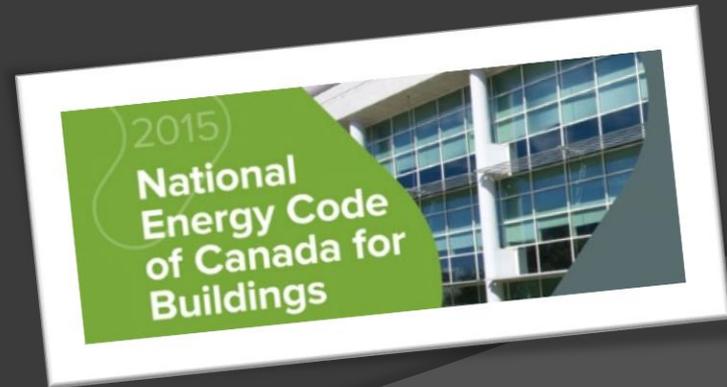
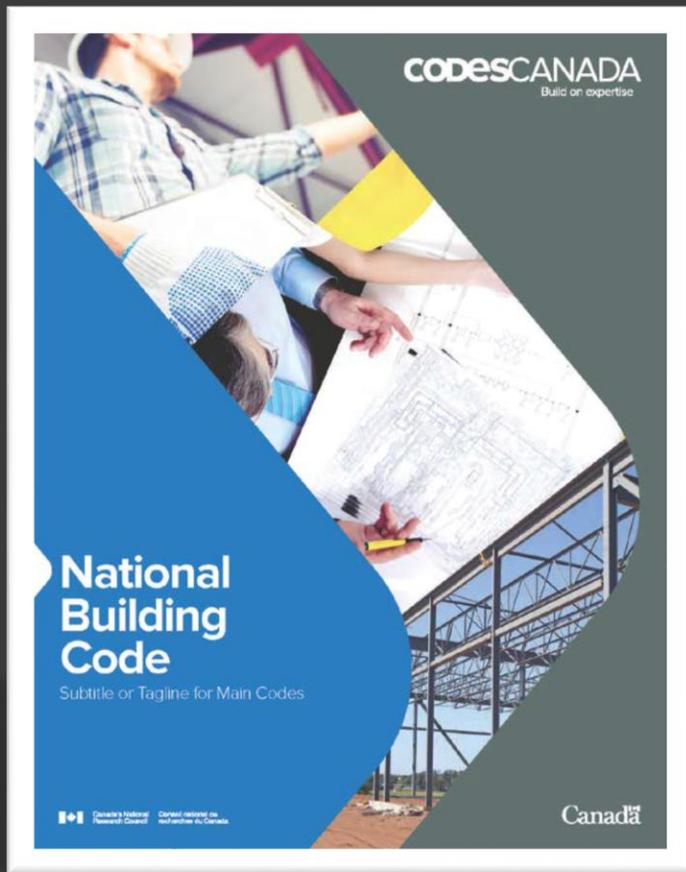


National Building Code – Alberta Edition 2019 [NBC(AE) 2019] & National Energy Code for Buildings 2017



Overview

- ◎ **NBC(AE) 2019**
 - **Part 3** **slide 3**
 - **Part 5** **slide 23**
 - **Part 6** **slide 29**
 - **Part 9** **slide 32**
- ◎ **NECB 2015** **slide 52**
- ◎ **NECB 2017** **slide 63**



Changes in the NBC(AE) 2019

Part 3

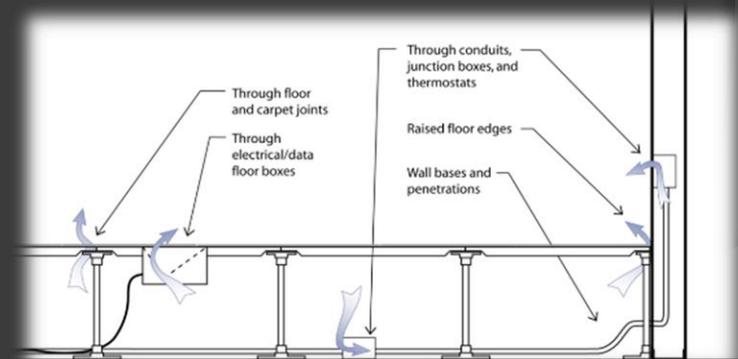
Alberta

Municipal Affairs

Fire Protection: Minimum Fire Rating of Cables in Air Plenums

3.1.4. Combustible Construction

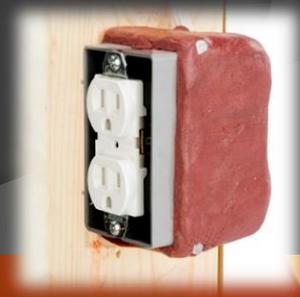
- Change in the minimum rating
- Optic fibre cables and electric cables with combustible insulation in air plenums (for voice, sound and data) in combustible construction used to be FT₄ now FT₆
- Now consistent with optical fiber cables and electrical wires and cables in noncombustible construction



Penetration by Electrical and Non-Electrical Outlet Boxes

3.1.9.4. Penetration by Outlet Boxes

- **Non-combustible outlet boxes (no fire stop required):**
 - Single maximum opening 0.016 m^2 (24.8 in²)
 - Maximum aggregate area of 0.065 m^2 (100 in²) / for every 9.3 m^2 (100 ft²)
 - Annular space membrane/outlet not more than 3 mm
- Exemption not applied for firewalls & horizontal fire separation**
- **Opposite direction outlet boxes:**
 - Separated horizontally not less than 600 mm, or
 - Fire block



Self-Service Storage Buildings

3.9. Self-service Storage Buildings

○ New Section

- Not more than one storey
- External access only
- No basement or mezzanine
- No other major occupancy



Example of the requirements:

3.9.2.2.(3) Subsection 3.2.3. need not apply, where the distance between these buildings is at least 6 m.

3.9.3.1.(6) The floor area of self-service storage buildings shall be
a) subdivided into compartments not more than 500 m² in area by a fire separation having a fire-resistance rating not less than 1 h, or
b) sprinklered.

Protection of Foamed Plastics

3.1.4.2.(2) / 3.1.5.7. / 3.1.5.14. / 3.1.5.15.

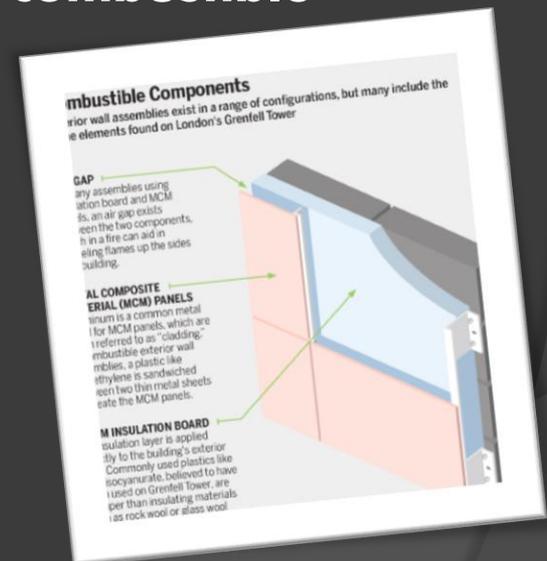
- ⦿ **New provisions for walk-in coolers or freezers containing foamed plastics in buildings of combustible construction**
- ⦿ **Factory assembled-panels containing foamed plastic insulation are permitted in buildings of non-combustible construction under certain conditions**
- ⦿ **Requirements for combustible insulation and foamed plastic insulation within buildings of non-combustible construction have been separated into two Articles: 3.1.5.14. and 3.1.5.15.**

Combustible Components for Exterior Walls

3.1.5.5. Combustible Cladding on Exterior Walls

3.1.5.6. Combustible Components in Exterior Walls

- For non-combustible construction:
- Now two articles (to clarify requirements)
- Combustible cladding / used to be within combustible components (ABC 2014)



Installation of Smoke Dampers

3.1.8.7. Location of Fire Dampers and Smoke Dampers

3.1.8.9. Smoke Dampers Waived

3.1.8.11. Installation of Smoke Dampers

- Previously only addressed fire dampers
- To prevent smoke spreading into egress paths
- In specific locations (e.g. public corridor)
- Waived in certain locations
- Combination of fire/smoke damper is also permitted



Fire



Smoke



Combination

Installation of Closures

3.1.8.5. Installation of Closures

- ⦿ **Installation of a leakage-rated door assembly is now required:**
 - **Protection of floor area with barrier-free path of travel divided into 2 zones - 3.3.1.7.(1)(b)**
 - **B₂/B₃ divided into compartments (1000 m²) - 3.3.3.5.(2/4)**
 - **Public corridors serving dwelling units in storeys that are not sprinklered**
 - **B₁/B₂/B₃ horizontal exit in firewalls - 3.3.3.5.(3)**



Smoke and Draft Control Door Assemblies



Installation of Closures

3.1.8.5. Installation of Closures

- Leakage-rated doors need not be installed where a *dwelling unit* served by a *public corridor* has
 - a) a second and separate *means of egress*, or
 - b) an open-air balcony
- Installation: NFPA 105, “Smoke Door Assemblies and Other Opening Protectives”
- Tested to: ANSI/UL 1784, “Air Leakage Tests of Door Assemblies and Other Opening Protectives”
- Doors tested in accordance with UL 1784 are eligible to bear a mark that reads “Smoke and Draft Control Door” or the letter “S”



Hold-Open Devices & Integrated Fire Protection and Life Safety Systems

3.1.8.13. / 3.2.9.1.

