA has supported and asked for resolving water-ingress implications with high-performance envelopes
- Why CHBA is concerned with windowsill requirements
  - PCF 1950 – Moisture protection at openings
    - Good accepted practice in many areas (certainly in CHBA's Manuals, LEEP training etc)
    - Some implementation challenges, trade sequencing, project scheduling – needs time
  - PCF 1951 – Less insulation at sill
    - CHBA's public review concerns with the potential for condensation was never resolved
      - Builders from colder regions (such as BC / AB) report condensation problems at bottom sash when insulating to only RSI 0.56 (R 3.2)
      - Committees referenced but did not review NRC research on condensation
      - Inconsistent with CSA A440.4 – as it requires all 4 sides to be insulated

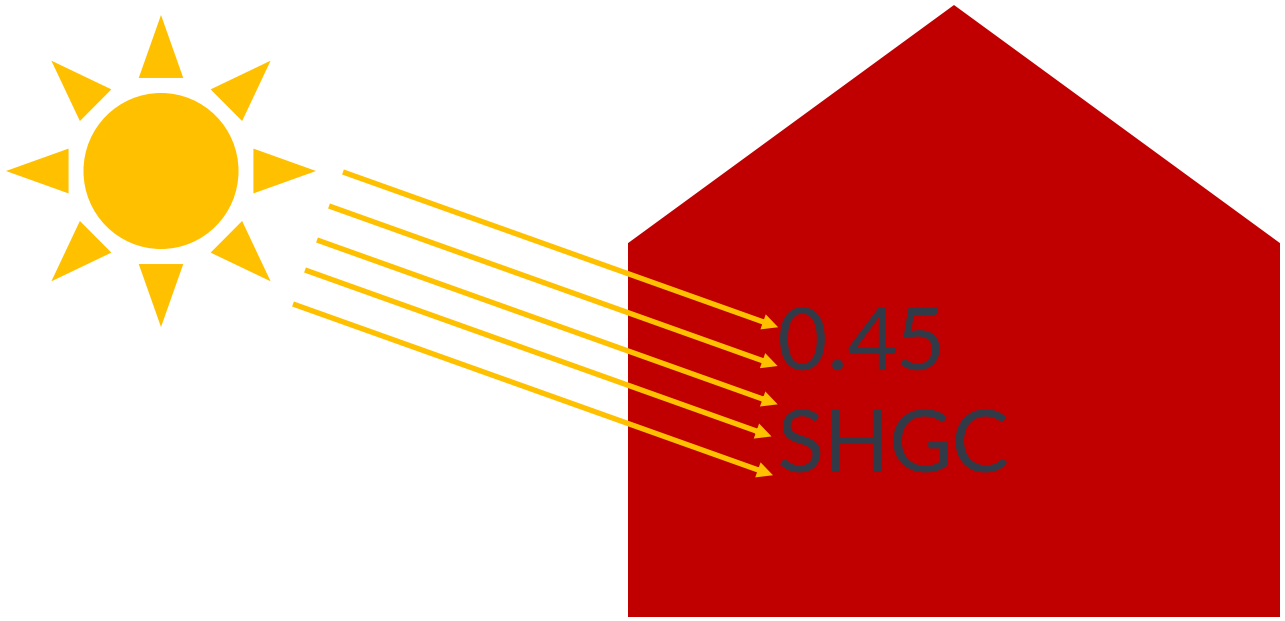
NBC 2025 Code Changes

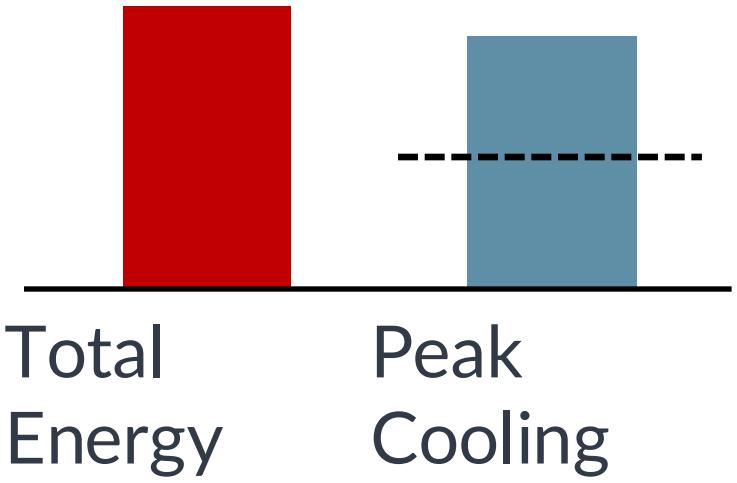
Windows and Solar Heat Gain

PCF 1823

SHGC in the Proposed House

- As SHGC ↑ total energy goes ↓ cooling load goes ↑
  Comfort goes ↓





* For illustration only, not to scale

NBC 2020: Peak Cooling Prescriptive vs. Performance

CURRENT 2020 NBC …

Performance Path

- Simplified, based on Ref. House Peak Cooling Load limit
- Reference House Window SHGC: 0.26
- Very **RESTRICTIVE**

Prescriptive Path

- **NO SHGC /Overheating restrictions !**

- Risk of non-compliance despite appearing to meet the intent of the Code:

- Examples of types of houses that may be affected include low-load houses with small volumes, houses with overall small cooling loads, and houses with mechanical cooling installed that is already accounted for in the energy model.

Peak Cooling and Overheating

- Peak Cooling Criteria **Fixed in NBC 2025**
  - Fixes the problems with the peak cooling compliance criteria for tiered codes
  - New exemptions **(!)** for
    - mechanical cooling
    - small cooling loads (10W/m^3)
- Maximum Solar Heat Gain Coefficient
  - Prescriptive requirements
  - reduce risk that passive solar energy inadvertently overheats energy efficient buildings
  - based on climate zone
  - based on window-to-wall ratio

Submit a comment

Proposed Change 1823

Code Reference(s):	**NBC20 Div.B 9.36.2.7. (first printing)** **NBC20 Div.B 9.36.5.3. (first printing)** **NBC20 Div.B 9.36.7.3. (first printing)**
Subject:	Fenestration
Title:	Thermal Characteristics of Fenestration and Doors
Description:	This proposed change places a limit on the maximum solar heat gain coefficient for fenestration and doors based on the fenestration and door area to gross wall area ratio.

NBC **2025 UPDATE** to Peak Cooling Load: PCF 1823

Prescriptive Path

- SHGC limits based on climate zones, FDWR (9.36.2.7)
- Apply FDWR to whole building (consistent with other requirements)

Fenestration and Door to Wall Ratio (FDWR)	Maximum Solar Heat Gain Coefficient of Fenestration and Doors					
	Heating Degree Days of Building Location					
	Zone 4	Zone 5	Zone 6	Zone 7A	Zone 7B	Zone 8
FDWR < 17%	0.35	0.40	0.45	0.50	0.55	0.60
17% < FDWR < 22%	0.30	0.35	0.40	0.45	0.50	0.55
22% < FDWR < 30%	0.26	0.30	0.35	0.40	0.45	0.50
FDWR > 30%	0.26 (= reference house)					

- Extensive modeling done: cooling load vs heating loads
- Supported by Fenestration industry
- Very little cost between different coatings/glazing options

NBC **2025 UPDATE** to Peak Cooling Load: PCF 1823

Performance Path

- Peak Cooling Load of Proposed ≤ Peak Cooling Load of Reference 9.36.6.3.(7)(a)
- OR Design Cooling Intensity ≤ ~~4.5~~ 10 W/m^3 9.36.6.3.(7)(b)
- OR Install a Cooling System (requires CSA F280) 9.36.6.3.(7) & (8)(b)

CHBA COMMENTARY

Canadian Home Builders' Association

- Very happy about fixing the Peak Cooling Criterion
  - CHBA had asked for these changes before the 2020 codes were published
  - Prescriptive Changes are only slightly limited – where warranted – leaves lots of product selection
  - Strong collaboration with fenestration industry
  - Next step could be adding solar incidence data to Appendix C (because climate zones are not the only indicator for overheating)


