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## Proposed Change 1847

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<b>Code Reference(s):</b>	<b>NBC20 Div.B 3.1.9. (first printing)</b> <b>NBC20 Div.B 3.1.7.1. (first printing)</b>
Subject:	Penetrations
Title:	Firestopping of Penetrations in Tested Fire-Rated Assemblies
Description:	This proposed change expands explanatory Note A-3.1.9. to clarify that the requirements of Article 3.1.9.1. are not meant to supersede the design details of an otherwise tested assembly.

This change could potentially affect the following topic areas:

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|--|---|
| <input type="checkbox"/> Division A                                | <input checked="" type="checkbox"/> Division B              |
| <input type="checkbox"/> Division C                                | <input checked="" type="checkbox"/> Design and Construction |
| <input type="checkbox"/> Building operations                       | <input type="checkbox"/> Housing                            |
| <input checked="" type="checkbox"/> Small Buildings                | <input checked="" type="checkbox"/> Large Buildings         |
| <input checked="" type="checkbox"/> Fire Protection                | <input type="checkbox"/> Occupant safety in use             |
| <input type="checkbox"/> Accessibility                             | <input type="checkbox"/> Structural Requirements            |
| <input type="checkbox"/> Building Envelope                         | <input type="checkbox"/> Energy Efficiency                  |
| <input type="checkbox"/> Heating, Ventilating and Air Conditioning | <input type="checkbox"/> Plumbing                           |
|  | <input type="checkbox"/> Construction and Demolition Sites  |

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## Problem

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The NBC 2020 introduced significant changes to Subsection 3.1.9., including revised requirements for firestops and cast-in-place solutions for penetrations of a fire separation or a membrane forming part of an assembly that requires a fire-resistance rating (Article 3.1.9.1.).

There is confusion among Code users about whether penetrations that are part of an assembly that was tested to determine its fire-resistance rating are also subject to the requirements of Article 3.1.9.1.

Currently, Article 3.1.7.1. contains provisions to determine the fire-resistance rating of an assembly by either

- using the results of tests conducted in conformance with CAN/ULC-S101, "Standard Method of Fire Endurance Tests of Building Construction and Materials," or
- assigning a rating on the basis of Appendix D of the NBC.

The determination of the fire-resistance rating in accordance with Article 3.1.7.1. may already take into account service penetrations in the assembly. For example, the assembly may have included service penetrations when tested.

The implementation of Article 3.1.9.1. could result in the assemblies described above being subject to additional testing or protection requirements (beyond those detailed for the tested assembly). This situation risks creating confusion during implementation and enforcement and could increase costs if additional firestopping measures are applied unnecessarily.

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## Justification

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The proposed change aims to reduce the risk of the Code not being applied as intended by assisting Code users in understanding the scope of Article 3.1.9.1.

The addition to explanatory Note A-3.1.9. clarifies that the requirements in Article 3.1.9.1. are not intended to supersede the design details of an assembly that has been tested to determine its fire-resistance rating. An assembly with a fire-resistance rating determined in accordance with Sentence 3.1.7.1.(1)—which may include openings or service penetrations, with or without protection—is thus exempted from any additional testing or protection of its penetrations (i.e., the firestopping provisions of Article 3.1.9.1.) beyond the design details of that particular tested assembly.

The addition of a cross-reference to explanatory Note A-3.1.9. in Sentence 3.1.7.1.(1) is also proposed on the basis that the proposed change makes reference to approved fire-resistance-rated assemblies. The cross-reference directs Code users to the revised explanatory Note A-3.1.9. to reduce potential confusion as to whether the additional testing or protection of the penetrations is needed for assemblies conforming to Sentence 3.1.7.1.(1).

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## PROPOSED CHANGE

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**NBC20 Div.B 3.1.9. (first printing)**

**[3.1.9.] 3.1.9. Penetrations in Fire Separations and Fire-Rated Assemblies**

(See Note A-3.1.9.)

**[3.1.9.1.] 3.1.9.1. Firestops****[3.1.9.2.] 3.1.9.2. Service Equipment Penetrations****[3.1.9.3.] 3.1.9.3. Penetration by Outlet Boxes****[3.1.9.4.] 3.1.9.4. Combustible Piping Penetrations****[3.1.9.5.] 3.1.9.5. Openings through a Membrane Ceiling****[3.1.9.6.] 3.1.9.6. Plenums****Note A-3.1.9. Penetrations.**

In the application of Subsection 3.1.9., a building service or structural element is considered to penetrate an assembly if it passes into or through the assembly. In some situations a service item enters an assembly through a membrane at one location, runs within the assembly, and then leaves the assembly through a membrane at another location.

The term "membrane penetration" usually designates an opening made through one side (wall, floor or ceiling membrane) of an assembly, whereas the term "through-penetration" designates an opening that passes through an entire assembly.

Firestopping of membrane penetrations and through-penetrations 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 penetrations.

Products for firestopping within a barrier 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.

In cases where an assembly conforming to Sentence 3.1.7.1.(1) contains penetrations or openings as part of the tested assembly, these specific penetrations or openings are not intended to be subjected to additional testing or provided with additional protection in accordance with Article 3.1.9.1.

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**NBC20 Div.B 3.1.7.1. (first printing)****[3.1.7.1.] 3.1.7.1. Determination of Ratings**

- [1] 1)** Except as permitted by Sentence (2) and Articles 3.1.7.2. and 3.6.3.5., the rating of a material, assembly of materials or a structural member that is required to have a *fire-resistance rating*, shall be determined on the basis of the results of tests conducted in conformance with CAN/ULC-S101, "Standard Method of Fire Endurance Tests of Building Construction and Materials". (See Note A-3.1.9.)
- [2] 2)** A material, assembly of materials or a structural member is permitted to be assigned a *fire-resistance rating* on the basis of Appendix D.

