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.

h. 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.

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.