

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 Major Occupancy which 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 which means a change of major occupancy within a suite of limited occupant load and lower hazard use. This categorization is contingent upon the provision of a separation incorporating additional gypsum board on the suite side from adjacent spaces in the building (including vertically).

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 the lesser of 25 per cent of the existing total building area, or 500 m² 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 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 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 implications from uplift, wind, or changes in rain or snow loads.

In addition to storeys, vertical additions may also include mezzanines, decks, or other roof areas intended for occupancy which in-fill existing unoccupied spaces, but which do not necessarily add to the floor or building areas.

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

Minor Vertical Addition is an addition of new floor area that does not result in an increase to the aggregate floor area by more than 25 per cent of the building area, 500 m² in aggregate floor area, or both.

Voluntary Building By-Law Upgrades are alterations to the building that directly contribute to the improvement of existing building systems and that are aligned with the fundamental objectives of the Building By-law, and exceed the minimum expectations for the code compliance of other planned improvements. These improvements may include improvements in the fire alarm system, sprinkler system, exit, accessibility, seismic, building envelope, and energy or water efficiency systems in an existing building. However, this does not generally apply to improvements to these systems where this is already a requirement needed to achieve code compliance for other planned new construction or renovation (e.g. one would not typically consider the addition of sprinklers to be a voluntary improvement, where an existing major occupancy was changed to a different major occupancy that would be required to be sprinklered).

A-11.1.3.1.(1)(e) Limitation of Upgrades to Suites. The objective described in Clause 11.1.3.1.(1)(e) is to limit the potential scope of upgrades to suite areas outside a renovated suite (i.e. to other suites, but not common areas) unless the effects of the renovation also have direct or significant impacts to another suite.

For example an increase to occupant loads to a suite, has direct impacts on the subject suite and the commonly accessed means of egress from the subject suite, which may lead to upgrades of those spaces, but the egress within another suite would likely not be affected until you left that other suite, and therefore upgrade would not be required.

However, judgement needs to be applied in this regards, as it may not be immediately obvious to what extent building systems shared by more than one suite might be affected. In the above example, a significant enough increase in the occupant load in a suite could have structural implications that affect all suites on a floor, in which case additional upgrades within suites not directly affected may be required.

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 11.1.4.1.(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, to facilitate conversions of existing buildings, in Section 11.2.;

- Alternative acceptable construction providing an alternative set of improvement for specific existing components or systems of a building which are deemed to comply with the upgrades that would otherwise be required by the upgrade triggers mechanisms, in Section 11.3; and
- Measures intended to facilitate the alteration of existing heritage construction, in Section 11.4.