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## Impact analysis

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This proposed change is not expected to have additional cost implications.

The proposed change clarifies the application of Articles 3.1.7.1 and 3.1.9.1. to avoid the potential added costs of firestopping for otherwise tested assemblies. The clarification also facilitates the enforcement of the Code requirements.

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## Enforcement implications

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This proposed change could be enforced by the infrastructure currently available to enforce the Code.

Since the revised explanatory Note and new cross-reference would clarify the application of Articles 3.1.7.1. and 3.1.9.1., there would be less confusion and misinterpretation when these Code requirements are enforced. This proposed change would facilitate the enforcement of the Code.

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## Who is affected

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Builders, consumers, manufacturers, regulators, designers, engineers, contractors and fire services.

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## OBJECTIVE-BASED ANALYSIS OF NEW OR CHANGED PROVISIONS

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### NBC20 Div.B 3.1.9. (first printing)

[\[3.1.9.1.\]](#) 3.1.9.1. ([\[1\]](#) 1) [F03-OS1.2] [F04-OS1.3]

[\[3.1.9.1.\]](#) 3.1.9.1. ([\[1\]](#) 1) [F03-OP1.2] [F04-OP1.3]

[\[3.1.9.1.\]](#) 3.1.9.1. ([\[2\]](#) 2) [F03-OS1.2]

[\[3.1.9.1.\]](#) 3.1.9.1. ([\[2\]](#) 2) [F03-OP3.1]

[\[3.1.9.1.\]](#) 3.1.9.1. ([\[2\]](#) 2) [F03-OP1.2]

[\[3.1.9.1.\]](#) 3.1.9.1. ([\[3\]](#) 3) [F03-OS1.2]

[\[3.1.9.1.\]](#) 3.1.9.1. ([\[3\]](#) 3) [F03-OP1.2]

[\[3.1.9.1.\]](#) 3.1.9.1. ([\[4\]](#) 4) no attributions

[\[3.1.9.1.\]](#) 3.1.9.1. ([\[5\]](#) 5) no attributions

[\[3.1.9.1.\]](#) 3.1.9.1. ([\[6\]](#) 6) no attributions

- [\[3.1.9.1.\]](#) 3.1.9.1. ([\[6\]](#) 6) [F03-OS1.2]
- [\[3.1.9.1.\]](#) 3.1.9.1. ([\[6\]](#) 6) [F03-OP1.2]
- [\[3.1.9.1.\]](#) 3.1.9.1. ([\[7\]](#) 7) no attributions
- [\[3.1.9.1.\]](#) 3.1.9.1. ([\[7\]](#) 7) [F03-OS1.2]
- [\[3.1.9.1.\]](#) 3.1.9.1. ([\[7\]](#) 7) [F03-OP1.2]
- [\[3.1.9.2.\]](#) 3.1.9.2. ([\[1\]](#) 1) no attributions
- [\[3.1.9.2.\]](#) 3.1.9.2. ([\[2\]](#) 2) no attributions
- [\[3.1.9.3.\]](#) 3.1.9.3. ([\[1\]](#) 1) [F03-OS1.2]
- [\[3.1.9.3.\]](#) 3.1.9.3. ([\[1\]](#) 1) [F03-OP1.2]
- [\[3.1.9.3.\]](#) 3.1.9.3. ([\[2\]](#) 2) [F03-OS1.2]
- [\[3.1.9.3.\]](#) 3.1.9.3. ([\[2\]](#) 2) [F03-OP1.2]
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- [\[3.1.9.3.\]](#) 3.1.9.3. ([\[4\]](#) 4) [F03-OS1.2]
- [\[3.1.9.3.\]](#) 3.1.9.3. ([\[4\]](#) 4) [F03-OP1.2]
- [\[3.1.9.4.\]](#) 3.1.9.4. ([\[1\]](#) 1) no attributions
- [\[3.1.9.4.\]](#) 3.1.9.4. ([\[2\]](#) 2) no attributions
- [\[3.1.9.4.\]](#) 3.1.9.4. ([\[3\]](#) 3) [F03-OS1.2] [F02,F04-OS1.3]
- [\[3.1.9.4.\]](#) 3.1.9.4. ([\[3\]](#) 3) [F03-OP1.2] [F02,F04-OP1.3]
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- [\[3.1.9.4.\]](#) 3.1.9.4. ([\[7\]](#) 7) [F03-OS1.2] [F02-OS1.3] [F04-OS1.3]
- [\[3.1.9.4.\]](#) 3.1.9.4. ([\[7\]](#) 7) [F03-OP1.2] [F02-OP1.3] [F04-OP1.3]
- [\[3.1.9.4.\]](#) 3.1.9.4. ([\[8\]](#) 8) no attributions
- [\[3.1.9.5.\]](#) 3.1.9.5. ([\[1\]](#) 1) [F04-OS1.3]
- [\[3.1.9.5.\]](#) 3.1.9.5. ([\[1\]](#) 1) [F04-OP1.3]
- [\[3.1.9.6.\]](#) 3.1.9.6. ([\[1\]](#) 1) no attributions

**NBC20 Div.B 3.1.7.1. (first printing)**

- [\[3.1.7.1.\]](#) 3.1.7.1. ([\[1\]](#) 1) [F03-OS1.2] [F04-OS1.3]
- [\[3.1.7.1.\]](#) 3.1.7.1. ([\[1\]](#) 1) [F03-OP1.2] [F04-OP1.3]
- [\[3.1.7.1.\]](#) 3.1.7.1. ([\[2\]](#) 2) no attributions