City of Whitehorse Builders Permit and Code Education webinar series

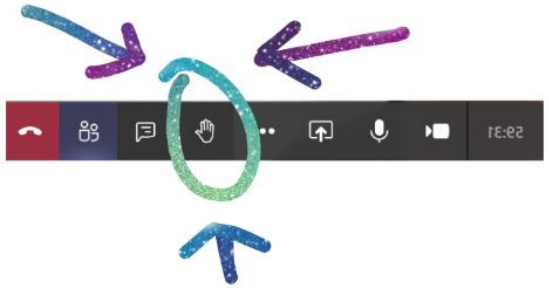
Session 04

9.10 – Fire Protection

March 05, 2025 Presenter – Ken Kunka AScT, BCQ

Session housekeeping

- Registration will be tracked
- Presentation is recorded for future access
- Please use raise hand icon if you have a question or comment
- **Turn on your Chat and add comments**
- Please mute your microphone
- You may need to turn off your camera
- Please follow up by email if you have specific question or example to share.
    - ken.flywheel@gmail.com



Workshop Series

As part of the City's commitment to improving the permit process and communication with building industry members, the city will be providing 5 online sessions to review local building regulations, the 2020 National Building Code and an overview on the building permit process.

This presentation is conceptual and for informal educational purposes only. Material presented must not be considered complete or exhaustive. Code provisions have been generally represented and may not reflect all provisions.

Workshop Series

2025 Education Webinar Sessions

1. ~~Jan 15 –~~ Part 9 overview & what makes up a complete permit submission
2. ~~Jan 22 –~~ Excavation, Footings/Foundations, Radon and Drainage,
3. ~~Feb 12 –~~ Framing including PWF S406-16,
4. March 5 - Fire Protection (Part 9.10),
5. March 26 – Building Envelopes & Mechanical Systems

These sessions will lead into the creation of building permit guide for Part 9 buildings – March 2025.

Learning Objectives – Session 04

This session has been developed to assist building industry partners to gain a better understanding of the following topics: **(general overview)**

- Principles of Fire
- Occupancy Classifications – Home Type Care
- Building Size Determination - Mezzanines
- Fire Separations and Smoke-tight Barriers
- Firewalls
- Spatial Separations (generic) – secondary suites (older buildings) – 9.10.15 to 9.10.14
  - Cladding and wall construction requirements.
  - Straddle
- Fire blocking – drill in (9.10.16.2.)
- Fire Department Access and Water Supply
- Interior Finishes and Clearances

Poll Question - Who is in the virtual room

- Registered Professionals
- Developers and General Contractors
- Part 9 Designers
- Trades
- Suppliers
- Other

Workshop Series Content

The NBC is broken into 5 main categories:

- Use and Egress
- Fire Protection
- Building Structure
- Environmental Separations
- Building Science

Session 04 will concentrate in the area of

- Fire Protection

Image from 2015 NBC Illustrated Guide

Contents of NBC Part 9

NBC Section	Use and Egress	Fire Protection	Building Structure	Environmental Separation	Building Services
9.1.	General				
9.2.	Definitions				
9.3.		Materials, Systems and Equipment			
9.4.			Structural Requirements		
9.5.	Design of Areas and Spaces				
9.6.				Glass	
9.7.				Windows, Doors and Skylights	
9.8.	Stairs, Ramps, Handrails and Guards				
9.9.	Means of Egress				
9.10.		Fire Protection			
9.11.				Sound Transmission	
9.12.			Excavation		
9.13.				Dampproofing, Waterproofing and Soil Gas Control	
9.14.				Drainage	
9.15.			Footings and Foundations		
9.16.				Floors-on-Ground	
9.17.			Columns		
9.18.				Crawl Spaces	
9.19.				Roof Spaces	
9.20.			Masonry and Insulating Concrete Form Walls Not in Contact with the Ground		
9.21.		Masonry and Concrete Chimneys and Flues			Masonry and Concrete Chimneys and Flues
9.22.		Fireplaces			
9.23.			Wood-Frame Construction		
9.24.			Sheet Steel Stud Wall Framing		
9.25.				Heat Transfer, Air Leakage and Condensation Control	
9.26.				Roofing	
9.27.				Cladding	
9.28.				Stucco	
9.29.		Interior Wall and Ceiling Finishes			
9.30.	Flooring			Flooring	
9.31.					Plumbing Facilities
9.32.					Ventilation
9.33.					Heating and Air-conditioning
9.34.					Electrical Facilities
9.35.			Garages and Carports		
9.36.				Energy Efficiency	
9.37.	Objectives and Functional Statements				

Numbering System (2020 NBC)

Numbering System

A consistent numbering system has been used throughout the National Model Codes. The first number indicates the Part of the Code; the second, the Section in the Part; the third, the Subsection; and the fourth, the Article in the Subsection. The detailed provisions are found at the Sentence level (indicated by numbers in brackets), and Sentences may be broken down into Clauses and Subclauses. This structure is illustrated as follows:

3	Part
3.5.	Section
3.5.2.	Subsection
3.5.2.1.	Article
3.5.2.1.(2)	Sentence
3.5.2.1.(2)(a)	Clause
3.5.2.1.(2)(a)(i)	Subclause

British Columbia Building Codes 2024

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Workshop Series – reference material

Workshop sessions along with updated PowerPoint presentations will be available for review on the city's website.

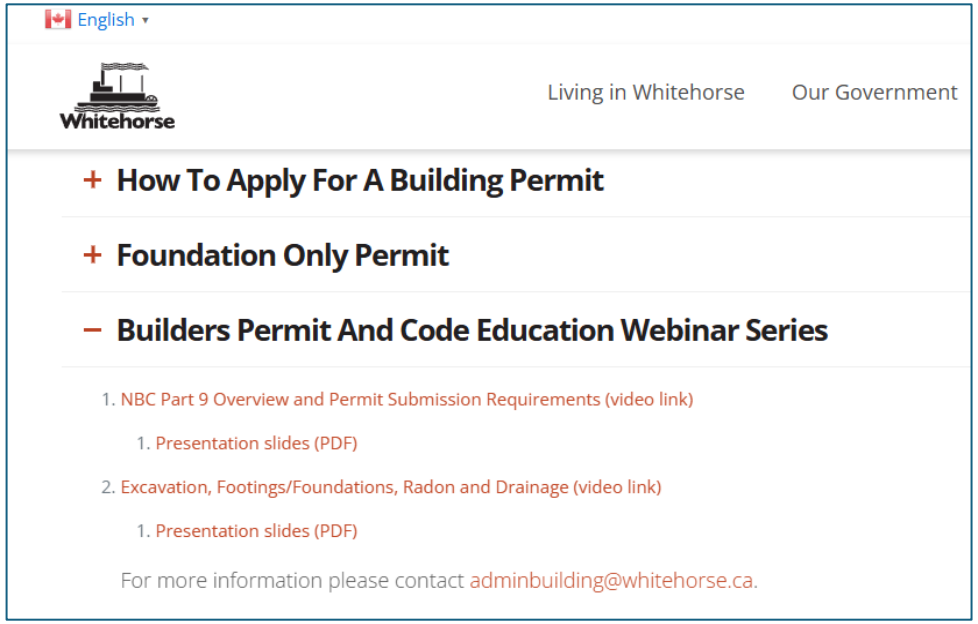
Please note new Building Department Bulletins for 2025!

NEW Building Bulletins

The following **Building Bulletins** have been created by the Land and Building Services Department. These Building Bulletins are designed to provide clarity and up-to-date information to builders, contractors, suppliers, and others in the construction industry on changes to building requirements under the National Building Code and amendments to the City's Building and Plumbing Bylaw.

Check back often for updates. To sign up for email updates, please contact adminbuilding@whitehorse.ca.

- Truss Design (Jan. 20, 2025)
- Permanent Wood Foundations (Jan. 20, 2025)
- Cast-in-Place and ICF Foundations (Jan. 20, 2025)



English

Whitehorse

Living in Whitehorse Our Government

+ How To Apply For A Building Permit

+ Foundation Only Permit

− Builders Permit And Code Education Webinar Series

1. NBC Part 9 Overview and Permit Submission Requirements (video link)
    1. Presentation slides (PDF)
2. Excavation, Footings/Foundations, Radon and Drainage (video link)
    1. Presentation slides (PDF)

For more information please contact adminbuilding@whitehorse.ca.

https://www.whitehorse.ca/city-launches-building-bulletins

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Learning References

Reference material for this session :

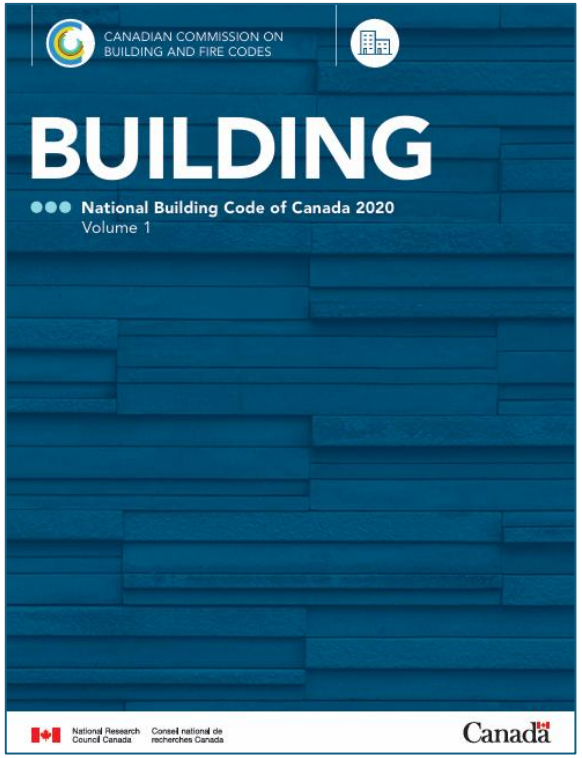
- 2020 National Building Code

Volume 2

Division B **Acceptable Solutions**

Part 9 Housing and Small Buildings

Index



- **2020 Illustrated Users Guide**
- **Canadian Board for Harmonized Construction Codes**

https://cbhcc-cchcc.ca/en/seminars/

CBHCC Canadian Board for Harmonized Construction Codes | CCHCC Comité canadien de l'harmonisation des codes de construction

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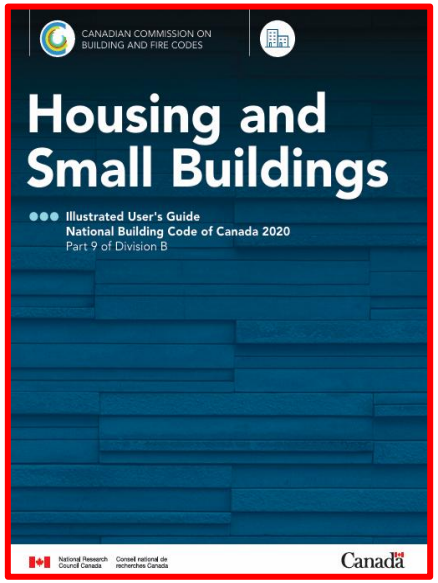
Overview

Part 9 - Housing and Small Buildings

Whether you are Building Official, Designer, Builder or Tradesperson – the transition from single dwelling unit home construction (with or without secondary suites) to small commercial or multi-unit residential can be challenging as it introduces a number of new code elements found in 9.10 Fire Protection.

Other important parts of the code to review are

- 9.5.2. Barrier-Free Design
- 9.8 Stairs, Ramps, Handrails and Guards – as it private or public uses
- 9.9 Means of Egress



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Overview- Housing and Small Buildings

1.3.3.3. Application of Part 9

1) Part 9 of Division B applies to all *buildings* described in Article 1.1.1.1. of 3 *storeys* or less in *building height*, having a *building area* not exceeding 600 m², and used for *major occupancies* classified as

a) Group B, Division 4, *home-type care occupancies*,
b) Group C, *residential occupancies* (see Note A-9.1.1.1.(1) of Division B),
c) Group D, *business and personal services occupancies*,
d) Group E, *mercantile occupancies*, or
e) Group F, Divisions 2 and 3, *medium-* and *low-hazard industrial occupancies*.

Residential occupancy (Group C) means the occupancy or use of a building or part thereof by persons for whom sleeping accommodation is provided but who are not harboured for the purpose of receiving care or treatment and are not involuntarily detained.

Recommend to read the defined terms in Div A – 1.4.1.2. for major occupancies

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Overview- Storeys

Note Building Height calculated differently in the Zoning Bylaw.

Basement means a storey or storeys of a building located below the first storey.

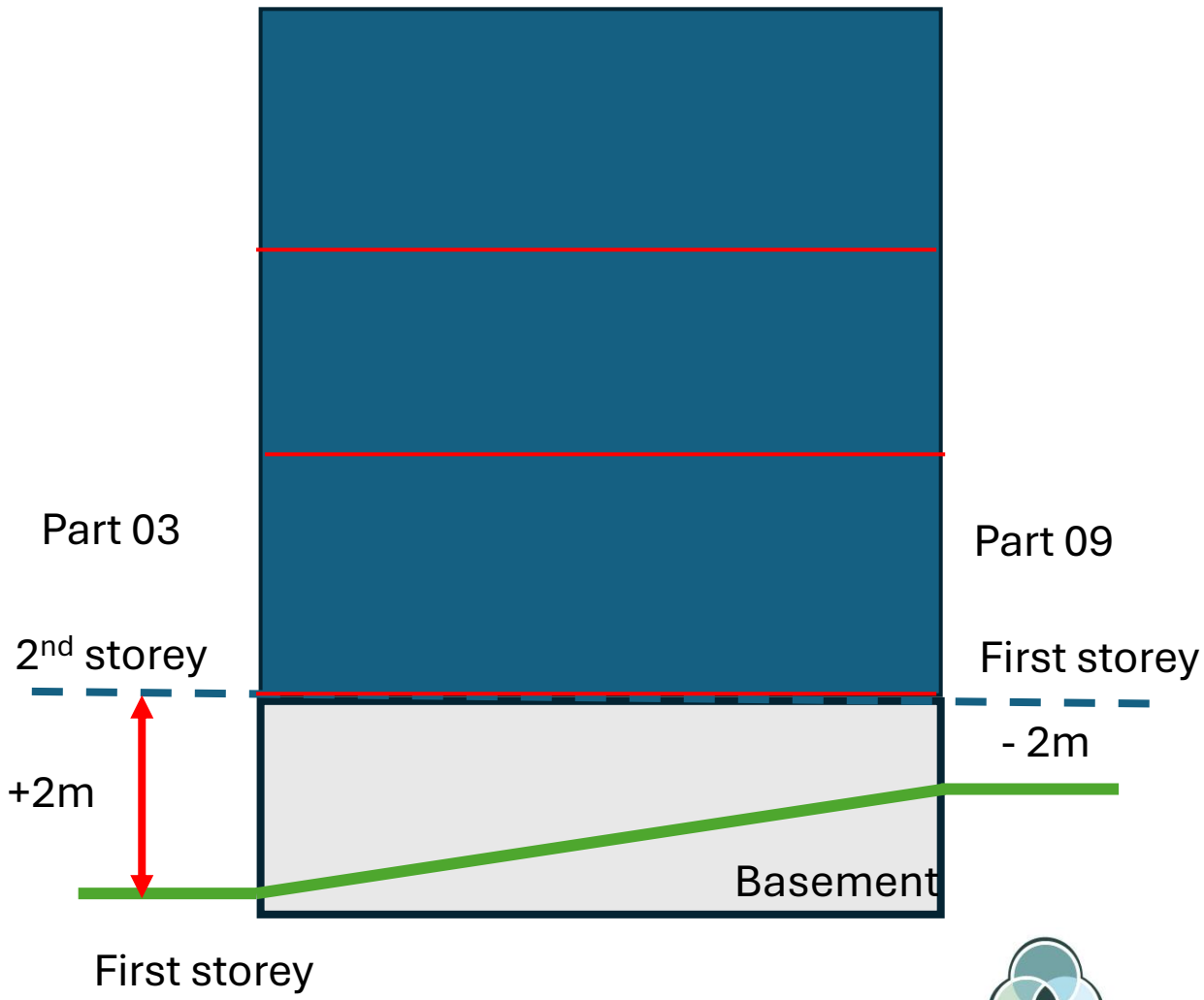
Building height (in storeys) means the number of storeys contained between the roof and the floor of the ***first storey***.

First storey means the uppermost storey having its floor level not more than 2 m above grade.

Grade means the lowest of the average levels of finished ground adjoining each exterior wall of a building, except that localized depressions need not be considered in the determination of average levels of finished ground. (See First storey and Note A-1.4.1.2.(1).)

Storey means that portion of a building that is situated between the top of any floor and the top of the floor next above it, and if there is no floor above it, that portion between the top of such floor and the ceiling above it.

A-1.4.1.2.(1) Grade - Localized depressions that need not be considered in the determination of the elevation of grade include such features as vehicle and pedestrian entrances and other minor depressions that do not affect accessibility for firefighting or evacuation.



finished ground – not defined

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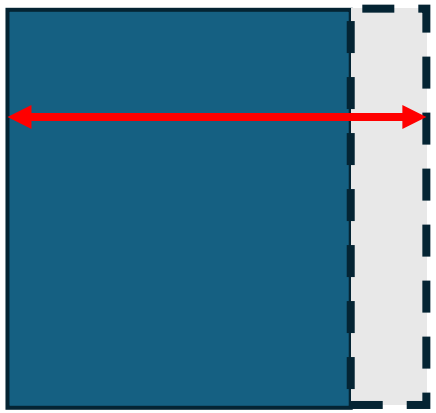
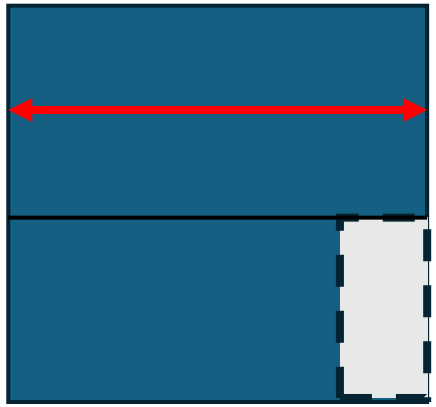
Overview- Building Area



Plan view



Elevation

Building means any structure used or intended for supporting or sheltering any use or occupancy.

Building area means the greatest horizontal area of a building above grade within the outside surface of exterior walls or within the outside surface of exterior walls and the centre line of firewalls.

Therefore, cantilevered floors or void areas on the main floor are counted in the total building area.

It is not a total of all areas on each storey.

It is important to indicate the floor area on each floor plan

It is important to not confuse a fire separation with a firewall.

To review SL - 54

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Staff comments related to 9.10

1. Fireblocking for residential buildings
2. Know the difference between fireblocking and firestopping
3. Continuity of fire separations at stairs and fixtures
4. Duplex party walls on a property line and limiting distance

Townhouse challenges
(registered on title prior to occupancy)
Fee simple – party wall agreement – 2hr wall.
9.10.11.2.

Fire Protection 9.10

The Fire Protection section of the BCBC for “small buildings” including houses is founded on principles intended to establish provisions that provide a reasonable level of life safety and property protection to occupants of premises and safety to fire fighters and emergency responders engaged in emergency operations.

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Table 9.10.-B

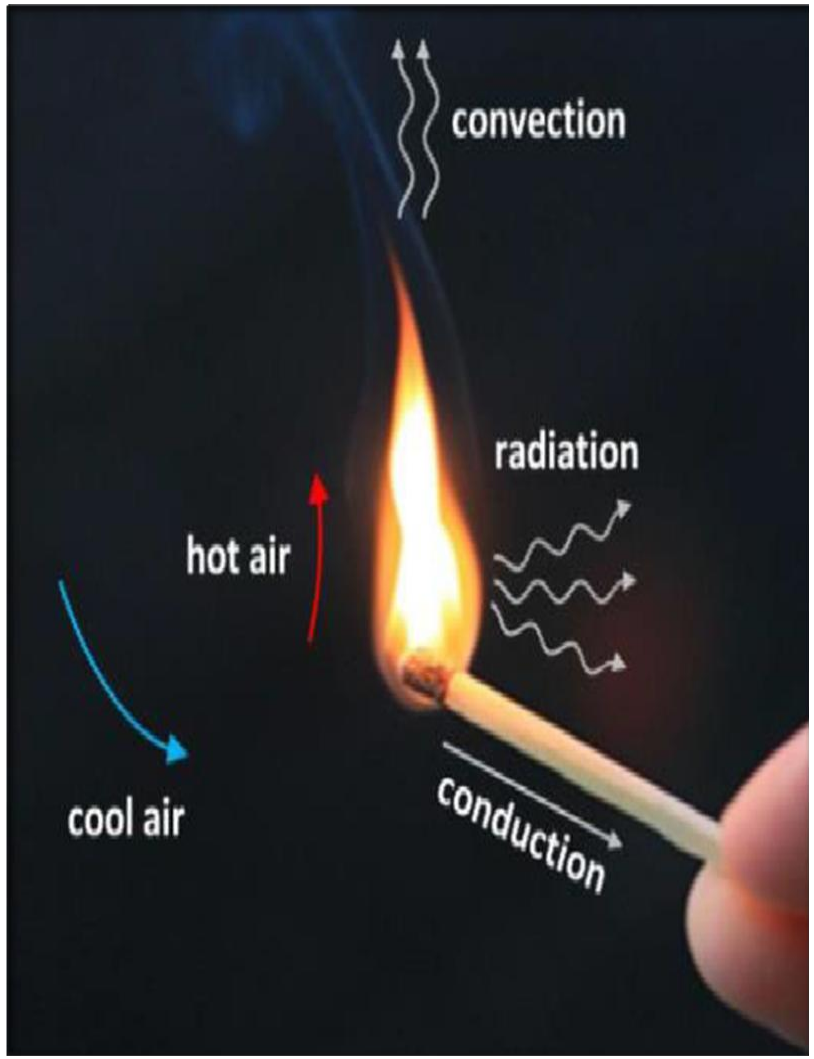
Table from 2020 NBC Illustrated guide

Table 9.10.-B
Fire Protection Requirements for Detached Houses

Subject	NBC Reference
Fire resistance of exterior walls (for houses within 1.2 m (3 ft. 11 in.) of property line)	9.10.1.1., Sloped Roofs; 9.10.3.1., Fire-Resistance and Fire-Protection Ratings; 9.10.3.3., Fire Exposure; 9.10.15.4., Glazed Openings in Exposing Building Face; and 9.10.15.5., Construction of Exposing Building Face of Houses
Surface flame spread on walls and ceilings	9.10.3.2., Flame-Spread Ratings; 9.10.17.1., Flame-Spread Rating of Interior Surfaces; 9.10.17.10., Protection of Foamed Plastics; and 9.10.17.11., Walls and Ceilings in Bathrooms
Construction between houses and attached garages	9.10.9.16., Separation of Storage Garages; and 9.10.13.15., Doors between Garages and Dwelling Units
Spatial separations between houses	9.10.15., Spatial Separation Between Houses
Fire blocks in concealed spaces	9.10.16., Fire Blocks
Protection of foam insulation	9.10.17.10., Protection of Foamed Plastics
Smoke alarms	9.10.19., Smoke Alarms
Fire department access	9.10.20.3., Fire Department Access to Buildings

Image from 2020 NBC Illustrated Guide

Fire Protection-Principles of Fire



How fire spreads

- Convection
- Radiation
- Conduction

Fire Triangle

Controlling one will stop or reduce the spread of fire. *Image: Fire triangle by Gustavb / CC BY-SA 3.0*

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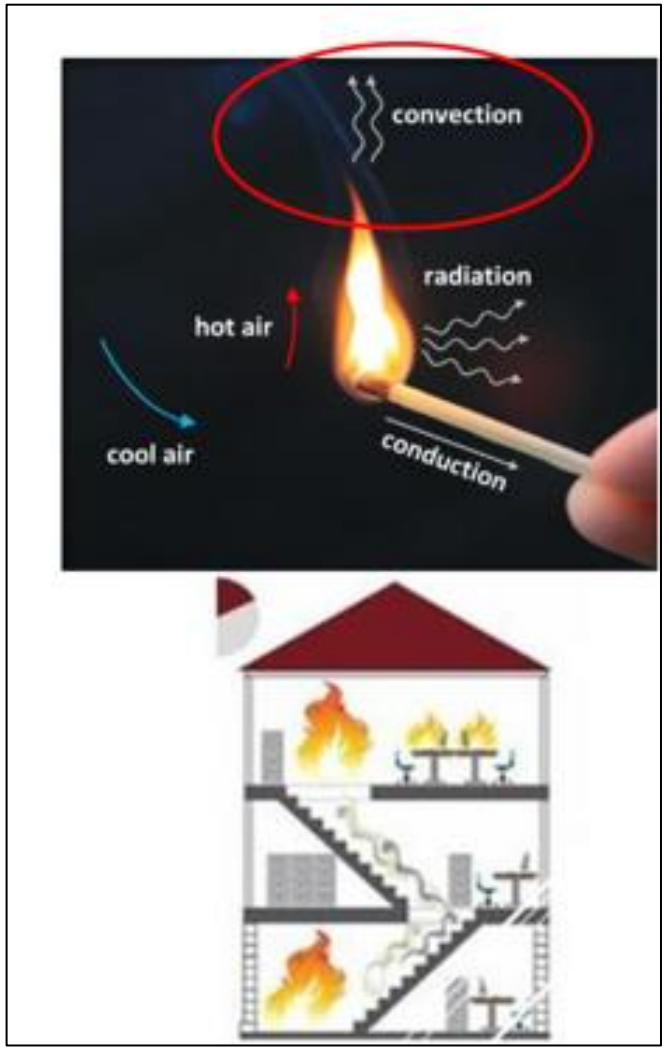
Fire Protection

Fire Spread - Convection

This type of heat transfer occurs only in liquids and gases. The heat from the fire can heat the air, to a very hot temperature. Hot air will always rise and it will flow under the ceiling of a room spreading the heat from the fire. This is the main way in which a fire spreads throughout a house.

When a fire is burning large amounts of hot gases and smoke are produced. These will travel through the house in hot air currents often igniting more combustible materials causing the fire to spread



Fire Protection - Fire Safety Features

The fire safety features in this Section can be broadly divided into six principal categories:

1. Protecting the structural members (9.10.3., 9.10.6. and 9.10.8)
2. **Dividing the building into fire compartments (9.10.9)**
3. Controlling the rate of fire spread within a compartment (9.10.12. and 9.10.13.)
4. Controlling the spread of fire from one building to another (9.10.14 and 9.10.15.)
5. Providing an early warning of fire through alarm systems (9.10.18. and 9.10.19)
6. Providing access to the building for both firefighters (9.10.20.)