2020 NATIONAL BUILDING CODE
Energy-efficiency requirements and overheating

Tiered Prescriptive Path 9.36.7 : Point based picklist

Prescriptive Path

- Approach uses energy conservation measures which have energy conservation points.
- Similar to the ENERGY STAR for New Homes, builders choose measures to meet Tier Pt sum
- Approach enables flexibility and is easy to extend by including new measures in the future.
- HRVs are mandatory in this path, all other measures are optional.
- Air tightness Testing Mandatory in Prescriptive Tiers 4 and 5

Energy Conservation Points (PCF 1890)	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Minimum Sum – **Total** Points*	0	10	20	40	75
Minimum Sum – Building Envelope points	0	0	5	10	15
Minimum Airtightness Level (ACH)				1.5	1.5

Updates & Additional Prescriptive Trade-Off “Points”

PCF 1890_NBC 2025
New Energy Conservation Point (ECP) OPTIONS

PCF 1835 : Additional ECPs for Drain Water Heat Recovery

PCF 1836 : New additional points AND more “credit” given for HRVs & ERVs

PCF 1889 : Fenestration & Doors

PCF 1923 : Building Envelope

PCF 2000 : Provision made for upgraded Oil Furnaces in some regions of Canada

PCF 2001 : Establishes minimum (>60% Capacity / Load Fraction) for air source heat pump as primary space heating

NBC 2025 Updates & Additional Prescriptive Trade-Off “Points”

PCF 1888_NBC 2025 More accurate and correct ECPs for airtightness

Energy Conservation Measures and Points for Airtightness - Detached Homes						
	Zone 4	Zone 5	Zone 6	Zone 7a	Zone 7b	Zone 8
2.5 ACH	-	-	-	-	-	-
2.0 ACH	2.2	3.2	3.5	3.8	4.3	4.8
1.5 ACH	4.3	6.3	6.9	7.6	8.5	9.7
1.0 ACH	6.5	9.6	10.5	11.4	12.9	14.7
0.6 ACH	8.3	12.3	13.4	14.7	16.5	18.8

PCF 1834_NBC 2025 Provides ability / methodology to interpolate between ECP’s for enclosure measures

Table [9.36.7.4.]
Energy Conservation Measures and Points for Above-Ground Opaque Assemblies (1)

Above-Ground Opaque Building Assembly	Energy Conservation Measure, Increased thermal insulation	Heating Degree-Days of Building Location, in Celsius Degree-Days					
		Zone 4 < 3000	Zone 5 3000 to 3999	Zone 6 4000 to 4999	Zone 7A 5000 to 5999	Zone 7B 6000 to 6999	Zone 8 ≥ 7000
		Energy Conservation Points					
Walls[1]	RSI 2.97 effective	2.0					
	RSI 3.08 effective	3.2	1.4	1.6	2.1		
	RSI 3.69 effective	7.4	5.4	6.2	6.7	5.4	5.2
	RSI 3.85 effective	8.2	6.0	6.9	7.4	6.2	6.0

Prescriptive Path: ECP's for Enclosures

Interpolation: Permitted to calculate points "in-between"

Ex.RSI 3.39 = 3.4 pts

Energy Conservation Measures for Above-Ground Walls – Minimum Effective RSI Values, $(m^2 \times K)/W$ (2)	Heating Degree-Days of *Building* Location, in Celsius Degree-Days					
	Zone 4 < 3000	Zone 5 3000 to 3999	Zone 6 4000 to 4999	Zone 7A 5000 to 5999	Zone 7B 6000 to 6999	Zone 8 ≥ 7000
	Energy Conservation Points					
2.97	2.0	–	–	–	–	–
3.08	3.2	1.4	1.6	2.1	–	–
3.69	7.4	5.4	6.2	6.7	5.4	5.2
3.85	8.2	6.0	6.9	7.4	6.2	6.0
3.96	8.9	6.8	7.7	8.2	7.0	6.8
4.29	10.2	8.1	9.2	9.7	8.6	8.4
4.40	10.8	8.7	9.9	10.3	9.3	9.1

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Prescriptive Path: More ECPs!

- Increased availability of points makes the Prescriptive path **far more flexible and usable**
- Introduces the ability to **pursue higher Tiers** (NBC 2020 only includes Tier 1 & 2)
- **Interpolation**! For increased flexibility
- Requirements for envelope improvements and airtightness in upper tiers

Prescriptive “Packages”
New Section 9.36.9

For **Tiers 1 and 5**
All Climate Zones

Table 9.36.9.8.-A1
Tier 5 Prescriptive Package — Electric (for buildings > 300 m³)

Component	Heating Degree-Days of *Building* Location, (1) in Celsius Degree-Days (2)					
	Zone 4 ≤ 3000	Zone 5 3000 to 3999	Zone 6 4000 to 4999	Zone 7A 5000 to 5999	Zone 7B 6000 to 6999	Zone 8 ≥ 7000
Ceilings Below Attics (Minimum RSI Value)	10.43	12.19	12.19	12.19	12.19	12.19
Cathedral Ceilings and Flat Roofs (Minimum RSI Value)	4.67	5.02	5.02	5.02	5.80	5.80
Floors Over Unheated Spaces (Minimum RSI Value)	4.67	5.02	5.02	5.02	5.42	5.42
Walls Above Grade (Minimum RSI Value)	5.69	5.69	5.69	5.77	6.65	6.65
Foundation Walls (Minimum RSI Value)	3.46	3.46	3.97	4.78	5.22	5.22
Unheated Floors above frost line (Minimum RSI Value)	1.96	1.96	1.96	1.96	2.84	2.84
Unheated Floors below frost line (Minimum RSI Value)	1.96	1.96	1.96	1.96	1.96	1.96
Heated and unheated Floors on permafrost (Minimum RSI Value)	-	-	-	-	4.62	4.62
Heated Floors (Minimum RSI Value)	2.32	3.72	3.72	3.72	4.62	4.62
Slabs-on-grade with an integral footing (Minimum RSI Value)	1.96	3.72	3.72	3.72	4.62	4.62
Windows and Sliding Glass Doors (Maximum U-Value or Minimum Energy Rating) (3)	1.05 or 40	1.05 or 40	0.94 or 42	0.94 or 42	0.82 or 44	0.82 or 44
Skylight (Maximum U-Value)	2.02	2.02	1.84	1.84	1.61	1.61
Space Heating Equipment — Heat Pump (4) (5)	HSPF V ≥ 8.7 / HSPF2 V ≥ 6.4 / SEER2 ≥ 15.2 / EER2 ≥ 11.7 Percent of Heating Capacity at −15 °C (5 °F) ≥ 70% of that at 8.3 °C (47° F) / COP_h ≥ 1.5 at −15 °C (5 °F).					
Electric Heat Pump Water Heater (4)	UEF ≥ 2.95					

SMALL: <300m3 Prescriptive Tier 5 : cz7a

Prescriptive "Packages" New Section 9.36.9

- HRV or ERV required
- Air Tightness Testing Required
- Heat pump as **primary** space conditioning **(could have Electric or Fuel back-up)**
- Heat Pump Water Heater for Domestic Hot Water

Ceilings Below Attics	**R60<eff**
Cathedral Ceilings and Flat Roofs	R29<eff
Floors Over Unheated Spaces	R29<eff
Walls Above Grade	**R22<eff 2x6+R5?**
Foundation Walls	R20<eff
Unheated Floors below frost line	R10<eff **Underslab R10?**
Window & Sliding Glass Doors	U 1.05> or ER 40< **TRIPANE?**
Airtightness	**1.0 ACH** as Tested
ASHP	HSPF V >= 8.7 / HSPF2 V>=6.4