- ⦿ The provisions were clarified for hold-open devices on closures in fire separations
- ⦿ Article 3.2.9.1. relocated from Article 3.2.4.6.
 - 1) Where fire protection and life safety systems and systems with fire protection and life safety functions are integrated with each other, they shall be tested as a whole in accordance with CAN/ULC-S1001, "Integrated Systems Testing of Fire Protection and Life Safety Systems," to verify that they have been properly integrated.

Mezzanines and Openings through Floor Assemblies

3.2.8.3. Construction Requirements (deleted)

3.2.8.3.(1) A building constructed in conformance with Articles 3.2.8.4. to 3.2.8.9. shall be of noncombustible construction, except that heavy timber construction is permitted if Subsection 3.2.2. permits the building to be constructed of combustible construction.

Exit Width of Principal Entrances

3.4.2.6. Principal Entrances

- 2) In a building that is not sprinklered ...the principal entrance serving a dance hall or licensed beverage establishment with an occupant load more than 250 shall provide at least one half of the required exit width.
- The principal entrance must account for at least one half of the required occupant load, even if the building has more than 2 exits

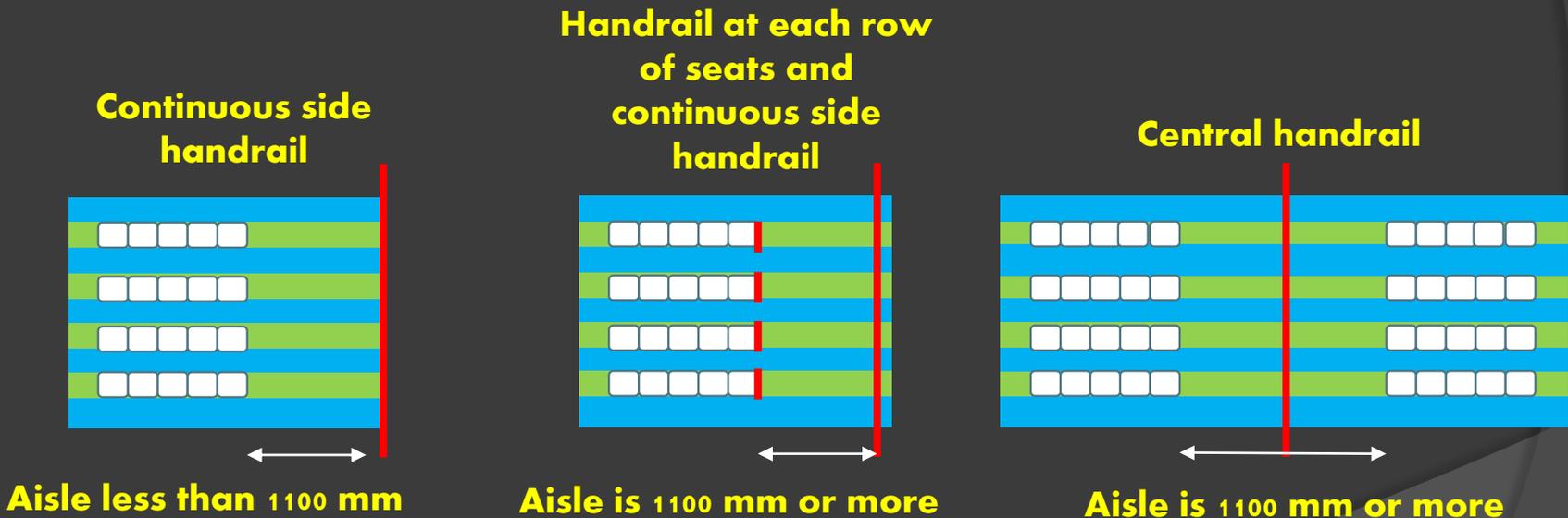
Handrails for Aisles with Steps

3.3.2. Assembly Occupancy

3.3.2.10. Handrails in Aisles with Steps

Assembly Occupancy

1) Handrails shall be provided in aisles with steps in conformance with Table 3.3.2.10.



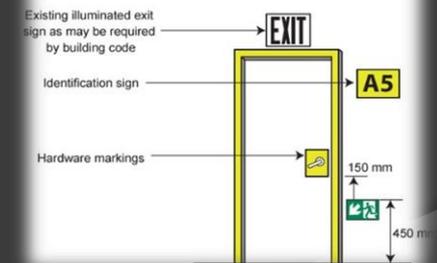
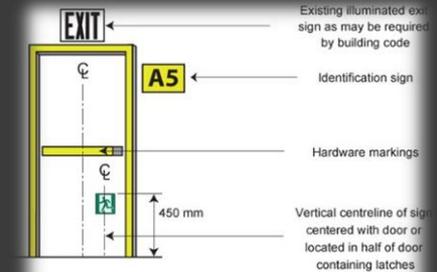
Emergency Crossover Access to Floor Areas

3.4.6.18. Emergency Crossover Access to Floor Areas

ABC 2014

~~3.4.6.18. Emergency Access to Floor Areas~~

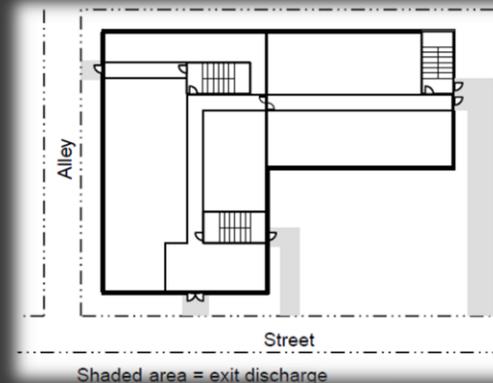
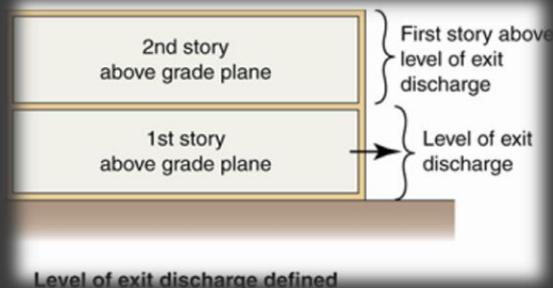
- Reworded
- Updated and clarified
- Electromagnetic locks permitted



Distance Between Exterior Discharges of Exits

3.4.2.3. Distance Between Exits

- 4) The distance between 2 exterior discharges of *exit* stairs serving the same *floor area* shall be
- a) not less than 9 m, or
 - b) not less than 6 m, where
 - i) the *building is sprinklered* throughout, and
 - ii) the 2 exterior discharges are located within 15 m of a *street*.



Stairs - Ornamental Guards

3.3.1.18.(4) Guards

- ❖ Permitted when protecting a level not more than 4.2 m above adjacent level. If greater than 4.2 m, design as per 9.8.8.6.
- ❖ Openings through guards shall still be of a size that prevents the passage of a spherical object having a diameter of 100 mm or less



Handrails, Guards and Stairs

3.4.6.5. Handrails

3.4.6.6. Guards

3.4.6.8. Treads and Risers

- “Graspable portion” for non-circular cross section handrails is now deleted
- Non-circular cross-section with ~~a graspable portion~~ perimeter not less. . .
- The height of guards serving a flight of exit stairs in Part 3 and Part 9 is harmonized – 1070 mm (previously 920 mm Part 3 and 1070 mm Part 9)
- The use of open risers in public stairs is prohibited, but is permitted in dwelling units and industrial occupancies



Accessibility

3.8. Accessibility

3.8.1.1. Scope

2) *Buildings* and facilities required to be *barrier-free* in accordance with Subsection 3.8.2. shall be designed in accordance with Subsection 3.8.3.

