Canada National Codes
Canada Building Codes

- **Canadian National Building Code – (NBC)**
- **US, Middle East, Caribbean, Parts of Asia**
  - International Building Code (ICC’s IBC) – Chapter 7
    - New Construction
  - International Fire Code (IFC) – Chapter 7
    - Existing Buildings, Enforced by Fire Marshal
  - NFPA 5000 & **NFPA 101**
    - Chapter 8
    - NFPA 101 @ New Brunswick

- **Minimum requirements for Construction & Maintenance**
Canada Building Codes

**National Building Code of Canada (NBC)**

- Health, Safety, Accessibility, Protection from Fire, Structural Damage.
  - New Construction
  - Demolition or Relocation
  - Building Use Changes
  - Significant Renovation, Alteration
  - Provinces, Energy...
Canada Building Codes

National Fire Code of Canada (NBC)

- **Buildings in Use...**Regulate activities that create fire hazards.
- **Maintenance**
- **Safe use of combustible materials in buildings – new, existing.**
- **Fire safety plans.**
- **Reduce likelihood of fires, limit damage...**handling dangerous materials.
Canada Building Codes

The Canadian Commission on Building and Fire Codes (CCBFC):

- Committees formed by NRC
- Standing Committee Volunteers appointed by NRC
- Committee Members – Individuals, not companies.
- Task Groups, Work Groups
- Regulators, construction industry & public interest
- NBC, NFC, NPC Codes

NRC Oversees the code development system.

Standards Development Organizations.

https://www.nrc-cnrc.gc.ca/eng/solutions/advisory/codes_centre/codes_developed.html
Canada Building Codes

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Canada Building Codes

- Canada Codes - Five Year Cycle
- IBC – Three Year Cycle
- NFPA – Three Year Cycle
Canada Building Codes

- **Canada Codes - Five Year Cycle**
- **Public Review – Key to Success**
  - General Public
  - Provinces & Territories
- **Standing Committees**
- **CCBFC...**
  - Approve
  - Deferred
  - Withdrawn

- **codes@nrc-cnrc.gc.ca**
Canada Building Codes

• **National Building Code of Canada**
  – NBC – New Construction Code
    • Adopt Entirely
    • Adapt With Amendments
    • Publish Provincial Code based on National Code

• **National Fire Code of Canada**
  – NFC - Existing Buildings
  – NFPA 101 - Newfoundland & Labrador

• **National Plumbing, Energy for Buildings, Farm Building Codes of Canada**
Canada Building Codes

• FCIA @ NBC/NFC Code Development Process
  – Proposals – Summer, 2017
    • Jim Smiley, rep. FCIA, proponent.
  – 1st Meeting - Sept. 21-23, 2016 Ottawa
  – Teleconferences - Sept. 14, 2017, etc.
  – Committees with Open Meetings
  – Task Groups, Work Groups to TG’s
  – Committee Consensus Process
  – Standing Committee recommendations
  – Canada Commission on Building and Fire Codes
Canada Building Codes

• **Submissions**

• CCR’s – Code Change Request
  – Sorted by Staff @ Codes Canada – SC

• **Staff Sends to ...**
  – Standing Committee
    • Working Group
    • Task Group
  – Executive Committee
  – Provinces and Territories
Canada Building Codes

- CCR’S
  - If not Admin...
  - To SC – Standing Committee(s)
    - Determine if it becomes a Proposed Change Form (PCF)
    - Determine how hard it is to become a Proposed Change
    - Working Group?
    - Task Group?
Canada Building Codes

• SC Might...
  – Appoint a Working Group, if minor effort (WG)
    • WG = Closed meetings.
    • WG is Standing Committee Members Only
    • Outsiders can be appointed to WG
  – Appoint Task Group if other than minor
    • Open to SC and non SC Members
  – Take action – on recommendations, possibly.
    • SC Meetings are open.
    • SC Actions final, not WG or TG
Canada Building Codes

• Provincial/Territory Input –
  – If Training, regulatory enforcement required, cost to jurisdiction...no industry in discussion.

• To Executive Committee
  – Determinations...
FCIA’s National Building Code of Canada Proposals - Summary

• Add New Requirements
  – FM 4991 Approved OR UL Qualified Firestop Contractors
  – ASTM E 2174 and ASTM E 2393 Standards for Firestop Inspection

• Add FM 4991, UL QFC, and “Breach”

• Change “Fire Stop to “Firestop”

• Require an “Inventory”
  – Fire Separations
  – Firestops, Fire Doors, Fire Dampers, Firestop Systems...for building maintenance.