9.10 also overlaps areas with Part 3 of the Code to provided greater harmony in areas of fire protection.

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Fire Protection 9.10 - Compartmentation

Compartmentation is the practice of dividing a building into fire compartments, either to confine fires to their areas of origin or to prevent them from reaching areas that must be kept tenable in a fire emergency.

The construction of floors as rated fire separations, and the separation of major occupancies with higher occupant risks is the first major step in compartmentation.

Image: Fire triangle by Gustavb / CC BY-SA 3.0

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2020 NBC – Section 9.2. Definitions - Fire Protection

9.2.1.1. Defined Words 1) Words in italics are defined in Article 1.4.1.2. of Division A.

Fire compartment means an enclosed space in a building that is separated from all other parts of the building by enclosing construction providing a fire separation having a required fire-resistance rating.

Fire-resistance rating means the time in minutes or hours that a material or assembly of materials will withstand the passage of flame and the transmission of heat when exposed to fire under specified conditions of test and performance criteria, or as determined by extension or interpretation of information derived therefrom as prescribed in this Code. (See Sentence D-1.2.1.(2) in Appendix D of Division B.)

Fire separation means a construction assembly that acts as a barrier against the spread of fire. (**See Note A-1.4.1.2.(1).)**

Fire Separation (A-1.4.1.2.(1)

It is generally understood that the term “fire” refers to all products of combustion, including heat and smoke. Although a fire separation is not always required to have a fire-resistance rating, it should act as a barrier to the spread of smoke and fire until some type of response is initiated. If the fire-resistance rating of a fire separation is permitted to be waived on the basis of the presence of an automatic sprinkler system, it is nonetheless the intent of the Code that the fire separation be constructed so that it will remain in place and act as a barrier against the spread of smoke until the sprinklers have actuated.

Party wall means a wall jointly owned and jointly used by 2 parties under easement agreement or by right in law, and erected at or upon a line separating 2 parcels of land each of which is, or is capable of being, a separate real-estate entity.

Section 9.1 General

Subsection 9.1.2. Limits on Floor Area

9.1.2. Limits on Floor Area

9.1.2.1. Floor Area Limits for Secondary Suites

1) The total *floor area* of all *storeys* of a *secondary suite* shall be not more than the lesser of

a) 80% of the total *floor area* of all *storeys* of the other *dwelling unit*, excluding the garage *floor area* and common spaces serving both *dwelling units*, and

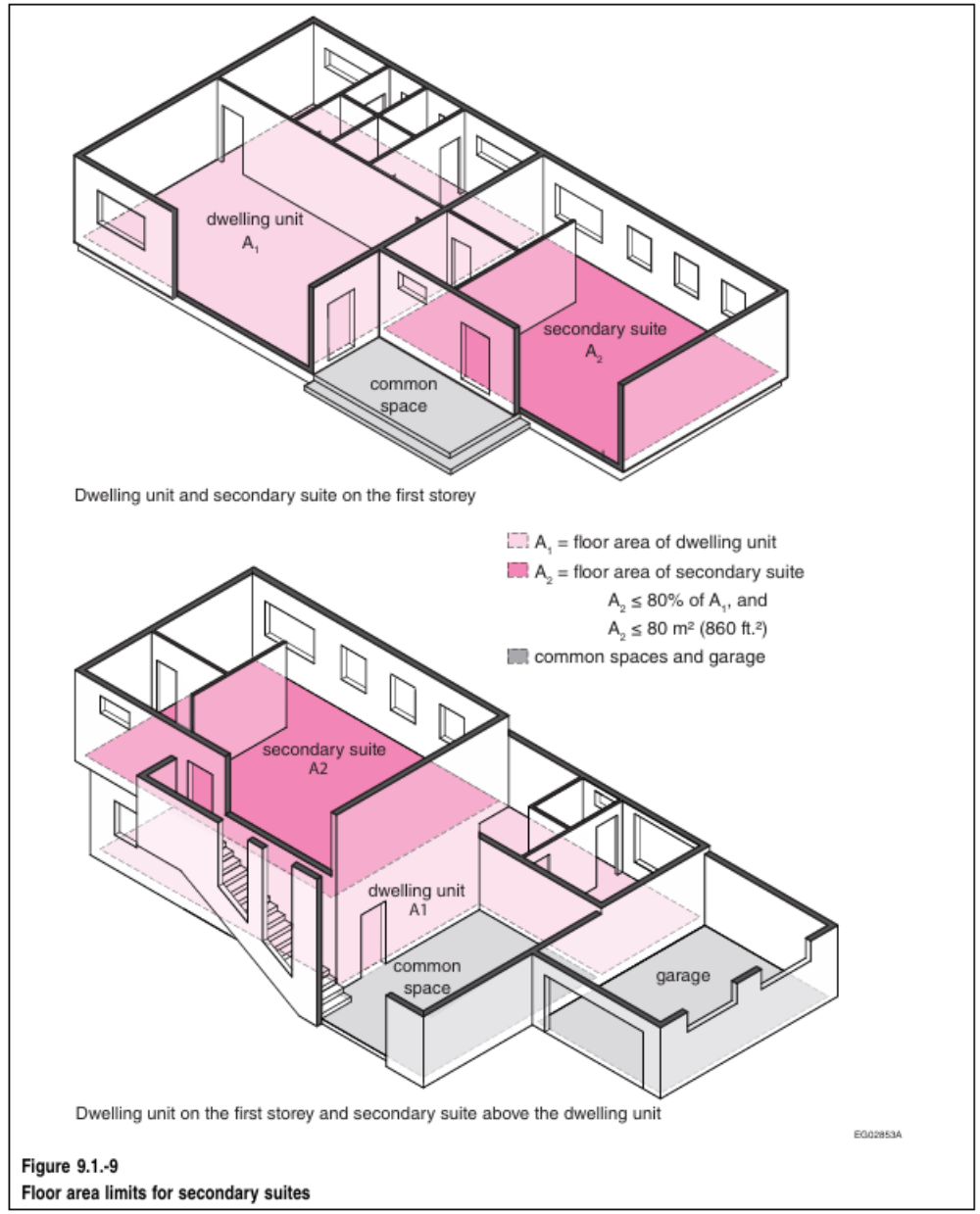
b) 80 m². (861 sqft)

Requirements related to secondary suite are spread throughout the NBC.

- 9.9
- 9.10
- DOORS – between suites 20 min. (solid core)

No relaxations for suites created in an existing home.

Image from Illustrated User's Guide– NBC 2020



Section 9.9. Means of Egress

Although, this session will not cover egress and exits – it is important to familiarize yourself with Sections 9.9. Means of Egress and specifically when thinking about fire protection:

- 9.9.1.2. Fire Protection
- **9.9.1.3. Occupant load**
- 9.9.4. Fire Protection of Exits
- 9.9.9. Egress from Dwelling Units
- 9.9.11. Signs
- 9.9.12. Lighting

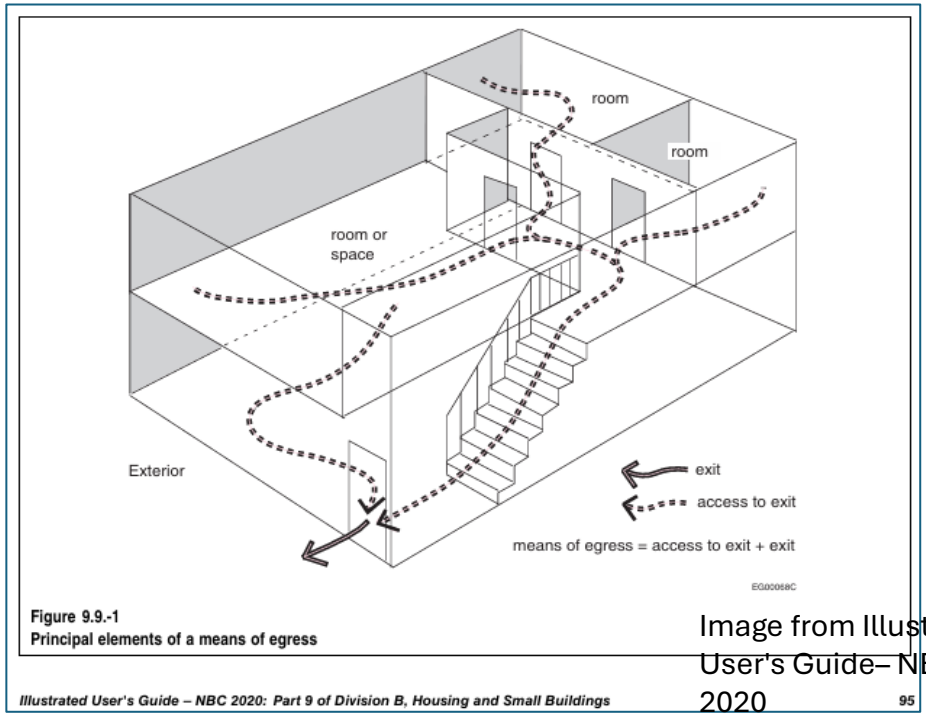


Image from Illustrated User's Guide– NBC 2020

9.9.1.2. Fire Protection This Article indicates that means of egress must comply with the fire-spread, fire-resistance and fire-protection ratings in NBC Section 9.10. as well as with the fire protection requirements in NBC Subsection 9.9.4.

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Occupant loads

9.9.1.2. Fire Protection

1) In addition to the fire protection requirements provided in Subsection 9.9.4., *flame-spread ratings*, *fire-resistance ratings* and *fire-protection ratings* for *means of egress* shall conform to Section 9.10.

9.9.1.3. Occupant Load

1) Except for *dwelling units*, the *occupant load* of a *floor area* or part of a *floor area* shall be the number of persons for which such areas are designed, but not fewer than that determined from Table 3.1.17.1., unless it can be shown that the area will be occupied by fewer persons.

2) The *occupant load* for *dwelling units* shall be based on 2 persons per bedroom or sleeping area.

Occupant load means the number of persons for which a building or part thereof is designed.

Table 3.1.17.1.
Occupant Load
Forming Part of Article 3.1.17.1.

Type of Use of *Floor Area* or Part Thereof	Area per person, m²
Assembly uses	
space with fixed seats	(1)
space with non-fixed seats	0.75
stages for theatrical performances	0.75
space with non-fixed seats and tables	0.95
standing space	0.40
stadia and grandstands	0.60
bowling alleys, pool and billiard rooms	9.30
classrooms	1.85
school shops and vocational rooms	9.30
reading or writing rooms or lounges	1.85
dining, beverage and cafeteria space	1.20
laboratories in schools	4.60
Care, *treatment* or detention uses	
suites	(2)
care, *treatment* and sleeping room areas	10.00
detention quarters	11.60
Residential uses	
dwelling units	(2)
dormitories	4.60
Business and personal services uses	
personal services shops	4.60
offices	9.30
Mercantile uses	
basements and *first storeys*	3.70
second *storeys* having a principal entrance from a pedestrian thoroughfare or a parking area	3.70
other *storeys*	5.60
Industrial uses	
manufacturing or process rooms	4.60
storage garages	46.00
storage spaces (warehouse)	28.00
aircraft hangars	46.00

Residential uses -

2 persons per sleeping room in a dwelling unit

9.10.2 Occupancy Classification

9.10.2.1. Occupancy Classification

1) Except as provided in Article 9.10.2.2., every building or part thereof shall be classified according to its major occupancy as belonging to one of the groups or divisions described in Table 9.10.2.1.

A-3.1.2.1.(1) further expands to types of uses in each occupancy category.

Group C
- Apartments
- Boarding houses
- Clubs, residential
- Colleges, residential
- Convents
- Dormitories
- Hotels
- Houses
- Lodging houses
- Monasteries
- Motels
- Schools, residential

Table 9.10.2.1.
Occupancy Classifications
Forming Part of Sentence 9.10.2.1.(1)

Group	Division	Description of *Major Occupancies*[1]
B	4	*Home-type care occupancies*
C	—	*Residential occupancies*
D	—	*Business and personal services occupancies*
E	—	*Mercantile occupancies*
F	2	*Medium-hazard industrial occupancies*
F	3	*Low-hazard industrial occupancies* (Does not include *storage garages* serving individual *dwelling units*)

Notes to Table 9.10.2.1.:
(1) See Note A-3.1.2.1.(1).

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9.10.1 Definitions and Application

General outline of life safety systems with specific reference to buildings and systems falling into Part 3 Jurisdictions (tents, elevators and Part 6 (commercial kitchens)

9.10.1.2. Testing of Integrated Fire Protection and Life Safety Systems

1) Where life safety and fire protection 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, "Standard for Integrated Systems Testing of Fire Protection and Life Safety Systems," to verify that they have been properly integrated. (See Note A-3.2.9.1.(1).)

A-3.2.9.1.(1) Testing of Fire Protection and Life Safety Systems. Building owners should verify that fire protection and life safety systems and their components (i.e. fire alarm systems, sprinklers, standpipes, smoke control, ventilation, pressurization, door hold-open devices, elevator recalls, smoke and fire shutters and dampers, emergency power, emergency lighting, fire pumps, generators, etc.), including their interconnections with other building systems, are functioning according to the intent of their design. CAN/ULC-S1001, "Standard for Integrated Systems Testing of Fire Protection and Life Safety Systems," provides the methodology for verifying and documenting that interconnections between building systems satisfy the intent of their design and that the systems function as intended by the Code.

As there are several tradespeople working on the installation of different components it is critical to ensure commissioning of the life safety systems prior to occupancy.

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9.10.2.2. Home-Type Care Occupancies

Provision in the code to allow for the creation of care homes

2) *Home-type care occupancies* with sleeping accommodation for not more than 10 persons shall

a) comply with the applicable requirements of Part 9 relating to detached houses (see Note A-9.10.2.2.(2)(a)), and

b) except as provided in Sentences (3) and (4), be

i) sprinklered in conformance with NFPA 13D, "Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes," and

ii) provided with a minimum 30-minute water supply for the sprinkler system.

A-9.10.2.2.(2)(a) Requirements for Detached Houses. The Part 9 requirements that apply to detached houses typically refer to "single dwelling units."

CBHCC Canadian Board for Harmonized Construction Codes | CCHCC Comité canadien de l'harmonisation des codes de construction

Video - 2020 Seminar on home-type care

Home Care

Relaxation for sprinkler systems

3) A sprinkler system need not be provided in accordance with Sentence (2) where the building

a) is 1 storey in building height, without a basement or mezzanine,

4) A sprinkler system need not be provided in accordance with Sentence (2) where

a) the building is not more than 2 storeys in building height, ...

Recommend to review

FLYWHEEL BUILDING SOLUTIONS

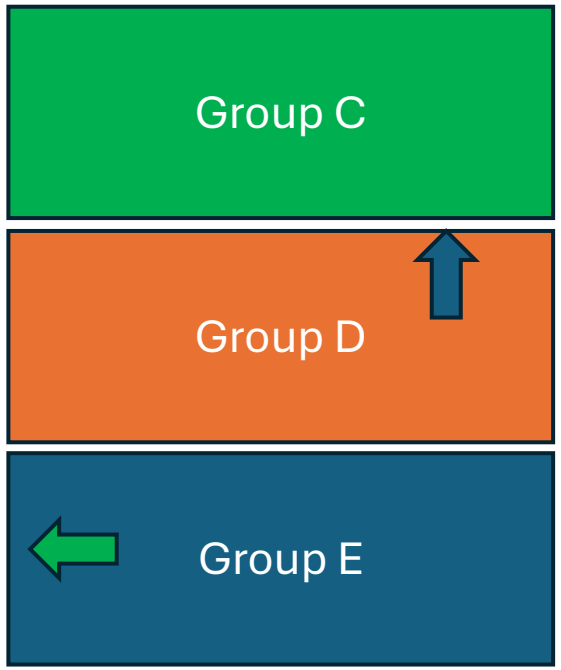
9.10.2.3. Major Occupancies above Other Major Occupancies

9.10.2.3. Major Occupancies above Other Major Occupancies

1) Except as permitted in Article 9.10.2.4., in any *building* containing more than one *major occupancy* in which one *major occupancy* is located entirely above another, the requirements of Article 9.10.8.1. for each portion of the *building* containing a *major occupancy* shall be applied to that portion as if the entire *building* was of that *major occupancy*.

9.10.2.4. Buildings Containing More Than One Major Occupancy

1) In a *building* containing more than one *major occupancy*, where the aggregate area of all *major occupancies* in a particular group or division does not exceed 10% of the *floor area* on the *storey* on which they are located, they need not be considered as *major occupancies* for the purposes of Articles 9.10.8.1. and 9.10.2.3. provided they are not classified as Group F, Division 2 *occupancies*.



Most restrictive structural fire protection requirements carry through the building

9.10.9.8. Fire Resistance and Combustibility in Relation to Occupancy, Height and Supported Elements

9.10.3. Ratings

9.10.3.1. Fire-Resistance and Fire-Protection Ratings

1) Where a **fire-resistance rating** or a **fire-protection** rating is required in this Section for an element of a building, such rating shall be determined in conformance with

a) the test methods described in Part 3,

b) the calculation method presented in Appendix D, or

c) the construction specifications presented in Tables 9.10.3.1.-A and 9.1

Fire-protection rating means the time in minutes or hours that a closure will withstand the passage of flame when exposed to fire under specified conditions of test and performance criteria, or as otherwise prescribed in this Code.0.3.1.-B.

Closure means a device or assembly for closing an opening through a fire separation or an exterior wall, such as a door, a shutter, a damper, wired glass or glass block, and includes all components such as hardware, closing devices, frames and anchors.

9.10.3. Ratings

9.10.3.1. Fire-Resistance and Fire-Protection Ratings

1) (b) the calculation method presented in Appendix D,

Individual components to make up a fire resistance rating vs a tested assembly.

Appendix D Fire-Performance Ratings - Examples

Table D-2.3.4.-A
Time Assigned to Protective Membranes on Fire-Exposed Side of Wood-Framed and Cold-Formed-Steel-Framed Walls

Description of Finish	Time, min	
	Loadbearing Walls	Non-Loadbearing Walls
11.0 mm Douglas Fir plywood phenolic bonded	–	10(1)
14.0 mm Douglas Fir plywood phenolic bonded	–	15(1)
12.7 mm Type X gypsum board	25(2)	25
15.9 mm Type X gypsum board	40(2)	40(3)
Double 12.7 mm Type X gypsum board(4)	50	80

Table D-2.3.4.-C
Time Assigned to Gypsum Board Membranes on Fire-Exposed Side of Roofs

Description of Finish	Time, min(1)
12.7 mm Type X gypsum board	25
15.9 mm Type X gypsum board	40

Notes to Table D-2.3.4.-C:

(1) Applies to wood joists, pre-fabricated metal-plate-connected wood trusses, and open-web steel joists with ceiling supports spaced ≤ 400 mm o.c.

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9.10.3. Ratings

9.10.3.1. Fire-Resistance and Fire-Protection Ratings

1(c) the construction specifications presented in Tables 9.10.3.1.-A and 9.10.3.1.-B.

Tested assemblies – must be constructed as described in the description notes

Ensure to read the footnotes.

Fire and Sound Resistance Tables

Table 9.10.3.1.-A
Fire and Sound Resistance of Walls(1)
Forming Part of Article 5.8.1.3., Sentence 9.10.3.1.(1), Articles 9.11.1.3. and 9.11.1.4., and Sentence 9.29.5.9.(5)

Type of Wall	Wall Number	Description	*Fire-Resistance Rating*(2)(3)(4)		Typical *Sound Transmission Class*(2)(4)(5)
			Loadbearing	Non-*Loadbearing*	
• Wood Studs	**W1**	• 38 mm × 89 mm studs spaced 400 mm or 600 mm o.c. • with or without absorptive material • 1 layer of gypsum board on each side	 GG00032A		
• Single Row	W1a	W1 with • 89 mm thick absorptive material(6) • 15.9 mm Type X gypsum board(7)	1 h	1 h	36
• *Loadbearing* or Non-*Loadbearing*	W1b	W1 with • 89 mm thick absorptive material(6) • 12.7 mm Type X gypsum board(7)	45 min [1 h(8)]	45 min [1 h(8)]	34
	W1c	W1 with • 89 mm thick absorptive material(6) • 12.7 mm regular gypsum board(7)(9)	30 min	30 min [45 min(8)]	32
	W1d	W1 with • no absorptive material • 15.9 mm Type X gypsum board(7)	1 h	1 h	32
	W1e	W1 with • no absorptive material • 12.7 mm Type X gypsum board(7)	45 min	45 min	32

(7) The complete descriptions of indicated finishes are as follows:
- 12.7 mm regular gypsum board – 12.7 mm regular gypsum board conforming to Article 9.29.5.2.
- 12.7 mm Type X gypsum board – 12.7 mm special fire-resistant Type X gypsum board conforming to Article 9.29.5.2.
- 15.9 mm Type X gypsum board – 15.9 mm special fire-resistant Type X gypsum board conforming to Article 9.29.5.2.
- Except for exterior walls (see Table Note (15)), the outer layer of finish on both sides of the wall must have its joints taped and finished.
- Except as otherwise required for fastener spacing (see Table Notes (14), (16) and (22)), fastener type, spacing and penetration depth for the attachment of gypsum board must conform to Subsection 9.29.5. and fasteners must consist of
  - nails or screws when attaching gypsum board to wood studs or wood strapping, and
  - screws when attaching gypsum board to cold-formed steel studs or resilient metal channels.

(8) Absorptive material required for the higher *fire-resistance rating* shall be mineral fibre processed from rock or slag with a mass per unit area of wall surface of at least 4.8 kg/m² for 150 mm thickness, 2.8 kg/m² for 89 mm thickness and 2.0 kg/m² for 65 mm thickness and shall completely fill the wall cavity. For assemblies with double wood studs on separate plates, absorptive material is required in the stud cavities on both sides.

(9) Regular gypsum board used in single layer assemblies must be installed so all edges are supported.

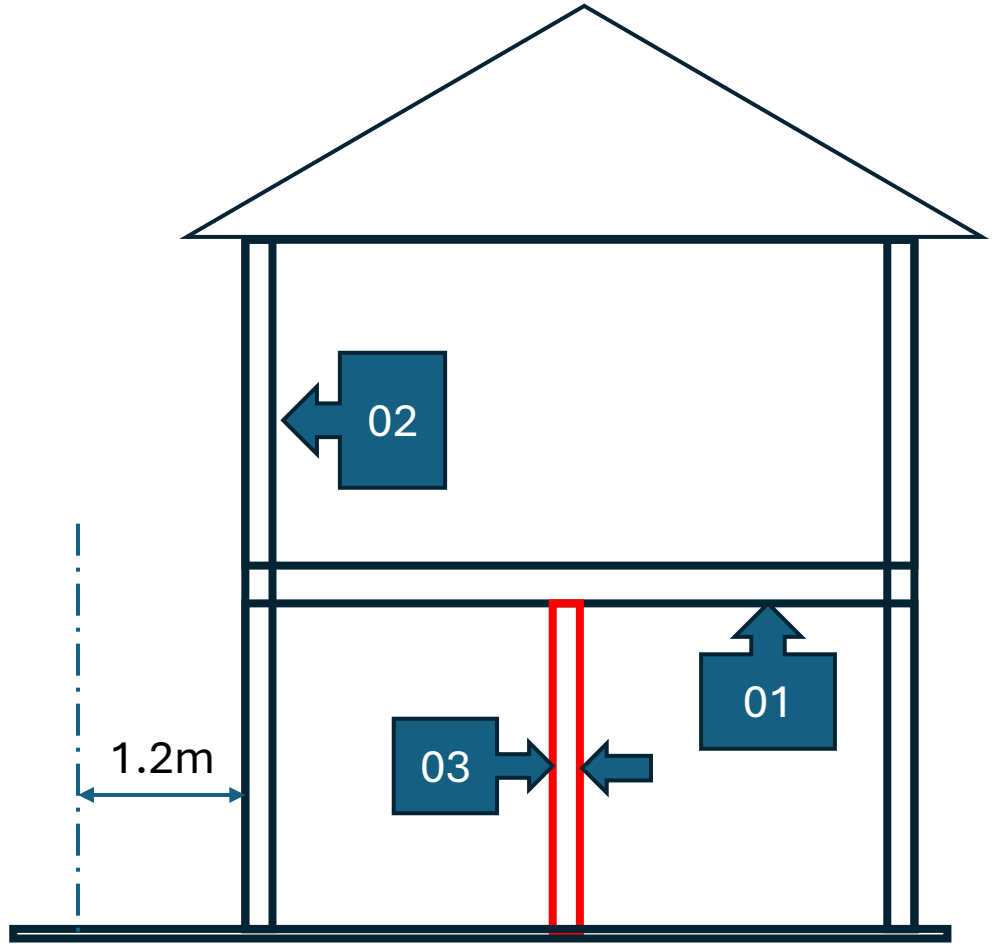
9.10.3. Ratings

9.10.3.3. Fire Exposure

1) Floor, roof and ceiling assemblies shall be rated for exposure to fire on the underside.

2) Exterior walls shall be rated for exposure to fire from inside the building, except that such walls need not comply with the temperature rise limitations required by the standard tests referred to in Article 9.10.3.1. if such walls have a limiting distance of not less than 1.2 m, and due allowance is made for the effects of heat radiation in accordance with the requirements in Part 3.

3) Interior vertical fire separations required to have fire-resistance ratings shall be rated for exposure to fire on each side.



