

# Public Review

## Vancouver Building By-law (VBBL)

### Proposed change to reorganize Part 11 “Existing Buildings”

**Topic:** Reorganization and simplification of Part 11, and new upgrade scope limitation statements.

**Code change number:** 24-0030

**Code reference:** Division B, Part 11

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## Description of the proposed change

Based on staff experience and industry feedback, it is understood that more casual users of the Building By-law find Part 11 difficult to follow. It is also understood that Part 11 will at times generate upgrade requirements that are substantially outside the tenant’s ability to carry out, and beyond their expected scope of work.

It is understood that tenants and building owners are not necessarily opposed to carrying out upgrades to address existing conditions, but tenants feel that these upgrades should provide value for the tenant space and are within the areas over which they have authority to construct, and building owners have indicated that the upgrades costs should be better aligned with the intended proposed project scope.

Very broadly, no major changes in direction to Part 11 are proposed this time, but a few enabling works and high value changes to support work to come after the new VBBL. This proposal for change addresses:

- A reorganization and clarification to the current Part 11, to make the application clearer - so that users understand that there are three paths to compliance with the upgrade requirements
  - a. the upgrade triggers (the general requirements, or simplified set for houses),
  - b. prescriptive Alternative Compliance Measures (for conversions or for specific retained construction) which are a series of deemed to comply upgrades to treat certain non-conformities as if they were conforming, or
  - c. upgrades acceptable to the Chief Building Official – which could include variations equivalent to the upgrade triggers or could potentially include a reasonable upgrade plan.
- Minor, but high value changes, to help limit the upgrading of major upgrade items (such as structural and non-structural) for tenant improvement works, in order to keep them within the Tenant spaces. It is our general understanding that one of the biggest issues with the current upgrade trigger mechanism is that it can in some cases generate upgrades that become substantially out of scope with the intended simple tenant improvement works, and the ability for the tenant to carry out.

# Justification

This proposed set of changes seeks to lay foundational changes to the organization of Part 11 to improve user comprehension (in particular the idea that there are three paths of compliance), and enabling future work to better align upgrade levels to the intended scope of work, and owner capacity to make changes to their building.

This proposal also include limited high value changes to reduce certain difficulties experienced by tenants and buildings owners when undertaking tenant improvements in tenant spaces, where no change in major occupancy has occurred, and it does so by placing a cap on upgrades for low value tenant improvements or limiting the application of seismic and non-seismic upgrades which have a tendency to impact areas outside the suite where the intended scope of work is limited to the tenant space alone.

Otherwise the general content and intent from the prior VBBL 2019 is carried forwards.

## Proposed VBBL content

### Legend

Black Text – 2019 Vancouver Building By-law content

Red Text – Proposed modification to Vancouver Building By-law content

### **11.1.4.2. Exceptions to Upgrade Requirements**

[...]

4) Where the scope of a renovation is limited to a minor or major renovation, and no alterations are proposed to existing fire separations, the applicable structural and non-structural upgrades may be limited to the renovated suites provided that measures are taken to limit the risk that a failure of connected elements outside the renovated

5) Where the scope of a renovation project is limited to a minor or major renovation and the value of project is less than \$250,000, structural or non-structural upgrading need not be provided.

[...]

(see attached Appendix info following for general context of reorganization and clarification - Note: references and italicization of defined terms in the draft document is a work in progress may not yet be complete)

# Part 11

## Existing Buildings

### Section 11.1. General

#### 11.1.1. Application

##### 11.1.1.1.Scope

1) The scope of this Part shall be as described in Subsection 1.3.3. of Division A.

##### 11.1.1.2.Application

1) The application of this Part shall be as described in Subsection 1.3.3. of Division A.

2) Where *construction* of existing *buildings* occurred before the effective date of **this** By-law, reconstruction or *alteration* of existing buildings is not a requirement of this By-law, except as required by Subsection 11.1.4.

#### 11.1.2. Definitions

##### 11.1.2.1. Defined Terms

1) Words that appear in italics are defined in Article 1.4.1.2. of Division A

2) The following additional words and terms shall have the following meanings for this Part.

(see Note A-11.1.2.1.(2))

##### **Change of Occupancy**

**Change of Major Occupancy** means a change of *major occupancy* within a *building*, a *suite*, or its constituent *floor areas*.

**Restricted Change of Occupancy** means a change of *major occupancy* restricted to a specific set of uses as set out in Clause 11.5.1.3.(9)(c) that are limited **both in hazard and scope such that it does not increase the overall level of risk.**

**Small Suite Change of Major Occupancy** means a **change of occupancy within a suite with an occupant load not exceeding 60 persons and limited to Group A2, Group D, Group E, Group F2 (limited to wholesale showroom use), or Group F3 major occupancies.**

##### **Horizontal Addition**

**Major Horizontal Addition** means any new *floor area* beyond the extents of the existing *floor area*, which exceeds the limits permitted by a Minor Horizontal Addition.

### Notes to Part 11

#### Existing Buildings

##### A-11.1.2.1.(2) Project Scopes in Part 11

For the purposes of Part 11, and establishing acceptable upgrade requirements, Sentence 11.1.2.1.(2) establishes several project scopes used to classify work involving existing construction. A project may fall under one or more project categories, and as a result, it will be subject to the most restrictive set of requirements applicable to all of the project categories that it falls under.

**Change of Major Occupancy** refers to a project scope that includes a change of use or introduces a new use within a suite, storey, or its constituent floor areas, that exceeds the last permitted major occupancy (as last legally authorized) of that suite, storey, or constituent floor areas. More limited scopes of Change of Major Occupancy include:

**Restricted Change of Occupancy** refers to changes of major occupancy within a limited set of uses as set out in Clause 11.5.1.3.(9)(c) that are limited by **both hazard and scope such that it does not increase the overall risk.**

**Small Suite Change of Major Occupancy Classification** means a change of occupancy within a suite of limited occupant load and lower hazard use, This is contingent upon the provision of a separation incorporating additional gypsum board on the suite side from adjacent spaces in the building (including vertically),

[This is an upgrade requirement - separated from adjacent spaces in a building by a fire separation incorporating at least two layers of gypsum wallboard on the suite side.]

**Horizontal Additions** are construction that creates new floor area beyond the extents of the existing floor area but which does not impose new vertical loads on existing construction. This could include the construction of a new addition to a building supported on grade.

**Minor Horizontal Additions** are horizontal additions, of limited size, the extents of which may not exceed either 25 per cent of the existing total building area, or by not more than 500 m<sup>2</sup> of floor area increase aggregated over all of a building's storeys.

**Renovation** projects include alterations to existing construction for the purpose of improvement, renovation, reconfiguration, or refurbishment of existing floor spaces. There are several subcategories of Renovations including

**Minor Horizontal Addition** means any new *floor area* beyond the extents of the existing *floor area* in which it is located by not more than 25 per cent of the existing *building area*, or by not more than 500 m<sup>2</sup> in aggregate *floor area*.

**Renovation** means a *project* whose scope of work includes *construction* limited to the improvement, renovation, reconfiguration, or refurbishment.

**Major Renovation** means a renovation whose scope of work includes multiple *suites* in a building, or work not falling into other subcategories of renovation.

**Minor Renovation** means a renovation of a single *suite* contained within a single tenant space and those demising walls shared with the adjoining *suites*, but which does not include the public or common floor areas of the *building*.

**Small Suite Renovation** means a renovation whose scope of work includes a *suite* that is limited to Group A2, Group D, Group E, Group F2 (limited to wholesale showroom use), or Group F3 major occupancies, and has an *occupant load* of

- up to 60 persons as determined by Division B, or
- up to 100 persons if egress is directly to the adjoining ground level.

**Reconstruction** means the extensive removal of the majority of *construction* to expose the *building's* primary structure on interior and exterior walls, floors and roof with only the primary structural elements remaining in place

**Repair** means work pertaining to a limited scope of interior or exterior renovation work to replace *existing building* components with functionally equivalent components.

### Vertical Addition

**Major Vertical Addition** means the addition of any new *floor area* that in-fills existing unoccupied roof or deck areas, or is superimposed over an *existing building structure* or *floor area*, and which exceeds the limits permitted by a Minor Horizontal Addition.

**Minor Vertical Addition** means the addition of new *floor area* that in-fills existing unoccupied roof or deck areas, or is superimposed over *existing building structure* or *floor area*, with an aggregate *floor area* increase of not more than 25 per cent of the *building area*, or by not more than 500 m<sup>2</sup> in aggregate *floor area*.

**Voluntary Building By-Law Upgrades** means upgrades limited to *alterations* that directly contribute to the improvement of the fire alarm, sprinkler, exit, accessibility, seismic, building envelope, and energy or water efficiency systems in an *existing building*.

the following:

**Major Renovation** is the broadest category of renovation work, and includes all renovations to existing construction which do not fall into other subcategories

**Minor Renovation** is renovation work within a single suite (or a space occupied by a single tenant space) and those demising walls shared with the adjoining suites, but which does not include the public or common floor areas of the building. Minor renovation may also include the subdivision of a single suite of not more than one storey into smaller constituent suites.

Minor Renovation may include the following:

- Reconfiguration of the interior space of the suite which may occupy multiple levels in a building,
- Retention of existing interconnected floor spaces that do not create new connections to previously unconnected floor areas,
- Retention of existing mezzanines that do not add floor area,
- Subdivision of an existing suite of not more than one storey into one or more suites which do not include floor area outside of the subdivided suite
- Renovation in adjacent suites to the extent necessary to support the relocation of shared demising walls, or
- Exterior renovations pertaining to the subject suite

Where the renovation includes a new interconnected floor space, this work would not be considered to be a minor renovation. New mezzanines are considered to be additions.

**Small Suite Renovation** means renovations pertaining to a suite of limited occupant load and lower hazard use. This is contingent upon the provision of a separation incorporating additional gypsum board on the suite side from adjacent spaces in the building (including vertically),

Small Suite renovations may include reconfiguration of the interior space of the suite, but may not include work on more than level (storey or mezzanine), interconnected floor spaces, exterior renovations, or the consolidation of more than one existing suite into a single new tenant space.

**Reconstruction** means the extensive removal of the major of construction to expose the building's primary structure on interior and exterior walls, floors and roof with only the primary structural elements remaining in place (building skeleton). Reconstruction also includes substantial reconfiguration of the interior floor space. Where work, which might otherwise be considered as reconstruction, is un-

### 11.1.3. Objectives

#### 11.1.3.1. Upgrade Objectives

1) An *alteration* to an *existing building* shall trigger upgrading of the *existing building* to meet the following objectives:

- a) all *unsafe conditions* shall be corrected to an *acceptable* level,
- b) all new materials and construction work shall comply with this By-law,
- c) the *building* shall be upgraded to an *acceptable* level of
  - i) fire, life and health safety,
  - ii) structural safety,
  - iii) non-structural safety,
  - iv) accessibility for persons with disabilities, and
  - v) water efficiency,
- d) any significant extension of the design life of an *existing building* beyond its original design life shall require upgrading to an *acceptable* level,
- e) an *alteration* to an individual *suite* within an *existing building* will not trigger upgrades within any other suites except where the alteration creates non-conformity with the By-law within such other *suites*, and
- f) the level of life safety and building performance shall not be decreased below the existing level.

2) An *alteration* to an *existing building* shall not trigger upgrading of the *existing building* to meet the rainwater management requirements described in Article 2.4.2.5. of Division B of Book II (Plumbing Systems) of this By-law.

undertaken solely to facilitate the repair or the abatement of a health hazard of a building, then such work need not to be considered a reconstruction and would be considered a repair, minor renovation or a major renovation as defined in this By-law.

**Repair** focuses on interior or exterior renovations where existing building components are being replaced with components that do not change the essential characteristics of the original building components. This is not the same as a restoration, but a repair may not include work that increases the usable floor area of a building, creates an interconnected floor space, supports an addition or change of use, or the consolidation of more than one existing suite into a single tenant space.

**Vertical Additions** are the addition of any new floor area superimposed over an existing building structure or floor area which imparts an additional structural load. Structural loads include not only gravity loads, but could include implication from uplift, wind, or changes in rain, or snow loads.

In addition to storeys, this may include mezzanines, decks or other roof areas intended for occupancy which in-fill existing unoccupied spaces.

Major Vertical Addition are those vertical additions which exceeds the limits permitted by a Minor Horizontal Addition.

Minor Vertical Addition is an addition of new floor area with an aggregate floor area increase of not more than 25 per cent of the building area, or by not more than 500 m<sup>2</sup> in aggregate floor area.

**Voluntary Building By-Law Upgrades** are alterations to the building that directly contribute to the improvement of existing building systems and aligned with the fundamental objectives of the Building By-law. These improvements may include improvements in the fire alarm, sprinkler, exit, accessibility, seismic, building envelope, and energy or water efficiency systems in an existing building.

### 11.1.4. Compliance

#### 11.1.4.1. Upgrading of Existing Buildings

1) Except as otherwise permitted in this Subsection, where an alteration is made to an existing building, the alteration shall comply with the upgrade objectives of this By-law and the existing building shall be

- a) upgraded to the upgrade levels as determined by the existing building Upgrade Mechanism in Section 11.5.,
- b) upgraded to the satisfaction of the Chief Building Official through Alternative Compliance Measures that demonstrate equivalent improvement where specific characteristics of the building are intended to be retained, or
- c) upgraded to the satisfaction of the Chief Building Official where the owner demonstrates that the design levels, as determined by the Upgrade Mechanism, present a hardship for the owner.

2) Where an order issued under the Fire By-law requires upgrading of a building, the Chief Building Official may allow deviations from this By-law.

#### 11.1.4.2. Exceptions to Upgrade Requirements

1) Where an alteration does not involve an addition or a change in major occupancy, further upgrading to an existing building is not a requirement of this By-law provided

- a) construction or a full upgrade of the building occurred by means of a building permit issued on or after May 1, 2007,
- b) all new work is in compliance with this By-law, and
- c) all unsafe conditions are corrected to the satisfaction of the Chief Building Official.

2) Where a voluntary Building By-law upgrade for fire alarm systems, sprinkler systems, exits, accessibility, seismic work, washrooms or kitchens for single room accommodations, energy efficiency or building envelope repair is carried out, no further upgrade of the building is required except that, where other work is included in the application the upgrade requirement will only be based on the non-voluntary work proposed.

3) Existing construction complying with Alternative Compliance Measures in accordance with Sections 11.2. to 11.4. need not be further upgraded. (see note A-11.1.3.1.(1) and 11.1.3.5.(3).)

4) Where the scope of an renovation is limited to a minor or major renovation, and no alterations are proposed to existing fire separations, the applicable structural and non-structural upgrades may be limited to the renovated suites provided that measures are taken to limit the risk that a failure of connected elements outside the renovated

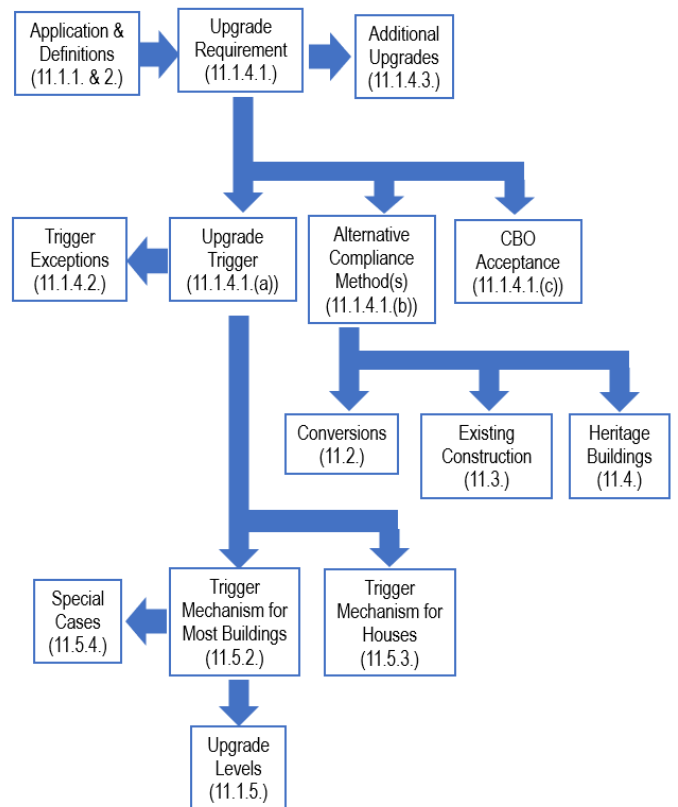
**A-11.1.4.1.(1) Upgrading of Existing Buildings.** Article 11.1.3.1. of the Building By-law identifies that existing buildings are required to be upgraded, and identifies three mechanism by which an appropriate level of upgrade may be determined. In most cases, this is achieved by use of the upgrade triggers mechanism described in Section 11.5.

However, the scope of projects vary considerably as do the state of existing building construction, and therefore upgrades in accordance with Clauses 11.1.3.1.(b) and (c) provide alternative means to establish acceptable upgrades to retained existing construction.

Clause (b) address upgrades via Alternative Compliance measures, which include:

- Construction to achieve modified code requirements, frequently referred to as renovation language, in Section 11.2.;
- Alternative Compliance Measures which identify alternative upgrades to specific existing components of a building which are deemed to comply with respect to that specific component, in Section 11.3; and
- Measures intended to facilitate the conversion of existing construction for new uses, in Section 11.4.

The figure below provides a general flowchart illustrating how the acceptable upgrade to an existing building is determined.



suites will cause a failure of structural or non-structural elements within the subject suite

5) Where the scope of a renovation project is limited to a minor or major renovation and the value of project is less than \$250,000, structural or non-structural upgrading need not be provided.

6) Where an alteration to a building is a self-contained volumetric space that is separated from the remainder of the building by a non-combustible vertical fire separation with a 2 h fire resistance rating, the upgrade requirements of this Part do not apply to the remainder of the building provided

- a) the self-contained volumetric space is upgraded in conformance with this By-law,
- b) the self-contained volumetric space does not exit through the remainder of the building,
- c) the building area of the self-contained volumetric space is not larger than 10% of the existing building area,
- d) a non-combustible vertical fire separation with a 2 h fire resistance rating is constructed as a continuous vertical fire separation from the building foundation to the underside of the roof sheathing, and
- e) the self-contained volumetric space does not reduce the existing structural capacity of the building.

#### 11.1.4.3. Additional Upgrade Requirements

1) Where building envelope repair involves more than 60% of an opaque portion of a building face, the building envelope on the entire vertical section of that building face shall be replaced and upgraded to the thermal resistance and air-tightness requirements of Part 10, except where

- a) the scope of work is limited to the replacement of windows
- b) the building is two storeys in building height or less and is required to comply with Part 9 per Division A, Article 1.3.3.3., or
- c) the building face has heritage merit and is required to be retained as part of an approved retention plan.

2) Where property lines are relocated closer to a building, the building shall be upgraded to conform to the spatial requirements, fire department access requirements and means of egress requirements of this By-law or the applicant shall demonstrate that the relocated property lines and the existing building configuration comply with this By-law.

3) Where a building has been damaged, all work necessary to reconstruct the damaged portions of the building shall conform to this By-law and the Fire By-law and the remainder of the building shall be upgraded in conformance

#### A-11.1.4.5.(2) Voluntary Building By-law Upgrades.

Where a voluntary upgrade for fire alarm systems, sprinkler systems, exits, accessibility, seismic work, building envelope repair, energy efficiency, or water efficiency is performed, it is not the intent of this By-law to require the owner to further upgrade the building provided no other work is included in the project. If other work is included in the project, the upgrade requirement will only be based on the non-voluntary work proposed.

**A-11.1.4.5.(3) Alternative Compliance Measure.** Where Alternative Compliance Measures are implemented to address specific retained characteristics of a building, the retained construction is deemed to be compliant for the purposes of establishing the building upgrades as determined by the Upgrade Trigger Mechanism.

#### A-11.1.4.2.(5) Self-contained Separated Spaces.

The self-contained space provisions of Article 11.5.1.6. are intended to be applied to modest upgrades or minor additions to existing buildings where the normal application of the upgrade requirements Part 11 would constitute a hardship. It is not intended that these provisions be utilized for the construction of additions of substantial size relative to the original building construction, or the conversion or substantial reconstruction of a heritage structure. Such structures should be upgraded in conformance with the general provisions of Part 11 as applicable to the intended scope of work.

with Article 11.5.1.3.

4) Where a building is being demolished in whole or in part, the demolition work shall conform to the requirements of Part 8 and any part of the building that remains after demolition shall be upgraded in conformance with Article 11.5.1.3.

5) Existing lighting exceeding the Lighting Power Density of ASHRAE 90.1-2016 shall be removed within existing spaces of a suite within the scope of a project.

6) Where the total construction value of an alteration to a marina exceeds 50% of the replacement value of the marina as determined at the application stage for alteration, then the marina shall comply with Subsection 12.2.1.

