

**EXPLANATION****A By-law to amend Building By-law No. 12511  
Regarding BC Building Code Amendments for Mass Timber Construction**

Following the Standing Committee on Policy and Strategic Priorities Meeting held on May 27, 2020 and June 2, 2020, Council resolved to amend the Building By-law to align with provincial regulation and National Building Code proposals enabling encapsulated mass timber construction up to 12 storeys for residential and commercial uses, to come into force and take effect on July 1, 2020. Enactment of the attached By-law will accomplish Council's resolution.

Director of Legal Services  
June 23, 2020

BY-LAW NO. \_\_\_\_\_

**A By-law to amend Building By-law No. 12511  
Regarding BC Building Code Amendments for Mass Timber Construction**

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This by-law amends the indicated provisions of Building By-law 12511.
2. In Article 1.4.1.2. of Division A of Book I, Council:
  - a) In the definition of “*Combustible construction*”, adds the words “or *encapsulated mass timber construction*” after “that does not meet the requirements for *noncombustible construction*”, and
  - b) Inserts the following new definitions in the correct alphabetical order:
    - i) “*Encapsulated mass timber construction* means that type of construction in which a degree of fire safety is attained by the use of encapsulated mass timber elements with an *encapsulation rating* and minimum dimensions for structural members and other *building assemblies*.”, and
    - ii) “*Encapsulation rating* means the time in minutes that a material or assembly of materials will delay the ignition and combustion of encapsulated mass timber elements when it is exposed to fire under specified conditions of test and performance criteria, or as otherwise prescribed by this By-Law.”.
3. In Article 1.3.1.2. of Division B of Book I, in Sentence (1) in Table 1.3.1.2. Council:

- a) After the row

ANSI	A208.1-2009	Particleboard	9.23.15.2.(3) 9.29.9.1.(1) 9.30.2.2.(1)
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”, inserts the following new row

ANSI/APA	PRG 320-2018	Standard for Performance-Rated Cross-Laminated Timber	3.1.18.3.(3)
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- b) Strikes out the row

ASTM	C 840-13	Application and Finishing of Gypsum Board	Table 5.9.1.1.
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”, and substitutes the following

ASTM	C 840-13	Application and Finishing of Gypsum Board	3.1.19.2.(2) Table 5.9.1.1.
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c) Strikes out the row

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ASTM	C 1396/C 1396M-14	Gypsum Board	3.1.5.14.(6) 3.1.5.15.(4) Table 5.9.1.1. Table 9.23.17.2.-A 9.29.5.2.(1) Table 9.29.5.3.
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”, and substitutes the following

“

ASTM	C 1396/C 1396M-14	Gypsum Board	3.1.5.14.(6) 3.1.5.15.(4) 3.1.18.13.(1) 3.1.19.2.(2) Table 5.9.1.1. Table 9.23.17.2.-A 9.29.5.2.(1) Table 9.29.5.3.
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”

d) Strikes out the row

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ASTM	D 2898-10	Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing	3.1.4.8.(2) 3.1.5.5.(3) 3.1.5.24.(1) 3.2.3.7.(4) 9.10.14.5.(3) 9.10.15.5.(3)
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”, and substitutes the following

“

ASTM	D 2898-10	Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing	3.1.4.8.(2) 3.1.5.5.(3) 3.1.5.24.(1) 3.1.18.7.(6) 3.2.3.7.(4) 9.10.14.5.(3) 9.10.15.5.(3)
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e) Strikes out the row

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ASTM	ASTM D 5456-10a	Evaluation of Structural Composite Lumber Products	3.1.11.7.(4)
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”, and substitutes the following

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ASTM	ASTM D 5456-10a	Evaluation of Structural Composite Lumber Products	3.1.11.7.(5)
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f) Strikes out the row

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CSA	CAN/CSA-A82.27-M91	Gypsum Board	3.1.5.14.(6) 3.1.5.15.(4)
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”, and substitutes the following

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CSA	CAN/CSA-A82.27-M91	Gypsum Board	3.1.5.14.(6) 3.1.5.15.(4) 3.1.18.13.(1) 3.1.19.2.(2)
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”

**g) Strikes out the row**

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CSA	O86-14	Engineering Design in Wood	Table 4.1.8.9. 4.3.1.1.(1) A-5.1.4.1.(6)(b) and (c) A-9.15.2.4.(1) A-9.23.4.2.
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”, and substitutes the following

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CSA	O86-14 incorporating Update1 to the original 2014 Standard	Engineering Design in Wood	Table 4.1.8.9. <sup>(7)</sup> 4.3.1.1.(1) A-5.1.4.1.(6)(b) and (c) A-9.15.2.4.(1) A-9.23.4.2.
CSA	O86-19	Engineering Design in Wood	Table 4.1.8.9. 4.3.1.1.(2) A-5.1.4.1.(6)(b) and (c)

”

**h) Strikes out the row**

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ULC	CAN/ULC-S101-14	Fire Endurance Tests of Building Construction and Materials	3.1.5.7.(2) 3.1.5.14.(5) 3.1.5.14.(6) 3.1.5.15.(3) 3.1.5.15.(4) 3.1.7.1.(1) 3.1.11.7.(1) 3.2.3.8.(1) 3.2.6.5.(6) A-3.1.5.14.(5)(d) A-3.2.6.5.(6)(b) 9.10.16.3.(1) Table 9.10.3.1.-B
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”, and substitutes the following

“

ULC	CAN/ULC-S101-14	Fire Endurance Tests of Building Construction and Materials	3.1.5.7.(2) 3.1.5.14.(5) 3.1.5.14.(6) 3.1.5.15.(3) 3.1.5.15.(4) 3.1.7.1.(1) 3.1.11.7.(1) 3.1.19.1.(3) 3.2.3.8.(1) 3.2.6.5.(6) A-3.1.5.14.(5)(d)
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			A- 3.1.19.1.(3) A-3.2.6.5.(6)(b) 9.10.16.3.(1) Table 9.10.3.1.-B
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i) Strikes out the row

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ULC	CAN/ULC-S702-09	Mineral Fibre Thermal Insulation for Buildings	Table 5.9.1.1. A-5.9.1.1.(1) Table 9.23.17.2.-A 9.25.2.2.(1)
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”, and substitutes the following

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ULC	CAN/ULC-S702-09	Mineral Fibre Thermal Insulation for Buildings	3.1.18.3.(4) Table 5.9.1.1. A-5.9.1.1.(1) Table 9.23.17.2.-A 9.25.2.2.(1)
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j) After the row

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ULC	CAN/ULC-S144-12	Fire Resistance Test – Grease Duct Assemblies	3.6.3.5.(2) A-3.6.3.5.
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”, inserts the following new row

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ULC	CAN/ULC-S146-19	Test for the Evaluation of Encapsulation Materials and Assemblies of Materials for the Protection of Structural Timber Elements	3.1.19.1.(1)
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”, and

k) At the end of the Table 1.3.1.2., adds in numerical order the following new note:

“(7)Notwithstanding the requirement stated in Sentence 4.3.1.1.(1), Update 1 to CSA O86-14 is not permitted to be used in the application of Subsection 4.1.8.”.

4. In Article 1.3.2.1. of Division B of Book I, Council inserts in alphabetical order the following abbreviation:

“APA..... APA – The Engineered Wood Association (www.apawood.org)”.

5. In Article 3.1.3.1.of Division B of Book I, Council strikes out Table-3.1.3.1. and substitutes the following Table:

“

**Table 3.1.3.1.  
Major Occupancy Fire Separations<sup>(1)</sup>  
Forming Part of Sentence 3.1.3.1.(1)**

<i>Major Occupancy</i>	Minimum Fire-Resistance Rating of <i>Fire Separation</i> , h												
	<i>Adjoining Major Occupancy</i>												
	A-1	A-2	A-3	A-4	B-1	B-2	B-3	C <sup>(7)</sup>	D	E	F-1	F-2	F-3
A-1	–	1	1	1	2	2	2	1	1	2	<sup>(2)</sup>	2	1
A-2	1	–	1	1	2	2	2	1 <sup>(3)</sup>	1 <sup>(4)</sup>	2	<sup>(2)</sup>	2	1
A-3	1	1	–	1	2	2	2	1	1	2	<sup>(2)</sup>	2	1
A-4	1	1	1	–	2	2	2	1	1	2	<sup>(2)</sup>	2	1
B-1	2	2	2	2	–	2	2	2	2	2	<sup>(2)</sup>	2	2
B-2	2	2	2	2	2	–	1	2	2	2	<sup>(2)</sup>	2	2
B-3	2	2	2	2	2	1	–	1	2	2	<sup>(2)</sup>	2	2
C <sup>(7)</sup>	1	1 <sup>(3)</sup>	1	1	2	2	1	–	1	2 <sup>(5)</sup>	<sup>(2)</sup>	2 <sup>(6)</sup>	1 <sup>(8)</sup>
D	1	1 <sup>(4)</sup>	1	1	2	2	2	1	–	– <sup>(9)</sup>	3	– <sup>(9)</sup>	– <sup>(9)</sup>
E	2	2	2	2	2	2	2	2 <sup>(5)</sup>	– <sup>(9)</sup>	–	3	–	–
F-1	<sup>(2)</sup>	<sup>(2)</sup>	<sup>(2)</sup>	<sup>(2)</sup>	<sup>(2)</sup>	<sup>(2)</sup>	<sup>(2)</sup>	<sup>(2)</sup>	3	3	–	2	2
F-2	2	2	2	2	2	2	2	2 <sup>(6)</sup>	– <sup>(9)</sup>	–	2	–	–
F-3	1	1	1	1	2	2	2	1 <sup>(8)</sup>	– <sup>(9)</sup>	–	2	–	–

**Notes to Table 3.1.3.1.:**

<sup>(1)</sup> Section 3.3. contains requirements for the separation of *occupancies* and tenancies that are in addition to the requirements for the separation of *major occupancies*.

<sup>(2)</sup> See Sentence 3.1.3.2.(1).

<sup>(3)</sup> Where the *building* or part thereof is constructed in accordance with Article 3.2.2.48EMTC. or Article 3.2.2.50., a *fire separation* with a 2 h *fire-resistance rating* is required between the Group C and Group A, Division 2 major occupancies.

<sup>(4)</sup> Where the *building* or part thereof is constructed in accordance with Article 3.2.2.57EMTC. or Article 3.2.2.58., a *fire separation* with a 2 h *fire-resistance rating* is required between the Group D and Group A, Division 2 *major occupancies*.

<sup>(5)</sup> See Sentence 3.1.3.1.(2).

<sup>(6)</sup> See Sentence 3.1.3.2.(2).

<sup>(7)</sup> See Article 3.2.1.7.

<sup>(8)</sup> Where the *building* or part thereof is constructed in accordance with Article 3.2.2.48EMTC., a *fire separation* with a 2 h *fire-resistance rating* is required between the Group C major occupancy and storage garages.

<sup>(9)</sup> Where the *building* or part thereof is constructed in accordance with Article 3.2.2.57EMTC., a *fire separation* with a 1 h *fire-resistance rating* is required between the Group D and Group E or Group F, Division 2 or 3 major occupancies.

”.

**6. In Article 3.1.7.5. of Division B of Book I, Council:**

- a) In Sentence (3), after the word “Except” adds the following:
    - “as provided in Sentence (4), and except”, and
  - b) At the end of the Article adds the following new Sentence:
    - “4) Except for portions of *buildings* constructed in accordance with Article 3.2.2.7. that are required to be of *noncombustible construction*, assemblies of *noncombustible construction* in *buildings* or portions of *buildings* permitted to be of *encapsulated mass timber construction* are permitted to be supported by *encapsulated mass timber construction*.”.
7. In Article 3.1.11.3. of Division B of Book I, Council adds the following new Sentences:
- “
- “3) In a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, a concealed space in which there is an exposed ceiling finish with a *flame-spread rating* more than 25 shall be provided with *fire blocks* conforming to Article 3.1.11.7. between wood nailing elements so that the maximum area of the concealed space is not more than 2 m<sup>2</sup>. (See Note A-3.1.11.3.(3).)
  - 4) In a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, *fire blocks* conforming to Article 3.1.11.7. shall be provided in the concealed spaces created by the wood members permitted by Sentence 3.1.18.10.(1) so that the maximum area of a concealed space is not more than 10 m<sup>2</sup>.”.
8. In Article 3.1.11.5. of Division B of Book I, Council:
- a) In Sentence (3) strikes out the reference “(4)” and substitutes “(5)”, and
  - b) Strikes out Sentence (4) and inserts the following:
    - “4) Except for crawl spaces conforming to Sentence 3.1.11.6.(1) and except as provided in Sentence (5), in *buildings* or parts thereof conforming to Article 3.2.2.48EMTC. or 3.2.2.57EMTC., horizontal concealed spaces within a floor assembly or roof assembly of *encapsulated mass timber construction* shall be separated by construction conforming to Article 3.1.11.7. into compartments that are
      - a) not more than 600 m<sup>2</sup> in area with no dimension more than 60 m, if the exposed construction materials within the space have a *flame-spread rating* not more than 25, and
      - b) not more than 300 m<sup>2</sup> in area with no dimension more than 20 m, if the exposed construction materials within the space have a *flame-spread rating* more than 25.
    - 5) *Fire blocks* conforming to Sentence (3) or (4) are not required where the horizontal concealed space within the floor or roof assembly is entirely filled with *noncombustible* insulation such that any air gap between the top of the insulation and the floor or roof deck does not exceed 50 mm.”.
9. In Article 3.1.11.7. of Division B of Book I, Council:
- (a) In Sentence (1) strikes out the references “(4)” and “(7)”, and substitutes “(5)” and “(8)” respectively,
  - (b) Strikes out Sentences (4) through (7) and substitutes the following:

“4) In a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, wood nailing elements referred to in Article 3.1.18.9. need not be tested in conformance with Sentence (1).

5) In a *building* permitted to be of *combustible construction*, in a *combustible* roof system permitted by Sentences 3.1.5.3.(2) and 3.1.18.5.(1), and in a raised platform permitted by Sentences 3.1.5.10.(2) and 3.1.18.10.(1), *fire blocks* are permitted to be

a) solid lumber or a structural composite lumber product conforming to ASTM D 5456, “Evaluation of Structural Composite Lumber Products,” not less than 38 mm thick,

b) phenolic bonded plywood, waferboard, or oriented strandboard not less than 12.5 mm thick with joints supported, or

c) two thicknesses of lumber or a structural composite lumber product conforming to ASTM D 5456, “Evaluation of Structural Composite Lumber Products,” each not less than 19 mm thick with joints staggered, where the width or height of the concealed space requires more than one piece of lumber or structural composite lumber product not less than 38 mm thick to block off the space.

6) Openings through materials referred to in Sentences (1) to (4) shall be protected to maintain the integrity of the construction.

7) Where materials referred to in Sentences (1) to (4) are penetrated by construction elements or by service equipment, a *fire stop* shall be used to seal the penetration. (See Note A-3.1.11.7.(7).)

