FCIA
Existing Building Fire-Resistance Symposium

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National Research Council of Canada

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Canadian Board for Harmonized Construction Codes

Important Changes: Penetrations and Continuity of Fire Separations

National Model Codes—2015 and 2020 Edition

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Outline

- National Model Codes
  - What are they and who develops them?
- History
- Definitions
- Important changes
  - 2015
  - 2020

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National Model Codes

What they are and who develops them

National Research Council of Canada

- 14 Research Centres
  - Construction Research Centre
    - Built Environment Regulations and Specifications
      - Codes Canada

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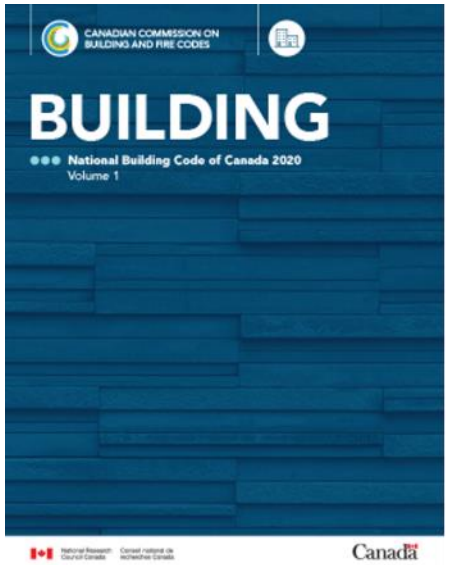
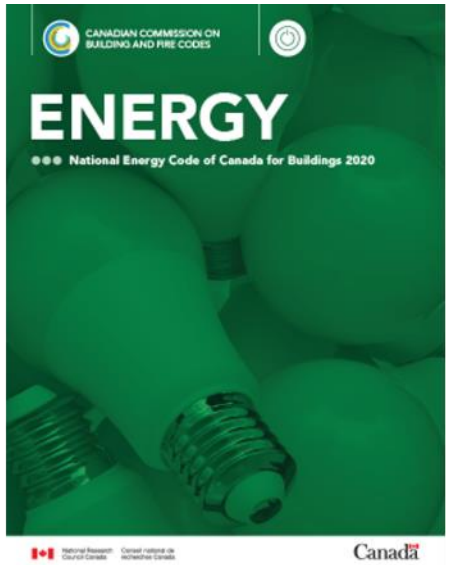
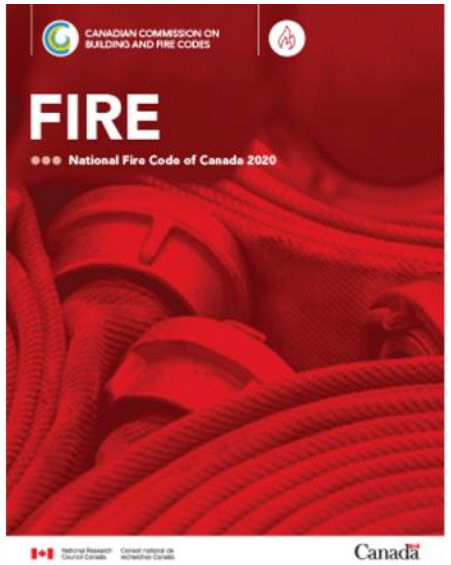
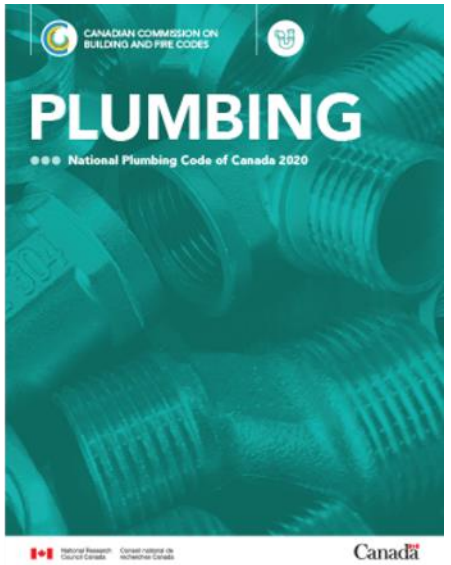
2020 Publications