• Repair Damage to Fire Separations

• Require Documentation
FCIA’s NBC Code Proposal 1

Code Change Request - Section
NBC 2015 Division B, Table 1.3.1.2

Subject
Add Standards for Approval or Qualification of Firestop Contractors and Inspection of Firestops.

Status
Executive Committee Reviewing, before review by the Standing Committee
FCIA’s NBC Code Proposal 1

The Problem

The problem currently is that highly technical firestop systems are installed by companies and their employees who have no idea what it takes to comply with tested and listed firestop systems and the manufacturers' installation instructions. Firestop products are bought through the retail stores with no qualifications required to install such a technical, life safety product. Many construction industry participating companies direct employees to firestop by: 'put that fire caulk around the breaches in the fire separation'...which accomplishes nothing.

This code proposal fixes that weakness by requiring that companies who have the specialized knowledge to install firestopping to the exacting firestop system detailed requirements.

Secondly, there is no inspection required for life safety firestop systems. This proposal introduces the concept.
FCIA’s NBC Code Proposal 1

• **Requested change /addition:**
  Add the following as standards to section 1.3.1.2, Division B.
  – FM 4991, Standard for the Approval of Firestop Contractors
  – UL Qualified Firestop Contractor Program
  – ASTM E2174, Standard Practice for the On-Site Inspection of Installed Firestops
  – ASTM E2393, Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers
FCIA’s NBC Code Proposal 1

- **Justification/explanation**

  Proper **Design, Installation, Inspection and Maintenance of Firestop Systems** is critical to fire and life safety in buildings because firestopping is used in everything from egress corridors to separation of spaces both vertically and horizontally. Firestopping is a highly technical industry, requiring specialized knowledge at the firestop contracting firm in the office and field to analyze conditions on construction.
FCIA NBC Code Proposal 2

• **Code Change Request** - - Sections - Division B 3.1.15.16.(3) (c; 3.1.9.1.(1), (1a) , 3.1.9.1.(2), 3.1.9.1.(3), 3.1.9.4(4), 9.10.9.6, A-3.1.9.1

• **Subject**
  Add Standards for approval or qualification of firestop contractors and inspection of firestops in addition to adding language to clarify in the code that firestopping is about protecting the breach in the fire separation or fire wall.
FCIA NBC Code Proposal 2

• Problem
  – What is being treated by a firestop system?
  – The 'breach' around the penetrating item.
  – The breach is not always 'sealed'.
  – An assemblage of materials is used to protect the breach in the fire-resistance rated assembly.

• Highly technical firestop systems are installed by companies and their employees who have no idea what it takes to comply with tested and listed firestop systems and the manufacturers' installation instructions.
  – Firestop products are bought through the retail stores
  – No qualifications required to install such a technical, life safety product.
  – Many companies direct employees to firestop by: 'put that fire caulk in the holes'...which accomplishes nothing.

• This code proposal fixes that weakness by requiring that companies who have the specialized knowledge to install firestopping to the exacting firestop system detailed requirements and requiring inspection.
FCIA NBC Code Proposal 2

• Requested Change/Addition: 3.1.15.16.(3) c)

• piping that penetrates a breach in a fire separation is protected at the penetration by a firestop that has an FT rating not less than the fire-resistance rating of the fire separation when subjected to the fire test method in CAN/ULC-S115, “Fire Tests of Firestop Systems,” with a pressure differential of 50 Pa between the exposed and unexposed sides, with the higher pressure on the exposed side and installed to tested and listed system design and the manufacturers installation instructions by a contractor who is either FM 4991 Approved or ULC Qualified. Penetration Firestop Systems shall be inspected to ASTM E 2174.
FCIA NBC Code Proposal 2

- **Requested Change/Addition:**
  3.1.9.1. Firestops

- 1) Except as required by Sentences (2) and (3), and permitted by Sentences (4) and (5), penetrations through breaches of a fire separation or a membrane forming part of an assembly required to have a fire-resistance rating shall be:

  a) protected by a firestop that, when subjected to the fire test method in CAN/ULC-S115, “Fire Tests of Firestop Systems,” has an F rating not less than the fire-protection rating required for closures in the fire separation in conformance with Table 3.1.8.4., installed to the tested and listed system design and manufacturers installation instructions by a contractor who is either FM 4991 Approved or ULC Qualified.