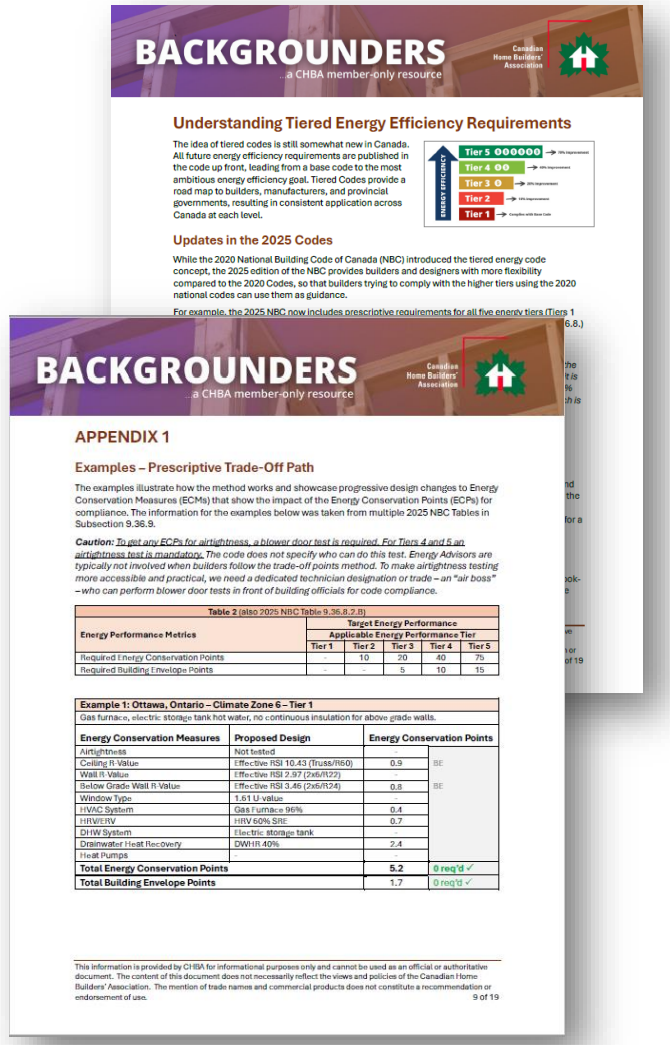
*(Percent of Heating Capacity at **-15C (5F) >=70%** / COPh >=1.5 at -15C (5F)*

Air Source Hot Water Tank	UEF 2.95<
Drain Water Heat Recovery	42% 2 or All

CHBA COMMENTARY

- Very happy that Points Trade-Off Method is complete
  - 2020 codes had no prescriptive methods for higher tiers
  - CHBA had asked for this before publishing 2020 codes
  - Some prov. gov'ts were also interested in this at the time
  - If this had been in the 2020 codes, maybe BC, QC and ON would have adopted the tiered energy codes by now

  - **Excellent method for builders to understand what is required to build Tiers 3, 4, 5, especially if they don't have access to modeling / EAs**


BACKGROUNDERS
a CHBA member-only resource

Understanding Tiered Energy Efficiency Requirements

The idea of tiered codes is still somewhat new in Canada. All future energy efficiency requirements are published in the code up front, leading from a base code to the most ambitious energy efficiency goal. Tiered Codes provide a road map to builders, manufacturers, and provincial governments, resulting in consistent application across Canada at each level.

Tier 5
Tier 4
Tier 3
Tier 2
Tier 1

Updates in the 2025 Codes

While the 2020 National Building Code of Canada (NBC) introduced the tiered energy code concept, the 2025 edition of the NBC provides builders and designers with more flexibility compared to the 2020 Codes, so that builders trying to comply with the higher tiers using the 2020 national codes can use them as guidance.

For example, the 2025 NBC now includes prescriptive requirements for all five energy tiers (Tiers 1

BACKGROUNDERS
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APPENDIX 1

Examples – Prescriptive Trade-Off Path

The examples illustrate how the method works and showcase progressive design changes to Energy Conservation Measures (ECMs) that show the impact of the Energy Conservation Points (ECPs) for compliance. The information for the examples below was taken from multiple 2025 NBC Tables in Subsection 9.36.9.

Caution: *To get any ECPs for airtightness, a blower door test is required. For Tiers 4 and 5 an airtightness test is mandatory. The code does not specify who can do this test. Energy Advisors are typically not involved when builders follow the trade-off points method. To make airtightness testing more accessible and practical, we need a dedicated technician designation or trade – an "air boss" – who can perform blower door tests in front of building officials for code compliance.*

Table 2 (also 2025 NBC Table 9.36.8.2.B)

Energy Performance Metrics	Target Energy Performance				
	Applicable Energy Performance Tier				
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Required Energy Conservation Points	-	10	20	40	75
Required Building Envelope Points	-	-	5	10	15

Example 1: Ottawa, Ontario – Climate Zone 6 – Tier 1

Gas furnace, electric storage tank hot water, no continuous insulation for above grade walls.

Energy Conservation Measures	Proposed Design	Energy Conservation Points	
Airtightness	Not tested		
Ceiling R-Value	Effective RSI 10.43 (Truss/R60)	0.9	BE
Wall R-Value	Effective RSI 2.97 (2x6/R22)	-	
Below Grade Wall R-Value	Effective RSI 3.46 (2x6/R24)	0.8	BE
Window Type	1.61 U-value	-	
HVAC System	Gas Furnace 96%	0.4	
HRV/ERV	HRV 60% SRE	0.7	
DHW System	Electric storage tank	-	
Drainwater Heat Recovery	DWHR 40%	2.4	
Heat Pumps		-	
Total Energy Conservation Points		**5.2**	0 req'd ✓
Total Building Envelope Points		1.7	0 req'd ✓

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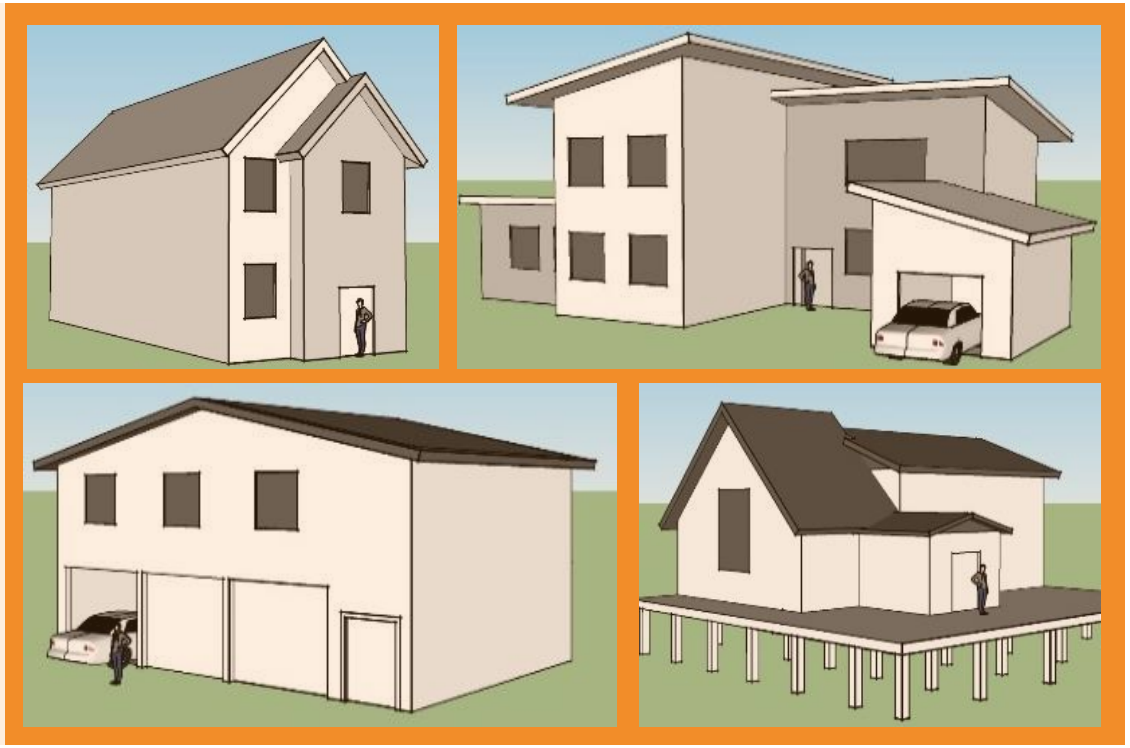
NEW NBC Tier Energy Compliance Option : Energy Use Intensity Metrics PCF 1869 (9.36.8)

- Addresses building form
- Linked to climate zones
- Maintains flexibility
- Considers small homes