### 11.1.5. Upgrade Levels

#### 11.1.5.1. Required Upgrade Levels

1) The required Upgrade Levels determined by this Part are as follows:

##### Fire

- F1** - Exiting to be reviewed to ensure that the exits do not present an unsafe condition.
- F2** - Existing building to meet the fire & life safety requirements of the Building By-law within the project area and have conforming exits leading from the project area to an acceptable open space.
- F3** - Existing building to meet fire, life and health safety requirements within the project area. Existing building to meet fire, life & health safety requirements within the public areas.
- F4** - Entire building to substantially meet the intent of health, fire and life safety requirements of the VBBL as well as provide protection to adjacent property

##### Structural

- S1** - Proposed work must not have an adverse effect on the structural capacity of the existing structure.
- S2** - Limited structural upgrade required in order to provide minimum protection to building occupants during a seismic event within the project area.
- S3** - The building structure shall be upgraded to an acceptable level in order to provide a minimum level of property and life safety to unreinforced masonry or other buildings having less than 30 percent of the current required seismic resistance. Falling hazards that may impact adjacent properties and over public ways must be addressed.
- S4** - The entire building structure shall be brought up to an acceptable level in order to meet seismic requirements of the VBBL.

**A-11.1.5.1.(1) Upgrade Levels.** The required upgrading of an existing building are assigned Levels 1 through 4, where 4 represents the highest level of upgrade in each of the areas associated with the upgrade objectives of the Building By-law.

If an alteration includes more than one category of work or project type, then the most restrictive upgrade levels from each category of work will be applied. The individual upgrade levels are cumulative, so the higher level upgrade levels include all of the preceding lower upgrade level requirements. For example, where the design upgrade level is F3, then all of the upgrade requirements under F2 and F1 also apply.

The acceptable solutions indicated in these notes and associated with upgrade levels are examples of possible upgrade plans that are deemed to satisfy the prescribed upgrade levels. Code users are not necessarily required to provide upgrades that comply exactly with the acceptable solutions.

It is expected that owner may choose to adopt specific upgrades that better align with the planned work. Analysis by the building designer may be required to demonstrate that the proposed set of upgrades will achieve the performance of the required upgrade level.

#### Acceptable Solutions for Upgrade Levels

**F1** Project Area – Exits to be upgraded with respect to number, capacity, and fire separations only.

**S1** Entire Building – Proposed work must not reduce the structural integrity of the existing building.

**N1** Project Area – Restrain all ceiling supporting frames, T-bars assemblies, ceiling gypsum wall boards, all overhead mechanical ducts, sprinklers, equipment, sprinkler system, overhead electrical conduits and lights

**A1** Project Area – Existing level of accessibility must be maintained throughout the project area. No additional accessibility enhancements are required.

**F2** Project Area – Alarms and detectors (only where existing devices are provided), emergency lights, access to exit, exits, exit signs, and exit lights.

Public Area (leading from project area to an acceptable open space) – emergency lights, exit signs, access to exit, exits, and flame spread ratings.

**S2** Project Area – Non-structural elements and falling hazards must be restrained to resist lateral loads due to earthquakes within the project area.

**N2** Project Area Means of Egress – Restrain interior partition walls. Restrain all ceiling supporting frames, T-bars assemblies, ceiling gypsum wall boards, all overhead mechanical ducts, sprinklers, equipment, sprinkler system,



**Nonstructural**

- N1** - Project area to be reviewed to ensure safety from overhead falling hazards.
- N2** - Project area and means of egress to be reviewed to ensure safety from overhead falling hazards.
- N3** - Building exits and to acceptable open space to be reviewed to ensure safety from overhead falling hazards.
- N4** - Entire Building and to acceptable open space to be reviewed to ensure safety from overhead falling hazards.

**Accessibility**

- A1** - The proposed work must not adversely affect the existing accessibility level of the building.
- A2** - A limited level of upgrade shall be provided within the project area to ensure access for persons with disabilities.
- A3** - The existing building shall be upgraded to an acceptable level in order to ensure complete access within the project area as well as access to the remainder of the building.
- A4** - The existing building shall be upgraded in order to provide the minimum accessibility requirements of the VBBL.

**11.1.6. Alternative Compliance Measures****11.1.6.1. Conditions for Using Alternative Compliance Measures**

- 1) Where a building or a portion of a building is required to be upgraded, the Alternative Compliance Measures provided in Section 11.2. or 11.4. may be applied as alternatives to those requirements contained elsewhere in this By-law, under the conditions specified in this Article, and Sections 11.2. through 11.4.
- 2) Except for additions, and new construction, where Subsection 3.2.2. requires that the construction of a building be noncombustible, the applicable Article in Subsection 11.3.3. may be applied as an alternative provided all of the requirements of that Article have been met.
- 3) Except for additions and new construction, where the spatial separation and exposure protection requirements of Subsection 3.2.3. or 9.10.14. require that the exterior wall construction of a building to be noncombustible, Subsection 11.3.4. may be applied.

overhead electrical conduits and lights. Restrain cladding veneer, parapets, canopies and ornaments over exit and extended to 5 m on either side of exit

**A2** Project Area – door clearances, door hardware, and areas of refuge.

**F3** Project Area – Alarms & detectors (only where existing devices are provided), emergency lighting, access to exit, exits, exit signs, exit lights, flame spread ratings, floor assemblies & supports, occupancy separation, standpipes and sprinklers, washrooms.

Public Area – Alarms & detectors (only where existing devices are provided), emergency lighting, access to exit, exits, exit signs, exit lights.

Entire Building – Fire fighter's access.

**S3** Entire Building – Building to be upgraded to resist 50 per cent of the current By-law specified lateral force levels, where the building is evaluated as having less than 30 percent of the current required seismic resistance. Restrain falling hazards from major building components such as cantilevered walls, parapets, exterior ornaments, towers, chimneys, or other appendages, which could impact adjacent properties and public ways to resist forces due to a seismic event.

**N3** Entire Building Exits – Restrain interior partition walls. Restrain ceiling supporting frames, T-bars assemblies, ceiling gypsum wall boards, overhead mechanical equipment and services, sprinklers, sprinkler system, overhead electrical equipment and services. Restrain falling hazards to resist forces due to a seismic event from non-structural elements including cladding, veneer,

cornices, canopies, awnings, and ornaments over exit and extended to 5 m on either side of exit.

**A3** Project Area – Door clearances, door hardware, accessible washrooms, and areas of refuge.

Public Area – Door clearances, door hardware, areas of refuge, washrooms, ramps, and elevators.

**F4** Entire Building – Alarms & detectors, emergency lighting, access to exit, exits, exit signs, exit lights, flame spread ratings, firefighting access & water supply, floor assemblies & support, spatial separation, occupancy separation, standpipes & sprinklers, washrooms, high building requirements, lighting levels, sound transmission classifications, ventilation, building envelope review, and radio antenna systems.

**S4** Entire Building – Building to be upgraded to resist 75 percent of the current By-law specified lateral force levels, where the building is evaluated as having less than 60 percent of the current required seismic resistance.

**N4** Entire Building – Restrain all interior partition walls. Restrain all ceiling supporting frames, T-bars assemblies,

ceiling gypsum wall boards, overhead mechanical equipment and services, sprinklers, sprinkler systems, overhead electrical equipment and services. Restrain exterior falling hazards to resist forces due to a seismic event from cladding, veneer, cornices, parapets, canopies, awnings, and ornaments attached to the exterior of the building.

**A4** Entire Building – Building to meet accessibility provisions of the current VBBL

Note: that where there is one or more upgrade level(s) within the same category preceding the design upgrade level in Table A-11.5.1.3.-B, then the design upgrade level shall also include all of the preceding upgrade levels. For example, where the design upgrade level is F3, then all of the upgrade requirements under F2 and F1 also apply. (see also 11.5.1.1.(3).)

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## **Section 11.2. Alternative Compliance Measures for the Conversion of Existing Buildings**

### **11.2.1. Application**

#### **11.2.1.1. Alternative Compliance Measures for Existing Conditions**

1) The alternative compliance measures for conversions in this Section apply to existing conditions only and do not apply to new work, which must conform to the requirements for new construction in this By-law.

2) The requirements of this section may be applied in lieu of the upgrades required by 11.5 Upgrade Triggers. Except as required by this Section, the alternative compliance measures in Section 11.3. may be applied to existing conditions for conversions.

3) Except as required by this Section, where a building is a heritage building, the measures in Section 11.4 may be applied to existing conditions for conversions.

### **11.2.2. Conversion of an Existing Residential Building Containing Not More Than Two Principal Dwelling Units into a Community Care Facility, Group Residence or Child Care Facility**

#### **11.2.2.1. General Requirements**

1) An existing residential building containing not more than two principal dwelling units may be converted or partially converted into a community care facility, group residence or child care facility provided

a) the occupant load does not exceed

i) 10 residents in a community care facility,

ii) 6 residents in a group residence, or

iii) 8 children in a child care facility,

b) the community care facility or group residence is

i) separated from the residential portions of the building containing not more than one principal dwelling unit by a fire separation with a fire resistance rating of 1 h,

ii) separated from the residential portions of the building containing not more than two principal dwelling units by a fire separation with a fire resistance rating of 2 h,

iii) completely sprinklered, and

iv) equipped with a fire alarm system, emergency lights and smoke and heat detectors installed throughout the building.

c) the child care facility conforms with Clauses 3.1.2.8.(1)(a) and (b),

d) firefighter access conforms with this By-law,

e) the building area is no more than 300 m<sup>2</sup>,

f) all unsafe conditions are corrected to the satisfaction of the Chief Building Official, and

g) the building shall be upgraded to conform to upgrade design levels F2, S2, N2, A2 as defined in the Upgrade Mechanism Model in note A-11.2.1.2.

#### **11.2.2.2. Alternative Compliance Measures**

1) The alternative compliance measures contained in Sentences (2) to (11) inclusive may be applied to the conversion or partial conversion of an existing residential building containing not more than two principal dwelling units into a community care facility, group residence or child care facility.

2) For the purposes of determining building height, a residential building containing not more than one principal dwelling unit constructed pursuant to a building permit issued prior to July 01, 1994 which is four storeys or less in height may

be considered as 3 storeys in building height.

**3)** Existing exterior wood-frame walls may be retained instead of required noncombustible construction, provided

- a) a minimum 45 min fire-resistance rating is provided, and
- b) all voids are filled with mineral wool or fibreglass batts.

**4)** Combustible exterior cladding materials may be used instead of required noncombustible cladding provided the cladding

- a) has a flame-spread rating of no more than 25,
- b) is underlaid with a minimum layer of 12.7 mm exterior gypsum board sheathing, and
- c) is composed of
  - i) aluminum panels,
  - ii) fire-retardant treated wood panels,
  - iii) fire-retardant treated cedar shakes or shingles, or
  - iv) vinyl siding.

**5)** Where exterior walls and openings are required by Subsections 3.2.3. or 9.10.14. to have exposure protection, existing openings need only conform to Article 11.2.3.4.

**6)** If one interior exit stair is no less than 900 mm wide, a second interior exit stair which is no less than 750 mm wide may be permitted.

**7)** The flame-spread rating of the existing interior finish of a means of egress shall not exceed 150.

**8)** Ducts passing through fire separations need not be equipped with fire dampers if

- a) the duct opening is less than 150 cm<sup>2</sup> in cross-sectional area, or
- b) the duct work is constructed entirely of sheet steel and the duct opening is no more than 1 000 cm<sup>2</sup> in cross-sectional area.

**9)** Manual stations are not required if the fire alarm system and the sprinkler water flow alarm are designed in accordance with Article 3.2.4.7.

**10)** An existing exterior wall opening adjacent to an exterior exit stair or fire escape need not conform to Article 3.2.3.13. if the opening is glazed with wired or tempered glass in an aluminum or wood frame.

**11)** A single exit from a dwelling unit need not conform to Sentence 3.3.4.3.(3) if

- a) the exit serves only one dwelling unit, and

**A-11.2.3.1.(1) Interconnected Smoke Alarms and Carbon Monoxide Detectors.** Concern has been expressed to the interconnection requirement of smoke alarms served by different electrical panels if the panels do not share a common ground. The concern is a current could be generated through the interconnecting wires and false alarms could result. Interconnected smoke alarms must be powered off the same (main) electrical panel so that a common ground and reliable operation is achieved.

b) the vertical floor elevation from the uppermost floor level to the adjacent ground level does not exceed 6 m.

**11.2.3. Conversion of a Portion of a Suite into an Ancillary Residential Unit**

**11.2.3.1. Alternative Compliance Measures**

1) Except as required in Sentences (2) and (3), where an existing building containing not more than two principal dwelling units is altered to create an ancillary residential suite, the existing building shall conform to the requirements of Section 9.37, except as permitted by Table 11.3.3.1., provided the building was constructed under a building permit issued on or prior to June 22, 2004. (See Note A-11.3.3.1.(1).)

2) Where the alteration in Sentence (1) includes an addition, the addition shall conform to the requirements of this By-law.

3) Where an existing building was constructed with a building permit issued on or after June 22, 2004, the existing building and the alteration shall conform to Part 9.37 of Division B.

4) Notwithstanding the requirements of Sentence 9.34.1.1.(1), circuits and receptacles in the ancillary residential suite shall have a minimum of

- a) two kitchen counter duplex receptacles
  - i) supplied by two appliance circuits, and
  - ii) wired on single circuits or a split circuit,
- b) two duplex receptacles located on different walls in each bedroom, and
- c) three duplex receptacles located on different walls in the living area.

5) Notwithstanding the requirements of Sentence 9.34.1.1. (1)

- a) where a single existing panel board is located in a common area within the building accessible to all occupants of the building, the panel board may supply electrical loads for both the principal dwelling and the ancillary residential suite,
- b) any electrical range and equipment loads provided for the ancillary residential suite shall be calculated with demand factors in conformance with Sentence 9.34.1.1.(2), and
- c) general circuit branch wiring may be interconnected between outlets located in the principal dwelling and the ancillary residential suite.

**Table 11.2.3.1.**  
**Fire Safety Requirements for Ancillary Residential Unit Conversions**  
 Forming Part of Article 11.2.3.1.

Item	Item Details	Alternative Compliance Measure(s)
Spatial Separation	Existing windows and doors	<ul style="list-style-type: none"> <li>• Original unaltered windows, doors, or other openings may remain.</li> </ul>
	New windows in existing openings	<ul style="list-style-type: none"> <li>• Where windows are provided in existing openings to be protected by Subsections 3.2.3. or 9.10.14.</li> <li>• Existing openings may be protected in conformance with Article 11.3.3.4.</li> </ul>

Fire Containment within a Principal Dwelling Unit	Separation between a principal dwelling unit and its contained ancillary residential units	<ul style="list-style-type: none"> <li>Existing lath and plaster in good condition or 13 mm gypsum wall board on wood studs at maximum 450 mm on centre may be used where the interior wall finish is in place prior to the construction of an ancillary residential suite. Where possible, New walls are to be 16 mm (5/8") type 'X' GWB or 12.5 mm (1/2") Type 'C' GWB on wood or steel studs at maximum 600 mm on centre. The stud cavity is to be filled with minimum 90 mm (3 1/2") mineral wool insulation.</li> <li>Caulk joints where floor and ceiling meet wall GWB.</li> <li>Use resilient acoustic channels where possible.</li> </ul>
	Ducts common to both units through suite separations	<ul style="list-style-type: none"> <li>Fire dampers not required if sheet metal ducting extends a minimum of 1800 mm (6'-0") beyond the suite separation and the opening is firecaulked.</li> <li>Acoustic insulation is to be used inside the common duct extending a minimum of 1500 mm (60") from either side of the suite separation.</li> </ul>
	Plumbing and sprinkler plastic piping that penetrate fire separations	<ul style="list-style-type: none"> <li>Shall be tightly fitted, cast in place, or caulked as per product listing.</li> </ul>
	Suite entry doors between the principal dwelling unit and its contained ancillary residential unit	<ul style="list-style-type: none"> <li>Existing solid core doors and frames with or without wired glass in good condition. Doors to be provided with positive latching hardware and self-closing devices.</li> </ul>
Resistance to Forced Entry	Solid Blocking	<ul style="list-style-type: none"> <li>Solid blocking may be omitted for doors described in Sentence 9.7.5.2.(9) where the interior wall finish adjacent the door is in place prior to the construction of an ancillary residential unit.</li> </ul>
Exits	Egress from each dwelling unit	<ul style="list-style-type: none"> <li>In combination with the Egress Windows requirement of Sentence 9.9.10.1., at least one conforming exit is required from the principal dwelling and one from the ancillary residential suite.</li> </ul>
	Windows and doors adjacent to exits	<ul style="list-style-type: none"> <li>No requirements where the suite is sprinklered, provided with a closure or provided with intervening construction extending out by at least 600 mm.</li> </ul>
Fire Department Access	Access Path	<ul style="list-style-type: none"> <li>Existing path designated for fire department is permitted to be minimum 860 mm.</li> </ul>
Flame Spread Rating	Exits	<ul style="list-style-type: none"> <li>≤150</li> </ul>
	Remainder of building	<ul style="list-style-type: none"> <li>No requirement</li> </ul>
Sprinklers		Sprinklers are required where the value of the alteration is less than \$250,000 or 50% of the replacement <sup>(1)</sup> value of the existing building.
Heating Systems	Furnace room enclosure	No separation required but provide proper combustion air and required clearances from all equipment. <sup>(2)</sup>
Smoke Alarms	Entire building	<ul style="list-style-type: none"> <li>Interconnected smoke alarms to be installed on each storey including basements, in each sleeping room and in a location between the sleeping room and the remainder of the storey and if the sleeping room is served by a hallway, the smoke alarm to be located in the hallway. Installed by permanent connections to an electrical circuit in conformance with Subsection 9.10.19. Division B. Provided with battery backup and manual silencing devices which will silence the alarm in conformance with Article 9.10.19.6. of Division B.</li> <li>Carbon Monoxide detectors to be provided in accordance with the 9.32.4.2.(3)</li> </ul>

Stairs and Hand-rails	Entire building	<ul style="list-style-type: none"> <li>Existing stairs to comply with Section 9.8, excepting the following dimensions: tread depth 235-355 mm, rise 125-200 mm and run 210-355 mm, unless considered to present an unsafe condition as determined by the Chief Building Official.</li> <li>All existing stairs to have at least one handrail in conformance with Subsection 9.8.7.</li> </ul>
Guardrail Protection	Entire building	<ul style="list-style-type: none"> <li>Existing guards may be retained provided they are structurally sound, non-climbable and <math>\geq 900</math> mm high.</li> </ul>
Sprinklers		<ul style="list-style-type: none"> <li>Sprinklers are not required provided the value of the alteration is less than or equal to 50% of the replacement(1) value of the existing building.</li> </ul>
Heating Systems	Furnace room enclosure	<ul style="list-style-type: none"> <li>No separation required but provide proper combustion air and required clearances from all equipment.(2)</li> </ul>
Smoke Alarms	Entire building	<ul style="list-style-type: none"> <li>Interconnected smoke alarms to be installed on each storey including basements, in each sleeping room and in a location between the sleeping room and the remainder of the storey and if the sleeping room is served by a hallway, the smoke alarm to be located in the hallway. Installed by permanent connections to an electrical circuit in conformance with Subsection 9.10.19. Division B. Provided with battery backup and manual silencing devices which will silence the alarm in conformance with Article 9.10.19.6. of Division B.</li> <li>Carbon Monoxide detectors to be provided in accordance with the 9.32.4.2.(3)</li> </ul>
Stairs and Hand-rails	Entire building	<ul style="list-style-type: none"> <li>Existing stairs to comply with Section 9.8, excepting the following dimensions: tread depth 235-355 mm, rise 125-200 mm and run 210-355 mm, unless considered to present an unsafe condition as determined by the Chief Building Official.</li> <li>All existing stairs to have at least one handrail in conformance with Subsection 9.8.7.</li> </ul>
Guardrail Protection	Entire building	<ul style="list-style-type: none"> <li>Existing guards may be retained provided they are structurally sound, non-climbable and <math>\geq 900</math> mm high.</li> </ul>
Existing Head-room	Entire building	<ul style="list-style-type: none"> <li>May be reduced to 1950 mm over 80% of the suite area and all egress routes.</li> <li>The minimum clear height under the remaining suite floor area shall be not less than 1 850 mm, except public corridors and exits which shall be not less than 2 000 mm.</li> </ul>
	Doorway opening sizes	<ul style="list-style-type: none"> <li>Other than, exit doors, and doors serving public corridors and exit corridors that serve principle dwelling units in a building contained an ancillary residential units, doorway openings shall be designed to accommodate swing-type and folding doors not less than 1 980 mm high, except doorway openings within an ancillary residential unit which may be reduced to not less than 1 890 mm high.</li> </ul>
Sound Separation	Between the principal dwelling unit and its contained ancillary residential suites	<ul style="list-style-type: none"> <li>Not required where the interior wall finish is in place prior to the construction of an ancillary residential suite.</li> <li>Fill cavity spaces of suite separation with mineral wool in walls and floor assemblies of new construction.</li> </ul>
Unsafe Conditions	Entire building	<ul style="list-style-type: none"> <li>Any condition within or around the building which could cause undue hazard or risk to persons to be corrected as directed by the Chief Building Official</li> </ul>

**Notes to Table 11.3.3.1.:**

(1) See Note A-11.5.1.4.(3)(a).

(2) The Gas Code places restrictions on locating gas furnaces adjacent to sleeping rooms or bathrooms.