3.8.3.1. Design Standards

1) *Buildings* or parts thereof and facilities that are required to be *barrier-free* shall be designed in accordance with

a) this Subsection, or

~~b) the provisions of CSA B651, "Accessible Design for the Built Environment," listed in Table 3.8.3.1., in their entirety.~~

Not adopted (less restrictive than AB-specific requirements)

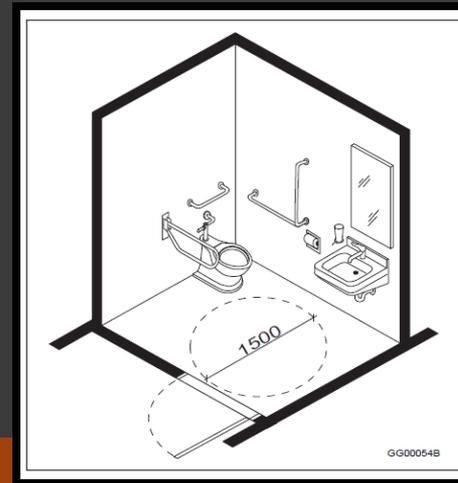
Table 3.8.3.1.
Barrier-free Design Provisions
Forming Part of Sentence 3.8.3.1.(1)

Barrier-free Application (Code References)	Applicable CSA B651 Provisions
Interior accessible routes (3.8.3.2.)	4.3 and 5.1
Exterior accessible routes (3.8.3.3.)	8.2.1 to 8.2.5 and 8.2.7
Passenger pickup areas (3.8.3.4.)	9.3
Ramps (3.8.3.5.)	5.3 and 5.5
Doors and doorways (3.8.3.6.)	5.2

Accessibility

3.8.3.11. Accessibility

- 1) Water-closet stalls and enclosures required by Sentence 3.8.2.8.(5) shall
 - e) be equipped with an L-shaped grab bar that
 - i) is mounted on the side wall closest to the water closet,
 - ii) has horizontal and vertical components not less than 760 mm long mounted with the horizontal component 750 mm to 850 mm above the floor and the vertical component 150 mm in front of the water closet



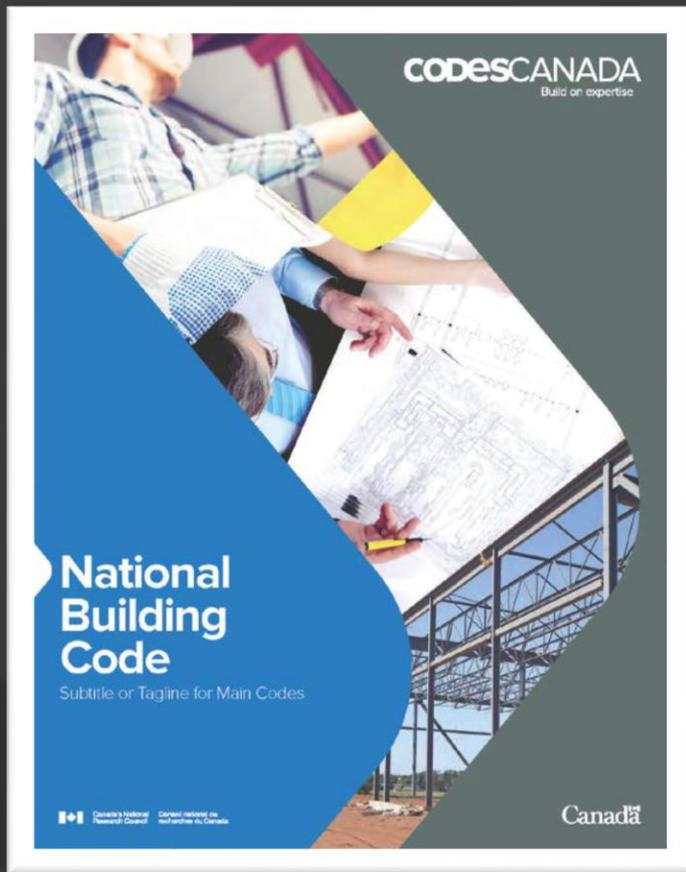
Accessibility

3.8.5. Medical Doctor Clinics and Offices

New requirements for medical doctor clinics and offices to provide enhanced accessibility, ex:

- ⦿ **Entrance doorway width is required to be 915 mm when the door is in the open position**





Changes in the NBC(AE) 2019

Part 5

Curtain Walls, Storefronts and Glazed Architectural Structures

5.9.3. Other Fenestration Assemblies

New Subsection 5.9.3.

5.9.3.2. Structural and Environmental Loads

5.9.3.3. Heat Transfer

5.9.3.4. Air Leakage

5.9.3.5. Water Penetration

Establishes:

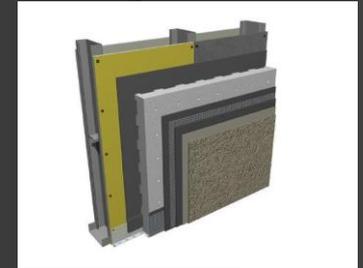
- **Minimum performance requirements**
- **Laboratory and in-situ testing procedures**



Exterior Insulation and Finishing System (EIFS)

5.9.4. Exterior Insulation Finish Systems

- ⦿ **New Subsection 5.9.4.**



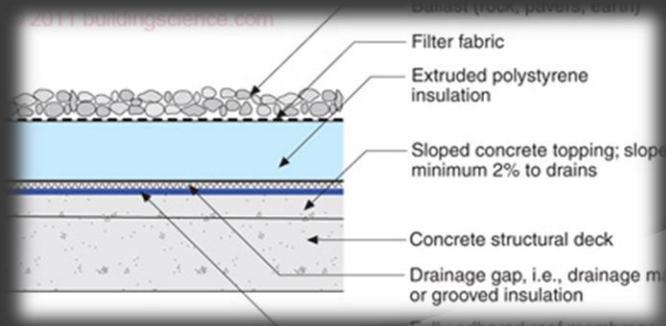
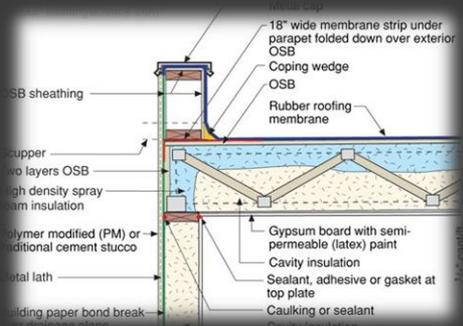
Comply to:

- ⦿ **Subsection 5.1.4. and Sections 5.3. to 5.6. and**
- ⦿ **CAN/ULC-S716.1, “Exterior Insulation and Finish Systems (EIFS) –Materials and Systems,” where covered in the scope of that standard**

Wind Uplift Resistance of Membrane Roofing Assemblies

5.2.2.2. Determination of Wind Load

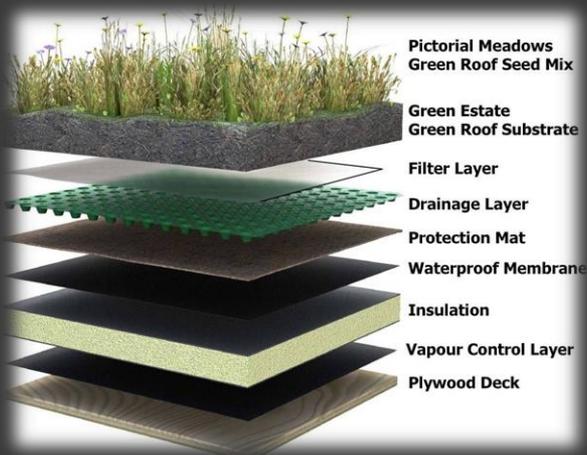
- New standard CAN/CSA-A123.21 "Dynamic Wind Uplift Resistance of Membrane-Roofing Systems" added
- Applies only to membrane roofing systems whose components' resistance to wind uplift is achieved by fasteners or adhesives
- It does not apply to roofing systems that use ballasts, such as gravel or pavers, to secure the membrane against wind uplift



Vegetative Roofing Systems

5.6.1.2. Installation of Protective Materials

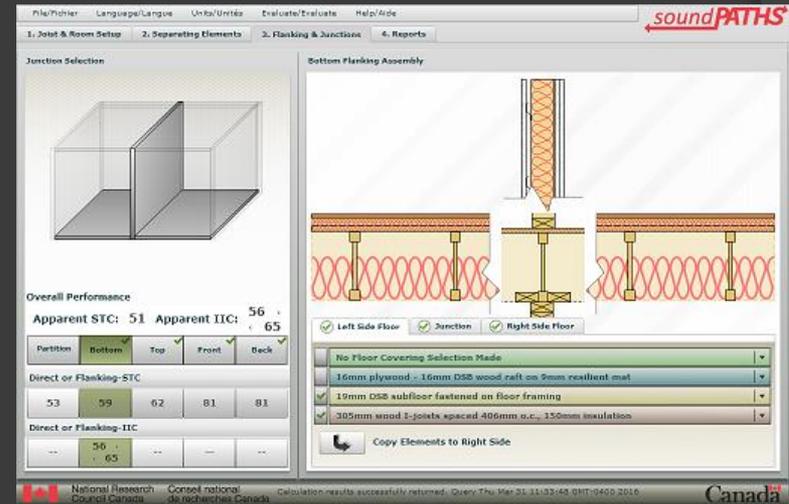
- **Materials that provide protection from precipitation need to be tested for resistance to root and rhizome penetration**
- **New standard ANSI/GRHC/SPRI VR-1**

