



BCBC 2018 Code Changes

BOABC

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BSSB

May 31, 2023

ENERGY
STEPCODE
BUILDING BEYOND THE STANDARD

ZERO CARBON
STEPCODE

Today's Presentation

- Commitments
- Overview of code changes
 - Energy Efficiency
 - Carbon Pollution
 - Compliance options with sample projects

BCBC 2022: 20% Improvement

Timeline for Energy Efficiency Regulatory Requirements in the BC Building Code

Here's what the province's CleanBC plan will mean for new-construction requirements.

2032

STEP 5

STEP 4

NET-ZERO ENERGY-READY

UP TO:
80%

2027*

STEP 4

STEP 3

40%

May 1,
2023

STEP 3

STEP 2

20%

*NEW TARGET
DEADLINES



PART 9
BUILDINGS



PART 3
BUILDINGS

Energy-efficiency improvement
above 2018 BC Building Code
requirements

ENERGY
STEPCODE
BUILDING BEYOND THE STANDARD

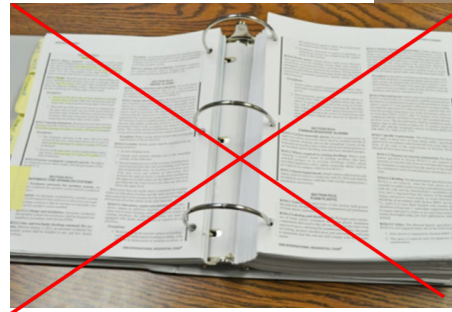


Principles and Foundational Concepts

Performance, not Prescriptive

- Energy Modeling
- Air Tightness Testing
- No Prescriptive Requirements

- Required outcome
- Defined tools for measuring the outcome
- Specific approach for using the tool



BCBC 2018: 20% Improvement

Part 10

- Step 2 required for the occupancies currently listed within the Step Code
 - A and B type occupancies – modelling as per Part 8 of NECB 2020
 - Office and Commercial occupancies have slightly more stringent TEUI (Total Energy Use Intensity) requirement
 - TEDI (Thermal Energy Demand Intensity) remains unchanged
- ASHRAE 90.1 2019 and NECB 2020 for all occupancy classifications outside of the Step Code
- Air Tightness Testing – Additional standard now being referenced - ASTM E3158

BCBC 2018: 20% Improvement

Part 9

- Step 3 required for all Part 9 residential*
- OR – the 20% better prescriptive approach – should it be adopted by the Local Authority
- 9.36 code language in alignment with NBC 2020

*with the exception of log homes

Part 9 – Performance Path

- Intensity Metrics and ‘% better than’ metrics now separated into 2 tables
- % better metrics have relaxations for homes with less than 300 m³ of interior volume
- Additional airtightness testing metrics – NLR (Normalized Leakage Rate) and NLA (Normalized Leakage Area)

Part 9 – Prescriptive Path

- Performance path is the default unless the prescriptive path has been adopted by the Local Authority via bylaw
- Heat Pump or HRV requirement
- Similar to the performance path, only applies to residential construction

BCBC 2018: 20% Improvement

Part 9 – Prescriptive Path

Table 9.36.2.6.-C
Effective Thermal Resistance Requirements of Above-ground Opaque Assemblies for
Buildings Containing Only Dwelling Units
Forming Part of Sentences 9.36.1.3.(6) and 9.36.2.6.(1)