Guiding Principles: NBC Metrics PCF 1869

Favored by EUI metrics

Favored by reference house approach

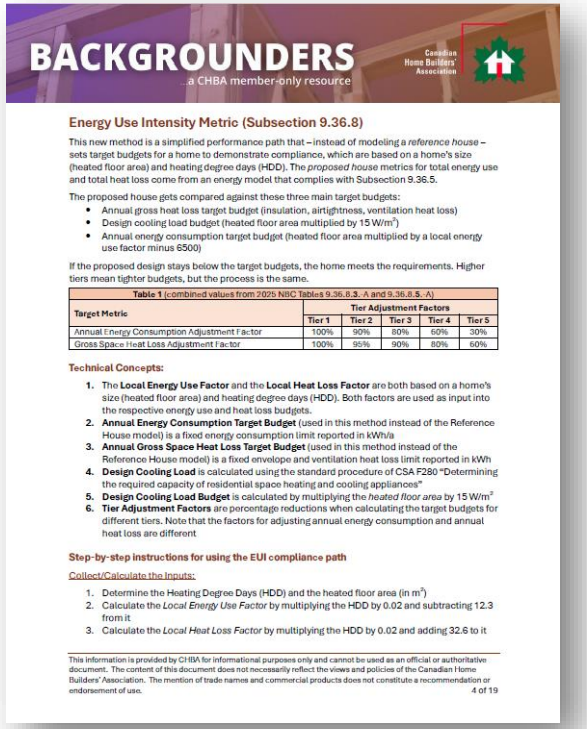


Source: S.Gilani and A. Ferguson — CanmetENERGY, Natural Resources Canada

CHBA COMMENTARY

- Energy Use Intensity
  - Very happy that this is finally here
  - Many issues with Referenced/Proposed Approach for smaller units
  - Even in 2010 many industry stakeholders asked for a simpler performance path

  - Idea for next codes:
    - De-couple this from modeling data
    - Very simple, linear approach for each climate zone
    - Create a simple budget from location/geometry-specific formula
    - Set annual heat loss budget with climate indicator, and the influencing geometry: # of storeys, floor area and volume (A/V)



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Energy Use Intensity Metric (Subsection 9.36.8)

This new method is a simplified performance path that – instead of modeling a *reference house* – sets target budgets for a home to demonstrate compliance, which are based on a home's size (heated floor area) and heating degree days (HDD). The *proposed house* metrics for total energy use and total heat loss come from an energy model that complies with Subsection 9.36.5.

The proposed house gets compared against these three main target budgets:

- Annual gross heat loss target budget (insulation, airtightness, ventilation heat loss)
- Design cooling load budget (heated floor area multiplied by 15 W/m²)
- Annual energy consumption target budget (heated floor area multiplied by a local energy use factor minus 6500)

If the proposed design stays below the target budgets, the home meets the requirements. Higher tiers mean tighter budgets, but the process is the same.

Table 1 (combined values from 2025 NBC Tables 9.36.8.3.-A and 9.36.8.5.-A)

Target Metric	Tier Adjustment Factors				
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Annual Energy Consumption Adjustment Factor	100%	90%	80%	60%	30%
Gross Space Heat Loss Adjustment Factor	100%	95%	90%	80%	60%

Technical Concepts:

1. The **Local Energy Use Factor** and the **Local Heat Loss Factor** are both based on a home's size (heated floor area) and heating degree days (HDD). Both factors are used as input into the respective energy use and heat loss budgets.
2. **Annual Energy Consumption Target Budget** (used in this method instead of the Reference House model) is a fixed energy consumption limit reported in kWh/a
3. **Annual Gross Space Heat Loss Target Budget** (used in this method instead of the Reference House model) is a fixed envelope and ventilation heat loss limit reported in kWh
4. **Design Cooling Load** is calculated using the standard procedure of CSA F280 "Determining the required capacity of residential space heating and cooling appliances"
5. **Design Cooling Load Budget** is calculated by multiplying the *heated floor area* by 15 W/m²
6. **Tier Adjustment Factors** are percentage reductions when calculating the target budgets for different tiers. Note that the factors for adjusting annual energy consumption and annual heat loss are different

Step-by-step instructions for using the EUI compliance path

Collect/Calculate the Inputs:

1. Determine the Heating Degree Days (HDD) and the heated floor area (in m²)
2. Calculate the *Local Energy Use Factor* by multiplying the HDD by 0.02 and subtracting 12.3 from it
3. Calculate the *Local Heat Loss Factor* by multiplying the HDD by 0.02 and adding 32.6 to it

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NBC 2025 Code Changes

Lateral Loads (Seismic & Wind)

PCF 1475

Lateral Loads

- New in NBC 2025, Section 9.23.13
- Addresses wind & seismic resistance in houses
- Closes gap between prescriptive and engineered design
- Lateral loads: wind & earthquakes
- Bracing systems resist horizontal forces

BC Housing Illustrated Guide

Lateral Loads

- Braced Wall Bands: imaginary continuous zones
- Braced Wall Panels (BWP): sheathed wall segments

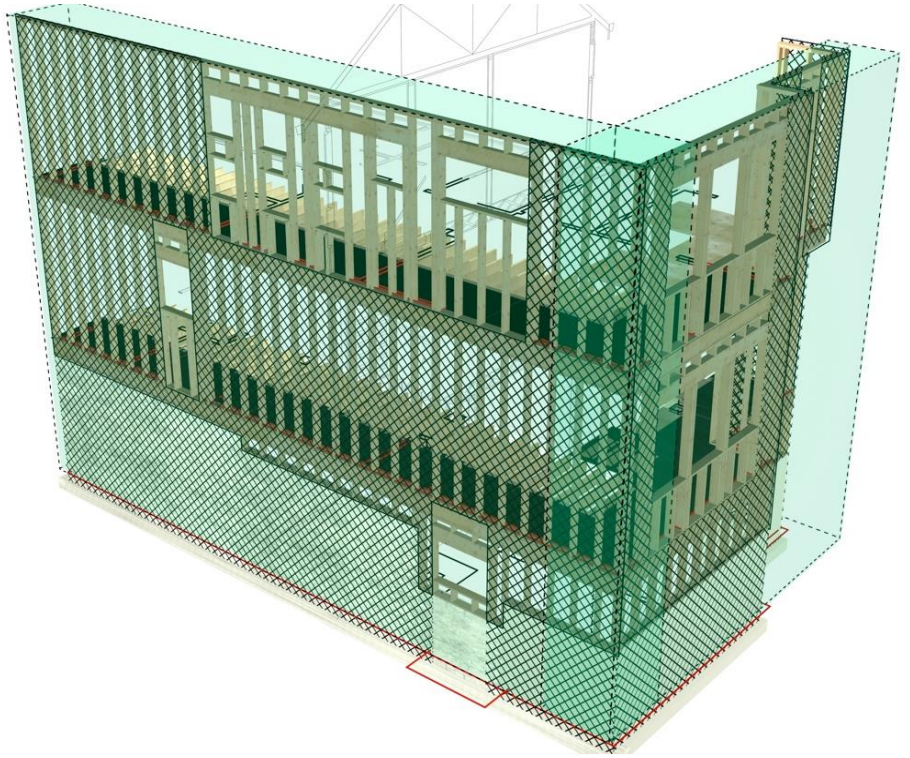
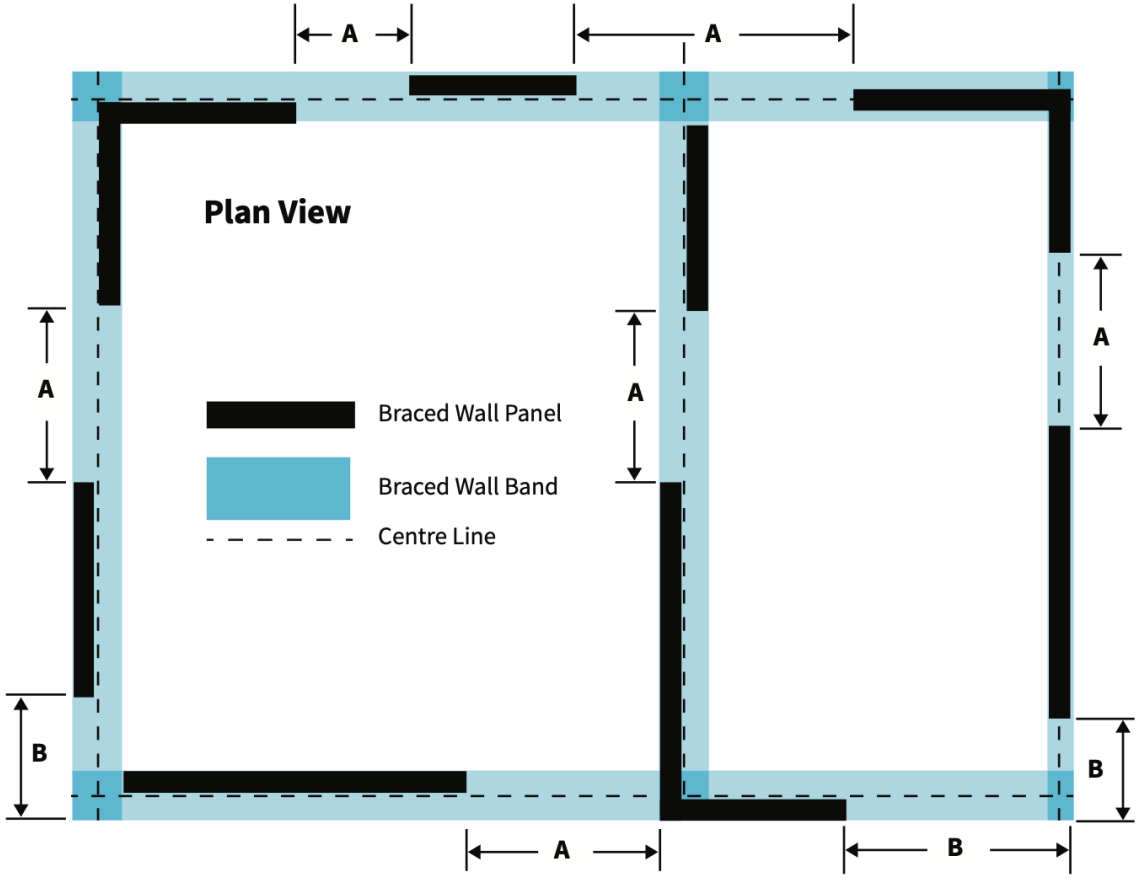