  Firestop Systems shall be inspected to ASTM E 2174.
FCIA NBC Code Proposal 2

- **Requested Change/Addition: 3.1.9.1.(2)**
Penetrations through a breach of a firewall or a horizontal fire separation that is required to have a fire-resistance rating in conformance with Article 3.2.1.2. shall be protected at the breach where the penetration takes place by a firestop that, when subjected to the fire test method in CAN/ULC-S115, “Fire Tests of Firestop Systems,” has an FT rating not less than the fire-resistance rating for the fire separation installed to the tested and listed system design and manufacturers installation instructions by a contractor who is either FM 4991 Approved or ULC Qualified. Firestop Systems shall be inspected to ASTM E 2174.

- **3.1.9.1.(3)**
Penetrations through a breach of a fire separation in conformance with Sentence 3.6.4.2.(2) shall be protected by a firestop that, when subjected to the fire test method in CAN/ULC-S115, “Fire Tests of Firestop Systems,” has an FT rating not less than the fire-resistance rating for the fire separation of the assembly installed to the tested and listed system design and manufacturers installation instructions by a contractor who is either FM 4991 Approved or ULC Qualified. Firestop Systems shall be inspected to ASTM E 2174.
FCIA NBC Code Proposal 2

- **Requested Change/Addition:**
  3.1.9.4.(4)
  
  Combustible drain, waste and vent piping is permitted to penetrate a breach in a fire separation required to have a fire-resistance rating or a breach in a membrane that forms part of an assembly required to have a fire-resistance rating, provided

  a) the piping is protected at the penetration by a firestop that has an F rating not less than the fire-resistance rating required for the fire separation when subjected to the fire test method in CAN/ULC-S115, “Fire Tests of Firestop Systems,” with a pressure differential of 50 Pa between the exposed and unexposed sides, with the higher pressure on the exposed side, is installed to the tested and listed system design and manufacturers installation instructions by a contractor who is either FM 4991 Approved or ULC Qualified. Firestop Systems shall be inspected to ASTM E 2174.

  and

  b) the piping is not located in a vertical service space.

- **9.10.9.6 - Penetration of Fire Separations - (See A-3.1.9. in Appendix A.)**
  1) Piping, tubing, ducts, chimneys, wiring, conduit, electrical outlet boxes and other similar service equipment that penetrate a breach in a required fire separation shall be tightly fitted or firestopped to maintain the integrity of the separation. (See Appendix A.)

  2) Penetrations of a firewall shall be protected at the breach of the penetration by a fire stop that, when subjected to the fire test method in CAN/ULC-S115, “Fire Tests of Firestop Systems,” has an FT rating not less than the fire-resistance rating for the fire separation and is installed to the tested and listed system design and manufacturers installation instructions by a contractor who is either FM 4991 Approved or ULC Qualified. Firestop Systems shall be inspected to ASTM E 2174.

- **A-3.1.9. Penetrations.** In the application of Subsection 3.1.9., a building service is considered to penetrate through the breach of an assembly if it passes into or through the breach in the assembly. In some situations a service item enters an assembly through a breach in a membrane at one location, runs within the assembly, and then leaves the assembly through a breach in a membrane at another location.
FCIA NBC Code Proposal 2

- **Code Change Request** - Sections - Division B
  A-3.1.9. Penetrations. In the application of Subsection 3.1.9., a building service is considered to penetrate **through the breach** of an assembly if it passes into or **through the breach in** the assembly. In some situations a service item enters an assembly **through a breach** in a membrane at one location, runs within the assembly, and then leaves the assembly **through a breach** in a membrane at another location.

The term “membrane penetration” usually designates **a breach made and a penetrating item(s)** entering through one side (wall, floor or ceiling membrane) of an assembly, whereas the term “through-penetration” designates **a breach made and a penetrating item(s)** that passes through **the breach in** both sides of an entire fire resistance rated assembly. Firestopping of membrane penetrations involves installing a material, device or construction to resist for a prescribed time period the passage of flame and heat through breaches in a protective membrane caused by cables, cable trays, conduit, tubing, pipes or similar items passing through **the breach**. Firestopping of a through-penetration involves installing an assemblage of specific materials or products that are designed, tested and fire-resistance rated to resist for a prescribed period of time the spread of fire **through the breaches** made for penetrating items. Products for firestopping within **the breach** in a barrier or separation are required to address movement of the assembly and to control smoke spread; as such, the flexibility of the material used at the flexible joints as well as the nature of the assembly and its potential movement must be taken into consideration. **Firestopping is installed to the tested and listed system design and manufacturers installation instructions. Firestopping is installed by a contractor who is either FM 4991 Approved or ULC Qualified. Through and Membrane Penetration Firestop Systems can be inspected to ASTM E 2174, Standard for the On Site Inspection of Installed Firestop Systems, while Joints are inspected to ASTM E 2393, Standard for the On Site Inspection of Joint Firestop Systems.**
Code Change Request - - Sections - Division B