<u>Above-ground Opaque Building Assembly</u>	<u>Heating Degree-Days of Building Location,⁽¹⁾ in Celsius Degree-Days</u>					
	<u>Zone 4 < 3000</u>	<u>Zone 5 3000 to 3999</u>	<u>Zone 6 4000 to 4999</u>	<u>Zone 7A 5000 to 5999</u>	<u>Zone 7B 6000 to 6999</u>	<u>Zone 8 ≥ 7000</u>
	<u>Minimum Effective Thermal Resistance (RSI) Requirements, (m²-K)/W</u>					
<u>Ceilings below attics⁽²⁾</u>	<u>8.67</u>	<u>8.67</u>	<u>10.43</u>	<u>10.43</u>	<u>10.43</u>	<u>10.43</u>
<u>Cathedral ceilings and roof decks⁽³⁾</u>	<u>4.67</u>	<u>4.67</u>	<u>4.67</u>	<u>5.02</u>	<u>5.02</u>	<u>5.02</u>
<u>Flat roofs⁽⁴⁾</u>	<u>5.28</u>	<u>5.28</u>	<u>5.28</u>	<u>5.72</u>	<u>5.72</u>	<u>5.72</u>
<u>Walls⁽⁵⁾</u>	<u>3.08</u>	<u>3.69</u>	<u>3.69</u>	<u>3.69</u>	<u>3.96</u>	<u>3.96</u>
<u>Floors over unheated spaces</u>	<u>4.67</u>	<u>4.67</u>	<u>4.67</u>	<u>5.02</u>	<u>5.02</u>	<u>5.02</u>

Notes to Table 9.36.2.6.-C:

⁽¹⁾ See Article 1.1.3.1.]

⁽²⁾ Notwithstanding Sentence 9.36.2.6.(3), ceilings below attics shall not have a reduction in effective thermal resistance.

⁽³⁾ For the purposes of this table, a roof deck shall mean a horizontal portion of a roof intended for *occupancy*.

⁽⁴⁾ For the purposes of this table, flat roofs shall mean a roof that is not intended for *occupancy*.

⁽⁵⁾ See Sentence 9.36.2.8.(3) for requirements concerning the above-ground portion of *foundation walls*.

Part 9 – Prescriptive Path

Table 9.36.2.7.-D
Required Thermal Characteristics of Fenestration for Buildings Containing Only Dwelling Units
Forming Part of Sentences 9.36.1.3.(6) and 9.36.2.7.(1)

Components	Thermal Characteristics ⁽¹⁾	Heating Degree-Days of Building Location ⁽²⁾ 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
Fenestration ⁽³⁾	Max. U-value, W/(m ² ·K)	1.22	1.22	1.22	1.22	1.22	1.22

Notes to Table 9.36.2.7.-D:

⁽¹⁾ See Note A-Table 9.36.2.7.-A.

⁽²⁾ See Article 1.1.3.1.

⁽³⁾ Except doors (see Sentence (1) and Table 9.36.2.7.-A), skylights (see Sentence (2) and Table 9.36.2.7.-B) and glass block assemblies (see Sentence (4)).



ZERO CARBON

STEP CODE

Origin of the new regulation

“By 2030, all new buildings will be zero carbon, and all new space and water heating equipment will meet the highest standards for efficiency.”