9.10.4. Building Size Determination

9.10.4.1. Mezzanines not Considered as Storeys

1) Except as required by Sentences (2) and 9.10.4.2.(1), the space above a mezzanine is permitted to be **excluded from the calculation of building height, provided**

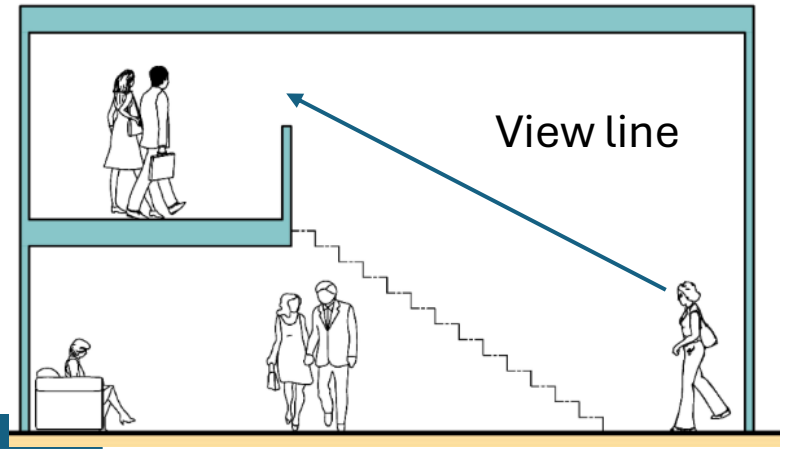
   a) the aggregate area of mezzanines that are **not superimposed** does not exceed 10% of the floor area of the building in which they are located, and

   b) the area of mezzanine in a suite does not exceed 10% of the area of that suite on the storey on which it is located

2) Except as required by Sentence 9.10.4.2.(1), the space above a mezzanine is permitted to be excluded from the calculation of building height, provided

(a) the aggregate area of mezzanines that are not superimposed does not exceed 40% of the open area of the room in which they are located (see A-3.2.1.1.(3)(a), and

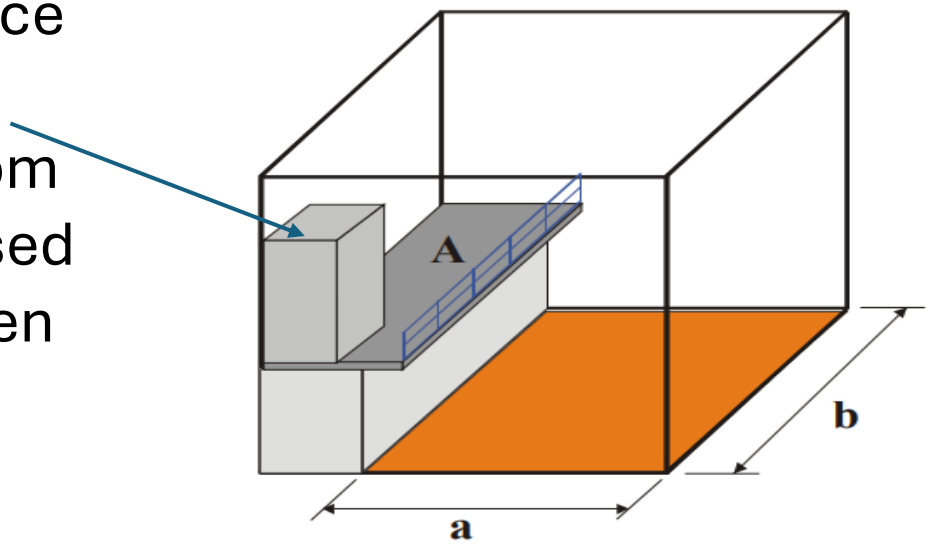
(b) Except as permitted in Sentence (3), the space above the mezzanine floor is used as an open area without partitions or **subdividing walls higher than 1070mm above the mezzanine floor.**



9.10.4. Building Size Determination

9.10.4.1. Mezzanines not Considered as Storeys

3) The space above a mezzanine conforming to Sentence (2) is permitted to include **an enclosed space whose area does not exceed 10% of the open area** of the room in which the mezzanine is located, provided the enclosed space does not obstruct visual communication between the open space above the mezzanine and the room in which it is located.



A = area of the mezzanine

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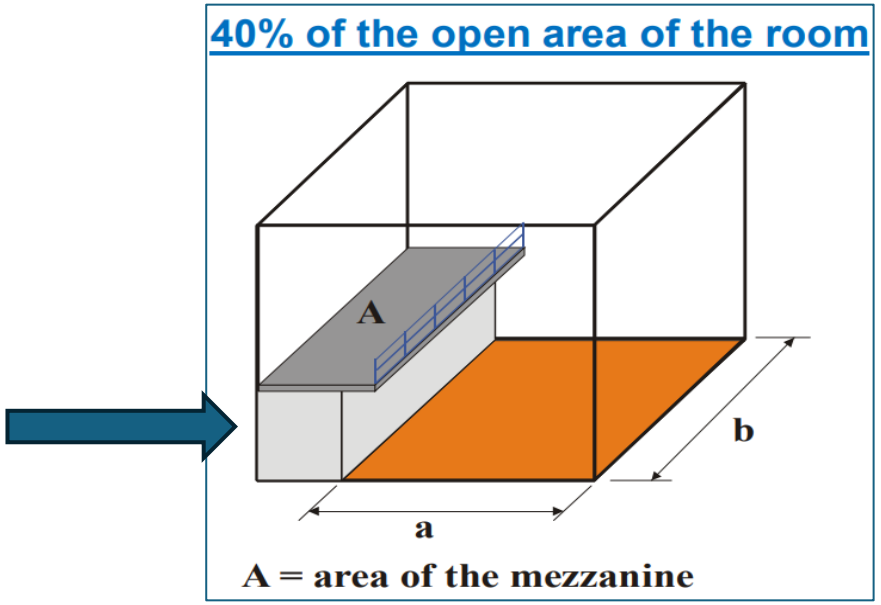
9.10.4. Building Size Determination

9.10.4.1. Mezzanines not Considered as Storeys

A-3.2.1.1.(3)(a) Mezzanine Area. The permitted area of the mezzanine for the purposes of determining the allowable percentage is to be based on the open area of the floor of the space in which the mezzanine is located. The Code does not restrict the enclosing of space below the mezzanine, but the enclosed area must be deducted from the area of the overall space before applying the percentage allowance.



9.10.4.2. More Than One Level of Mezzanine

1) Each level of mezzanine that is partly or wholly **superimposed above** the first level of mezzanine shall be considered as a storey in calculating the building height.

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9.10.5. Permitted Openings in a Wall and Ceiling membranes

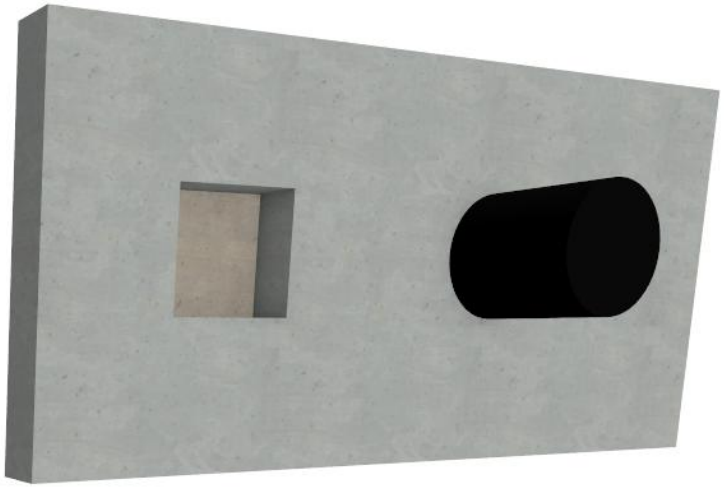
9.10.5. Permitted Openings in Wall and Ceiling Membranes

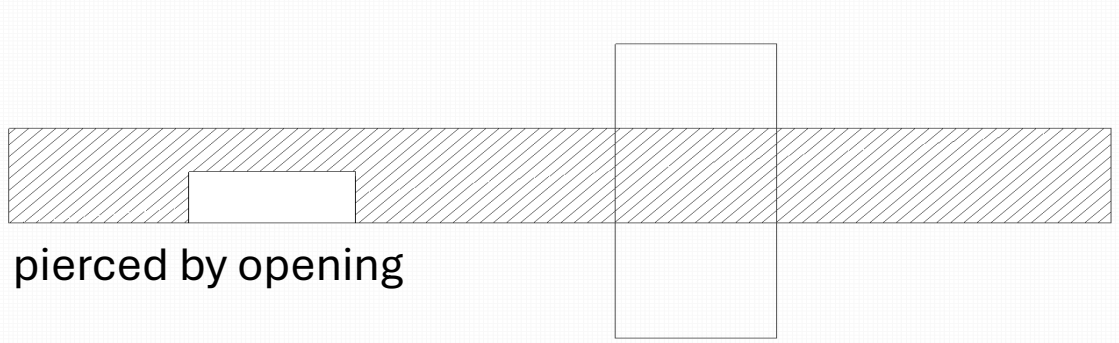
9.10.5.1. Permitted Openings in Wall and Ceiling Membranes

1) Except as permitted in Sentences (2) and (3), a membrane forming part of an assembly required to have a *fire-resistance rating* shall not be pierced by openings into the assembly unless the assembly has been tested and rated for such openings.

2) A wall or ceiling membrane forming part of an assembly required to have a *fire-resistance rating* is permitted to be pierced by openings for electrical and similar service outlet boxes, provided such outlet boxes and the penetrations conform to Article 9.10.9.8.

3) A membrane ceiling forming part of an assembly assigned a *fire-resistance rating* on the basis of Table 9.10.3.1.-B or Appendix D is permitted to be pierced by openings leading to ducts within the ceiling space, provided the ducts, the amount of openings and their protection conform to the requirements of Appendix D.





pierced by opening

Appendix D - Fire-Performance Ratings

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9.10. 8. Fire Resistance and Combustibility in Relation to Occupancy, Height and Supported Elements

9.10.8.1. Fire-Resistance Ratings for Floors and Roofs

1) Except as otherwise provided in this Subsection, the fire-resistance ratings of floors and roofs shall conform to Table 9.10.8.1. (See Subsection 9.10.2. for mixed occupancies and Subsection 9.10.21. for construction camps.)

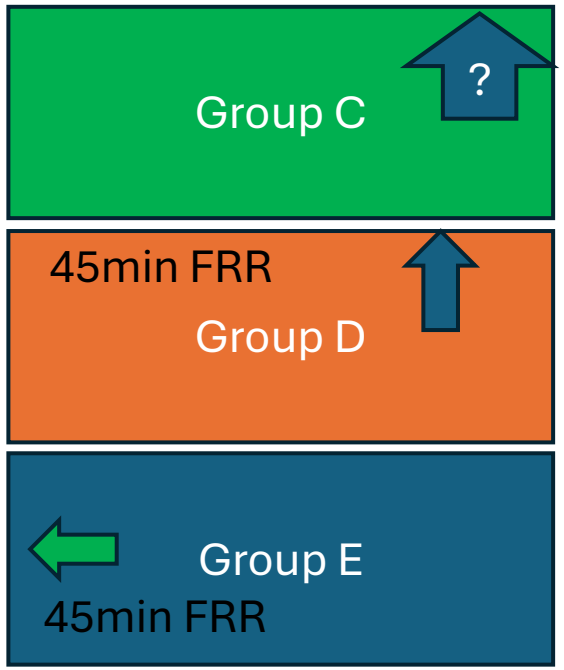

Table 9.10.8.1.
Fire-Resistance Ratings for Floors and Roofs
Forming Part of Sentence 9.10.8.1.(1)

Major Occupancy	Maximum *Building Height*, *storeys*	Minimum *Fire-Resistance Rating* by *Building* Element, min		
		Floors Except Floors over Crawl Spaces	*Mezzanine* Floors	Roofs
Residential (Group C)	3	45	45	—
All other *occupancies*	2	45	—	—
	3	45	45	45

9.10. 8. Fire Resistance and Combustibility in Relation to Occupancy, Height and Supported Elements

9.10.8.3. Fire-Resistance Ratings for Walls, Columns and Arches

1) Except as otherwise provided in this Subsection, all loadbearing walls, columns and arches in the storey immediately below a floor or roof assembly shall have a fire-resistance rating of not less than that required for the supported floor or roof assembly.

2) Light-frame walls, columns, arches and beams as well as loadbearing steel elements that support floors between dwelling units in a house with a secondary suite including their common spaces shall be protected by not less than 12.7 mm thick gypsum board. (See Note A-9.10.8.3.(2).)

9.10. 8. Fire Resistance and Combustibility in Relation to Occupancy, Height and Supported Elements

9.10.8.10. Application to Houses

1) Table 9.10.8.1. does not apply to

a) a dwelling unit that has no other dwelling unit above or below it,

b) houses with a secondary suite, where the floor framing is protected on the underside by a continuous smoke-tight barrier of not less than 12.7 mm thick gypsum board, or

c) a dwelling unit that is not above or below another major occupancy.

9.10.9. Fire Separations and Smoke-tight Barriers between Rooms and Spaces within Buildings

9.10.9.1. Application

1) This Subsection applies to

a) *fire separations* required between rooms and spaces in *buildings*, and

b) smoke-tight barriers required in houses with a *secondary suite* including their common spaces.

9.10.9.2. Continuous Barrier

1) Except as permitted in Article 9.10.9.3., a wall or floor assembly required to be a *fire separation* shall be constructed as a continuous barrier against the spread of fire and retard the passage of smoke.

2) Except as permitted in Article 9.10.9.3., a wall or floor assembly required to be a smoke-tight barrier shall be constructed as a continuous barrier against the spread of smoke. (See Note A-9.10.9.2.(2) and (3).)

Fire Separation

It is generally understood that the term "fire" refers to all products of combustion, including heat and smoke. Although a fire separation is not always required to have a fire-resistance rating, it should act as a barrier to the spread of smoke and fire until some type of response is initiated. If the fire-resistance rating of a fire separation is permitted to be waived on the basis of the presence of an automatic sprinkler system, it is nonetheless the intent of the Code that the fire separation be constructed so that it will remain in place and act as a barrier against the spread of smoke until the sprinklers have actuated.

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9.10.9.2. Continuous Barrier

3) Except as provided in Sentence (6), the continuity of a *fire separation* where it abuts another *fire separation* or smoke-tight barrier, a floor, a ceiling, or a roof shall be maintained by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, "Standard Method of Fire Tests of Firestop Systems," has an FT rating not less than the *fire-resistance rating* for the abutting *fire separation*. (See Note A-9.10.9.2.(2) and (3).) (See also Note A-3.1.8.3.(2).)

4) Except as provided in Sentence (6), joints located in a horizontal plane between a floor and an exterior wall shall be sealed by a *firestop* that, when subjected to the fire test method in ASTM E2307, "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-storey Test Apparatus," has an F rating not less than the *fire-resistance rating* for the horizontal *fire separation*.

5) Except as provided in Sentence (6), all gypsum board joints in the assemblies described in Sentences (1) and (2) shall conform to CSA A82.31-M, "Gypsum Board Application," to maintain the integrity of the smoke-tight barrier over the entire surface.

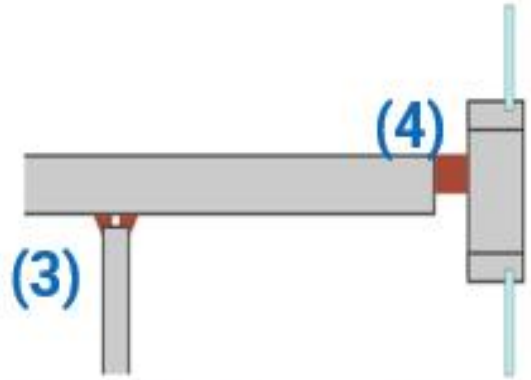

Image provided by Archtoolbox

(3)

Images provided by Hilti Canada

9.10.9.2. Continuous Barrier

6) Joints between ceilings and walls, between floors and walls, and between walls at corners need not comply with Sentences (3) to (5) where such joints consist of gypsum board that is attached to framing members and arranged so as to restrict the passage of flame and smoke through the joints. (See Note A-3.1.8.3.(5).)

Note separations that include furring (resilient channels) as this creates a gap between wood and drywall.

A-3.1.8.3.(5) Joints. Firestops need not be installed between joints of interior finish materials that are arranged so as to create a smoke-tight joint.

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9.10.9.6. General Requirements for Penetrations of Fire Separations

1) Except as required by Sentence (2) and Articles 9.10.9.7. and 9.10.9.8. and as permitted by Article 9.10.9.9., penetrations of a required fire separation or a membrane forming part of an assembly required to be a fire separation shall be

a) sealed by a firestop that, when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an F rating not less than the required fire-resistance rating for the fire separation,

b) tightly fitted or cast in place, provided the penetrating item is made of steel, ferrous, copper, concrete or masonry, or

c) sealed to maintain the integrity of the fire separation.

(See Note A-9.10.9.6.(1).)

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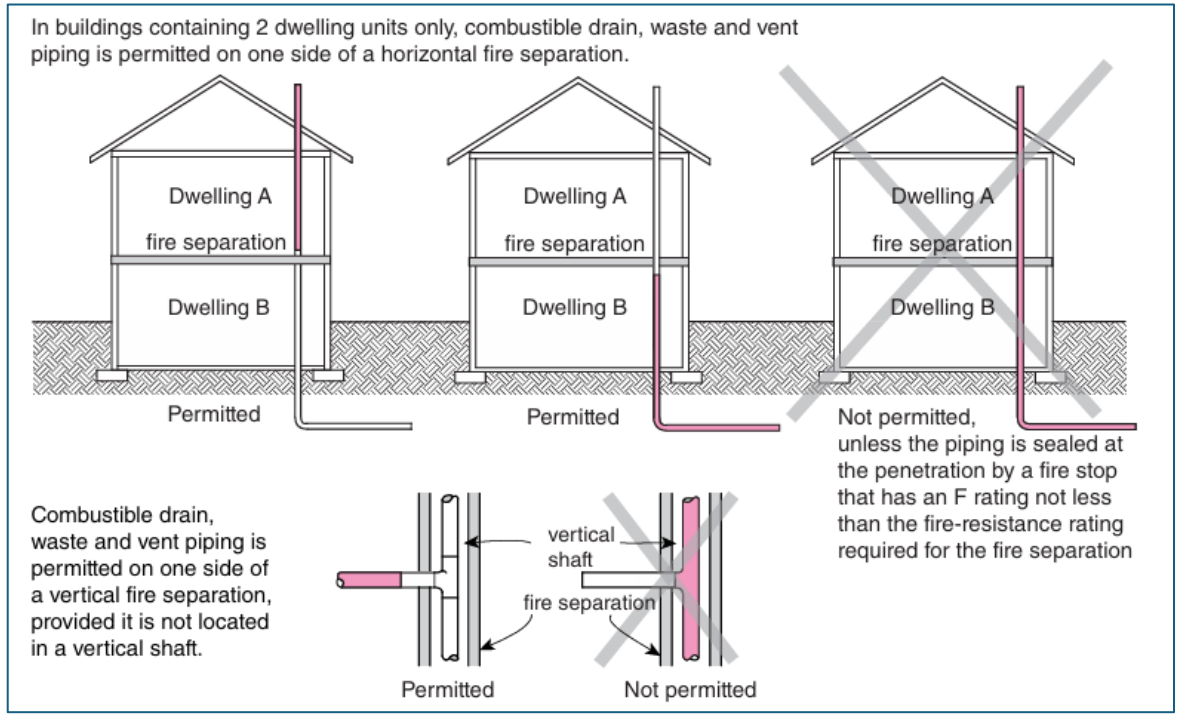
9.10.9.7. Piping Penetrations

This Article permits noncombustible piping for drain, waste, vent and central vacuum systems to penetrate fire separations that are required to have a fire-resistance rating or a membrane that forms part of an assembly that requires a fire-resistance rating under certain conditions.



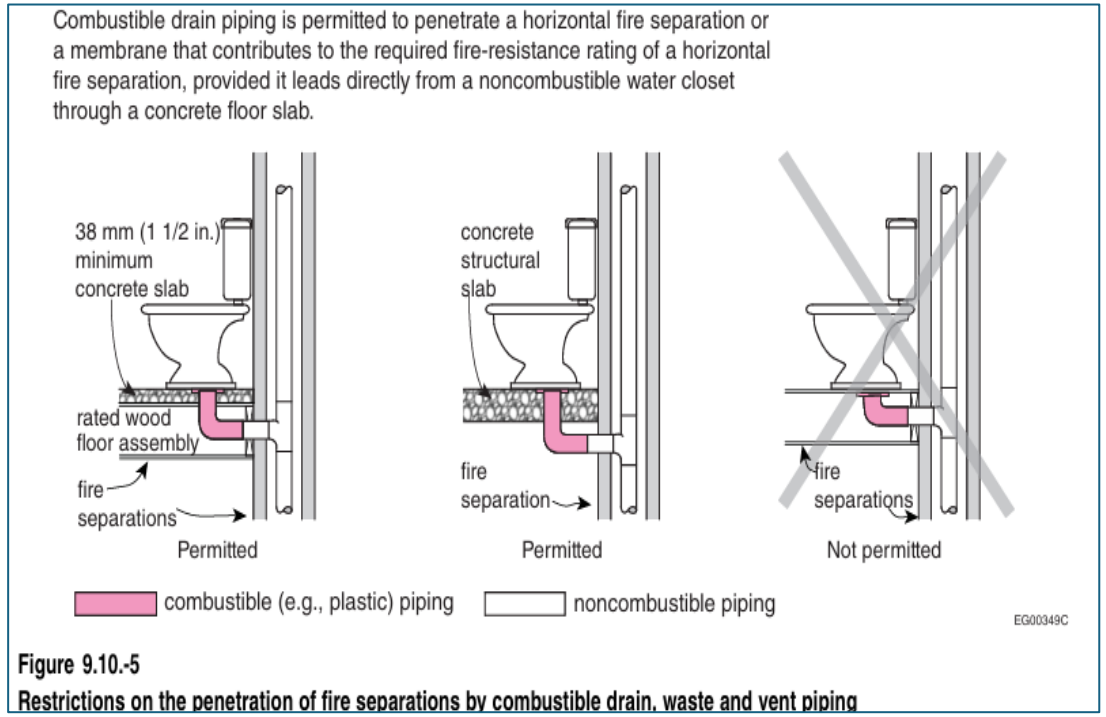


Figure 9.10.-5
Restrictions on the penetration of fire separations by combustible drain, waste and vent piping

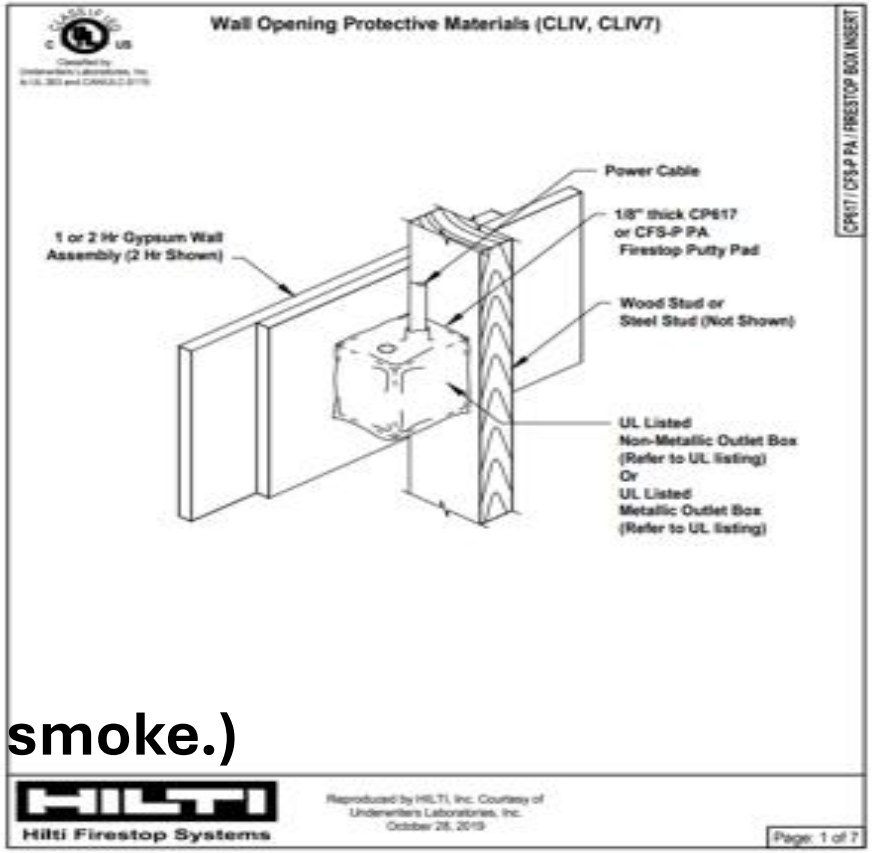
Image from 2020 NBC Illustrated Guide

9.10.9.8. Penetrations of Outlet Boxes or Service Equipment in Concealed Spaces

1) Except as provided in Sentences (2) to (5), outlet boxes are permitted to penetrate the membrane of an assembly required to have a *fire-resistance rating*, provided they are sealed at the penetration by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, "Standard Method of Fire Tests of Firestop Systems," has an FT rating not less than the *fire-resistance rating* of the *fire separation*. (See Note A-9.10.9.8.(1).)

CAN/ULC-S115, "Standard Method of Fire Tests of Firestop Systems,"

Images provided by Hilti Canada



(2020 Code updates – important in controlling fire and smoke.)

9.10.9.8. Penetrations of Outlet Boxes or Service Equipment in Concealed Spaces

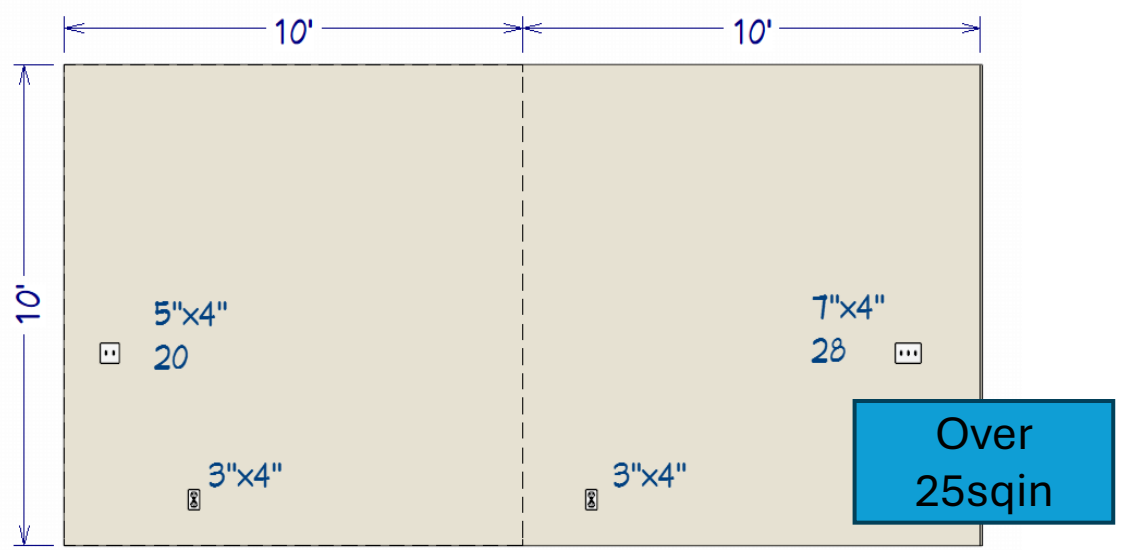
2) Except as provided in Sentence 9.10.9.6.(2), *noncombustible* outlet boxes that penetrate a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* need not conform to Sentence (1), provided

a) they do not exceed

i) 0.016 m^2 in area, and

ii) an aggregate area of 0.065 m^2 in any 9.3 m^2 of surface area, and

b) the annular space between the membrane and the *noncombustible* outlet boxes does not exceed 3 mm.