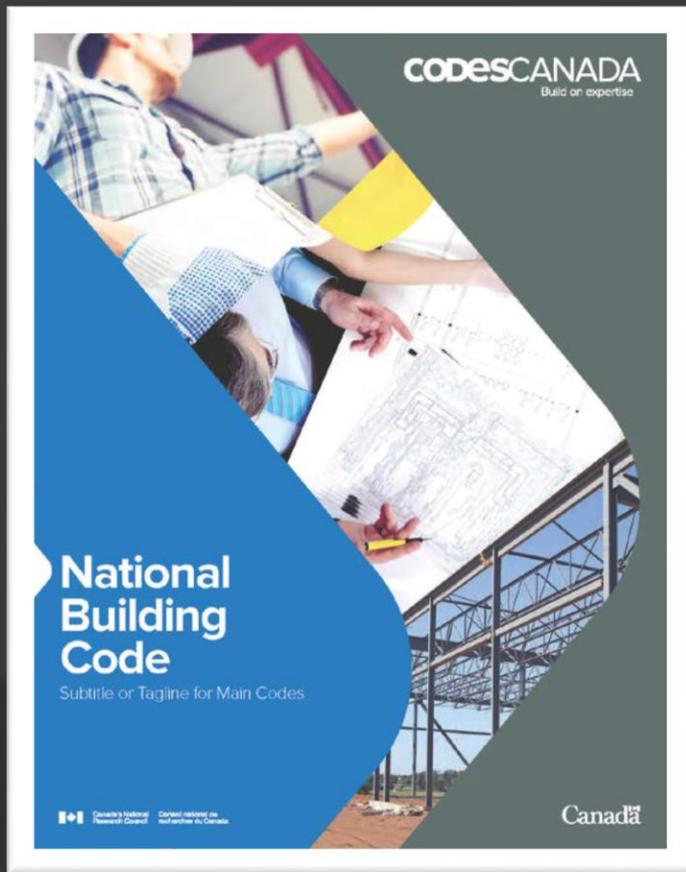


Sound Transmission

5.8. Sound Transmission

- The Apparent Sound Transmission Class (ASTC) is introduced to take into account flanking sound transmission in addition to the direct sound transmission
- Calculation of ASTC
 - Measurement to ASTM
 - Calculations
 - Detailed
 - Simplified
- Dwelling Units
 - **ASTC 47**
 - **or 50 STC (Tables 9.10.3.1.A/B) and adjoining construction requirements of 9.11.1.4.**
 - **Wall between dwelling unit and elevator or refuse shaft - 55 STC**





Changes in the NBC(AE) 2019

Part 6

Drain Pans

6.3.2.2. Drain Pans

- **Drain pans beneath (for condensation)**
 - **Dehumidifying cooling coil assemblies**
 - **Condensate-producing heat exchangers**
- **Standard (design):**
 - **Section 5.11. of ANSI/ASHRAE 62.1**
- **Outlet that is piped to the outside of the airstream in a location where condensate can be eliminated**
- **Water drains freely from the pan**

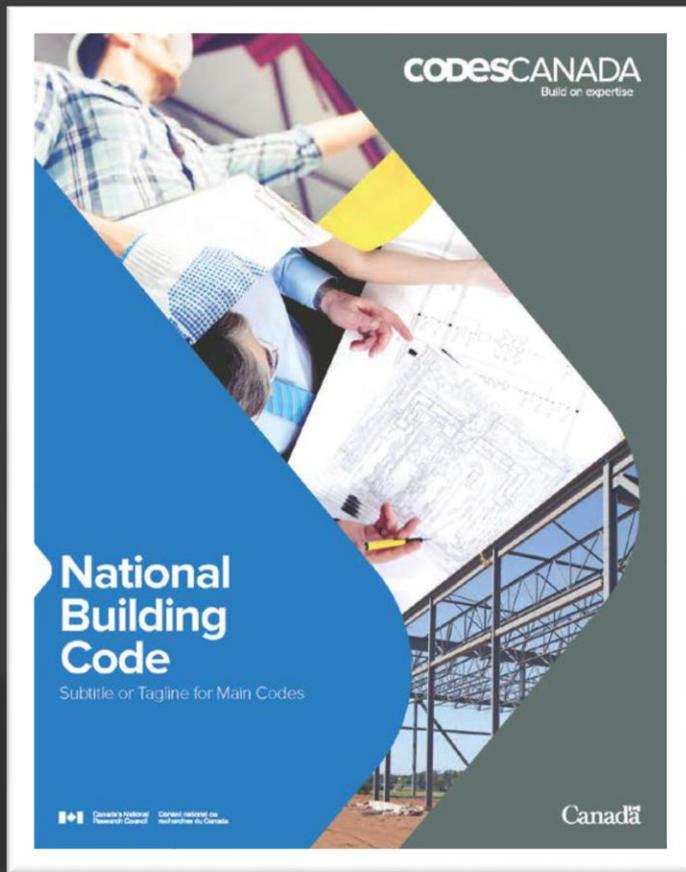
Separation Distances of Exhausts and Outdoor Air Intakes

6.3.2.9. Supply, Return, Intake and Exhaust Air Openings

New Table

Table 6.3.2.9.
Minimum Distances of Air Intakes from Sources of Contaminants
Forming Part of Sentence 6.3.2.9.(2)

Source of Contaminants	Minimum Distance of Outdoor Air Intake, m
Garage entry of a garage for 5 or more motor vehicles, automobile loading area and drive-in queue	4.5
Truck loading area or dock, and bus parking	7.6
Driveway, <i>street</i> , and parking space	1.5
Thoroughfare, arterial road, freeway, and highway	7.6
Garbage storage/pick-up area and dumpsters	4.5
Discharge from evaporative cooling tower, evaporative fluid cooler and evaporative condenser	7.6
Sanitary vent	3.5
Kitchen cooking exhaust	3.0
Vent for combustion products	3.0



Changes in the NBC(AE) 2019

Part 9

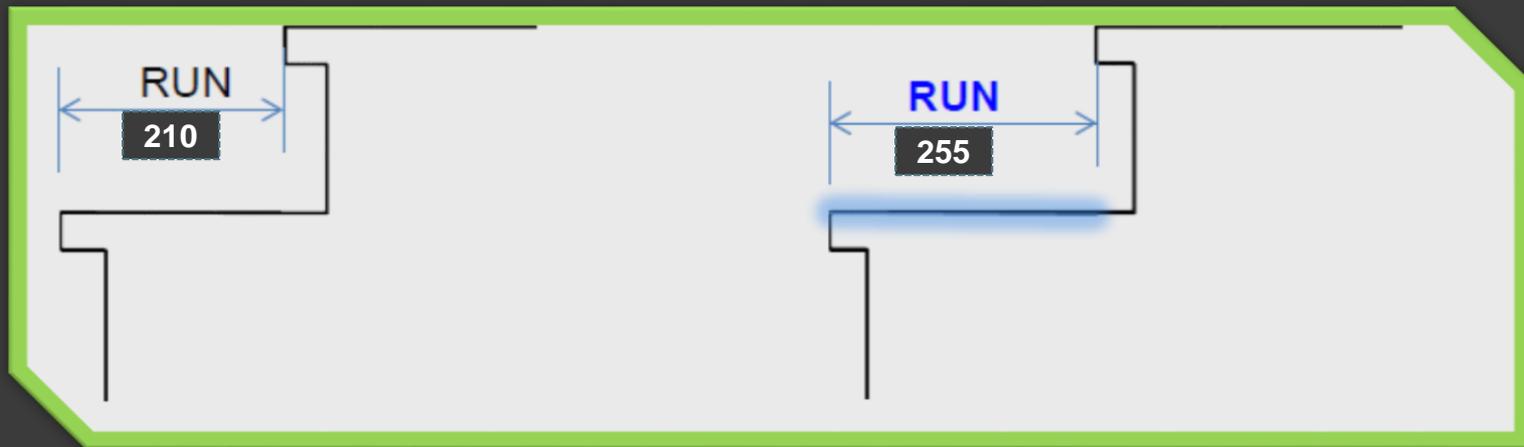
Alberta

Municipal Affairs

Stairs - Run Width

9.8.4.2. Dimensions for Rectangular Treads (private stairs)

	NBC 2010/ABC 2014	NBC 2015/NBC(AE) 2019
RUN (Min.)	210 mm (8 1/4 in.)	255 mm (10 in.)
RISE (Max.)	200 mm (7 7/8 in.)	200 mm (7 7/8 in.)

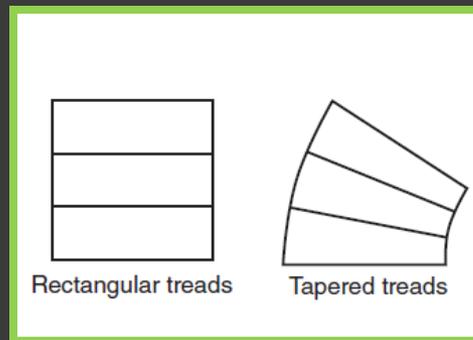


Stairs - Mixed Treads

9.8.4.5. Uniformity of Runs in Flights with Mixed Treads within Dwelling Units

- ❖ **ABC 2014 did not allow mixed treads between floor levels**
- ❖ **Now possible to mix in dwelling units**
- ❖ **Both tapered and rectangular**
- ❖ **In both directions**

Result: More design options available.



Stairs - Spiral Stairs

9.8.4.7. Spiral Stairs

- ❖ **Detailed and clarified (new to NBC)**
- ❖ **Not limited to dwelling units anymore**
- ❖ **Now permitted as the only means of egress when:**
 - **Serves not more than 3 persons**
 - **Not serve as an exit**

One bedroom = 2 persons, so the spiral stairs could serve one bedroom only



Stairs - Clarifications

9.8.7.5. Ergonomic Design

Clearance and Design

1) The clearance between a handrail and the surface behind it shall be not less than

a) 50 mm, or

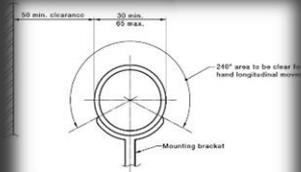
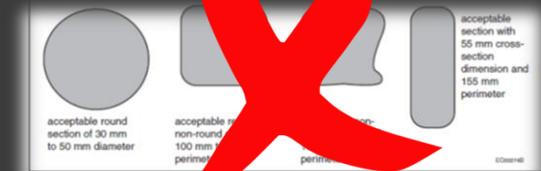
b) where said surface is rough or abrasive, 60 mm.