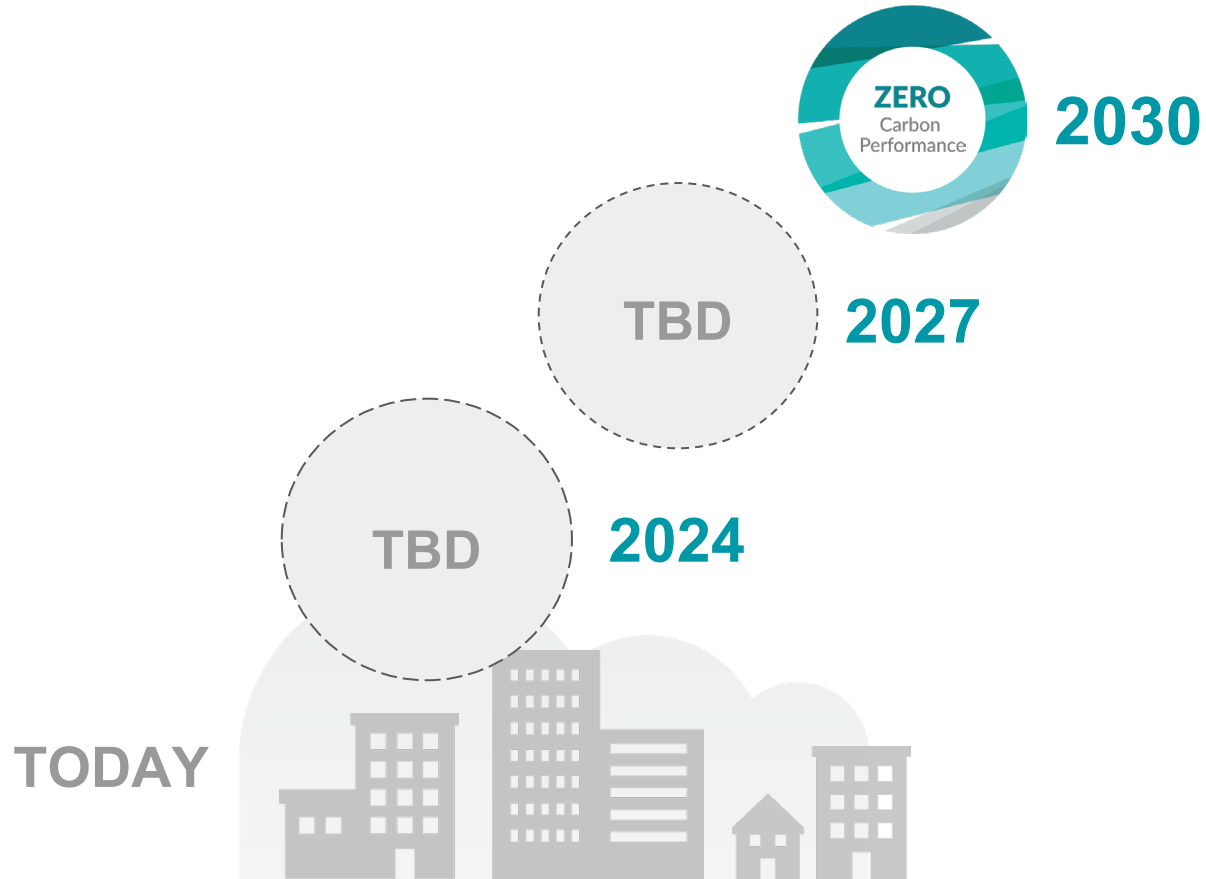
– *CleanBC Roadmap to 2030*



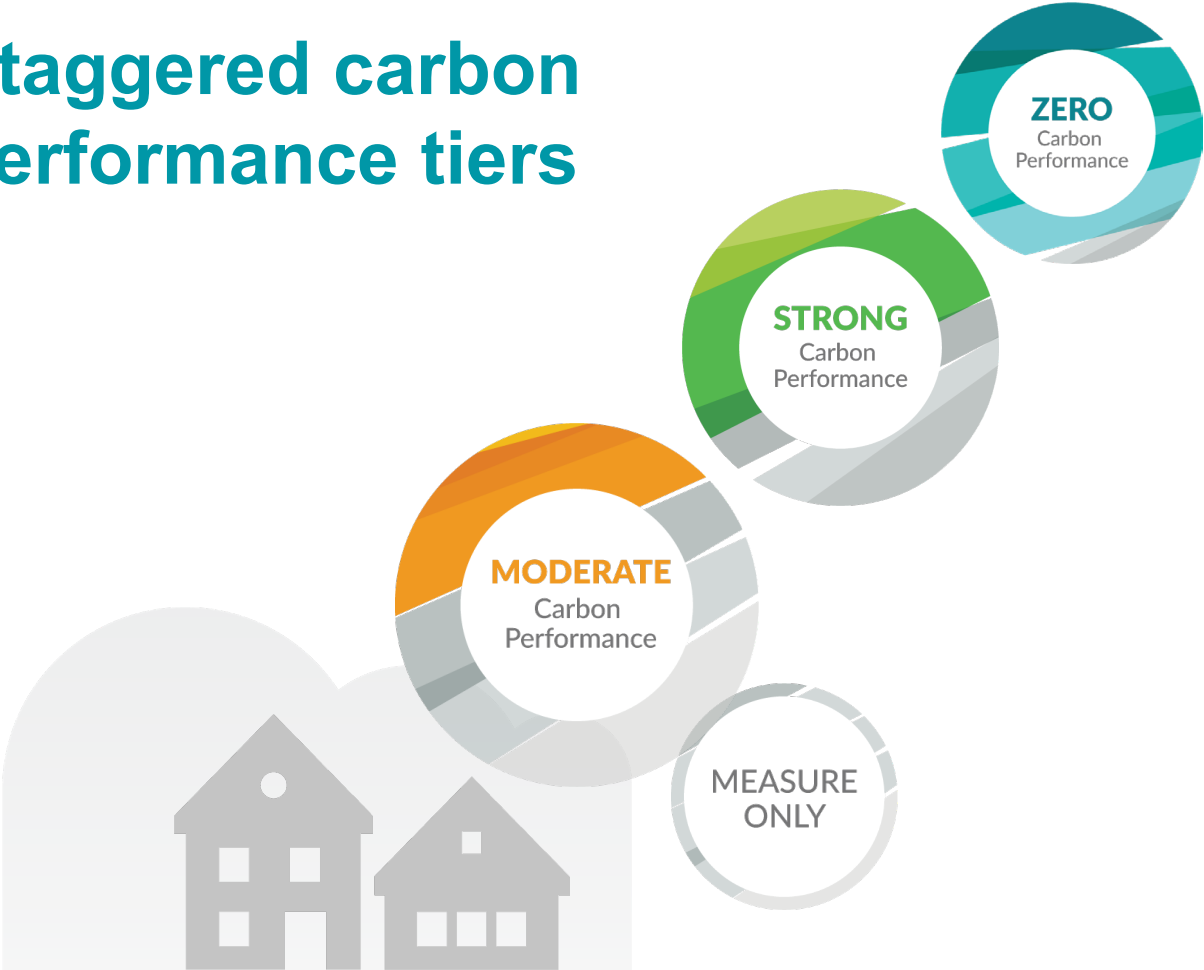
Roadmap to 2030



Provincial Pathway: Stepping up to 2030



Staggered carbon performance tiers



Many types of buildings can be regulated under the **Zero Carbon Step Code**

Part 9: Residential



“House”

Part 3:

Larger and more complex buildings – Major Occupancies C, D and E



Offices



Condos +
apartments



Financial
institutions




Retail +
grocery stores

Zero Carbon Step Code

Emissions Factors

- Electricity
- Natural Gas
- Others – Bulletin B23-03
 - National Inventory Report
- District Energy Systems
 - Determined by LG in discussion with utility



Compliance options
and sample projects:
Part 9

Industry compliance: Homebuilders and the performance approach

Quantity of carbon pollution



Maximum GHG emissions per house per year

Intensity of carbon pollution



Maximum GHG intensity per house per year



Zero Carbon Step Code

What's Included?

Performance Pathways – GHG and GHGI

- MEUI (Mechanical Energy Use Intensity)
 - Space Conditioning
 - DHW (Domestic Hot Water)
 - Ventilation
- Includes supplementary equipment
- Does not include all end uses

Prescriptive Pathway

- All building systems including equipment and appliances
- **For all pathways, back-up or redundant equipment is permitted to be excluded**

Industry compliance: Homebuilders and the performance approach

Table 9.37.1.3.
Greenhouse Gas Emissions
 Forming part of Sentence 9.37.1.3.(1)