0.016 sqm = 25 sq in
0.065 sqm = 100 sq inches
9.3 sqm = 100 sqft

Max 3mm (1/3”) Annular space.
Thickness of a toonie is 1.75mm

9.10.9.8. Penetrations of Outlet Boxes or Service Equipment in Concealed Spaces

3) Except as provided in Sentence 9.10.9.6.(2), *combustible* outlet boxes that penetrate a *fire separation* or a membrane forming ~~part of an assembly required~~ to have a *fire-resistance rating* need not conform to Sentence (1), provided

a) the outlet boxes are

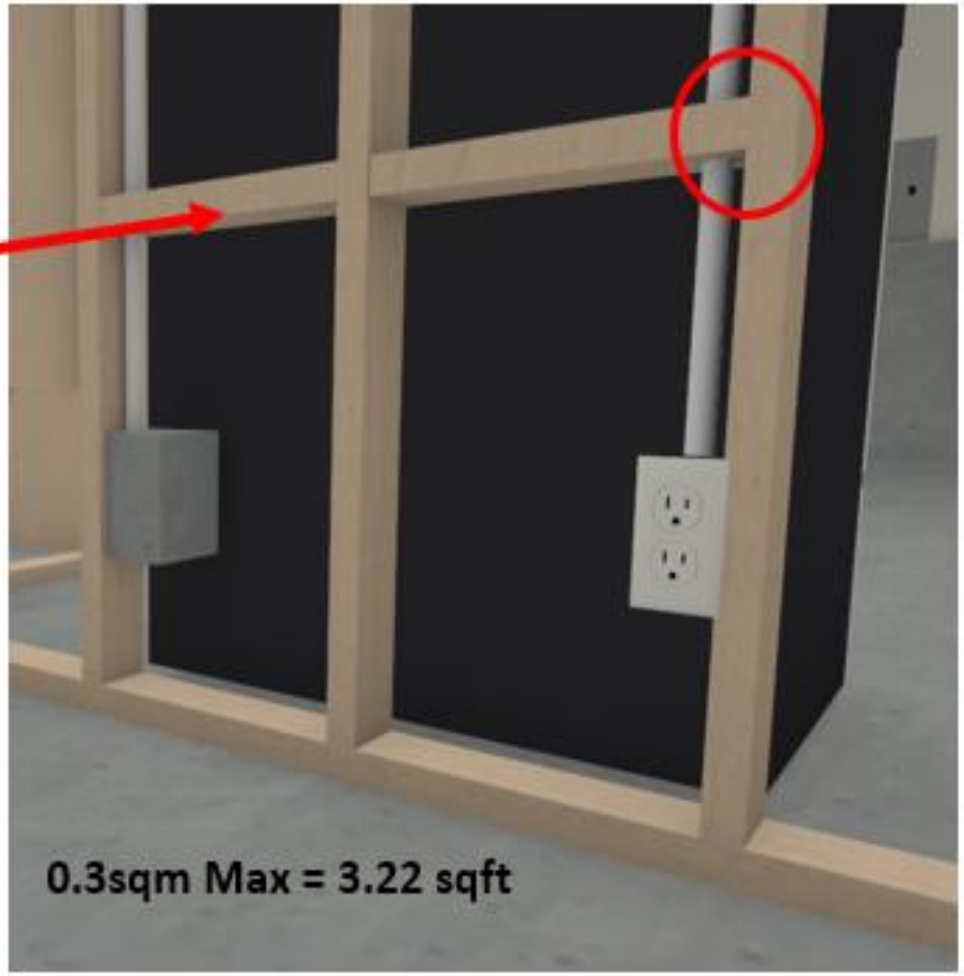
i) separated from the remainder of the space within the assembly by an enclosure of not more than 0.3 m^2 in area made of *fire block* material conforming to Article 9.10.16.3. (see Note A-9.10.9.8.(3)(a)(i)), or

(Sentence (1) – firestopping required)

A-9.10.9.8.(3)(a)(i) Separating Enclosures. The fire block material separating the outlet box from the adjacent space within the assembly should span the framing members such that all four sides and the back of the outlet box are enclosed by a membrane or framing member conforming to Article 9.10.16.3. Any penetrations of the enclosure by wiring or cables must comply with all applicable requirements. (See also Note A-3.1.11.7.(7).)

A-3.1.11.7.(7) Integrity of Fire Blocks. Sentence 3.1.11.7.(7), together with Article 3.1.9.1., is intended to ensure that the integrity of fire blocks is maintained at areas where they are penetrated. This requirement is satisfied by the use of generic firestops such as mineral wool, gypsum plaster or Portland cement mortar, or by the use of sealants that form part of a firestop tested in accordance with CAN/ULC-S115, "Standard Method of Fire Tests of Firestop Systems."

What about when there are resilient channels?



9.10.9.8. Penetrations of Outlet Boxes or Service Equipment in Concealed Spaces

4) *Noncombustible* outlet boxes conforming to Sentence (2) are permitted to be located on opposite sides of a vertical *fire separation* having a *fire-resistance rating* and need not conform to Sentence (1), provided they are

a) separated from each other by a horizontal distance of not less than 600 mm,

b) separated from each other and the remainder of the wall space by an enclosure conforming to Subclause (3)(a)(i), or

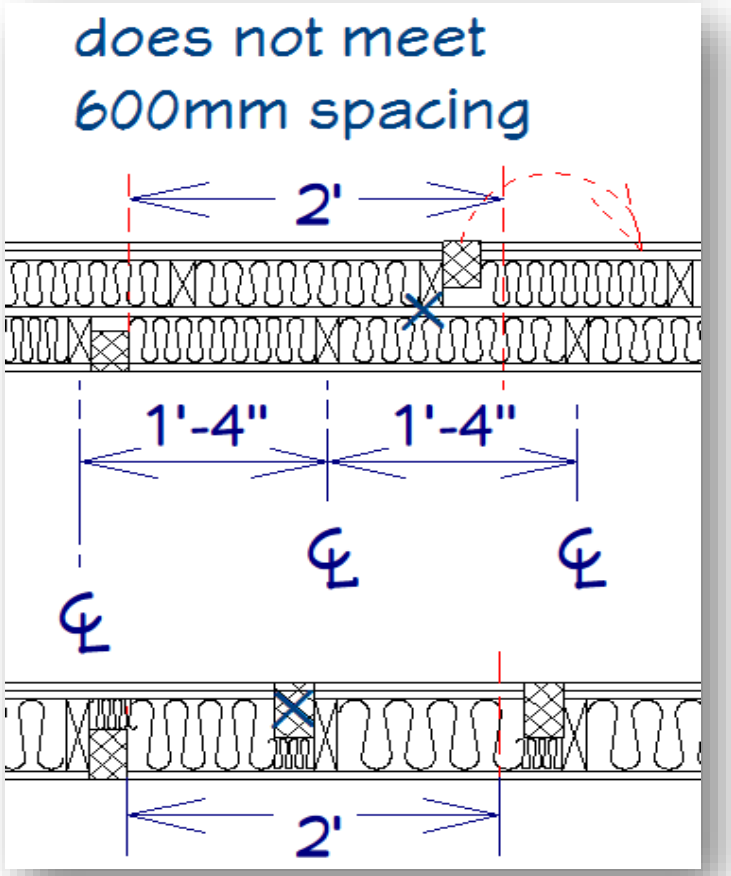
c) located in an insulated wall space in accordance with Subclause (3)(a)(ii).

"back to back" clarification

Sentence 2 – no firestopping required because of area limits

5) *Combustible* outlet boxes conforming to Sentence (3) are permitted to be located on opposite sides of a vertical *fire separation* having a *fire-resistance rating* and need not conform to Sentence (1).

Sentence 3 –fire blocked or assembly filled with preformed by fiber batt insulation



4.(a)

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9.10.9.13. Separation of Residential Occupancies

Part 3 is formatted much better

9.10.9.13. Separation of Residential Occupancies

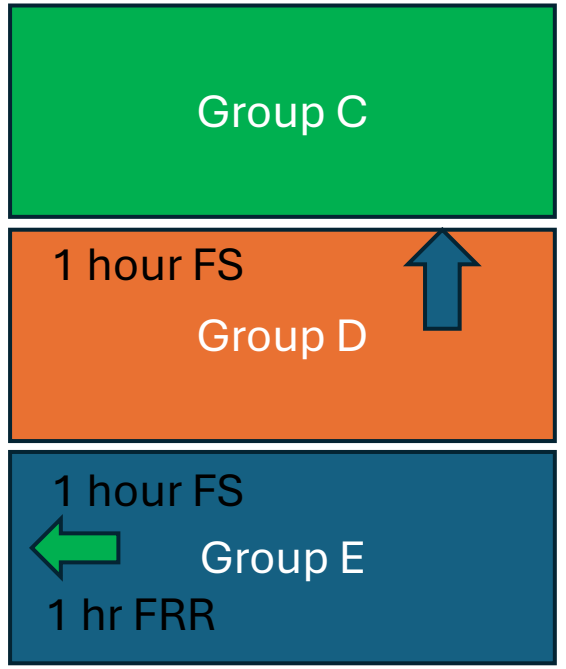
1) Except as provided in Sentence (2), *residential occupancies* shall be separated from all other *major occupancies* by a *fire separation* having a *fire-resistance rating* of not less than 1 h.

2) Except as provided in Sentence (3), a *major occupancy* classified as a *residential occupancy* shall be separated from other *major occupancies* classified as *mercantile* or *medium-hazard industrial occupancies* by a *fire separation* having a *fire-resistance rating* of not less than 2 h.

3) Where not more than two *dwelling units* are located in a *building* containing a *mercantile occupancy*, such *mercantile occupancy* shall be separated from the *dwelling units* by a *fire separation* having not less than 1 h *fire-resistance rating*.

This would be 2hr if over a Group E

2hr FRR



9.10.9.15. Separation of Suites

1) Except as required in Article 9.10.9.16. and as permitted by Sentence (2), each *suite* in other than *business and personal services occupancies* shall be separated from adjoining *suites* by a *fire separation* having a *fire-resistance rating* of not less than 45 min.

2) In *sprinklered buildings*, *suites* of *business and personal services occupancy* and *mercantile occupancy* that are served by *public corridors* conforming with Clause 3.3.1.4.(4)(b) are not required to be separated from each other by *fire separations*.

Suites (fire compartments) within a floor space

Note also – 9.10.9.17. Separation of public corridors

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9.10.9.16. Separation of Residential Units

9.10.9.16. Separation of Residential Suites

1) Except as provided in Sentences (2) to (4) and Article 9.10.21.2., *suites* in *residential occupancies* shall be separated from adjacent rooms and *suites* by a *fire separation* having a *fire-resistance rating* of not less than 45 min.

2) Sleeping rooms in boarding and lodging houses where sleeping accommodation is provided for not more than 8 boarders or lodgers need not be separated from the remainder of the *floor area* as required in Sentence (1) where the sleeping rooms form part of the proprietor's residence and do not contain cooking facilities.

3) Except as provided in Sentence (4), *dwelling units* that contain 2 or more *storeys* including *basements* shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 1 h. (See Note A-3.3.4.4.(1).)

4) Walls and floor-ceiling framing in a house with a *secondary suite* that separate *dwelling units* from each other or *dwelling units* from ancillary spaces and common spaces need not comply with Sentence (1), where the walls and floor-ceiling framing are protected by a continuous smoke-tight barrier of not less than 12.7 mm thick gypsum board installed on

a) both sides of walls, and

b) the underside of floor-ceiling framing.

(See Sentence 9.10.9.3.(2) for *closures*.)

9.10.9.3. Openings to be Protected with Closures

1) Except as permitted in Articles 9.10.9.5. to 9.10.9.8., openings in required *fire separations* shall be protected with *closures* conforming to Subsection 9.10.13.

2) Doors in smoke-tight barriers shall

a) be solid-core, wood doors at least 45 mm thick, and

b) have a self-closing device.

(See Note A-9.10.9.3.(2).)

Whitehouse

2121 – 2nd AVE.
WHITEHORSE, YT Y1A 1C2
LAND & BUILDING SERVICES
PH: 668-8340
adminbuilding@whitehorse.ca

GUIDELINES TO CREATING A LIVING SUITE

City of Whitehorse Zoning Bylaw 2012-20 Living Suite Requirements

"LIVING SUITE" means a self-contained, accessory dwelling unit located within a single detached house intended to be used for living and sleeping purposes.

1. A development permit is required.
2. A development cost charge fee is to be paid for all living suites.
3. The suite cannot be more than 100 m2 in floor area of a single detached house.
4. A living suite is only permitted in single detached houses and only one suite shall be permitted in a single detached house. A living suite shall not be permitted where a garden suite is established.
5. One additional off street parking space must be provided.
6. A living suite shall have unobstructed pedestrian access to a street frontage.

Living Suite Check List

A building permit is required for a Living Suite. The following is a general list required for occupancy. Please contact the office to discuss particular and specifics of your project. An inspection of the premises will be carried out to ensure that the minimum Health, Fire and Life Safety items are met:

1. Entrance - A separate entrance is preferred to form a separate exit way.
2. Fire ratings - A fire separation, a continuous smoke-tight barrier of 12.7mm (1 /2") gypsum board installed on ceilings and both sides of walls, is required between dwelling units & common areas. A 45 min Fire Resistance Rating is not required if the living suite is less than 80m² (860ft²) in area.
3. Sound Proofing – Separations shall have a minimum of 150mm (6") of sound absorbing material (insulation) in joists space and 89mm (3.5") of sound absorbing material in stud spaces with resilient channel on one side or a Sound Transmission Class (STC) rating of 43.
4. Egress bedroom windows - Bedroom windows require an unobstructed opening area of 3.8 sq. ft. (i.e. 15"x36", 24"x24"). Windows are not required if bedroom has an exterior door, or if the building is sprinklered.
5. Ventilation - A Heat Recovery Ventilator (HRV) is required to serve as the principal ventilation fan and can act as the kitchen/bathroom exhaust as well.
6. Smoke and carbon monoxide alarms - Hardwired interconnected smoke alarms to be located within each bedroom and in a location between the bedroom(s) and the remainder of the storey. CO alarms shall be installed in or within 5m of bedroom(s) when a fuel burning appliance is located in the building. All suite alarms to be interconnected with alarms in common areas and each storey of house.
7. Heating systems - The living suite shall have independent controls for its heating system. Air from one dwelling unit shall not be circulated to any other dwelling unit in the building.
8. Stairs, handrails, & guards - Stairs, handrails and guards to conform to the current National Building Code requirements. (Max riser 77 /8", min tread depth 9¼", min stair width 34").
9. Adequate supply of hot water - One hot water tank shall be provided for each dwelling unit unless it can be shown there is a sufficient supply.
10. Doors separating [illegible] shall be solid core wood construction with a deadbolt and a self-closing mechanism.
11. Ceiling height - A living suite shall have a minimum clear height of 1.95m (77"). Clear height under beams and ducting may be reduced to 1.85m (73").

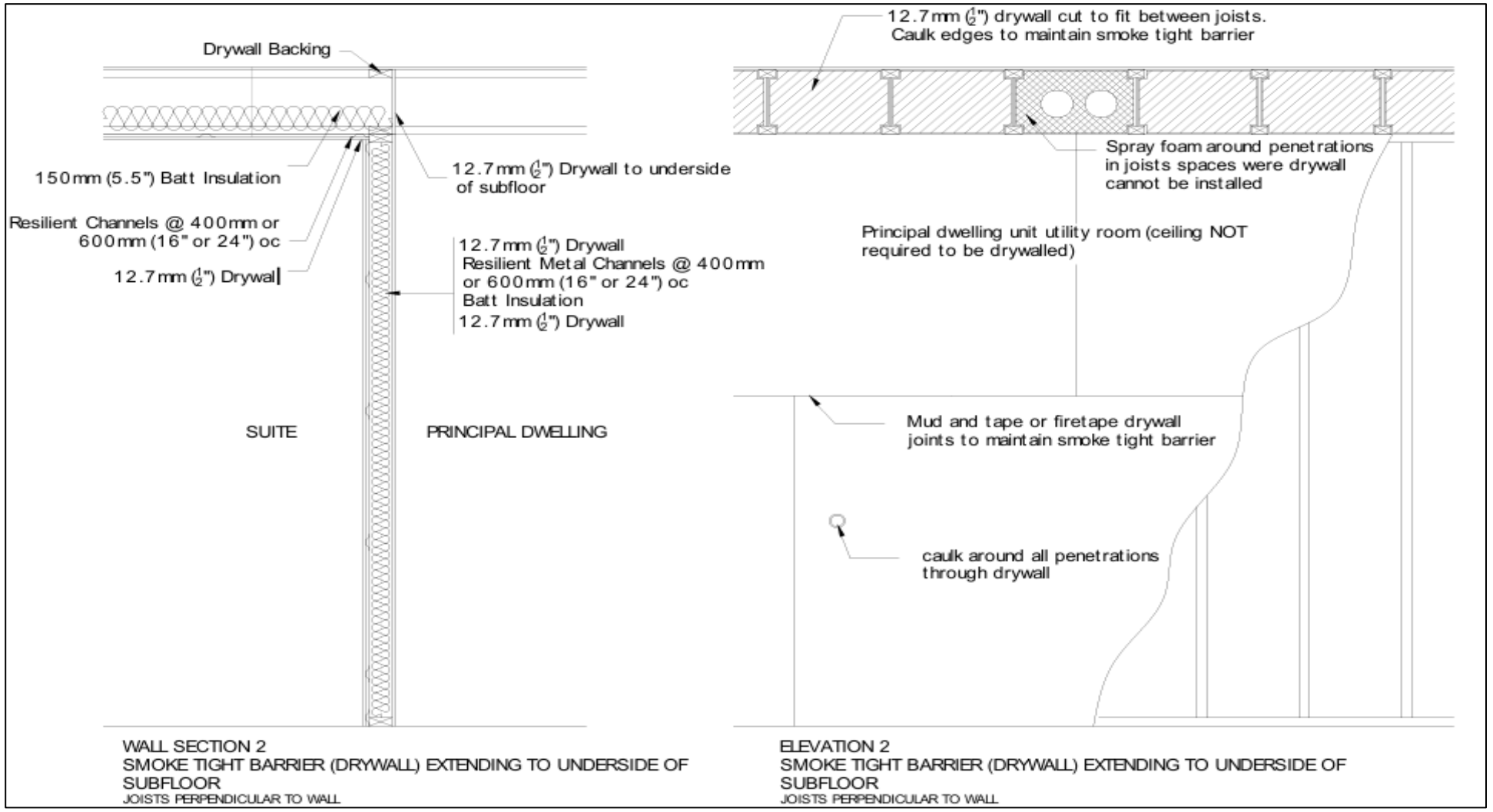
Please do not hesitate to contact a Building Official for further information at 668-8340.

UPDATED FEBRUARY 2016

UPDATED FEBRUARY 2016

Secondary Suite – Guide Recommendation

https://www.saskatoon.ca/sites/default/files/secondary_suite_handbook.pdf



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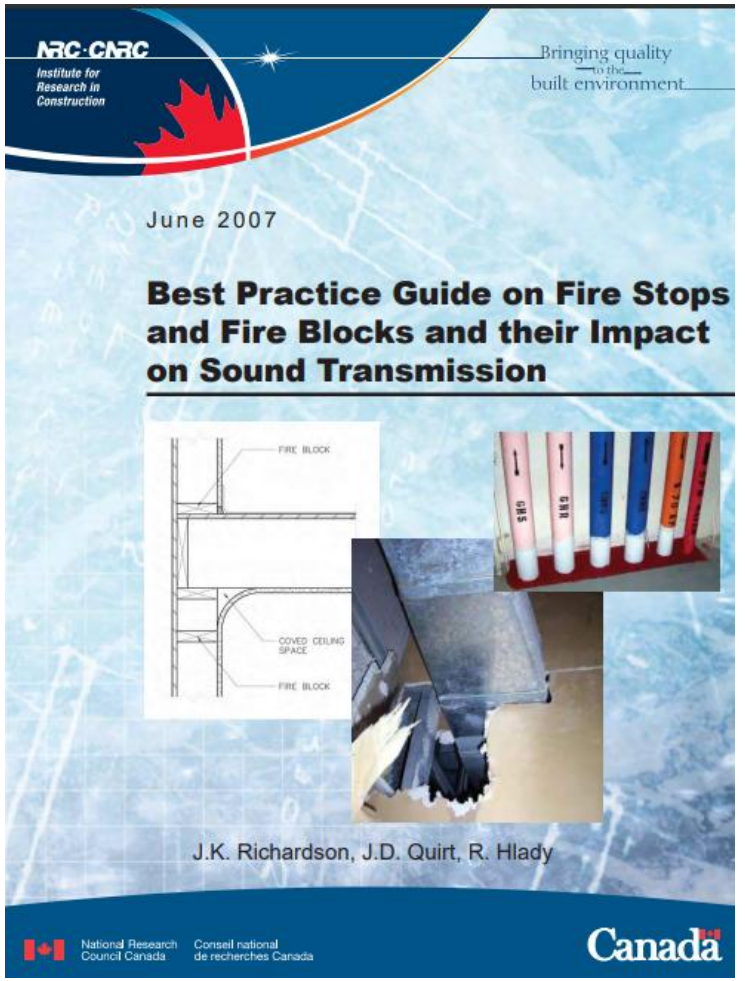
Fire Blocking Resource (& Fire Stopping)

NRC Best Practice Guide on Fire Stops and Fire Blocks and their Impact on Sound Transmission.

Sound transmission is a growing concern

Slightly out of date but a great resource.



Questions?
5 Minute Break

9.10.11. Firewalls

A firewall is a particular type of fire separation that is of noncombustible construction and has a fire-resistance rating of at least 2 h.

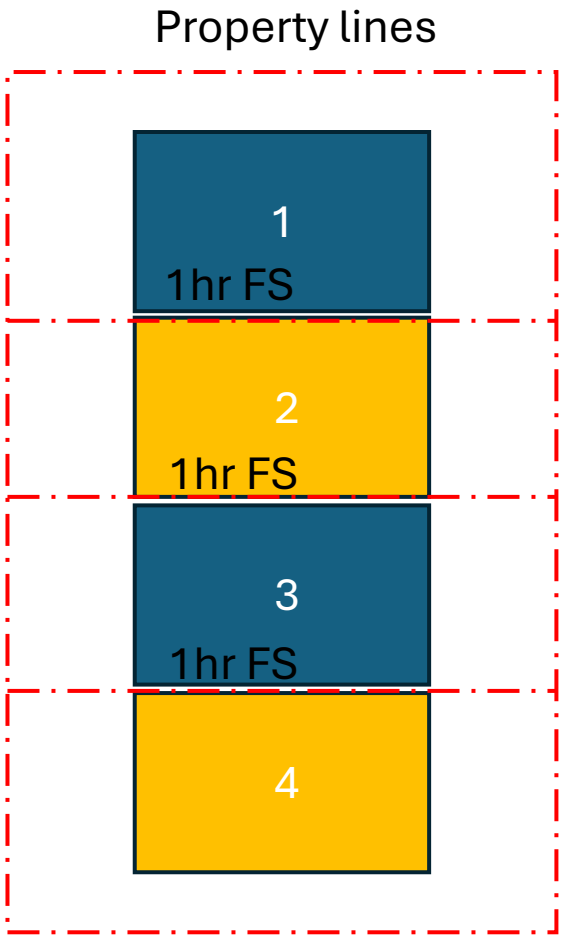
9.10.11.2. Firewalls Not Required

1) Except as stated in Sentence (2), a **party wall** on a property line of a building of residential occupancy need not be constructed as a firewall, provided it is constructed as a **fire separation having not less than a 1h fire-resistance rating, where the party wall separates**

a) two dwelling units where there is no dwelling unit above another dwelling unit,

b) A dwelling unit and a house with a secondary suite including their common spaces, or

c) Two houses with a secondary suite including their common spaces.



Firewall means a type of fire separation of noncombustible construction that subdivides a building or separates adjoining buildings to resist the spread of fire and that has a fire resistance rating as prescribed in this Code and has structural stability to remain intact under fire conditions for the required fire-rated time.

Does this four-unit townhouse meet the requirements for only a 1hr party wall?

9.10.11. Fire walls

Note potential issues with thermal bridging

2) Where a building of residential occupancy contains more than 2 houses, a party wall that separates any 2 adjacent houses with a secondary suite from the rest of the building shall be constructed as a firewall to create separate buildings each containing no more than 2 adjacent houses with a secondary suite.

3) The wall described in Sentence (1) shall provide continuous protection from the **top of the footings to the underside of the roof** deck.

4) Any space between the top of the wall described in Sentence (1) and the roof deck shall be tightly filled with mineral wool or noncombustible material.

Construction of Firewalls

1) Where firewalls are used, the requirements in Part 3 shall apply.