(3) See Note A-11.3.3.1.(1) Interconnected Smoke Alarms and Carbon Monoxide Detectors

6) For the purposes of determining building height, an existing building containing not more than two principal dwelling units constructed pursuant to a building permit issued on or prior to June 22, 2004 which is four storeys or less in height may be considered as 3 storeys in building height where the project is limited to the creation of a new ancillary residential unit.

### **11.2.4. Enclosure of an Exterior Open Balcony in an Existing Residential Building**

#### **11.2.4.1. Alternative Compliance Measures**

- 1) An existing open balcony may be converted to an enclosed balcony if
  - a) required suite fire separations are provided,
  - b) spatial separations conform to this By-law,
  - c) travel distances conform to this By-law,
  - d) guards conform to this By-law,
  - e) exhaust ducts conform to this By-law,
  - f) light and natural ventilation are maintained and conform to this By-law,
  - g) all new structural work conforms to this By-law,
  - h) high building measures (smoke-free refuge areas) are maintained,
  - i) the existing door assembly separating the suite from the existing open balcony is maintained, and
  - j) the suite is upgraded to an acceptable level as defined in the Upgrade Mechanism Model in Division B Appendix A.

### **11.2.5. Conversion of Space in an Existing Group F Division 2 Building into Artist Live/Work Studios**

#### **11.2.5.1. Alternative Compliance Measures**

- 1) Artist live/work studios are permitted in an existing building classified as a Group F, Division 2 occupancy if
  - a) the building is sprinklered with fast-response heads,
  - b) all suites are separated from the remainder of the building by a fire separation with a 1 h fire resistance rating and all floors are separated from each other by a fire separation with a 1 h fire resistance rating, except that a 45 min fire-resistance rating or existing lath and plaster in good repair is acceptable in a building less than 4 storeys in building height,
  - c) the exit systems conform to Section 3.4., except as permitted in Subsections 11.2.5. and 11.2.6.,
  - d) all public corridors conform to Article 3.3.1.4., except as permitted in Subsections 11.2.4. and 11.2.6.,
  - e) the emergency lighting conforms to Subsection 3.2.7.,
  - f) a fire alarm and detection system conforming to Subsection 3.2.4. is installed in the entire building,
  - g) if dust or fumes are produced in a studio
    - i) the building complies with the Fire By-law, and
    - ii) the building is heated by hot water, electrical equipment, or elevated gas-fired forced-air heaters,
  - h) if flammable or combustible liquids or gases are stored or used in a studio, the building complies with the Fire By-law and the British Columbia Gas Safety Act,
  - i) service rooms and storage rooms located outside of a studio conform to Section 3.6.,
  - j) the floor assembly is designed for a minimum live load of 3.6 kPa and the building conforms to the structural upgrade level S3 as defined in the upgrade mechanism model within Division B Appendix A,



- k) a studio complies with the sound transmission requirements of Section 5.8.,
- l) light and ventilation for the studio sleeping area complies with Parts 5 and 6,
- m) shared washroom facilities comply with the requirements of the Standards of Maintenance By-law for lodging houses, and
- n) the building is upgraded to an acceptable level as defined in the upgrade mechanism model in Division B Appendix A.

2) For the purpose of determining occupancy classification, artist live/work studios shall be considered to have an occupancy classification as defined in Articles 3.1.3.3. and 3.1.3.4.

## 11.2.6. Conversion of an Existing Hotel to Single Room Accommodation

### 11.3.6.1. Alternative Compliance Measures

- 1) Single room accommodation is permitted in an existing building classified as a Group C major occupancy (hotel) if
  - a) all suites are separated from the remainder of the building by a fire separation with a 1 h fire resistance rating and all floors are separated from each other by a fire separation with a 1 h fire resistance rating, except that a 45 min fire-resistance rating or existing lath and plaster in good repair is acceptable if the building is less than 4 storeys in building height,
  - b) the exit systems conform to Section 3.4., except as permitted in Subsections 11.2.5. and 11.2.6.,
  - c) all public corridors conform to Article 3.3.1.4., except as permitted in Subsections 11.2.4. and 11.2.6.,
  - d) the emergency lighting conforms to Subsection 3.2.7.,
  - e) a fire alarm and detection system conforming to Subsection 3.2.4. is installed throughout the building,
  - f) the floor assembly is designed for a minimum live load of 2.4 kPa,
  - g) notwithstanding Clause (j), the building conforms to the structural upgrade level S3 as defined in the upgrade mechanism model in Division B Appendix A,
  - h) shared washroom facilities comply with the requirements of the Standards of Maintenance By-law for lodging houses,
  - i) the suites comply with the sound transmission requirements of Section 5.8 of Division B, and
  - j) the building is upgraded to an acceptable level as defined in the upgrade mechanism model in Division

**A-11.2.7.1.(2) Bare Lands Strata Conversions.** It is the general intent of the strata conversions requirements of this By-law to require upgrades to existing buildings where they undergo subdivision under the provincial Strata Act. In cases where the land is being subdivided, and existing buildings are not being internally subdivided into separate strata lots, then the extent of the upgrades may be limited to upgrades addressing the external where there is no other intent to alter the buildings. These upgrades could include, but are not limited to, risks associated with the partial or total collapse of the existing buildings, overhead fall hazards, and fire exposure to or from adjacent buildings and the egress and access routes. 'S4' and 'N4' and sprinklering are the appropriate upgrade categories, but as with all existing buildings, there may be a need to consider the impacts of site specific features which could constitute a hardship. Such cases should be evaluated by appropriately trained professionals, and alternative measures discussed with the Chief Building Official.

B Appendix A.

**11.2.7. Conversion of an Existing Non-Strata Building to a Strata Property**

**11.2.7.1. Alternative Compliance Measures**

1) Except as permitted by Sentence (2), an existing building or parcel may be converted into 2 or more strata lots, if the entire building is

- a) upgraded to design upgrade levels F4, S4, N4, and A4 as detailed in the upgrade mechanism model in Division B Appendix A, and
- b) fully sprinklered.

2) An existing parcel containing one or more buildings, may be converted into 2 or more strata lots, if the existing buildings are not otherwise altered, and

- a) upgraded to comply with the exposure requirements of Subsection 3.2.3., 9.10.14. or 9.10.15. as applicable,
- b) upgraded to comply with the fire department access path of travel in accordance with Articles 3.2.5.5. and 3.2.5.6.,
- c) upgraded to design upgrade levels S4 and N4, as detailed in the upgrade mechanism model in Division B Note A-11.5.1.2., and
- d) fully sprinklered.

(See Note A-11.3.7.1.(2).)

## Section 11.3. Alternative Compliance Measures for Existing Conditions to Assist Renovation

### 11.3.1. Application

#### 11.3.1.1. Application of Alternative Compliance Measures for Existing Conditions

(See Note A-11.2.1.1.)

1) Except as permitted in Sentence (3), the alternative compliance measures provided in Subsection 11.3.3. shall not apply to newly constructed buildings or portions of a building, which shall conform to the requirements for new construction in this By-law.

2) Where the building is a heritage building, the alternative compliance measures in Section 11.4 may be applied to existing construction.

3) The alternative compliance measures provided in Subsection 11.3.2. may be applied to existing conditions or existing construction required to be modified to support new construction.

### 11.3.2. Energy Retrofit Design Building Classification

#### 11.3.2.1. Application to Existing Buildings

1) Except as permitted by Sentence (2), alterations to a building shall be in conformance with this Subsection for the purposes of energy and emissions performance.

2) A structure that cannot be identified by the characteristics of a building in this Subsection shall comply with the requirements of Article 11.2.2.2., or as deemed acceptable to the Chief Building Official.

3) Except as permitted in Sentence (5) and Articles 11.2.2.2. through 11.2.2.5., alterations to a building shall comply with

- a) alterations clauses within ANSI/ASHRAE/IES 90.1, "Energy Standard for Buildings Except Low-Rise Residential Buildings," and Sentence 10.2.2.2.(2), or
- b) the "Alteration Language Supporting NECB 2020" (See Note A-11.2.2.1.(3).)

4) Where a building contains one or more major occupancies that conform to Article 10.2.2.5., the remaining major occupancies shall comply with Clause (3)(a) or (b).

5) Spaces never previously occupied, shall be designed and constructed to new building requirements, in compliance with

- a) Article 10.2.2.3., if the building was designed or upgraded to NECB, or

**A-11.3.1.1. Application of Alternative Measures for Existing Conditions.** This Article is not intended to be applied to new construction. In general, it is the purpose of Sections 11.2 to 11.4 to facilitate retention of existing conditions where the existing construction is not being substantially modified and the conditions of construction of the building do not otherwise affect their compliance. If there is new construction, this is subject to the general requirements pertaining to new construction in this By-law. Furthermore, "new work" (as opposed to existing construction) may include not only new construction, but could also consist of converted floor areas that feature newly occupied areas or spaces, areas of increased occupant load or net new floor area, or the altering of existing floor space beyond its original configuration to support new uses or occupancy.

**A-11.3.2.1.(3) Alteration Language Supporting NECB 2015.** The term "alteration language" is used in Subsection 11.2.2. to describe the design upgrade requirements pertaining to the energy efficiency performance of buildings that are being altered from their existing condition. These requirements are fully described in the living document available on the City of Vancouver website and which is updated from time to time.

This document contains an introduction that clarifies Intent, Implementation, Scope, and Application and is reproduced here for convenience. By-law users are reminded of the need to keep up to date with the current requirements.

(See next page - Alteration Language to Support the Application of the NECB 2015)

#### **A-11.3.2.1.(5) Spaces Never Previously Occupied.**

Spaces "never previously occupied" shall be designed and constructed to "new building" requirements, and must comply with all applicable new construction requirements within the applicable standard/code (ASHRAE 90.1, NECB, ZEBP), rather than the alteration language supporting the applicable standard/code. No length of unoccupied period can downgrade the design requirements, for a space's first occupancy, from full code to alteration requirements.

**Alteration Language to Support the Application of the NECB 2015**

Version: July 1, 2020

**ACKNOWLEDGEMENT**

The City of Vancouver would like to acknowledge the permission granted by ASHRAE for use of their alteration language, from the ASHRAE 90.1-2016 standard, as the foundation for this document. ASHRAE's willingness to support consistency within a jurisdiction with multiple energy standards is very much appreciated.

**INTENT**

The intention of this document is to provide building renovation requirements to support the NECB in a manner consistent with the existing requirements pertaining to the ASHRAE 90.1-2016 standard.

With the implementation of NECB 2015 within Vancouver's Building Bylaw on June 3, 2019, this document provides the minimum requirements for alterations to existing buildings designed and constructed to NECB 2011 and those buildings subject to this document through Subsection 11.2.2. of Division B.

**SCOPE**

This document pertains to the application of existing buildings, specifically buildings:

- designed to NECB 2011,
- designed to ZEBP (10.2.2.5), or
- subject to 11.2.2.1(3)(b) requirements.

**APPLICATION**

This document applies to the alteration of any and all building components with prescriptive requirements listed within NECB 2015, with the exception of Solar Heat Gain Coefficient requirements being applicable to the City of Vancouver only.

**DEFINITIONS**

Alteration means a replacement or addition to a building or its systems and equipment; routine maintenance, repair, and service or a change in a building's use classification or category shall not constitute an alteration.

Equipment means devices for comfort conditioning, electric power, lighting, transportation, or service water, including but not limited to, furnaces, boilers, air conditioners, heat pumps, chillers, water heaters, lamps, luminaires, ballasts, elevators, escalators, or other devices or installations.

Existing building means a building or portion thereof that was previously occupied or approved for occupancy by the authority having jurisdiction.

Existing system means a system or systems previously installed in an existing building.

Fenestration area means the total area of the fenestration measured using the rough opening and including the glazing, sash, and frame. For doors where the glazed vision is less than 50% of the door area, the fenestration area is the glazed vision area. For all other doors, the fenestration area is the door area.

Solar Heat Gain Coefficient (SHGC\*) means the ratio of the solar heat gain entering the space through the fenestration area to the incident radiation.

Solar heat gain includes directly transmitted solar heat and absorbed solar radiation, which is then reradiated, conducted, or convected into the space.

\*All SHGC references within this document apply to the City of Vancouver only

Space means an enclosed space within a building.

System means a combination of equipment and auxiliary devices (e.g., controls, accessories, interconnecting means, and terminal elements) by which energy is transformed so it performs a specific function such as HVAC, service water, or lighting.

**1.1 General****1.1.1 Instructions**

This document shall be read in conjunction with NECB 2015. Words that appear in italics are defined in this document unless already defined within NECB 2015. All references to Parts are referring to the Parts within NECB 2015.

1.1.1.1 Additions to Existing Buildings. An extension or increase in the floor area or height of a building outside of the existing building envelope shall be considered additions to existing buildings and shall comply with 1.2 of this document.

1.1.1.2 Alterations of Existing Buildings. Alterations of existing buildings shall comply with 1.2 of this document.

1.1.1.3 Replacement of Portions of Existing Buildings. Portions of a building envelope, heating, ventilating, air-conditioning, service water, power, lighting, and other systems and equipment that are being replaced shall be considered as alterations of existing buildings and shall comply with 1.2 of this document.

**1.2 Compliance****1.2.1 Compliance Paths**

1.2.1.1 Additions to Existing Buildings. Additions to existing buildings shall comply with either the provisions of Parts 3, 4, 5, 6, and 7, or Part 8.

Exception: When an addition to an existing building cannot comply by itself, trade-offs will be allowed by modification to one or more of the existing components of the existing building. Modelling of the modified components of the existing building and addition shall employ the procedures of NECB's Part 8; the addition shall not increase the energy consumption of the existing building plus the addition beyond the energy that would be consumed by the existing building plus the addition if the addition alone did comply.

1.2.1.2 Alterations of Existing Buildings. Alterations of existing buildings shall comply with the provisions of Parts 3, 4, 5, 6, and 7, or Part 8.

Exception:

- a. A building that has been specifically designated as a Heritage building by the authority having jurisdiction, need not comply with these requirements.

**2.1 Building Components and Systems****2.1.1 Building Envelope (supports Part 3 of the NECB 2015)**

2.1.1.1 Envelope Alterations. Alterations to the building envelope shall comply with the requirements of Part 3 for insulation, air leakage, and fenestration applicable to those specific portions of the building that are being altered. Fenestration must also comply with the SHGC values of 10.2.2.3 of the Vancouver Building Bylaw.

Exceptions: The following alterations need not comply with these requirements, provided such alterations will not increase the energy usage of the building:

- a. Installation of storm windows or glazing panels over existing glazing, provided the storm window or glazing panel contains a low-emissivity coating. However, a low-emissivity coating is not required where the existing glazing already has a low-emissivity coating. Installation is permitted to be either on the inside or outside of the existing glazing.

- b. Replacement of glazing in existing sash and frame provided the U-factor and SHGC (Vancouver only) will be equal to or lower than before the glass replacement.
- c. Alterations to roof, wall, or floor cavities that are insulated to full depth with insulation having a minimum nominal value of R-3.0/in.
- d. Alterations to walls and floors, where the existing structure is without framing cavities and no new framing cavities are created.
- e. Roof recovering
- f. Removal and replacement of a roof membrane where there is existing roof insulation integral to or below the roof deck.
- g. Replacement of existing doors that separate a conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided that an existing vestibule that separates a conditioned space from the exterior shall not be removed.
- h. Replacement of existing fenestration, provided that the area of the replacement fenestration does not exceed 25% of the total fenestration area of an existing building and that the U-factor and SHGC (Vancouver only) will be equal to, or lower than before the fenestration replacement.

#### 2.1.2 Lighting (supports Part 4 of the NECB 2015)

2.1.2.1 Lighting Alterations. For the alteration of any lighting system in an interior space or exterior area, that space shall comply with the entirety of Part 4 as applicable to that space or area.

For the alteration of any lighting system for the exterior of a building application, that lighting system shall comply with the lighting power density (LPD) allowances of Part 4 applicable to the area illuminated by that lighting system and the applicable control requirements of 4.2.4.

Exceptions:

1. Interior lighting alterations where the total new wattage of all replaced luminaires on a project is 2,000 watts or less, the total wattage of replaced luminaires of a lighting system within a space shall be at least 50% below the total wattage of all removed luminaires of that lighting system, unless the space is at or below the LPD allowances of Part 4.  
Controls shall comply with the requirement of 4.2.2.1.(20).
2. Exterior lighting alterations where the total number of replaced luminaires on a project is 10 or less, the total wattage of replaced luminaires shall be at least 50% below the total wattage of all removed luminaires, unless each altered area is at or below the LPD allowances of Part 4.  
Controls shall comply with the requirement of 4.2.4.
3. The replacement of a failed lamp or ballast/driver in an individual luminaire or the replacement of any failed lighting control.
4. The removal or relocation of interior or exterior luminaires as part of, or independent of, exceptions 1, 2, or 3.

#### 2.1.3 HVAC (supports Part 5 of the NECB 2015)

2.1.3.1 Additions to Existing Buildings. Mechanical equipment and systems serving the heating, cooling, or ventilating needs of additions to existing buildings shall comply with the requirements of Part 5.

Exception: When HVAC to an addition is provided by existing HVAC systems and equipment, such existing systems and equipment shall not be required to comply with Part 5. However, any new systems or equipment installed must comply with specific requirements applicable to those systems and equipment.

#### 2.1.3.2 Alterations to Heating, Ventilating, and Air Conditioning in Existing Buildings

2.1.3.2.1 New HVAC equipment as a direct replacement of existing HVAC equipment shall comply with the specific minimum efficiency requirements of Part 5, applicable to that equipment.

2.1.3.2.2 New cooling systems installed to serve previously uncooled spaces shall comply with 5.1.1.3.

2.1.3.2.3 Alterations to existing cooling systems shall not decrease economizer capability unless the system complies with 5.2.2.8 and 5.2.2.9.

2.1.3.2.4 New and replacement ductwork shall comply with 5.2.2 and,

2.1.3.2.5 New and replacement piping shall comply with 5.2.5.

Exceptions: Compliance shall not be required:

- a. for equipment that is being modified or repaired but not replaced, provided that such modifications and/or repairs will not result in an increase in the annual energy consumption of the equipment using the same energy type;
- b. where a replacement or alteration of equipment requires extensive revisions to other systems, equipment, or elements of a building, and such replaced or altered equipment is a like-for-like replacement, or better;
- c. for a refrigerant change of existing equipment;
- d. for the relocation of existing equipment; or
- e. for ducts and pipes where there is insufficient space or access to meet these requirements.

#### 2.1.4 Service Water Systems (supports Part 6 of the NECB 2015)

2.1.4.1 Additions to Existing Buildings. Service water systems and equipment shall comply with the requirements of Part 6.

Exception: When the service water system to an addition is provided by existing service water systems and equipment, such systems and equipment shall not be required to comply with Part 6. However, any new systems or equipment installed must comply with specific requirements applicable to those systems and equipment.

2.1.4.2 Alterations to Existing Buildings. Building service water systems equipment installed as a direct replacement for existing building service water system equipment shall comply with the requirements of Part 6 applicable to the equipment being replaced. New and replacement piping shall comply with 6.2.3.

Exception: Compliance shall not be required where there is insufficient space or access to meet these requirements.

#### 2.1.5 Power (supports Part 7 of the NECB 2015)

2.1.5.1 Addition to Existing Buildings. Equipment installed in addition to existing buildings shall comply with the requirements of Part 7.

2.1.5.2 Alterations to Existing Buildings.

Exception: Compliance shall not be required for the relocation or reuse of existing equipment at the same site.

2.1.5.3 Alterations to building service equipment or systems shall comply with the requirements of this section applicable to those specific portions of the building and its systems that are being altered.

2.1.5.4 Any new equipment subject to the requirements of this section that is installed in conjunction with the alterations, as a direct replacement of existing equipment shall comply with the specific requirements applicable to that equipment.

b) Article 10.2.2.2.  
(See Note A-11.2.2.1.(5).)

6) The design requirements of Subsection 10.2.2. shall form an integral part of this Subsection, except where otherwise indicated.

7) Compliance with the requirements of this Subsection does not exempt upgrades that are otherwise required by this Part.

### **11.3.2.2. Buildings without Residential or Commercial Components**

1) Alterations to energy systems or components of a building, except those included in Articles 11.2.2.3. through 11.2.2.5., shall comply with

- a) the alteration requirements of
  - i) Clause 11.2.2.1.(3)(a) except as required by Clause (ii), or
  - ii) Clause 11.2.2.1.(3)(b) where the building was designed or upgraded to NECB, and
- b) Articles 10.2.2.8. through 10.2.2.22. as applicable.

### **11.3.2.3. Residential Buildings of 4 Storeys or More, and Commercial Buildings (including Hotels and Motels)**

1) Alterations to energy systems or components of a building containing Group C, D, or E Major Occupancies, except those included in Articles 11.2.2.4. through 11.2.2.5., shall comply with

- a) the alteration requirements of Clause 11.7.2.2.(3)(b),
- b) Articles 10.2.2.8. through 10.2.2.20. as applicable,
- c) the airtightness performance of Article 10.2.2.21. for reconstruction projects, and
- d) Article 10.2.2.22. as applicable.