2) All handrails shall be constructed so as to be continually graspable along their entire length with no obstruction on or above them to break a handhold. (See Note A-9.8.7.5.(2).)

Note A-9.8.7.5.(2) Handrail Sections:

The graspable portion of a handrail should allow a person to comfortably and firmly grab hold by allowing their fingers and thumb to curl under part or all of the handrail.

Appendix note that illustrates handrail sections has been deleted



Stairs - Ornamental Guards

9.8.8.6. Design of Guards to Not Facilitate Climbing

- ❖ Permitted when protecting a level not more than 4.2 m above adjacent level. If greater than 4.2 m, design as per 9.8.8.6.
- ❖ Openings through guards shall still be of a size that prevents the passage of a spherical object having a diameter of 100 mm or less



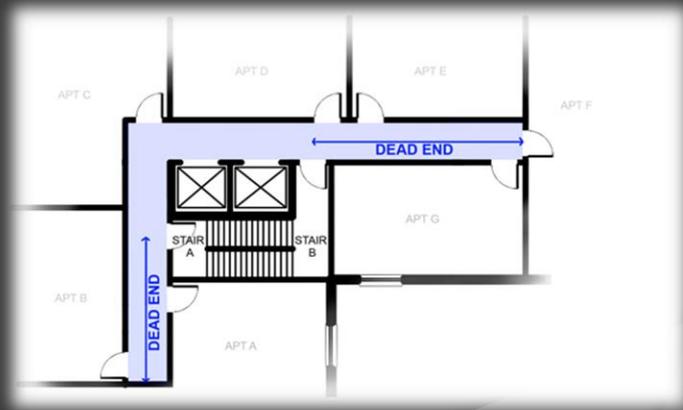
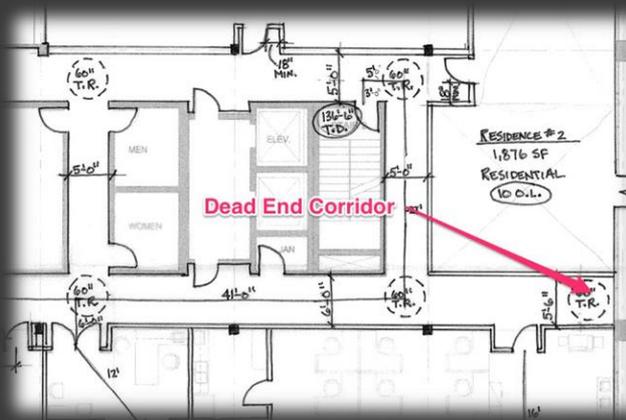
Corridor Length

9.9.7.3. Dead-End Corridors

- 1) Except for a dead-end corridor that is entirely within a suite and except as permitted in Sentence 9.9.9.2.(1), a dead-end corridor is permitted provided it is not more than 6 m long.

Previous Alberta-specific max was 3 m long

Harmonizing with NBC 2015



New Residential Fire Warning Systems (ULC-S 540)

9.10.19.8. Residential Fire Warning Systems

- An additional prescriptive requirement is added to address the use and installation of residential fire warning systems
- Smoke detectors in lieu of smoke alarms
 - Audible signals
 - Same power supply requirements
 - Equipped with silencing device



Airborne Sound Transmission: Direct vs. Flanking

9.11.1.2. Determination of Sound Transmission Ratings

- **Flanking Transmission**
 - The sound passes around and over the top or under the primary partition (wall, ceiling or floor) separating two spaces
 - Bothersome in multi-family residential buildings
- **Dwelling Units**
 - 47 ATSC or
 - 50 STC + prescriptive requirements for adjoining constructionASTC can be calculated through Part 5: simple/detailed method (NRC Guide) and soundPATHS (a web application)
- **Wall Between Dwelling Unit and Refuse or Elevator Shaft**
 - 55 STC

Roofing, Waterproofing and Dampproofing

9.13. Dampproofing, Waterproofing and Soil Gas Control

- CGSB material standards
 - Deleted outdated standards
 - Replaced with ASTM where acceptable
 - Kept CGSB standards where no replacements are available
- CGSB installation standards
 - Deleted and replaced with prescriptive requirements

~~9.13.2.3. Standards for Application~~

~~1) The method of application of all bituminous dampproofing materials shall conform to~~

~~a) CAN/CGSB-37.3-M, "Application of Emulsified Asphalts for Dampproofing or Waterproofing,"~~

~~b) CGSB-37-GP-12Ma, "Application of Unfilled Cutback Asphalt for Dampproofing," or~~

~~c) CAN/CGSB-37.22-M, "Application of Unfilled, Cutback Tar Foundation Coating for Dampproofing,"~~

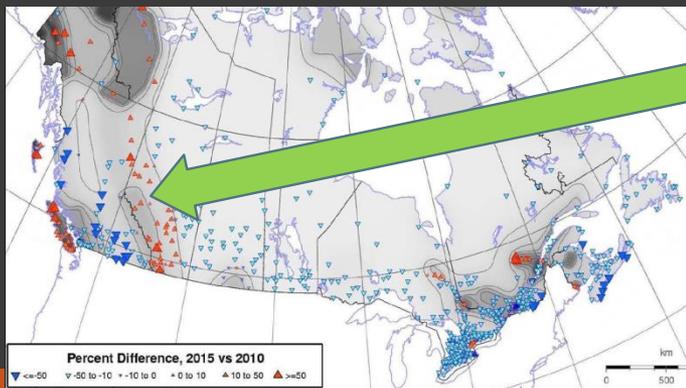
Structural Design – Lateral Loads

9.23.13. Bracing to Resist Lateral Loads Due to Wind and Earthquake

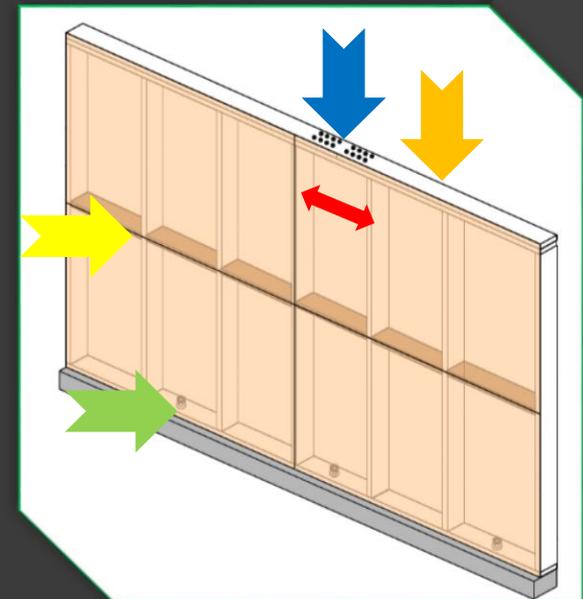
High and extreme (doesn't apply to moderate or low forces)

Enhanced lateral resistance

- ❖ Thicker sheathing
- ❖ Perpendicular blocking between wall studs
- ❖ Nailing of splices in wall top plates
- ❖ Anchor bolts
- ❖ Reduced spacing



Seismic and
Snow Loads
have
increased



Low-Permeance Materials

9.25.5. Properties and Position of Materials in the Building Envelope

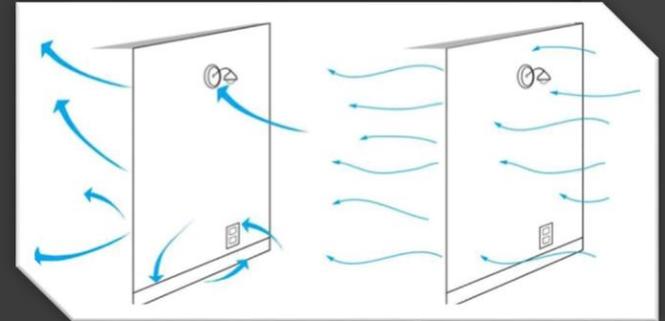
Requirements ABC 2014

- ❖ **Water vapour permeance**
 $< 60 \text{ ng}/(\text{Pa} \cdot \text{s} \cdot \text{m}^2)$
- ❖ **Air leakage characteristics**
 $< 0.1 \text{ L}/(\text{s} \cdot \text{m}^2) @ 75 \text{ Pa}$

- ❖ **Requirements**

Compliance with Article/Table 9.25.5.2.