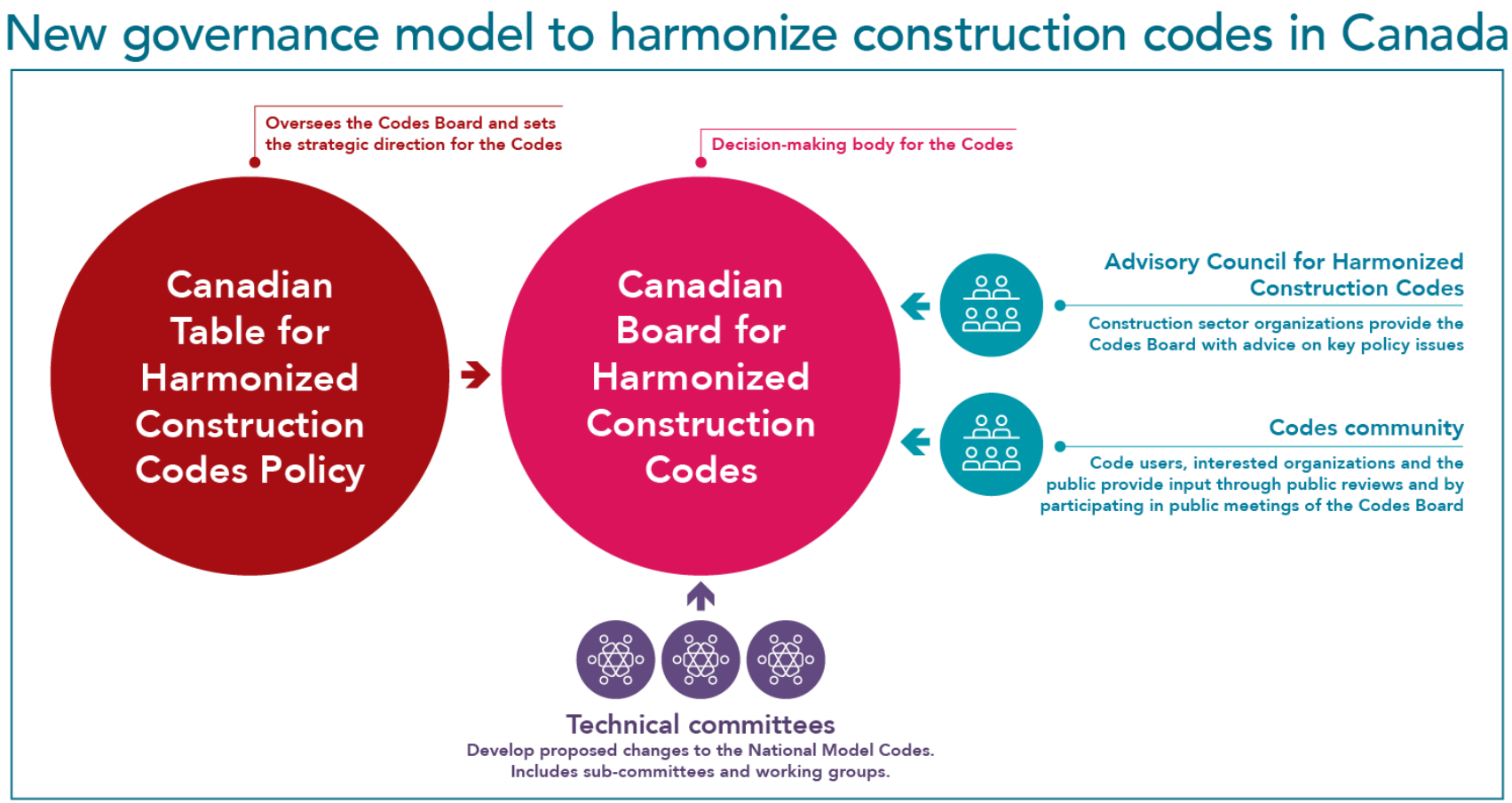








New harmonized code development system



Who’s doing what?

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How do I find out more about a specific change?

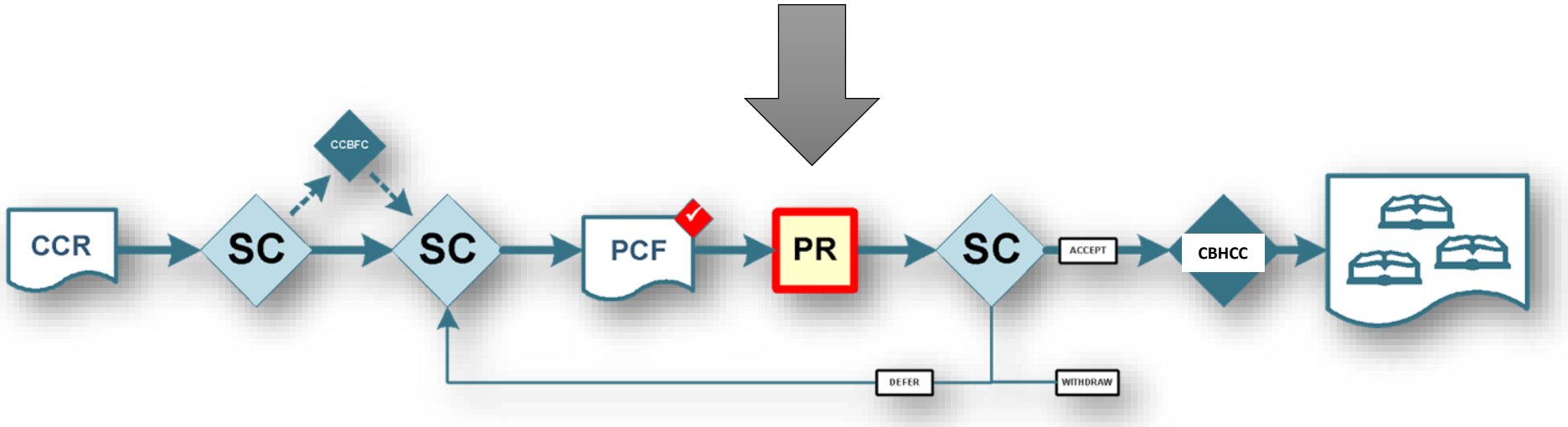
https://cbhcc-cchcc.ca/en/

When will these changes affect me?