### **11.3.2.4. Residential Buildings of 1 to 3 Storeys**

1) Except as otherwise required by Sentence 11.2.2.1.(7), Table 11.5.1.5.(2), or in this Subsection, alterations to energy systems or components of a building, described in Sentence 10.2.1.5.(1), shall comply with

- a) the thermal performance requirements of Article 10.2.2.6., except as permitted by Sentence (2),
- b) the fenestration performance requirements of Article 10.2.2.7., except as permitted by Sentence (2),
- c) Articles 10.2.2.8 through 10.2.2.11. as applicable,
- d) domestic hot water requirements of Article 10.2.2.12. except the system may be gas-fired with a uniform energy factor of not less than 0.78 or a thermal efficiency of not less than 90%;
- e) space-heating appliance performance requirements of Articles 10.2.2.13. and 10.2.2.14, except a system may be gas-fired with an Annual Fuel Utilization Efficiency (AFUE) rating of not less than 92% as tested using CSA 2.6/ANSI Z83.8, "Gas unit heaters, gas packaged heaters, gas utility heaters and gas-fired duct furnaces"
- f) the domestic fireplace performance requirements of Sentences 10.2.2.15 (1) to (4) and Article 10.2.2.16.,
- g) the heat recovery ventilator requirements of Article 10.2.2.17., except that non-reconstruction projects may provide continuous exhaust ventilation in accordance with Section 9.32.,
- h) Article 10.2.2.20. for all alterations, except Sentence (3) shall apply to reconstruction projects only,
- i) Article 10.2.2.21. except an airtightness performance of 3.5 ACH may be used for reconstruction projects, and
- j) Article 10.2.2.22. as applicable.

2) Where it is deemed prohibitive by the Chief Building Official, an alteration or upgrade to a building may

- a) achieve the applicable standard of performance in Table 11.2.2.5 or as otherwise permitted by the Chief Building

Official, and

- b) trade-off the remaining emissions-reduction outcomes with other building systems or components, acceptable to the Chief Building Official.

**Table 11.2.2.5.**

**Permitted minimum standards (with equivalent emissions reduction trade-offs selected and approved)**  
Forming part of 11.2.2.5.(2)(a)

10.2.2.6. Wall Assemblies	Shall achieve a minimum nominal RSI of 2.5 m2K/W in the affected assemblies with heat transfer, air leakage and condensation control per Section 9.25.
10.2.2.6. Roof Assemblies	Shall achieve a minimum nominal RSI of 3.8 m2K/W in the affected assemblies with heat transfer, air leakage and condensation control per Section 9.25.
10.2.2.7. Windows, Curtain wall, Sliding or folding doors with glazing	Shall achieve a maximum USI of 1.44 W/m2K

**11.3.2.5. Application to Existing Buildings**

1) Except as permitted by Sentence (2), alterations to a building shall be in conformance with this Subsection for the purposes of energy and emissions performance.

2) A structure that cannot be identified by the characteristics of a building in this Subsection shall comply with the requirements of Article 11.7.1.2., or as deemed acceptable to the Chief Building Official.

3) Except as permitted in Sentence (5) and Articles 11.7.1.2. through 11.7.1.5., alterations to a building shall comply with

- a) alterations clauses within ANSI/ASHRAE/IES 90.1, “Energy Standard for Buildings Except Low-Rise Residential Buildings,” and Sentence 10.2.2.2.(2), or
- b) the “Alteration Language Supporting NECB 2015” (See Note A-11.7.1.1.(3)).

4) Where a building contains one or more major occupancies that conform to Article 10.2.2.5., the remaining major occupancies shall comply with Clause (3)(a) or (b).

5) Spaces never previously occupied, shall be designed and constructed to new building requirements, in compliance with

- a) Article 10.2.2.3., if the building was designed or upgraded to NECB, or
  - b) Article 10.2.2.2.,
- (See Note A-11.7.1.1.(5).)

6) The design requirements of Subsection 10.2.2. shall form an integral part of this Subsection, except where otherwise indicated.

7) Compliance with the requirements of this Subsection does not exempt upgrades that are otherwise required by this Part.

**11.3.2.6. Buildings without Residential or Commercial Components**

1) Alterations to energy systems or components of a building, except those included in Articles 11.7.1.3. through 11.7.1.5., shall comply with

- a) the alteration requirements of
  - i) Clause 11.7.1.1.(3)(a) except as required by Clause (ii), or
  - ii) Clause 11.7.1.1.(3)(b) where the building was designed or upgraded to NECB, and
- b) Articles 10.2.2.8. through 10.2.2.22. as applicable.

**11.3.2.7. Residential Buildings of 4 Storeys or More, and Commercial Buildings**

(including Hotels and Motels)

1) Alterations to energy systems or components of a building containing Group C, D, or E Major Occupancies, except those included in Articles 11.7.1.4. through 11.7.1.5., shall comply with

- a) the alteration requirements of Clause 11.7.1.1.(3)(b),
- b) Articles 10.2.2.8. through 10.2.2.20. as applicable,
- c) the airtightness performance of Article 10.2.2.21. for reconstruction projects, and
- d) Article 10.2.2.22. as applicable.

**11.3.2.8. Residential Buildings of 1 to 3 Storeys**

1) Except as otherwise required by Sentence 11.7.1.1.(7), Table 11.2.1.4.(2), or in this Subsection, alterations to energy systems or components of a building, described in Sentence 10.2.1.5.(1), shall comply with

- a) the thermal performance requirements of Article 10.2.2.6., except as permitted by Sentence (2),
- b) the fenestration performance requirements of Article 10.2.2.7., except as permitted by Sentence (2),
- c) Articles 10.2.2.8 through 10.2.2.11. as applicable,
- d) domestic hot water requirements of Article 10.2.2.12. except the system may be gas-fired with a uniform energy factor of not less than 0.78 or a thermal efficiency of not less than 90%;
- e) space-heating appliance performance requirements of Articles 10.2.2.13. and 10.2.2.14, except a system may be gas-fired with an Annual Fuel Utilization Efficiency (AFUE) rating of not less than 92% as tested using CSA 2.6/ANSI Z83.8, "Gas unit heaters, gas packaged heaters, gas utility heaters and gas-fired duct furnaces"
- f) the domestic fireplace performance requirements of Sentences 10.2.2.15 (1) to (4) and Article 10.2.2.16.,
- g) the heat recovery ventilator requirements of Article 10.2.2.17., except that non-reconstruction projects may provide continuous exhaust ventilation in accordance with Section 9.32.,
- h) Article 10.2.2.20. for all alterations, except Sentence (3) shall apply to reconstruction projects only,
- i) Article 10.2.2.21. except an airtightness performance of 3.5 ACH may be used for reconstruction projects, and
- j) Article 10.2.2.22. as applicable.

2) Where it is deemed prohibitive by the Chief Building Official, an alteration or upgrade to a building may

- a) achieve the applicable standard of performance in Table 11.7.1.5 or as otherwise permitted by the Chief Building Official, and
- b) trade-off the remaining emissions-reduction outcomes with other building systems or components, acceptable to the Chief Building Official.

**Table 11.7.1.5.**

**Permitted minimum standards (with equivalent emissions reduction trade-offs selected and approved)**

Forming part of 11.7.1.5.(2)(a)

10.2.2.6. Wall Assemblies	Shall achieve a minimum nominal RSI of 2.5 m <sup>2</sup> K/W in the affected assemblies with heat transfer, air leakage and condensation control per Section 9.25.
10.2.2.6. Roof Assemblies	Shall achieve a minimum nominal RSI of 3.8 m <sup>2</sup> K/W in the affected assemblies with heat transfer, air leakage and condensation control per Section 9.25.
10.2.2.7. Windows, Curtain wall, Sliding or folding doors with glazing	Shall achieve a maximum USI of 1.44 W/m <sup>2</sup> K

**11.3.3. Construction and Building Safety Alternatives**



**11.3.3.1. General**

1) Except for additions and new construction, where the building is required to be of noncombustible construction, the provisions of this Subsection may be applied as an alternative to the Construction requirements of Subsection 3.2.2.

**11.3.3.2. Group A1 up to 600 Auditorium Occupants**

1) A Group A, Division 1 occupancy having an occupant load of no more than 600 may be permitted within the first storey and second storey of a building provided the building conforms to Sentences (2) and (3).

2) A building referred to in Sentence (1) may be of heavy timber construction or noncombustible construction used singly or in combination, and

a) floor assemblies shall be fire separations

i) with a fire resistance rating not less than 1 h, or

ii) of heavy timber construction with a fire resistance rating not less than 1 h, and

b) loadbearing walls, columns and arches shall

i) have a fire resistance rating not less than that required for the supported assembly, or

ii) be of heavy timber construction with a fire resistance rating not less than 1 h.

3) A building referred to in Sentence (1) shall

a) be provided with a fire alarm and detection system conforming to Subsection 3.2.4., notwithstanding any exemptions permitted by Article 3.2.4.1.,

b) be provided with lighting and emergency power systems conforming to Subsection 3.2.7.,

c) be upgraded to provide all exit locations with a maximum travel distance of 22.5 m for sprinklered buildings and 15 m for unsprinklered buildings,

d) except as permitted in Subsection 11.2.4., be upgraded to provide exterior wall and opening protection conforming to Subsection 3.2.3.,

e) be structurally upgraded to the design upgrade level S3 as defined in 11.1.3. Objectives

f) except as permitted in Subsections 11.2.5. and 11.2.7., be upgraded to comply with the fire containment requirements within a floor area conforming to this By-law, and

g) except as permitted in Subsections 11.2.6. and 11.2.7. and as required by Clause (d), be upgraded to provide exit systems conforming to Section 3.4.

**11.3.3.3. Group A1 up to 300 Auditorium Occupants**

1) A Group A, Division 1 occupancy having an auditorium occupant load of no more than 300, may be permitted within the first storey and second storey of a building, provided the building conforms to Sentences (2) and (3).

2) A building referred to in Sentence (1) may be of combustible construction or noncombustible construction used singly, or in combination, and

a) floor assemblies shall be fire separations with a fire resistance rating not less than 1 h,

b) mezzanines shall have, if of combustible construction, a fire resistance rating not less than 45 min,

c) loadbearing walls, columns and arches supporting an assembly shall have a fire resistance rating not less than that required for the supported assembly.

3) A building referred to in Sentence (1) shall

a) be provided with a fire alarm and detection system conforming to Subsection 3.2.4., notwithstanding any exemptions permitted by Article 3.2.4.1.,

b) be provided with lighting and emergency power systems conforming to Subsection 3.2.7.,

- c) be upgraded to provide all exit locations with a maximum travel distance of 22.5 m for sprinklered buildings and 15 m for unsprinklered buildings,
- d) except as permitted in Subsection 11.2.4. and Table 11.4.1.1., be upgraded to provide exterior wall and opening protection conforming to Subsection 3.2.3.,
- e) be structurally upgraded to the design upgrade level S3 as defined in 11.1.3. Objectives
- f) except as permitted in Subsections 11.2.5. and 11.2.7., be upgraded to comply with the fire containment requirements within a floor area conforming to this By-law, and
- g) except as permitted in Subsections 11.2.6. and 11.2.7. and as required by Clause (d), be upgraded to provide exit systems conforming to Section 3.4.

**11.3.3.3. Group A2 in Building More Than 3 Storeys**

1) A Group A, Division 2 occupancy may be permitted within the first 3 storeys of a building which is more than three storeys in building height, provided the building conforms to Sentence (2), and provided

- a) where the occupancy is located on the third storey or where the building area exceeds 400 m<sup>2</sup>, the entire building shall be sprinklered or
- b) where the occupancy is located on the first storey or second storey or the building area does not exceed 400 m<sup>2</sup> the building shall be sprinklered up to and including the storey containing the Group A2 occupancy.

2) A building referred to in Sentence (1) shall conform to Sentences 11.2.3.4.(2) and (3).

**11.3.3.4. Group A2 Up to 3 Storeys**

1) A Group A, Division 2 occupancy may be permitted in a building no more than three storeys in building height, provided

- a) the building conforms to the construction requirements of Sentences (2) and (3), and
- b) the entire building is sprinklered, where
  - i) the building area exceeds 400 m<sup>2</sup>, or
  - ii) the occupancy is located on the third storey.

2) A building referred to in Sentence (1) may be of combustible or noncombustible construction used singly or in combination, and

- a) floor assemblies shall be fire separations and, if of combustible construction, shall have a fire-resistance rating not less than 45 min,
- b) mezzanines shall have, if of combustible construction, a fire-resistance rating not less than 45 min,
- c) roof assemblies shall have, if of combustible construction, a fire-resistance rating not less than 45 min, except that in a building not more than 1 storey in building height, the fire-resistance rating is permitted to be waived provided the roof assembly is constructed as a fire-retardant-treated wood roof system conforming to Article 3.1.14.1., and the building area is not more than
  - i) 800 m<sup>2</sup> if facing one street,
  - ii) 1 000 m<sup>2</sup> if facing 2 streets, or
  - iii) 1 200 m<sup>2</sup> if facing 3 streets, and
- d) loadbearing walls, columns and arches supporting an assembly required to have a fire-resistance rating shall
  - i) have a fire-resistance rating not less than 45 min, or
  - ii) be of noncombustible construction.

3) A building referred to in Sentence (1) shall

- a) be provided with a fire alarm and detection system conforming to Subsection 3.2.4., notwithstanding any exemptions

permitted by Article 3.2.4.1.,

- b) be provided with lighting and emergency power systems conforming to Subsection 3.2.7.,
- c) except as permitted in Subsection 11.2.4., be upgraded to provide exterior wall and opening protection conforming to Subsection 3.2.3.,
- d) be structurally upgraded to the design upgrade level S3 as defined in the 11.1.3. Objectives
- e) except as permitted in Subsections 11.2.5. and 11.2.7., be upgraded to comply with the fire containment requirements within a floor area conforming to this By-law, and
- f) except as permitted in Subsections 11.2.6. and 11.2.7., be upgraded to provide exit systems conforming to Section 3.4.

#### **11.3.3.5. Group B2 Ambulatory Occupants**

1) A Group B, Division 2 occupancy containing only occupants that are capable of walking up or down stairs unaided may be permitted within the first 3 storeys of a building, provided the entire building is sprinklered and conforms to Sentences (2) and (3).

2) A building referred to in Sentence (1) may be of combustible construction or noncombustible construction used singly or in combination, and

- a) floor assemblies shall be fire separations with a fire-resistance rating not less than 45 min,
- b) mezzanines shall have, if of combustible construction, a fire-resistance rating not less than 45 min, and
- c) loadbearing walls, columns and arches shall have a fire-resistance rating not less than that required for the supported assembly.

3) A building referred to in Sentence (1) shall

- a) be provided with a fire alarm and detection system conforming to Subsection 3.2.4. where the building contains more than 2 storeys including storeys below grade or where the building area exceeds 250 m<sup>2</sup> regardless of the occupant load,
- b) be provided with lighting and emergency power systems conforming to Subsection 3.2.7.,
- c) except as permitted in Subsection 11.2.4., be upgraded to provide exterior wall and opening protection conforming to Subsection 3.2.3.,
- d) be structurally upgraded to the design upgrade level S3 as defined in 11.1.3. Objectives
- e) except as permitted in Subsections 11.2.5. and 11.2.7., be upgraded to comply with the fire containment requirements within a floor area conforming to this By-law, and
- f) except as permitted in Subsections 11.2.6. and 11.2.7., be upgraded to provide exit systems conforming to Section 3.4.

#### **11.3.3.6. Group B2 Non-ambulatory Occupants**

1) A Group B, Division 2, non-ambulatory occupancy may be permitted only within a storey of a building which has direct or ramped access to ground level, provided the entire building is sprinklered and conforms to Sentences (2) and (3).

2) A building referred to in Sentence (1) may be of combustible construction or noncombustible construction used singly or in combination, and

- a) floor assemblies shall be fire separations with a fire-resistance rating not less than 45 min,
- b) mezzanines shall have, if of combustible construction, a fire-resistance rating not less than 45 min, and
- c) loadbearing walls, columns and arches shall have a fire-resistance rating not less than that required for the supported assembly.

3) A building referred to in Sentence (1) shall

- a) be provided with a fire alarm and detection system conforming to Subsection 3.2.4.,
- b) be provided with lighting and emergency power systems conforming to Subsection 3.2.7.,
- c) except as permitted in Subsection 11.2.4., be upgraded to provide exterior wall and opening protection conforming to Subsection 3.2.3.,
- d) be structurally upgraded to the design upgrade level S3 as defined in 11.1.3. Objectives
- e) except as permitted in Subsections 11.2.5. and 11.2.7., be upgraded to comply with the fire containment requirements within a floor area conforming to this By-law, and
- f) except as permitted in Subsections 11.2.6. and 11.2.7., be upgraded to provide exit systems conforming to Section 3.4.

#### **11.3.3.7. Group C More Than 3 Storeys**

1) A Group C occupancy may be permitted in a building more than 3 storeys in building height provided the entire building is sprinklered and conforms to Sentences (2) to (4).

2) A building referred to in Sentence (1) shall have a maximum height of less than 18 m measured between grade and the uppermost floor level of the top storey,

3) A building referred to in Sentence (1) may be of combustible construction or noncombustible construction used singly or in combination, and

- a) floor assemblies shall be fire separations with a fire-resistance rating not less than 1 h,
- b) mezzanines shall have, if of combustible construction, a fire-resistance rating not less than 1 h, and
- c) loadbearing walls, columns and arches shall have a fire-resistance rating not less than that required for the supported assembly.

4) A building referred to in Sentence (1) shall

- a) be provided with a fire alarm and detection system conforming to Subsection 3.2.4.,
- b) be provided with lighting and emergency power systems conforming to Subsection 3.2.7.,
- c) except as permitted in Subsection 11.2.4., be upgraded to provide exterior wall and opening protection conforming to Subsection 3.2.3.,
- d) be structurally upgraded to the design upgrade level S3 as defined in 11.1.3. Objectives
- e) except as permitted in Subsections 11.2.5. and 11.2.7., be upgraded to comply with the fire containment requirements within a floor area conforming to this By-law, and
- f) except as permitted in Subsections 11.2.6. and 11.2.7., be upgraded to provide exit systems conforming to Section 3.4.

#### **11.3.3.8. Group D Occupancies**

1) A Group D occupancy may be permitted in a building that exceeds 3 storeys in building height provided that the entire building is sprinklered and conforms to Sentence (2) to (4).

2) A building referred to in Sentence (1) may be of combustible construction or noncombustible construction used singly or in combination, and

- a) floor assemblies shall be fire separations with a fire-resistance rating not less than 1 h,
- b) mezzanines shall have, if of combustible construction, a fire-resistance rating not less than 1 h,
- c) roof assemblies shall have, if of combustible construction, a fire resistance rating not less than 45 min, except that in a building not more than 1 storey in building height, the fire resistance rating is permitted to be waived provided the roof assembly is constructed as a fire-retardant-treated wood roof system conforming to Article 3.1.14.1. and the building area is not more than

- i) 2 400 m<sup>2</sup> if facing one street,
- ii) 3 000 m<sup>2</sup> if facing 2 streets, or
- iii) 3 600 m<sup>2</sup> if facing 3 streets, and

d) loadbearing walls, columns and arches shall have a fire-resistance rating not less than that required for the supported assembly.

3) Notwithstanding the requirements of Sentence (2), the floor, mezzanine, and roof assemblies, are permitted to have a fire-resistance rating of 45 min provided

- a) it is not more than 6 storeys in building height, and
- b) it has a building area not more than the value in Table 11.2.3.8.

Table 11.2.3.8.

Maximum Building Area, Group D, up to 6 Storeys  
Forming part of Sentence 11.2.3.8.(3)

No. of Storeys	Maximum Area, m2		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	not limited	not limited	not limited
2	7 200	not limited	not limited
3	4 800	6 000	7 200
4	3 600	4 500	5 400
5	2 880	3 600	4 320
6	2 400	3 000	3 600

4) A building referred to in Sentence (1) shall

- a) be provided with a fire alarm and detection system conforming to Subsection 3.2.4., notwithstanding any exemptions permitted by Article 3.2.4.1.,
- b) Be provided with lighting and emergency power systems conforming to Subsection 3.2.7.,
- c) except as permitted in Subsection 11.2.4., be upgraded to provide exterior wall and opening protection conforming to Subsection 3.2.3.,
- d) be structurally upgraded to the design upgrade level S3 as defined in 11.1.3. Objectives
- e) except as permitted in Subsections 11.2.5. and 11.2.7., be upgraded to comply with the fire containment requirements within a floor area conforming to this By-law, and
- f) except as permitted in Subsections 11.2.6. and 11.2.7., be upgraded to provide exit systems conforming to Section 3.4.

#### 11.3.3.9. Group E Occupancies

1) A Group E occupancy may be permitted in a building conforming to Sentences (2) to (5) except that where the building exceeds 1000 m<sup>2</sup> in building area or 3 storeys in building height the entire building shall be sprinklered.