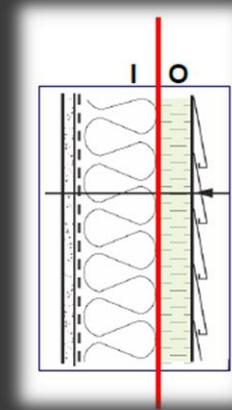
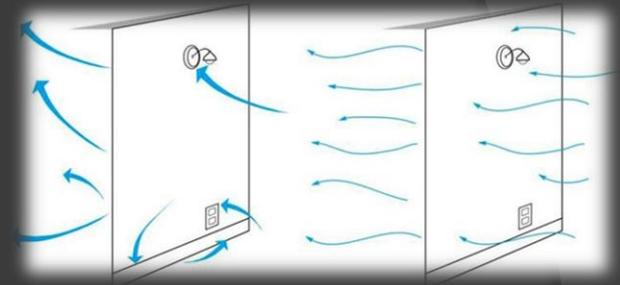
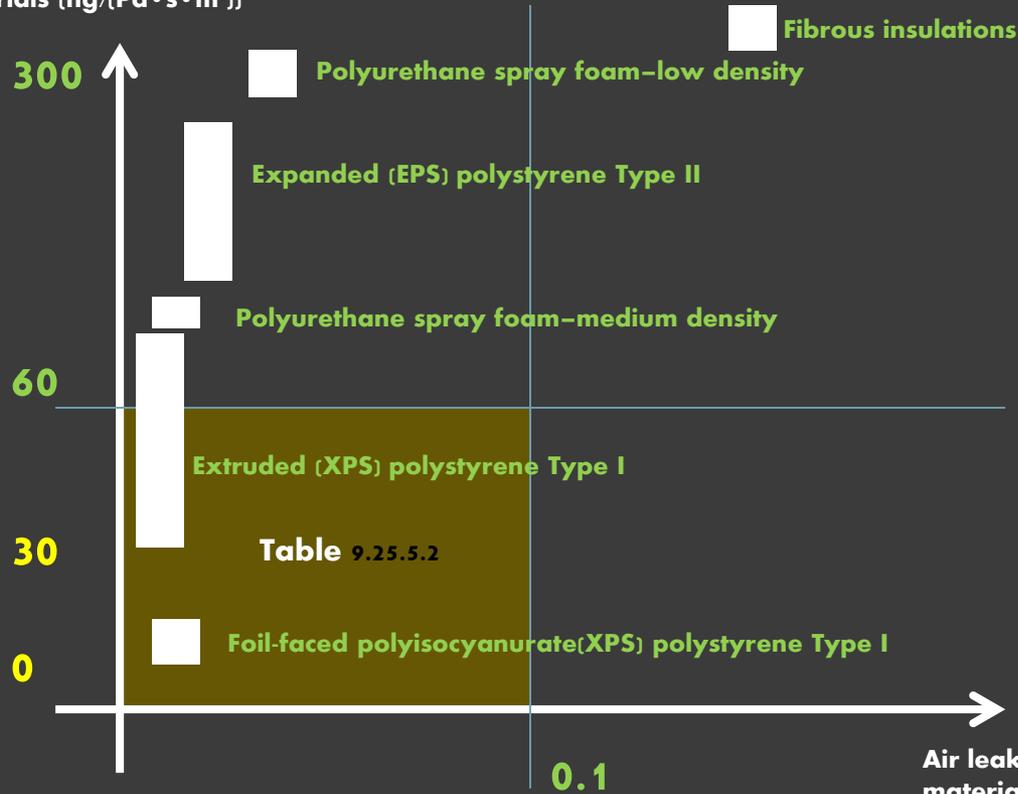
{Position of materials in the building envelope}



Low-Permeance Materials

9.25.5. Properties and Position of Materials in the Building Envelope

Water vapour permeance for panel-type materials ($\text{ng}/(\text{Pa} \cdot \text{s} \cdot \text{m}^2)$)

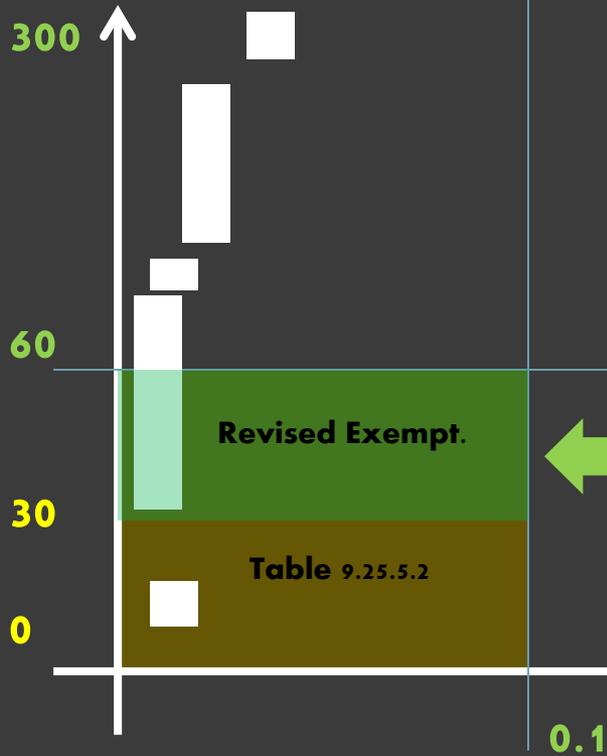


Air leakage characteristic for panel-type materials ($\text{L}/(\text{s} \cdot \text{m}^2) @ 75 \text{ Pa}$)

Low-Permeance Materials

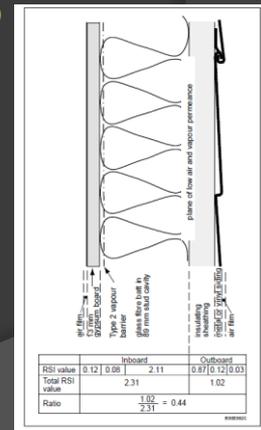
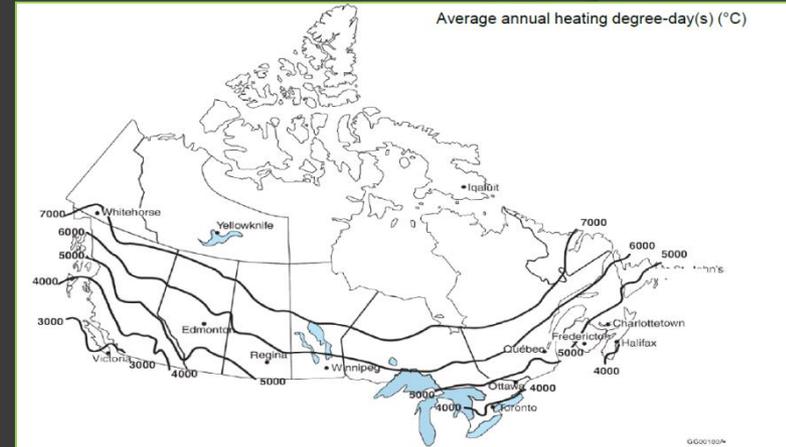
9.25.5. Properties and Position of Materials in the Building Envelope

Water vapour permeance for panel-type materials ($\text{ng}/(\text{Pa} \cdot \text{s} \cdot \text{m}^2)$)



With water vapour permeance of 30 – 60
Minimum R4 insulation value
In locations with HDD \leq 6000

Air leakage characteristic for panel-type materials ($\text{L}/(\text{s} \cdot \text{m}^2)$ @ 75 Pa)



Exterior Insulation and Finish Systems (EIFS)

9.27.13. Exterior Insulation Finish Systems



New requirements for EIFS:

- Comply with prescribed drainage cavity and referenced ULC standards, or
- Comply with Part 5

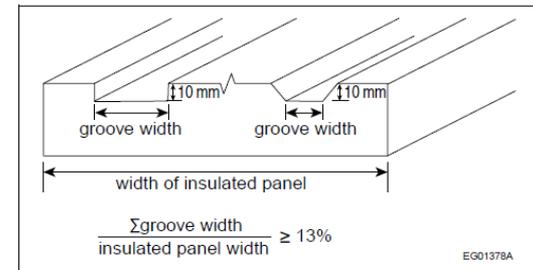
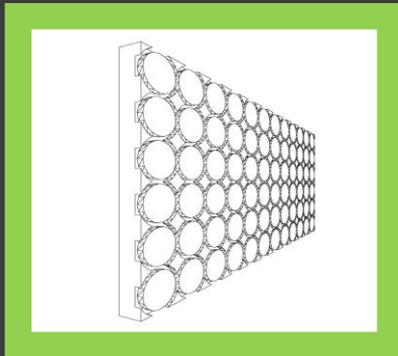


Figure A-9.27.13.1.(1)
Geometrically defined drainage cavity

Energy Efficiency (Section 9.36.)

9.36.2. Building Envelope

Garages

ABC 2014 - 9.36.2.1.(8) The requirements of this Subsection also apply to components of a *building* envelope assembly that separate a heated or unheated attached garage from unconditioned space or the exterior air, where the attached garage serves

- a) not more than one *dwelling unit*, or
- b) a house with a *secondary suite*.

The above has been removed from Section 9.36. Building envelope requirements for attached garages and heated detached garages are now located in Section 9.25.

Energy Efficiency (Section 9.36.)

9.36.2.2. Determination of Thermal Characteristics of Materials, Components and Assemblies

- 4) The effective thermal resistance of opaque building assemblies shall be determined from:
- a) calculations conforming to Article 9.36.2.4., or
 - b) laboratory tests performed in accordance with ASTM C 1363, "Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus," using an indoor air temperature of $21 \pm 1^\circ\text{C}$ and an outdoor air temperature of $-18 \pm 1^\circ\text{C}$ (~~$-35 \pm 1^\circ\text{C}$~~).