GHG Emission Level	GHG Emission Compliance Options					
	Maximum GHG Emissions by House, Expressed in kg CO _{2e} /year	or	Maximum GHG Emissions by House ¹		Reduction of GHG Emissions by Energy Source of Building Systems ²	
	Maximum GHGI of the House, Expressed in kgCO _{2e} /m ² /year		Maximum GHG Emissions by House, Expressed in kgCO _{2e} /year			
EL-1	measure only	or	measure only		N/A	
EL-2	1050		6.0	2400	or	Energy sources supplying heating systems have an emissions factor ≤ 0.011 kgCO _{2e} /kWh
EL-3	440		2.5	800		Energy sources supplying heating and service water heating systems have an emissions factor ≤ 0.011 kgCO _{2e} /kWh
EL-4	265		1.5	500		Energy sources supplying all building systems, including equipment and appliances, have an emissions factor ≤ 0.011 kgCO _{2e} /kWh

Notes to Table 9.37.1.3.:

(1) Compliance for this option is demonstrated by meeting both the GHGI and the GHG emission requirements for each house.

(2) Redundant or back-up equipment for the systems and equipment listed in Sentence 9.36.5.4.(1). is permitted to be excluded, provided it is equipped with controls and is not required to meet the space-conditioning load of the house.

Zero Carbon Performance: Westside Residence, Invermere

Four bedrooms
143 square metres
Climate zone 6

All electric systems:
Air source electric heat
pump, conventional
electric hot water tank.