Get involved

- https://cbhcc-cchcc.ca/en/get-involved/

Where are we now?



- CCR: code change request
- SC: standing committee
- PCF: proposed change form
- PR: public review

A brief history of firestopping

National Building Code (NBC)

Where things have started

- NBC 1960

→The term fire-stop is used for the first time

→There is no requirement confirming how to do it!

- NBC 1970

→Fire stop becomes a defined term

→“…draft-tight barrier within or between construction assemblies that acts to retard the passage of smoke and flame.”

→Subsection on fire stopping requirements

Important dates

- NBC 1980

→Clarification added where firestopping is required

- NBC 1985

→Major overhaul of the requirements; but, with minor revisions

History in movement

- NBC 1990

→All types of penetration in fire separation are identified

→Introduction of a Canadian standard to determine the F rating of the firestopping material in compliance with:

  - fire-protection rating of a closure
  - fire-resistance rating of an assembly

Objective-based codes

- NBC 1995→2010

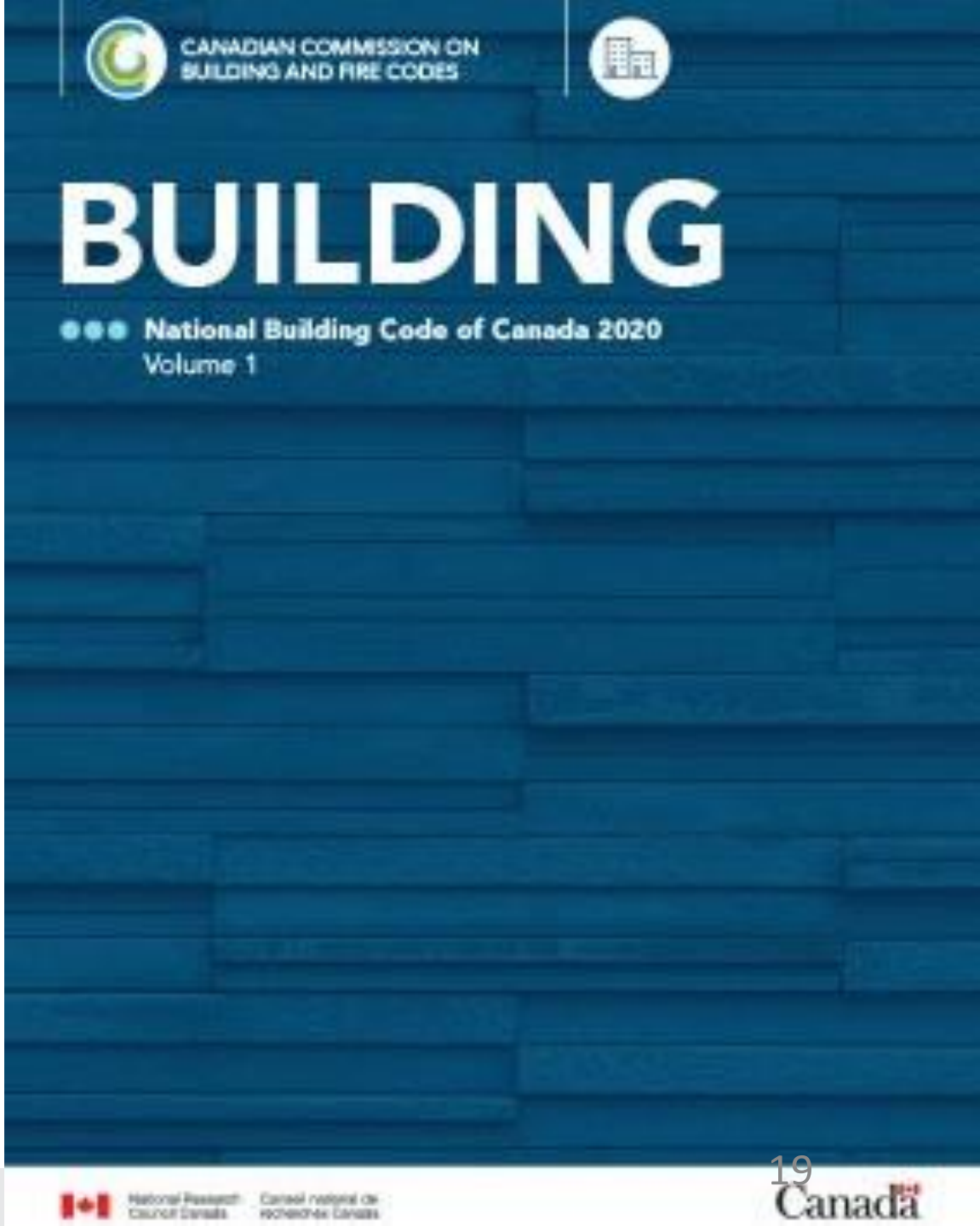
- NBC 2010
  - →New definitions
  - →New ratings
  - →Clarification of applications

Definitions

What are *penetrations*?