8) In *buildings* permitted to be of *combustible construction*, semi-rigid fibre insulation board produced from glass, rock or slag is permitted to be used to block the vertical space in a double stud wall assembly formed at the intersection of the floor assembly and the walls, provided the width of the vertical space does not exceed 25 mm and the insulation board

a) has a density not less than 45 kg/m<sup>3</sup>,

b) is securely fastened to one set of studs,

c) extends from below the bottom of the top plates in the lower *storey* to above the top of the bottom plate in the upper *storey*, and

d) completely fills the portion of the vertical space between the headers and between the wall plates.

(See Note A-3.1.11.7.(8).)”.

10. In Subsection 3.1.13. of Division B of Book I, following Article 3.1.13.11., Council adds the following:

**“3.1.13.12. Encapsulated Mass Timber Construction**

1) In a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*,

a) the *flame-spread ratings* required by Subsection 3.1.18. shall apply in addition to the requirements in this Subsection, and

b) the *flame-spread ratings* for *exits* required by this Subsection shall also apply to any surface in the *exit* that would be exposed by cutting through the material in any direction, except that this requirement does not apply to doors, structural mass timber elements conforming to Sentence 3.1.18.4.(3), *heavy timber construction*, and *fire-retardant-treated wood*.”.

11. In Article 3.1.15.2. of Division B of Book I, Council:

a) In Sentence (1), strikes out the words “Sentences (2) and (3)” and substitutes “Sentences (2), (3), and (4)”,



- b) In Sentence (3) strikes out “(4)” and substitutes “(5)”, and
- c) Strikes out Sentence (4) and substitutes the following:

“4) Except as provided in Sentence (5), roof coverings in *buildings* or parts of *buildings* permitted to be of *encapsulated mass timber construction* shall have a Class A classification where the roof height is greater than 25 m measured from the floor of the *first storey* to the highest point of the roof.

5) Where *buildings* or parts thereof conforming to Article 3.2.2.48EMTC., 3.2.2.50., 3.2.2.57EMTC., or 3.2.2.58. include non-contiguous roof assemblies at different elevations, the roof coverings referred to in Sentences (3) and (4) are permitted to be evaluated separately to determine the roof covering classification required.”.

12. In Section 3.1. of Division B of Book I, following Subsection 3.1.17., Council inserts the following:

**“3.1.18. Encapsulated Mass Timber Construction**  
(See Note A-3.1.18.)

**3.1.18.1. Scope**

1) *Encapsulated mass timber* construction permitted in this Part shall conform to this Subsection.

**3.1.18.2. Materials Permitted**

1) Except as otherwise provided in this Part and Sentence 6.4.3.1.(1), materials used in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction* shall conform to Subsection 3.1.5.

**3.1.18.3. Structural Mass Timber Elements**  
(See Note A-3.1.18.3.)

1) Except as otherwise provided in this Subsection and Articles 3.2.2.16. and 3.2.3.19., a *building* or part of a *building* permitted to be of *encapsulated mass timber construction* is permitted to include structural mass timber elements, including beams, columns, arches, and wall, floor and roof assemblies, provided they comply with Sentences (2) and (3).

2) Structural mass timber elements referred to in Sentence (1) shall

- a) except as permitted in Sentence (4), be arranged in heavy solid masses containing no concealed spaces,
- b) have essentially smooth flat surfaces with no thin sections or sharp projections, and
- c) except as provided in Article 3.1.18.15., conform to the minimum dimensions stated in Table 3.1.18.3.

**Table 3.1.18.3.**  
**Minimum Dimensions of Structural Mass Timber Elements in Encapsulated Mass Timber Construction<sup>(1)</sup>**  
 Forming Part of Sentence 3.1.18.3.(2)

Structural Wood Elements	Minimum Thickness, mm	Minimum Width x Depth, mm x mm
Walls that are <i>fire separations</i> or exterior walls (1-sided exposure)	96	--
Walls that require <i>fire-resistance rating</i> , but are not <i>fire separations</i> (2-sided exposure)	192	--
Floors and roofs (1-sided exposure)	96	--
Beams, columns and arches (2- or 3-sided fire exposure)-sided exposure)	--	192 x 192
Beams, columns and arches (4-sided fire exposure)	--	224 x 224

Notes to table 3.1.18.3.:

<sup>(1)</sup> See Note A-Table 3.1.18.3.

3) Adhesives used in structural mass timber elements referred to in Sentence (1) that are constructed of cross-laminated timber shall conform to the elevated temperature performance requirements in ANSI/APA PRG 320 “Standard for Performance-Rated Cross-Laminated Timber.”

4) Concealed spaces are permitted within structural mass timber elements referred to in Sentence (2) and need not comply with Sentence 3.1.18.4.(1) provided the concealed spaces are

- a) notwithstanding any exemptions permitted in NFPA 13, *sprinklered* and divided into compartments by *fire blocks* in conformance with Subsection 3.1.11.,
- b) completely filled with rock or slag fibre insulation conforming to CAN/ULC-S702, “Mineral Fibre Thermal Insulation for Buildings,” and having a density of not less than 32 kg/m<sup>3</sup>.
- c) if horizontal, lined with not less than a single layer of 12.7 mm Type X gypsum board or *noncombustible* material providing an *encapsulation rating* of not less than 25 min, or
- d) if vertical, lined with not less than a single layer of 12.7 mm Type X gypsum board or *noncombustible* material providing an *encapsulation rating* of not less than 25 min and vertically divided into compartments by *fire blocks* in conformance with Subsection 3.1.11.

#### 3.1.18.4. Encapsulation of Mass Timber Elements (See Note A-3.1.18.3.)

1) Except as provided in Sentences (3) to (6), Sentences 3.1.18.3.(4) and 3.1.18.14.(2), and Articles 3.1.18.5., 3.1.18.10. and 3.1.18.15., the exposed surfaces of structural timber elements conforming to Article 3.1.18.3. shall be protected from adjacent spaces in the *building*, including adjacent concealed spaces within wall, floor and roof assemblies, by a material or assembly of materials conforming to Sentence (2) that provides an *encapsulation rating* of not less than 50 min.  
 (See Note A-3.1.18.4.(1).)

2) Except as provided in Sentence 3.1.18.9.(1), the material or assembly of materials referred to in Sentence (1) shall consist of

- a) gypsum board,

- b) gypsum concrete,
- c) *noncombustible* materials,
- d) materials that conform to Sentences 3.1.5.1.(2) to (4), or
- e) any combination of the materials listed in Clauses (a) to (d).

3) Except as provided in Sentence (5), the exposed surfaces of mass timber beams, columns and arches within a *suite*, other than a *residential suite*, or fire *compartment* need not be protected in accordance with Sentence (1), provided

- a) their aggregate surface area does not exceed 10% of the total wall area of the perimeter of the *suite* or fire *compartment* in which they are located, and
  - b) the *flame-spread rating* on any exposed surface is not more than 150.
- (See Note A-3.1.18.4.(3) to (6).)

4) Except as provided in Sentences (5) and (6), the exposed surfaces of mass timber walls within a *suite*, other than a *residential suite*, need not be protected in accordance with Sentence (1), provided

- a) each exposed surface faces the same direction, and
  - b) the *flame-spread rating* on any exposed surface is not more than 150.
- (See Notes A-3.1.18.4.(4) and A-3.1.18.4.(3) to (6).)

5) The aggregate exposed surface area of mass timber elements within a *suite* permitted in Sentences (3) and (4) shall not exceed 35% of the total wall area of the perimeter of the *suite*.

(See Note A-3.1.18.4.(3) to (6).)

6) The exposed surfaces of mass timber ceilings within a *suite*, other than a *residential suite*, need not be protected in accordance with Sentence (1), provided their aggregate area does not exceed

- a) 10% of the total ceiling area of the *suite*, where the exposed surfaces have a *flame-spread rating* not more than 150, or
- b) 25% of the total ceiling area of the *suite*, where
  - i) the *suite* contains no mass timber walls with exposed surfaces, and
  - ii) the exposed surfaces of the mass timber ceiling have a *flame-spread rating* not more than 75.

(See Note A-3.1.18.4.(3) to (6).)

### 3.1.18.5. Combustible Roofing Materials

1) Wood roof sheathing and roof sheathing supports that do not conform to Articles 3.1.18.3. and 3.1.18.4. are permitted in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, provided they are installed

- a) above a concrete deck in accordance with Clauses 3.1.5.3.(2)(a) to (f), or
- b) above a deck of *encapsulated mass timber construction*, where
  - i) said deck is permitted to be encapsulated between the roof sheathing supports by a material or assembly
  - ii) of materials conforming to Sentence 3.1.18.4.(2) that provides an *encapsulation rating* of not less than 50min,
  - iii) the height of the roof space is not more than 1 m,
  - iiii) the roof space is divided into compartments by *fire blocks* in conformance with Article 3.1.11.5.,
  - iv) openings through the deck other than for *noncombustible* roof drains and plumbing piping are protected by shafts constructed as *fire separations* having a *fire-resistance rating* not less than 1 h that extend from the deck to not less than 150 mm above the adjacent sheathing, and
  - v) except as permitted by Subclause (iv), the roof space does not contain any *building services*.

2) *Combustible* cant strips, roof curbs, nailing strips and similar components used in the installation of roofing are permitted on a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*.

3) Wood nailer facings to parapets not more than 600 mm high, are permitted on a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, provided the facings and any roof membranes covering the facings are protected by sheet metal.

#### 3.1.18.6. Combustible Window Sashes and Frames

1) Combustible window sashes and frames are permitted in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, provided

a) each window in an exterior wall face is an individual unit separated from every other opening in the wall by *noncombustible* wall construction or mass timber wall construction conforming to the dimensions stated in Table 3.1.18.3.,

b) windows in exterior walls in contiguous *storeys* are separated by not less than 1 m of noncombustible wall construction or mass timber wall construction conforming to the dimensions stated in Table 3.1.18.3., and

c) the aggregate area of openings in an exterior wall face of a *fire compartment* is not more than 40% of the area of the wall face.

#### 3.1.18.7. Exterior Cladding

1) Except as provided in Sentences (2), (3) and (6), cladding on an exterior wall assembly of a *building* or part of a *building* permitted to be of *encapsulated mass timber construction* shall be *noncombustible*. (See Note A-3.1.18.7.(1) and (2).)

2) Except as provided in Sentences (3) to (5) and (7), cladding on an exterior wall assembly of a *building* or part of a *building* permitted to be of *encapsulated mass timber construction* is permitted to consist of

a) *combustible* cladding that

i) is not contiguous over more than 4 *storeys*,

ii) represents not more than 10% of the cladding on each exterior wall of each *storey*,

iii) is not more than 1.2 m in width,

iv) has a *flame-spread rating* not more than 75 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction,

v) is separated from other portions of *combustible* cladding on adjacent *storeys* by a horizontal distance of not less than 2.4 m, and

vi) is separated from other portions of *combustible* cladding by a horizontal distance of not less than 1.2 m,

b) *combustible* cladding that,

i) is not contiguous across adjacent *storeys*,

ii) represents not more than 10% of the cladding on each exterior wall of each *storey*,

iii) has a *flame-spread rating* not more than 75 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction, and

iv) is separated from other portions of *combustible* cladding on adjacent *storeys* by a horizontal distance of not less than 2.4 m,

c) *combustible* cladding representing up to 100% of the cladding on exterior walls of the *first storey*, provided all portions of the cladding can be directly accessed and are located not more than 15 m from a *street* or access route conforming to Article 3.2.5.6., measured horizontally from the face of the *building*,

d) a wall assembly that satisfies the criteria of Clause 3.1.5.5.(1)(b), or

e) a combination of *noncombustible* cladding and the cladding described in Clauses (a) to (d).

(See Note A-3.1.18.7.(1) and (2).)

3) The permitted area of *combustible* cladding in Clause (2)(a) or (b) shall not exceed 5% of the cladding on each exterior wall of each *storey* where the time from receipt of notification of a fire by the fire department until the arrival of the first fire department vehicle at the *building* exceeds 10 min in 10% or more of all fire department calls to the *building*.

(See Note A-3.2.3.1.(8).)

4) An exterior wall assembly constructed in conformance with Appendix D-6 is deemed to satisfy the criteria of Clause (2)(d).

5) Except as provided in Article 3.2.3.10., where the *limiting distance* in Table 3.2.3.1.-D or 3.2.3.1.-E permits an area of *unprotected openings* of not more than 10% of the *exposing building face*, the construction requirements of Table 3.2.3.7. shall be met.

6) A wall assembly conforming to Clause (2)(d) that includes *combustible* cladding made of *fire-retardant-treated wood* shall be tested for fire exposure after the cladding has been subjected to the accelerated weathering test specified in ASTM D 2898, "Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing."

7) Where *combustible* cladding conforming to Clause (2)(a) or (b) on an exterior wall of a *fire compartment* is exposed to *combustible* cladding conforming to Clause (2)(a) or (b) on an exterior wall of the same *fire compartment* or of another *fire compartment*, and the planes of the two walls are parallel or at an angle less than 135° measured from the exterior of the building, the different portions of *combustible* cladding shall

- a) be separated by a horizontal distance of not less than 3 m, and
- b) not be contiguous over more than 2 *storeys*.

### 3.1.19. Encapsulation Ratings

#### 3.1.19.1. Determination of Ratings

1) Except as provided in Article 3.1.19.2., the rating of a material or assembly of materials that is required to have an *encapsulation rating* shall be determined on the basis of the results of tests conducted in conformance with CAN/ULC-S146, "Test for the Evaluation of Encapsulation Materials and Assemblies of Materials for the Protection of Structural Timber Elements."

#### 3.1.19.2. Encapsulation Materials

(See Note A-3.1.19.2.)

1) Gypsum-concrete topping and concrete not less than 38 mm thick are deemed to have an *encapsulation rating* of 50 min when installed on the upper side of a mass timber floor or roof assembly.

2) Two layers of Type X gypsum board each not less than 12.7 mm thick are deemed to have an *encapsulation rating* of 50 min when installed on a mass timber element, provided they

- a) are mechanically fastened directly to the mass timber element with
  - i) screws of sufficient length to penetrate the mass timber element not less than 20 mm spaced not more than 400 mm o.c. and 20 mm to 38 mm from the boards' edges, or
  - ii) screws fastened to wood nailing elements or resilient metal or steel furring channels not more than 25 mm thick spaced not more than 400 mm o.c.,
- b) are installed with the joints in each layer staggered from those in the adjacent layer,
- c) are attached by a minimum of two rows of fasteners in each layer,
- d) are installed in conformance with ASTM C 840, "Application and Finishing of Gypsum Board," except that their joints need not be taped and finished, and
- e) conform to
  - i) ASTM C 1396/C 1396M, "Gypsum Board," or

ii) CAN/CSA-A82.27-M, "Gypsum Board."  
(See Note A-3.1.19.2.(2).)".

13. In Article 3.2.1.2. of Division B of Book I, Council:

- a) In Subclause (2)(b)(ii) after the words "2 m beyond the exterior face of the *storage garage* if the upper *storeys* are permitted to be of *combustible construction*", adds the following "or *encapsulated mass timber construction*", and
- b) In Subclause (2)(c)(ii) after the words "2 m if the upper *storeys* are permitted to be of *combustible construction*", adds the following "or *encapsulated mass timber construction*".