Cost Benefit implications

The changes, in our opinion, actually highlight the correct installed cost of firestopping. Firestopping and other fire and life safety systems cost is a function of proper design, installation, inspection and maintenance. The Installation and Inspection is what is dealt with in this section. When a firestop contractor who does not understand the 'systems' concept of firestopping is allowed to propose work, they may not include a 'system' cost, but instead, a 'product cost'. Product cost basis means there are no tested and listed firestop systems used and there may be little or no protection provided. Installing firestop systems correctly takes skilled worker time and materials to get right. Those installing firestop 'products' and not systems will always be cheaper. The inspection provides the check and balance that the quality system is working. From a cost of construction perspective, the inspection is an added cost.

The benefits are that the firestop products will be installed to the tested and listed system and manufacturer's installation instructions. This proper installation means better fire and life safety through effective compartmentation, slowing fire through fire separations in key areas.

Quantitatively, the building owner and manager will now have the correct value and reliability when needed with firestop systems installation. And, the concept that the breach in the fire separation or fire wall are protected will make clear the objective of firestopping.

Enforcement Implications

This code proposal will actually mean a reduction in resources needed to enforce the code. The code officials can ask for qualifications of the contractor and inspection agency and make judgments on same. Secondly, the concept of what is accomplished will minimize confusion in field.

Other Comments:

See another code proposal for the other sections, including, but not limited to Division B, 1.3.1
FCIA NBC Code Proposal 3

• Code Change Request – **Fire Stop to Firestop**
  – IFC also same request...

• Division A, 1.4.1.2

• Subject
  The subject in this case is that of the words in the definition for Fire Stop and clarify that the breaches are protected using firestop systems.

• Problem:
  **The words in the definition Fire Stop in the NBC is not the same as the ULC Standard for Firestops.** To be consistent with the ULC-S-115 Standard, Fire Tests of Firestop Systems. If the standard is one word, the code should also reference one word for consistency.
Subject & Proposal
The subject in this case is to complete the existing code language in 2.2.1.1. - National Fire Code of Canada

2.2.1.1 Fire Separations and Fire Resistance Rated Elements of Construction

1) Fire resistance rated assemblies, fire separations including firestop systems, fire dampers, fire doors and fire rated glazing shall be installed and inspected in accordance with the NBC. “Build It Right”

2) An inventory of fire separations and fire resistance rated elements of construction shall be maintained. “Where are the Fire Separations?”

3) A survey of fire separations shall take place annually by the building owner.

4) Where fire separations and fire-resistance ratings of elements of construction are damaged so as to affect their integrity, they shall be repaired so that the integrity of the fire separation or fire resistance rating of the element of construction is maintained.

5) Documentation for the fire separation and fire resistance elements repair(s) shall maintained.

SC - Back to Proponent – Justify ??
Problem:

• The section on maintaining fire resistance rated construction seems to not follow a logical flow. **Before the assembly can be maintained, it has to be built right in the first place.** Similar to what is stated in fire suppression and fire extinguishers, we have added charging language that will result in the building owner getting the structure from the contactor ‘built right’.

• Also added is an important item, the inventory of assemblies. Without an inventory of fire resistance rated assemblies, the building owner and manager has no idea where to start to maintain their assemblies.

• Finally, where damaged, fire resistance rated elements of construction need to be repaired to the tested and listed system or construction at time of permit. The repairs are documented and kept by the responsible person in the building for view by authorities, potential tenants or purchasers.

Objectives

• 2015 NFC – OP, OP1, OP1.2, OP1.4, OP3.1, OS Fire Safety, OS 1.2, OS 1.3, OS1.4, OS1.5, OS3.7

**SC - Back to Proponent – Justify ??**
FCIA’s National Building Code of Canada Proposals - Summary

- **Add New Requirements**
  - FM 4991 Approved Firestop Contractors
  - UL Qualified Firestop Contractors
  - ASTM E 2174 and ASTM E 2393 Standards for Firestop Inspection

- **Add New Requirements above, and “Breach”**

- **Change “Fire Stop to “Firestop”**

- **Require an “Inventory” of Elements of Fire Resistance**
  - Fire Separations
  - Firestops, Fire Doors, Fire Dampers, Firestop Systems...for building maintenance.