2) A building referred to in Sentence (1), that is not more than 4 storeys in building height and the building area is no more than 1800 m<sup>2</sup> is permitted to be of combustible construction or noncombustible construction used singly or in combination, provided

- a) floor assemblies shall be fire separations with a fire-resistance rating not less than 45 min,
- b) mezzanines shall have, if of combustible construction, a fire-resistance rating not less than 45 min,
- c) roof assemblies shall have a fire-resistance rating not less than 45 min, except that in a building not more than 1 storey in building height, the fire-resistance rating is permitted to be waived provided the roof assembly is of noncombustible construction or is constructed as a fire-retardant-treated wood roof system conforming to Article 3.1.14.1.,
- d) loadbearing walls, columns and arches supporting an assembly required to have a fire-resistance rating shall
  - i) have a fire-resistance rating not less than 45 min, or
  - ii) be of noncombustible construction, and
- e) loadbearing walls, columns and arches supporting a fire separation shall have a fire-resistance rating not less than that required for the fire separation.

3) A building referred to in Sentence (1), that is not more than 6 storeys in building height and the building area conforms to Table 11.2.3.9., is permitted to be of noncombustible construction, provided

- a) floor assemblies shall be fire separations with a fire-resistance rating not less than 1 h,
- b) mezzanines shall have a fire-resistance rating not less than 1 h, and
- c) loadbearing walls, columns and arches shall have a fire-resistance rating not less than that required for the supported assembly.

4) A building referred to in Sentence (1), is permitted to retain existing combustible construction, provided

- a) floor assemblies shall be fire separations with a fire-resistance rating not less than 1.5 h,
  - b) mezzanines shall have a fire-resistance rating not less than 1 h, and
  - c) loadbearing walls, columns and arches shall have a fire-resistance rating not less than that required for the supported assembly.
- 5) A building referred to in Sentence (1) shall be upgraded as follows
- a) where required to have a sprinkler system, the building shall be provided with a fire alarm and detection system conforming to Subsection 3.2.4.,
  - b) be provided with lighting and emergency power systems conforming to Subsection 3.2.7.,
  - c) except as permitted in Subsection 11.2.4., be upgraded to provide exterior wall and opening protection conforming to Subsection 3.2.3.,
  - d) be structurally upgraded to the design upgrade level S3 as defined in 11.1.3. Objectives
  - e) except as permitted in Subsections 11.2.5. and 11.2.7., be upgraded to comply with the fire containment requirements within a floor area conforming to this By-law, and
  - f) except as permitted in Subsections 11.2.6. and 11.2.7., be upgraded to provide exit systems conforming to Section 3.4.

**Table 11.3.3.9.**

**Maximum Building Area, Group E, Existing Building**

Forming part of Sentence 11.2.3.9.(3)

No. of Storeys	Maximum Area, m2		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	Unlimited	Unlimited	Unlimited
2	7 500	Unlimited	Unlimited
3	5 000	6 250	7 500
4	3 750	4 688	5 625
5	3 000	3 750	4 500
6	2 500	3 125	3 750

**11.3.3.10. Group F2 or F3 Occupancies**

1) A Group F, Division 2 or 3 occupancy may be permitted in a building, provided that the building conforms to Sentences (2) to (5) except that where the building exceeds 1000 m2 in building area, or 2 storeys in building height, the entire building shall be sprinklered.

2) A building referred to in Sentence (1) and in conformance with Table 11.2.3.10. is permitted to be of combustible construction or noncombustible construction used singly or in combination, provided

- a) floor assemblies shall be fire separations with a fire-resistance rating not less than 45 min,
- b) mezzanines shall have, if of combustible construction, a fire-resistance rating not less than 45 min,
- c) roof assemblies shall be
  - i) noncombustible construction,
  - ii) combustible construction with a fire-resistance rating of no less than 45 min in buildings with a building area no greater than 4800 m2, or
  - iii) combustible construction constructed as a fire-retardant-treated wood roof system conforming to Article 3.1.14.1. in a building of not more than 1 storey in building height,
- d) loadbearing walls, columns and arches supporting an assembly required to have a fire-resistance rating shall

- i) have a fire-resistance rating not less than 45 min, or
- ii) be of noncombustible construction, and
- e) loadbearing walls, columns and arches supporting a fire separation shall have a fire-resistance rating not less than that required for the fire separation.
- 3)** A building referred to in Sentence (1) is permitted to be of noncombustible construction, provided
  - a) floor assemblies shall be fire separations with a fire-resistance rating not less than 1 h,
  - b) mezzanines shall have a fire-resistance rating not less than 1 h, and
  - c) loadbearing walls, columns and arches shall have a fire-resistance rating not less than that required for the supported assembly.
- 4)** A building referred to in Sentence (1), is permitted to retain existing combustible construction, provided
  - a) floor assemblies shall be fire separations with a fire-resistance rating not less than 1.5 h,
  - b) mezzanines shall have a fire-resistance rating not less than 1 h, and
  - c) loadbearing walls, columns and arches shall have a fire-resistance rating not less than that required for the supported assembly.
- 5)** A building referred to in Sentence (1) shall be upgraded as follows
  - a) Where required to have a sprinkler system, the building shall be provided with a fire alarm and detection system conforming to Subsection 3.2.4.,
  - b) Be provided with lighting and emergency power systems conforming to Subsection 3.2.7.,
  - c) be upgraded to provide exterior wall and opening protection conforming to Subsection 3.2.3., except as permitted in Subsection 11.2.4.,
  - d) be structurally upgraded to the design upgrade level S3 as defined in 11.1.3. Objectives
  - e) except as permitted in Subsections 11.2.5. and 11.2.7., be upgraded to comply with the fire containment requirements within a floor area conforming to this By-law, and
  - f) except as permitted in Subsections 11.2.6. and 11.2.7., be upgraded to provide exit systems conforming to Section 3.4.

**Table 11.3.3.10.**  
**Maximum Building Area, Group F, Division 2 or 3, Existing Building**  
 Forming part of Sentence 11.2.3.10.(2)

No. of Storeys	Maximum Area, m2		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	9 000	11 250	13 500
2	4 500	5 625	6 750
3	3 000	3 750	4 500
4	2 250	2 812	3 375
5	1 800	2 250	2 700
6	1 500	1 875	2 250

**11.3.3.11. Combustible Construction for Minor Repairs**  
 (See Article 1.5.2.9. of Division C.)

**11.3.3.12. Open Air Repair and Storage Garages**

- 1) Open-air storeys of a storage garage or repair garage located below grade need not be sprinklered.

### 11.3.4. Spatial Separation Alternatives

#### 11.3.4.1. General

1) Except for additions and new construction, where the exterior wall of a building is required by Parts 3 and 9 to be of noncombustible construction, the provisions of this Subsection may be used as an alternative compliance measure to the spatial separation requirements of Parts 3 and 9.

#### 11.3.4.2. Exterior Wall Construction

1) In a building of Group B or C occupancy, existing combustible construction may be retained in an existing exterior wall provided

- a) the wall has at least a 1 h fire-resistance rating,
- b) the building is sprinklered, and
- c) all voids in the wall are completely filled with noncombustible insulation and fire stopped.

2) In a building of other than Group B or C occupancy, existing combustible construction may be retained in an existing exterior wall provided the wall has at least a 1 h fire-resistance rating, and

- a) the building is sprinklered, or
- b) all voids in the wall are completely filled with noncombustible insulation and fire stopped.

3) When an existing exterior wall requires a 2 h fire-resistance rating, existing combustible construction may be retained provided

- a) the wall has at least a 1 h fire-resistance rating,
- b) the building is sprinklered, and
- c) all voids in the wall are completely filled with noncombustible insulation and fire stopped.

#### 11.3.4.3. Exterior Cladding

1) Existing combustible cladding may be retained provided

- a) the building is sprinklered using fast-response heads,
- b) the exterior cladding is treated with acceptable exterior quality fire retardant intumescent paint,

(See Note A-11.2.4.3.(1)(b).) and

- c) all exterior windows contain wired or safety glass in steel frames.

#### 11.3.4.4. Existing Unprotected and Relocated Openings

1) Where the limiting distance is less than 900 mm, existing unprotected openings may be retained, provided

- a) the openings are constructed with non-operable closures of glass block, wired glass, tempered glass or laminated safety glass, and the building is sprinklered using fast-response heads,

- b) the openings are constructed of glass block, wired glass, tempered glass or laminated safety glass in operable frames, the building is sprinklered using fast-response and openings are protected with close spaced sprinkler in

**A-11.3.4.3.(1)(b) Intumescent Paint.** Experience has shown that maintenance considerations of fire retardant intumescent paint are not well understood by applicants. To be effective, multiple coats are required at installation time for complete and proper application. Proper surface preparation is also a significant portion of the work and imperative to prevent pre-mature delamination. This preparation and application period could span several days based on existing surfaces and re-coat durations. Then there is the curing time needed prior to the application of any exterior finish coat. Exterior finish coat(s) will likely be necessary as most intumescent coatings are not suitable for prolonged exterior exposure. As well, there could be a detailed installation and inspection process to confirm the installation. Experienced labour is a major factor in the process.

Another consideration is exposure to weather effects; particularly water can lead to cracking and delamination of the coating systems. As well, product information has stated that fire-resistive coatings are not intended for exterior exposures or interior environments exposed to freeze/thaw conditions. This exposure can lead to severe cracking and delamination. This could lead to expensive re-application.

Ongoing maintenance and re-application due to weather degradation or mechanical damage is another significant consideration. Product and care information must be provided to new owners or tenants when there is a change of use or ownership. This must be provided in the strata information, maintenance manuals and guaranteed by restrictive covenant against the property's deed.

**A-11.3.4.4.(4) Window Replacement.** The provisions of Sentence 11.2.4.4.(4) are intended to facilitate voluntary window replacements to higher energy efficient products as part of a renovation project. As modern windows may have slightly different dimensional requirements, this Sentence allows for minor variations that do not substantially affect the existing spatial condition of the existing building. This means that the location, orientation, and size of the windows may not change, excepting minor dimensional variations to the extent necessary to accommodate the new window.



accordance with Sentence 3.2.3.13.(5), or

c) acceptable self-closing fire protection shutters are installed at the existing opening locations, where the fire shutter operation is not obstructed by the openable window, and where the opening is not required for an escape function as outlined in Article 9.9.10.1.

2) Where a limiting distance is 900 mm or more, existing unprotected openings which have a total area exceeding the values listed in or extrapolated from Tables 3.2.3.1.B, 3.2.3.1.C, 3.2.3.1.D, 3.2.3.1.E or 9.10.14.4.A, may be retained, provided

- a) the openings are constructed of glass blocks or wired glass in fixed frames, or
- b) the building is to be sprinklered using fast-response heads.

3) Where construction on an existing building consists of renovation where the exposing building face is not being altered, the existing unprotected openings of that building face may be retained and no additional protection shall be required provided

- a) the work consists of a interior work only,
- b) no additional principal dwelling units are being added,
- c) the openings on the vertical building face are less than 10% of the entire exposing building face, and
- d) the limiting distance is greater than 600 mm.

4) Notwithstanding the requirements of this Article, the replacement of existing windows that do not substantially alter the existing spatial separation configuration by more than 2% shall not require additional protection provided that the openings are constructed of glass block, wired glass, tempered glass or laminated safety glass. (See Note A-11.2.4.4.(4).)

5) A new unprotected opening in an existing exterior wall need not comply with the requirements of Article 9.10.15.4.(1) provided

- a) an equivalent area of existing unprotected openings within the same fire compartment or storey are removed, and
- b) the limiting distance of the new unprotected opening is greater than 2 m.

### **11.3.5. Alternatives for Fire Containment and Separation**

#### **11.3.5.1. Public Corridors**

1) Existing public corridor walls, serving Group A Division 2, D, E, F Division 2 and F Division 3 occupancies, required to have a fire-resistance rating exceeding 45 min may be terminated at the underside of a 30 min ceiling membrane, where the public corridors are equipped with acceptable smoke detectors connected to the building fire alarm system.

#### **11.2.5.2. Occupancy and Suite Separations**

1) Existing vertical occupancy fire separations and suite fire separations in Group A Division 2, D, E, F Division 2 and F Division 3 occupancies, need not exceed a 1 h fire-resistance rating provided acceptable smoke detectors are installed on each side of such separations and are connected to the building fire alarm system.

2) Existing floor assemblies required by Sentence 3.3.1.1.(5) to be fire separations, need not exceed a 1 h fire-resistance rating provided the suite is sprinklered.

#### **11.3.5.3. Alternative to 20 Minute Doors**

1) An existing door assembly may be retained in place of a required door assembly with a 20 min fire-protection rating provided

- a) a solid core wood door has a minimum thickness of no less than 45 mm, or
- b) a hollow core or panel type suite door has a layer of gypsum wallboard on the suite side covered by a minimum 0.9 mm thick sheet steel which extends over the edges of the door.

### **11.3.6. Alternatives for Exits and Means of Egress**

#### **11.3.6.1. General**

1) Except as permitted in Articles 11.2.6.2. through 11.2.6.4. and in Subsection 11.2.7., every floor area or other space shall be served with exits in conformance with Section 3.4.

#### **11.3.6.2. Openings in an Exit Enclosure**

1) A maximum of 2 suite doors or 2 room doors per storey may be located within an exit enclosure provided

- a) the exit enclosure is not required to have a fire-resistance rating of more than 1 h,
- b) the suites or rooms have a second and separate means of egress, and
- c) the suite or room doors have a fire-protection rating of 45 min, are self-closing and self-latching and do not lock automatically.

- 2) Exit stairs shall be enclosed as required in Subsection 3.4.4. except that existing exit enclosures may have
- a) wired glass set in steel frames conforming to Article 3.1.8.14. only in the portion of the enclosure which faces a public corridor, and
  - b) in sprinklered buildings, acceptable hold-open devices actuated by smoke detectors and the building fire alarm system.

**11.3.6.3. Group C Single Exit**

- 1) A single exit is permitted from an existing non-sprinklered dwelling unit provided
  - a) the exit is an exterior doorway located no more than 1.5 m above adjacent ground level,
  - b) the total area served by the exit door does not exceed 100 m<sup>2</sup>,
  - c) the maximum travel distance within the dwelling unit does not exceed 15 m, and
  - d) it is not necessary to travel up or down more than one storey to reach the exit door, or the uppermost floor level opens from a common area to an unenclosed balcony or deck no more than 6 m above adjacent ground level.

**11.3.6.4. Existing Stairs in a Means of Egress**

1) Existing stairs with rectangular treads in straight flights in an exit or a means of egress, other than those serving seating areas, may be retained provided that

- a) existing tread and riser dimensions within a flight comply with Table 11.2.6.4.(1),

**Table 11.3.6.4.(1)**  
**Dimensions of Existing Stairs**  
 Forming Part of Sentence 11.2.6.4.(1)

	Maximum (mm)	Minimum (mm)
Rise	205	125
Run	355	200

- b) existing treads and landings shall
  - i) be dimensionally uniform,
  - ii) have a finish that is slip resistant,
  - iii) have nosings with distinct colour contrast for the full width of the leading edge of each tread visible in both direction of travel, and
- iv) have no projecting stair nosing, rakeback, or combination thereof, exceeding 38 mm or angle of more than 30 degrees from the vertical,
- c) lighting is provided to
  - i) an average level of not less than 100 lx at floor or tread level, and
  - ii) the minimum value of the illumination required by (i) shall be not less than 20 lx,
- d) emergency lighting is provided to
  - i) an average level of illumination of not less than 20 lx at floor or tread level,
  - ii) a minimum value of the illumination required by (i) shall be not less than 2 lx, and
  - iii) provided with emergency power in accordance with Article 3.2.7.4.,
- e) handrails are provided conforming to the requirements of Article 3.4.6.5., and
- f) tread and landings of exterior egress stairs are designed to be free of ice and snow accumulations.

**11.3.7. Alternatives for Sprinklered Buildings**

**11.3.7.1. General**

- 1) The alternative compliance measures in Articles 11.2.7.2. to 11.2.7.9. may be used in a building where
  - a) the building is sprinklered in conformance with Subsection 3.2.5., and
  - b) the building has a fire alarm system in conformance with Subsection 3.2.4.

**11.3.7.2. Group C and D Fire Containment**

- 1) The fire separation between a Group C or D occupancy and the remainder of a building which is no more than 3 storeys in building height need not exceed a fire-resistance rating of 45 min.
- 2) Existing lath and plaster, properly restored to its original condition, may be accepted by the Chief Building Official as meeting the fire separation requirements in Sentence (1).

**11.3.7.3. Occupancy Separations**

- 1) The existing fire-resistance rating for an occupancy separation in a building need not exceed 1 h when the By-law requires 2 h for new construction and 45 min when the By-law requires 1 h for new construction.

**11.3.7.4. Flame Spread Rating**

- 1) The flame-spread rating for an existing wall or ceiling finish may be increased to 300 for no more than 25% of the wall or ceiling area, provided the wall or ceiling has no exposed foamed plastic.

**11.3.7.5. Fire Dampers**

- 1) Where a fire separation is permitted to have a 45 min fire-resistance rating, a fire damper is not required for existing noncombustible ducts less than 0.065 m<sup>2</sup> in cross-sectional area.

**11.3.7.6. Plastic Sprinkler Piping**

- 1) Plastic sprinkler piping may penetrate a vertical fire separation provided
  - a) the piping and its installation are listed by an acceptable testing agency, and
  - b) the piping is tightly fitted or fire stopped to maintain the integrity of the separation.

**11.3.7.7. Smoke-Venting in High Buildings**

- 1) Existing means of venting which are capable of removing smoke to aid firefighting may penetrate exterior openings and existing service shafts in adjacent fire compartments.

**11.3.7.8. Alternatives for Dead-end Public Corridors**

- 1) In a building provided with a sprinkler system with fast-response heads, existing public corridors which have smoke detectors installed and connected to the fire alarm system may contain existing dead-end public corridors of lengths not exceeding 10 m to the nearest exit in Group C occupancies and 15 m to the nearest exit in Group D, Group E, Group F Divisions 2 and Group F Division 3 occupancies.
- 2) In a building containing exits conforming to Article 11.2.7.9., one existing dead-end public corridor per floor may be permitted provided
  - a) the existing dead-end public corridor does not exceed the lengths specified in Sentence (1),
  - b) each exit stair serving the existing dead-end public corridor contains a smoke barrier between each storey or mezzanine, which prevents smoke from entering stairways and allows access to other stairways, and which may have a door equipped with an acceptable hold-open device actuated by a local smoke detector circuit, and
  - c) the entire building is sprinklered with fast-response heads.

**11.3.7.9. Alternatives for Exits**

- 1) Existing open exit stairways located at the ends of public corridors need not be enclosed provided
  - a) the building does not exceed 3 storeys in building height,

- b) there is a smoke barrier located within each public corridor approximately midway between the exit stairways, which
    - i) has a door provided with an acceptable hold-open device actuated by the fire alarm system and smoke detectors on that floor,
    - ii) is constructed of tempered or wired glass, or has a fire-protection rating of no less than 20 min, and
    - iii) is designed to retard the passage of smoke,
  - c) the public corridor contains no dead-ends,
  - d) the public corridor on both sides of the smoke barrier is continuously pressurized, and
  - e) the entire building is sprinklered with fast-response heads.
- 2) Wired glass in steel frame exposure protection for exterior fire escapes need not be provided in an existing building provided
- a) there is at least one exit enclosure which conforms to this By-law and which leads directly to the exterior of the building,
  - b) access to the fire escape is by means of a full-size door at each floor level,
  - c) the fire escape leads directly to grade level or leads to grade level by means of an interior stair enclosure no less than 750 mm in width,
  - d) a sprinkler head is located on the ceiling adjacent to and within 1 500 mm of each opening requiring protection, and
  - e) the entire building is sprinklered with fast-response heads.
- 3) Where a building is provided with a sprinkler system with fast-response heads, existing exit doors may be retained provided they do not swing over stairs or significantly impede safe egress and the Chief Building Official is satisfied that the existing exit door swing and existing exit and corridor widths substantially comply with the requirements of Section 3.4.

### **11.3.8. Alternatives for Accessibility**

#### **11.3.8.1. Protection on Accessible Floor Areas**

- 1) Every floor area that is not sprinklered throughout and that has an accessible path of travel shall
  - a) be served by an elevator
    - i) conforming to Sentences 3.2.6.5.(4) to (6),

**A-11.3.8.1.(1) Temporary Refuge for Persons with Disabilities.** These measures are intended to provide temporary refuge for persons with disabilities. It is acknowledged, however, that the measures cannot provide absolute safety for all occupants in the fire area. It may, therefore, be necessary to develop special arrangements in the fire safety plan to evacuate persons with disabilities from these areas. Details for a suitable plan are contained in the Fire By-law.

The protected elevator referred to in Clause 11.2.8.1.(1)(a) is intended to be used by firefighters as a means for evacuating persons with disabilities. It is not intended that this elevator be used by persons with disabilities as a means of egress without the assistance of firefighters.

If an estimate is to be made of the number of persons with disabilities in a floor area who can be accommodated in each zone in Clause 11.2.8.1.(1)(b), this estimate may be based on Table 3.8.2.3., which is used to determine the minimum number of spaces to be provided for wheelchair occupants in fixed seating areas. If more precise information is available, it should be used for sizing the zones.