Image: BCHousing

Braced Wall Bands

- Braced wall bands must surround the perimeter of the building, and additional braced wall bands may be required at interior wall locations.
- Braced wall bands can be up to 1.2 m wide.
- They must be full storey height and aligned with braced wall bands on storeys above and below.



A Distance between braced wall panel edges

B Distance from end of braced wall band to end of 1st braced wall panel

Braced Wall Panels

- A portion of a wood-frame wall designed and installed to provide the required resistance to lateral loads due to earthquakes.
- Unlike the imaginary braced wall band, a braced wall panel is an actual physical element that meets certain dimension and construction requirements.
- Must be located within a braced wall band to be considered effective.

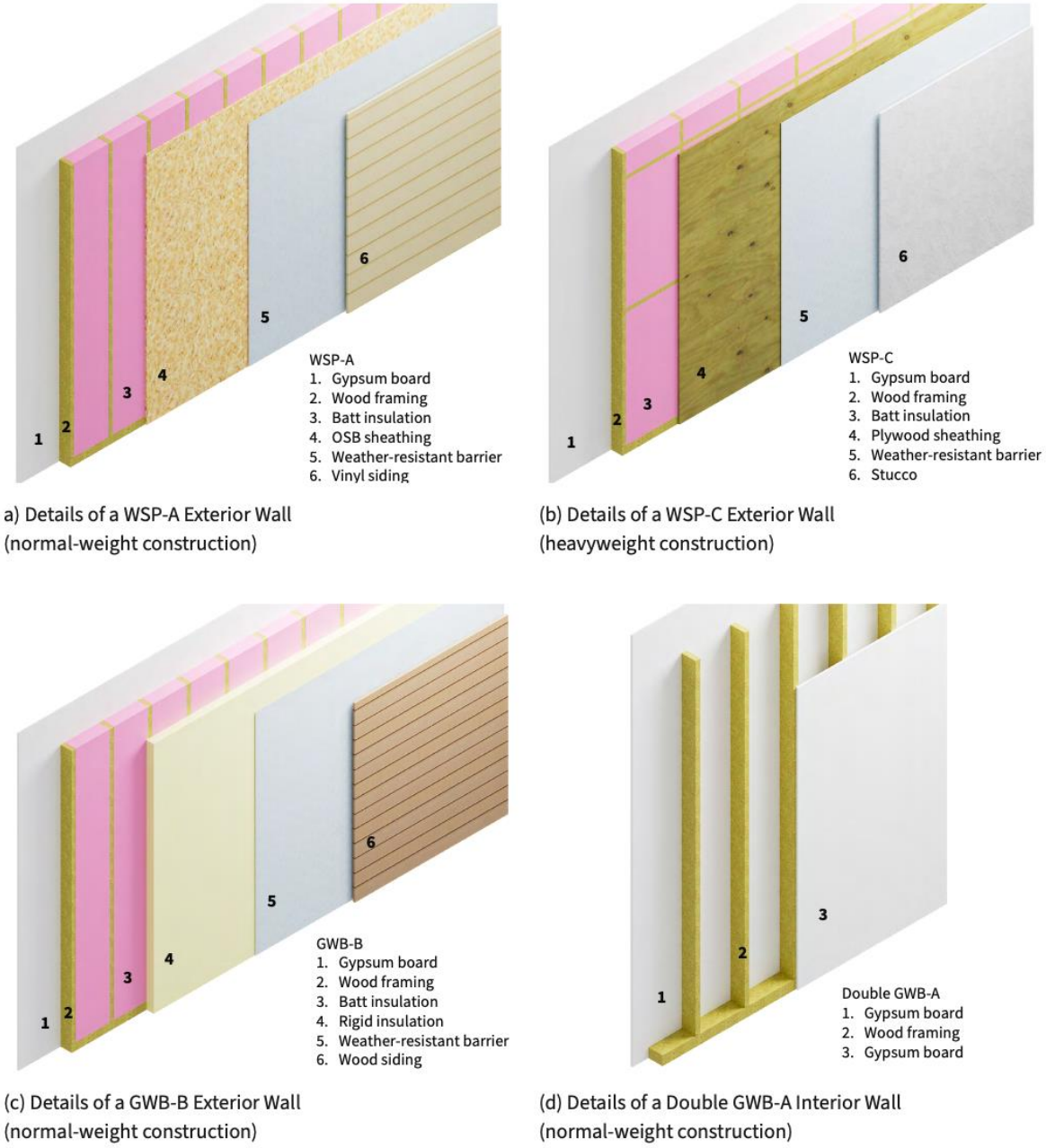


Figure 2.5: Details of Sample Exterior and Interior Walls

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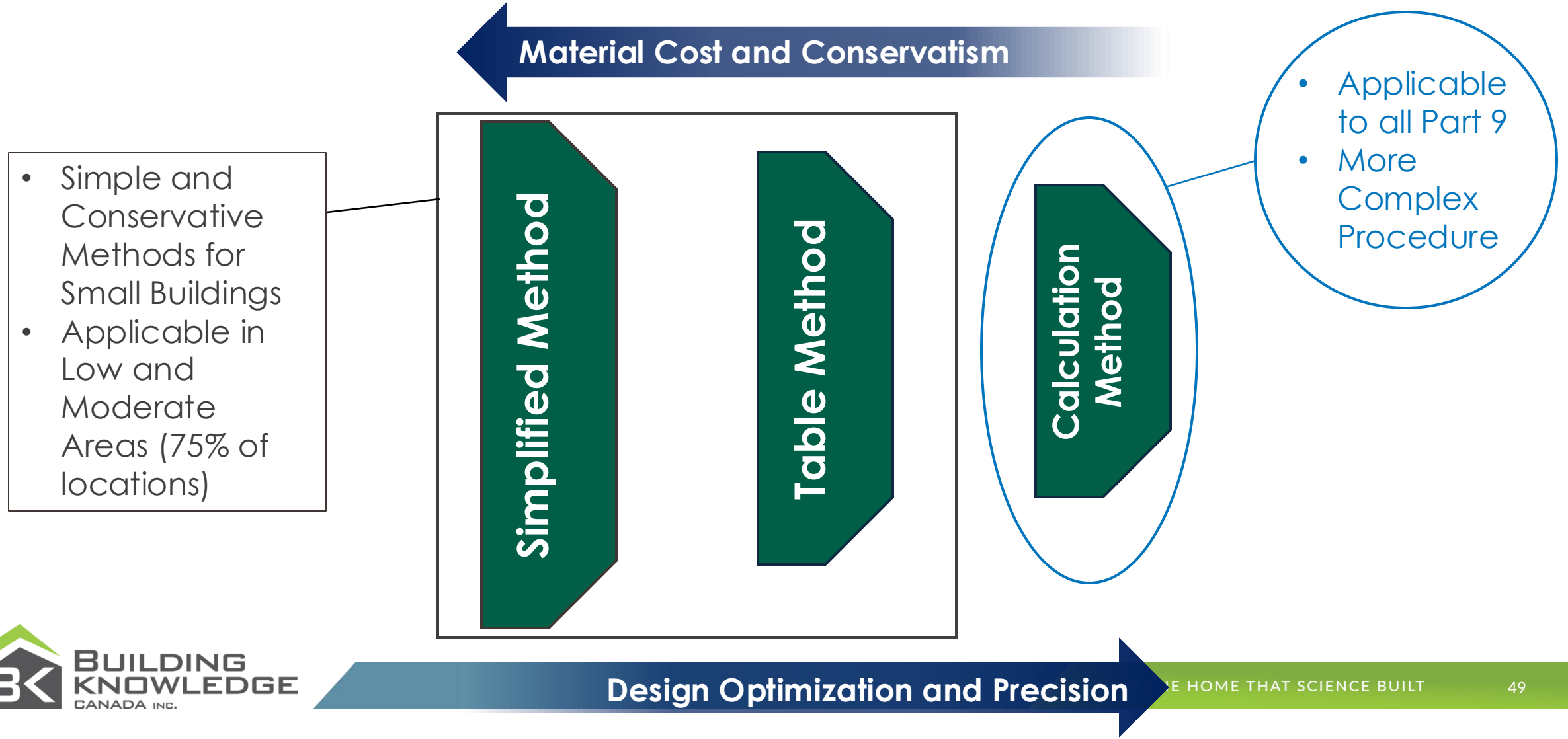