Structural design to Part 4

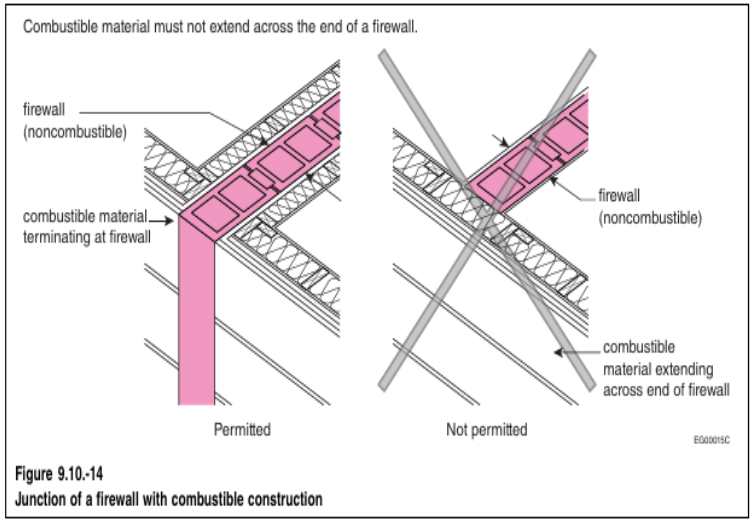


Figure 9.10.-14
Junction of a firewall with combustible construction

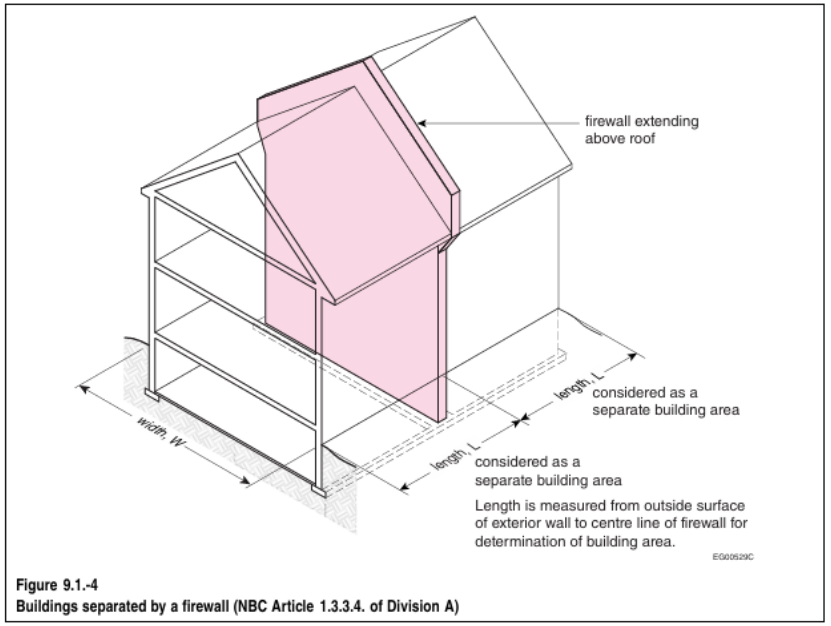


Figure 9.1.-4
Buildings separated by a firewall (NBC Article 1.3.3.4. of Division A)

Image from Illustrated User's Guide– NBC 2020

Place holder

9.10.12. Prevention of Fire Spread at Exterior Walls and between Storeys

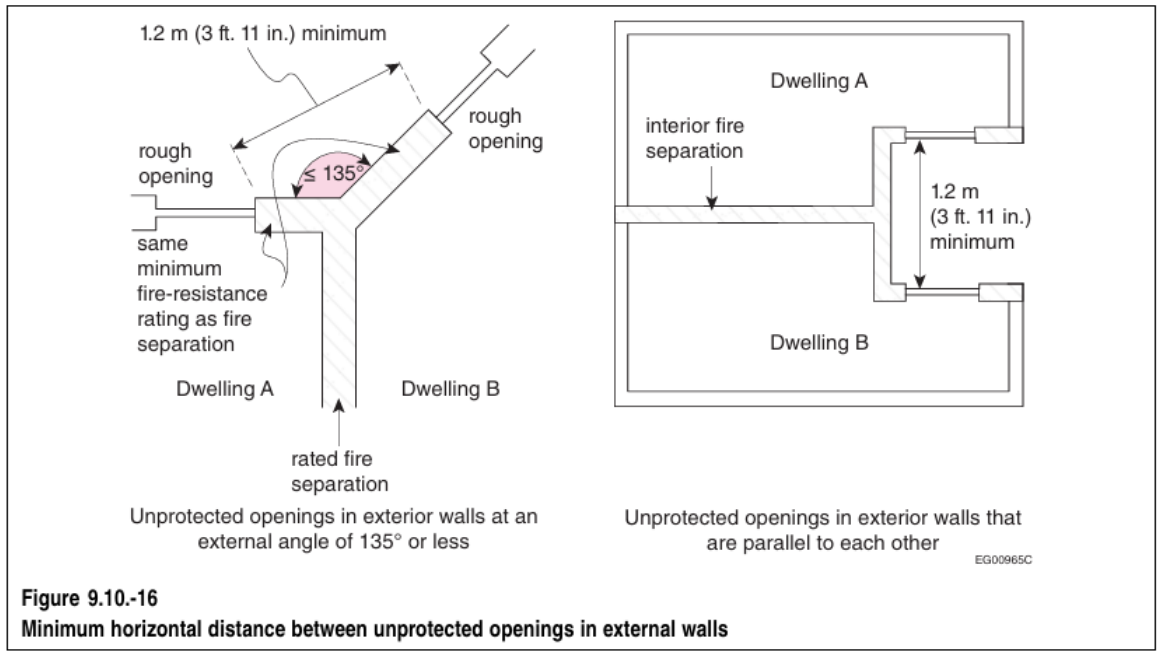


Figure 9.10.-16
Minimum horizontal distance between unprotected openings in external walls

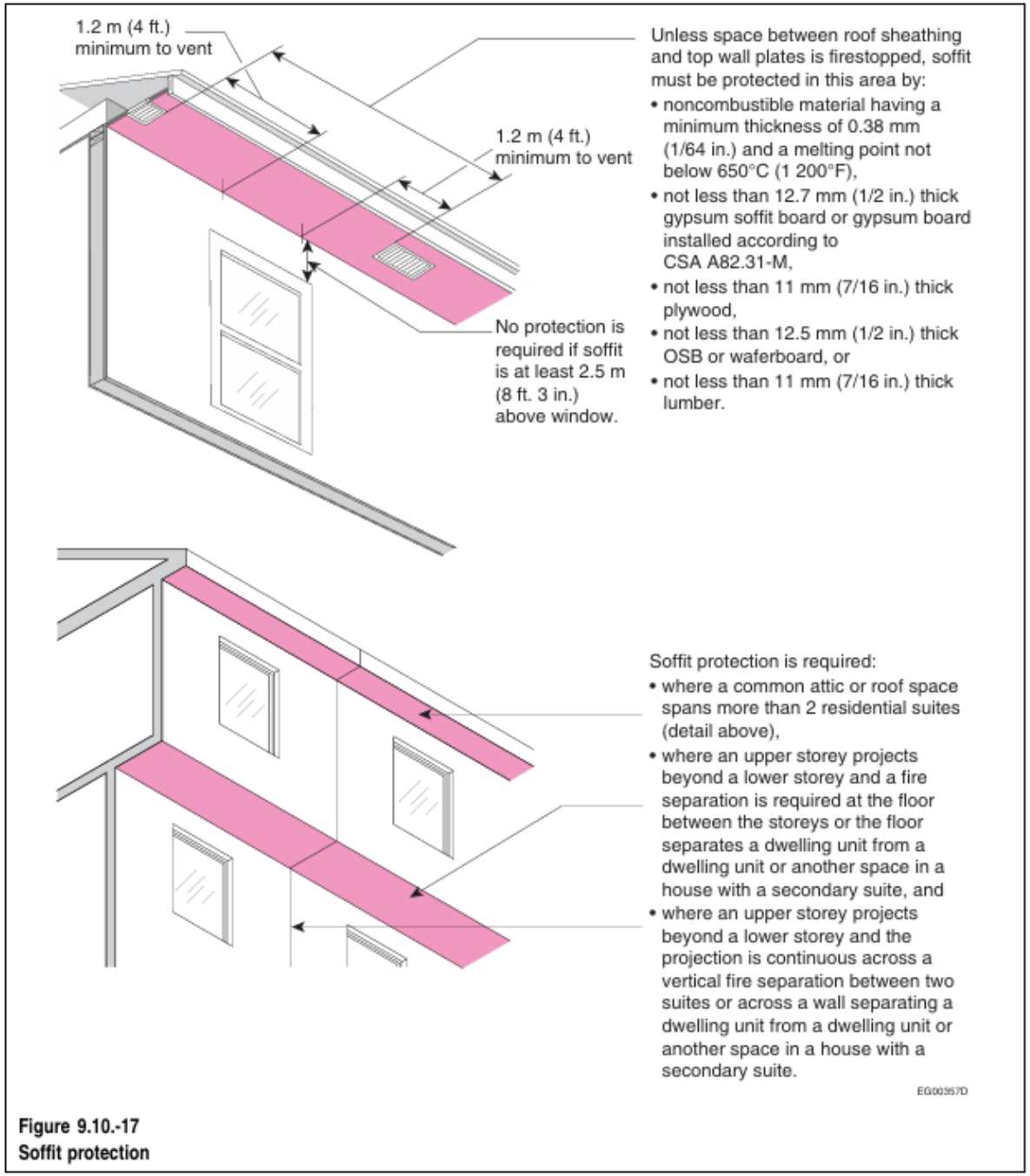


Figure 9.10.-17
Soffit protection

9.10.13. Doors, Dampers and Other Closures in Fire Separations

The purpose of closures is to hinder the passage of fire across an opening in an assembly required to act as a fire separation for a time commensurate with the rating period required for the fire separation. All devices that close off openings through fire separations are referred to as “closures.” These must be tested and rated. Ratings for closures, however, are referred to as “fire protection ratings” rather than “fire-resistance ratings.” Although the fire exposure temperatures are similar to those used in tests for fire-resistance ratings, the criteria for meeting a given rating are different. The term “fire-protection rating” is used to avoid confusing the two rating systems

9.10.13. Doors, Dampers and Other Closures in Fire Separations

9.10.13.1. Closures

1) Except as provided in Article 9.10.13.2., openings in required *fire separations* shall be protected with a *closure* conforming to Table 9.10.13.1. and shall be installed in conformance with Chapters 2 to 14 of NFPA 80, "Standard for Fire Doors and Other Opening Protectives," unless otherwise specified herein. (See also Article 9.10.3.1.)

Table 9.10.13.1.
Fire-Protection Ratings for Closures
Forming Part of Sentence 9.10.13.1.(1)

Required *Fire-Resistance Rating* of *Fire Separation*	Minimum *Fire-Protection Rating* of *Closure*
30 or 45 min	20 min(1)
1 h	45 min(1)
1.5 h	1 h
2 h	1.5 h
3 h	2 h
4 h	3 h

Lesser time

Notes to Table 9.10.13.1.:
(1) See Article 9.10.13.2.

9.10.13.3. Unrated Wood Door Frames

1) Doors required to provide a 20 min *fire-protection rating* or permitted to be 45 mm solid core wood shall be mounted in a wood frame of not less than 38 mm thickness where the frame has not been tested and rated.

Other types of closures

- Wired Glass
- Glass block
- Fire Dampers
- Fire Flaps

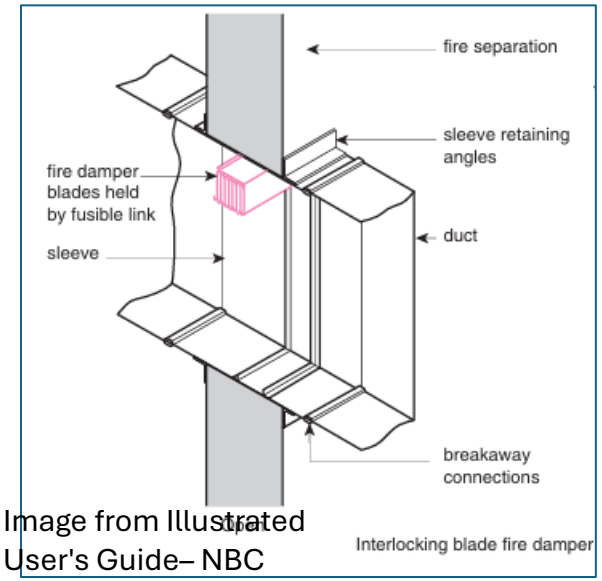


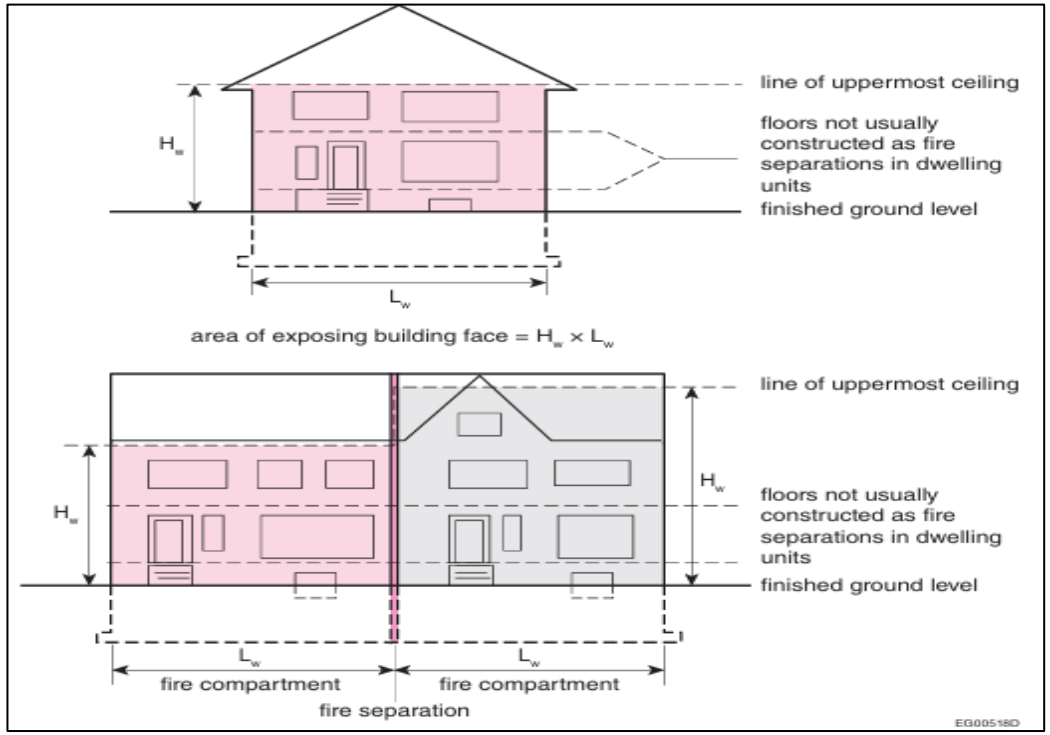
Image from Illustrated User's Guide– NBC 2020

Questions?

9.10.14 & 9.10.15 Spatial Separations

Spatial separations sets limits on openings in exterior walls that face a property line, between buildings and center line of the street. It also controls the type of wall construction based on the allowable openings and use of a building.

Important defined terms: (no defined term for glazed opening)



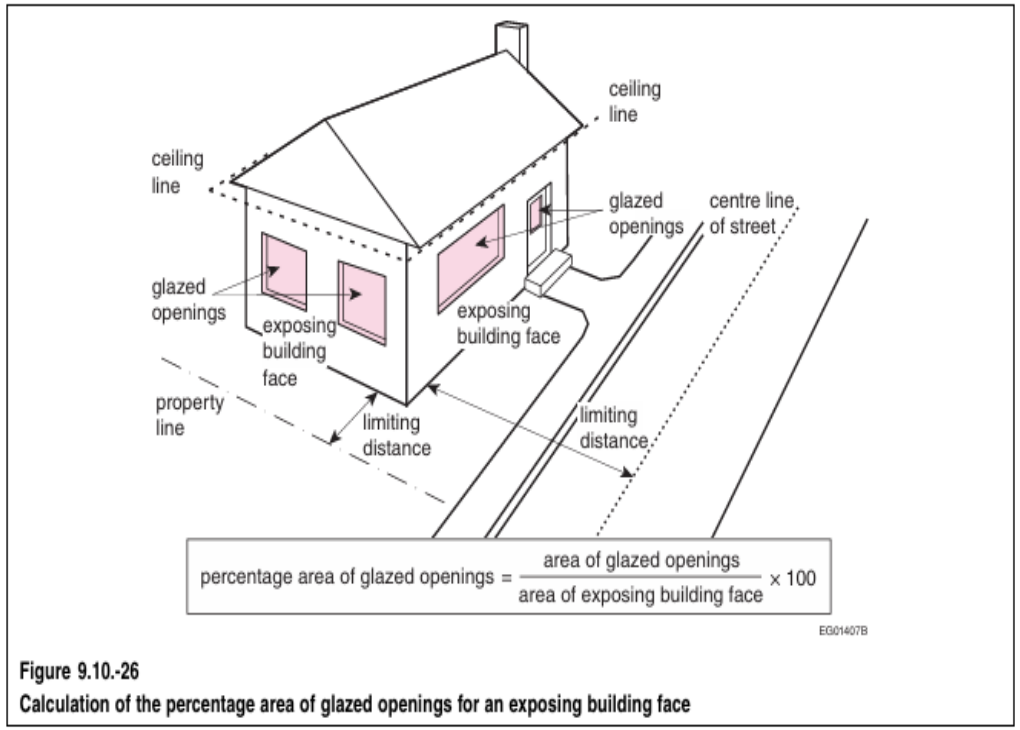


Figure 9.10.-26
Calculation of the percentage area of glazed openings for an exposing building face

Image from Illustrated User's Guide– NBC 2020

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2020 NBC – Section 9.2. Definitions – 9.10.14 & 12

9.2.1.1. Defined Words 1) Words in italics are defined in Article 1.4.1.2. of Division A.

Attic or roof space means the space between the roof and the ceiling of the top storey or between a dwarf wall and a sloping roof.

Exposing building face (EBF) means that part of the exterior wall of a building that faces one direction and is located between ground level and the ceiling of its top storey or, where a building is divided into fire compartments, the exterior wall of a fire compartment that faces one direction.

Fire compartment means an enclosed space in a building that is separated from all other parts of the building by enclosing construction providing a fire separation having a required fire -resistance rating.

Glazed Openings (undefined) means glazed portion of a window other than one equipped with a closure having the required fire-protection rating, or any part of a wall forming part of the exposing building face that has a fire-resistance rating less than that required for the exposing building face.

Limiting distance means the distance from an exposing building face to a property line, the centre line of a street, lane or public thoroughfare, or to an imaginary line between 2 buildings or fire compartments on the same property, measured at right angles to the exposing building face.

Unprotected opening (as applying to exposing building face) means a doorway, window or opening other than one equipped with a closure having the required fire-protection rating, or any part of a wall forming part of the exposing building face that has a fire-resistance rating less than that required for the exposing building face.

9.10.14 Spatial Separation Between Buildings

9.10.14. Spatial Separation Between Buildings

9.10.14.1. Application

1) This Subsection applies to *buildings* other than those to which Subsection 9.10.15. applies.

2) This Subsection does not apply to detached carports conforming to Section 9.35. that serve not more than one *dwelling unit* or a house with a *secondary suite*.

9.35.2. General

9.35.2.1. Carport Considered to be Garage

1) Where a roofed enclosure used for the storage or parking of motor vehicles has more than 60% of the total perimeter enclosed by walls, doors or windows, the enclosure shall be considered a garage.

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9.10.14 Spatial Separation Between Buildings

9.10.14.3. Limiting Distance and Fire Department Response

1) Except for the purpose of applying Sentences 9.10.14.4.(2), (3), (8) and (9), and Sentences 9.10.14.5.(3), (8) and (13), a *limiting distance* equal to half the actual *limiting distance* shall be used as input to the requirements of this Subsection, where

a) the time from receipt of notification of a fire by the fire department until the first fire department vehicle arrives at the *building* exceeds 10 min in 10% or more of all calls to the *building*, and

b) any *storey* in the *building* is not *sprinklered*.

(See Notes A-3.2.3. and A-3.2.3.1.(8).)

9.10.14.4. Openings in Exposing Building Face

1) Except as provided in Sentences (6) to (10), the maximum aggregate area of *unprotected openings* in an *exposing building face* shall

a) conform to Table 9.10.14.4.-A,

b) conform to Subsection 3.2.3., or

c) where the *limiting distance* is not less than 1.2 m, be equal to or less than

i) the *limiting distance* squared, for *residential occupancies*, *business and personal services occupancies* and *low-hazard industrial occupancies*, and

ii) half the *limiting distance* squared, for *mercantile occupancies* and *medium-hazard industrial occupancies*.

- Confirm 10-minute response times

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9.10.15 Spatial Separation Between Houses

9.10.15.1. Application

1) This Subsection applies to

a) *buildings* that contain only *dwelling units* and have no *dwelling unit* above another *dwelling unit*, and

b) houses with a *secondary suite* including their common spaces.

(See Note A-9.10.15.1.(1).)

A-9.10.15.1.(1) Application of Subsection 9.10.15. The buildings to which Subsection 9.10.15. applies include:

- traditional individual detached houses with or without a secondary suite,
- semi-detached houses (doubles) where each house may contain a secondary suite,
- row houses, where any house may contain a secondary suite (see Sentence 9.10.11.2.(1)), and
- stacked dwelling units where one of them is a secondary suite.

Subsection 9.10.15. does not apply to stacked townhouses, stacked duplexes or stacked dwelling units that are not within a house with a secondary suite.

9.10.11. Firewalls

9.10.11.1. Required Firewalls

1) Except as provided in Article 9.10.11.2., a *party wall* on a property line shall be constructed as a *firewall*. (See Note A-3.2.3.4.(1).)

9.10.11.2. Firewalls Not Required

1) Except as stated in Sentence (2), a *party wall* on a property line of a *building* of *residential occupancy* need not be constructed as a *firewall*, provided it is constructed as a *fire separation* having not less than a 1 h *fire-resistance rating*, where the *party wall* separates

a) two *dwelling units* where there is no *dwelling unit* above another *dwelling unit*,

b) a *dwelling unit* and a house with a *secondary suite* including their common spaces, or

c) two houses with a *secondary suite* including their common spaces.

9.10.15 Spatial Separation Between Houses

9.10.15.3. Limiting Distance and Fire Department Response

1) Except for the purpose of applying Sentences 9.10.15.2.(2), 9.10.15.4.(3) and 9.10.15.5.(13), a *limiting distance* equal to half the actual *limiting distance* shall be used as input to the requirements of this Subsection, where

a) the time from receipt of notification of a fire by the fire department until the first fire department vehicle arrives at the *building* exceeds 10 min in 10% or more of all calls to the *building*, and

b) any *storey* in the *building* is not *sprinklered*.

(See Notes A-3.2.3. and A-3.2.3.1.(8).)

9.10.15.4. Glazed Openings in Exposing Building Face

1) Except as provided in Sentences (6) and (7), the maximum aggregate area of glazed openings in an *exposing building face* shall

a) conform to Table 9.10.15.4.,

b) conform to Subsection 3.2.3., or

c) where the *limiting distance* is not less than 1.2 m, be equal to or less than the *limiting distance* squared.

- Note the difference – glazed openings

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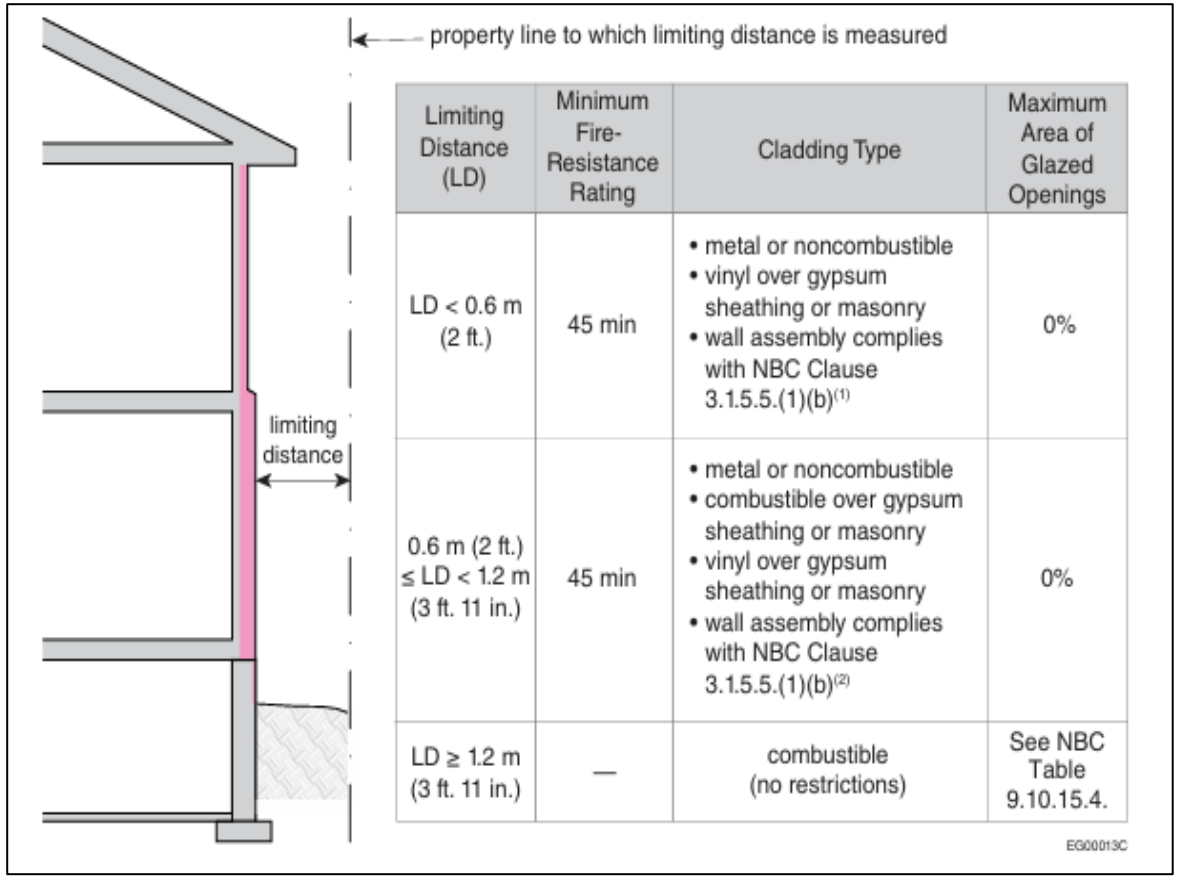
9.10.15 Construction of Exposing Building Face of Houses

This Article determines the types of construction permitted on exposing walls, as determined by the percentage of openings and their proximity to the property line.