For residential occupancies, the choices of protection include the option to provide an accessible balcony, but it is not required that balconies be the chosen means of protection.

- ii) protected against fire in conformance with Clauses 3.2.6.5.(3)(b) or (c), and
  - iii) in a building over 3 storeys in building height, protected against smoke movement so that the hoistway will not contain more than 1% per cent by volume of contaminated air from a fire floor during a period of 2 h after the start of a fire, assuming an outdoor temperature equal to the January design temperature on a 2.5% per cent basis determined in conformance with Subsection 1.1.3.,
- b) be divided into at least 2 zones by fire separations conforming to Sentences (2), (3) and 3.1.8.5.(6) so that (See Note A-3.3.1.7.(1)(b))
- i) persons with disabilities can be accommodated in each zone, and
  - ii) the travel distance from any point in one zone to a doorway leading to another zone shall be not more than the value for travel distance permitted by Sentence 3.4.2.5.(1) for the occupancy classification of the zone, (See also Sentence 3.1.8.5.(6) for requirements regarding the passage of smoke.
- c) in the case of residential occupancies, be provided with balconies conforming to Sentence (4),
- d) have an accessible exterior exit at ground level, or
- e) have a ramp conforming to Subsection 3.8.3. leading to ground level.
- (See Note A-11.2.8.1.(1).)
- 2) Except as permitted by Sentence (3), the fire separations referred to in Clause (1)(b) shall have a fire-resistance rating not less than 1 h.
- 3) The fire-resistance rating of the fire separations referred to in Clause (1)(b) 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.
- 4) A balcony required by Clause (1)(c) shall
- a) have direct access from the suite or floor area,
  - b) be not less than 1.5 m deep from the outside face of the exterior wall to the inside edge of the balcony, and
  - c) provide not less than 2 m<sup>2</sup> of balcony space for each accessible sleeping room or bed space.
- 5) The floor area on either side of a horizontal exit conforming to Article 3.4.6.10. is permitted to be considered as a zone in applying the requirements of Clause (1)(b).

### **11.3.9. Alternatives for Building Systems**

#### **11.3.9.1. Location of Exhaust Vents in a Building Containing not more than 2 Principal Dwelling Units**

- 1) In a building containing not more than 2 principal dwelling units, exhaust vents serving heating and air conditioning equipment and similar appliances, other than direct vented fireplaces, shall
- a) not terminate within
    - (i) 1.2 m horizontally of an adjacent property line,
    - (ii) 1.8 m vertically of the underside of a soffit above, or
    - (iii) 1.2 m horizontally of any soffit vent above,
  - b) be located as high as possible, and
  - c) be directed upwards and away from the source building with
    - i) a vertical discharge through the roof, or
    - ii) a side discharge configuration that terminates vertically only in a manner that minimizes condensation on adjacent

surfaces.

## Section 11.4. Alternative Compliance Measures for Heritage Buildings

### 11.4.1. Application

#### 11.4.1.1. Alternative Compliance Measures

- 1) This Subsection provides alternative compliance measures for the restoration and renovation of heritage buildings.
- 2) The alternative compliance measures provided in Table 11.4.1.1. apply to existing conditions only and do not apply to new work which must conform to the requirements for new construction in other Parts of this By-law.
- 3) Notwithstanding Article 11.2.1.6, relocation of a heritage building may conform to the upgrade requirements for spatial separation outlined in Table 11.4.1.1.
- 4) Site-built and custom-built replica wood doors, wood framed windows and wood framed skylights, intended to preserve the heritage look of a building that separated conditioned space and unconditioned space from the exterior, are exempt from the provisions of Subsection 9.7.4. and Article 5.9.2.2. provided the replica
  - a) complies with Clause 9.7.5.1.(3)(a) or (b) as applicable,
  - b) does not create an unsafe condition, and
  - c) is acceptable to the Chief Building Official.

**Table 11.4.1.1.**  
**Alternative Compliance Measures for Heritage Buildings**  
Forming part of Sentence 11.4.1.1.(2)

No.	By-law Requirement	Alternative Compliance Measures
1	<b>Fire Separations</b> Sentence 3.1.3.1.(1) and Table 3.1.3.1.; Sub-section 9.10.9. 2 h fire separation required between some major occupancies	Except for F1 occupancies, 1 h fire separation is acceptable, if the building is sprinklered.
2	<b>Fire Separations</b> Sentence 3.1.3.1.(1) and 3.1.3.1.; Subsection 9.10.9. 1 h fire separation required between some major occupancies	1/2 h fire separation is acceptable, if the building is sprinklered.
3	<b>Noncombustible Construction</b> Subsection 3.1.5. and Article 9.10.6.1. All materials used in noncombustible construction must be noncombustible unless otherwise permitted.	<ol style="list-style-type: none"> <li>1. Roofs may be of combustible construction provided the building is sprinklered.</li> <li>2. Up to 10% gross floor area to a maximum of 10% of any one floor area may be of combustible construction provided the building is sprinklered.</li> </ol>
4	<b>Fire-resistance Rating</b> Sentence 3.1.7.1.(1); Article 9.10.3.1. Where a material, assembly of materials or structural member is required to have a fire-resistance rating it shall be tested in accordance with CAN/ULC-S101.	<p>A fire-resistance rating may also be used based on:</p> <ol style="list-style-type: none"> <li>1. HUD No. 8 Guideline on Fire Ratings of Archaic Materials and Assemblies.</li> <li>2. Fire Endurance of Protected Steel Columns and Beams, DBR Technical Paper No. 194.</li> <li>3. Fire Endurance of Unit Masonry Walls, DBR Technical Paper No. 207.</li> <li>4. Fire Endurance of Light-Framed and Miscellaneous Assemblies, DBR Technical Paper No. 222.</li> </ol>

No.	By-law Requirement	Alternative Compliance Measures
5	<p><b>Rating of Supporting Construction</b> Article 3.1.7.5.; Article 9.10.8.3. Supporting assemblies to have fire resistance rating at least equivalent to that of the supported floor.</p>	<p>Heavy timber construction is permitted to have a fire resistance rating less than would be required by the By-law provided the building:</p> <ul style="list-style-type: none"> <li>(a) is sprinklered, and</li> <li>(b) does not exceed 6 storeys in building height.</li> </ul>
6	<p><b>Continuity of Fire Separations</b> Sentence 3.1.8.3.(1) and 3.1.8.3.(2); Article 9.10.9.2. Fire separations are required to be continuous above the ceiling space.</p>	<p>Fire separations are not required to be continuous above the ceiling space where:</p> <ul style="list-style-type: none"> <li>(a) the ceiling space is non-combustible construction,</li> <li>(b) both fire compartments are sprinklered, or</li> <li>(c) the ceiling has a minimum rating of 30 minutes.</li> </ul>
7	<p><b>Wired Glass</b> Sentences 3.1.8.5.(1) and 3.1.8.16; Articles 9.10.13.1. and 9.10.13.5. 6 mm wired glass in steel frame required in fire separations.</p>	<p>For fixed transoms or sidelights, 6 mm wired glass fixed to a wood frame of at least 50 mm thickness with steel stops is permitted in a required fire separation.</p>
8	<p><b>Mezzanines</b> Sentences 3.2.1.1.(3) to 3.2.1.1.(6); Article 9.10.4.1. Mezzanines enclosing more than 10% above the horizontal plane are considered as storey in building height.</p>	<p>Enclosed mezzanines may be up to 40% of the storey in which they occur and not be considered a storey in building height if the building is sprinklered.</p>
9	<p><b>Building Height</b> Articles 3.2.2.20. to 3.2.2.90. Noncombustible construction required for buildings over 3 storeys in building height.</p>	<p>Buildings may be of combustible construction up to 6 storeys provided:</p> <ul style="list-style-type: none"> <li>(a) the building is sprinklered</li> <li>(b) the building contains Group C, D, E, F2 or F3 occupancies, and</li> <li>(c) floor assemblies not required to exceed 1 h fire separation requirements may be of heavy timber construction.</li> </ul>
10	<p><b>Spatial Separation</b> Subsection 3.2.3. The area of unprotected opening shall not exceed the limits in Tables 3.2.3.1.A to 3.2.3.1.E</p>	<p>The area of existing unprotected opening is not limited provided:</p> <ul style="list-style-type: none"> <li>(a) the limiting distance is a minimum 1 m,</li> <li>(b) the building has a supervised sprinkler system in conformance with Article 3.2.4.9., and</li> <li>(c) the sprinkler system is designed to notify the fire department in conformance with Article 3.2.4.7.</li> </ul>
	<p><b>Spatial Separation</b> Subsection 9.10.14.; Subsection 9.10.15. The area of unprotected opening in an un-sprinklered building shall not exceed the limits in Tables 9.10.14.4.-A or 9.10.15.4.</p>	<p>The area of existing unprotected opening on a building face is not limited provided:</p> <ul style="list-style-type: none"> <li>(a) the existing unprotected openings on that face are protected with close spaced sprinklers per clause 3.2.3.13.(5), and</li> <li>(b) the close spaced sprinklers shall be designed to notify the fire department in conformance with Sentence 3.2.4.7.</li> </ul>
11	<p><b>Construction of Exposing Building Face</b> Article 3.2.3.7.; Article 9.10.14.5. The exposing building face is required to have a fire-resistance rating and/or be of noncombustible construction.</p>	<p>Exposing building face is not required to have a fire resistance rating if the building is sprinklered. Also, the exposing building face is not required to be of noncombustible construction if it is protected by an exterior sprinkler system conforming to NFPA 13.</p>



No.	By-law Requirement	Alternative Compliance Measures
12	<b>Roof Covering Rating</b> Sentence 3.1.15.2.(1) Class A, B or C roof covering in conformance with CAN/ULC-S107 required.	For existing roofs not covered by a Class A, B or C roofing, a manually operated deluge system in accordance with NFPA 13 is permitted.
13	<b>Smoke Alarms</b> Sentences 3.2.4.20.(7) and 3.2.4.20.(9); Sentence 9.10.19.1.(2) Smoke alarms are required to be connected to an electric circuit.	Smoke alarms may be battery operated in a residential building containing not more than one principal dwelling unit.
14	<b>Interconnected Floor Space</b> Subsection 3.2.8.; Sentence 9.10.1.3.(6)	1. Open stairs in buildings of maximum 4 storeys in building height need not comply with Subsection 3.2.8. provided: (a) the building contains a Group C or D occupancy, (b) the building is sprinklered with fast-response sprinklers, (c) corridors opening into the interconnected floor space are separated from the interconnected floor space by a fire separation with the rating required for the corridor, and (d) smoke detectors are installed in the rooms opening into the interconnected floor space and the smoke detectors are connected to the fire alarm system. 2. Open stairs in buildings of maximum 3 storeys in building height, or the first 2 storeys and basement, need not comply with Subsection 3.2.8. provided: (a) the building contains a Group C or D occupancy, (b) the building is sprinklered with fast-response sprinklers, (c) smoke detectors are installed in the rooms opening into the interconnected floor space and the smoke detectors are connected to the fire alarm system, and (d) at least one means of egress is not through the interconnected floor space.
15	<b>Separation of Suites</b> Article 3.3.1.1.; Article 9.10.9.13., Article 9.10.9.14. Suites are required to be separated from adjoining suites by 3/4 h or 1 h rated fire separations.	Existing fire separations of 30 min, such as wood lath and plaster in good condition, are acceptable in sprinklered buildings not exceeding 6 storeys in building height.
16	<b>Corridor Fire Separation</b> Article 3.3.1.4.; Article 9.10.9.15. Public corridors are required to be separated from the remainder of the building by a fire separation having a fire resistance rating of at least 3/4 h.	Existing corridors with 30 min fire-resistance ratings, such as wood lath and plaster in good condition, are acceptable in residential occupancies provided the building: (a) does not exceed 6 storeys in building height, and (b) is fully sprinklered with fast-response sprinklers.
17	<b>Corridor Width</b> Articles 3.3.1.9. and Subsection 3.4.3.; Article 9.9.3.3. Public corridors and exit corridors are required to have a minimum width of 1 100 mm.	Public corridors and exit corridors are required with a minimum width of 800 mm provided: (a) the occupant load of the building is maximum 20 people, and (b) the building does not exceed 3 storeys in building height.

No.	By-law Requirement	Alternative Compliance Measures
18	<p><b>Door Swing</b> Articles 3.3.1.11. and 3.4.6.12. Doors required to swing in the direction of exit travel.</p>	<p>Second egress door from a room is not required to swing in the direction of exit travel provided:</p> <ul style="list-style-type: none"> <li>(a) the building is sprinklered and the system is supervised in conformance with Sentence 3.2.4.9.(3), and</li> <li>(b) the occupant load of the building is a maximum of 100 people.</li> </ul>
19	<p><b>Stairs, Ramps, Handrails and Guards</b> Article 3.3.1.14., Article 3.3.1.16., Article 3.3.1.18., Article 3.4.6.4., Article 3.4.6.6., Article 3.4.6.2. through Article 3.4.6.9.; Section 9.8.</p>	<p>Existing conditions that do not comply fully with the requirements are permitted if they are acceptable to the Chief Building Official.</p>
20	<p><b>Transparent Doors and Panels</b> Article 3.3.1.19.; Article 9.6.1.4. Glass in doors and sidelights are required to be protected by guards and to be safety glass.</p>	<p>Existing glass or transparent panels that do not comply fully with the requirements are permitted if sufficiently discernible or guards are provided in unsafe conditions.</p>
21	<p><b>Dead-end Corridors</b> Sentence 3.3.1.9.(7); Article 9.9.7.3. Dead-end corridors are permitted to a maximum length of 6 m.</p>	<ul style="list-style-type: none"> <li>1. Dead-end corridors are permitted to a maximum length of 10 m in Group C occupancies provided: <ul style="list-style-type: none"> <li>(a) the building is sprinklered with fast-response sprinklers, and</li> <li>(b) smoke detectors are installed in the corridor system.</li> </ul> </li> <li>2. Dead-end corridors are permitted to a maximum of 15 m in length in Group D, E, F2 and F3 occupancies provided: <ul style="list-style-type: none"> <li>(a) the building is sprinklered with fast-response sprinklers, and</li> <li>(b) smoke detectors are installed in the corridor system.</li> </ul> </li> </ul>
22	<p><b>Exits</b> Article 3.4.2.1.; Article 9.9.8.2. Floor areas shall be served by not fewer than 2 exits except as permitted by Sentence 3.4.2.1.(2)</p>	<p>Floor areas may be served by a single exit within the limits of Sentence 3.4.2.1.(2).(b) provided:</p> <ul style="list-style-type: none"> <li>(a) the building does not exceed 3 storeys in building height,</li> <li>(b) the building is sprinklered with fast-response sprinklers, and</li> <li>(c) all floor areas are protected by a system of smoke detectors connected to a fire alarm system.</li> </ul>
23	<p><b>Reduction of Exit Width</b> Sentence 3.4.3.3.(2); Article 9.9.6.1. Swinging doors in their swing shall not reduce the effective width of exit stairs and landings to less than 750 mm.</p>	<p>Existing swinging doors in their swing are permitted to reduce the effective width of exit stairs and landings to a minimum of 550 mm provided:</p> <ul style="list-style-type: none"> <li>(a) they serve Group C or D occupancies,</li> <li>(b) the building does not exceed 4 storeys in building height, and</li> <li>(c) the building is sprinklered.</li> </ul>
24	<p><b>Fire Separation of Exits</b> Article 3.4.4.1.; Subsection 9.9.4. Article 3.4.4.1.; Subsection 9.9.4. Exits are required to be separated from the remainder of the floor area by a fire separation having a fire-resistance rating of not less than 3/4 h.</p>	<ul style="list-style-type: none"> <li>1. Buildings of 3 storeys or less may have exits that are separated by a fire separation that does not have a fire-resistance rating provided: <ul style="list-style-type: none"> <li>(a) the building is sprinklered with fast-response sprinklers, and</li> <li>(b) the sprinkler system is supervised in accordance with Sentence 3.2.4.9.(2).</li> </ul> </li> <li>2. Buildings not exceeding 6 storeys in building height may have exits that are separated by a 45 min fire separation provided the building is sprinklered.</li> </ul>

No.	By-law Requirement	Alternative Compliance Measures
25	<b>Exits Through Lobbies</b> Article 3.4.4.2.; Article 9.9.8.5. Rooms adjacent to the lobby are required to be separated by a fire separation.	Rooms adjacent to the lobby are not required to be separated by a fire separation provided: (a) the floor area is sprinklered with fast-response sprinklers, and (b) smoke detectors are installed in the adjacent rooms.
26	<b>Rooms Opening into an Exit</b> Sentence 3.4.4.4.(7); Article 9.9.5.9. Service rooms and ancillary rooms are not permitted to open directly into an exit.	Service rooms and ancillary rooms may open directly into an exit provided: (a) the rooms are sprinklered with fast-response sprinklers, and (b) weather stripping is installed on the doors to prevent the passage of smoke.
27	<b>Illumination of Exit Signs</b> Sentences 3.4.5.1.(2) and 3.4.5.1.(4); Sentences 9.9.11.3.(3) to 9.9.11.3.(4) Exit signs are required to be illuminated continuously while the building is occupied.	Where exit signage may compromise historic appearances, or authenticity of displays, exit signs may be installed to light only on an emergency condition, such as by the fire alarm system or due to power failure.
28	<b>Clearance from Exit Doors</b> Sentence 3.4.6.11.(1); Article 9.9.6.6. Stair risers shall not be closer than 300 mm from an exit door.	Except as permitted in Sentences 3.4.6.11.(3) or 9.9.6.6.(2), existing exit doors shall not extend beyond the first riser.
29	<b>Fire Escapes</b> Subsection 3.4.7.; Sentence 9.9.2.1.(2) Fire escapes are required to conform to Subsection 3.4.7.	Existing fire escapes that do not completely conform to Subsection 3.4.7. are acceptable provided: (a) the fire escapes are acceptable, and (b) the building is sprinklered.
30	<b>Fire Escape Construction</b> 3.4.7.2.; Sentence 9.9.2.1.(2)	Existing combustible fire escapes are permitted if the building is permitted to be of combustible construction by Part 3, Part 9 or by this table.
31	<b>Protection of Fire Escapes</b> Article 3.4.7.4.; Sentence 9.9.2.1.(2) Openings in the exterior wall adjacent to the fire escape are required to be protected by closures.	Existing openings in the exterior wall adjacent to the fire escape are not required to be protected by closures provided: (a) the building is sprinklered, and (b) a sprinkler head is located within 1.5 m of the opening required to be protected by Article 3.4.7.4.
32	<b>Vertical Service Space</b> Article 3.6.3.1. Vertical service spaces are required to be separated from the adjacent floor area by a rated fire separation.	Existing vertical service spaces that do not completely conform to the rated fire separation requirements are acceptable provided the vertical service spaces are sprinklered.
33	<b>Height and Area of Rooms</b> Subsection 3.7.1.; Section 9.5. The height and area of rooms are required to comply to minimum dimension requirements.	Existing rooms are not required to comply to the minimum dimension requirements of Subsection 3.7.1. or Subsection 9.5.3. provided it is acceptable to the Chief Building Official.
34	<b>Washroom Requirements</b> Subsection 3.7.2.; Section 9.31. Buildings are required to be provided with a minimum number of washroom fixtures.	Existing facilities are not required to completely comply to the requirements of Subsection 3.7.2. or Section 9.31. provided it is acceptable to the Chief Building Official.

No.	By-law Requirement	Alternative Compliance Measures
35	<b>Seismic Anchorage of Exterior Decoration</b> Subsection 4.1.8.	Existing exterior decorations are not required to fully comply to the anchorage requirements of Subsection 4.1.8. provided: (a) acceptable means of protection is provided, or (b) there is no exposure to the public.
36	<b>Mechanical Systems</b> Part 6 and Part 7	Existing mechanical systems in buildings are not required to fully comply to the requirements of Parts 6 or 7 provided: (a) it is not an unsafe condition, and (b) it is acceptable to the Chief Building Official.
37	<b>Mechanical and Plumbing Systems</b> Parts 9, 10 and 11	Existing mechanical systems in buildings are not required to fully comply to the requirements of Parts 6 or 7 provided: (a) it is not an unsafe condition, and (b) it is acceptable to the Chief Building Official.
38	<b>Energy and Water Efficiency</b> Parts 9, 10 and 11.	The existing level of energy and water efficiency in a building is not required to comply with the requirements of Parts 9, 10 or 11 provided the level of energy efficiency is acceptable to the Chief Building Official.

## 11.5. Upgrade Mechanism

### 11.5.1. General

#### 11.5.1.1. Application

(See Note A-11.5.1.3.)

- 1) Except for a single detached house or duplex, the *acceptable* level of upgrade required for a *building* shall be determined on the basis of Article 11.5.1.2.
- 2) For a single detached house or duplex, the *acceptable* level of upgrade required shall be determined on the basis of Article 11.5.1.3.
- 3) Where a project scope includes multiple categories of work the highest upgrade level in each category shall apply and include the requirements of all lower upgrade levels.
- 4) The Hazard Index may be determined by the Hazard Index Table A-11.5.1.1.(4)-C. or other methodology as deemed *acceptable* to the *Chief Building Official*.
- 5) Where a small *suite* is altered as a small suite renovation or small suite change of major occupancy, the assemblies separating the small suite from adjacent spaces in the building shall be provided with at least 2 layer of gypsum board each with a 13 mm thickness on the interior side of the assembly.