Energy Efficiency (Section 9.36.)

9.36.2.9. Airtightness

1) The leakage of air into and out of conditioned spaces shall be controlled by constructing

a) 9.36.2.9. (2-6) / 9.36.2.10. / 9.25.3.,

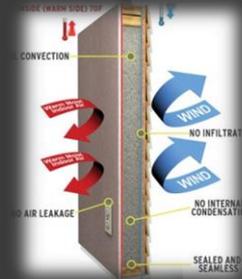
b) 9.36.2.9. (2-6) / Tested assembly to ULC-S742 / 9.25.3., or

c) 9.36.2.9. (2-6) / Tested assembly to ASTM E 2357 / 9.25.3.

NEW Subclauses - conditions for using Clause (c):

i) the building will not be subjected to sustained wind loads calculated based on a 1-in-50 hourly wind pressure that exceed 0.65 kPa, and

ii) the air barrier assembly is installed on the warm side of the thermal insulation of the opaque building assembly.

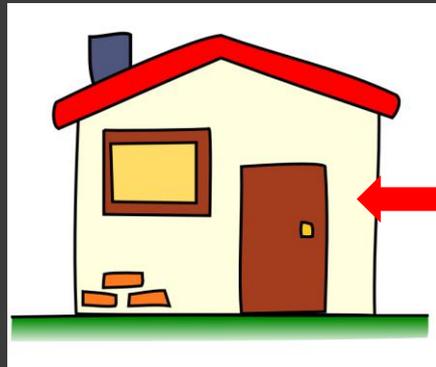


Edmonton 0.45 / Calgary 0.48 / Red Deer 0.40 / Lethbridge 0.66 / Fort McMurray 0.35 / Rocky Mountain 0.36 / Fort MacLeod 0.68 / Pincher Creek 0.96 / Turner Valley 0.65 / Taber 0.63 / Cardston 0.72 /

Main Entrance Doors

Performance of Doors: Limited Water Ingress Control

A-9.7.4.2.(1) Standards Referenced for Windows, Doors and Skylights

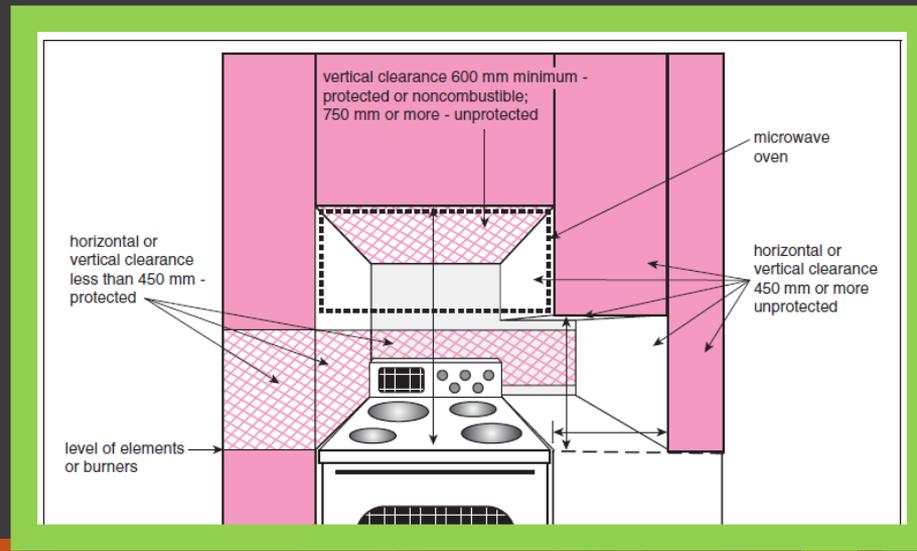


- Added Note to clarify the requirements
- Exterior doors must control air infiltration and precipitation ingress and conform to the NAFS Standard and the Canadian Supplement
- Clarifies the requirements for main entrance doors that are protected from precipitation, air infiltration and resistance to forced entry
- Side-hinged doors protected from precipitation can be tested with no pressure difference across the door. These are identified with a Limited Water (LW) rating on the label

Microwave Ovens and Range Hoods

A-9.10.22. Clearances from Gas, Propane and Electric Cooktops

- Now clarifies that clearances specified in Article 9.10.22.2. do not apply to microwave ovens and range hood
- [CEC c22.2 #150] This standard includes tests to confirm that the appliance will not present a hazard when installed according to the manufacturer's instructions
- Asbestos is not permitted for protection anymore





Changes in the NECB 2015

(also applicable to NECB 2017 – unless otherwise indicated)

Thermal Requirements for Semi-Heated Buildings

1.2.1.2. Defined Terms

3.2.2.2. Thermal Characteristics of Above-Ground Opaque Building Assemblies

New Sentences:

1.2.1.2.(2) For the purposes of this Code, a semi-heated *building* is considered to be a *building* with a design set-point temperature of less than 15°C.

3.2.2.2.(2)the *overall thermal transmittance* of above-ground *opaque building assemblies* in semi-heated *buildings*, as defined in Sentence 1.2.1.2.(2), shall be not more than that shown in Table 3.2.2.2.*assembly*, for the applicable heating-degree-day category taken at 15°C.

Note: The trade-off path does not apply to additions or to semi-heated buildings

Performance Level for Air Barrier Assemblies

3.2.4.2. Opaque Building Assemblies

NECB 2011:

an air barrier assembly is required; no prescriptive or measurement method

NECB 2015:

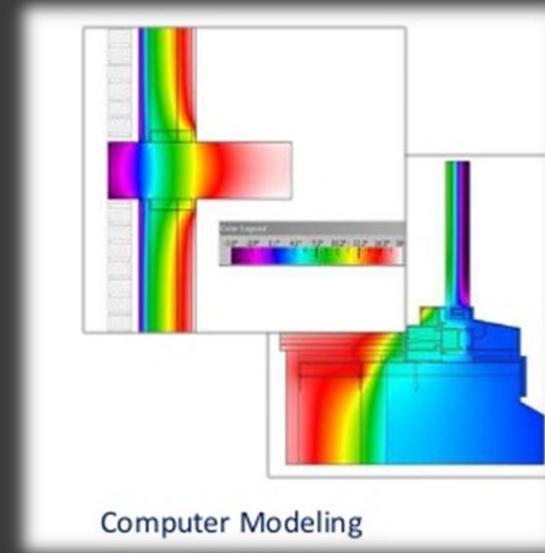
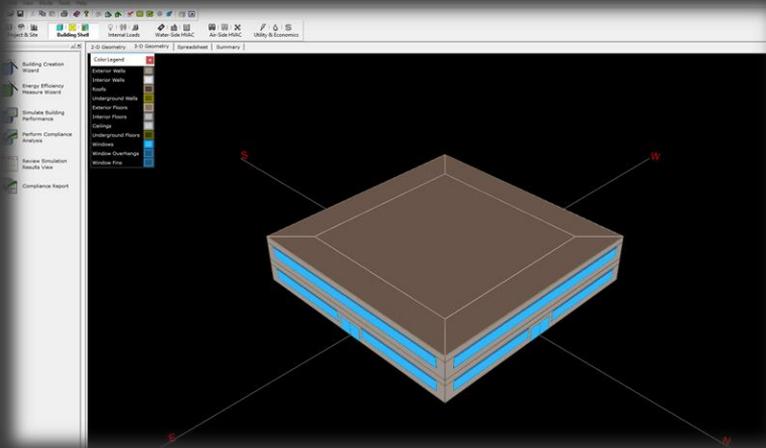
Air barrier assemblies conform to CAN/ULC-S742, "Air Barrier Assemblies – Specification," and an air leakage rate no greater than 0.2 L/(s·m²) at a pressure differential of 75 Pa., or

Air barrier assemblies tested in accordance with ASTM E 2357, "Determining Air Leakage of Air Barrier Assemblies," to meet the air leakage requirement stated in Sentence above, provided the 1-in-50 hourly wind pressures do not exceed 0.65 kPa, and the air barrier installed on the warm side of the thermal insulation

Trade-Off Path

3.3. Trade-Off Path

- The detailed trade-off path has been deleted
- Now the only trade-off path is simple method



Updated Max LPD

4.2.1.5. Calculation of Interior Lighting Power Allowance Using the Building Area Method

Building Type	NECB 2015	NECB 2011
Hotel	9.4	10.8
Hospital	11.3	13.0
Warehouse	7.1	7.1
Library	12.8	12.7

Harmonizing with ASHRAE 90.1-2013



Demand Control Ventilation

5.2.3.4. Demand Control Ventilation Systems

1) Enclosed semi-heated spaces or *conditioned spaces* where fuel-powered vehicles or mobile fuel-powered equipment or appliances are intermittently used shall be provided with sensors and demand control ventilation systems capable of limiting the expected air contaminants to acceptable levels by:

- a) staging the ventilation fans, or
- b) modulating the outdoor airflow rates.