Fire separations

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



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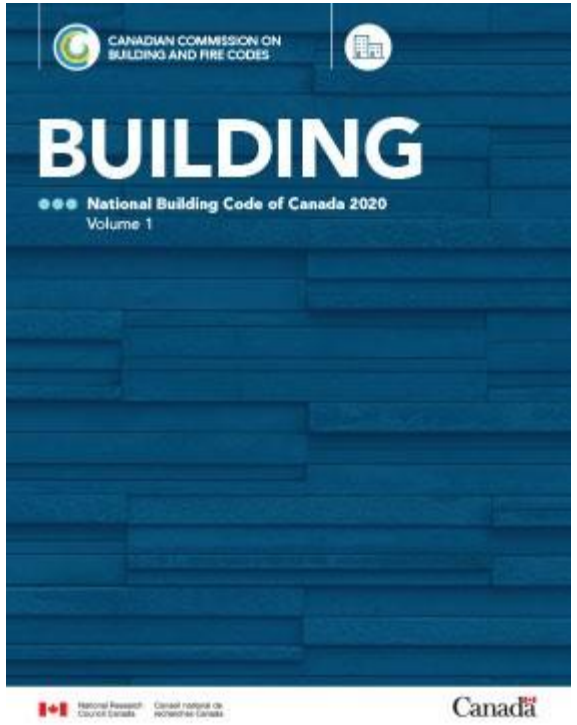
Penetration sources

→Building services

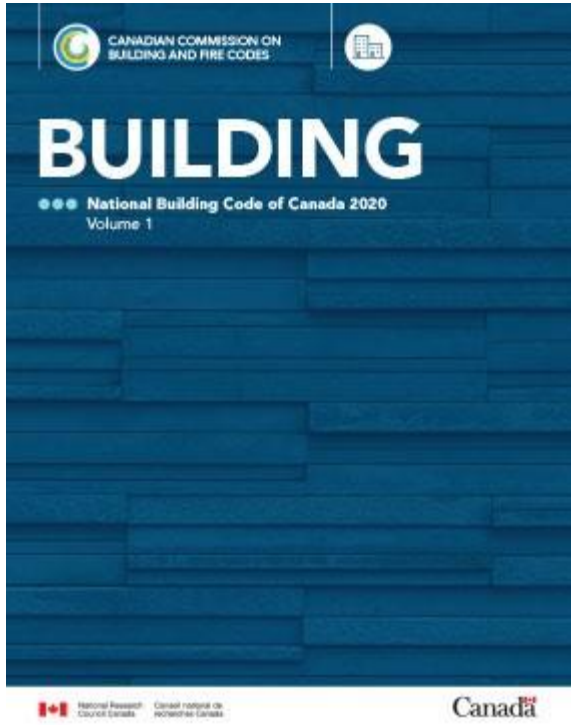
→Structural elements
(NEW)