Although the rationale for increasing the level of fire protection of exposing walls of houses in relation to their proximity to the property line is the same as for other buildings (9.10.14.), a lower level of protection is permitted for dwelling units, provided that either such units are not stacked one above another, or that not more than one unit is stacked on top of another, and that one of these two is a secondary suite.

This relaxation is largely related to the cost of providing a higher level of fire protection. However, it is also rationalized on the basis of past performance, and the fact that the risk to life is very minimal in such locations.



Limiting Distance (LD)	Minimum Fire-Resistance Rating	Cladding Type	Maximum Area of Glazed Openings
LD < 0.6 m (2 ft.)	45 min	• metal or noncombustible • vinyl over gypsum sheathing or masonry • wall assembly complies with NBC Clause 3.1.5.5.(1)(b)(1)	0%
0.6 m (2 ft.) ≤ LD < 1.2 m (3 ft. 11 in.)	45 min	• metal or noncombustible • combustible over gypsum sheathing or masonry • vinyl over gypsum sheathing or masonry • wall assembly complies with NBC Clause 3.1.5.5.(1)(b)(2)	0%
LD ≥ 1.2 m (3 ft. 11 in.)	—	combustible (no restrictions)	See NBC Table 9.10.15.4.

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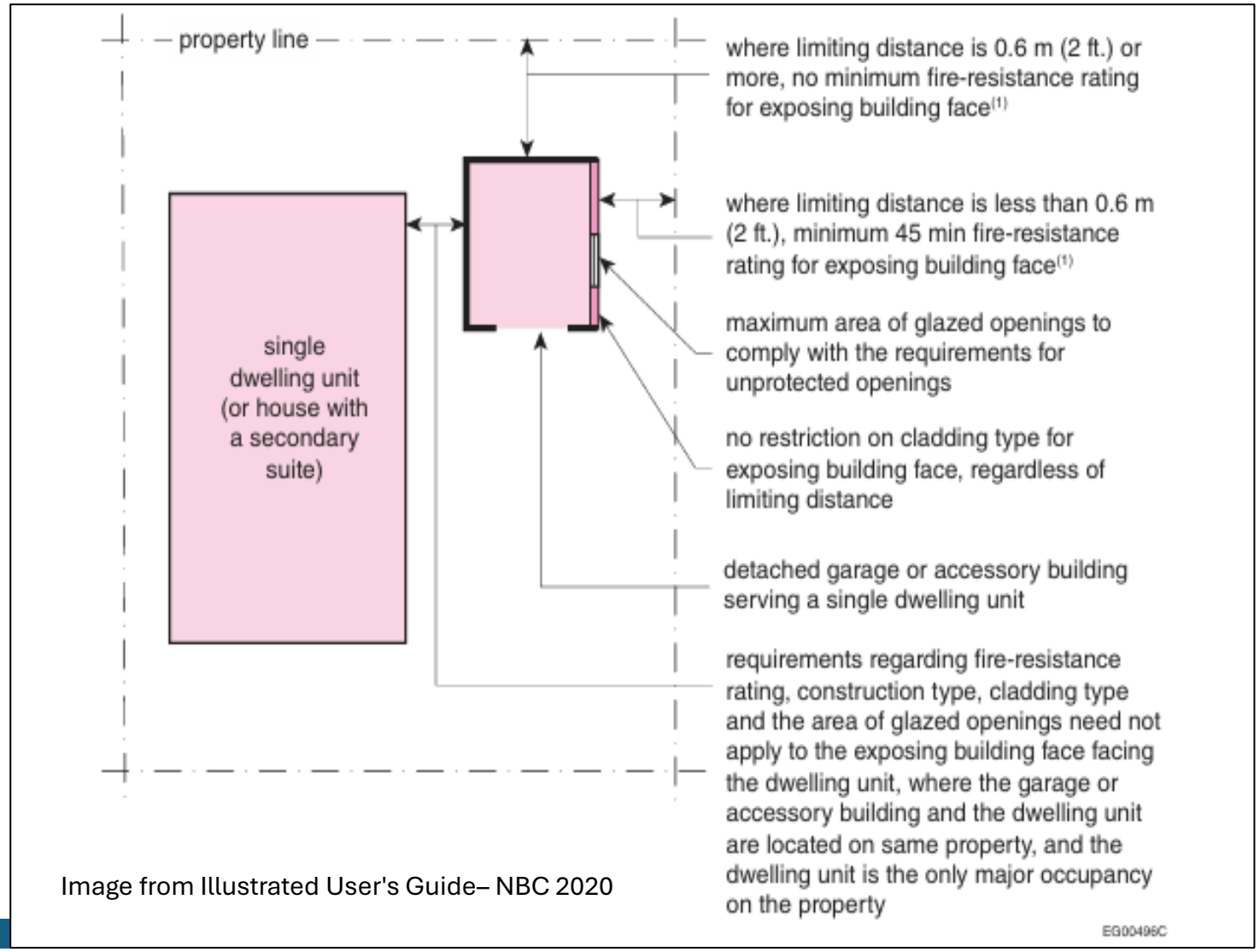
9.10.14& 15 Spatial Separation – Accessory Bldgs.

Minimum fire-resistance ratings for a detached garage or accessory building serving a single dwelling unit.

Exemption from glazed openings between the buildings & construction and cladding.

Note if the accessory is converted into a different use – business, living unit – then full requirements come into effect.



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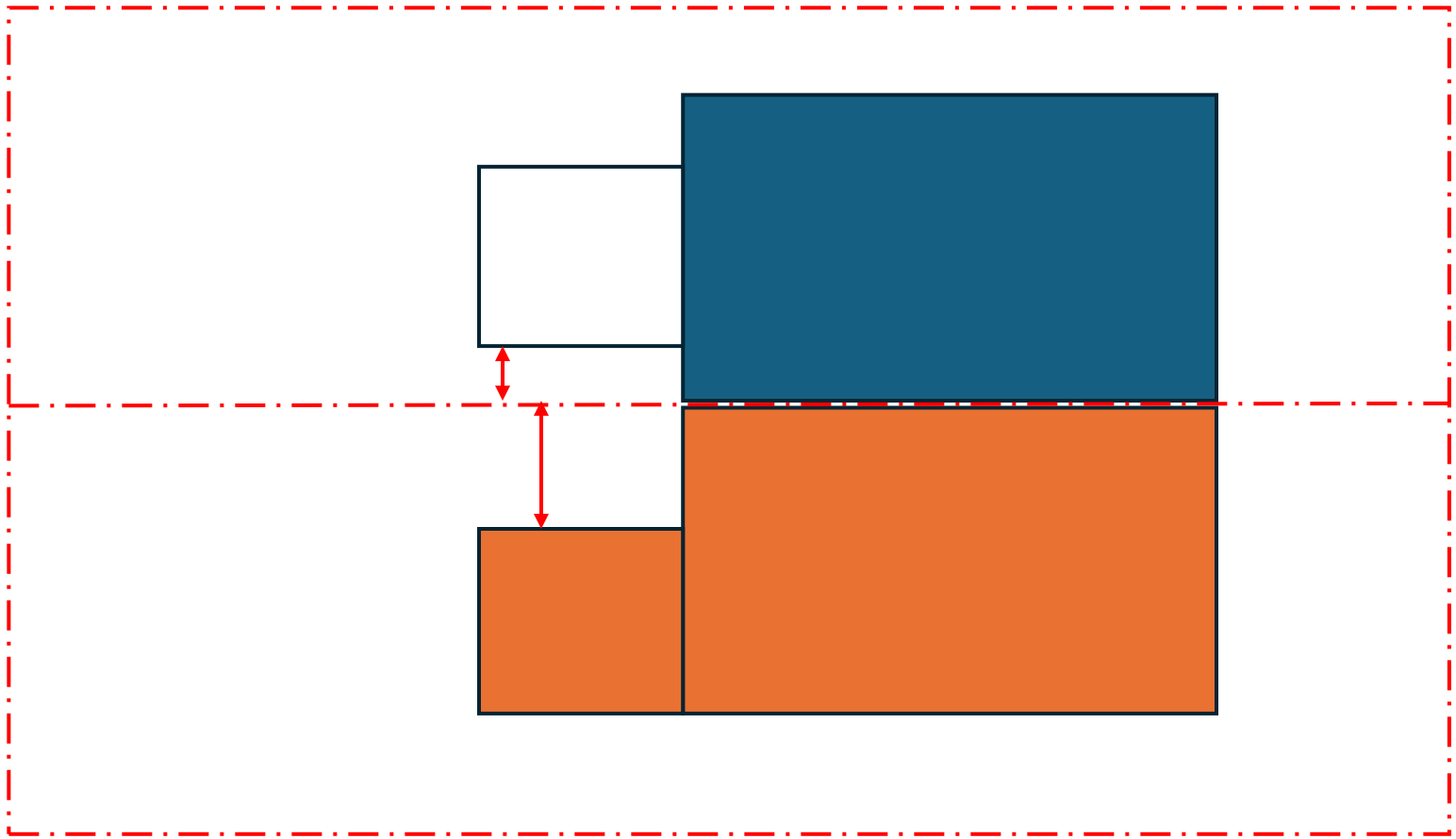
9.10.15. Spatial Separation - Duplex

Reminder of a party wall on a property line.

Limiting distance is from the PL and therefore the proposed addition should be more than 1.2m to limit limitations.

Also note restrictions on overhangs.



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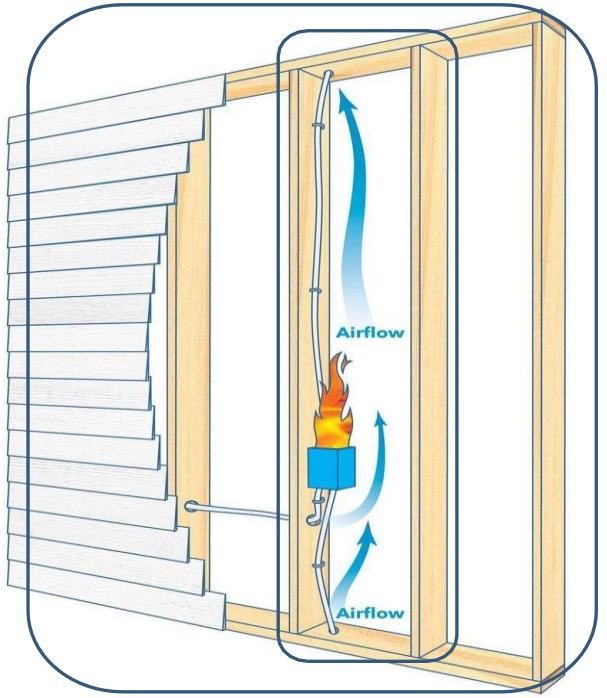
9.10.16. Fire Blocking

The term fire blocking was created to distinguish it from fire stopping. Fire blocking does not have a fire resistance rating like a fire stop.

The intent of fire blocking is to restrict fire (smoke) movement in a concealed space. With some exemptions, fire blocking is required in all buildings including houses.

Fires originating in concealed spaces, or that gain entry through openings in enclosing membranes, can travel undetected from one part of the building to another. This may jeopardize the occupants‘ escape, and make firefighting very difficult.



Fire block means a material, component or system that restricts the spread of fire within a concealed space or from a concealed space to an adjacent space.

Fire compartment means an enclosed space in a building that is separated from all other parts of the building by enclosing construction providing a fire separation having a required fire-resistance rating.

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Wood-Frame Construction

Once very common, **balloon framing** is now only used occasionally. It involves the use of wall framing that extends more than one storey. Intermediate floors are then secured to the walls. While **platform construction** automatically provides fire blocking between floors, balloon framing requires that designated fire blocks be installed in all gaps between storeys that occur at floor and roof intersections.

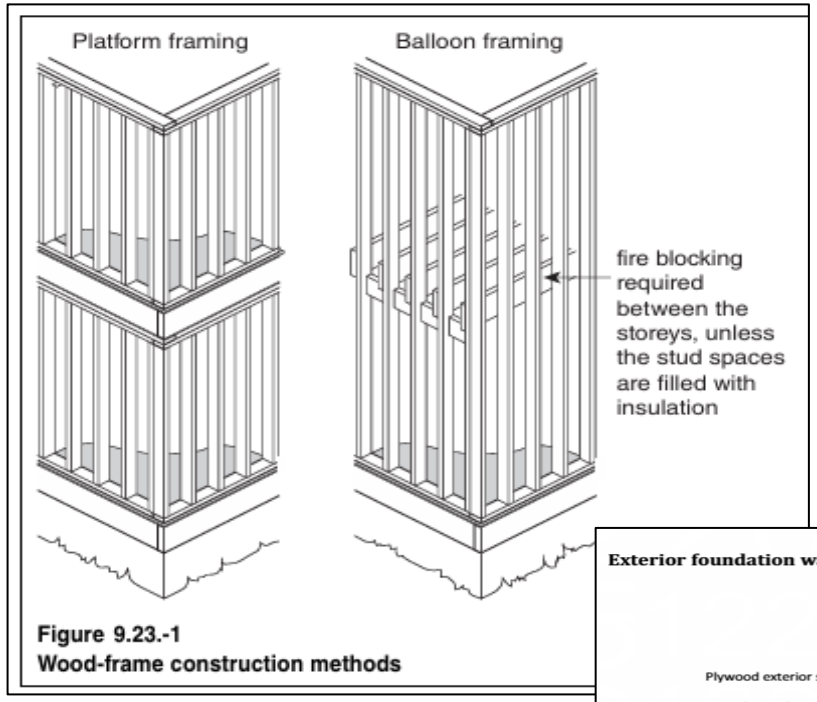
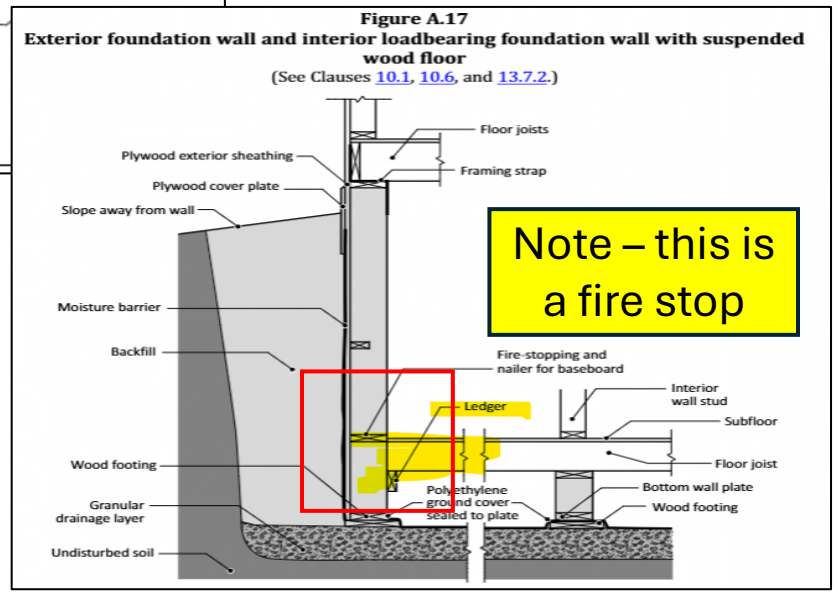


Figure 9.23.-1
Wood-frame construction methods

S406-16 Standard



9.10.16. Fire Blocking

9.10.16.1 Required Fire Blocks in Concealed Spaces

1) Vertical concealed spaces in interior walls and exterior walls shall be separated by fire blocks

a) one from the other, and

b) from horizontal concealed spaces.

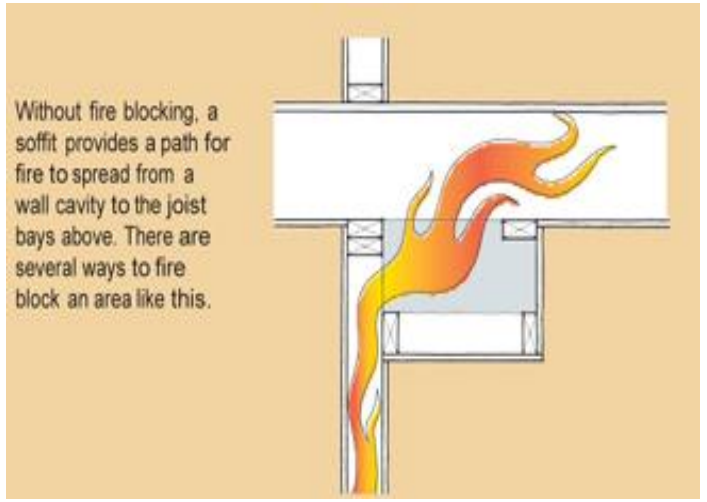
2) Horizontal concealed spaces in attics, roof spaces, ceilings, floors, and crawl spaces shall be separated by fire blocks

a) one from the other, and

b) from vertical concealed spaces.

3) Fire blocks shall be provided at all **interconnections between concealed vertical** and horizontal spaces in interior coved ceilings, drop ceilings and soffits where the exposed construction materials within the concealed spaces have a surface flame-spread rating greater than 25.

See also sentences – 4 to 7



If you can take your tape measure and run it up a wall into an attic or floor space then fire blocking is required.

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9.10.16. Fire Blocking

9.10.16.2. Required Fire Blocks in Wall Assemblies

1) Except as permitted in Sentence (2), fire blocks shall be provided to block off concealed spaces within wall assemblies, including spaces created by furring, a) at each floor level,

b) at each ceiling level where the ceiling contributes to part of the required fire-resistance rating, and

c) at other locations within the wall, so that the distance between fire blocks does not exceed 20 m horizontally and 3 m vertically.

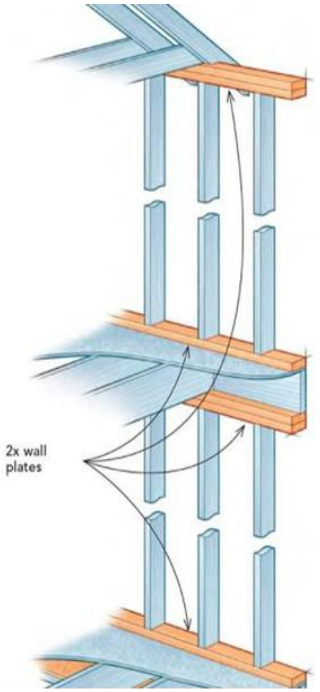
2) Fire blocks described in Sentence (1) are not required, provided

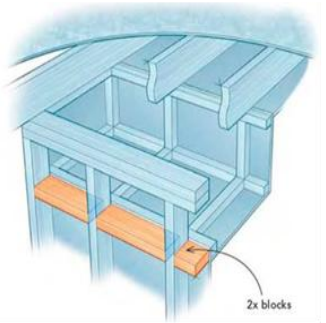
a) the insulated wall assembly contains not more than one concealed air space whose horizontal thickness is not more than 25 mm,

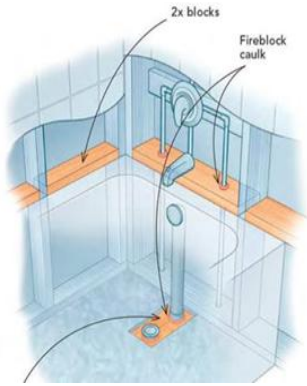
b) the exposed construction materials within the space are noncombustible,

c) the exposed construction materials within the space, including insulation, but not including wiring, piping or similar services, have a flame-spread rating of not more than 25, **or**

d) the concealed wall space is filled with insulation.







9.10.16. Fire Blocking

A building's overhanging eaves and appendages, such as exterior passageways, balconies and canopies, create spaces where fire can spread horizontally within concealed spaces.

Vertical fire blocks are, therefore, required at horizontal intervals of not more than 20 m (65 ft. 7 in.), and at locations where the construction extends across the ends of fire separations, such as in row housing with gambrel-type roofs (Figure 9.10.-32).

This requirement applies to both sprinklered and unsprinklered buildings.

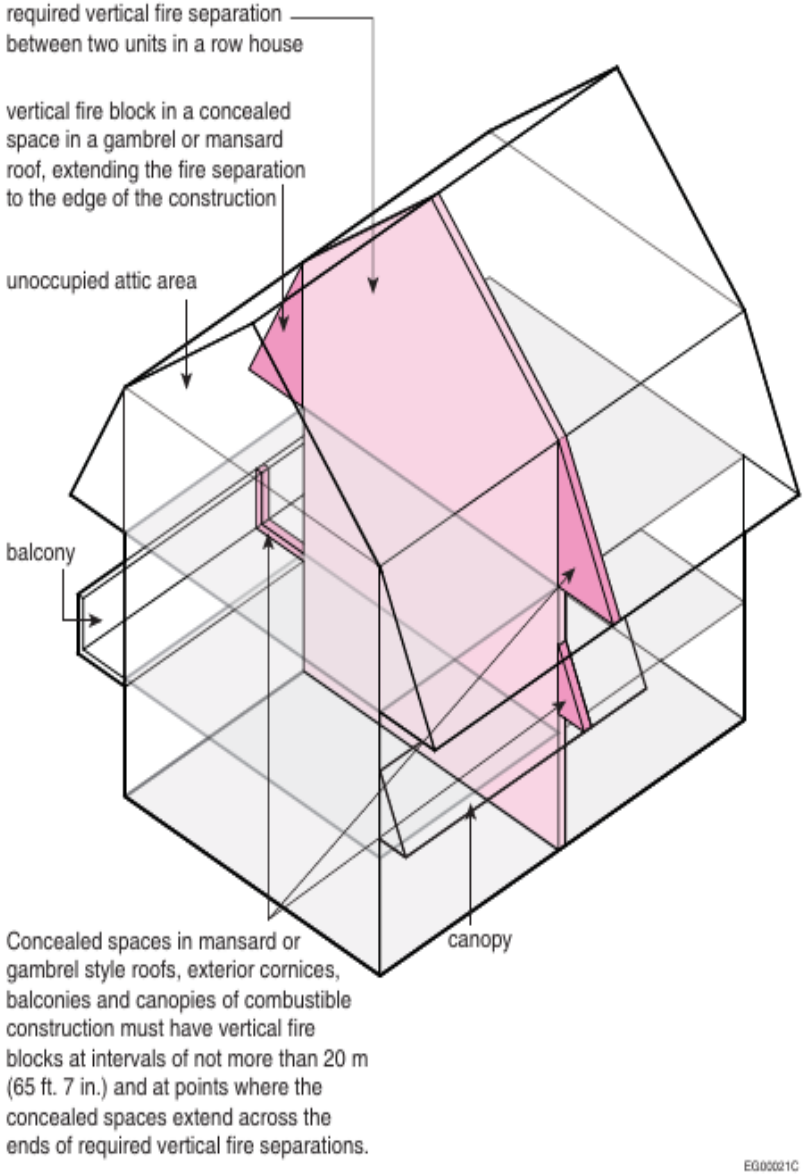


Figure 9.10.-32
Fire block locations in horizontal concealed spaces

Image from Illustrated User's Guide– NBC 2020

Fire Blocking – Exterior Walls

BCAB #1896 - Province of British Columbia

BCAB #1896

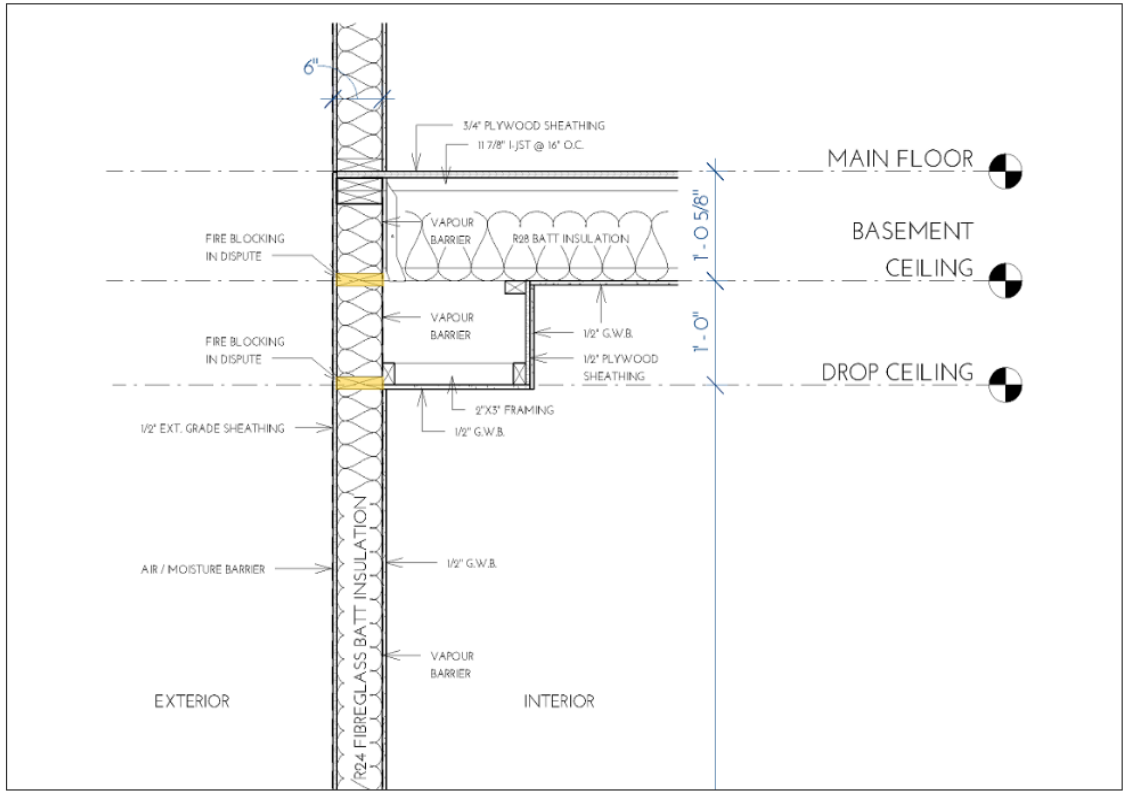
✦ Last updated on January 10, 2024

September 15, 2022

Re: Required Fire Blocking

Project Description

The project is a residential building (house) constructed under Part 9 of the BC Building Code. The exterior 3.37 m high wood frame walls of the walk out basement consists of 2X6 studs @ 16" O.C. with the top of the wall extending to the underside of the floor sheathing. The main floor system is 11 7/8" wood I-joists which are mounted to the exterior wall with top mounted hangers. The wall is filled with R24 batt insulation. (See detail below). Materials within the exterior walls and ceiling spaces have a flame spread rating greater than 25.