Bracing Provisions

Overview of Methods



CHBA COMMENTARY

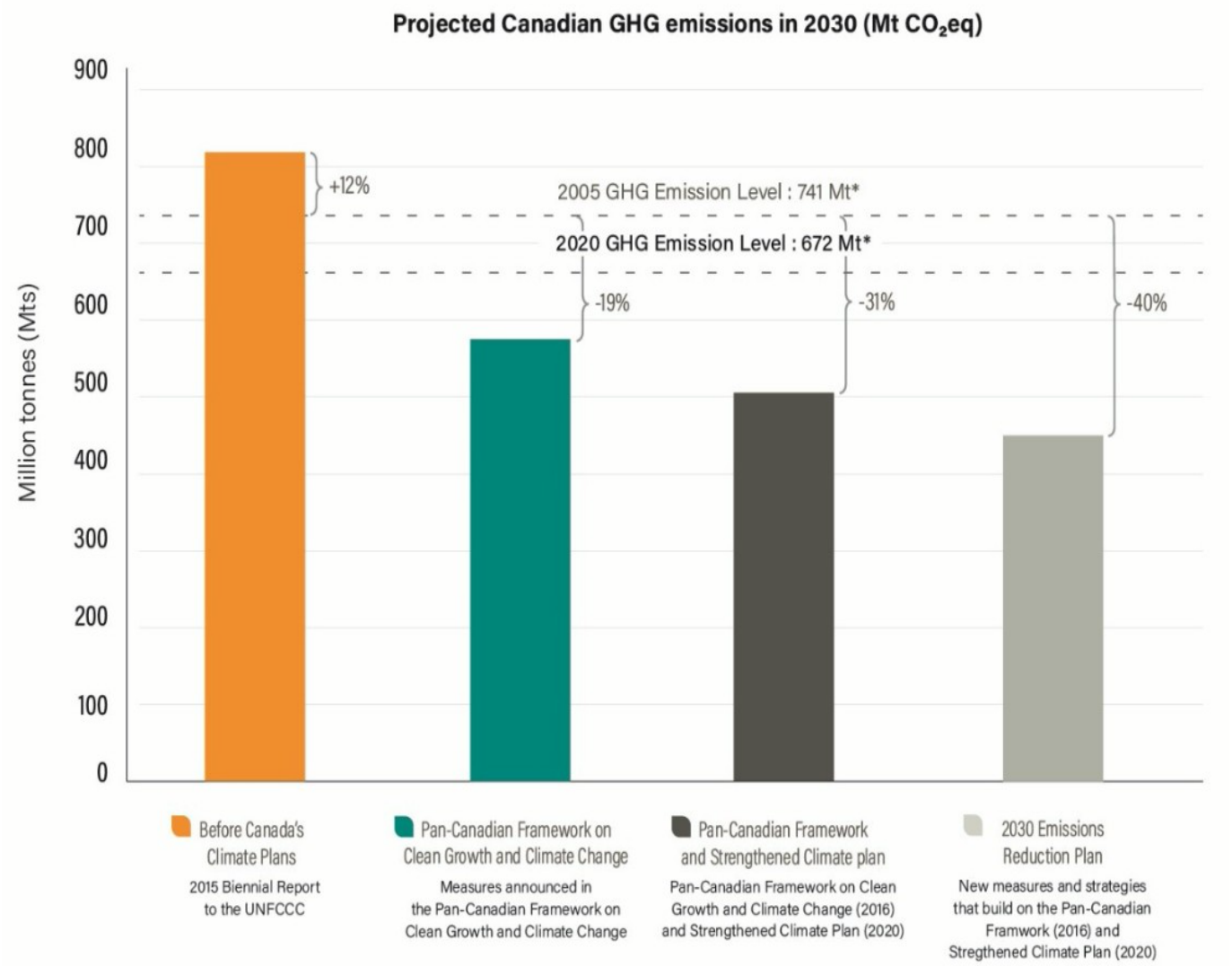
- Why Lateral Load requirements remain very problematic
  - Application
    - Applies everywhere in Canada now: lower wind load triggers
    - No evidence of failures supporting wind-load triggers becoming more stringent
  - Design method
    - Adds braced wall design procedures into Part 9 (60? Pages)
    - Still need to find/understand **which wall type**
  - Simplified method
    - is the only prescriptive part – **very limited**
    - CHBA is working on expanding simplified method
  - Cost & Enforcement
    - Actual Cost are higher than expected (BC experience)
    - So complicated, that building officials may 'simplify' enforcement and ask for an engineer's stamp for every home (BC experience)

NBC 2025 Code Change

GHGs: Tiered Operational Carbon Code

Compliance Options

The New Imperative - Greenhouse Gas Emissions



Canadian Goals:

40% reduction by 2030

Near Zero by 2050?