14. In Article 3.2.1.7. of Division B of Book I, Council:

- a) Strikes out Sentence (1) and substitutes the following:

"  
1) All Group C *major occupancies* in a *building* of *combustible construction* greater than 2 *storeys* in *building height* shall be separated from all other *major occupancies* except as prohibited in Article 3.1.3.2. and except as permitted in Sentence (2) and (3), by a *fire separation* with at least a 2 h *fire-resistance rating* constructed of  
a) concrete,  
b) masonry, or  
c) in a *sprinklered building*, encapsulated mass timber.  
"

- b) Strikes out Sentences (3) and (4) and substitutes the following:

"  
3) The *fire separation* of every *exit*, elevator and vertical service shaft that penetrates a concrete, masonry, or encapsulated mass timber floor assembly as required in Sentence (1) shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* determined by Sentences (1) or (2) for  
a) the floor assembly above the *storey*, or  
b) the floor assembly below the *storey*, if there is no floor assembly above.  
"

4) Where a *building* of *combustible construction* or *encapsulated mass timber construction* greater than 2 *storeys* in *building height* contains an *occupancy* other than Group C or Group D on the second or third *storey* that is required to be constructed in accordance with Sentences 3.2.2.48EMTC.(4), 3.2.2.50.(5), 3.2.2.57EMTC.(3) or 3.2.2.58.(4), the *building* shall  
a) be *sprinklered*,  
b) be divided into at least two horizontal *fire compartments* on each *storey* containing a *major occupancy* other than Group C or Group D which are  
i) not more than 1000 m<sup>2</sup> in area, and  
ii) constructed as *fire separations* with at least a 2 h *fire-resistance rating*,  
c) *exit stairs* serving *storeys* above the third *storey* shall be constructed as *fire separations* with at least a 2 h *fire-resistance rating*, and  
d) each *fire compartment* required by Clause (b) shall be served by at least one *exit stair*.  
(See Note A-3.2.1.7.(4) )  
"

- c) Strikes out Sentence (5), and

d) Strikes out Table 3.2.1.7.(5).

15. In Article 3.2.2.6. of Division B of Book I, Council strikes out Sentence (1) and substitutes the following:

“**1)** Except as permitted by Articles 3.2.2.7. and 3.2.2.8., and Sentences 3.2.2.48EMTC.(4), 3.2.2.50.(5), 3.2.2.57EMTC.(3) and 3.2.2.58.(4), in a *building* containing more than one *major occupancy*, the requirements of this Subsection for the most restricted *major occupancy* contained shall apply to the whole *building*.”.

16. In Article 3.2.2.7. of Division B of Book I, Council strikes out Sentence (1) and substitutes the following:

“**1)** Except as provided in Article 3.2.2.8., Sentence 3.2.2.18.(2), and Sentences 3.2.2.48EMTC.(4), 3.2.2.50.(5), 3.2.2.57EMTC.(3) and 3.2.2.58.(4), in a *building* in which one *major occupancy* is located entirely above another *major occupancy*, the requirements in this Subsection for each portion of the *building* containing a *major occupancy* shall apply to that portion as if the entire *building* were of that *major occupancy*.”.

17. In Article 3.2.2.11. of Division B of Book I, Council:

a) In Sentence (1), strikes out “An exterior balcony” and substitutes “Except as provided in Sentence (2), an exterior balcony”, and

b) Adds a new Sentence (2) as follows:

“**2)** The floor assembly of an exterior balcony in a *building* or part of a *building* conforming to Article 3.2.2.48EMTC. or 3.2.2.57EMTC. shall

a) be of *noncombustible construction*, or

b) be constructed in accordance with Article 3.1.18.3., but need not comply with Sentence 3.1.18.4.(1).”.

18. In Article 3.2.2.18. of Division B of Book I, in Sentence (1):

a) After the reference “3.2.2.48”, Council inserts “3.2.2.48EMTC.,”, and

b) After the reference “3.2.2.57”, Council inserts “3.2.2.57EMTC.,”.

19. In Subsection 3.2.2. of Division B of Book I after Article 3.2.2.48, Council inserts a new Article as follows:

“3.2.2.48EMTC. Group C, up to 12 storeys, Sprinklered

1) A *building* classified as Group C is permitted to conform to Sentence (2), provided

a) it is *sprinklered* throughout,

b) it is not more than 12 *storeys* in *building height*,

- c) it has a height not more than 42 m measured between the floor of the first *storey* and the uppermost floor level, excluding any floor level within a rooftop enclosure that is not considered as a *storey* in calculating *building height* in accordance with Sentence 3.2.1.1.(1), and
- d) it has a *building area* not more than 6 000 m<sup>2</sup>.

- 2) Except as provided in Article 3.2.2.16., the *building* referred to in Sentence (1) is permitted to be of *encapsulated mass timber construction* or *noncombustible construction*, used singly or in combination, and
  - a) except as provided in Sentence (3), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
  - b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
  - c) *loadbearing walls*, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

- 3) In a *building* that contains *dwelling units* that have more than one *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including floors over *basements*, that are entirely contained within these *dwelling units* shall have a *fire-resistance rating* not less than 1 h but need not be constructed as *fire separations*.

- 4) Group A, Division 2 *major occupancies*, Group E *major occupancies* and *storage garages* located in a *building* or part of a *building* within the scope of this Article are permitted to be constructed in accordance with this Article, provided
  - a) the Group A, Division 2 *major occupancy* is located below the fourth *storey*,
  - b) the Group E *major occupancy* is located below the third *storey*, and
  - c) the *storage garage* is located below the fifth *storey* (see also Article 4.4.2.1.).  
(See Note A-3.2.2.48EMTC.(4) and 3.2.2.57EMTC.(3).)”.

20. In Subsection 3.2.2. of Division B of Book I after Article 3.2.2.57, Council inserts a new Article as follows:

**“3.2.2.57EMTC. Group D, up to 12 storeys, Sprinklered**

- 1) A *building* classified as Group D is permitted to conform to Sentence (2), provided
  - a) it is *sprinklered* throughout,
  - b) it is not more than 12 *storeys* in *building height*,
  - c) it has a height not more than 42 m measured between the floor of the *first storey* and the uppermost floor level, excluding any floor level within a rooftop enclosure that is not considered as a *storey* in calculating *building height* in accordance with Sentence 3.2.1.1.(1), and it has a *building area* not more than 7 200 m<sup>2</sup>.
- 2) Except as provided in Article 3.2.2.16., the *building* referred to in Sentence (1) is permitted to be of *encapsulated mass timber construction* or *noncombustible construction*, used singly or in combination, and
  - a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
  - b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
  - c) *loadbearing walls*, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.
- 3) Group A, Division 2 *major occupancies*, Group E *major occupancies*, Group F, Division 2 and 3 *major occupancies*, and *storage garages* located in a *building* or part of a *building* within the scope of this Article are permitted to be constructed in accordance with this Article, provided
  - a) the Group A, Division 2 *major occupancy* is located below the fourth *storey*,
  - b) the Group E *major occupancy* and Group F, Division 2 or 3 *major occupancy* are located below the third *storey*, and
  - c) the *storage garage* is located below the fifth *storey* (see also Article 4.4.2.1.).



(See Note A-3.2.2.48EMTC.(4) and 3.2.2.57EMTC.(3).)”.

21. In Article 3.2.3.7. of Division B of Book I, Council:

a) In Sentence (2), strikes out Table 3.2.3.7 and substitutes the following:

“

**Table 3.2.3.7.**  
**Minimum Construction Requirements for Exposing Building Faces**  
 Forming Part of Sentences 3.2.3.7.(1) and (2)

<i>Occupancy Classification of Building or Fire Compartment</i>	<i>Maximum Area of Unprotected Openings Permitted, % of Exposing Building Face Area</i>	<i>Minimum Required Fire-Resistance Rating</i>	<i>Type of Construction Required</i>	<i>Type of Cladding Required</i>
Group A, B, C, D, or Group F, Division 3	0 to 10	1 h	<i>Noncombustible</i>	<i>Noncombustible</i>
	> 10 to 25	1 h	<i>Combustible, Encapsulated mass timber, or Noncombustible</i>	<i>Noncombustible</i>
	> 25 to 50	45 min	<i>Combustible, Encapsulated mass timber, or Noncombustible</i>	<i>Noncombustible</i>
	> 50 to < 100	45 min	<i>Combustible, Encapsulated mass timber, or Noncombustible</i>	<i>Combustible or Noncombustible<sup>(1)(2)</sup></i>
Group E, or Group F, Division 1 or 2	0 to 10	2 h	<i>Noncombustible</i>	<i>Noncombustible</i>
	> 10 to 25	2 h	<i>Combustible, Encapsulated mass timber, or Noncombustible</i>	<i>Noncombustible</i>
	> 25 to 50	1 h	<i>Combustible, Encapsulated mass timber, or Noncombustible</i>	<i>Noncombustible</i>
	> 50 to < 100	1 h	<i>Combustible,</i>	<i>Combustible</i>

			Encapsulated mass timber, or Noncombustible	or Noncombustible <sup>(1)</sup>
--	--	--	---	----------------------------------

Notes to Table 3.2.3.7.:

<sup>(1)</sup> See also Article 3.1.4.8. for additional requirements for exterior cladding on *buildings* conforming to Article 3.2.2.50. and Article 3.2.2.58.

<sup>(2)</sup> The cladding on Group C *buildings* or parts thereof conforming to Article 3.2.2.48EMTC. and on Group D *buildings* or parts thereof conforming to Article 3.2.2.57EMTC. shall conform to Sentence 3.1.18.7.(2) or be *noncombustible*.

- ”
- b) In Sentence (3) after the words “Except as provided in Article 3.1.4.8.”, adds “and 3.1.18.7.”, and
- c) In Sentence (4) after the words “Except as provided in Article 3.1.4.8.”, adds “and 3.1.18.7.”.

22. In Article 3.2.3.19. of Division B of Book I, Council strikes out Sentences (3) through (5) and substitutes the following:

**3)** Except as provided in Sentence (4), a *walkway* connected to a *building* or part of a *building* permitted to be of *encapsulated mass timber construction* shall be of *noncombustible construction* or *encapsulated mass timber construction*.

**4)** A *walkway* connected to a *building* required to be of *noncombustible construction* or a *building* or part of a *building* permitted to be of *encapsulated mass timber construction* is permitted to be of *heavy timber construction* provided

- a) not less than 50% of the area of any enclosing perimeter walls is open to the outdoors, and  
b) the *walkway* is at ground level.

**5)** A *walkway* of *noncombustible construction* used only as a pedestrian thoroughfare need not conform to the requirements of Articles 3.2.3.14. and 3.2.3.15.

**6)** A *walkway* between *buildings* shall be not more than 9 m wide.”.

23. In Article 3.2.5.12. of Division B of Book I, in Sentence (8), Council strikes out “in *buildings* conforming to Article 3.2.2.50. or 3.2.2.58.” and substitutes “in *buildings* conforming to Article 3.2.2.48EMTC., 3.2.2.50., 3.2.2.57EMTC., or 3.2.2.58.”.

24. In Article 3.6.4.3. of Division B of Book I, in Subclause (1)(a)(iii) after the words “in a *building* required to be of *noncombustible construction*”, Council adds “or in *buildings* or parts of *buildings* permitted to be of *encapsulated mass timber construction*”.

25. In Article 3.6.5.1 of Division B of Book I, in Sentence (2), Council:

- a) In Clause (b) after the words “conform to Article 3.1.5.18. in a *building* required to be of *noncombustible construction*,”, adds “or in *buildings* or parts of *buildings* permitted to be of *encapsulated mass timber construction*,”, and

- b) In Clause (d) after the words “are used only in horizontal runs in a *building* required to be of *noncombustible construction*,”, adds “or in *buildings* or parts of *buildings* permitted to be of *encapsulated mass timber construction*,”.

26. In Article 3.6.5.5. of Division B of Book I, in Clause (2)(a) after the words “not more than 25 in a *building* required to be of *noncombustible construction*,”, Council adds “or in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*,”.

27. In Article 3.10.1.1. of Division B of Book I, in Sentence 3.10.1.1.(1), in Table 3.10.1.1. Council:

- a) Strikes out the rows associated with “3.1.11.3. Fire Blocks between Nailing and Supporting Elements” and substitutes the following:

“

3.1.11.3. Fire Blocks between Nailing and Supporting Elements	
(1)	[F03-OS1.2]
	[F03-OP1.2]
(2)	[F03-OS1.2]
	[F03-OP1.2]
(3)	[F03-OS1.2]
	[F03-OP1.2]
(4)	[F03-OS1.2]
	[F03-OP1.2]

”

- b) Strikes out the rows associated with “3.1.11.5. Fire Blocks in Horizontal Concealed Spaces” and substitutes the following:

“

3.1.11.5. Fire Blocks in Horizontal Concealed Spaces	
(1)	[F03,F04-OS1.2]
	[F03,F04-OP1.2]
(2)	[F03,F04-OS1.2]
	[F03,F04-OP1.2]
(3)	[F02,F03-OP1.2] [F04-OP1.3]
	[F02,F03-OP1.2] [F04-OP1.3]
(4)	[F02, F03-OS1.2]

	[F04-OS1.3]
	[F02, F03-OP1.2]
	[F04-OP1.3]

”  
,

c) Strikes out the rows associated with “3.1.15.2. Roof Coverings” and substitutes the following:

“

<b>3.1.15.2. Roof Coverings</b>	
(1)	[F02-OS1.2]
	[F02-OP1.2]
	[F02-OP3.1]
(3)	[F02-OS1.2]
	[F02-OP1.2]
	[F02-OP3.1]
(4)	[F02-OS1.2]
	[F02-OP1.2]
	[F02-OP3.1]

”  
,

d) After the rows associated with “3.1.17.1. Occupant Load Determination”, inserts the following:

“

<b>3.1.18.2. Materials Permitted</b>	
(1)	[F02-OS1.2]
	[F02-OP1.2]
<b>3.1.18.3. Structural Mass Timber Elements</b>	
(2)	[F04-OS1.3]
	[F04-OP1.3]
(3)	[F02-OS1.2]
	[F02-OP1.2]
<b>3.1.18.4. Encapsulation of Mass Timber Elements</b>	
(1)	[F02-OS1.2]
	[F02-OP1.2]
(2)	[F02-OS1.2]

	[F02-OP1.2]
3.1.18.7. Exterior Cladding	
(1)	[F02-OS1.2] [F02-OP1.2]
(5)	[F02, F03-OP3.1]
(7)	[F03-OS1.2] [F03-OP1.2]
3.1.18.15. Penetration by Outlet Boxes	
(3)	[F03-OS1.2] [F03-OP1.2]
3.1.19.1. Determination of Ratings	
(1)	[F02-OS1.2] [F04-OS1.3] [F02-OP1.2] [F04-OP1.3]

”  
,

- e) After the rows associated with “3.2.2.48. Group C, up to 6 Storeys, Sprinklered, Noncombustible Construction”, inserts the following:

“

3.2.2.48EMTC. Group C, up to 12 Storeys, Sprinklered

- (1) [F02,F04-OP1.2,OP1.3] Applies to portion of By-law text: “... the *building* is *sprinklered* throughout ...”  
(2) (b),(c) [F04-OS1.3]  
(b),(c) [F04-OP1.3]  
(a),(c) [F03-OS1.2] [F04-OS1.2,OS1.3]  
(a),(c) [F03-OP1.2] [F04-OP1.2,OP1.3]

“  
,

- f) After the rows associated with “3.2.2.57. Group D, up to 6 Storeys, Sprinklered, Noncombustible Construction”, inserts the following:

“

3.2.2.57EMTC. Group D, up to 12 Storeys, Sprinklered	
(2)	(b),(c) [F04-OS1.3]
	(b),(c) [F04-OP1.3]

(a),(c) [F03-OS1.2] [F04-OS1.2,OS1.3]
(a),(c) [F03-OP1.2] [F04-OP1.2,OP1.3]

”, and

- g) Strikes out the rows associated with “3.2.3.19. Walkway between Buildings” and substitutes the following:

“

3.2.3.19. Walkway between Buildings	
(1)	[F03-OP3.1]
(2)	[F02-OP3.1]
(3)	[F02-OP3.1] [F02, F12-OP3.1]
(4)	[F02,F12-OP3.1]

”.