- **Survey the assemblies annually**

- **Maintain assemblies constantly.**

- **Require Fire Resistance Documentation**
Canada Building Codes

• IFC Proposals
  – 1118-1120 - Fire Resistance vs. Fire Protection Ratings
  – 1121 - Clarify Cast in Place means non combustible penetrating items...
  – 1122 – T-Ratings – None when in Rated Fire Separation.
  – 1123 – T-Ratings – Not required:
    • Concealed spaces
    • Above fire-resistance-rated ceiling membrane
    • Within horizontal service space...
  – 1124/1125 – Clarify, firestopping where wires, cables....
  – 1126 – Clarify, alarm cables need firestopping
  – 1127 – Recognize putty pads for outlet boxes as alternative to fire blocking.
  – 1128 – Adds appendix discussion on ASTM E 2307 in section A-3.1.8.3.(4)
Canada Building Codes

- **IFC Proposals**
  - 1129 – Clarifies Membrane and Through Penetrations
  - 1130 – Clarify that there is no rated firestop for penetrations of fire blocking, ‘materials’.
  - 1131 – Change Fire Stop to Firestop... (FCIA too)
  - 1132 – Clarify terminology in 3.1.9.3 (5), penetrations by wires, cables.
  - 1133 – Plastic Piping, Remove 50pa where height is under 4 stories...
  - 1134 – Plastic Piping, Remove 50pa where building is sprinklered, keep if not sprinklered...
  - 1135 – Transitions, plastic/metal/plastic at horizontal fire separations, pass S-115...or not allowed.
  - 1136 – Adds firestopping for single, sheathed cables.
Canada Building Codes

• NBC Code Development Process – Other Topics
  – Fire Separations
    • How Many?
    • How Big a Space?
    • How Tall can a Wood Structure be Built?
    • Are Current Height and Area Limits Correct?
  – Sprinklers
    • Unlimited Size Buildings?
    • Compartment Sizes?
    • Fuel Loads?
Compartmentation Codes

Compartmentation Codes

NBCC - 3.1.8.1.(1)(b) Barrier to Control Smoke Spread.

Although a fire separation is not always required to have a fire-resistance rating, the fire separation should act as a barrier to the spread of smoke and fire until some response is initiated.

NEW: When choosing products for fire stopping, the physical characteristics of the material used at the joints as well as the nature of the assembly and its potential movement should be taken into consideration.

If the fire-resistance rating of a fire separation is waived on the basis of the presence of an automatic sprinkler system, it is intended that the fire separation will be constructed so that it will remain in place and act as a barrier against the spread of smoke for a period of time until the sprinklers have actuated and controlled the fire.

• CAN/UL-S115 Listed Systems – NOTE: Smoke = L-Rating.
National Fire Code of Canada

National Fire Code of Canada – Critical Point...
• Division B – Part 2, Building and Occupant Fire Safety
  2.2.1.2 – Damage to Fire Separations – where fire separations are damaged so as to affect their integrity, they shall be repaired so that the integrity of the fire separation is maintained...

NFC yes...but First, NBC...

Includes Fire Dampers, Fire Doors...and Continuity
Canada Building Codes

• FCIA @ NBC Code Development Process
  – Committee Meetings & Teleconferences
  – Consensus Process
  – 5 Year Code Cycle
  – NBC 2020....
Compartmentation Codes

Compartmentation Codes

**NBCC - A 3.1.8.1.(1)(b) Barrier to Control Smoke Spread.**

Although a fire separation is not always required to have a fire-resistance rating, the **fire separation** should act as a **barrier to the spread of smoke and fire** until some response is initiated.

**NEW: When** choosing products for fire stopping, the physical characteristics of the material used at the joints as well as the nature of the assembly and its potential movement should be taken into consideration.

If the **fire-resistance rating of a fire separation is waived** on the basis of the presence of an automatic **sprinkler system**, it is intended that the **fire separation will be constructed so that it will remain in place and act as a barrier against the spread of smoke for a period of time** until the sprinklers have actuated and controlled the fire.

- **CAN/UL-S115** Listed Systems – **NOTE: Smoke = L-Rating.**
9.10.9. Fire Separations and Smoke-tight Barriers between Rooms and Spaces within Buildings

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.