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

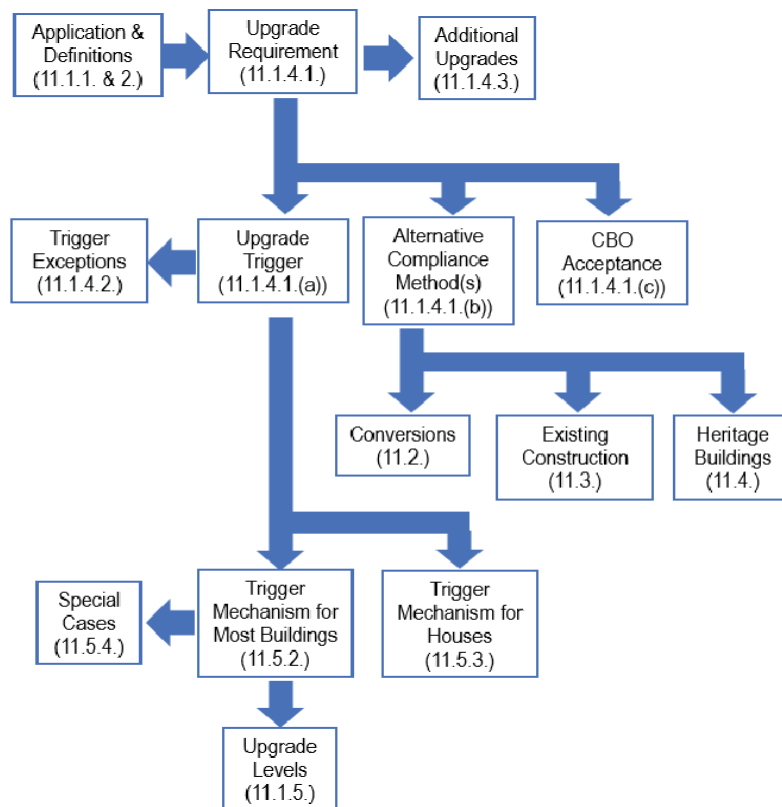


Figure 11.1.4.1.(1): Building Upgrade Overview

A-11.1.4.2.(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-11.1.4.2.(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.(6) 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.

A-11.1.4.3.(6), 11.2.3.1., 11.5.3.1.(2) & (4), and 11.5.4.2.(4) 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-11.2.3.1. and 11.1.4.3.(6) 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-11.5.1.2.(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 are 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

Fire

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

Structural

- S1** Entire Building – Proposed work must not reduce the structural integrity of the existing building.
- S2** Project Area – Non-structural elements and falling hazards must be restrained to resist lateral loads due to earthquakes within the project area.
- 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.
- 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.

Nonstructural

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.

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

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*.

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.

Accessibility

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

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

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.

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 Article 11.5.1.2., 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 11.5.2.1.(2).)*

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

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.

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)(b) Alteration Language Supporting NECB 2020. 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.

Version: 2025

ACKNOWLEDGEMENT

The City of Vancouver would like to acknowledge the permission granted by ASHRAE for use of their alteration language, from the ASHRAE 90.1-2019 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 rehabilitation requirements to support the NECB in a manner consistent with the existing requirements pertaining to the ASHRAE 90.1-2019 standard.

With the implementation of NECB 2020 within Vancouver's Building Bylaw in 2025, this document provides the minimum requirements for alterations to existing buildings designed and constructed to NECB 2011/2015 and those buildings subject to this document through Subsection 11.3.2. (formerly 11.7) of Division B.

SCOPE

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

- designed to NECB 2011,
- designed to NECB 2015,
- designed to ZEBP (10.2.2.5), or
- subject to 11.3.2.1.(3)(b) requirements (formerly 11.7.1.1.(3)(b) requirements).

APPLICATION

This document applies to the alteration of all building components with prescriptive requirements listed within NECB 2020, 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 *space heating, space cooling, ventilation, humidification, dehumidification*, electric power, lighting, transportation, *refrigeration, cooking*, or *service water heating*, 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 heating*, or lighting.

1.1 General

1.1.1 Instructions

This document shall be read in conjunction with NECB 2020. Words that appear in italics are defined in this document unless already defined within NECB 2020. All references to Parts are referring to the Parts within NECB 2020.

1.1.1.1 Additions to Existing Buildings. *Additions to existing buildings* 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 heating*, 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: In a *building* where components have been formally recognized by a federal, provincial, territorial, or municipal *authority having jurisdiction*, as having either Heritage or Character value, the alteration of these components need not comply with these requirements.

2.1 Building Components and Systems

2.1.1 Building Envelope (supports Part 3 of the NECB 2020)

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 Article 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 2020)

2.1.2.1 Lighting Alterations. For the *alteration* of any lighting *system* in an interior *space*, 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:

- a. 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).
- b. 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.
- c. The replacement of a failed lamp or *ballast/driver* in an individual *luminaire* or the replacement of any failed lighting control.
- d. 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 2020)

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

Exception: When *HVACR* to an addition is provided by existing *HVACR 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 *HVACR equipment* as a direct replacement of existing *HVACR 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;
- c. for a refrigerant change of existing *equipment*;
- d. for the relocation of existing *equipment*; or
- e. for ducts and *piping* where there is insufficient *space* or access to meet these requirements.

2.1.4 Service Water Heating Systems (supports Part 6 of the NECB 2020)

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

Exception: When the service water *heating system* to an addition is provided by existing service water *heating 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 *heating systems equipment* installed as a direct replacement for *existing building service water heating 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 2020)

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*.