28. In Article 4.1.8.3. of Division B of Book I, Council:

- a) In Sentence (1), strikes out “The *building* shall be designed” and substitutes “Except as provided in Sentence (9), the *building* shall be designed”, and
- b) At the end of the Article, adds the following new Sentence:  
“**9)** Notwithstanding the requirement stated in Sentence 4.3.1.1.(1), Update 1 to CSA O86-14 is not permitted to be used in the application of Subsection 4.1.8.”.

29. In Sentence 4.1.8.9.(1) of Division B of Book I, in Table 4.1.8.9, under the section entitled “Timber Structures Designed and Detailed According to CSA O86”, Council adds the following rows to the end of that section:

“

Moderately ductile cross-laminated timber shear walls: platform-type construction	2.0	1.5	30	30	30	20	20
Limited ductility cross-laminated timber shear walls: platform-type construction	1.0	1.3	30	30	30	20	20

”.

30. In Article 4.1.8.10. of Division B of Book I, Council strikes out Sentences (5), (6) and (7) and substitutes the following:

“5) For *buildings* constructed with more than 4 *storeys* of continuous wood construction and where  $I_E F_a S_a(0.2)$  is equal to or greater than 0.35, timber SFRS consisting of moderately ductile cross-laminated timber shear walls, platform-type construction, or limited ductility cross-laminated timber shear walls, platform-type construction, as defined in Table 4.1.8.9. within the continuous wood construction shall not have Type 4, 5, 6, 8, 9 or 10 irregularities as described in Table 4.1.8.6. (See Note A-4.1.8.10.(4) and (5).)

6) The ratio,  $\alpha$ , for a Type 9 irregularity as described in Table 4.1.8.6. shall be determined independently for each orthogonal direction using the following equation:

$$\alpha = Q_G / Q_y$$

where

$Q_G$  = gravity-induced lateral demand on the SFRS at the critical level of the yielding system, and  
 $Q_y$  = the resistance of the yielding mechanism required to resist the minimum earthquake loads, which need not be taken as less than  $R_o$  multiplied by the minimum lateral earthquake force as determined in Article 4.1.8.11. or 4.1.8.12., as appropriate.

(See Note A-4.1.8.10.(5).)

7) For *buildings* with a Type 9 irregularity as described in Table 4.1.8.6. and where  $I_E F_a S_a(0.2)$  is equal to or greater than 0.5, deflections determined in accordance with Article 4.1.8.13. shall be multiplied by 1.2.

8) Structures where the value of  $\alpha$ , as determined in accordance with Sentence (5), exceeds twice the limits specified in Table 4.1.8.6. for a Type 9 irregularity, and where  $I_E F_a S_a(0.2)$  is equal to or greater than 0.5 are not permitted unless determined to be acceptable based on non-linear dynamic analysis studies. (See Note A-4.1.8.10.(7).)”.

31. In Article 4.3.1.1. of Division B of Book I, Council:

a) Strikes out Sentence (1) and substitutes:

“1) Except as provided in Sentence (2), *buildings* and their structural members made of wood shall conform to CSA O86, “Engineering Design in Wood,” incorporating Update 1 to the original 2014 Standard. (See also the applicable row in Table 1.3.1.2.)”, and

b) Adds the following new Sentence (2):

“2) *Buildings* or parts of *buildings* of *encapsulated mass timber construction* and their structural members made of wood shall conform to CSA O86, “Engineering Design in Wood .” (See also the applicable row in Table 1.3.1.2.)”.

32. In Article 4.5.1.1. of Division B of Book I, in Sentence 4.5.1.1.(1), Council amends Table 4.5.1.1. as follows:

a) Strikes out the rows associated with “4.1.8.10. Additional System Restrictions” and substitutes the following:

“

4.1.8.10. Additional System Restrictions	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(2)	(a) [F20-OP2.3] [F22-OP2.4]
	(b) [F20-OP2.3] [F22-OP2.4]
	(c) [F20-OP2.3] [F22-OP2.4]

	(d) [F20-OP2.3] [F22-OP2.4]
(3)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(4)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(5)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(7)	[F22-OS2.3, OS2.4]
	[F22-OP2.3, OP2.4]
(8)	[F22-OS2.1]
	[F20-OP2.1] [F22-OP2.4]

”, and

- b) Strikes out the rows associated with “4.3.1.1. Design Basis for Wood” and substitutes the following:

“

4.3.1.1. Design Basis for Wood	
(1)	[F22, F21, F80-OH4]
	[F20-OS2.1] [F80-OS2.3]
	[F20-OP2.1] [F21, F22-OP2.4] [F80-OP2.3, OP2.4]
(2)	[F22, F21, F80-OH4]
	[F20-OS2.1] [F80-OS2.3]
	[F20-OP2.1] [F21, F22-OP2.4] [F80-OP2.3, OP2.4]

”.

33. In Article 6.4.3.1. of Division B of Book I, in Clause (1)(b) after the words “attached to the face of a wall of combustible construction”, Council adds the following: “or *encapsulated mass timber construction*”.

34. In Article D-1.1.1. of Division B of Book I, Council strikes out Sentence (8) and substitutes:



“8) Article D-6.1.1. contains construction specifications for exterior wall assemblies that are deemed to satisfy the criteria of Clause 3.1.5.5.(1)(b) when tested in accordance with CAN/ULC-S134, “Fire Test of Exterior Wall Assemblies.

9) Section D-7 contains background information regarding fire test reports, obsolete materials and assemblies, assessment of archaic assemblies and the development of the component additive method.”.

35. In Article D-1.1.2. of Division B of Book I, in Sentence (1), Council strikes out Table D-1.1.2 and substitutes:

“

Table D-1.1.2.  
Documents Referenced in Appendix D, Fire-Performance Ratings

Issuing Agency	Document Number <sup>(1)</sup>	Title of Document <sup>(2)</sup>	By-law Reference
ANSI	A208.1-2009	Particleboard	D-3.1.1.
ASTM	C 330/C 330M-13	Lightweight Aggregates for Structural Concrete	D-1.4.3.
ASTM	C 840-13	Application and Finishing of Gypsum Board	D-2.3.9.
ASTM	C 1396/C 1396M-14	Gypsum Board	D-1.5.1. D-3.1.1.
ASTM	D2898-10	Accelerated Weathering of Fire-Retardant-Treated Wood for fire Testing	Table D-6.1.1.
CCBFC	NRCC 30629	Supplement to the National Building Code of Canada 1990	D-6.2. D-6.3. D-6.4.
CGSB	4-GP-36M-1978	Carpet Underlay, Fiber Type	D-3.1.1.
CGSB	CAN/CGSB-4.129-97	Carpets for Commercial Use	D-3.1.1.
CGSB	CAN/CGSB-11.3-M87	Hardboard	D-3.1.1.
CGSB	CAN/CGSB-92.2-M90	Trowel or Spray Applied Acoustical Material	D-2.3.4.
CSA	A23.1-14/A23.2-14	Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete	D-1.4.3.
CSA	A23.3-14	Design of Concrete Structures	D-2.1.5. D-2.6.6. D-2.8.2.

CSA	CAN/CSA-A82-14	Fired Masonry Brick Made from Clay or Shale	D-2.6.1.
CSA	A82.22-M1977	Gypsum Plasters	D-3.1.1.
CSA	CAN/CSA-A82.27-M91	Gypsum Board	D-1.5.1. D-3.1.1.
CSA	A82.30-M1980	Interior Furring, Lathing and Gypsum Plastering	D-1.7.2. D-2.3.9. D-2.5.1.
CSA	A165.1-14	Concrete Block Masonry Units	D-2.1.1.
CSA	O86-14	Engineering Design in Wood	D-2.11.2. D-2.12.1.
CSA	O86-19	Engineering Design in Wood incorporating Update No.1 to the original 2014 Standard	D-2.11.4.
CSA	O112.10-08	Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure)	D-2.3.6.
CSA	O121-08	Douglas Fir Plywood	D-3.1.1.
CSA	O141-05	Softwood Lumber	D-2.3.6. D-2.4.1.
CSA	O151-09	Canadian Softwood Plywood	D-3.1.1.
CSA	O153-13	Poplar Plywood	D-3.1.1.
CSA	O325-07	Construction Sheathing	D-3.1.1.
CSA	O437.0-93	OSB and Waferboard	D-3.1.1.
CSA	S16-14	Design of Steel Structures	D-2.6.6.
NFPA	80-2013	Fire Doors and Other Opening Protectives	D-5.2.1.
ULC	CAN/ULC-S101-14	Fire Endurance Tests of Building Construction and Materials	D-1.1.1. D-1.12.1. D-2.3.2. D2.11.1.
ULC	CAN/ULC-S102-10	Test for Surface Burning Characteristics of Building Materials and Assemblies	D-1.1.1. D-6.1.1. Table D-6.1.1.
ULC	CAN/ULC-S102.2-10	Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies	D-1.1.1. D-3.1.1.
ULC	CAN/ULC-S112.2-07	Fire Test of Ceiling Firestop Flap Assemblies	D-2.3.10. D-2.3.11.

ULC	CAN/ULC-S114-05	Test for Determination of Non-Combustibility in Building Materials	D-1.1.1. D-4.1.1. D-4.2.1.
ULC	CAN/ULC-S134-13	Fire Test of Exterior Wall Assemblies	D-1.1.1. D-6.1.1.
ULC	CAN/ULC-S702-09	Mineral Fibre Thermal Insulation for Buildings	D-2.3.4. D-2.3.5. D-2.6.1. Table D-6.1.1.
ULC	CAN/ULC-S703-09	Cellulose Fibre Insulation for Buildings	D-2.3.4.
ULC	CAN/ULC-S706-09	Wood Fibre Insulating Boards for Buildings	D-3.1.1.

Notes to Table D-1.1.2.:

(1) Some documents may have been reaffirmed or reapproved. Check with the applicable issuing agency for up-to-date information.

(2) Some titles have been abridged to omit superfluous wording.

”.

36. In Section D-2 of Division B of Book I, Council strikes out the words “D-2.11. **Glue-Laminated Timber Beams and Columns**” and substitutes: “D-2.11. **Mass Timber Elements**”.

37. In Subsection D-2.11 of Division B of Book I, Council strikes out Article D-2.11.1 and substitutes the following:

**“D-2.11.1. Determination of Rating**

1) The design methodologies described in this Section are intended to be used to establish fire resistance ratings on the basis of the structural elements being exposed to the standard fire exposure conditions in accordance with CAN/ULC-S101.

2) In a standard fire-resistance test, loadbearing timber beams and columns are assigned a fire-resistance rating that relates to the time in the test at which the applied load can no longer be sustained. Wall, floor and roof assemblies are assigned a fire-resistance rating that relates to the time in the test that is the lesser of any of the times at which

- a) an average temperature rise of 140°C or a maximum temperature rise of 180°C at any location is recorded on the unexposed side,
- b) there is passage of flame or passage of gases hot enough to ignite cotton pads through the unexposed side, or,
- c) the applied load is no longer being sustained, where the assembly is loadbearing.

**D-2.11.2. Applicability of Methods**

1) The method of calculation in Article D-2.11.3. applies to glued-laminated timber beams and columns required to have fire-resistance ratings greater than those afforded under the provisions of Article 3.1.4.6.

2) The method of calculation in Article D-2.11.4. applies to mass timber members required to have a fire-resistance rating, including solid-sawn timber and glued-laminated timber beams and columns required to have fire-resistance ratings greater than those afforded under the provisions of Article 3.1.4.6.

3) The two methods of calculation in Articles D-2.11.3. and D-2.11.4. are separate and independent methodologies that use different approaches to the development of fire-resistance ratings for mass timber elements.

### D-2.11.3. Method A - Glued-Laminated Timber Beams and Columns

1) The fire-resistance rating of glued-laminated timber beams and columns in minutes shall be equal to

- a)  $0.1 f_B [4 - 2(B/D)]$  for beams that may be exposed to fire on 4 sides,
- b)  $0.1 f_B [4 - (B/D)]$  for beams that may be exposed to fire on 3 sides,
- c)  $0.1 f_B [3 - (B/D)]$  for columns that may be exposed to fire on 4 sides, and
- d)  $0.1 f_B [3 - (B/2D)]$  for columns that may be exposed to fire on 3 sides,

where

f = the load factor shown in Figure D-2.11.3.-A,

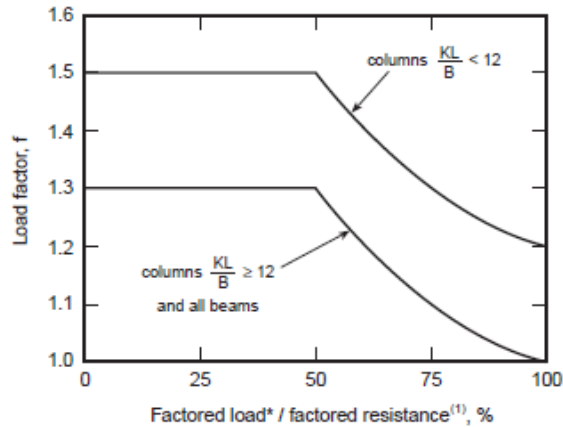
B = the full dimension of the smaller side of a beam or column in millimetres before exposure to fire  
[see Figure D-2.11.3.-B],

D = the full dimension of the larger side of a beam or column in millimetres before exposure to fire  
[see Figure D-2.11.3.-B],

k = the effective length factor obtained from CSA O86, "Engineering Design in Wood,"

L = the unsupported length of a column in millimetres.

2) The factored resistance of a beam or column shall be determined by using the specified strengths in CSA O86, "Engineering Design in Wood."



