

Alteration Language
to Support
the Application of the NECB 2015

Version: May 2, 2019

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 rehabilitation 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 11.7 of Division B.

SCOPE

This document pertains to the application of the Vancouver Building Bylaw, specifically:

- the alteration of existing buildings;
 - designed to NECB 2011,
 - designed to ZEBP (10.2.2.5), or
 - subject to 11.7.1.1(3)(c) 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*, that *space* shall comply with the lighting power density (LPD) requirements of Part 4 and the automatic shut-off requirements of 4.2.2.1.(20) as applicable to that *space*.

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. *Alterations* that involve 20% or less of the connected lighting load in a *space* or area need not comply with these requirements provided that such *alterations* do not increase the installed lighting power.
- b. Lighting *alterations* that only involve replacement of lamps plus ballast/drivers or only involve one-for-one luminaire replacement need only comply with LPD requirement and 4.2.2.1(20).
- c. Routine maintenance and repair situations.

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*.