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.

A-11.3.2.2.(1)(d) Commissioning (Cx) Requirements and Scope. These new commissioning requirements are not meant to include the Re-commissioning or Retro-commissioning of existing equipment or existing systems unless they are part of a new system, or dependent upon or interlocked with, the operation of new equipment.

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.

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.

A-11.5.1. 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 11.5.2.1. of Division B.

A-11.5.1.1.(3) Hazard Index. **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. The Hazard Index for various building uses are indicated in Table A-11.5.1.1.(4), and are used to determine 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.

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-11.5.3.1.(1)).

Table A-11.5.1.1.(3)		
Hazard Index Table		
Group A, Division 1		
Building Use	Hazard Index⁽¹⁾	
	≤200 m²	>200 m²
Dinner Theatres	4	5
Live Theatres	4	5
Motion Picture Theatres	4	5
Opera Houses	4	5
Television Studios (With Audience)	4	5
Group A, Division 2		
Building Use	Hazard Index	
	≤200 m²	>200 m²
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	
Gymnasias (Multi-Purpose)	3	4
Gymnasias (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
Group A Division 3		
Building Use	Hazard Index⁽¹⁾	
	≤200 m²	>200 m²
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
Group A Division 4		
Building Use	Hazard Index⁽¹⁾	
	≤200 m²	>200 m²
Amusement Park Structures	2	3
Bleachers	1	3
Grandstands (Open)	1	3
Reviewing Stands	1	3
Stadia (Open)	1	3
Group B, Division 1		
Building Use	Hazard Index	
	≤200 m²	>200 m²
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
Group B, Division 2		
Building Use	Hazard Index	
	≤200 m²	>200 m²
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
Group B, Division 3		
Building Use	Hazard Index	
	≤200 m²	>200 m²
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

Group C		
Building Use	Hazard Index	
	≤200 m²	>200 m²
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
Group D		
Building Use	Hazard Index	
	≤200 m²	>200 m²
Advertising and Sales Offices	3	3
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
Group E		
Building Use	Hazard Index	
	≤200 m ²	>200 m ²
Automotive/Hardware Department Store	4	5
China Shops	3	4
Department Stores	4	5
Electrical Stores (Fixtures)	3	3
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
Group F, Division 1		
Building Use	Hazard Index	
	≤200 m²	>200 m²
All Uses	6	6
Group F, Division 2		
Building Use	Hazard Index	
	≤200 m²	>200 m²
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
Planing 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
Group F, Division 3		
Building Use	Hazard Index	
	≤200 m ²	>200 m ²
Creameries	2	2
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-11.5.1.1.(3):

⁽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.

A-11.5.2.1.(1) Procedure for Using the Upgrade Trigger Mechanism. The following steps outline a recommended procedure for using the Upgrade Trigger 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 Trigger 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 11.5.2.1.

For Change of Major occupancy Type Projects use Flow Chart No. 2 in Article 11.5.2.1.

For Addition Type Projects use Flow Chart No. 3 in Article 11.5.2.1.

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.

A-11.5.2.1.(2) 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 **A 11.5.1.2 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-11.5.3.1.(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.

A-11.5.4.1.(1) Restricted Change of Major Occupancy. The term “restricted change of major occupancy” refers to a change in major occupancy restricted to a specific set of uses 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-11.5.1.1.(3), for the purposes of the uses specified in Sentence 11.5.3.1.(2) – 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 m² is being repartitioned and converted from a “business office” use (Group D) to a suite of “retail toystore” use (Group E) of 150 m² and second suite of “health care office” use which are fully contained within the original 300 m² 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 m²) – 4 (original)
- Retail Toystore (150 m²) – 4 (new)
- Health Care Office (150 m²) – 3 (new)

By comparison, a larger toystore, such as the conversion of the original 300 m² 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 major 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.

A-11.5.4.1.(2) Sprinkler Installation Determination Where Dwelling units Are Added. Table 11.5.4.1.(2) 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.