\*In the case of beams, use bending moment in place of load.

EC01237A

Figure D-2.11.3.-A  
Factors to compensate for partially loaded columns and beams

Note to Figure D-2.11.3.-A:

- (1) See Sentence (2).

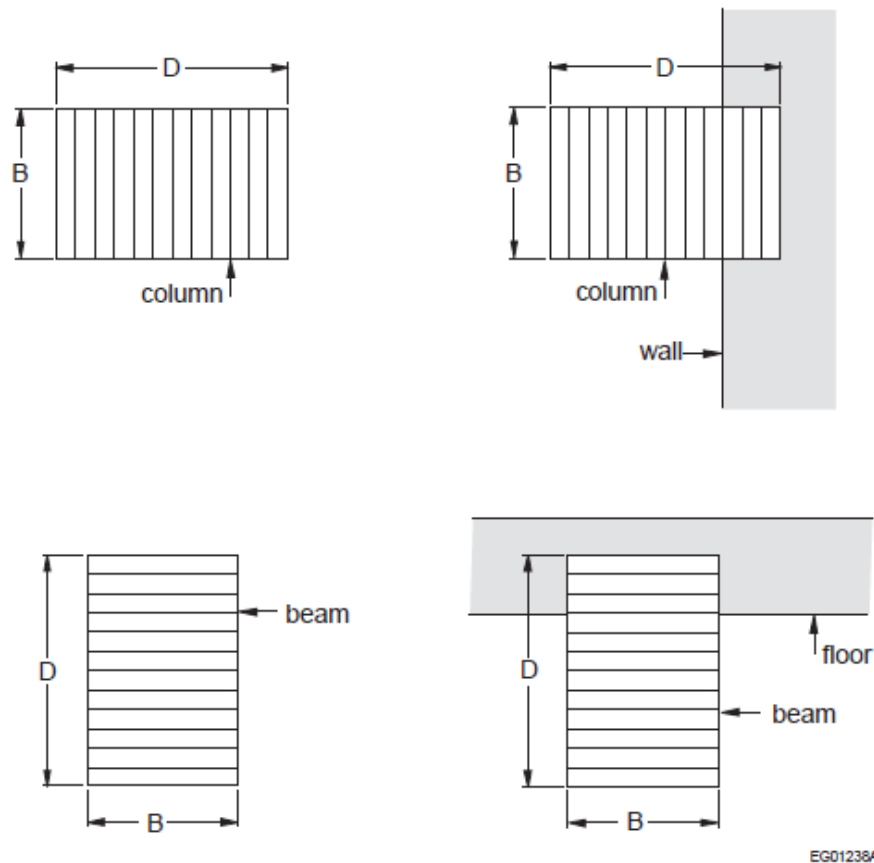


Figure D-2.11.3.-B  
Full dimensions of glued-laminated beams and columns

#### D-2.11.4. Method B - Mass Timber Members and Elements

1) A fire-resistance rating is permitted to be assigned to mass timber structural members, such as beams and columns of glued-laminated timber, solid-sawn timber and structural composite lumber, using the method of calculation in Annex B, “Fire resistance of large cross-section wood elements”, of CSA O86, “Engineering Design in Wood”.

2) Except as required in Sentence (3) and provided in Sentences (4) to (6), a fire-resistance rating is permitted to be assigned to mass timber wall, floor and roof assemblies, including those constructed of cross-laminated timber, using the method of calculation in Annex B, “Fire resistance of large cross-section wood elements”, of CSA O86, “Engineering Design in Wood”.

3) Except as permitted in Sentence (4), for wall, floor and roof assemblies described in Sentence (2), protection shall be applied to the assembly to ensure the integrity and thermal insulation properties of the assembly for the fire-resistance rating period calculated, consisting of

a) except as provided in Clause (b), for floor and roof assemblies, at least one of the following protection methods applied to the unexposed surface

- i) not less than 12.5 mm thick OSB or plywood, with staggering of joints from the joints in the mass timber assembly
- ii) not less than 38 mm thick concrete topping, or

- iii) not less than 25 mm thick gypsum-concrete topping
- b) for plank decking designed in accordance with Clause B.10, at least one of the protection methods for the unexposed surface listed in Clause B.10.4 applied to the unexposed surface
- c) for interior wall assemblies, at least one of the following protection methods applied to at least one side of the assembly, with staggering of joints from the joints in the mass timber assembly
  - i) not less than 12.5 mm thick OSB or plywood, or
  - ii) not less than 12.7 mm thick Type X gypsum board, and
- d) for exterior wall assemblies, at least one of the following protection methods applied to at least one side of the assembly, with staggering of joints from the joints in the mass timber assembly
  - i) not less than 12.5 mm thick OSB or plywood,
  - ii) not less than 12.7 mm thick Type X gypsum board,
  - iii) not less than 12.7 mm thick gypsum sheathing on the exterior side of the assembly, or
  - iv) not less than 50 mm thick rock or slag insulation sheathing on the exterior side of the assembly.

4) For wall, floor and roof assemblies constructed of cross-laminated timber, the joints between mass timber panels need not be protected using one of the protection methods in Sentence (3) provided the joints are either lapped or splined to ensure the integrity and thermal insulation properties of the assembly for the fire-resistance rating period calculated. [see Figure D-2.11.4.(4)].

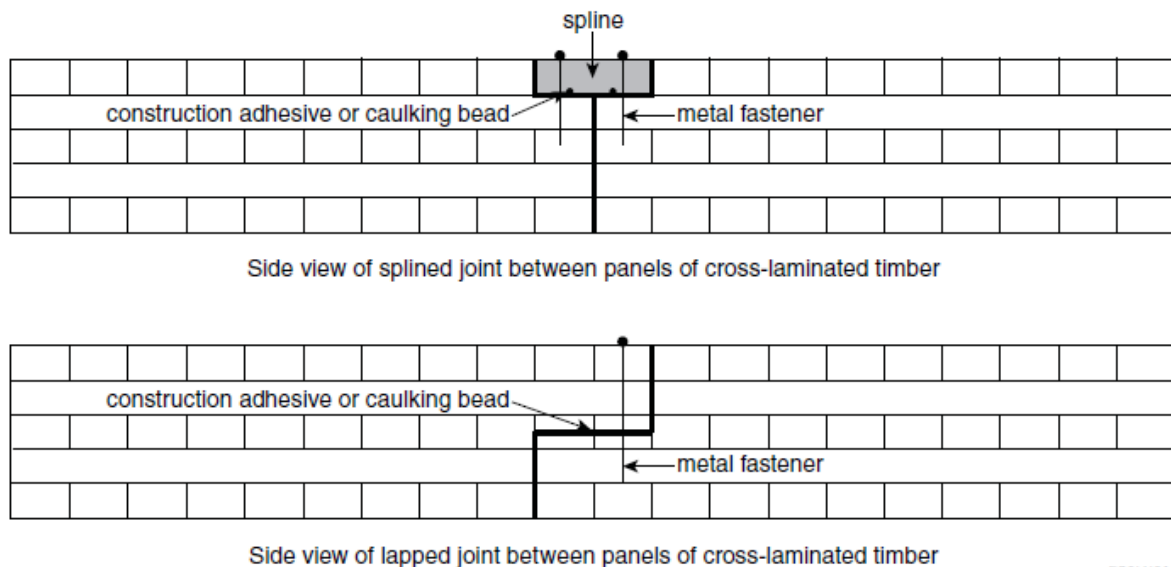


Figure D-2.11.4.  
Structural joint details in cross-laminated timber elements

- 5) For interior wall assemblies, the additional fire-resistance times assigned in Clause B.8.1 shall only be applicable when both sides of the wall assembly are protected using one of the options in Clause B.8. When the level of protection differs on the two sides, the additional fire-resistance time assigned is the lesser of the two values for the different levels of protection being used.
- 6) For exterior wall assemblies, the additional fire-resistance times assigned in Clause B.8.1 shall only be applicable when
  - a) the protection is applied to the interior (fire-exposed) side of the wall assembly, and

b) except for wall assemblies constructed of cross-laminated timber as described in Sentence (4), there is at least one of the protection methods in Subclauses (3)(d)(i) to (iv) applied on the exterior (unexposed) side of the assembly.”

38. In Article D-2.12.1. of Division B of Book I, Council strikes out “At this time, this By-law does not presently contain explicit provisions for the use of CLT although this may be considered as part of a design compliant with Article 3.2.1.7.”

39. In Appendix D of Division B of Book I, Council strikes out Section D-6 and substitutes the following:

“Section D-6 Fire Performance of Exterior Wall Assemblies

D-6.1. Scope

D-6.1.1. Exterior Wall Assemblies

Table D-6.1.1. shows construction specifications for exterior wall assemblies that are deemed to satisfy the criteria of Clause 3.1.5.5.(1)(b) when tested in accordance with CAN/ULC-S134, “Fire Test of Exterior Wall Assemblies.” These exterior wall assemblies are suitable for use in buildings permitted to be of encapsulated mass timber construction.

Table D-6.1.1. Construction Specifications for Exterior Wall Assemblies that Are Deemed to Satisfy the Criteria of Clause 3.1.5.5.(1)(b) when Tested in Accordance with CAN/ULC-S134

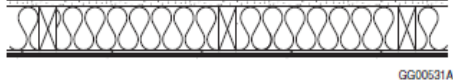


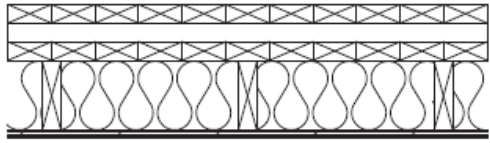
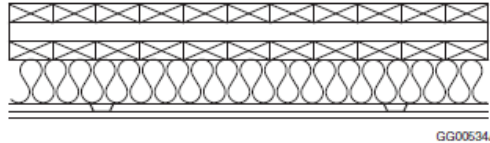
Wall Number	Structural Members	Absorptive Material	Sheathing	Cladding	Design
EXTW-1	38 mm × 89 mm wood studs spaced at 400 mm o.c. <sup>(1)(2)</sup>	89 mm thick rock or slag fibre in cavities formed by studs <sup>(3)(4)</sup>	=	12.7 mm thick fire-retardant-treated plywood siding <sup>(5)</sup>	 GG00531A
EXTW-2	38 mm × 140 mm wood studs spaced at 400 mm o.c. <sup>(1)(2)</sup>	140 mm thick rock or slag fibre in cavities formed by studs <sup>(3)(4)</sup>	Gypsum sheathing ≥ 12.7 mm thick	Noncombustible exterior cladding	 GG00530A
EXTW-3	38 mm × 140 mm wood studs spaced at 400 mm o.c. <sup>(1)(2)</sup>	140 mm thick rock or slag fibre in cavities formed by studs <sup>(3)(4)</sup>	15.9 mm thick fire-retardant-treated plywood <sup>(5)</sup>	Noncombustible exterior cladding	 GG00532A

Table D-6.1.1.  
Construction Specifications for Exterior Wall Assemblies that Are Deemed to Satisfy the Criteria of Clause 3.1.5.5.(1)(b) when  
Accordance with CAN/ULC-S134

Tested in

EXTW-4	38 mm × 140 mm wood studs spaced at 600 mm o.c. <sup>(1)(7)</sup> attached to cross-laminated timber (CLT) wall panels ≥ 38 mm thick <sup>(8)</sup>	140 mm thick glass, rock or slag fibre in cavities formed by studs <sup>(3)</sup>	Gypsum sheathing ≥ 12.7 mm thick	Noncombustible exterior cladding	 <p style="text-align: right;">GG00533A</p>
EXTW-5	89 mm horizontal Z-bars spaced at 600 mm o.c. attached to CLT wall panels ≥ 105 mm thick <sup>(8)</sup>	89 mm thick rock or slag fibre in cavities formed by Z-bars <sup>(3)(4)</sup>	=	Noncombustible exterior cladding attached to 19 mm vertical hat channels spaced at 600 mm o.c.	 <p style="text-align: right;">GG00534A</p>

Notes to Table D-6.1.1.:

- (1) The stated stud dimensions are maximum values. Where wood studs with a smaller depth are used, the thickness of absorptive material in the cavities formed by the studs must be reduced accordingly.
- (2) Horizontal blocking between the vertical studs or horizontal stud plates must be installed at vertical intervals of at most 2 324 mm, such that the maximum clear length between the horizontal blocking or stud plates is 2 286 mm.
- (3) The absorptive material must conform to CAN/ULC-S702, "Mineral Fibre Thermal Insulation for Buildings."
- (4) The absorptive material must have a density not less than 32 kg/m<sup>3</sup>.
- (5) The fire-retardant-treated plywood siding must conform to the requirements of Article 3.1.4.5. and must have been conditioned in conformance with ASTM D 2898, "Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing," before being tested in accordance with CAN/ULC-S102, "Test for Surface Burning Characteristics of Building Materials and Assemblies."
- (6) The fire-retardant-treated plywood must conform to the requirements of Article 3.1.4.5.
- (7) Horizontal blocking between the vertical studs or horizontal stud plates must be installed at vertical intervals of at most 2 438 mm, such that the maximum clear length between the horizontal blocking or stud plates is 2 400 mm.
- (8) A water-resistant barrier may be attached to the face of the CLT wall panels.

## Section D-7 Background Information

### D-7.1. Fire Test Reports

Summaries of available fire test information have been published by NRC as follows:

- (1) M. Galbreath, Flame Spread Performance of Common Building Materials. Technical Paper No. 170, Division of Building Research, National Research Council Canada, Ottawa, April 1964. NRCC 7820.
- (2) M. Galbreath and W.W. Stanzak, Fire Endurance of Protected Steel Columns and Beams. Technical Paper No. 194, Division of Building Research, National Research Council Canada, Ottawa, April 1965. NRCC 8379.
- (3) T.Z. Harmathy and W.W. Stanzak, Elevated-Temperature Tensile and Creep Properties of Some Structural and Prestressing Steels. American Society for Testing and Materials, Special Technical Publication 464, 1970, p. 186 (DBR Research Paper No. 424) NRCC 11163.