3) The continuity of a fire separation or smoke-tight barrier shall be maintained where it abuts another fire separation or smoke-tight barrier, a floor, a ceiling, a roof, or an exterior wall assembly. (See Appendix A and A-3.1.8.3.(4) in Appendix A.)
Compartmentation Codes – NBC

NBCC - 3.1.8.1. - General Requirements

1) Any wall, partition or floor assembly required to be a fire separation shall
   a) except as permitted by Sentence (2), be constructed as continuous element, and
   b) as required in this part, have a fire-resistance-rating as specified (see appendix A)

2) Openings in a fire separation shall be protected with closures, shafts or other means in conformance with Articles 3.1.8.4-7.
Compartmentation Codes – NBC

• **3.1.8.3 (4) Fire Separation Continuity** –
The continuity of a fire separation where it abuts against another fire separation, a floor, a ceiling or an exterior wall assembly is maintained by filling all openings at the juncture of the assembles with a material that will ensure the integrity of the fire separation at that location.

• **9.10.9.2 Continuous Barrier**
3.1.9.1. Fire Stopping of Service Penetrations

Except as required by Sentences (2) and (3), and permitted by sentences (4) and (5), penetrations of a fire separation or membrane forming part of an assembly required to have a fire resistance rating shall be

a) **sealed by a fire stop system** that, when subjected to the fire test method in **CAN/UL-S115, “Fire Tests of Firestop Systems,”** has an F rating not less than the fire-protection rating required for closures in the fire separation in conformance with Table 3.1.8.4., or **(50pa, plastics)**

b) **cast in place** (see Appendix A).

SEE ALSO 3.1.9.4, penetrations by combustible drain, waste and vent piping.
3.1.9.1. Fire Stopping of Service Penetrations

2) Penetrations of a firewall or a horizontal fire separation that is required to have a fire-resistance rating in conformance with Article 3.2.1.2 shall be sealed at the penetration by a fire stop that, when subjected to the fire test method CAN/ULC-S115, “Fire Tests of Firestop Systems”, has an FT Rating not less than the fire-resistance rating of the fire separation.
3.1.9.1. Fire Stopping of Service Penetrations

3) Penetrations of a fire separation in conformance with Article 3.6.4.2 (2) shall be sealed by a fire stop that, when subjected to the fire test method CAN/ULC-S115, “Fire Tests of Firestop Systems”, has an FT Rating not less than the fire-resistance rating of the fire separation.
3.1.9.1.(1)(b) Fire Stopping of Service Penetrations

*cast in place* (see Appendix A).

- Concrete, Grout...Full Thickness of the Assembly OR Thickness as required to meet fire resistance

A-3.1.9.1.(1)(b) Penetration. The intention behind the use of the term “cast in place” is to reinforce that there are to be no gaps between the building service or penetrating item and the membrane or assembly it penetrates. The term “cast in place” describes a typical means of fire stopping for a service penetration through a concrete slab or wall.
Division B - 3.1.9.3

(4) Sprinklers are permitted to penetrate a fire separation or a membrane forming part of an assembly required to have a fire-resistance rating without having to meet the fire stop requirements of sentences (1) to (3), provided that the annular space created by the penetration of a fire sprinkler is covered by a metal escutcheon plate in accordance with NFPA 13, “Installation of Sprinkler Systems”.
(5) Unless specifically designed with a fire-stop, fire dampers are permitted to penetrate a fire separation or a membrane forming part of an assembly required to have a fire-resistance rating without having to meet the fire stop requirements of Sentences (1) to (3), provided the fire dampers is installed in conformance with NFPA 80, “Fire Doors and Other Opening Protectives”
3.1.9.4 – Combustible Piping Penetrations

4) Combustible drain, waste and vent piping is permitted to penetrate a fire separation required to have a fire-resistance rating or membrane that forms part of an assembly required to have a fire-resistance rating, provided

a.) the piping is sealed at the penetration by a fire stop that has an F rating not less than the fire-resistance rating required for the fire separation when subjected to the fire test method in CAN/ULC-S115, Fire Tests of Firestop Systems”, with a pressure differential of 50 Pa between the exposed and unexposed sides, with the higher pressure on the exposed side, and

b.) the piping is not located in a vertical service space.
Compartmentation Codes – NBC

3) Polypropylene pipes and fittings are permitted to be of non-combustible construction provided:

a) The building is sprinklered throughout

b) The piping is not located in a vertical shaft, and

c) Piping that penetrates a fire separation is sealed at the penetration by a ‘fire stop’ that has an FT rating not less than the fire-resistance rating of the fire separation when subjected to the fire test method CAN/ULC-S115, “Fire Tests of Firestop Systems”, with a pressure differential of 50 PA between the exposed and unexposed sides, with higher pressure on the exposed side.
Fire Separations

