BC BUILDING CODE INTERPRETATION COMMITTEE

A joint committee with members representing

AIBC, EGBC, BOABC

File No: 18-0146 **INTERPRETATION**

Interpretation Date:	October 19, 2021
Building Code Edition:	BC Building Code 2018
Subject:	Fire Stopping and Fire Resistance Contribution of Subfloors in Wood Frame Floor Assemblies
Keywords:	Fire Stop, Subfloor, Fire-Resistance Rating
Building Code Reference(s):	3.1.9.1.(1), D-2.3

Questions:

1. Where a wood frame floor assembly is a fire separation with a fire resistance rating, is fire stopping required at services such as piping or conduit that penetrate the subfloor, if the services do not penetrate the gypsum wallboard membrane on the underside of the floor?

2. When the component additive method is used to determine the fire-resistance rating of a wood frame floor assembly, is any time assigned to the subfloor?

Interpretation:

1. Yes, unless the penetrations comply with one of the other BCBC requirements to waive the fire stopping.

Sentence 3.1.9.1.(1) requires penetrations of a fire separation, or of a membrane forming part of an assembly required to have a fire-resistance rating, to be:

a) Sealed by a fire stop system that has the required F rating, in accordance with CAN/ULC-S115, or
b) Cast in place, or
c) Tightly fitted.

There are additional exceptions in Sentence 3.1.9.1.(2) to (5) which do not relate to this question. The BCBC Notes provide further information on the requirements for cast in place or tightly fitted services.

Pat Shek

Patrick Shek, P.Eng., CP, FEC, Committee Chair

With respect to Sentence 3.1.9.1.(1), "membrane" is not a defined term in the BCBC. A subfloor could be considered as a membrane in the dictionary definition of a thin covering over an opening. However, the term "penetrations of a fire separation" refers to penetrations that extend partly through a fire separation, not just to penetrations that extend entirely through the separation. Therefore, fire stopping is required for penetrations through the subfloor, unless the penetrations comply with the criteria to be considered as cast in place or tightly fitted. Also refer to the final paragraph in the response below for question 2.

2. No.

The component additive method to determine fire-resistance ratings is described in Section D-2.3 in Appendix D of the BCBC. Sentence D-2.3.4.(1) states that the fire-resistance rating of a framed assembly is calculated by adding the time assigned for the membrane on the fire-exposed side to the time assigned for the framing members, and then adding any additional time for applicable additional protective measures such as specific types of insulation as described in Table D-2.3.4.-G.

The subfloor is not on the fire-exposed side of the floor assembly, so there is no time assigned for the subfloor. The subfloor will not stay in place longer than the joists that support it, so the subfloor cannot be assumed to add to the fire-resistance of the assembly.

In a wood frame floor assembly, the main contribution of the subfloor to the fire-resistance is that the subfloor is intended to stay in place long enough to prevent premature burn-through of the assembly. Table D-2.3.5 states the minimum requirements for the subfloor. For example, where the structural members of a floor assembly are wood joists, wood I-joists, wood trusses and cold-formed steel joists, the minimum required subfloor is 15.5 mm T & G plywood or 15.5 mm oriented strandboard.

Note that this principle also applies to question 1 above. If there is no firestopping of penetrations through the subfloor, and the penetrations are not cast in place or tightly fitted, flame or smoke may pass through the floor assembly while the subfloor and the joists are still in place. This would reduce the effective fire-resistance of the floor fire separation.

Patrick Shek, P.Eng., CP, FEC, Committee Chair