- (4) T.Z. Harmathy, Thermal Performance of Concrete Masonry Walls in Fire. American Society for Testing and Materials, Special Technical Publication 464, 1970, p. 209 (DBR Research Paper No. 423) NRCC 11161.
- (5) L.W. Allen, Fire Endurance of Selected Non-Loadbearing Concrete Masonry Walls. DBR Fire Study No. 25, Division of Building Research, National Research Council Canada, Ottawa, March 1970. NRCC 11275.
- (6) A. Rose, Comparison of Flame Spread Ratings by Radiant Panel, Tunnel Furnace, and Pittsburgh-Corning Apparatus. DBR Fire Study No. 22, Division of Building Research, National Research Council Canada, Ottawa, June 1969. NRCC 10788.
- (7) T.T. Lie and D.E. Allen, Calculation of the Fire Resistance of Reinforced Concrete Columns. DBR Technical Paper No. 378, Division of Building Research, National Research Council Canada, Ottawa, August 1972. NRCC 12797.
- (8) W.W. Stanzak, Column Covers: A Practical Application of Sheet Steel as a Protective Membrane. DBR Fire Study No. 27, Division of Building Research, National Research Council Canada, Ottawa, February 1972. NRCC 12483.
- (9) W.W. Stanzak, Sheet Steel as a Protective Membrane for Steel Beams and Columns. DBR Fire Study No. 23, Division of Building Research, National Research Council Canada, Ottawa, November 1969. NRCC 10865.
- (10) W.W. Stanzak and T.T. Lie, Fire Tests on Protected Steel Columns with Different Cross-Sections. DBR Fire Study No. 30, Division of Building Research, National Research Council Canada, Ottawa, February 1973. NRCC 13072.
- (11) G. Williams-Leir and L.W. Allen, Prediction of Fire Endurance of Concrete Masonry Walls. DBR Technical Paper No. 399, Division of Building Research, National Research Council Canada, Ottawa, November 1973. NRCC 13560.
- (12) G. Williams-Leir, Prediction of Fire Endurance of Concrete Slabs. DBR Technical Paper No. 398, Division of Building Research, National Research Council Canada, Ottawa, November 1973. NRCC 13559.
- (13) A. Rose, Flammability of Fibreboard Interior Finish Materials. Building Research Note No. 68, Division of Building Research, National Research Council Canada, Ottawa, October 1969.
- (14) L.W. Allen, Effect of Sand Replacement on the Fire Endurance of Lightweight Aggregate Masonry Units. DBR Fire Study No. 26, Division of Building Research, National Research Council Canada, Ottawa, September 1971. NRCC 12112.
- (15) L.W. Allen, W.W. Stanzak and M. Galbreath, Fire Endurance Tests on Unit Masonry Walls with Gypsum Wallboard. DBR Fire Study No. 32, Division of Building Research, National Research Council Canada, Ottawa, February 1974, NRCC 13901.
- (16) W.W. Stanzak and T.T. Lie, Fire Resistance of Unprotected Steel Columns. Journal of Structural Division, Proc., Am. Soc. Civ. Eng., Vol. 99, No. ST5 Proc. Paper 9719, May 1973 (DBR Research Paper No. 577) NRCC 13589.
- (17) T.T. Lie and T.Z. Harmathy, Fire Endurance of Concrete-Protected Steel Columns. A.C.I. Journal, January 1974, Title No. 71-4 (DBR Technical Paper No. 597) NRCC 13876.
- (18) T.T. Lie, A Method for Assessing the Fire Resistance of Laminated Timber Beams and Columns. Can. J. Civ. Eng., Vol. 4, No. 2, June 1977 (DBR Technical Paper No. 718) NRCC 15946.
- (19) T.T. Lie, Calculation of the Fire Resistance of Composite Concrete Floor and Roof Slabs. Fire Technology, Vol. 14, No. 1, February 1978 (DBR Technical Paper No. 772) NRCC 16658.
- (20) M.A. Sultan, Y.P. Séguin and P. Leroux. Results of Fire Resistance Tests on Full-Scale Floor Assemblies, Institute for Research in Construction, National Research Council Canada, Ottawa, May 1998, IRC-IR-764.
- (21) M.A. Sultan, J.C. Latour, P. Leroux, R.C. Monette, Y.P. Séguin and J.P. Henrie, Results of Fire Resistance Tests on Full-Scale Floor Assemblies - Phase II, Institute for Research in Construction, National Research Council Canada, Ottawa, March 2005, RR-184.

- (22) M.A. Sultan and G.D. Lougheed, Results of Fire Resistance Tests on Full-Scale Gypsum Board Wall Assemblies, Institute for Research in Construction, National Research Council Canada, Ottawa, August 2002, IRC-IR-833.
- (23) V.K.R. Kodur, M.A. Sultan, J.C. Latour, P. Leroux, R.C. Monette, Experimental Studies on the Fire Resistance of Load-Bearing Steel Stud Walls, Research Report, National Research Council Canada, Ottawa, August 2013, RR-343.
- (24) E. Gibbs, B.C. Taber, G.D. Lougheed, J.Z. Su and N. Bénichou, Solutions for Mid-Rise Wood Construction: Full-Scale Standard Fire Test for Exterior Wall Assembly Using Lightweight Wood Frame Construction with Gypsum Sheathing (Test EXTW-1), Report to Research Consortium for Wood and Wood-Hybrid Mid-Rise Buildings, National Research Council Canada, Ottawa, December 2014, A1-100035-01.4.
- (25) E. Gibbs, B.C. Taber, G.D. Lougheed, J.Z. Su and N. Bénichou, Solutions for Mid-Rise Wood Construction: Full-Scale Standard Fire Test for Exterior Wall Assembly Using a Simulated Cross-Laminated Timber Wall Assembly with Gypsum Sheathing (Test EXTW-2), Report to Research Consortium for Wood and Wood-Hybrid Mid-Rise Buildings, National Research Council Canada, Ottawa, December 2014, A1-100035-01.5.
- (26) E. Gibbs, B.C. Taber, G.D. Lougheed, J.Z. Su and N. Bénichou, Solutions for Mid-Rise Wood Construction: Full-Scale Standard Fire Test for Exterior Wall Assembly Using Lightweight Wood Frame Construction with Interior Fire-Retardant-Treated Plywood Sheathing (Test EXTW-3), Report to Research Consortium for Wood and Wood-Hybrid Mid-Rise Buildings, National Research Council Canada, Ottawa, December 2014, A1-100035-01.6.
- (27) E. Gibbs and J. Su, Full Scale Exterior Wall Test on Nordic Cross-Laminated Timber System, National Research Council Canada, Ottawa, January 2015, A1-006009.1.

#### D-7.2. Obsolete Materials and Assemblies

Building materials, components and structural members and assemblies in buildings constructed before 1995 may have been assigned ratings based on earlier editions of the Supplement to the National Building Code of Canada or older reports of fire tests. To assist users in determining the ratings of these obsolete assemblies and structural members, the following list of reference documents has been prepared. Although some of these publications are out of print, reference copies are available through NRC.

- (1) M. Galbreath, Fire Endurance of Unit Masonry Walls. Technical Paper No. 207, Division of Building Research, National Research Council Canada, Ottawa, October 1965. NRCC 8740.
- (2) M. Galbreath, Fire Endurance of Light Framed and Miscellaneous Assemblies. Technical Paper No. 222, Division of Building Research, National Research Council Canada, Ottawa, June 1966. NRCC 9085.
- (3) M. Galbreath, Fire Endurance of Concrete Assemblies. Technical Paper No. 235, Division of Building Research, National Research Council Canada, Ottawa, November 1966. NRCC 9279.
- (4) Guideline on Fire Ratings of Archaic Materials and Assemblies. Rehabilitation Guideline #8, U.S. Department of Housing and Urban Development, Germantown, Maryland 20767, October 1980.
- (5) T.Z. Harmathy, Fire Test of a Plank Wall Construction. Fire Study No. 2, Division of Building Research, National Research Council Canada, Ottawa, July 1960. NRCC 5760.
- (6) T.Z. Harmathy, Fire Test of a Wood Partition. Fire Study No. 3, Division of Building Research, National Research Council Canada, Ottawa, October 1960. NRCC 5769.\

#### D-7.3. Assessment of Archaic Assemblies

Information in this document applies to new construction. Please refer to early editions of the Supplement to the National Building Code of Canada for the assessment or evaluation of assemblies that do not conform to the information in this edition of the National Building Code. As with other documents, this By-law is revised

according to the information presented to the standing committee responsible for its content, and with each update new material may be added and material that is not relevant may be deleted.

#### D-7.4. Development of the Component Additive Method

The component additive method was developed based upon the following observations and conclusions drawn from published as well as unpublished test information.

Study of the test data showed that structural failure preceded failure by other criteria (transmission of heat or hot gases) in most of the tests of loadbearing wood-framed assemblies. The major contributor to fire resistance was the membrane on the fire-exposed side.

Fire tests of wood joist floors without protective ceilings resulted in structural failure between 8 and 10 min. Calculation of the time for wood joists to approach breaking stress, based upon the charring rate of natural woods, suggested a time of 10 min for structural failure. This time was subtracted from the fire-resistance test results of wood joist floors and the remainder considered to be the contribution of the membrane.

The figures obtained for the contribution of membranes were then applied to the test results for open web steel joist floors and wood and steel stud walls and values of 20 min for the contribution of wood stud framing and 10 min for steel framing were derived.

The fire-resistance rating has been limited to 1.5 h as this method of developing ratings for framed assemblies was new and untried.

Although this is the subject of current review, no decision has been made to extend the ratings beyond 1.5 h.

- (1) M. Galbreath, G. C. Gosselin, and R. B. Chauhan, Historical Guide to Chapter 2 of the Supplement to the National Building Code of Canada, Committee Paper FPR 1-3, Prepared for the Standing Committee on Fire Performance Ratings, May 1987.

Example showing fire-resistance rating of a typical membrane assembly, calculated using the component additive method.

#### 1 hour Gypsum Board/Wood Stud Interior Partition

A 1 h fire-resistance rating is required for an interior wood framed partition, using 12.7 mm Type X gypsum board.

- a) Since gypsum board is used (Sentence D-2.3.4.(2) and Table D-2.3.4.-A) time assigned to 12.7 mm Type X gypsum board membrane on the fire-exposed side of the partition = 25 min
- b) Time assigned to wood framing members at 400 mm o.c. (Sentence D-2.3.4.(3) and Table D-2.3.4.-E) = 20 min
- c) Time assigned to insulation, if the spaces between the studs are filled with preformed insulation of rock or slag fibres conforming to CAN/ULC-S702, "Mineral Fibre Thermal Insulation for Buildings," (Sentence D-2.3.4.(4) and Table D-2.3.4.-G) = 15 min
- d) Time assigned to the membrane on the non-fire-exposed side (Sentence D-2.3.5.(1)) = 0 min
- e) Fire-resistance rating = 25 + 20 + 15 = 60 min

”.

40. In Article 2.2.3.1. of Division C of Book I and Book II, in Sentence (1), Council strikes out Clauses (e) and (f) and substitutes the following:

“e) the source of information for *encapsulation ratings* of mass timber elements of construction (to be indicated on large-scale sections),

f) the location of *exits*, and  
 g) fire detection, suppression and alarm systems.”.

41. This By-law is to come into force and take effect on July 1, 2020.

ENACTED by Council this \_\_\_\_\_ day of \_\_\_\_\_, 2020

\_\_\_\_\_  
 Mayor

\_\_\_\_\_  
 Acting City Clerk

**EXPLANATION****A By-law to amend Fire By-law No. 12472  
Regarding BC Fire Code Amendments**

Following the Standing Committee on Policy and Strategic Priorities Meeting on May 27, 2020 and June 2, 2020, Council resolved to amend the Fire By-law to adopt amendments to the BC Fire Code related to encapsulated mass timber construction, to come into force and take effect on July 1, 2020. Enactment of the attached By-law will accomplish Council's resolution.

Director of Legal Services  
June 23, 2020

**BY-LAW NO.**

**A By-law to amend Fire By-law No. 12472  
Regarding BC Fire Code Amendments**

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This By-law amends the indicated provisions of Fire By-law No. 12472.
2. Council strikes out section 1.1, and substitutes the following:  

“1.1 Council adopts the British Columbia Fire Code (the “Fire Code”) as established under Ministerial Order No. FSA 20181 dated October 16, 2018 and effective December 20, 2018 and amended under Ministerial Order No. FSA 20182 dated November 18, 2019 and effective December 12, 2019, and incorporates the Fire Code into this By-law to the extent and subject to the changes and additions to the Fire Code which are set out in the attachments marked Schedules A, B, C and D to this By-law.”.
3. A decision by a court that any part of this By-law is illegal, void, or unenforceable severs that part from this By-law, and is not to affect the balance of this By-law.
4. This By-law is to come into force and take effect on July 1, 2020.

ENACTED by Council this                  day of    , 2020

\_\_\_\_\_  
Mayor

\_\_\_\_\_  
Acting City Clerk

**EXPLANATION****A By-law to amend Building By-law No. 12511  
Regarding Plumbing Safety Amendments**

Following the Standing Committee on City Finance and Services on June 10, 2020, Council resolved to amend the Building By-law No. 12511 to implement safety improvements to various plumbing and building mechanical systems; with certain provisions to come into force and take effect on January 1, 2021, and others on January 1, 2022. Enactment of the attached By-law will implement Council's resolutions.

Director of Legal Services  
June 23, 2020

## BY-LAW NO.

### A By-law to amend Building By-law No. 12511 Regarding Plumbing Safety Amendments

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This By-law amends the indicated provisions of Building By-law No. 12511.
2. In Book II, Division A, Council adds a new definition to Sentence 1.4.1.2.(1), in correct alphabetical order, as follows:

“*Decorative water feature* means a human-made fountain, waterfall, cascade, spray or the like that uses water for architectural, decorative or aesthetic effects, is not intended for human contact, and is located indoors or outdoors, and does not include a fish pond, natural body of water, natural waterfall, or a regulated activity under the BC Pool Regulation. (See Note A-1.4.1.2.(1)).”
3. In Book II, Division A, Council adds the following new abbreviations to Sentence 1.4.2.1.(1), in correct alphabetical order:
  - (a) “CFU ..... colony forming units”;
  - (b) “LPM ..... litres per minute”;
  - (c) “MPN ..... most probable number”; and
  - (d) “NTU ..... nephelometric turbidity units”.
4. In Book II, Division A, Council adds a new note under “A-1.4.1.2.(1) Defined Terms.” in the Notes to Part 1, in the correct alphabetical order, as follows:

“Decorative Water Feature.

A living or green wall is not considered a *decorative water feature*, but should be reviewed to identify hazards and to establish procedures to reduce risks. To preclude the growth of *Legionella*, consideration should be given to including non-chemical water treatment (such as UV), maintaining water temperature below 20 °C, and removing organic matter from the water. Water flow should be behind the plant material and airflow should be directed toward the living wall to minimize aerosolization into the occupied space.”.
5. In Book II, Division B, Council strikes out in Table 1.3.1.2 the rows for “CSA CAN/CSA-B127.1-99” and “CSA B127.2-M1977”.
6. In Book II, Division B, Council strikes out in Table 1.3.1.2 the By-law Reference “2.2.10.10.(2)” in the row for “CSA B125.3-12”.
7. In Book II, Division B, Council strikes out in Table 1.3.1.2 the By-law Reference “2.7.6.2.(1)” in the row for “IAPMO Water Demand Calculator” and substitutes “2.7.6.2.(2)”.
8. In Book II, Division B, Council adds in Table 1.3.1.2 new By-law References to the row for “CSA CAN/CSA-B181.2-11”, in correct numerical order, as follows:



“2.2.5.15.(1)  
2.2.5.15.(2)”.