Appeal Board decision #1896

In this specific application, it is the determination of the Board that fire blocking within the concealed space of the exterior wall located at the plane of the bottom of the dropped bulkhead is required in order to comply with Sentences 9.10.16.1.(1) and (3). Further the Board does not consider the application of using insulation permitted by Clause 9.10.16.2.(2)(d) to satisfy the requirements of Sentence 9.10.16.1.(1) and (3).

Appellant's position

The appellant contends that as the **wall assembly cavity is fully insulated in accordance with Clause 9.10.16.2.(2)(d)** that the requirement for fire blocks in Sentence 9.10.16.1.(1) has been met.

9.10.16. Fire Blocks

9.10.16.3. Fire Block Materials

1) Except as permitted by Sentences (2) and (3), fire blocks shall be constructed of materials that will remain in place and prevent the passage of flames for not less than 15 min when subjected to the standard fire exposure in CAN/ULC-S101,"Standard Method of Fire Endurance Tests of Building Construction and Materials."

2) Fire blocks are deemed to comply with Sentence (1) if they are constructed of not less than

a) 0.38 mm sheet steel,

b) 12.7 mm gypsum board,

c) 12.5 mm plywood, OSB or waferboard, with joints having continuous supports,

d) two layers of lumber, each not less than 19 mm thick, with joints staggered, or

e) 38mmlumber.

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9.10.16. Fire Blocks

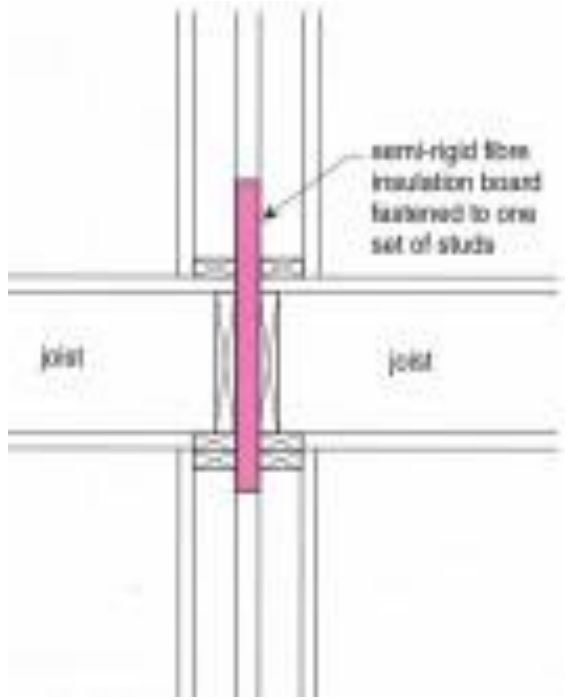
3) In a building permitted to be of combustible construction, semi-rigid fibre insulation board produced from glass, rock or slag is permitted to be used to block the vertical space in a double-frame wall assembly formed at the intersection of the floor assembly and the walls, provided the width of the vertical space does not exceed 25 mm and the insulation board

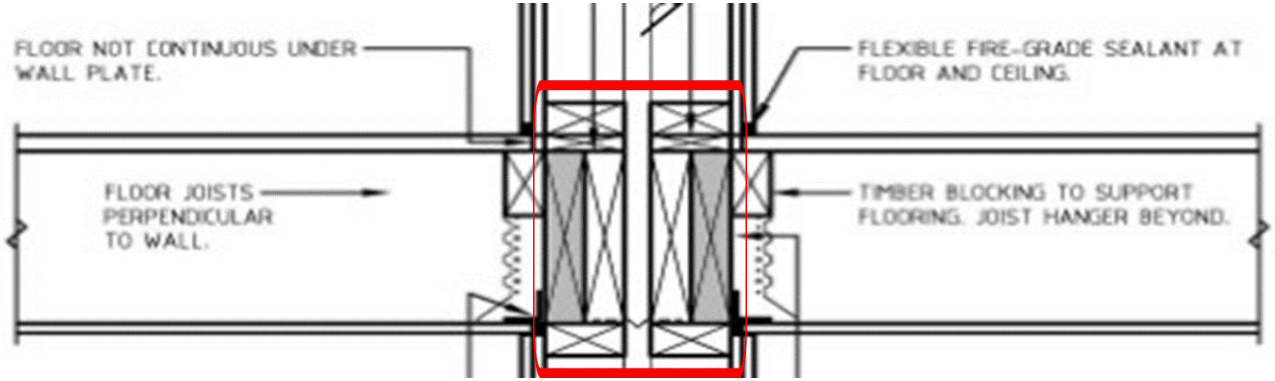
a) has a density not less than 45 kg/m3,

b) is securely fastened to one set of studs,

c) extends from below the bottom of the top plates in the lower storey to above the top of the bottom plate in the upper storey, and

d) completely fills the portion of the vertical space between the headers and between the wall plates. (See Note A-3.1.11.7.(8).





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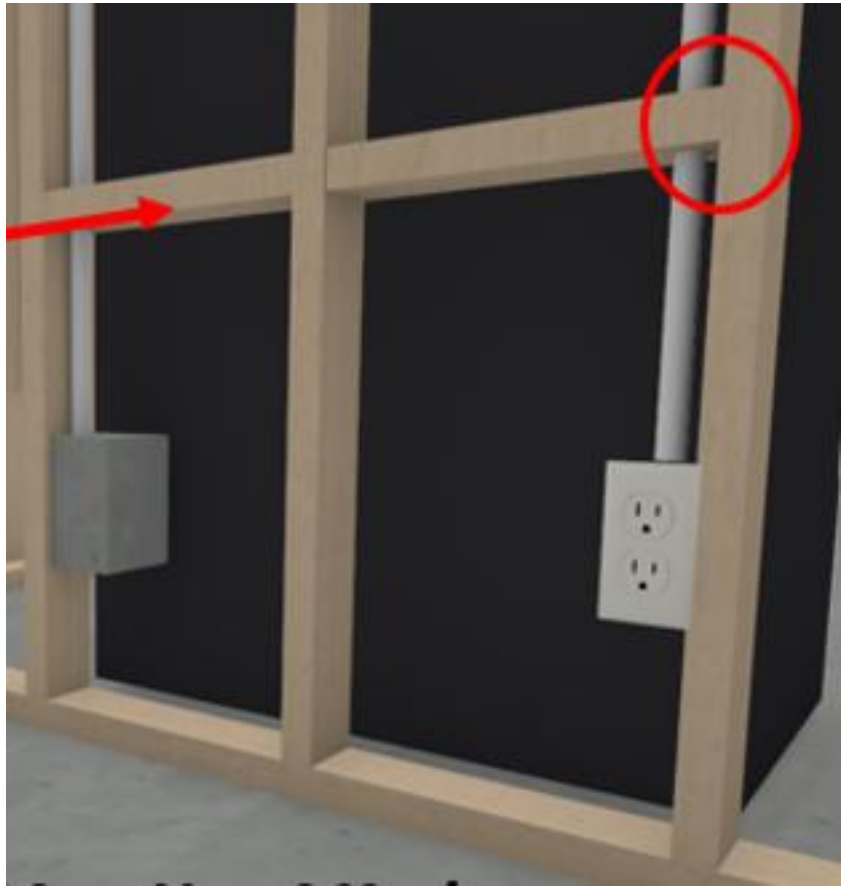
9.10.16. Fire Blocks

9.10.16.4. Penetration of Fire Blocks

1) Where fire blocks are pierced by pipes, ducts or other elements, the effectiveness of the fire blocks shall be maintained around such elements. (See also Note A-3.1.11.7.(7).)

A-3.1.11.7.(7) Integrity of Fire Blocks. Sentence 3.1.11.7.(7), together with Article 3.1.9.1., is intended to ensure that the integrity of fire blocks is maintained at areas where they are penetrated. This requirement is satisfied by the use of generic firestops such as mineral wool, gypsum plaster or Portland cement mortar, or by the use of sealants that form part of a firestop tested in accordance with CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems.”



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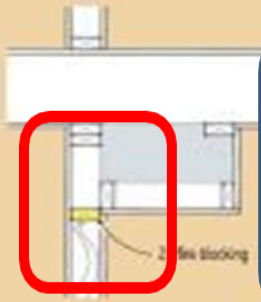
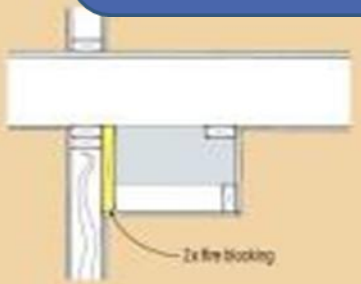
Fire-Blocking Strategies

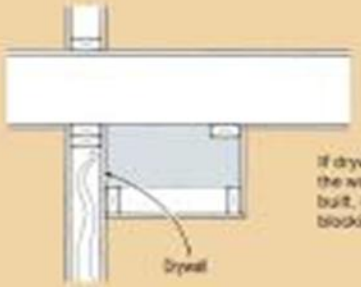
Without fire blocking, a soffit provides a path for fire to spread from a wall cavity to the joist bays above. There are several ways to fire block an area like this.



Who is allowing insul. Batts? 9.10.16.2 (d)

Installing a single piece of material across the face of the studs is often faster than using individual blocks. Approved materials include 2x lumber, ⅜" structural sheathing, and ½" drywall.





If drywall has been installed on the wall before the soffit is built, no additional fire blocking is needed.

Fire Blocking Locations

City of Penticton Handout

Permitted Fire Blocking Materials

- 0.38 mm sheet steel,
- 12.7 mm gypsum board,
- 12.5 mm plywood, OSB or waterboard, with joints having continuous supports,
- 2 layers of 19 mm lumber with joints staggered,
- 38 mm lumber

Fire Blocking Exemption for Walls

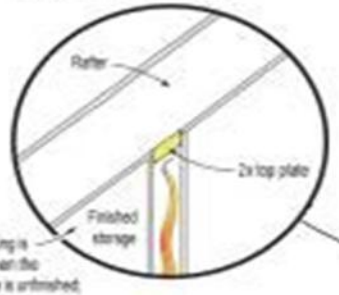
- No blocking required in walls where the wall is insulated and insulation is supported from moving in the cavity.

Penetrations

- Penetrations for wires and piping between horizontal and vertical spaces are required to be fire/smoke sealed.

Knee Walls

If the space behind the knee wall is finished, the stud bays must be fire blocked. Here, the top plate acts as the fire blocking, preventing flames from entering the rafter bay.

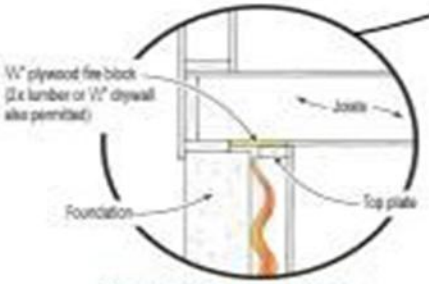


Note: Fire blocking is not required when the knee-wall space is unfinished; the stud bays are considered part of the unfinished attic.

Tub Deck

Fire blocking is required in the stud bays around a drop-in tub on interior walls.

Note: Blocking may be omitted if stud bay is filled with batt insulation.



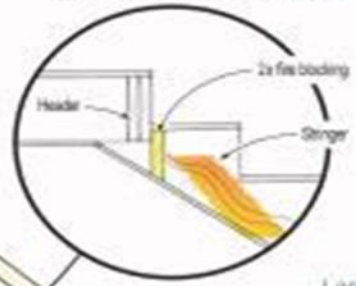
Perimeter Basement Walls

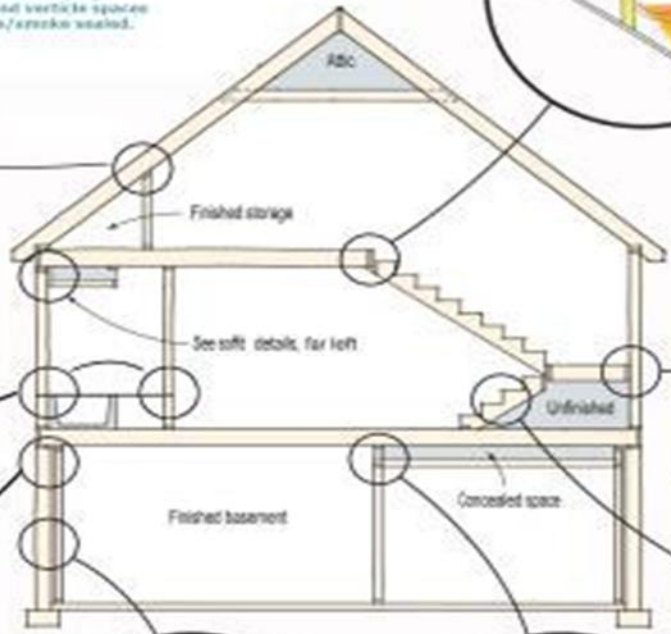
A space behind a 2x4 perimeter basement wall must be separated from the joist bays above.

9.10.16.2 - B.C.B.C.

Stair Stringers

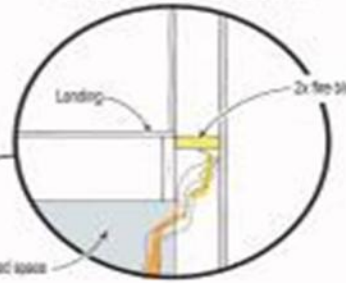
The space between stringers must be separated from the upper-story floor joist bays. 9.10.16.1 (4) - B.C.B.C.

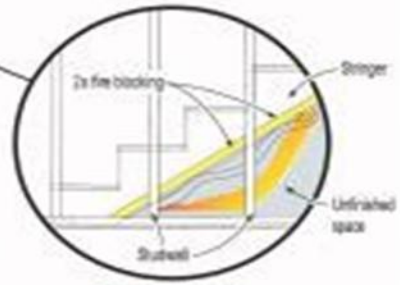




Landings

If the area underneath the landing is unfinished, the wall bays must be blocked.

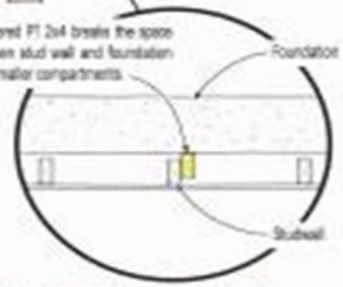




Stair Stringers

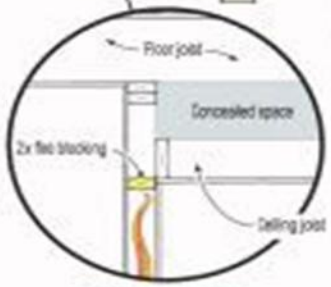
If the area below the stair is unfinished, fire blocks are required in the stud bays alongside the stringer. If the area beneath is finished with minimum ½" drywall, this blocking is typically not required.

A sidered Ft 2x4 breaks the space between stud wall and foundation into smaller compartments.



Concealed Spaces in Walls

When a wall is not drywalled or sheathed on both sides — which is typical of furred-out basement walls and double stud walls — there must be a full-height fire block every 20 meters horizontally. 9.10.16.1 (1) - B.C.B.C.



Dropped Ceilings

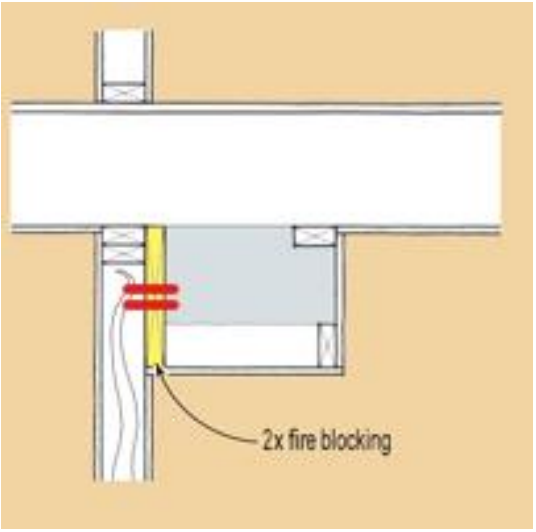
Dropped ceilings can be blocked in the same way as soffits (see "Fire-Blocking Strategies," far left).

9.10.16.1 (5) - B.C.B.C.

Fire Blocking Recommendation – site control

Much like for air barrier protection, the general contractor should educate all trades on importance on fire blocking and control where penetrations can be made.

Better yet, set up blocking first then where piping, wires and mechanical can run.



Questions?

9.10.17. Flame-Spread Limits

9.10.17.1 Flame-Spread Rating of Interior Surfaces

1) Except as otherwise provided in this Subsection, the exposed surface of every interior wall and ceiling, including skylights and glazing, shall have a surface flame-spread rating of **not more than 150.**

2) Except as permitted in Sentence (3), doors need not conform to Sentence (1) provided they have a surface flame-spread rating of **not more than 200**.

3) Doors within dwelling units, other than garage doors, need not conform to Sentences (1) and (2).

9.10.17.10. Protection of Foamed Plastics

Further restrictions apply for finishes in

- **Public corridors**
- **Exits**
- **Exterior Exit Passages**

Gypsum Board – 25/50
Lumber – 150/300
Plywood (unfin) – 150/100

9.10.18. Alarm and Detection Systems

9.10.18.2 Fire Alarm System Required

1) Except as permitted in Sentences (3) and (4), a fire alarm system shall be installed in buildings in which a sprinkler system is installed.

2) Except as provided in Sentence (5), a fire alarm system shall be installed

a) in every building that contains more than 3 storeys, including storeys below the first storey,

b) where the total occupant load exceeds 300, or

3) when the occupant load for any major occupancy in Table 9.10.18.2. is exceeded.

Interesting note – BCBC "is required"

Therefore, when required by Code or other conditions such as lack of fire department access or water supply requirements

Table 9.10.18.2.
Maximum Occupant Load for Buildings without Fire Alarm Systems
Forming Part of Sentence 9.10.18.2.(2)

Major Occupancy Classification	*Occupant Load* Above which a Fire Alarm System is Required
Residential	10 (sleeping accommodation)
Business and personal services, Mercantile	150 above or below the *first storey*
Low- or *medium-hazard industrial*	75 above or below the *first storey*

9.10.18. Alarm and Detection Systems

9.10.18.2 Fire Alarm System Required

3) In buildings in which a sprinkler system has been installed in accordance with NFPA13D,"Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes," a fire alarm system need not be installed.

4) In buildings that contain fewer than 9 sprinklers conforming to Sentence 3.2.5.12.(4), a fire alarm system need not be installed.

5) A fire alarm system is not required in a residential occupancy where an exit or public corridor serves not more than 4 suites or where each suite has direct access to an exterior exit facility leading to ground level.

Don't confuse - fire detectors - smoke alarms – smoke detectors

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9.10.18. Alarm and Detection Systems

Fire detector means a device that detects a fire condition and automatically initiates an electrical signal to actuate an alert signal or alarm signal and includes heat detectors and smoke detectors.

Smoke alarm means a combined smoke detector and audible alarm device designed to sound an alarm within the room or suite in which it is located upon the detection of smoke within that room or suite.

Smoke detector means a fire detector designed to operate when the concentration of airborne combustion products exceeds a predetermined level.

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Questions?

9.10.19. Smoke Alarms

9.10.19.1. Required Smoke Alarms

Required Smoke Alarms

1) Except as permitted by Article 9.10.19.8., smoke alarms conforming to CAN/ULC-S531, “Standard for Smoke Alarms,” shall be installed in

a) each dwelling unit,

b) each sleeping room not within a dwelling unit, and

c) ancillary spaces and common spaces not in dwelling units in a house with a secondary suite

Recommend reading this Subsection for a refresher.

9.10.19. Smoke Alarms

9.10.19.8. Residential Fire Warning Systems

1) Except where a fire alarm system is installed or required in a building, smoke detectors forming part of a residential fire warning system installed in conformance with CAN/ULC-S540, “Standard for Residential Fire and Life Safety Warning Systems: Installation, Inspection, Testing and Maintenance,” are permitted to be installed in lieu of all smoke alarms required by Articles 9.10.19.1. and 9.10.19.3., provided that the fire warning system

    a) is capable of sounding audible signals as stated in Articles9.10.19.2. and 9.10.19.5.,

    b) is powered as stated in Article 9.10.19.4., and

    c) is equipped with a silencing device as stated in Article 9.10.19.6.

9.10.20. Firefighting

9.10.20.3 Fire Department Access to Buildings

1) Access for fire department equipment shall be provided to each building by means of a street, private roadway or yard. (See Notes A-9.10.20.3.(1) and A-3.2.5.6.(1).)

2) Where access to a building as required in Sentence (1) is provided by means of a roadway or yard, the design and location of such roadway or yard shall take into account connection with public thoroughfares, weight of firefighting equipment, width of roadway, radius of curves, overhead clearance, location of fire hydrants, location of fire department connections and vehicular parking.

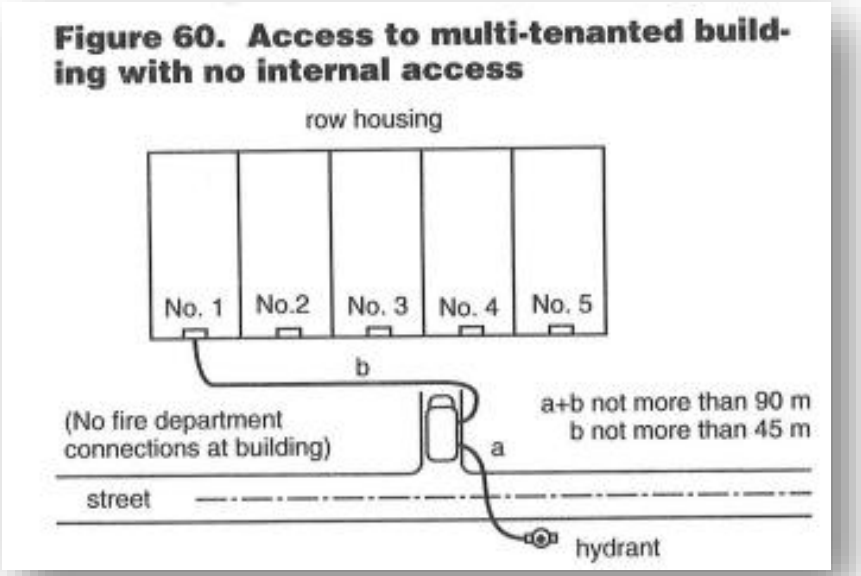
Note local challenges – Part 9 – water supply and fire access

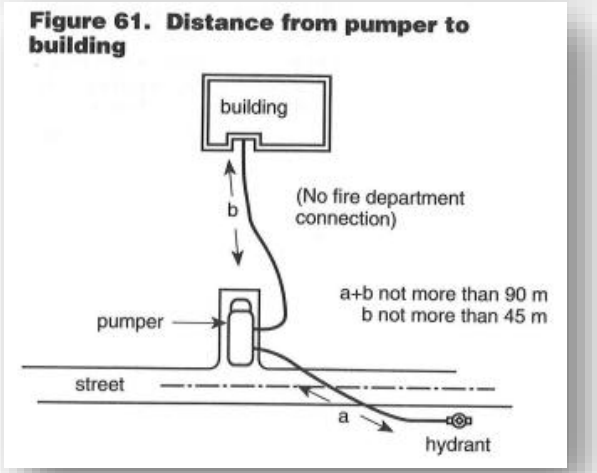
9.10.20. Firefighting

9.10.20.3 Fire Department Access to Buildings

A-9.10.20.3.(1) Fire Department Access Route Modification. In addition to other considerations taken into account in the planning of fire department access routes, special variations could be permitted for a house or residential building that is protected with an automatic sprinkler system.

The sprinkler system must be designed in accordance with the appropriate NFPA standard and there must be assurance that water supply pressure and quantity are unlikely to fail. **These considerations could apply to buildings that are located on the sides of hills and are not conveniently accessible by roads designed for firefighting equipment and also to <u>infill housing units that are located behind other buildings on a given property.</u>**





Illustrations taken from 1990 NBC guide

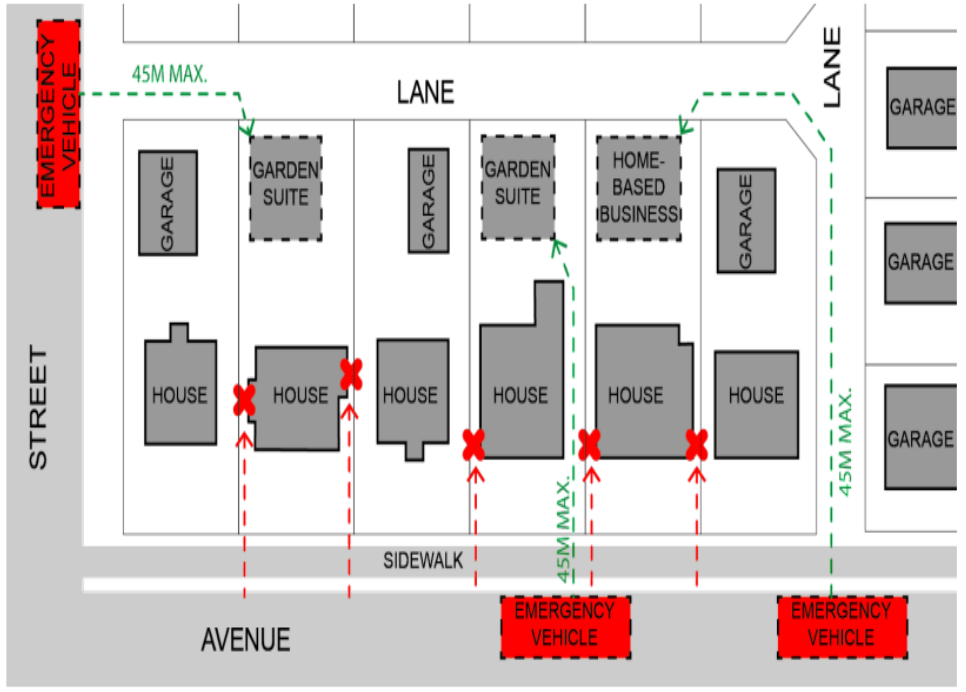
9.10.20. Firefighting

A-3.2.5.6.(1) Fire Department Access Route.

