

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:

- a. *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:

- 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.
- 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.
- 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.
- Alterations* to walls and floors, where the existing structure is without framing cavities and no new framing cavities are created.
- Roof recovering
- Removal and replacement of a roof membrane where there is existing roof insulation integral to or below the roof deck.
- 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 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:

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