9. In Book II, Division B, Council adds new rows to Table 1.3.1.2. in correct alphabetical order, as follows:

(a)

ANSI/ ASHRAE	188-2018	Legionellosis: Risk Management for Building Water Systems	2.2.10.6.(7)
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(b)

ASME/CSA	ASME A112.18.6- 2017/CSA B125.6-17	Flexible Water Connectors	2.2.10.18.(1)
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(c)

ASSE	ASSE 1002- 2015/ASME A112.1002- 2015/CSA B125.12-15	Anti-Siphon Fill Valves for Water Closet Tanks	2.2.10.10.(2)
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(d)

ASSE	ASSE 1037- 2015/ASME A112.1037- 2015/CSA B125.37-15	Performance Requirements for Pressurized Flushing Devices for Plumbing Fixtures	2.2.10.8.(1)
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(e)

ASTM	F 3128-19	Poly(Vinyl Chloride) (PVC) Schedule 40 Drain, Waste, and Vent Pipe with a Cellular Core	2.2.5.15.(1)
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(f) “

BC	B.C. Reg. 296/2010	Pool Regulation	1.4.1.2.(1)
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”;

(g) “

CSA	CAN/CSA- B127.3-18	Fibrocement Drain, Waste, and Vent Pipe and Pipe Fittings	2.2.5.1.(1) A-2.2.5., 2.2.6. and 2.2.7.
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”;

(h) “

ISO	11731:2017	Water Quality — Enumeration of <i>Legionella</i>	2.2.1.7.(2)
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”;

(i) “

ISO/IEC	17025:2017	General Requirements for the Competence of Testing and Calibration Laboratories	2.2.1.7.(2)
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”;

(j) “

NSF/ANSI	55-2019	Ultraviolet Microbiological Water Treatment Systems	2.2.11.3.(3)
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”; and

(k) “

PSPC	MD 15161-2013	Control of Legionella in Mechanical Systems	A-2.2.11.6.(7)
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”.

10. In Book II, Division B, Council adds the following new abbreviations to Sentence 1.3.2.1.(1), in correct alphabetical order:

- (a) “BC ..... Province of British Columbia (gov.bc.ca)”;
- (b) “IEC ..... International Electrotechnical Commission (www.iec.ch)”;
- (c) “ISO ..... International Organization for Standardization (www.iso.org)”;
- (d) “PSPC ..... Public Services and Procurement Canada (www.tpsgc-pwgsc.gc.ca)”.

11. In Book II, Division B, Council adds a new Article 2.2.1.7. as follows:

“2.2.1.7. Microbiological Testing

- 1) *E. coli* testing shall be conducted by an *accredited laboratory*.
- 2) *Legionella pneumophila* testing shall be conducted by a laboratory
  - a) accredited to ISO/IEC 17025, “General requirements for the competence of testing and calibration laboratories,” or equivalent,
  - b) using a culture method to identify all serogroups of *Legionella pneumophila* and that conforms to ISO 11731, “Water Quality — Enumeration of *Legionella*,” or equivalent, and
  - c) enrolled in a bi-annual external proficiency testing program for recognised approval for testing.
- 3) The owner of a *building* with a *cooling tower* or a *decorative water feature* shall ensure that the laboratory conducting *Legionella pneumophila* testing for the *cooling tower* or *decorative water feature* has agreed to give immediate notice to the owner, the *Chief Building Official*, and the local medical health officer if the result exceeds a standard set out in Table 2.2.11.6. or 2.2.11.7. that requires such notice to be given.”.

12. In Article 2.2.5.1. of Book II, Division B, Council:

- a) strikes out the title “Asbestos Cement Pipe and Fittings” and substitutes “Fibrocement Pipe and Fittings”; and
- b) in Sentence (1), strikes out “Reserved.” and substitutes “Fibrocement pipe and fittings for use in a drain, waste and vent system shall conform to CAN/CSA-B127.3-18, “Fibrocement Drain, Waste, and Vent Pipe and Pipe Fittings.”

13. In Book II, Division B, Council adds to the beginning of Table A-2.2.5., 2.2.6. and 2.2.7. in Note A-2.2.5., 2.2.6. and 2.2.7 “Pipe and Fitting Applications”, in the Notes to Part 2 the following:

“

<u>Fibrocement DWV pipe</u>	<u>CAN/CSA-B127.3-</u>	<u>2.2.5.1.(1).</u>	<u>P</u>	<u>P</u>	<u>P</u>	<u>P</u>	<u>P</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>
	<u>18</u>										
<u>Type 1, Class 3000</u>											
<u>and</u>											
<u>Type 2, Class 4000</u>											

”.

14. In Subsection 2.2.5, Council adds a new Article 2.2.5.15. as follows:

“2.2.5.15. Cellular Core PVC Pipe and Fittings

- 1) Cellular core PVC pipe shall
  - a) conform to ASTM F 3128-19, “Poly(Vinyl Chloride) (PVC) Schedule 40 Drain, Waste, and Vent Pipe with a Cellular Core,” and
  - b) be light grey, as specified in CAN/CSA-B181.2, “Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings.”

2) Fittings and solvent cements for cellular core PVC pipe shall conform to CAN/CSA-B181.2, "Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings."

3) Cellular core PVC pipe shall only be used in residential *buildings* containing 1 or 2 *dwelling units* and row houses that do not exceed 3 *storeys* in height."

15. In Article 2.2.10.6. of Book II, Division B, Council:

- a) in sentence (2), strikes out "Supply fittings and individual shower heads" and substitutes "Except as provided in Sentence (7), supply fittings and individual *shower heads*";
- b) strikes out Table 2.2.10.6. and substitutes the following:

"Table 2.2.10.6.  
Water Flow Rates from Supply Fittings  
Forming Part of Sentence 2.2.10.6.(2)

Supply Fittings	Maximum Water Flow Rate, L/min
Kitchen faucet (non-residential)	8.3
Kitchen faucet (residential)	6.8 <sup>(1)</sup>
Lavatory faucet (for <i>private</i> use)	5.7
Lavatory faucet (for <i>public</i> use)	1.9 <sup>(2)</sup>
<i>Pre-rinse spray valve</i>	4.8 <sup>(3)</sup>
<i>Shower head</i>	7.6 <sup>(4)</sup>
Wash fountain, per <i>plumbing fixture</i> fitting	6.8 <sup>(5)</sup>

Notes to Table 2.2.10.6.:

(1) May be temporarily increased to a maximum flow rate of 8.3 L/min but must default to the lower flow rate upon release of the activation mechanism or closure of the faucet valve.

(2) A *metering fixture* faucet is limited to 1.0 L per cycle.

(3) Each *pre-rinse spray valve* shall be equipped with an automatic shut-off.

(4) Emergency and safety *shower heads* are exempted from this requirement.

(5) A maximum flow rate of 6.8 L/min is permitted for each 500 mm of circumference. For a wash fountain with *metering fixture* faucets, a maximum of one *metering fixture* faucet is permitted for each 500 mm of circumference. A *metering fixture* faucet is limited to 1.0 L per cycle.";

- c) in Sentence (3), italicizes the words "shower head" wherever they appear;
- d) in Sentence (4), italicizes the words "shower heads" and "shower head" wherever they appear;
- e) in Sentence (5), strikes out "Each lavatory" and substitutes "Except as provided in Sentence (7), each lavatory"; and
- f) adds a new Sentence (7) as follows:

"7) The requirements of Sentences (2) and (5) do not apply to

a) any part of a *building* classified as Group B within Table 3.1.2.1. of Division B of Book I (General) of this By-law, or

b) a *plumbing fixture* specifically identified in a *building's* water management plan that conforms to ANSI/ASHRAE 188, "Legionellosis: Risk Management for Building Water Systems" and is signed by a *registered professional*."

16. In Sentence 2.2.10.8.(1) of Book II, Division B, Council:

- a) in Clause (c), strikes out "and" at the end of the Clause;
- b) in Clause (d), strikes out "." at the end of the Clause and substitutes ", and"; and
- c) adds a new Clause (e) as follows:

"e) conform to ASSE 1037-2015/ASME A112.1037-2015/CSA B125.37-15, "Performance Requirements for Pressurized Flushing Devices for Plumbing Fixtures.""

17. In Sentence 2.2.10.10.(2) of Book II, Division B, Council strikes out "CSA B125.3, "Plumbing Fittings."" and substitutes "ASSE 1002-2015/ASME A112.1002-2015/CSA B125.12-15, "Anti-Siphon Fill Valves for Water Closet Tanks.""

18. In Clause 2.2.10.17.(1)(b) of Book II, Division B, Council adds "a minimum of 8.5 in by 11 in in size and" before "securely fastened".

19. In Subsection 2.2.10., Council adds a new Article 2.2.10.18. as follows:

"2.2.10.18. Flexible Water Connectors

1) Flexible water connectors exposed to continuous pressure shall conform to ASME A112.18.6-2017/CSA B125.6-17, "Flexible Water Connectors.""

20. In Article 2.2.11.1. of Book II, Division B, Council:

- a) in Sentence (1), strikes out "Appliances", and substitutes "Except when a clothes washer is supplied by an *alternate water source system*, appliances"; and
- b) in Sentence (2), strikes out "Clothes washers", and substitutes "Except when a clothes washer is supplied by an *alternate water source system*, clothes washers".

21. In Article 2.2.11.3. of Book II, Division B, Council:

- a) in Sentence (1), strikes out "The maximum", and substitutes "Except when a vehicle wash facility is supplied by an alternate water source system, the maximum";
- b) in Clause (2)(a), strikes out "a water recycling system", and substitutes "except when a vehicle wash facility is supplied by an alternate water source system, a water recycling system"; and
- c) adds a new Sentence (3) as follows:

"3) Where a vehicle wash facility is supplied by an *alternate water source system*, disinfection of the non-*potable* water shall be provided at the vehicle wash facility at point of use by ultraviolet

light and conform to NSF/ANSI 55, "Ultraviolet Microbiological Water Treatment Systems," Class A."

22. In Clause 2.2.11.4.(2)(b) of Book II, Division B, Council adds "a minimum of 8.5 in by 11 in in size and" before "securely fastened".

23. In Book II, Division B, Council strikes out Article 2.2.11.6 and substitutes the following:

**"2.2.11.6. Cooling Towers**

(See Article 6.3.2.15. of Division B of Book I (General) of this By-law.)

1) An *operating permit* shall be obtained for the installation of a *cooling tower*, or the retention of an existing *cooling tower*.

2) In order to obtain an *operating permit* for the installation of a *cooling tower*, a service contract must be in place with a qualified service provider to perform maintenance of the *cooling tower* for a minimum of one year.

3) The *operating permit* number assigned to the *cooling tower* shall be posted on a sign or plate that is a minimum of 8.5 in by 11 in in size and securely fastened to the *cooling tower* in a location that is conspicuously visible and constructed of a durable, weather resistant material.

4) The *Chief Building Official* shall be notified, in the form prescribed by the *Chief Building Official*,  
a) within 5 days of any start-up or shut down of a *cooling tower*,  
b) within 5 days of any *Legionella pneumophila* test result from a *cooling tower*, or sooner as required by Sentence (8), and  
c) within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*.

5) A maintenance log shall be maintained for each *cooling tower* and shall include  
a) the address and location of the *cooling tower*,  
b) the *operating permit* number assigned to the *cooling tower*,  
c) emergency contact information and the name and contact information of the owner,  
d) a description of the location of the operating manual for the *cooling tower*, and as applicable, the location of safety data sheets and the location of the water management plan,  
e) a single line schematic plan, including water sampling locations, of the *cooling tower* system,  
f) details of any changes or alterations made to the system at any time since January 1, 2021,  
g) a record of inspections and any maintenance performed within the last 24 months,  
h) a record of operational disruptions within the last 24 months and the corrective actions taken,  
i) a record of chemical treatments applied and dosages within the last 24 months,  
j) a record of all water quality results from analyses performed within the last 24 months, and for *Legionella pneumophila* test results, the name of the person and company collecting the sample and the name of the company conducting the laboratory test, and  
k) if a laboratory result fails to meet a standard defined in Table 2.2.11.6., a description of the extent of the deviation from the standard, the corrective action taken, a record of any required notification, and the outcome of the corrective action, including all applicable dates and times.

6) The maintenance log shall be made available on such request to the *Chief Building Official*.

- 7) *Legionella pneumophila* testing shall be conducted
- in accordance with Article 2.2.1.7.,
  - on water samples collected at a point in the recirculation loop just prior to the point where treatment chemicals are injected, or where this is not feasible, from a location representative of water in the system,
  - no less than 48 hours and no more than 5 days after completion of system start-up and disinfection, and
  - as required by Sentence (8).
- 8) If a laboratory test shows that a *Legionella* result exceeds a standard set out in Table 2.2.11.6., the response set out in Table 2.2.11.6 shall be undertaken. (See Note A-2.2.11.6.(8).)

<p align="center"><b>Table 2.2.11.6.</b>  <b>Required Response to Failure to Meet <i>Legionella</i> Standards for <i>Cooling Towers</i></b>            Forming part of Sentence 2.2.11.6.(8)</p>		
Test Type	Test Result	Required Response
<i>Legionella pneumophila</i> culture test <sup>(1)</sup>	10 or more CFU / mL and less than or equal to 1,000 CFU / mL	<ol style="list-style-type: none"> <li>The owner shall give notice to the <i>Chief Building Official</i> within 24 hours.</li> <li>The owner shall, within 24 hours, either               <ol style="list-style-type: none"> <li>shut down the <i>cooling tower</i> system and perform offline cleaning and disinfection, or</li> <li>perform online remedial treatment<sup>(2)</sup> and within 7 days shut down the <i>cooling tower</i> system and perform offline cleaning and disinfection.</li> </ol> </li> <li>The owner shall perform a <i>Legionella</i> culture test<sup>(1)</sup> no less than 48 hours and no more than 5 days after cleaning and disinfection.</li> </ol>
<i>Legionella pneumophila</i> culture test <sup>(1)</sup>	Greater than 1,000 CFU / mL	<ol style="list-style-type: none"> <li>The laboratory shall immediately give notice to the owner, the <i>Chief Building Official</i> and the medical health officer<sup>(3)</sup>, and in addition, an owner who receives notice from the laboratory must give immediate notice to the <i>Chief Building Official</i> advising that the owner has been notified by the laboratory<sup>(4)</sup>.</li> <li>The owner shall immediately implement measures that will eliminate water dispersion by aerosol from the affected <i>cooling tower</i> system and then perform offline cleaning and disinfection of the system before putting the system back into service.</li> <li>The owner shall perform a <i>Legionella</i> culture test<sup>(1)</sup> no less than 48 hours and no more than 5 days after cleaning and disinfection.</li> </ol>

**Notes to Table 2.2.11.6.:**

- The *Legionella pneumophila* culture test shall conform to the requirements of Article 2.2.1.7.
- Online remedial treatment is also known as “running disinfection.”
- See Sentence 2.2.1.7.(3).
- The person giving the immediate notice shall take all reasonable steps to give notice by speaking directly to or by telephone with each person required to be notified, a person designated for this purpose by the person required to be notified, or a person answering the telephone number designated for this purpose by the person required to be notified, and follow with notice in writing to each person within 24 hours.