Example:

- Indoor spaces where fuel-powered equipment is used



Updated Piping and Duct Insulation Requirements

5.2.5.3. Piping Insulation



HVAC piping that conveys fluids with design operating temperatures greater than ~~13°C~~ 16°C and less than 41°C need not comply with Table 5.2.5.3., if it is located within a *conditioned space*

The insulation thickness used to determine compliance with Table 5.2.5.3. shall be the thickness of the insulation after installation

Prescriptive Requirements for Gas-Fired Outdoor Packaged Units

5.2.12.1. Unitary and Packaged HVAC Equipment

Component or Equipment	Cooling or Heating Capacity, kW (Btu/h)	Standard	Minimum Performance(2)
Gas-fired outdoor packaged units	> 65.9 kW (225 000) and < 2 930 kW (10 000 000)	CAN/CSA-P.8(8)	Et ≥ 80%



Heat Rejection

5.2.12.2. Heat Rejection Equipment

New article - performance requirements for standalone heat rejection equipment

Cooling tower and condenser categories:

- **Direct-contact**
- **Indirect-contact**
- **Indirect-contact evaporative**
- **Air-cooled**



Updated Performance Requirements in the Mechanical and Service Water Tables

5.2.12.1. Unitary and Packaged HVAC Equipment

6.2.2.1. Equipment Efficiency

Meets or exceeds the Federal Equipment Efficiency Regulations

Added:

- electric instantaneous - $E_t \geq 98\%$
- gas instantaneous - $EF \geq 0.8$



Reduced Hot Water Discharge Rate for Showers and Lavatories

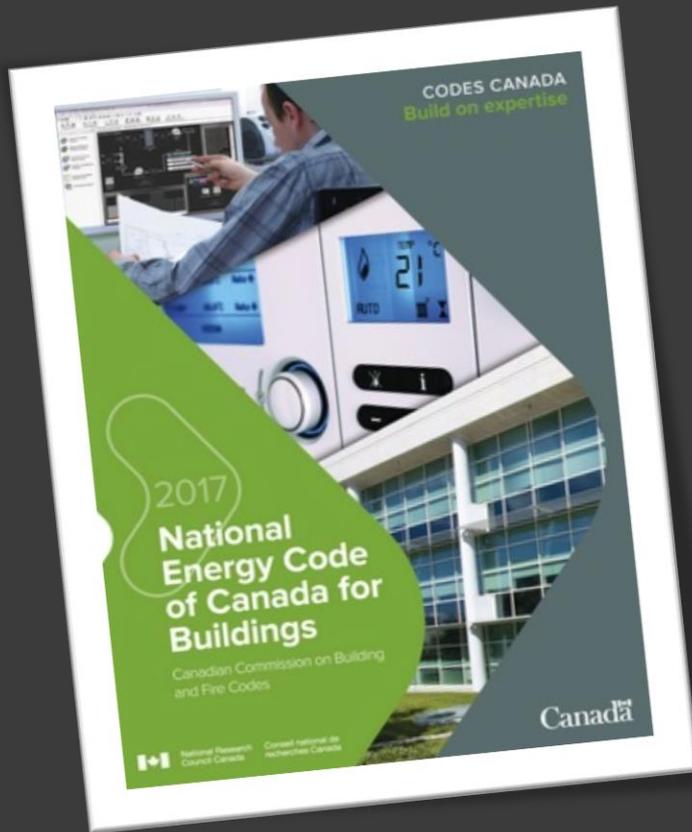
6.2.6. Hot Service Water

6.2.6.1. Showers

1) Except for emergency eye washes and emergency showers, individual shower heads shall have an integral means of limiting the maximum water flow rate to ~~9.5~~ 7.6 L/min when tested in accordance with ASME A112.18.1/CSA B125.1, "Plumbing Supply Fittings."

6.2.6.2. Lavatories

1) Except for lavatories in health care facilities and emergency eye washes, lavatories shall have an integral means of limiting the maximum water flow rate to ~~8.3~~ 5.7 L/min for private use and 1.9 L/min for public use, when tested in accordance with ASME A112.18.1/CSA B125.1, "Plumbing Supply Fittings."



Significant Changes in the NECB 2017

Energy Efficiency Improvements

Modelling for the changes in the NECB 2017 indicated a potential energy improvement of 10.3 to 14.4 % compared to the NECB 2011



Part 3 Building Envelope



What's New?

New standards for determining the thermal characteristics of building assemblies:

- ⦿ **BC Hydro's Building Envelope Thermal Bridging Guide. Using Building Envelope Thermal Analysis (BETA)**
- ⦿ **ASHRAE RP-1365 "Thermal Performance of Building Envelope Details for Mid and High-Rise Buildings"**
- ⦿ **ISO 14683 "Thermal Bridges in Building Construction"**

Modeling:

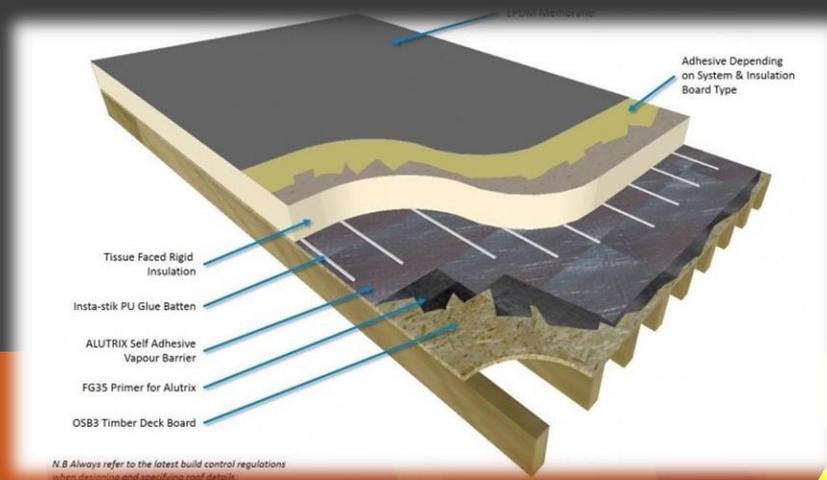
- ⦿ **The option to use two- or three-dimensional thermal modeling**

What's New?

Lowered U-Values for Roofs in all Zones

e.g. Zone 7A

	NECB 2011	NECB 2015	NECB 2017
Walls	0.21	0.21	0.21
Roofs	0.162	0.162 RSI 6.17 (R35)	0.138 RSI 7.24 (R41)
Floors	0.162	0.162	0.162

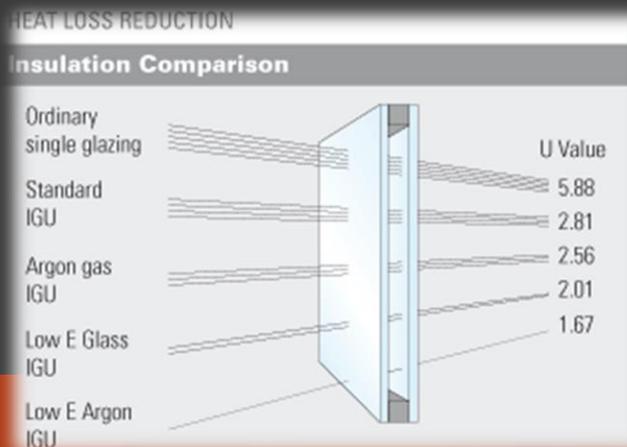


What's New?

Lowered U-Values for Fenestration and Doors in all Zones

Zone 7A

	NECB 2011	NECB 2015	NECB 2017
Fenestrations (except doors)	2.2	2.2 (RSI 0.45 – R 2.56)	1.9 (RSI 0.52 – R 2.95)
Doors	2.2	2.2 (RSI 0.45 – R 2.56)	1.9 (RSI 0.52 – R 2.95)



Part 4 Lighting

What's New?

**Decreased LPD for both building area
and space by space method**



Building Type	NECB 2017	NECB 2015	NECB 2011
Hotel	8.1	9.4	10.8
Hospital	11.3	11.3	13.0
Warehouse	5.2	7.1	7.1
Library	8.4	12.8	12.7

What's New?

Reduced Base Site Allowance for Exterior Lighting

Zone	NECB 2017	NECB 2015	NECB 2011
4	900 W	1300 W	1300 W
3	500 W	750 W	750 W
2	400 W	600 W	600 W
1	350 W	500 W	500 W



Reduced LPD/LP Allowance for Specific and General Exterior Applications

Application	NECB 2017	NECB 2015	NECB 2011
Drive Through	200 W	400 W	400 W
ATM machines	135 W + 45 W for additional	270 W + 90 W for additional	270 W + 90 W for additional

Part 5 HVAC

What's New?

5.2.3.4. Demand Control Ventilation Systems

5.2.8.3. Temperature Control in Guest Rooms and Suites in Commercial Temporary Lodgings

Demand Control Ventilation Systems

- Commercial kitchen where exhaust fan air flow rate design exceeds or meets certain values shall be equipped with demand control ventilation systems

Temperature Control in Guest Rooms and Suites in Commercial Temporary Lodging

- Shall be controlled so its is automatically adjusted to a set back temperature within 15 minutes of the space being unoccupied

What's New?

Energy Recovery Systems:

- Name changed from “heat recovery ventilator” to “energy recovery systems”
- If the exhaust air system design exceeds or meets certain values, it shall be equipped with an energy recovery system
- Ventilation systems that operate less than 8000 hours per year are considered non-continuously operating