#### A-11.5.1.3.(1) Existing Building Upgrade Mechanism

BACKGROUND AND INTENT. When work is carried out to an existing building, the Building By-law requires that the building be upgraded to an “acceptable” level. On April 20, 2004 Council approved a new model for determining the “acceptable” level of Building By-law upgrade for existing buildings undergoing alterations under the City’s building permit process.

Prior to April 20, 2004, the **required upgrades to an existing building were** based primarily on construction values. The **Upgrade Mechanism** determines the required “acceptable” level of upgrade for an existing building using the concept of defined “Categories of Work” **falling with the broad project types of Rehabilitation, Additions, and Change of Major Occupancy.**

The intent of the **Upgrade Mechanism** is to provide a road map for building owners and designers to determine the required level of Building By-law upgrade for the existing portion of a building as a function of the project types and the related categories of work.

The **Upgrade Mechanism** is not generally intended for existing residential buildings containing not more than two principal dwelling units. The general upgrade requirement for these types of buildings is defined in Article 11.5.1.5.of Division B.

#### A-11.5.1.1.(3) Incremental Upgrade

The model is based on incremental upgrade levels for each of the fire, life and health safety (F), structural safety (S); non-structural safety (N); and accessibility (A). For each of the upgrade levels, there is a corresponding acceptable solution that is deemed to meet the intended **upgrade objectives** of the applicable upgrade level. The **upgrade objectives** and acceptable solution for each F, S, N and A upgrade level provided in **Subsection 11.1.5. and its associated notes.**

**If an alteration includes more than one category of work or project type, then the most restrictive upgrade levels from each category of work will be applied. The individual upgrade levels are cumulative, so the higher level upgrade levels include all of the preceding lower upgrade level requirements. For example, where the design upgrade level is F3, then all of the upgrade requirements under F2 and F1 also apply.**

#### A-11.5.2.1.(1) Procedure for Using the Upgrade Mechanism

The following steps outline a recommended procedure for using the **Upgrade Mechanism.**

STEP 1 – Determine Any Other Requirements that may be Applicable. Other Building By-law requirements may be applicable to the existing building project. Review the Overall Conditions for the **Upgrade Mechanism** to determine if other requirements are applicable.

STEP 2 – Determine the appropriate Project Type(s) and Related Category or Categories of Work as a function of the

scope of work for the alteration.

**STEP 3 – Determine the Required Design Upgrade Level Based on the Category of Work for the Project**

The required upgrade levels for fire, life & health safety; structural safety; non-structural safety; and accessibility for persons with disabilities are to be determined using each of the applicable project type flow charts and the related category of work

For Renovation Type Projects use Flow Chart No. 1 in Article 11.5.1.3

For Change of Major Occupancy Type Projects use Flow Chart No. 2 in Article 11.5.1.3

For Addition Type Projects use Flow Chart No. 3 in Article 11.5.1.3

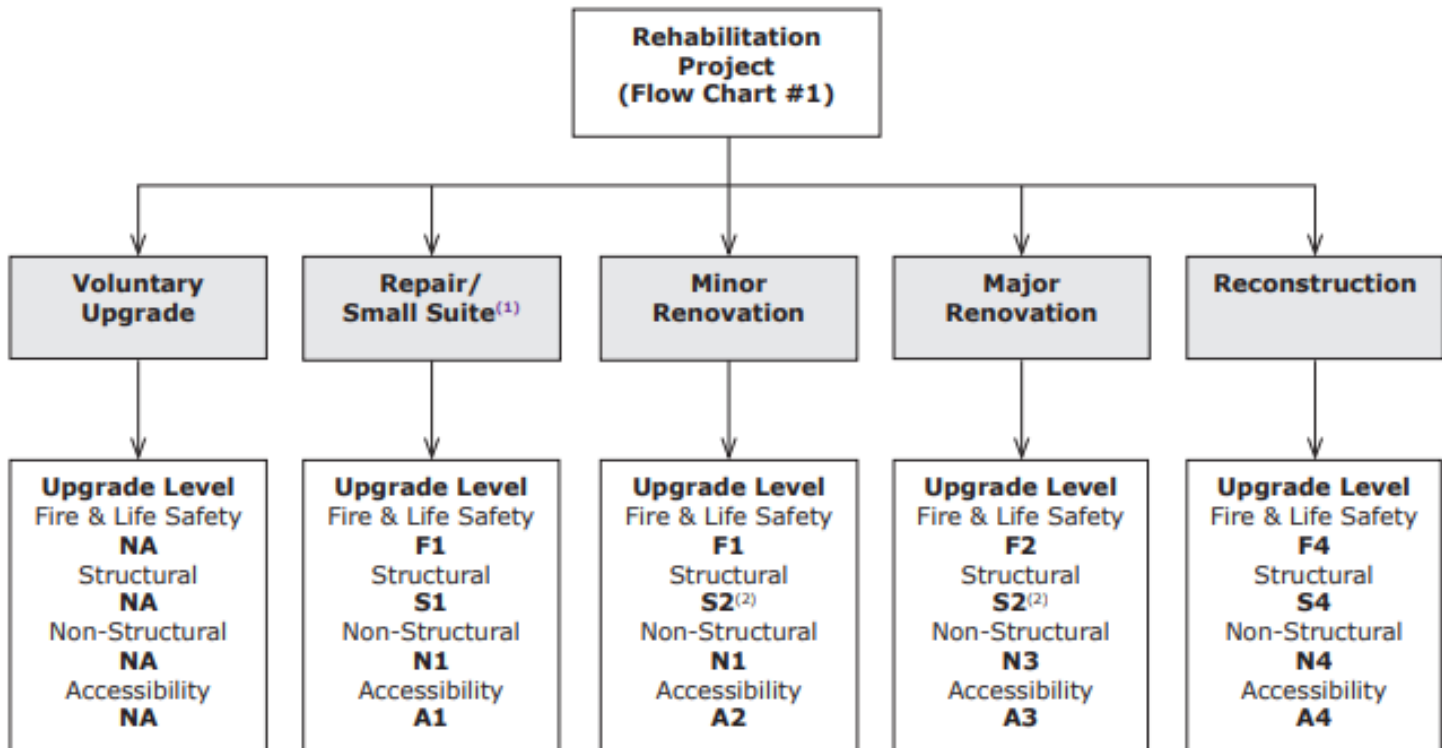
NOTE: Where a project involves more than one category of work, the most restrictive upgrade level, as determined from each category of work, shall determine the upgrade design level.

STEP 4 – Determine the objective and acceptable solution for the most restrictive upgrade level for fire, life and health safety; structural safety; non-structural safety; and accessibility for persons with disabilities. The most restrictive upgrade levels are the design upgrade levels that are to be applied to the existing building.

**11.5.1.2. Upgrade Trigger Mechanism**

1) Except as permitted by Subsection 11.5.4., the *acceptable* level of upgrade for an *existing building* shall be determined in accordance with Flow Chart 11.5.1.2.-A, -B, and -C for each type of project.

**RENOVATION PROJECT TYPE (Flow Chart No. 1)**

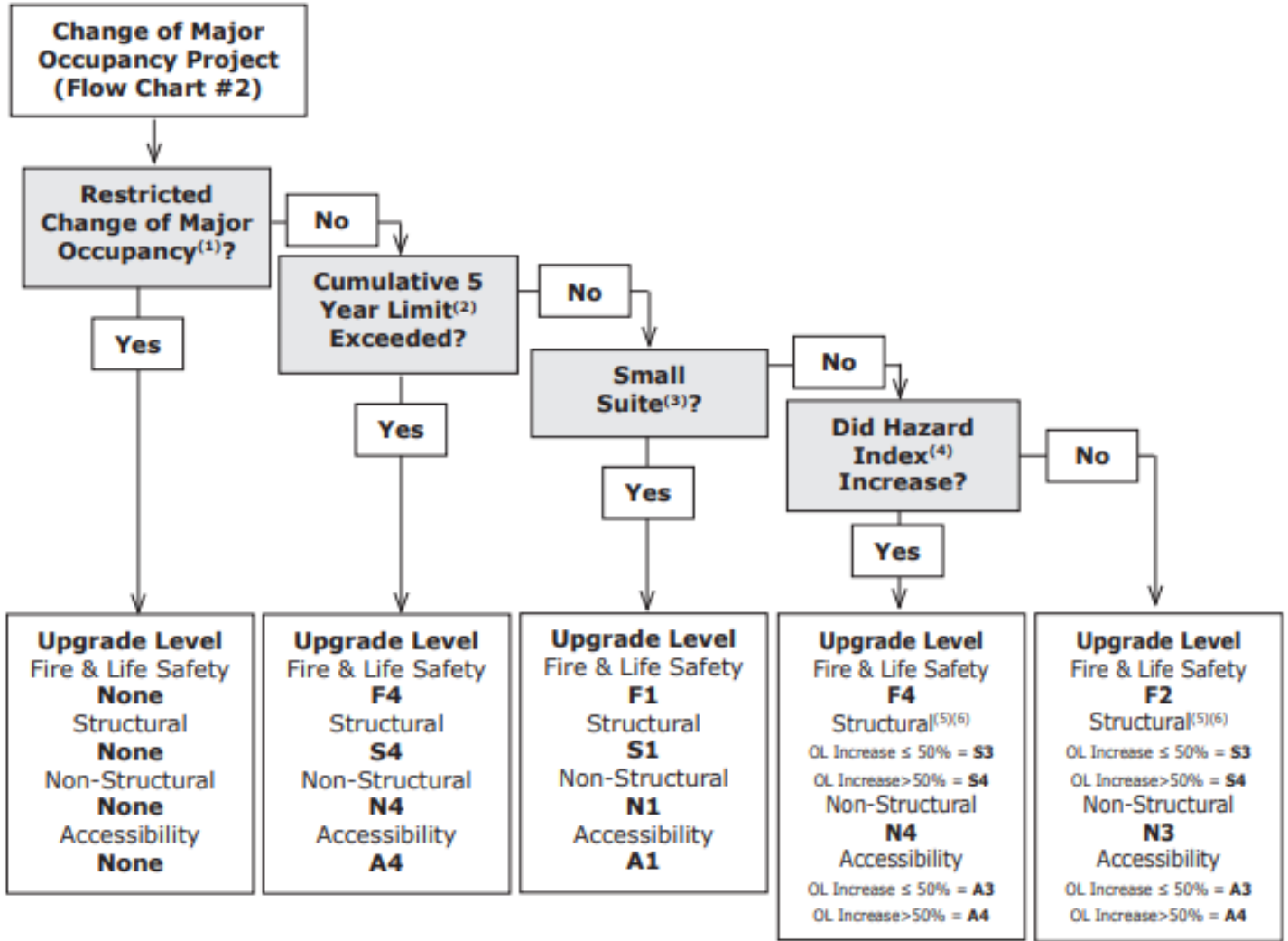


**Notes to Flow Chart No. 1:**

(1) For small suites, the small suite must be separated on the suite side of the suite separation with at least two layers of gypsum wall board (GWB) as required by Sentence 11.5.1.1.(5).

(2) Notwithstanding the upgrade levels in Flow Chart #1, where a minor or major renovation involves an entire building and the renovation includes the removal of the majority interior wall cladding then the structural seismic upgrade level shall be S3.

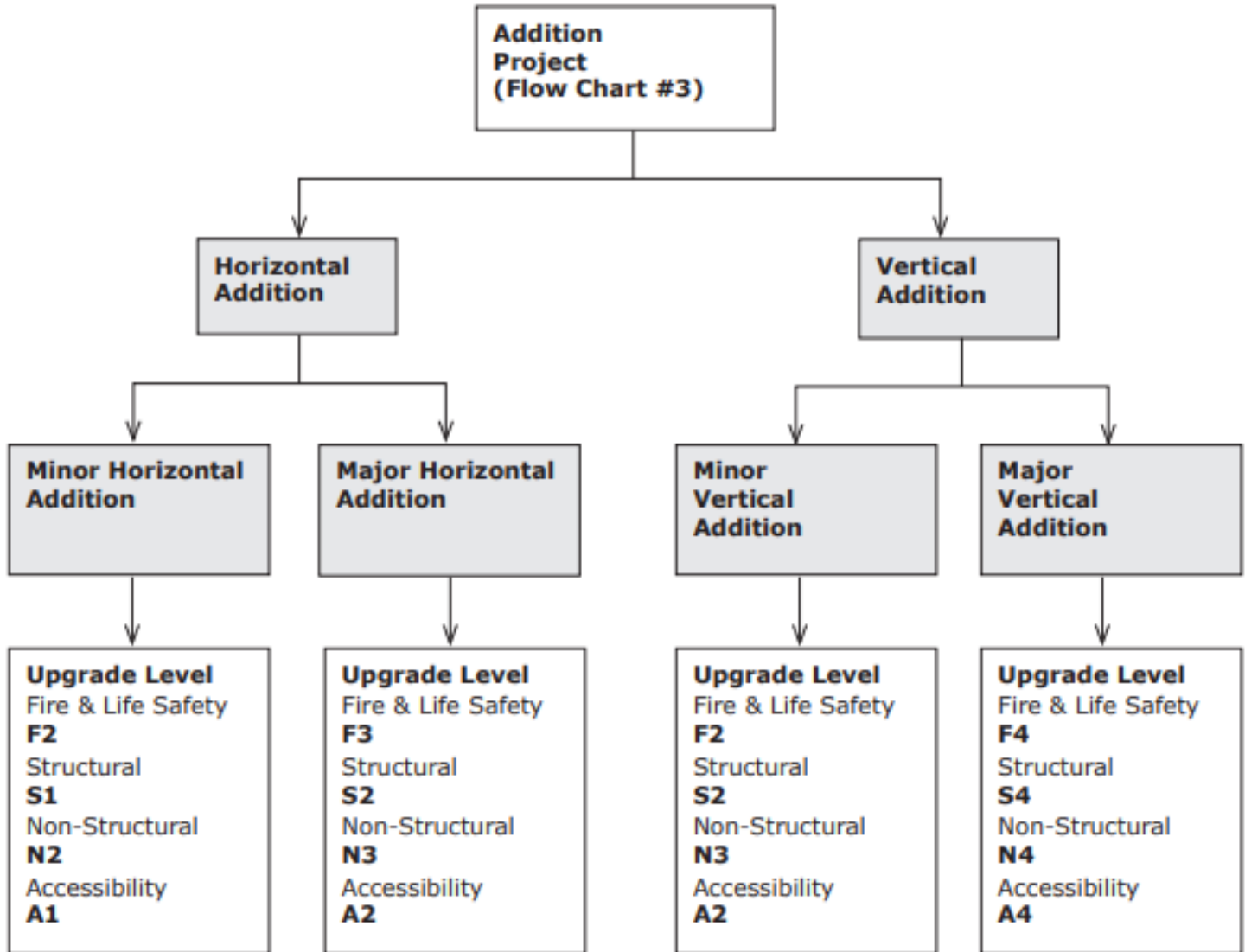
**CHANGE OF MAJOR OCCUPANCY CLASSIFICATION PROJECTS (Flow Chart No. 2)**



**Notes to Flow Chart No. 2:**

- (1) Restricted Change of Occupancy (see Article 11.5.1.3.(9) and Note A-11.5.1.3.(9) )
- (2) The cumulative 5 year limit is triggered when there is a change of major occupancy in an existing building and the aggregate area of the change in major occupancy including the current work within any 5 year period is greater than 50% of the building area (as defined in Article 1.4.1.2. of Division A) in a building of not more than one storey, or the aggregate area of the change in major occupancy within any 5 year period is greater than 100% of the building area (as defined in Article 1.4.1.2. of Division A) in a building of more than one storey.
- (3) For small suites, the small suite must be separated on the suite side of the suite separation with at least two layers of gypsum wall board (GWB) as required by Sentence 11.5.1.1.(5).
- (4) Where there is a change of major occupancy and the structural load paths or structural design criteria are altered then it must be demonstrated that the existing building has the structural capacity to carry the increase in load or the building shall be structurally upgraded to carry the increase in live load.
- (5) Occupant load (OL) increase is based on the proposed occupant load for the entire building versus the current occupant load for the entire building. The OL change may be assessed in a comparative manner by considering only those areas undergoing a change of major occupancy, where the occupant load of the remainder of the building cannot otherwise reasonably be assessed. Occupant loads are to be determined by the acceptable solutions in Subsection 3.1.17. of Division B.
- (6) ~~The Hazard Index may be determined by the Hazard Index Table A-11.5.1.3.-C. or other methodology as deemed acceptable to the Chief Building Official.~~

**ADDITION PROJECTS (Flow Chart No. 3)**



**A-11.5.1.1.(4) Hazard Index Table.** The hazard index for various building uses are indicated in Table A-11.5.1.3.-C. The required level of Building By-law upgrade for a Change of Major Occupancy Type projects is dependent on whether or not the Hazard Index has increased for the proposed alteration. Hazard Index ratings are intended to reflect the level of fire and life safety risk to occupants for various building uses. Hazard index ratings range from 1 to 6, such that a hazard index of rating of 6 represents the highest risk to occupants.

For the purposes of a Restricted Change of Occupancy, the Hazard Index may be established based on the aggregate area of the suite, to provided indices that can be compared to establish a relative level of risk between the proposed and current uses of different sizes. Where a suite is subdivided as part of change in major occupancy, the relative risk is established based on the index number of the final aggregate size of the suite as compared to the original size of the suite (see Note A-11.5.1.3.(9) ).



**Table A-11.5.1.3.-C  
Hazard Index Table**

Building Use	Hazard Index <sup>(1)</sup>	
	≤200 m <sup>2</sup>	>200 m <sup>2</sup>
<b>Group A, Division 1</b>		
Dinner Theatres	4	5
Live Theatres	4	5
Motion Picture Theatres	4	5
Opera Houses	4	5
Television Studios (With Audience)	4	5
<b>Group A, Division 2</b>		
Art Galleries	3	4
Auditoria	3	4
Billiard Halls, Amusement Arcades	3	4
Bowling Alleys	3	4
Churches	3	4
Clubs, Lodges (Non-Residential)	3	4
Community Halls	3	4
Concert Halls	3	4
Court Rooms	3	4
Dance Halls	3	4
Daycare Centres	3	4
Exhibition Halls (Without Sales)	3	4
Exhibition Halls (With Sales)	See Group E	
Gymnasia (Multi-Purpose)	3	4
Gymnasia (Athletic)	3	4
Lecture Halls	3	4
Libraries	3	4
Licensed Beverage Establishments	3	4
Licensed Clubs, Lodges	3	4
Museums	3	4
Passenger Stations/Depots	3	4
Recreational Piers	3	4
Restaurants (Seating Over 17)	3	4
Schools, Colleges	3	4
Undertaking Premises	3	4
<b>Group A Division 3</b>		
Arenas (No Occupancy On Activity Surface)	3	4
Armouries (No Occupancy On Activity Surface)	3	4
Enclosed Stadia or Grandstand	3	4
Ice Rinks (No Occupancy On Activity Surface)	3	4
Indoor Swimming Pools	3	4

Building Use	Hazard Index <sup>(1)</sup>	
	≤200 m <sup>2</sup>	>200 m <sup>2</sup>
<b>Group A Division 4</b>		
Amusement Park Structures	2	3
Bleachers	1	3
Grandstands (Open)	1	3
Reviewing Stands	1	3
Stadia (Open)	1	3
<b>Group B, Division 1</b>		
Detention Facilities (Minimum Security)	4	5
Detention Facilities (All other types of security)	6	6
Police Station with Detention (not meeting Article 3.1.2.4.)	3	4
<b>Group B, Division 2</b>		
Hospital, Nursing Home, Geriatric, Sanitarium (Immobile)	4	5
Hospital, Nursing Home, Geriatric, Sanitarium (Non-Ambulatory)	4	5
Psychiatric Hospitals (Maximum Confinement)	4	5
Psychiatric Hospitals (Minimum Confinement)	3	4
Police Station with Detention (Meeting Article 3.1.2.4.)	3	3
<b>Group B, Division 3</b>		
Residential Care Facilities (Ambulatory)	3	4
Residential Care Facilities (Non-Ambulatory)	4	5
Children Custodial Homes	3	4
Convalescent Homes (Ambulatory)	3	4
Convalescent Homes (Non-Ambulatory)	4	5
Group Homes for Adult Residents with Developmental Disabilities (Minimum Confinement)	3	4
Group Homes for Adult Residents with Developmental Disabilities (Maximum Confinement)	4	5
<b>Group C</b>		
Apartments	3	4
Clubs, Residential	3	4
Colleges Residential	3	4
Congregate Care Housing for Seniors	3	5
Convents	3	4
Dormitories/Hotels	3	4
Hotels	3	5
Detached Houses (1 or 2 Family)	2	2
Live/work units	3	5
Monasteries	3	4
Retirement Homes	3	4
Schools, Residential	3	4
<b>Group D</b>		
Advertising and Sales Offices	3	3