• Fire Separations - Barriers
  – Break building into Sections
  – Mixed Use Occupancies
  – Incidental Uses
  – Hazardous Area Separations
  – Exit Enclosures
  – Shaft enclosures
  – Horizontal Exits
  – Corridor Walls
North American Terminology
NBC, NFPA, IBC

• Compartmentation Codes  NBC, NFPA, IBC
  – *Exterior Walls*
  – *Firewalls (Both NBC, NFPA, IBC)*
  – *Fire Barriers*
  – *Fire Separations (Canada Only)*
  – *Fire Partitions (IBC Only, not NFPA)*
  – *Smoke Barriers*
  – *Smoke Partitions*
Building & Fire
Code Requirements

• **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.
Building & Fire Code Requirements

• 3.1.10.3. Continuity of Firewalls
• [F03-OS1.2] Applies to portion “A firewall shall extend from the ground continuously through, or adjacent to, all storeys of a building or buildings so separated ...”

• **Terminates** –
  – @ Reinforced Concrete Roof Slab – 1hr/2hr; 2hr/4hr
  – 150mm high – 2 hr
  – 900mm high – 4 hr
• 3.1.10.5. Maximum Openings
1) Openings in a firewall shall conform to the size limits described in Article 3.1.8.6. and the aggregate width of openings shall be not more than 25% of the entire length of the firewall.
Building & Fire Code Requirements

• Compartmentation Codes CAN & US
  – Exterior Walls
  – Firewalls
  – Fire Barriers
  – Fire Separations
  – Fire Partitions (Not NFPA)
  – Smoke Barriers
  – Smoke Partitions
Compartmentation Codes – NBC

• Division A:1.4.1.2, NBCC 2010

• *Fire separation* means a construction assembly that acts as a barrier against the spread of fire. See Appendix A.

• A *fire separation* may or may not have a fire-resistance rating.
Compartmentation Codes – NBC

- **Division A, 1.4.1.2**
- **Fire resistance rating means the** time in minutes or hours that a material or assemblies 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.

- **CAN/UL-S101** - Standard Methods of Fire Endurance Tests of Building Construction Materials
Compartmentation Codes – NBC

- **Division A, 1.4.1.2**
- **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.
- **Flame-spread rating** means an index or classification indicating the extent of *spread-of-flame* on the surface of a material or an assembly of materials as determined in a standard fire test as prescribed in this Code.
3.1.7.5. Rating of Supporting Construction

1) Except as permitted by Sentence (2) and by Articles 3.2.2.20. to 3.2.2.88. for mixed types of construction, all loadbearing walls, columns and arches in the storey immediately below a floor or roof assembly required to have a fire-resistance rating shall have a fire-resistance rating not less than that required for the supported floor or roof assembly.
Compartmentation Codes – NBC

A-2.2.6.2.(1) **Information Required on Drawings and Specifications.**
Examples of information that should be shown on architectural drawings and drawings for heating, ventilating and air-conditioning systems are

(n) the location and fire-resistance rating of required fire separations.
3.3.3. Care, Treatment or Detention Occupancies
3.3.3.5. Compartments and Fire Separations

1) *Floor areas* containing patients' or residents' sleeping rooms in a *care* or *treatment occupancy* where overnight sleeping accommodation is provided for more than a total of 10 patients or residents shall conform to Sentences (2) to (14).

2) Except as permitted by Sentence (3), a *floor area* described in Sentence (1) shall be divided into not less than 2 *fire compartments*, each not more than 1 000 m2 in area.

3) The *floor area* on either side of a *horizontal exit* conforming to Article 3.4.6.10. is permitted to be considered as a *fire compartment* in applying the requirements of this Article.

4) Except as permitted by Sentence (5), *fire separations* separating *fire compartments* required by Sentence (2) shall have a *fire-resistance rating* not less than 1 h. the conditions described in Sentence 3.3.4.2.(4) are met
3.3.3. Care, Treatment or Detention Occupancies

3.3.3.5. Compartments and Fire Separations

5) The fire-resistance rating of a fire separation referred to in Sentence (4) is permitted to be less than 1 h but not less than 45 min provided the fire-resistance rating required by Subsection 3.2.2. is permitted to be less than 1 h for

a) the floor assembly above the floor area, or

b) the floor assembly below the floor area, if there is no floor assembly above.