248

Kg/CO₂e/yr

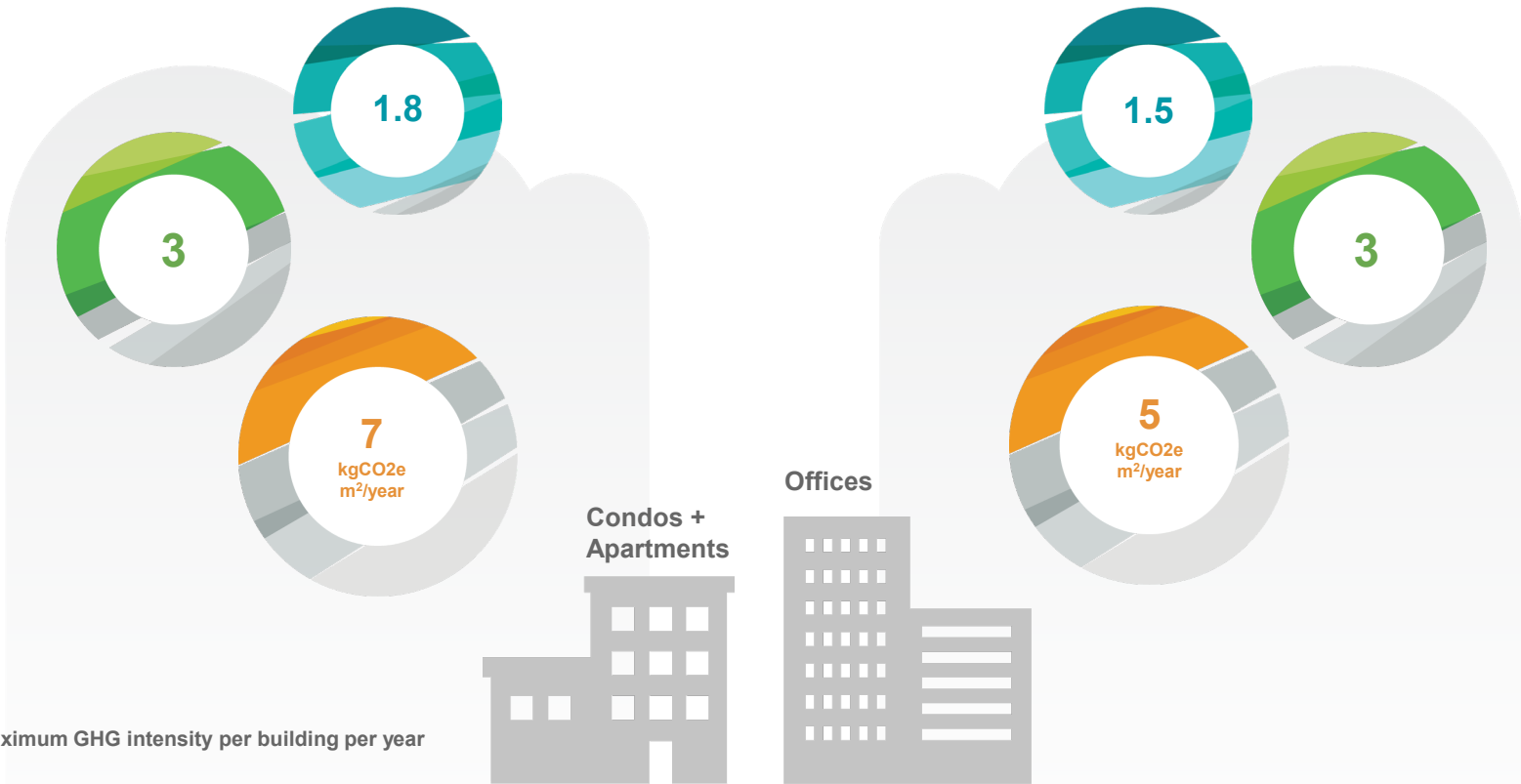


Courtesy thinkBright



Compliance options and
sample projects: **Part 3**

Industry compliance: Developers and the performance approach



Maximum GHG intensity per building per year

Industry compliance: Developers and the performance approach

<u>Table 10.3.1.3.</u>				
<u>Greenhouse Gas Emissions</u>				
<u>Forming Part of Sentence 10.3.1.3.(1)</u>				
<u>GHG Emission Level</u>	<u>Maximum GHGI of the Building, Expressed in kgCO_{2e}/m²/year</u>			
	<u>Residential Major Occupancy</u>		<u>Business and Personal Service and Mercantile Major Occupancies</u>	
	<u>Hotels and Motels</u>	<u>Other Residential Occupancies</u>	<u>Offices</u>	<u>Other Business and Personal Service and Mercantile Occupancies</u>
<u>EL-1</u>	<u>measure only</u>			
<u>EL-2</u>	<u>9.0</u>	<u>7.0</u>	<u>5.0</u>	<u>6.0</u>
<u>EL-3</u>	<u>4.0</u>	<u>3.0</u>	<u>3.0</u>	<u>3.0</u>
<u>EL-4</u>	<u>2.0</u>	<u>1.8</u>	<u>1.5</u>	<u>2.0</u>

Maximum GHG intensity per building per year



Moderate Carbon Performance: First Avenue Supportive Housing, Prince George

Four stories
48 units
3,037 square metres
Climate zone 6

Natural gas hot water, through-wall electric heat pumps in each unit, induction cooktops

3.9

kgCO₂e
M²/year

Image + credit
to follow

Existing Buildings

Application to Existing Buildings

- Bulletin 23-01:
 - Information for Planners about 20% Better Energy Efficiency and Zero Carbon Step Code
- Division A of the BC Building Code
- Retrofit Code
- Local Government Peer Network
- Building Official Handbook
- LG Best Practice Guide

Compliance Tools

Compliance tools for ESC and ZCSC

- Part 9 and Part 3

- Beta versions now available on the Step Code website
- Beta period ends at end of June

-<https://energystepcode.ca/compliance-tools-part9/>

-<https://energystepcode.ca/compliance-tools-part3/>

- Please provide feedback to:
 - building.safety@gov.bc.ca

BC Codes 2023 Changes and Proposed Changes

Building and Safety Standards Branch
Update 2023-05-31



Ministry of
Housing



BC Codes 2023

- Coming to the BC Codes from the National Codes
- **Not** coming to the BC Codes from the National Codes
- B.C. proposed changes currently out for public review





**Follow the rules or
follow the fools.**

—Tupac Shakur



Not for BC Codes 2023

New NBC and NFC
requirements for large
farm buildings



Significant technical
changes

- Other regulatory impacts
- Other enforcement impacts



Not for BC Codes 2023



~~Home-type Care Facilities~~

- Group B, Division 4
- Built under Part 9
- No sprinklers required
- Other regulatory impacts
- Other enforcement impacts