Building Use	Hazard Index <sup>(1)</sup>	
	≤200 m <sup>2</sup>	>200 m <sup>2</sup>
Automatic Bank Deposit	3	4
Barber/Hairdresser Shops	3	4
Beauty Parlours	3	4
Branch Banks	3	4
Car Rental Premises	3	3
Chiropractic Offices	3	4
Communications Offices (Telephone Exchange)	3	4
Communications Offices (Telex)	3	4
Communications Offices (Courier)	3	3
Computer Centres	3	4
Construction Offices	3	3
Costume Rental Premises	3	4
Dental Offices (Denture Clinic)	3	4
Dental Offices (General)	3	4
Dental Offices (Surgical/Anaesthesia)	4	5
Dry Cleaning Depots	3	4
Dry Cleaning Premises (Self-Serve)	4	4
Health/Fitness Clubs	3	4
Laundries (Self-Serve)	4	4
Massage Parlours	3	4
Medical Offices (Examination)	3	4
Medical Offices (Surgical Anaesthesia)	4	5
Offices (Business)	3	3
Offices (Charitable)	3	3
Offices (Legal/Accounting)	3	3
Offices (Design)	3	4
Pharmacy Offices	3	4
Photographic Studios	3	4
Physiotherapy Offices	3	4
Police Stations (No Detention)	3	4
Printing and Duplicating	4	5
Public Saunas	3	4
Radio Stations (No Audience)	3	4
Small Tool Rental Premises	3	4
Suntan Parlours	3	4
Veterinary Offices	3	4
<b>Group E</b>		
Automotive/Hardware Department Store	4	5
China Shops	3	4
Department Stores	4	5
Electrical Stores (Fixtures)	3	3

Building Use	Hazard Index <sup>(1)</sup>	
	≤200 m <sup>2</sup>	>200 m <sup>2</sup>
Exhibition Halls (With Sales)	4	5
“Fast Food” Outlets	3	4
Feed and Seed Stores	4	5
Flea Markets	3	5
Flower Shops	3	4
“Food” and Vegetable Markets	3	4
Garden Shops	3	4
“Gas” Bars	4	5
Gift Shops	3	4
Home Improvement Stores	4	5
Kitchen/Bathroom Cupboards Stores	3	4
Plumbing Stores (Fixtures/Accessories)	3	3
“Pop” Shops	3	4
Restaurants (Not More Than 30 Persons)	3	4
Shopping Malls	4	5
Stationery/Office Supply Stores	3	4
Stores (Art)	3	4
Stores (Baked Goods)	3	4
Stores (Beer)	3	4
Stores (Book)	3	4
Stores (Camera)	3	4
Stores (Candy)	3	4
Stores (Clothing)	3	4
Stores (Drugs)	4	4
Stores (Electronic)	3	4
Stores (Floor Coverings)	4	5
Stores (Food)	3	3
Stores (Furniture/Appliances)	3	4
Stores (Hardware)	4	5
Stores (Health)	4	4
Stores (Hobby)	3	4
Stores (Jewellery)	3	3
Stores (Paint/Wallpaper)	4	5
Stores (Pet)	3	4
Stores (Records/Tapes)	3	4
Stores (Spirits)	4	5
Stores (Toys)	4	5
Stores (Variety)	4	4
Stores (Video Sales/Rental)	3	4
Supermarket	3	4

Building Use	Hazard Index <sup>(1)</sup>	
	≤200 m <sup>2</sup>	>200 m <sup>2</sup>
<b>Group F, Division 1</b>		
All Uses	6	6
<b>Group F, Division 2</b>		
Aircraft Hangars	3	5
Abattoirs	3	4
Bakeries	3	5
Body Shop	3	5
Candy Plants	3	4
Cold Storage Plants with Flammable Refrigerant	3	5
Cold Storage Plants with Non-flammable Refrigerant and	3	4
Dry Cleaning Establishments (non-flammable or non-explosive)	3	4
Electrical Substations	3	4
Factories (High Fire Load)	3	5
Freight Depots (High Fire Load)	3	5
Laboratories (High Fire Load)	3	5
Laundries (not self-serve)	3	4
Manufacturer Sales (High Fire Load)	3	5
Mattress Factories	3	4
Meat Packing Plants	3	4
Packaging Manufacturers (Cellulose)	3	4
Packaging Manufacturers (Noncombustible)	3	3
Packaging Manufacturers (Plastics)	3	5
Paper Processing Plants (Wet)	3	5
Plaining Mills	3	5
Printing Plants	3	4
Public Heritage Buildings	3	3
Repair Garages	3	5
Sample Display Rooms (High Fire Load)	3	5
Self Service Storage Buildings	3	4
Service Stations (no spray painting)	3	5
Storage Rooms (High Fire Load)	3	5
Television Studios (no audience)	3	4
Tire Storage	3	5
Warehouse (High Fire Load)	3	5
Welding Shops	3	5
Wholesale Rooms (High Fire Load)	3	5
Wood Working Factories	3	5
Workshops (High Fire Load)	3	5
<b>Group F, Division 3</b>		
Creameries	2	2

Building Use	Hazard Index <sup>(1)</sup>	
	≤200 m <sup>2</sup>	>200 m <sup>2</sup>
Factories (Low Fire Load)	2	3
Freight Depots (Low Fire Load)	2	3
Laboratories (Low Fire Load)	2	3
Manufacturers Sales (Low Fire Load)	2	3
Power Plants	3	4
Public Heritage Buildings	3	3
Sample Display Rooms (Low Fire Load)	2	3
Storage Garages	2	3
Storage Rooms (Low Fire Load)	2	3
Warehouse (Low Fire Load)	2	3
Wholesale Rooms (Low Fire Load)	2	3
Workshops (Low Fire Load)	2	3

**Notes to Table A-11.5.1.3-C:**

(1) For the purposes of a Restricted Change of Occupancy, the Hazard Index may be established based on the aggregate area of the suite provided the suite changing occupancy is fully contained in the original suite area.

**11.5.3.1. Upgrade Requirements for a Residential Building Containing not more than Two Principal Dwelling Units**

1) Except as permitted by Subsection 11.4, an alteration or addition to a solely residential building containing not more than two principal dwelling units shall comply with this By-law, and the existing portions of building shall be upgraded to an acceptable level as determined by Tables 11.2.1.4.(1)-A, 11.2.1.4.(1)-B, and 11.2.1.4.(1)-C.

**A-11.5.3.1.(1) Upgrade Requirements for Detached Houses and Duplexes.** The upgrades applicable to Detached house and Duplexes are determined by Article 11.5.3.1. through a simplified and more prescriptive process. This is intended to reflect the simpler nature of these projects, and the absence of many of the usual design features of such projects.

**Table 11.5.3.1.(1)-A  
Fire and Life Safety Upgrade requirements for Residential Buildings containing not more than Two Principal Dwelling Units**

Forming part of Sentence 11.5.3.1.(1)

Scope of Work	Smoke Alarms(1)	CO Alarms(2)	Guards(3)	Spatial Separation(4)	Structural(5)
Renovation	Y	Y	Y	N	N
Relocation or Reconstruction	Y	Y	Y	Y	Y
Horizontal Addition Floor Area					
up to 25%(6)	Y	Y	Y	N	N
over 25%(7)	Y	Y	Y	Y	Y
Vertical Addition Floor Area					
up to 25%(6)	Y	Y	Y	N	Y
over 25%(7)	Y	Y	Y	Y	Y

**Notes to Table 11.2.1.4.(1)-A:**

- (1) Smoke Alarms: to be installed in conformance with Subsections 3.2.4. and 9.10.19. as applicable.
- (2) CO Alarms: to be installed in conformance with Subsections 6.9.3. and 9.32.4. as applicable.
- (3) Guards: all unsafe guards to be upgraded to the satisfaction of the Chief Building Official.
- (4) Spatial Separation: Spatial separation of the building shall comply with Subsections 3.2.3., 9.10.14. or 9.10.15. as applicable; or as permitted by Section 11.3.
- (5) All existing wood frame walls to be anchored to existing concrete foundation walls for seismic resistance
- (6) Aggregate increase in floor area less than 25% of the building area (see flow chart #3 of Note A-11.2.1.2).
- (7) Aggregate increase in floor area greater than 25% of the building area.

**Table 11.5.3.1.(1)-B  
Egress and Exit Upgrade requirements for Residential Buildings containing not more than Two Principal Dwelling Units**

Forming part of Sentence 11.5.3.1.(1)

Scope of Work	Means of Egress(1)	Handrails(2)	Exit Exposure(3)	Stair Dimensions(4)	Building Services(5)	Falling Hazards(6)
Renovation	N	Y	N	N	N	N
Relocation or Reconstruction	Y	Y	Y	Y	Y	Y
Horizontal Addition Floor Area						
up to 25%(7)	Y	N	N	N	N	Y
over 25%(8)	Y	Y	Y	Y	Y	Y
Vertical Addition Floor Area						
up to 25%(7)	Y	Y	N	N	N	Y
over 25%(8)	Y	Y	Y	Y	Y	Y

**Notes to Table 11.2.1.4.(1)-B:**

- (1) Means of Egress: confirm that access to exit (9.9.9.) and means of escape (9.9.10.) from all floor areas is compliant with regards to travel distance and fire separation (where applicable).
- (2) Handrails: all unsafe handrails to be upgraded to the satisfaction of the Chief Building Official.
- (3) Exit Exposure: Exits to be confirmed to be compliant with regards to exit exposure where applicable.

- (4) Stair Dimensions: Existing stairs in means of egress to comply with the dimensional requirements of Subsection 9.8.2.
- (5) Building Services: Restrain building service piping, conduit, and appliances to resist lateral movement due to earthquake.
- (6) Falling hazards: Restrain falling hazards within 3 m of the egress path to resist lateral movement due to earthquake.
- (7) Aggregate increase in floor area less than 25% of the building area (see flow chart #3 of Note A-11.2.1.2).
- (8) Aggregate increase in floor area greater than 25% of the building area.

**Table 11.5.3.1.(1)-C**  
**Floor Area Upgrade Requirements for Residential Buildings containing not more than Two Principal Dwelling Units**  
 Forming part of Sentence 11.5.3.1.(1)

Scope of Work	Flame Spread <sup>(1)</sup>	Floor Fire Separations <sup>(2)</sup>	Suite Fire Separations <sup>(3)</sup>	Lighting & Emergency Lights <sup>(4)</sup>	Door Hardware <sup>(5)</sup>
Renovation	N	N	N	N	N
Relocation or Reconstruction	Y	Y	Y	Y	Y
Horizontal Addition Floor Area					
up to 25% <sup>(6)</sup>	N	N	N	N	N
over 25% <sup>(7)</sup>	Y	Y	Y	Y	Y
Vertical Addition Floor Area					
up to 25% <sup>(6)</sup>	N	N	N	Y	N
over 25% <sup>(7)</sup>	Y	Y	Y	Y	Y

**Notes to Table 11.2.1.4.(1)-C:**

- <sup>(1)</sup> Flame Spread Rating: Exposed wall and ceiling finishes of egress routes to meet the requirements of Subsection 9.10.17. in exits
- <sup>(2)</sup> Floor Fire separations: Floor and occupied roof assemblies to be fire rated per Article 9.10.8.1.
- <sup>(3)</sup> Suite Fire Separations (where applicable): Residential suites to be provided with a fire separation in accordance with Article 9.10.9.14. and Section 9.37.
- <sup>(4)</sup> Lighting & Emergency Lights (where applicable): Lighting and emergency lighting to be provided in means of egress in accordance with Subsection 9.9.12.
- <sup>(5)</sup> Door Hardware: Door hardware within existing floor areas to be made adaptable as per Subsection 3.8.5.
- <sup>(6)</sup> Aggregate increase in floor area less than 25% of the building area (see flow chart #3 of Note A-11.2.1.2).
- <sup>(7)</sup> Aggregate increase in floor area greater than 25% of the building area.

**2)** Where an alteration or addition is made to an existing residential building, containing not more than two principal dwelling units, the energy efficiency of a the building shall be upgraded to an acceptable level in conformance with Table 11.2.1.4.(2).

**Table 11.5.3.1.(3)**  
**Energy Efficiency Upgrade Requirements for Residential Buildings containing not more than Two Principal Dwelling Units**  
 Forming part of Sentence 11.2.1.4.(2)

Alteration construction value	EnerGuide Assessment <sup>(1)</sup>	Air tightness up-grades <sup>(2)</sup>	Attic and Sloped Roof Insulation <sup>(3)</sup>	Electric Space and Hot Water Heating	Space Heating
\$0.00 to \$149,999	N	N	N	N	N
\$150,000 to \$249,999	N	N	N	Y	N
≥\$250,000	Y(1)	Y	Y	Y	Y

**Notes to Table 11.2.1.4.(2):**

- <sup>(1)</sup> An EnerGuide Assessment completed within the last 4 years must be submitted, a post-construction assessment must also be completed.
- <sup>(2)</sup> Where EGH>5 air changes per hour, air sealing is required.
- <sup>(3)</sup> Where attic insulation <R12 (2.11RSI), increase to R28 (4.93RSI); where attic insulation ≥R12 (2.11RSI), increase to R40 (7.04RSI); Insulation in existing attics shall not exceed R43.7 (7.7RSI). All flat roof and cathedral ceiling insulation shall be upgraded to ≥R14 (2.47RSI).
- <sup>(4)</sup> Domestic hot water equipment must be replaced in compliance with the domestic hot water requirements of Article 10.2.2.12. or a uniform energy factor of not less than 1.0, except the system may be gas-fired with a uniform energy factor of not less than 0.78 or a thermal efficiency of not less than 90% where: the building mechanical room, storage or service spaces have insufficient space to accommodate the footprint, height, or manufacturer-specified space requirements of the new equipment; the existing electrical panel has insufficient circuit or amperage capacity to accommodate the new equipment; the existing domestic hot water system is part of a combined system that also provides space-heating; the existing domestic hot water equipment was installed with a valid permit within the previous five years; or, equivalent emissions reduction measures are completed as acceptable to the Chief Building Official.”.

**3)** Where an *alteration* is made to an existing residential *building* containing not more than two principal residential



*dwelling units*, that creates one or more new principal *dwelling units* or increases the size of an existing *dwelling unit*, a sprinkler system shall be installed

- a) throughout the building, where the construction value of the *alteration* exceeds 50% of the replacement value of the *existing building* (See Note A-11.2.1.4.(3) (a).),
- b) throughout any *storey* on which a new principal *dwelling unit* is created, and all *storeys* below, or
- c) throughout any *storey* on which an *alteration* to the *building* increases the aggregate area of an existing *dwelling unit* and the converted space is greater than 50% of the *floor area* of the original *dwelling unit*.

**A-11.5.3.1.(2) & 11.5.1.12. Project Value.** The term “construction value” refers to the value of the proposed work stated on the application for the permit established by Division C, Article 1.6.2.3. This includes the current monetary worth of all labour and all fees and costs incurred for design, investigative testing, consulting services, construction, construction management, contractor’s profit and overhead, sales taxes, and construction insurance related to the building, including all components of the building, and the market value of all labour, including unpaid labour provided by an owner or volunteer, and the market value of all materials, including donated, recycled or used materials.

**A-11.5.1.5.(2) Replacement Value.** The term “replacement value” is used as a baseline for determining the applicability of specific upgrade requirements. The term refers to the cost to replace the structure in its current state or serve the function of a previous structure. This is similar to the insurable value – the cost to replace the destructible improvements of a property (as applied to a building or part thereof). This is not intended to be an assessment of the construction, planning, and ancillary costs that could be incurred if the structure in question was built as a reproduction of the original or redeveloped as new construction.

**A-11.5.3.1.(3) Sprinkler Installation Determination Where Dwelling Units Are Added.** Table 11.5.1.4. provides a matrix that determines sprinkler upgrades for existing unsprinklered or partially sprinklered buildings. The location of the newly created dwelling unit will determine the extent of the sprinkler coverage for the subject building.

### 11.5.4. Special Cases

#### 11.5.4.1. General

1) Where there is a change of major occupancy in a building, and the aggregate area of the change in major occupancy within any 5 year period is greater than 50% of the building area in a one storey building or greater than 100% of the building area in a building of more than one storey, the entire building shall be upgraded to design upgrade levels F4, S4, N4 and A4 as detailed in the Upgrade Trigger Mechanism except where

- a) the change in major occupancy is to a single suite of not more than 100 m<sup>2</sup>, and the work does not exceed 5% of the building area, or
- b) such upgrades are in conflict with an approved heritage retention plan.

2) Where there is a change of major occupancy in a building, the upgrade requirements of Flow Chart #2 of the Upgrade Trigger Mechanism need not be provided where

- a) the change in major occupancy is to a single suite,
- b) the aggregate suite area does not exceed the lesser of 50% of the building area or 300 m<sup>2</sup>,
- c) the major occupancy of the suite is Group D or Group E, and
- d) the use and aggregate suite area complies with Table 11.5.1.3.-A.

Table 11.5.1.3.-A Maximum Aggregate Suite Area Forming part of Sentence 11.2.1.3.(9)			
Major Occupancy	Suite Use	Aggregate Suite Area	
		≤200 m <sup>2</sup>	201 to 300 m <sup>2</sup>
Group D	Administrative & Business Offices	Y	Y
	Barber and Hairdressing Shop		
Beauty Salon	Y	Y	
	Health Care Offices (non-surgical, non-sedation)	Y	Y(1)
Group E	General Retail (Non-hazardous materials)	Y(1)	N(2)

**Notes to Table 11.5.1.3.-A.:**

(1) Provided the Hazard Index of the space is not increased (see Table A-11.2.1.3.C)

#### A-11.5.4.1.(1) Restricted Change of Occupancy.

The term “restricted change of occupancy” refers to a change in major occupancy restricted to a specific set of uses as set out in Sentence 11.5.1.3.(9) that are limited both in scope and risk such that it does not increase the overall hazard.

While it is intended that designers and owners seeking to apply this requirement refer to the hazard index Table A-11.5.1.3.-B, for the purposes of this Article – they may substitute the aggregate suite area of the suite in lieu of the building area where the change of major occupancy is wholly contained within the original suite.

For example: a suite of 300 m<sup>2</sup> is being repartitioned and converted from a “business office” use (Group D) to a suite of “retail toystore” use (Group E) of 150 m<sup>2</sup> and second suite of “health care office” use which are fully contained within the original 300 m<sup>2</sup> suite area. The aggregate suite area is therefore permitted to be used for the purposes of determining the appropriate hazard index which is then established as follows:

- Business Office (300 m<sup>2</sup>) – 4 (original)
- Retail Toystore (150 m<sup>2</sup>) – 4 (new)
- Health Care Office (150 m<sup>2</sup>) – 3 (new)

By comparison, a larger toystore, such as the conversion of the original 300 m<sup>2</sup> suite area into a toystore, would result in a hazard index of ‘5’ which would not meet the requirements of Article 11.5.1.3. for a “restricted change of occupancy” as it represents an increase in hazard.

While the hazard index table is a useful tool for assessment, it is also important to understand that no table can address all possible combinations of uses. Designers and owners should exercise caution when making judgments of relative hazards in this regard.

(2) Except as acceptable to the Chief Building Official

3) Where a building is altered and is a post disaster building as defined in Table 4.1.2.1., or where there is a major addition to a post disaster building, the entire building shall be upgraded to design upgrade levels F4, S4, N4 and A4 as detailed in the Upgrade Trigger Mechanism.

**11.5.1.4. Sprinkler Installation Requirements for the Addition of Dwelling Units in Multi-family Buildings**

(See Note A-11.5.1.4.)

1) Except as provided in Sentence (2) and Sentence 11.5.1.5.(3), where an alteration to an existing building creates or adds one or more dwelling units, the building shall be sprinklered in conformance with Table 11.5.1.4.

2) Where the alteration in Sentence (1) involves the addition of existing floor area to an existing dwelling unit, and that converted space is greater than 50% of the floor area of the original dwelling unit, the altered dwelling unit shall be considered as a new dwelling unit and the building shall be sprinklered in conformance with Table 11.5.1.4.

3) If sprinklers are required by Table 11.5.1.4., they shall be installed throughout the storey on which the new dwelling unit is to be located and all storeys below the new dwelling unit.

**Table 11.5.1.4. Sprinkler Installation Determination Where Dwelling Units are Added**

Forming part of Sentence 11.5.1.4.(1),(2), and (3)

Existing Dwelling Units	New DUs(1) Added Over Any 5 year Period(2)				
	1	2-3	4-5	6	>6
0-1	Spr R(3)	Spr R	Spr R	Spr R	Spr R
2-4	-	Spr R	Spr R	Spr R	Spr R
5-10	-	-	Spr R	Spr R	Spr R
11-20	-	-	-	Spr R	Spr R
>20	-	-	-	-	Spr R

**Notes to Table 11.5.1.4.**

- (1) Dwelling Units
- (2) The creation of dwelling units over the previous 5 years from the date of the proposed building permit application.
- (3) Sprinklers Required.

4) Except as permitted by Article 11.5.1.5., where a building is relocated from another municipality to the City, from another lot within the City or within its existing lot, the building shall be upgraded to Design Upgrade Levels F4, S4, N4 and A4, as determined by the Upgrade Trigger Mechanism.