Penetration types

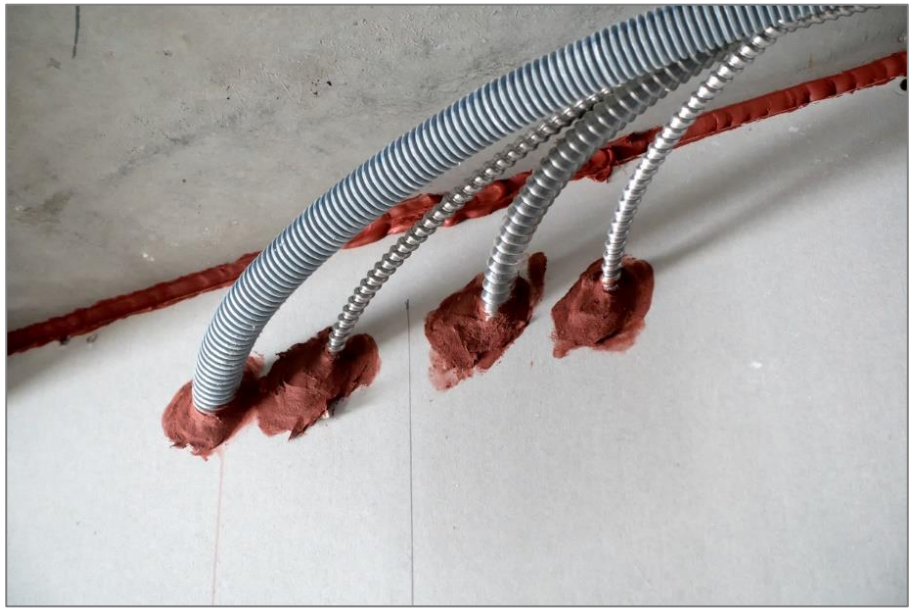
→Membrane

→Through-penetration



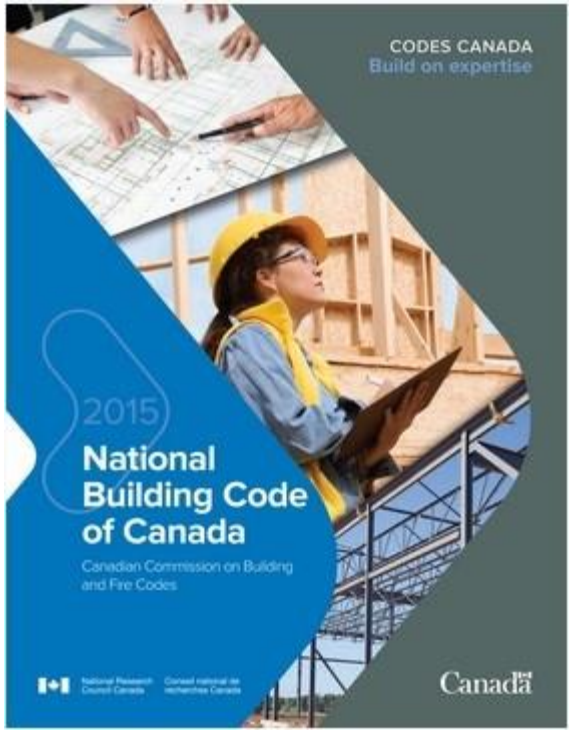
Integrity of fire separations

- CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems”
  - F rating
  - Not less than the required fire-resistance rating of the fire separation

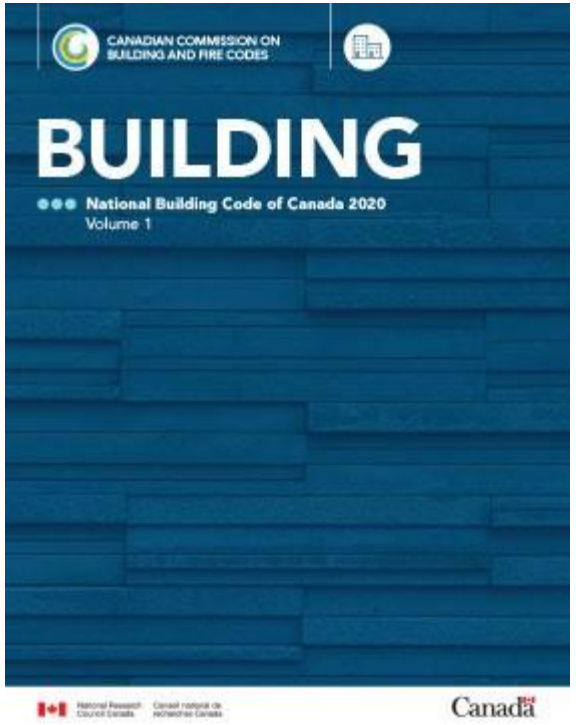


Credit: iStock.com/SimplyCreativePhotography

Harmonization of nomenclature



“Fire stop”



“Firestop”

Definition

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Definition

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Cast-in-place

- Steel
- Ferrous
- Copper
- Concrete
- Masonry

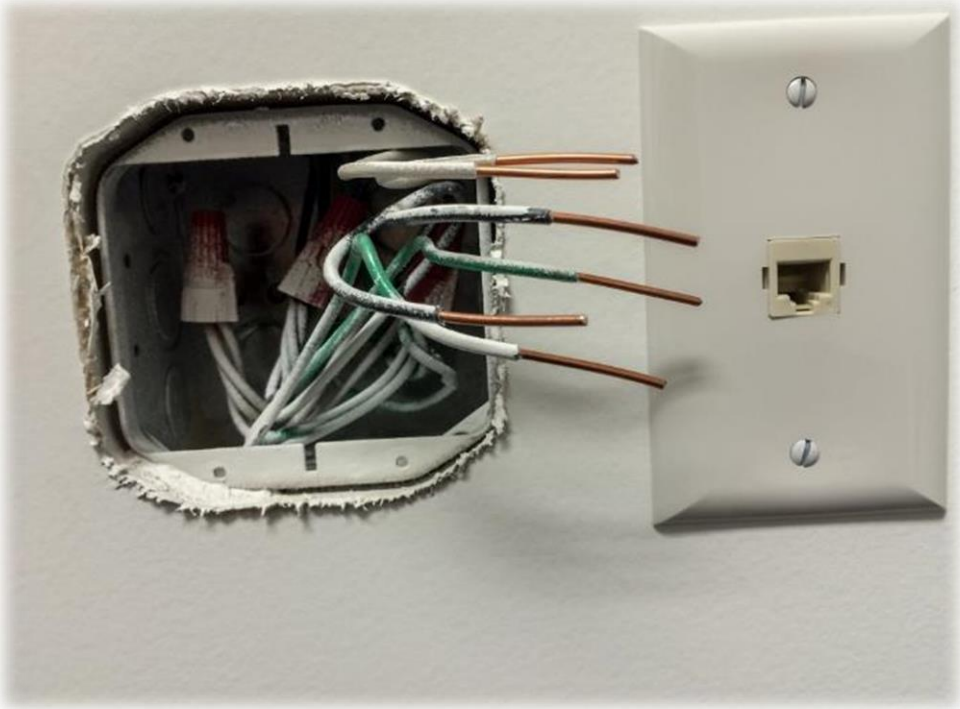
Credit: iStock.com/Kinek00

Important changes

National Building Code 2015

Electrical outlet boxes

- CAN/ULC-S112.2, “Standard Method of Fire Test of Ceiling Firestop Flap Assemblies”