Proposed NBC 2025_Tiered Operational Carbon Emissions Reduction

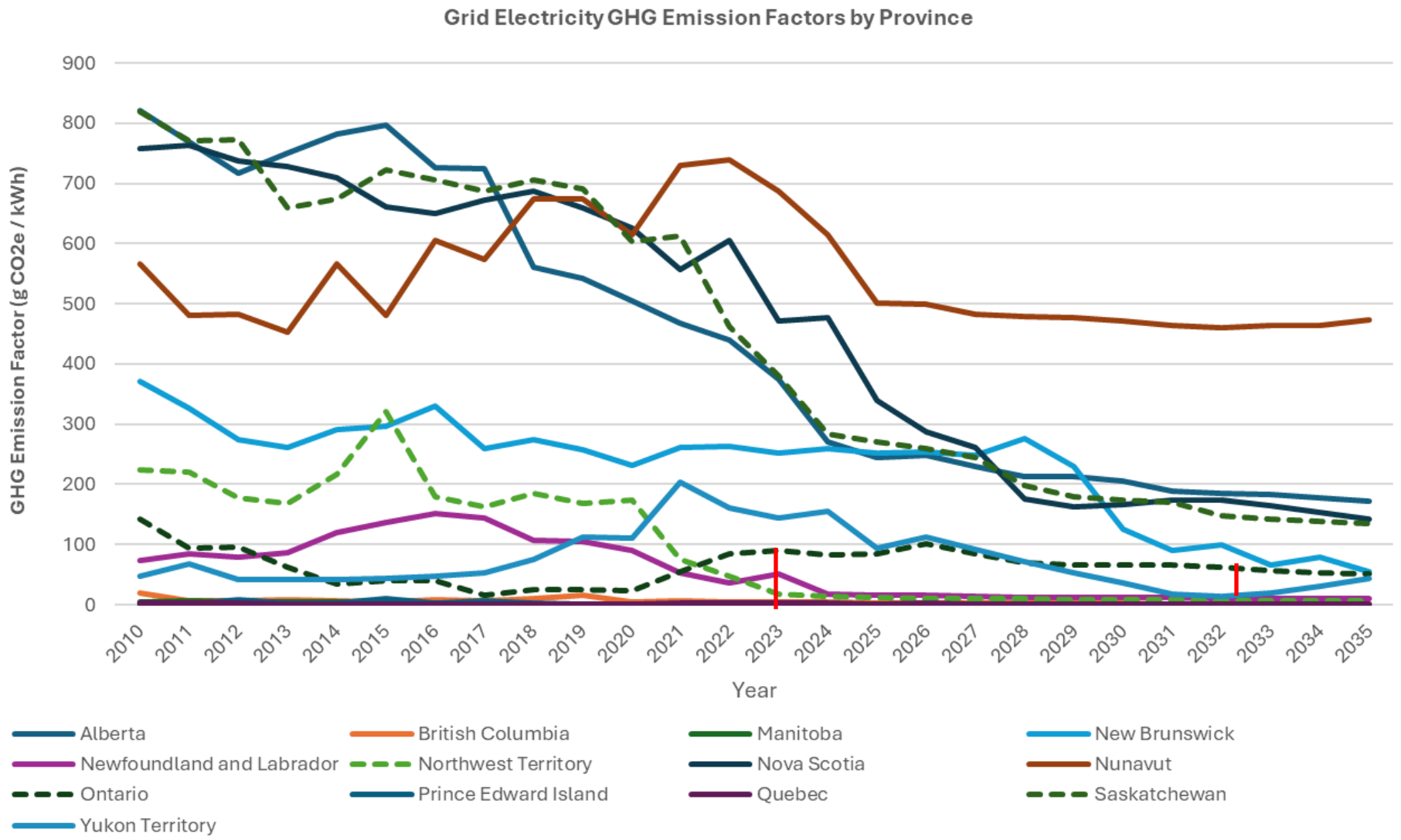
Key 2025 NBC Proposed Changes

- **PCF 2004: Performance Path**
- **PCF 2026: Prescriptive Path**

- Electric utilities are shifting away from coal power generation, while gas utilities are experimenting with new technologies to lower emissions through use of hydrogen and renewable biogas sources
- Some provincial utilities expect to reduce electric emissions by 60% or more by 2030.
- The **proposed emission requirements/targets are based on the best available future looking forecasts for utility emissions, averaged for the years 2031-2035**
- Natural gas utilities: Such projections are expected in future years, and could be incorporated into the code at a later date

2020 GHG Emissions in the Residential and Building Sectors Source .CBHCC

FUTURE Electrical Grid Emissions 2035 -Info from P&T's



Data Natural Resources Canada, visualization by RWDI

NBC 2025_Tiered Operational Carbon Emissions Reduction

NBC 2025_PCF 2026 GHG Emissions in the Residential and Building Sectors

- Provides projected electrical grid emission rates for P&T 2030-35

Classification of provincial/territorial electric grids

- **High:** Emission factor more than or equal to 100 g CO_2e/kWh
- **Moderate:** Emission factor more than 25 g CO_2e/kWh and less than 100 g CO_2e/kWh
- **Low:** Emission factor less than or equal to 25 g CO_2e/kWh

Source .CBHCC _PCF 2026

NBC 2025 proposed

Province/Territory	Grid GHG Emissions	2030<Grid GHG Emissions Factor (g CO_2e/kWh)	Current Grid GHG Emissions Factor (gCO2e/kWh)
Alberta	High	181.86	540<
British Columbia	Low	1.32	10<
Manitoba	Low	0.00	3<
New Brunswick	Moderate	77.88	250<
Newfoundland and Labrador	Low	11.08	
Nova Scotia	High	161.64	700<
Northwestern Territory	Low	6.82	
Nunavut	High	465.16	
Ontario	Moderate	57.90	30>
Prince Edward Island	Moderate	80.42	
Quebec	Low	0.38	2>
Saskatchewan	High	146.60	700<
Yukon Territory	Low	25.00	

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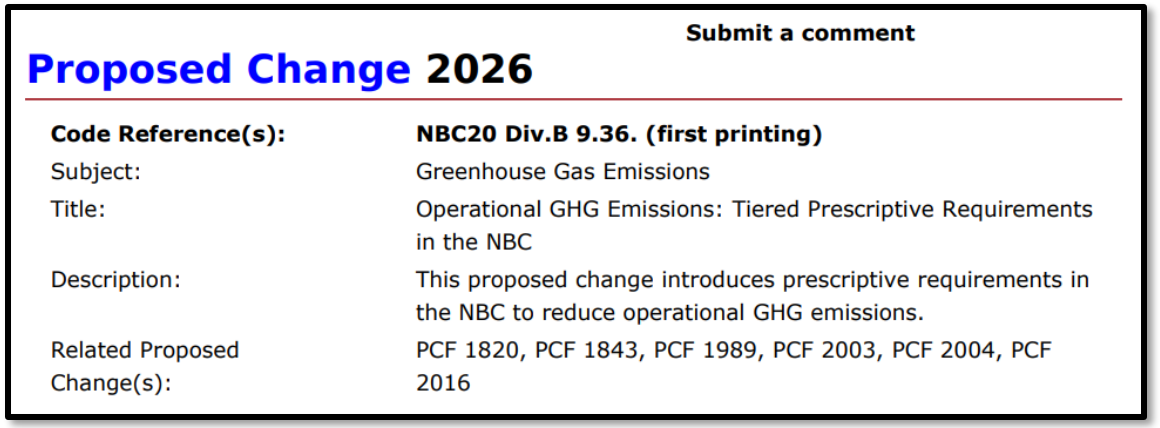
Greenhouse Gas Emissions (Operational Carbon Emissions)

Greenhouse Gas Emissions:

- Policy Level
  - Operational GHG emissions: 2025 codes
  - Embodied GHG emissions: 2030 codes
  - Renewable energy sources not recognized
  - Provinces coordinate minimum required emission levels with required energy tiers

- Technical Requirements
  - Levels A to F (A=best, F=worst)
  - Emission factors_Can use any of the following..
    1. **Provincial emission factors**
    2. **Utility emission factors**
    3. **National Codes emissions factors**



Submit a comment

Proposed Change 2026

Code Reference(s):	**NBC20 Div.B 9.36. (first printing)**
Subject:	Greenhouse Gas Emissions
Title:	Operational GHG Emissions: Tiered Prescriptive Requirements in the NBC
Description:	This proposed change introduces prescriptive requirements in the NBC to reduce operational GHG emissions.
Related Proposed Change(s):	PCF 1820, PCF 1843, PCF 1989, PCF 2003, PCF 2004, PCF 2016

NBC 2025_Tiered Operational Carbon Emissions Reduction

NBC 2025_ PCF 2004 Provides Operational Carbon Emission Reduction Tiers

- Canadian National targets : emissions reduction target of **40 percent** below **2005** levels by **2030**
- **Zero or near zero** operational GHG emissions across provinces and territories by **2050** ”

GHG Emission Performance Level	% Building GHG Emissions Target	% Improvement	
A	≤ 10%	≥ 90%	By 2050?
B	≤ 25%	≥ 75%	
C	≤ 50%	≥ 50%	
D	≤ 75%	≥ 25%	
E	≤ 90%	≥ 10%	By 2030?
F	≤ 100%	≥ 0%	

2025 Greenhouse Gas Emissions REQ's

Performance Path

- Space Conditioning + Water Heating Energy **Demand Loads from Energy Model**
- Multiply by Regional **Emission Factor** (based on proposed equipment fuel)
- Compare against **Reference**:
  - Reference Emission Factor for Space Heating = **235g** CO2e /kWh
  - Reference Emission Factor for Water Heating = **260g** CO2e /kWh
- Express in **Percentage Improvement** to get Emission Performance Level