6) A closure in a fire separation between fire compartments referred to in Sentence (2) shall be weatherstripped or otherwise designed and installed to retard the passage of smoke. (See Appendix A.)

7) The travel distance from any point within each fire compartment referred to in Sentence (2) to a door to an adjoining fire compartment shall be not more than 45 m.

8) Each fire compartment referred to in Sentence (2) shall be capable of accommodating, in addition to its own occupants, the occupants of the largest adjacent fire compartment based on a clear floor space of 2.5 m2 per patient in the adjacent fire Compartment. described in Sentence 3.3.4.2.(4) are met
3.3.3. Care, Treatment or Detention Occupancies
3.3.3.5. Compartments and Fire Separations
9) Except as provided in Sentences (10) to (14), walls between patients’ or residents’ sleeping rooms and the remainder of the floor area shall be constructed as fire separations but are not required to have a fire-resistance rating unless one is required by other provisions in this Part. (See A-3.1.8.1.(1)(b) in Appendix A.)
10) The fire separation requirements of Sentence (9) do not apply to walls within a group of intercommunicating patients’ or residents’ sleeping rooms, provided the group of rooms does not
   a) contain more than 5 patients or residents, or
   b) include storage, bathing or toilet facilities serving persons not occupying the group of rooms.
   (See Appendix A.)
11) The fire separation requirements of Sentence (9) do not apply to walls within individual suites of care occupancy.
   the conditions described in Sentence 3.3.4.2.(4) are met
3.3.3. Care, Treatment or Detention Occupancies
3.3.3.5. Compartments and Fire Separations
12) A door in a *fire separation* required by Sentence (9) is permitted to be equipped with a roller latch.
13) Except as permitted by Sentence (14), a *fire separation* required by Sentence (9) shall not have any grilles, louvres or other openings.
14) A door or wall separating a patient's or resident’s sleeping room from an ensuite toilet room, shower room or similar ancillary space is permitted to incorporate grilles and louvres, provided
   a) the adjacent rooms are not used to store flammable or *combustible* materials,
   and
   b) the openings are located so that smoke cannot pass through these rooms to other parts of the *building*.
(See Appendix A.)
3.3.3. Care, Treatment or Detention Occupancies

3.3.3.5. Compartments and Fire Separations

15) Walls between individual suites of care occupancy and the remainder of the floor area in buildings of care occupancy shall be constructed as fire separations with a fire-resistance rating not less than that specified for residential occupancies in Sentences 3.3.4.2.(1) and (2).

16) Floor assemblies within individual suites of care occupancy need not be constructed as fire separations, provided the suites meet the conditions described in Clauses 3.3.4.2.(3)(a) and (b).

17) The fire-resistance rating of the fire separation required by Sentence 3.3.5.6.(1) is permitted to be waived if the fire separation is located between individual suites of care occupancy and an attached storage garage containing not more than 5 vehicles, provided the conditions described in Sentence 3.3.4.2.(4) are met.
Compartmentation Codes

**NBCC - 3.1.8.1.(1)(b) Barrier to Control Smoke Spread.**

Although a fire separation is not always required to have a fire-resistance rating, the fire separation should act as a **barrier to the spread of smoke and fire** until some response is initiated.

**NEW:** When choosing products for fire stopping, the physical characteristics of the material used at the joints as well as the nature of the assembly and its potential movement should be taken into consideration.

If the fire-resistance rating of a fire separation is waived on the basis of the presence of an automatic sprinkler system, it is intended that the fire separation will be constructed so that it will remain in place and act as a **barrier against the spread of smoke for a period of time** until the sprinklers have actuated and controlled the fire.

- CAN/UL-S115 Listed Systems – **NOTE:** Smoke = L-Rating.
9.10.9. Fire Separations and Smoke-tight Barriers between Rooms and Spaces within Buildings

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.

3) The continuity of a fire separation or smoke-tight barrier shall be maintained where it abuts another fire separation or smoke-tight barrier, a floor, a ceiling, a roof, or an exterior wall assembly. (See Appendix A and A-3.1.8.3.(4) in Appendix A.)

• ASTM E 1966, ASTM E 2837, UL 2079 & L-Ratings...
4) All gypsum board joints in the assemblies described in Sentences (1) and (2) shall conform to CSA A82.31-M, “Gypsum Board Application,” and penetrations in these assemblies shall be sealed using flexible sealant or tape to maintain the integrity of the smoke-tight barrier over the entire surface.

• CAN/UL-S115 - “L” Rating
Canada National Codes