The design and construction of fire department access routes involves the consideration of many variables, some of which are specified in the requirements in the Code. All these variables should be considered in relation to the type and size of fire department vehicles available in the municipality or area where the building will be constructed. **It is appropriate, therefore, that the local fire department be consulted prior to the design and construction of access routes.**

Examples:

Access to garden suite or home-based business in backyard of mid-block house, where the lane does not meet the minimum requirements for access route (NBC(AE):3.2.5.6., 9.10.20.3.):



https://www.edmonton.ca/sites/default/files/public-files/assets/PDF/B19-04_Small_Building_Access_Policy.pdf?cb=1625655590

9.10.20. Firefighting

Increased density via laneway houses, duplexes and townhouses are triggering reviews of water supply for insurance purposes in most communities– outside scope of the Code.

Designs compliant with basic Part 9 are increasingly being required to add additional hydrants, fire suppression, reduce combustible design, add firewalls. This is adding costs to developments, however increased density adds additional risks that perhaps the Code is not fully taking into account.

The assumption can be made, that local governments would zone appropriately for uses and ensure basic water supplies are adequate for the allowable use – building type? Is this valid?

The Code is silent on this item for Part 9 vs Part 3 – 3.2.5.7, with many local governments referring to FUS, which is an old standard for calculating fire loads.

9.10.22. Fire Protection for Gas, Propane and Electric Cooktops and Ovens

Code references

9.10.22.1 Installation of Cooktops and Ovens

- natural gas and propane cooktops and ovens shall be installed in accordance with the applicable provincial or territorial regulations or municipal bylaws

9.10.22.2. Vertical Clearances above Cooktops

framing, finishes and cabinetry installed directly above the location of the cooktop

- shall be not less than 750 mm above the level of cooktop burners or elements, or
- reduced to 600 mm above the level of the elements or burners, provided the framing, finishes and cabinets
  - Non-combustible
  - protected by a metal hood

9.10.22.3 Protection around Cooktops

- gypsum board not less than 9.5 mm thick, or
- any material providing a fire-resistance rating of not less than 10 min and a **flame-spread rating** of not more than 25

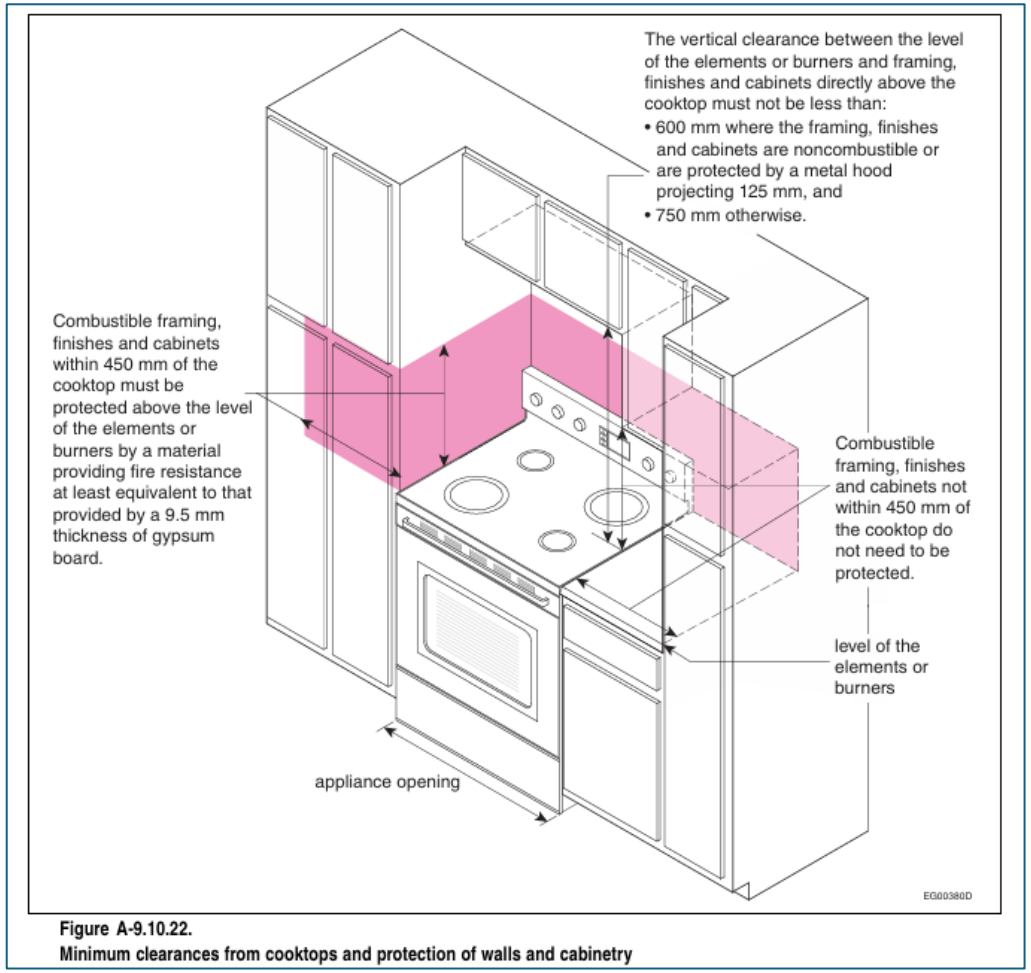


Figure A-9.10.22.
Minimum clearances from cooktops and protection of walls and cabinetry

Image from Illustrated User's Guide– NBC 2020

9.11. Sound Transmission

9.11.1.1. Required Protection

1) Except as provided in **Sentences (2) and (3),** a dwelling unit shall be separated from every other space in a building in which noise may be generated by

a) a separating assembly and adjoining constructions, which together provide an apparent sound transmission class (ASTC) rating of not less than 47, or

b) a separating assembly providing a sound transmission class (STC) rating of not less than 50 and adjoining constructions that conform to Article 9.11.1.4. (See Note A-9.11.1.4.)

9.11. Sound Transmission

9.11.1.1. Required Protection

2) Where a house contains a secondary suite, each dwelling unit shall be separated from every other space in the house in which noise may be transmitted by

a) construction

i) whose joist spaces are filled with sound-absorbing material of not less than 150 mm nominal thickness,

ii) whose stud spaces are filled with sound-absorbing material,

iii) having a resilient channel on one side of the separation spaced 400 or 600 mm o.c., and iv) having not less than 12.7 mm thick gypsum board on ceilings and on both sides of walls,

b) construction providing an STC rating of not less than 43, or

c) a separating assembly and adjoining constructions, which together provide an ASTC rating of not less than 40.

(See Note A-9.11.1.1.(2).)

9.11. Sound Transmission

Determination of Sound Transmission Ratings

1) The STC ratings shall be determined in accordance with ASTM E413, "Classification for Rating Sound Insulation," using the results from measurements carried out in accordance with ASTM E90, "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements."

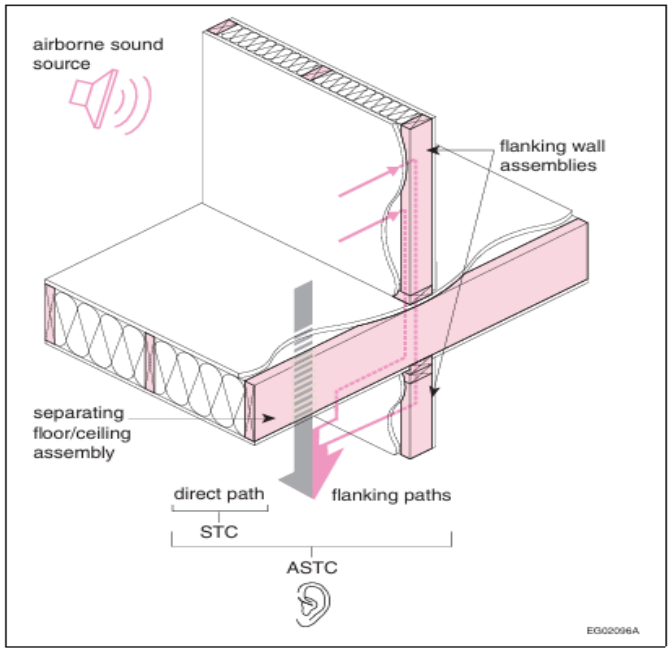


Figure A-9.11.-B
Vertical sound transmission paths at wall/floor junction

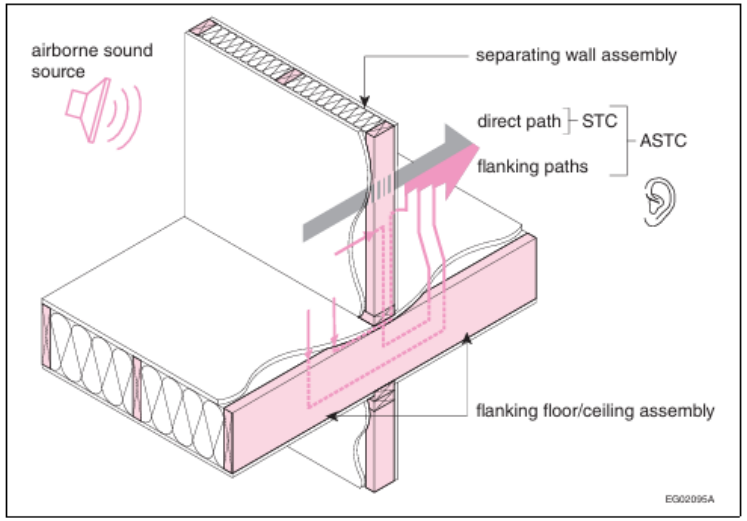


Figure A-9.11.-A
Horizontal sound transmission paths at floor/wall junction

Questions?

Building Permit Application

BP

- BP Application

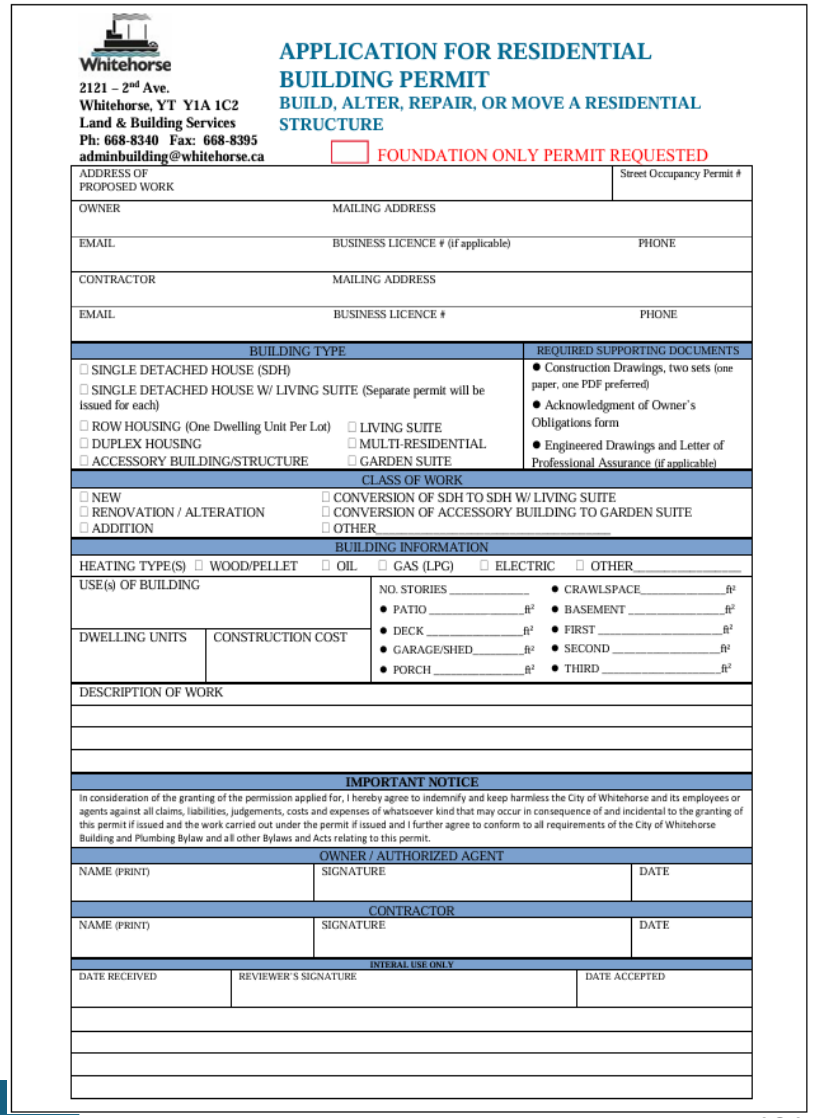
It is critical to ensure that the BP application is filled out and all required information has been provided. Please read the application package in full to ensure all the required information is provided.

In 2025, to improve the efficiency of the plan review process, incomplete building permit applications will not be accepted.

Please note that the DP site plan and lot grading information matches the BP drawings.

Separate projects such as a Garden Suites will require a separate BP application.

Link - 1Residential-Permit-Application-Form-V.3.1-July-2019.pdf



Whitehorse
2121 – 2nd Ave.
Whitehorse, YT Y1A 1C2
Land & Building Services
Ph: 668-8340 Fax: 668-8395
adminbuilding@whitehorse.ca

APPLICATION FOR RESIDENTIAL BUILDING PERMIT
BUILD, ALTER, REPAIR, OR MOVE A RESIDENTIAL STRUCTURE

☐ FOUNDATION ONLY PERMIT REQUESTED

ADDRESS OF PROPOSED WORK | Street Occupancy Permit #
OWNER | MAILING ADDRESS
EMAIL | BUSINESS LICENCE # (if applicable) | PHONE
CONTRACTOR | MAILING ADDRESS
EMAIL | BUSINESS LICENCE # | PHONE

BUILDING TYPE
☐ SINGLE DETACHED HOUSE (SDH)
☐ SINGLE DETACHED HOUSE W/ LIVING SUITE (Separate permit will be issued for each)
☐ ROW HOUSING (One Dwelling Unit Per Lot) ☐ LIVING SUITE
☐ DUPLEX HOUSING ☐ MULTI-RESIDENTIAL
☐ ACCESSORY BUILDING/STRUCTURE ☐ GARDEN SUITE

REQUIRED SUPPORTING DOCUMENTS
- Construction Drawings, two sets (one paper, one PDF preferred)
- Acknowledgment of Owner's Obligations form
- Engineered Drawings and Letter of Professional Assurance (if applicable)

CLASS OF WORK
☐ NEW
☐ RENOVATION / ALTERATION
☐ ADDITION
☐ CONVERSION OF SDH TO SDH W/ LIVING SUITE
☐ CONVERSION OF ACCESSORY BUILDING TO GARDEN SUITE
☐ OTHER_____

BUILDING INFORMATION
HEATING TYPE(S) ☐ WOOD/PELLET ☐ OIL ☐ GAS (LPG) ☐ ELECTRIC ☐ OTHER_____
USE(s) OF BUILDING
DWELLING UNITS | CONSTRUCTION COST
NO. STORIES _____
- PATIO _____ ft²
- DECK _____ ft²
- GARAGE/SHED _____ ft²
- PORCH _____ ft²
- CRAWLSPACE _____ ft²
- BASEMENT _____ ft²
- FIRST _____ ft²
- SECOND _____ ft²
- THIRD _____ ft²

DESCRIPTION OF WORK

IMPORTANT NOTICE
In consideration of the granting of the permission applied for, I hereby agree to indemnify and keep harmless the City of Whitehorse and its employees or agents against all claims, liabilities, judgements, costs and expenses of whatsoever kind that may occur in consequence of and incidental to the granting of this permit if issued and the work carried out under the permit if issued and I further agree to conform to all requirements of the City of Whitehorse Building and Plumbing Bylaw and all other Bylaws and Acts relating to this permit.

OWNER / AUTHORIZED AGENT
NAME (PRINT) | SIGNATURE | DATE

CONTRACTOR
NAME (PRINT) | SIGNATURE | DATE

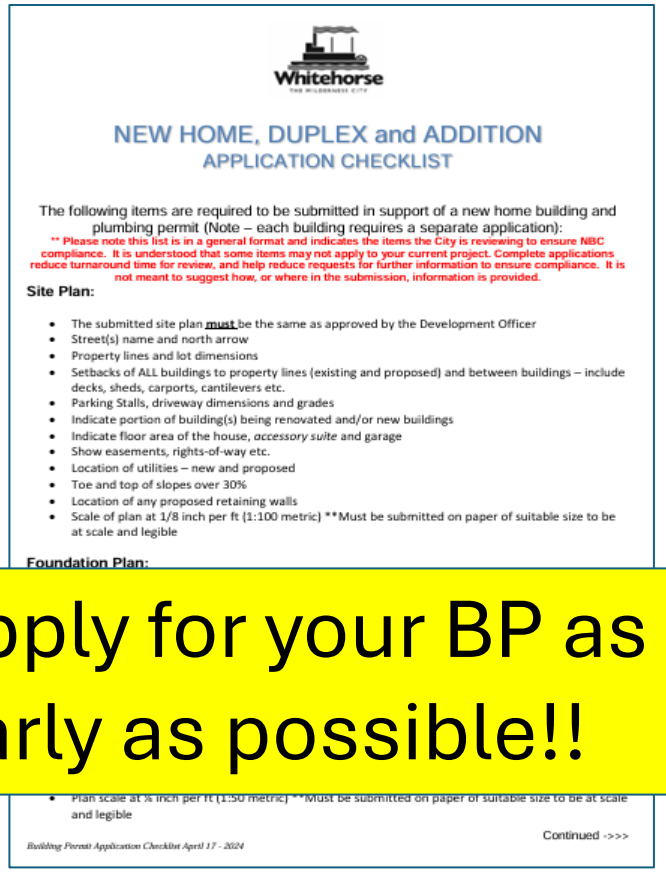
INTERAL USE ONLY
DATE RECEIVED | REVIEWER'S SIGNATURE | DATE ACCEPTED

Building Permit Application

BP

- BP Application

Refer to the City's permit drawing checklist to ensure the minimum requirements to show substantial compliance with the National Building Code and Municipal regulations. It is understood that some items may not apply to your current project. Drawings should provide enough information to show substantial compliance to Code and city regulations, which will reduce turnaround time for review, and help reduce requests for further information to ensure compliance.



Whitehorse

NEW HOME, DUPLEX and ADDITION
APPLICATION CHECKLIST

The following items are required to be submitted in support of a new home building and plumbing permit (Note – each building requires a separate application):
** Please note this list is in a general format and indicates the items the City is reviewing to ensure NBC compliance. It is understood that some items may not apply to your current project. Complete applications reduce turnaround time for review, and help reduce requests for further information to ensure compliance. It is not meant to suggest how, or where in the submission, information is provided.

Site Plan:

- The submitted site plan must be the same as approved by the Development Officer
- Street(s) name and north arrow
- Property lines and lot dimensions
- Setbacks of ALL buildings to property lines (existing and proposed) and between buildings – include decks, sheds, carports, cantilevers etc.
- Parking Stalls, driveway dimensions and grades
- Indicate portion of building(s) being renovated and/or new buildings
- Indicate floor area of the house, *accessory suite* and garage
- Show easements, rights-of-way etc.
- Location of utilities – new and proposed
- Toe and top of slopes over 30%
- Location of any proposed retaining walls
- Scale of plan at 1/8 inch per ft (1:100 metric) **Must be submitted on paper of suitable size to be at scale and legible

Foundation Plan:

- Plan scale at ¼ inch per ft (1:50 metric) **Must be submitted on paper of suitable size to be at scale and legible

Building Permit Application Checklist April 17 - 2024

Continued ->>>

Apply for your BP as early as possible!!

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Building Permit Drawings

BP

- **BP Application**

It is important to be aware of the requirements of 9.10 Fire Protection and the information to supply on permit drawings.
The following items should be identified on the building permit drawing set:

- **Site Plan**
  - Fire Department Access & closet hydrant location
  - Clear and Open Space
- **Floor Plan**
  - Fire(Smoke) & Sound separations
  - Note related to fire stopping and fire blocking
- **Elevations**
  - Spatial Calculations
  - Exterior exit protection
- **Sections/Details**
  - Fire (Smoke) & Sound separations
  - Fire blocking and Fire Stopping details

Also refer to FP requirements

Table 9.10.-B
Fire Protection Requirements for Detached Houses

Subject	NBC Reference
Fire resistance of exterior walls (for houses within 1.2 m (3 ft. 11 in.) of property line)	9.10.1.1., Sloped Roofs; 9.10.3.1., Fire-Resistance and Fire-Protection Ratings; 9.10.3.3., Fire Exposure; 9.10.15.4., Glazed Openings in Exposing Building Face; and 9.10.15.5., Construction of Exposing Building Face of Houses
Surface flame spread on walls and ceilings	9.10.3.2., Flame-Spread Ratings; 9.10.17.1., Flame-Spread Rating of Interior Surfaces; 9.10.17.10., Protection of Foamed Plastics; and 9.10.17.11., Walls and Ceilings in Bathrooms
Construction between houses and attached garages	9.10.9.16., Separation of Storage Garages; and 9.10.13.15., Doors between Garages and Dwelling Units
Spatial separations between houses	9.10.15., Spatial Separation Between Houses
Fire blocks in concealed spaces	9.10.16., Fire Blocks
Protection of foam insulation	9.10.17.10., Protection of Foamed Plastics
Smoke alarms	9.10.19., Smoke Alarms
Fire department access	9.10.20.3., Fire Department Access to Buildings

Building Permit Inspections – New SFH

BP • BP Inspections

3) Framing/Insulation Inspections

Minimum on-site conditions and documents reviewed:

- Previous - inspection deficiencies completed,
- Review of substantial changes of layout or use,
- Verification of spatial calculation – no changes to window sizes
- Back-framing and fire blocking and backing for firestopping to be substantial completed,
- Soffit protection within attic spaces,
- Sound barrier installation – resilient channels

Separate fire separation may be required.

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Building Permit Inspections – New SFH

BP • BP Inspections

3) Final - Occupancy

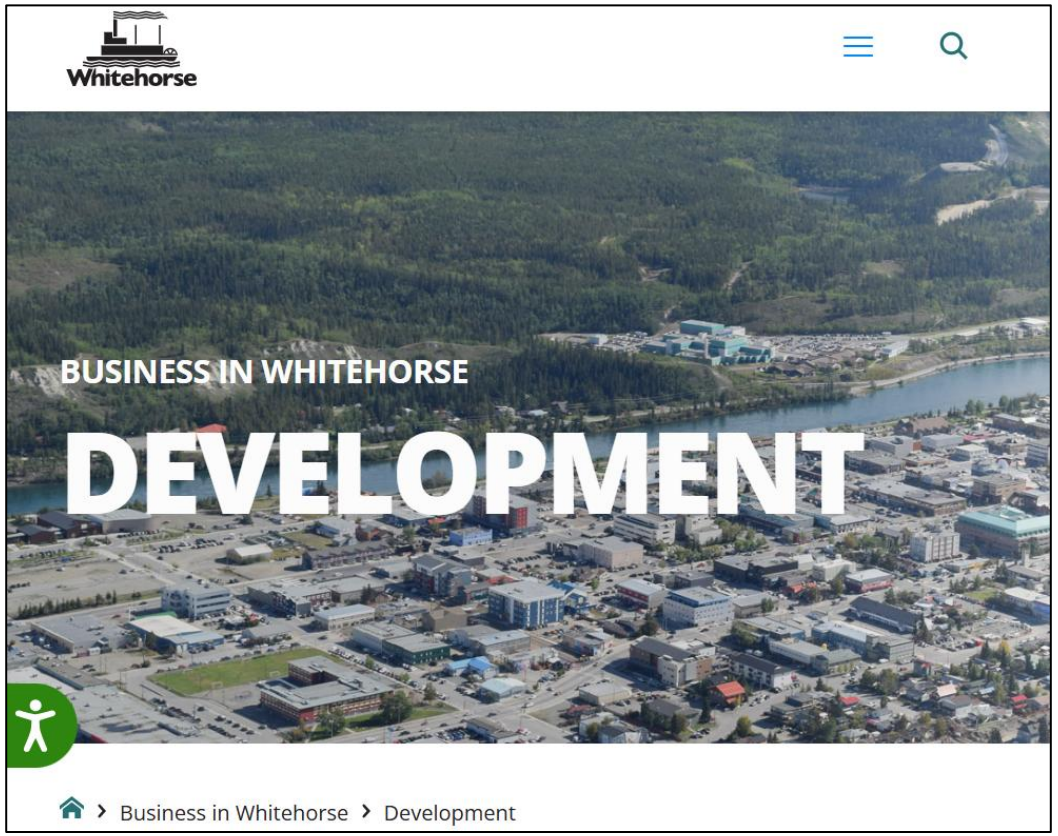
Minimum on-site conditions and documents reviewed:

- Previous - inspection deficiencies completed,
- Review of substantial changes of layout or use – revised as-built drawings may be required,
- Verification of fire alarm and fire-suppression systems (Letter of Assurances)
- Smoke alarm covers to be removed and ready for testing
- Completion of fire separations and required fire-stopping – drywall joints to be completed in unfinished spaces including attics
- Soffit protection for spatial (if required) and fire protection,
- Fire department access routes and required signage
- Completion of firewalls (where appliable) – no damage or additional penetrations – sign off from Engineer.
- Kitchen cabinet clearances

FLYWHEEL BUILDING SOLUTIONS

When in doubt – reach out

Development - City of Whitehorse



Land And Building Services

Land and Building Services: 867-668-8346, 867-668-8340, or 867-668-8330
Land Services including subdivisions and lot sales: land@whitehorse.ca
Business Licenses: adminbuilding@whitehorse.ca
Building Inspections: inquirybuilding@whitehorse.ca
Development Permits, Zoning Inquiries: development@whitehorse.ca

Duke, Peter

Manager, Land and Building Services
peter.duke@whitehorse.ca

Gau, Mike

Director, Development Services
mike.gau@whitehorse.ca

FLYWHEEL BUILDING SOLUTIONS

Next Session – March 26th – 9am

Building Envelope and Mechanical Systems

Please forward any questions or comments to Ken at ken.flywheel@gmail.com

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BUILDING SOLUTIONS

Questions?