Coming to the BC Codes

Encapsulated Mass
Timber Construction

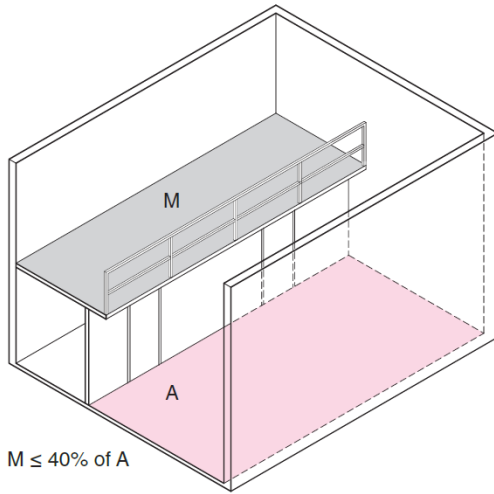


Self-service Storage Buildings

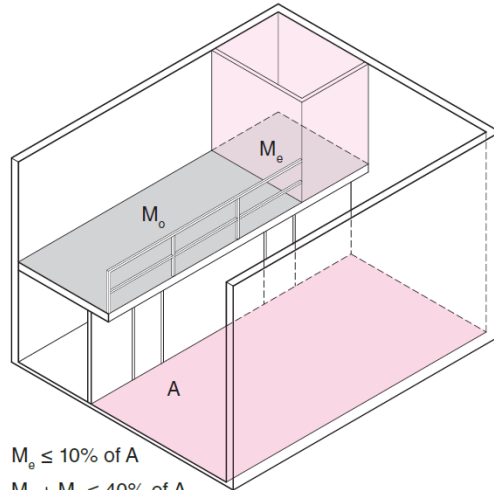


Coming to the BC Codes

Mezzanines



$$M \leq 40\% \text{ of } A$$



$$M_e \leq 10\% \text{ of } A$$

$$M_o + M_e \leq 40\% \text{ of } A$$



Chemical Contaminants
(as in *protection from*)



Coming to the BC Codes

Rainwater Harvesting

Spatial Separation of accessory buildings

Owner

Climactic Data



Location	Degree-Days Below 18°C	
	NBC 2020	NBC 2015 / BCBC 2018
Comox	2930	3100
Courtenay	2930	3100
Hope	2820	3000
Ladysmith	2920	3000
Nanaimo	2920	3000
Parksville	2990	3200



Plumbing and Fire Code Notification

British Columbia Building Code 2023
(Book II: Plumbing Systems)



National Fire Code of Canada 2020

- B.C. amendments in adopting Order
- B.C. hose thread requirements discontinued



New B.C. Proposed Changes

Fenestration – Part 5



- Harmonization with NBC Part 5
- Updated referenced standards
- Custom engineered solutions
- “Limited Water” doors



New B.C. Proposed Changes

Free-standing Steel Pallet Storage Racks – Part 4

CSA S16-19, “Design of steel structures,” Annex N

CSA A344.2-05 (R 2011),
“Standard for the design and
construction of steel storage
racks”



New B.C. Proposed Changes

Overheating – Parts 6 and 9

Upper limit for indoor design temperature of **26 °C**



Residential buildings

- One living space in each dwelling unit
- Passive cooling measures
- CSA F280 (Part 9)



New B.C. Proposed Changes

Seismic Design – Part 9

Higher seismic hazard values

- Exceed Part 9 design parameters

Early adopt proposal for NBC 2025

- Proposed Change Form (PCF) 1475
- Provides Part 9 design options
- Defines new wood-frame wall types



New B.C. Proposed Changes

Ventilation – Part 9

Harmonization with NBC Section 9.32., but

- Retain requirements for heated crawl spaces
- Retain protection against depressurization
- Retain carbon monoxide alarms