Summary—2015 important changes

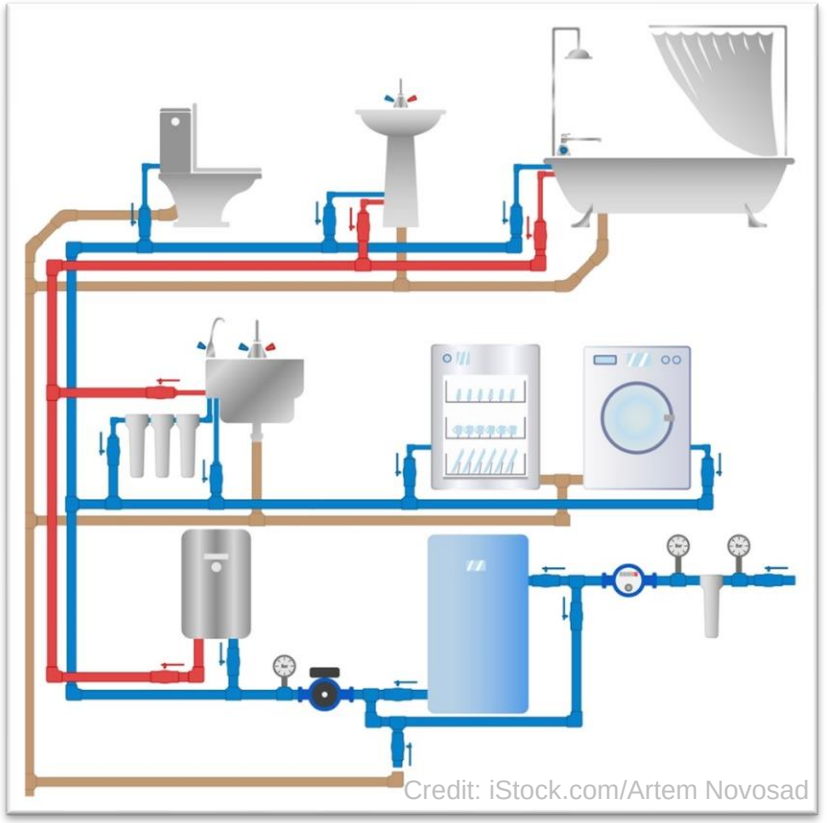
- Clarification for the protection of outlet boxes

Important changes

National Building Code 2020

Transition combustible ↔ noncombustible piping

- Combustible branches within a fire compartment
- On one side of a horizontal fire separation



Transition combustible ↔ noncombustible piping

Credit: iStock.com/SimplyCreativePhotography

- Sealed by a firestop
- F rating
- Pressure differential of 50 Pa
- Higher pressure on the exposed side

