



# Public Review

## Vancouver Building By-law (VBBL)

### Proposed change to Commissioning

**Topic:** Commissioning

**Code change number:** 24-0019

**Code reference:** New 10.2.2.18 (with supporting adjustments/statements within Part 5, Part 6, Part 11, and the Elect Bylaw)

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## Description of the proposed change

Adding commissioning of building operations equipment and associated systems (including controls) for new Part 3 buildings of 10.2.1.2 and 10.2.1.3 buildings, and new work in existing Part 3 buildings of 11.7.1.2 and 11.7.1.3 buildings. The commissioning requirement is located in Part 10 and is referenced in Part 5 (Environmental Separation), Part 6 (HVAC), Section 11.7, and the Electrical Bylaw (Electrical systems).

## Justification

In our fight against climate change, the CoV and the building industry have incorporated many energy and emissions reduction policies and requirements resulting in improved building systems design and construction, yet operationally, these systems are still not required to be commissioned for optimal performance resulting in wasted energy and increased emissions.

Since the 1980s, mechanical contractors have been responsible for 'commissioning' their own work. In practice that means the basic functional performance testing, adjusting and balancing of individual HVAC equipment. Now, with more complex HVAC equipment and sophisticated controls equipment and strategies to operate inter-dependent HVAC systems, a significant gap has materialized due to the lack of coordination and unclear roles and responsibilities split between different trades who are only responsible for their part of the contract. As such, many buildings designed based on current code requirements for energy efficient and low carbon performance are not likely to meet the design intent. A commissioning requirement in VBBL based on referenced industry standards will help ensure that qualified professionals are carrying out an appropriate level of commissioning oversight to help buildings deliver on energy and carbon performance targets throughout the buildings' life cycle.

Commissioning requirements have been in place since 2017 for over 200 large new construction projects following rezoning under the conditions of the Green Buildings Policy for Rezoning. These projects account for approximately 50% of large new construction in Vancouver. There is sufficient industry capacity to expand and deliver commissioning services for all 10.2.1.2. and 10.2.1.3 buildings.

## Proposed VBBL content

### Legend

Black Text – 2019 Vancouver Building By-law content

Black Underlined Text – Proposed modification to Vancouver Building By-law content

#### **10.2.2.18. Building Equipment and Systems Commissioning (excluding Part 9 buildings)**

(See Note A-10.2.2.18.(1)).

1) In a building required to comply with this Article, the building equipment, controls, meters, submeters, and systems shall follow a commissioning process led by a Commissioning Authority in accordance with:

a) ASHRAE Standard 202-2018, or

b) CSA Z320-11 (R2021) and CSA Z5000-18, with

i) no requirement to install metering or submetering equipment to monitor, record or display energy consumption, water consumption or end-use data,

ii) no requirement for post-occupancy monitoring-based commissioning, or continuous tracking and analysis for energy or water consumption data on an on-going basis, or user surveys, or post-occupancy energy model calibration.

2) In a building required to comply with this Article, acceptable documentation for compliance shall include a commissioning plan and a commissioning report completed by the Commissioning Authority, or other documentation to the satisfaction of the Chief Building Official.

### **Supported by new sentences and clauses per;**

#### Part 5 (Environmental Separation – General):

##### Section 5.1.2.2 Building Envelope Professional Requirements

Sentence 5.1.2.2.(4) The Building Envelope Professional shall support the commissioning of building envelope systems in compliance with Article 10.2.2.18.

#### Part 6 (HVAC systems):

##### Section 6.2.1.1. Good Engineering Practice

Sentence 6.2.1.1.(3) Heating, ventilating and air-conditioning equipment, controls, meters, submeters and systems, including mechanical refrigeration equipment, shall be commissioned in compliance with Article 10.2.2.18.,

Part 10 (for Part 3 buildings of 10.2.1.2 and 10.2.1.3 only):

Clause 10.2.1.2.(1)(i) shall *commission* equipment, controls, meters, submeters and systems in compliance with Article 10.2.2.18.,

Clause 10.2.1.3.(1)(i) shall *commission* equipment, controls, meters, submeters and systems in compliance with Article 10.2.2.18.,

...while removing existing commissioning requirements from referenced standard ASHRAE 90.1;

Clause 10.2.2.2.(2)(c) no requirement for commissioning per ASHRAE 90.1 Section 4.2.5.2.

Electrical Bylaw (Electrical systems):

### **7.3.6 Energy Efficiency**

Where a building is constructed, commissioned, retro-commissioned, renovated, upgraded, or otherwise altered from the existing condition other than for the purposes of repair, an owner shall comply with the Energy Efficiency provisions in Part 10, or Section 11.7 as applicable, of the applicable Building By-law only insofar as those provisions pertain to the installation of new electrical equipment, devices, conductors, and all associated electrical components, thereof.

**Add definitions to Div A Section 1.4 –**

#### **1.4.1.2 Defined Terms**

*Commissioning (or commissioning process)* means a systematic verification, documentation, and training process applied to all activities during the design, construction, static verification, start-up, and functional performance testing of equipment and systems in a building to ensure that the building operates in conformity with the owner's project requirements and the basis of design in accordance with the contract documents.

*Commissioning authority* means a qualified individual identified by an owner to lead the commissioning team in the planning and implementation of the commissioning process. The commissioning authority may be an owner or a third party. The commissioning authority may also be a commissioning provider. The commissioning authority shall be qualified based on the following:

- 10 or more years of demonstrated experience in commissioning with a minimum of 5 projects of a similar scale and scope, or
- 4 or more years of demonstrated experience in commissioning with a professional commissioning designation provided by an organization who has an accredited commissioning training program, or
- A member or licensee of the Association of Professional Engineers and Geoscientists of British Columbia qualified by virtue of training or experience to provide commissioning services.

*Commissioning agent* means an individual or entity who is part of the commissioning team and is responsible for implementing the *commissioning* tasks required within their respective contracts to verify that elements of the building project meet stated requirements.

Recommissioning means to commission a building using the documentation created during the previous commissioning process.

Retro-commissioning means to commission an existing building when commissioning has never been carried out or documentation does not exist.

**Add to “Notes to Part 10”**

Note A-10.2.2.18.(1). The intention of 10.2.2.18 is to apply only to Part 3 buildings, and to exclude Part 9 buildings regardless of major occupancy classification. BC Housing projects that follow the commissioning requirements of the BC Housing Building Commissioning Guidelines are deemed equivalent to 10.2.2.18 requirements.

For building projects with simple building systems, the commissioning authority and project team should follow guidance from the referenced standards to adapt the scale of the commissioning process and activities to suit.

Section 11.7 (Articles 11.7.1.2. and 11.7.1.3.)

**11.7.1.2. 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) the airtightness performance requirements of ASHRAE/NECB for reconstruction projects.
  - c) Articles 10.2.2.8 through 10.2.2.17. as applicable,
  - d) the commissioning requirements of Article 10.2.2.18 for new equipment and new systems including controls, meters, submeters, and
  - e) Articles 10.2.2.19 through 10.2.2.22. as applicable.

**11.7.1.3. 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 11.7.1.4 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 10.2.2.17. as applicable,
  - c) the commissioning requirements of Article 10.2.2.18 for new equipment and new systems including controls, meters, submeters,
  - d) Articles 10.2.2.19. and 10.2.2.20. as applicable,
  - e) the airtightness performance requirements of Article 10.2.2.21. for reconstruction projects, and
  - f) Article 10.2.2.22. as applicable.