

# Public Review

## Vancouver Building By-law (VBBL)

### Proposed change to Fire Separation of Floors in Dwelling units (Part 3)

**Topic:** Interconnected Floors in Part 3 Dwelling Units

**Code change number:** 24-0007

**Code reference:** 3.3.4.2.(3)

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## Description of the proposed change

Fire separation of Floors in Part 3 Dwelling Units

## Justification

Dwelling units constructed under Part 9 are not limited in term of the height of the interconnected storeys unlike Part 3 dwelling units. This is becoming an increasing problem since the form of current development now frequently includes 3 store townhouse structures installed ovetop of a common parkade, with direct access, storage, or service rooms located on the parkade level. This is usually resolved through alternative solutions but these are quite varied and occur on a large proportion of projects.

The proposed changes are intended to introduce a common set of features from frequently submitted alternative solutions, that provide an acceptable solution to reduce potential delays in building permits, and providing a baseline for performance should the applicant desire to approach this from an alternative solution standpoint.

The principal concern is that fire or the products of a fire could lead to occupants on upper storeys being trapped due to a delay in notification on account of occupants on upper floors being remote from a fire on lower storeys. Therefore, the provision for an area of refuge where occupants could shelter until rescued is proposed as a means to provide occupants with an alternative in the event they find their means of egress from the suite compromised.

The provisions of Clauses (6)(c)(ii) to (iv) are based upon the standard of performance established for a balcony used as an area of refuge in the 2024 BCBC 3.3.1.7.(4). The provisions are consistent with commonly accepted alternative solutions, and accounts for potential delays during fire department response.

In dwelling units in a Part 9 building, there is no height limitation for a dwelling unit or number of levels that could be interconnected per Sentence 9.10.9.4.(2). However, these are inherently limited to not more than 3 storeys plus 1 level of garage by the application of Part 9. While the code provides no maximal height for each storey, the general economics of traditional residential units designs lead to storey heights of about 3 m (8.5' to 9' ceiling, plus 1' floor assembly). This means that the total height of interconnection within the typical dwelling unit could be as much as 12 m.

The proposed acceptable solution limits dwelling units with similar interconnected level in a Part 3 building to a similar size and construction. It is proposed to set an upper boundary of 10 m (~3 storeys), so that more substantive heights may be reviewed by Staff and Fire Department through the alternative solution process.

## Proposed VBBL content

### Legend

Black Text – 2019 Vancouver Building By-law content

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#### **3.3.4.2. Fire Separations**

[...]

**3)** Floor assemblies within a *dwelling unit* need not be constructed as *fire separations* provided the dwelling unit complies with Sentence (6) or

- a) the distance between the lowest floor level and the uppermost floor level within the *dwelling unit* is not more than 6 m, and
- b) the *dwelling unit* is separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than
  - i) 1 h if the *building* is not *sprinklered* throughout,
  - ii) 45 min if the *building* is *sprinklered* throughout and it is not more than 3 *storeys* in *building height*, or
  - iii) 1 h if the *building* is *sprinklered* throughout and it is more than 3 *storeys* in *building height*.

[...]

**6)** Floor assemblies within a *dwelling unit* need not be constructed as *fire separations* provided

- a) the *dwelling unit* does not
  - i) exceed 4 *storeys* in height, or
  - ii) include more than 1 *storey* of basement,
- b) the *building* is *sprinklered*,

- c) means of egress is provided directly to the exterior in accordance with Article 3.3.4.4.,
- d) an unenclosed balcony or deck directly accessed from the top most storey, that
  - i) is not more than 10 m above grade,
  - iii) be not less than 1500 mm deep from the outside face of the exterior wall to the inside edge of the balcony with a clear perpendicular dimension of not less than 1700 mm, and
  - iv) provide not less than 2 m<sup>2</sup> of balcony space for each accessible sleeping room or bed space, and
- e) The balcony or deck required by Clause (d), shall be separated from the remainder of the dwelling unit by a fire separation with not less than a 1 h fire-resistance rating, except
  - i) the fire-resistance rating may be 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 the floor assembly below the floor area, and
  - ii) openings in the fire separation may be protected by a water curtain designed in conformance with Sentence 3.2.3.13.(5).

(see Note A-3.3.4.2.(6))

**A-3.3.4.2.(6) Floor Fire Separations in Dwelling Units.** The provision of 3.3.4.2.(6) are intended to provide an alternative to the provisions of Clauses 3.3.4.2.(3)(a) and (b) that addresses complex residential building forms on sloped sites. Due to urban densification efforts, residential development is now occurring on denser and larger sites, the form of residential units are changing and they are frequently higher above adjacent ground surfaces due to stacked dwelling unit arrangements and sloped sites.

Because the establishment of a fire separation within a dwelling unit is generally impractical and unreliable, Sentence 3.3.4.2.(6) provides for the design of a protected balcony or deck to act as an area of refuge for occupants in the event they are cut-off from the means of egress by a rapidly developing fire.

The means of egress from a dwelling unit provided with a balcony or deck meeting Sentence 3.3.4.2.(6) is required to both be directly to the exterior and comply with Article 3.3.4.4., this may constrain the set of egress solution available under Article 3.3.4.4. In most cases, this will be an exterior door directly at the adjacent ground level or may include a set of stairs discharging directly to the adjacent ground level. The adjacent ground level, as referred to in this Article and in 3.3.4.4. is not necessarily the same as grade, and may be an exterior hardscaped surface designed to be suitable for unimpeded occupant egress to a street, lane, or other public throughfare.