Stack effect

Credit: iStock.com/ArchonCodex

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50 Pa pressure differential

- **Before**

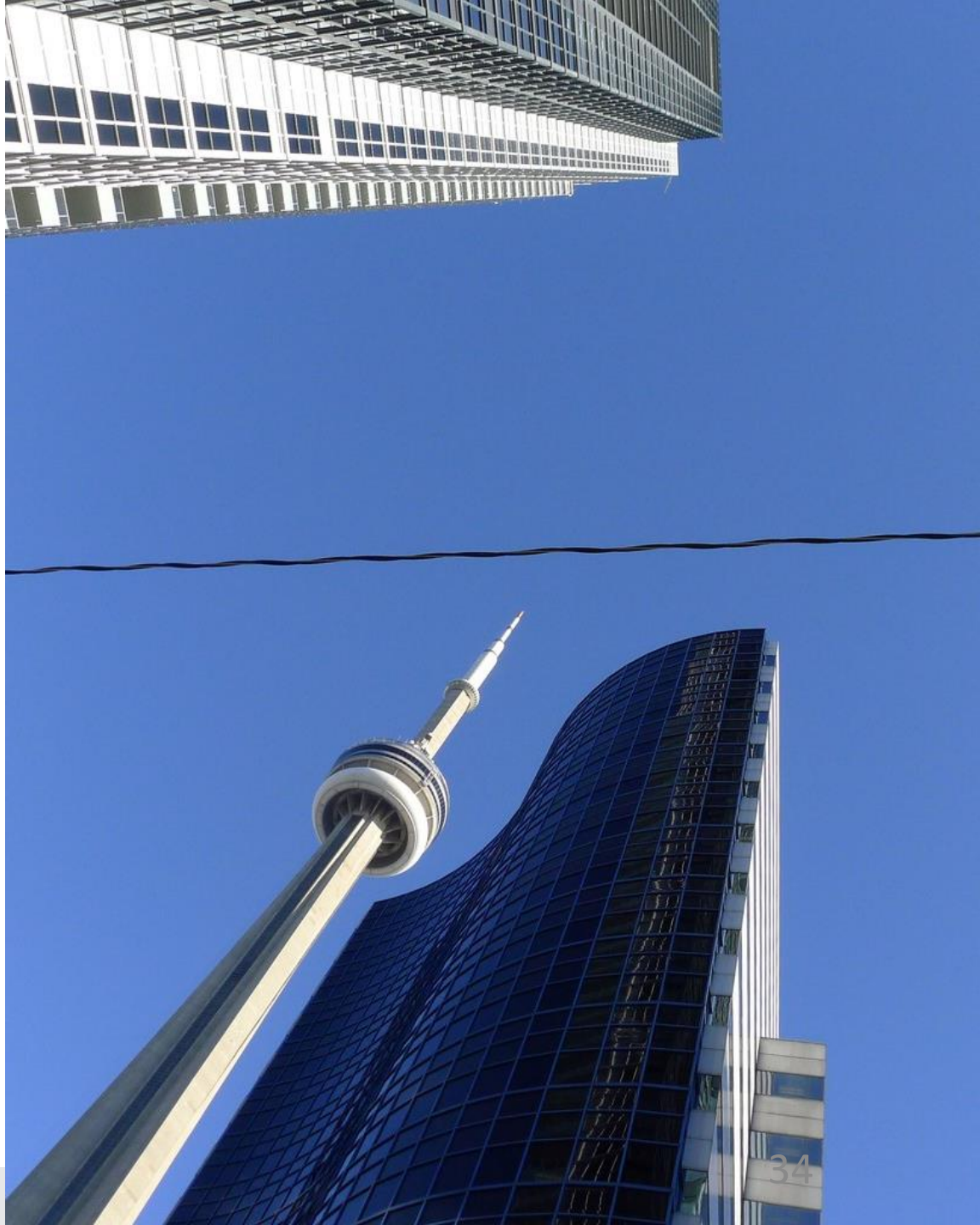
→Misapplied research

→Overly onerous

- **Now**

→Removed from Part 9

→Limited to Part 3 buildings above 3 storeys in building height



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Horizontal fire separations

Service equipment penetration of fire separation for horizontal service space **under certain conditions**

Penetration of fire separation for horizontal service space

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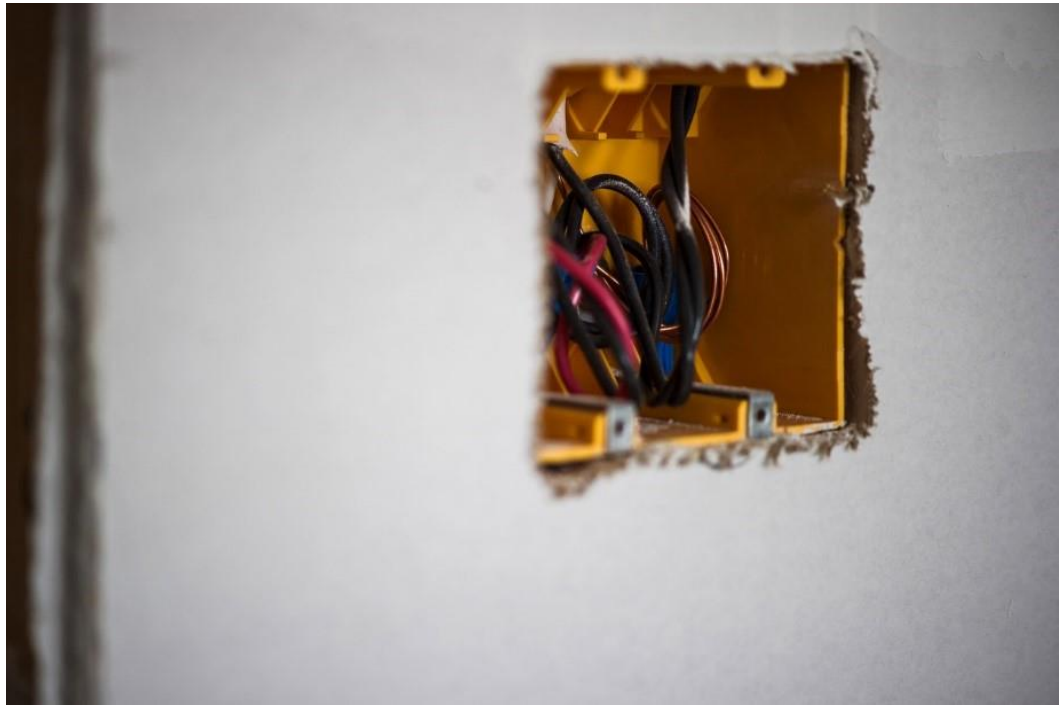
Combustible outlet boxes

- Firestopped
- FT rating



Credit: iStock.com/razerbird

Protection of outlet boxes

- On opposite sides of a vertical fire separation

- Horizontal distance ≥ 600 mm
  - →Fire block
  - →Firestop with FT rating

Credit: iStock.com/photovs

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Deletion—Service equipment penetrations