- **No credit for Zero-Emission Renewables like Solar PV**

	GHG Emission Factors (g CO_2e /kWh)	
Province or Territory	**Electricity**	**Utility Gas**
Alberta	181.86	189
British Columbia	1.32	190
Manitoba	0.00	185
New Brunswick	77.88	185
Newfoundland and Labrador	11.08	185
Northwest Territories	6.82	185
Nova Scotia	161.64	190
Nunavut	465.16	190
Ontario	57.90	185
Prince Edward Island	80.42	185
Quebec	0.38	186
Saskatchewan	146.60	185
Yukon	25.00	190

Emission Performance Level	Improvement (%)
Level A	**≥ 90%**
Level B	**≥ 75%**
Level C	**≥ 50%**
Level D	**≥ 25%**
Level E	**≥ 10%**
Level F	**≥ 0%**

2025 Greenhouse Gas Emissions

Prescriptive Path (Revised)

- Lookup Table Concept for each Performance Level
  - Examples:
    - Ontario: **GEF = 57.90**
    - Alberta: **GEF = 181.86**
- Lookup Table based on:
  - Energy source for Space Heating
  - Energy source for Water Heating
  - Electricity Emission Factor
  - Energy Conservation Points
- **No credit for Zero-Emission Renewables like Solar PV**

GHG Emissions Performance Level B

Energy Source Space Heating	Energy Source Water Heating	Electricity Emission Factor (g CO_2e/kWh)	Minimum **Energy** Conservation **Points**
(any) Electricity	Heat Pump Water Heater	< 25	10
		25 < EF < 100	35
	Storage Type or tankless	< 25	15
		25 < EF < 100	35

GHG Emissions Performance Level D

Energy Source Space Heating	Energy Source Water Heating	Electricity Emission Factor (g CO_2e/kWh)	Minimum **Energy** Conservation **Points**
Utility Gas / Propane	Utility Gas / Propane	Any	35
	Electricity	≤ 100	10
Electricity	Electricity	≤ 200	10
Electric Heat Pump	Electric Heat Pump or Storage Tank	GEF < 200	0

CHBA COMMENTARY

Canadian Home Builders' Association

- Why Operational GHG Emissions remain very problematic
  - Why not concentrate on grid emissions / building energy efficiency?
  - Builders have no control on grid emissions
  - Why were benefits not disclosed
    - Code addresses only new construction / space heating/cooling, water heating loads
    - Resulting in maybe 1% reduction every year (new/existing homes (1.42%), portion of regulated energy (65%), not a 100 reduction)
  - Codes went political (gas EFs are historic, avg data, electricity EFS are forward projecting (2030-2035))
  - The most common zero-emission technology is not recognized
    - This creates uneven stock for 5 years. Huge opportunity wasted
  - Why not wait until everything is done and optimized / integrated (Energy Efficiency , operational & embodied GHG, resilience)

In Review

- Get involved – Codes, Standards. No one knows the practical challenge like the practitioners(Builders!)
- Pace of change will only increase
- Benchmark your product.
- Work on a 1-5-10 year development and product design plan
- Integrate IDP in all project development schedules .

Questions?

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Coming summer of 2026

Critical Canadian Building Science Series

Indoor Environmental Quality

Webinar Series with Robert Bean

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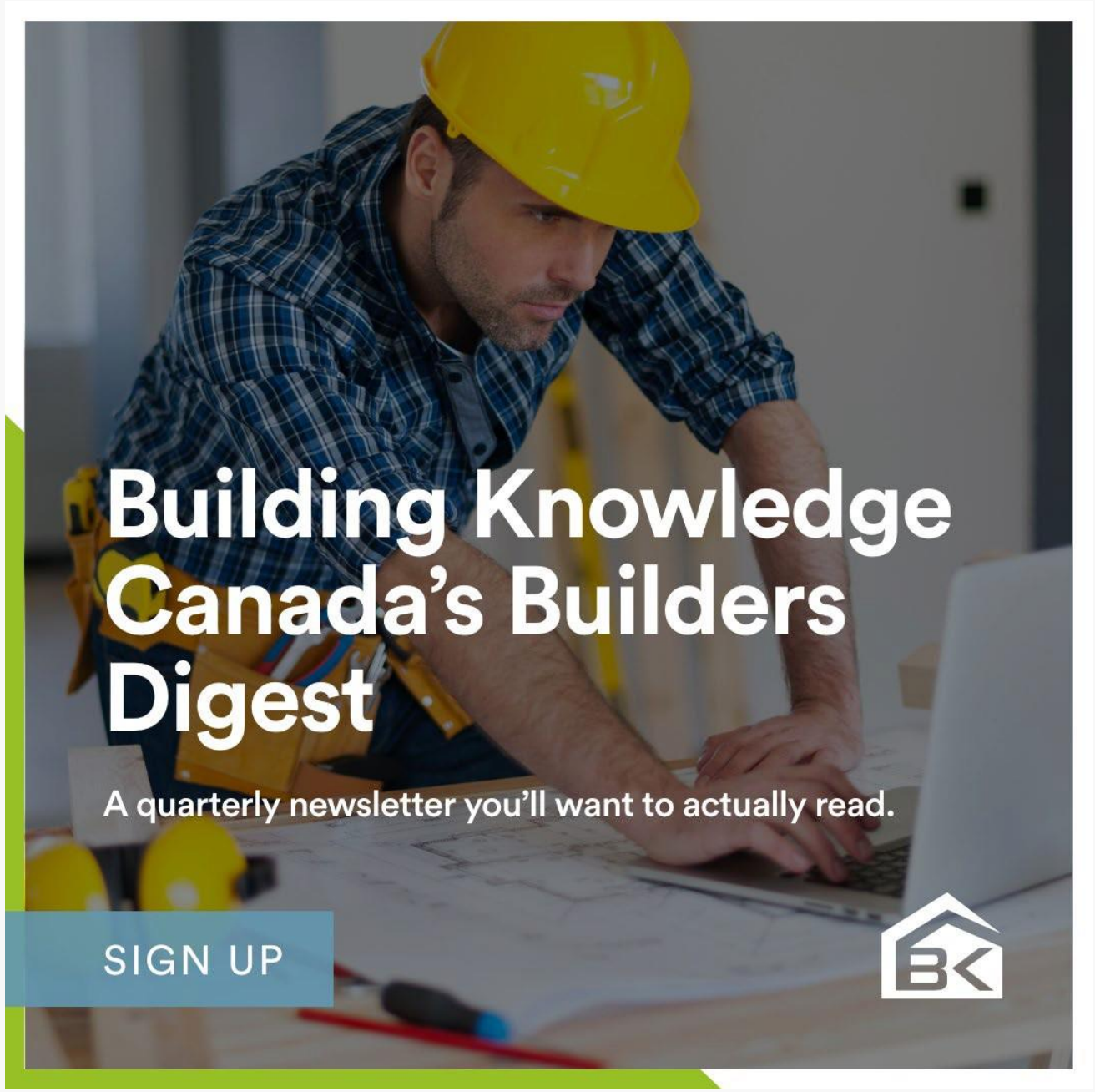

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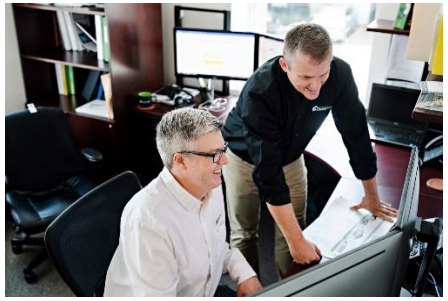

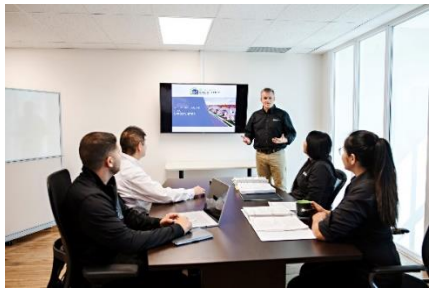

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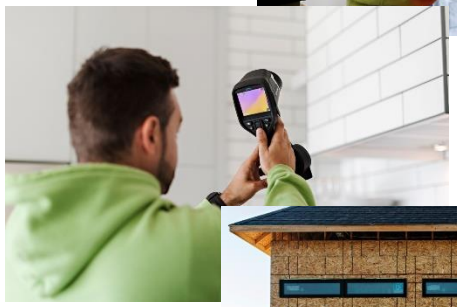

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