Secondary suites

- Retain option for passive ventilation
- Discontinue shared systems



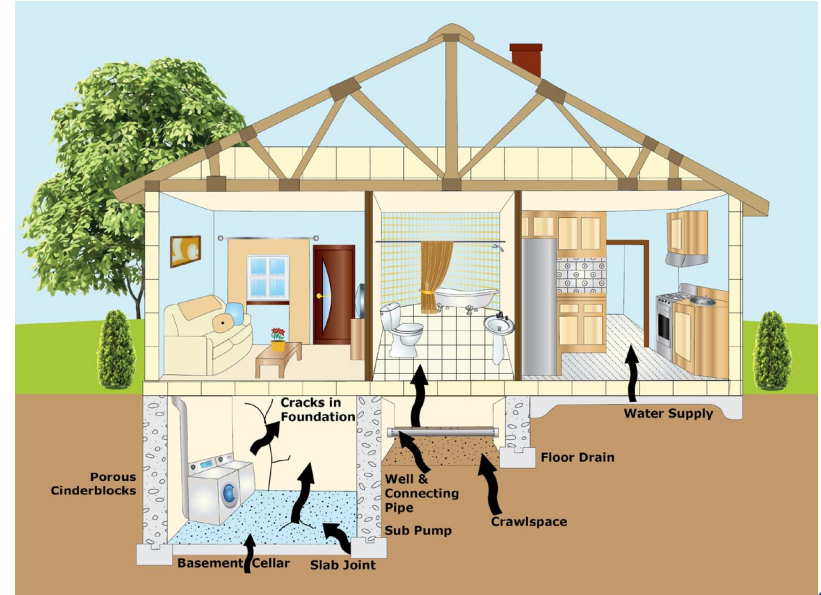
New B.C. Proposed Changes

Radon – Part 9



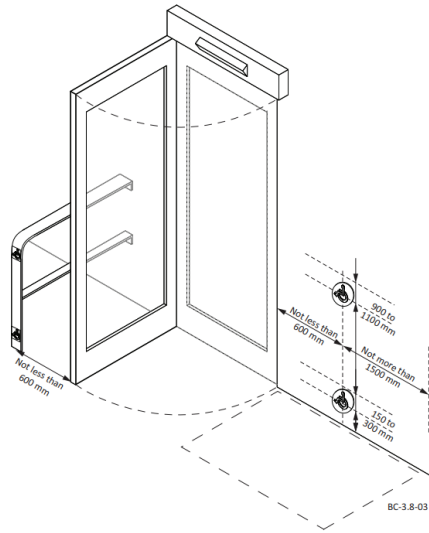
Rough-in for subfloor depressurization system

- All locations
- Updated rough-in requirements
- CAN/CGSB-149.11 Standard



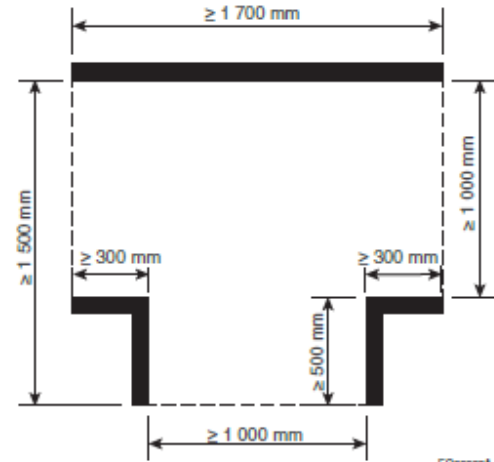
New B.C. Proposed Changes

Accessibility – From the 2020 National Building Code



All building entrances be accessible and equipped with power-door operators

New dimensions for paths of travel



New B.C. Proposed Changes

Accessibility – From the 2020 National Building Code

WASHROOM FOR EVERYONE



Inclusive washrooms, full-sized change table in universal washrooms and dressing rooms

Improved signage and assistive listening systems

More elevators



New B.C. Proposed Changes

B.C. Adaptable Dwelling Units



Accessible clearances through doorways and along paths of travel to living spaces

Space in a bedroom, bathroom, and kitchen to support diverse needs

Switches and controls at an accessible height

Reinforcement of bathroom walls



THANK YOU