- Totally enclosed non-metallic raceways, optical fibre cables, electrical wires and cables with combustible insulation, jackets or sheathes
- Overall diameter (single or grouped) is not more than 25 mm
- Single conductor metal sheathed cables with combustible jacketing
- More than 25 mm in overall diameter
- Cables are not grouped
- Spaced a minimum of 300 mm apart

Other important changes in Part 9

- Cast-in-place
  - →Steel
  - →Ferrous
  - →Copper
  - →Concrete
  - →Masonry

Credit: iStock.com/Krzysztof12

- F rating when tested to CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems”

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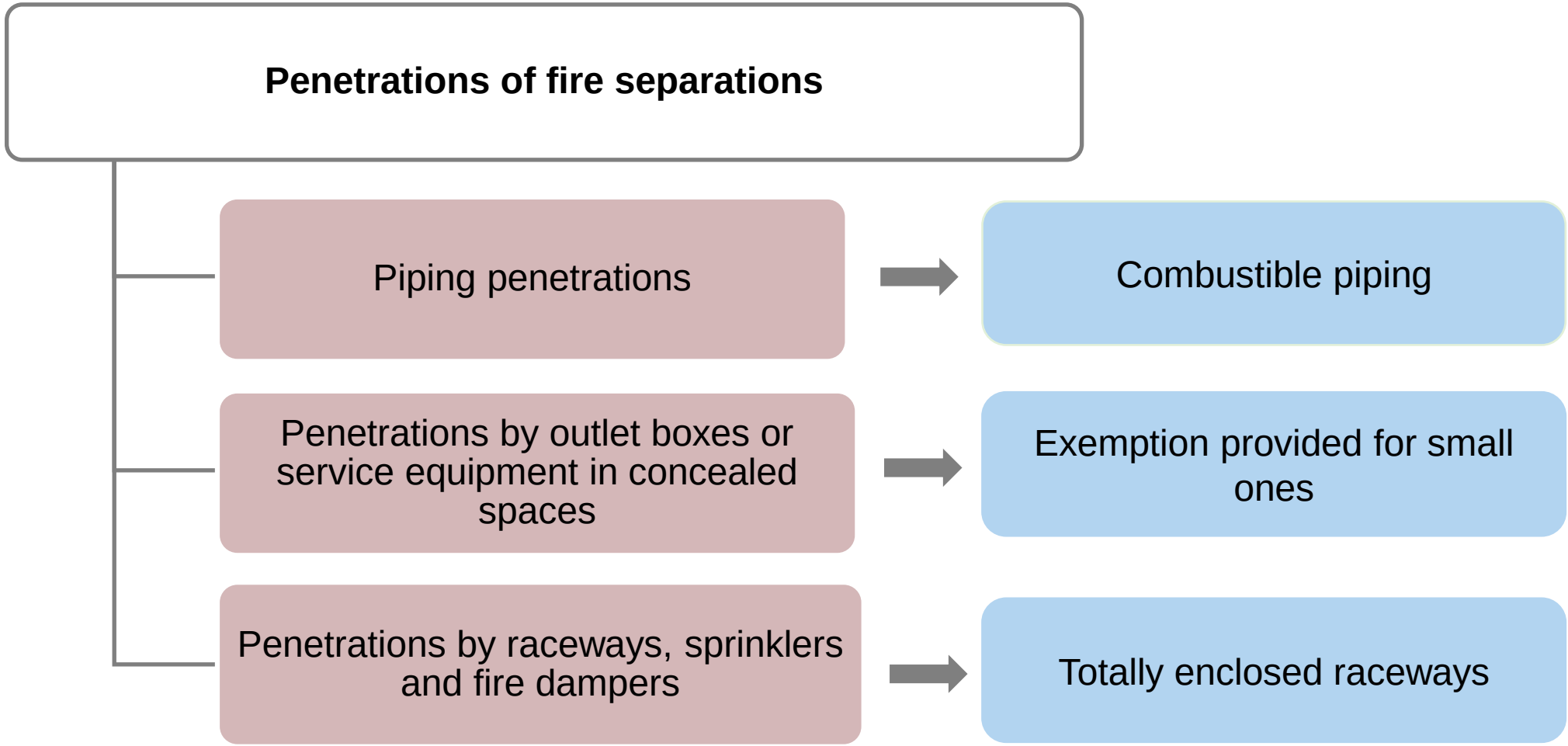
General requirements



Continuity of fire separations

Fire separation abutting another fire separation, a floor, a ceiling or a roof

- FT rating
- Tested to CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems”

Horizontal joints between a floor and an exterior wall

- F rating
- Tested to ASTM E2307, “Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-storey Test Apparatus”

Continuity of fire separation

- Exemption for closely fitted joints between

→Ceilings and walls
→Floors and walls
→Walls at corners

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Credit: iStock.com/Double_Vision

Summary–2020 important changes

- Harmonization between Parts 3 and 9
- Added clarification of applications and intents
  - Continuity of fire separations
  - Protection of outlet boxes
  - Horizontal fire separations
  - Stack effect and required testing to 50 Pa pressure differential
  - Transition of combustible of noncombustible piping

Thank you

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