- 9) Offline cleaning and disinfection of a *cooling tower* shall be carried out
- a) a minimum of once every calendar year,
  - b) for any start-up at any time, and
  - c) as required by Sentence (8).

10) When a *cooling tower* has been shut down for more than 3 days, it shall be drained within 5 days of being shut down, or when this is not practical during shut downs of short duration, stagnant water shall be pre-treated with an appropriate biocide regimen before start-up, allowing for proper contact time according to the supplier's recommendations.

11) If a *cooling tower* is removed or its use is permanently discontinued, it shall be safely drained, thoroughly sanitized, and the make-up water line shall be disconnected and capped.”.

24. In the Notes to Part 2 in Book II, Division B, Council adds a new note as follows:

“Note A-2.2.11.6.(8). Required Response to Failure to Meet *Legionella* Standards. This Sentence is based on Public Services and Procurement Canada's standard MD 15161 – 2013 Control of *Legionella* in Mechanical Systems.”.

25. In Book II, Division B, Council strikes out Article 2.2.11.7. and substitutes the following:

“2.2.11.7. Decorative Water Features

(See Article 6.3.2.16. of Division B of Book I (General) of this By-law.)

- 1) An *operating permit* shall be obtained for the installation of a *decorative water feature*, or the retention of an existing *decorative water feature* except for a *decorative water feature* in a building used exclusively for residential occupancy containing no more than four principal *dwelling units*.
- 2) The following shall be posted in a location that is conspicuously visible:
  - a) the *operating permit* number assigned to the *decorative water feature*, on a sign or plate that is a minimum of 8.5 in by 11 in in size, constructed of a durable, weather resistant material and securely fastened to the *decorative water feature* or its associated mechanical equipment, and,
  - b) an advisory that the *decorative water feature* is not intended for human access, printed using a minimum letter height of 4 in and located around the perimeter of, or near an obvious access point to, the *decorative water feature*.
- 3) The *Chief Building Official* shall be notified, in the form prescribed by the *Chief Building Official*,
  - a) within 5 days of any start-up of a *decorative water feature* that had been shut down for 3 or more consecutive days,
  - b) within 5 days of any *decorative water feature* shut down for 3 or more consecutive days,
  - c) within 5 days of any *Legionella pneumophila* test result from a *decorative water feature*, or sooner as required by Sentence (8), and
  - d) within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*.



4) Where an outdoor *decorative water feature* is provided as an auxiliary system to a *building*, then the outdoor *decorative water feature* shall be considered part of the *building* for the purposes of this Article.

- 5) A maintenance log shall be maintained and shall include
- a) the address and location of the *decorative water feature*,
  - b) the *operating permit* number assigned to the *decorative water feature*,
  - c) emergency contact information and the name and contact information of the owner,
  - d) a description of the location of the operating manual for the *decorative water feature*, and as applicable, the location of safety data sheets and the location of the water management plan,
  - e) a single line schematic plan, including water sampling locations, of the *decorative water feature*,
  - f) details of any changes or alterations made to the system at any time since January 1, 2021,
  - g) a record of inspections and any maintenance performed within the last 24 months,
  - h) a record of operational disruptions within the last 24 months and the corrective actions taken,
  - i) a record of chemical treatments applied and dosages within the last 24 months,
  - j) a record of all water quality results from analyses performed within the last 24 months, and for *Legionella pneumophila* test results, the name of the person and company collecting the sample and the name of the company conducting the laboratory test, and
  - k) if a laboratory result fails to meet a standard defined in Table 2.2.11.7., a description of the extent of the deviation from the standard, the corrective action taken, a record of any required notification, and the outcome of the corrective action, including all applicable dates and times.

6) The maintenance log shall be made available on such request to the *Chief Building Official*.

- 7) *Legionella pneumophila* testing shall be conducted
- a) in accordance with Article 2.2.1.7.,
  - b) on water samples collected at a point representative of water that is aerosolized, or where this is not feasible or aerosolization is not obvious, from a location
    - i) prior to the point where treatment chemicals are injected in a recirculating system, or
    - ii) representative of water in the system in a non-recirculating system, and
  - c) as required by Sentence (8).

8) If a laboratory test shows that the *Legionella* result exceeds a standard set out in Table 2.2.11.7., the response set out in Table 2.2.11.7 shall be undertaken.

Table 2.2.11.7. Required Response to Failure to Meet <i>Legionella</i> Standards for <i>Decorative Water Features</i> Forming part of Sentence 2.2.11.7.(8)		
Test Type	Test Result	Required Response
<i>Legionella pneumophila</i> culture test <sup>(1)</sup>	10 or more CFU / mL and less than or equal to 1,000 CFU / mL	1. The owner shall give notice to the <i>Chief Building Official</i> within 24 hours. 2. The owner shall, within 24 hours, shut down the system and perform offline cleaning and disinfection. 3. The owner shall perform a <i>Legionella</i> culture test <sup>(1)</sup> no less than 48 hours and no more than 5 days after cleaning and disinfection.

<p><i>Legionella pneumophila</i> culture test<sup>(1)</sup></p>	<p>Greater than 1,000 CFU / mL</p>	<p>1. The laboratory shall immediately give notice to the owner, the <i>Chief Building Official</i> and the medical health officer<sup>(2)</sup>, and in addition, an owner who receives notice from the laboratory must give immediate notice to the <i>Chief Building Official</i> advising that the owner has been notified by the laboratory<sup>(3)</sup>.</p> <p>2. The owner shall immediately implement measures that will eliminate water dispersion by aerosol from the <i>decorative water feature</i> and then perform offline cleaning and disinfection of the system before putting the feature back into service.</p> <p>3. The owner shall perform a <i>Legionella</i> culture test<sup>(1)</sup> no less than 48 hours and no more than 5 days after cleaning and disinfection.</p>
---	------------------------------------	--

Notes to Table 2.2.11.7.:

(1) The *Legionella pneumophila* culture test shall conform to the requirements of Article 2.2.1.7.

(2) See Sentence 2.2.1.7.(3).

(3) The person giving the immediate notice shall take all reasonable steps to give notice by speaking directly to or by telephone with each person required to be notified, a person designated for this purpose by the person required to be notified, or a person answering the telephone number designated for this purpose by the person required to be notified, and follow with notice in writing to each person within 24 hours.

- 9) Offline cleaning and disinfection of a *decorative water feature* shall be carried out
- a) as recommended by the manufacturer, and at minimum of once every calendar year,
  - b) for any start-up after having been shut down for 3 or more consecutive days, and
  - c) as required by Sentence (8).

10) When a *decorative water feature* has been shut down for 3 or more consecutive days, it shall be drained within 5 days of being shut down.

11) If a *decorative water feature* is removed or its use is permanently discontinued, it shall be safely drained, thoroughly sanitized, and the make-up water line shall be disconnected and capped.”.

26. In Article 2.4.2.3. of Book II, Division B, Council:

- a) in Clause (1)(a), strikes out “and” at the end of the Clause;
- b) in Clause (2)(a), strikes out “and” at the end of the Clause;
- c) in Clause (3)(a), strikes out “and” at the end of the Clause;
- d) in Clause (1)(b), strikes out “.” and substitutes “, and”;
- e) in Clause (2)(b), strikes out “.” and substitutes “, and”;
- f) in Clause (3)(b), strikes out “.” and substitutes “, and”;
- g) adds a new Clause 1(c) as follows:

“c) is located within a single room or *suite*.”;

- h) adds a new Clause 2(c) as follows:

“c) is located within a single room or *suite*.”; and

i) adds a new Clause 3(c) as follows:

“c) is located within a single room or *suite*.”.

27. In Book II, Division B, Council strikes out Article 2.4.2.4. and substitutes the following:

“2.4.2.4. Connections to Storm Drainage Systems

1) Except as provided in Sentence (2), all roof and paved areas shall drain to a *storm drainage system*.

2) *Building* and site drainage need not connect to a *storm drainage system* if on-site rainwater or *storm water* management practices are employed and

a) rainwater or *storm water* does not create a hazardous condition or discharge upon or impact other lands or sites and

b) overflow is drained to a *storm drainage system*. (See Sentence 2.4.2.2.(1).)”.

28. In Article 2.4.6.4. in Book II, Division B, Council:

a) in Sentence (1), strikes out “(See Note A-2.4.6.4.(1).)”;

b) in Sentence (3), strikes out “a gate valve or”;

c) in Sentence (4), strikes out “Where the *fixture* is a floor drain, a removable screw cap is permitted to be installed on the upstream side of the *trap*.”, and substitutes “Deleted.”; and

d) in Sentence (5), strikes out “gate valve or”.

29. In the Notes to Part 2 in Book II, Division B, Council strikes out Note A-2.4.6.4.(1) “Backwater Valve or Gate Valve.”.

30. In Table 2.4.9.3. in Book II, Division B, Council strikes out the rows for “Shower Drain” and substitutes the following:

“

Shower drain		
Total volume of discharge from all <i>shower heads</i> :		
(a) < 9.5 LPM	1½	1½
(b) 9.5 LPM to 20 LPM	2	3
(c) > 20 LPM	3	6

”.

31. In Sentence 2.6.1.12.(1) in Book II, Division B, Council strikes out the word “electric”.

32. In the Notes to Part 2 in Book II, Division B, Council strikes out the text in Note A-2.6.1.12.(1) beginning with “Contemporary electric water heater tanks” to the end of the note.

33. In Book II, Division B, Council strikes out Article 2.6.3.3. and substitutes the following;

“2.6.3.3. Static Pressure  
(See Sentence 2.2.11.2.(2).)

1) Where the static pressure at any *fixture* may exceed 550 kPa, a pressure-reducing valve shall be installed to limit the maximum static pressure at the *fixture* to 550 kPa.”.

34. In Book II, Division B, Council strikes out Section 2.7., and substitutes the following:

“Section 2.7. Non-Potable Water Systems

2.7.1. Connection

2.7.1.1. General

1) A *non-potable water system* shall not be connected to a *potable water system*.

2) For the purpose of this Section

a) all *non-potable water systems* shall comply with Subsections 2.7.1., 2.7.2. and 2.7.3.,

b) an *alternate water source system* installed prior to January 1, 2019 shall comply with Subsection 2.7.4., and

c) an *alternate water source system* installed on or after January 1, 2019 shall comply with Subsections 2.7.5., 2.7.6., 2.7.7., and 2.7.8.

2.7.1.2. Non-potable Water Sources

1) A *non-potable water system* shall collect only

a) rainwater from roof surfaces or similar areas:

i) that do not allow the passage of vehicular traffic,

ii) that are above grade, and

iii) where hydrocarbon-based fuels, hazardous materials, or fertilizers are not stored or used on such surfaces, or

b) *clear-water waste*, or

c) both.

2) A *non-potable water system* shall not collect *perimeter drainage water, groundwater, storm water, greywater, or blackwater*.

### 2.7.1.3. Non-potable Water Uses

1) Except as provided in Sentence (2), a *non-potable water system* may use treated *non-potable water* for any of the uses set out in Columns A or B of Table 2.7.1.3.

2) An *alternate water source system* shall use treated *non-potable water* in lieu of *potable water* for all of the uses set out in Column A of Table 2.7.1.3.

3) *Non-potable water* shall not be used in lieu of *potable water* for any other uses.

**Table 2.7.1.3.**  
**Uses for Treated Non-potable Water**  
 Forming Part of Sentences 2.7.1.3.(1), (2) and (3)

Non-potable Water Source	Uses for Treated Non-potable Water	
	Column A	Column B
Rainwater as specified by Clause 2.7.1.2.(1)(a)	Water closets, urinals, and trap primers	Irrigation of non-food purpose plants, clothes washers, vehicle wash facilities <sup>(1)</sup> , make-up water for hydronic systems, make-up water for <i>cooling towers</i> , and tempering of discharge.
Clear-water waste		
Groundwater	Not permitted	
Perimeter drainage water		
Storm water		
Greywater		
Blackwater		

Notes to Table 2.7.1.3.:

(1) See Article 2.2.11.3.

4) Where the static pressure at any *fixture* in a *non-potable water system* may exceed 550 kPa, a pressure-reducing valve shall be installed to limit the maximum static pressure at the *fixture* to 550 kPa.

## 2.7.2. Identification

### 2.7.2.1. Piping and Outlet Identification

- 1) All *non-potable* water distribution system piping shall be purple in colour and conform to the requirements of NSF-rw and NSF/ANSI 14, "Plastics Piping System Components and Related Materials."
- 2) All other *non-potable* water piping shall be identified and marked in accordance with CAN/CSA-B128.1, "Design and Installation of Non-Potable Water Systems."
- 3) *Non-potable* water outlets shall be identified by a sign or plate in a location that is conspicuously visible and constructed of a durable, weather resistant material.

### 2.7.3. Location

#### 2.7.3.1. Pipes

- 1) *Non-potable* water piping shall not be located directly above
  - a) areas where food, drink or products that are intended for human consumption are prepared, handled, dispensed or stored, or
  - b) a non-pressurized or pressurized *potable* water tank.

#### 2.7.3.2. Outlets

- 1) An outlet from a *non-potable water system* shall not be located where it can discharge into
  - a) a sink or lavatory,
  - b) a *fixture* into which an outlet from a *potable water system* is discharged, or
  - c) a *fixture* that is used for the preparation, handling or dispensing of food, drink or products that are intended for human consumption.

(See Note A-2.7.3.2.(1).)

### 2.7.4. Alternate Water Source Systems Installed Prior to January 1, 2019

#### 2.7.4.1. Requirements for Alternate Water Source Systems Installed Prior to January 1, 2019

- 1) An *operating permit* shall be obtained.
- 2) The *operating permit* number assigned to the *alternate water source system* shall be posted on a sign or plate that is a minimum of 8.5 in by 11 in in size and securely fastened to the *alternate water source system* in a location that is conspicuously visible and constructed of a durable, weather resistant material.
- 3) The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with regard to the operating permit, in the form prescribed by the *Chief Building Official*.
- 4) Water quality shall comply with the water quality standards, testing, documentation, and reporting requirements set out in Articles 2.7.7.1. and 2.7.7.2.

5) If a test result shows that the water quality fails to meet any of the standards set out in Table 2.7.7.1., the response set out in Table 2.7.4.1. shall be undertaken.

**Table 2.7.4.1.**  
**Required Response to Failure to Meet Water Quality Standards for *Alternate Water Source Systems* Installed**  
**Prior to January 1, 2019**  
**Forming Part of Sentence 2.7.4.1.(5)**

Parameter	Test Result	Required Response
<i>E. coli</i> <sup>(1)</sup>	100 or more CFU per 100 mL or 100 or more MPN per 100 mL	1. The <i>owner</i> shall immediately supply the <i>alternate water source system</i> with <i>potable water</i> only; 2. The <i>owner</i> shall give notice to the <i>Chief Building Official</i> within 24 hours; and 3. The <i>owner</i> shall perform an <i>E. coli</i> test <sup>(1)</sup> and a <i>Legionella</i> culture test <sup>(1)</sup> within 5 days, but no less than 48 hours after any cleaning or disinfection.
<i>Legionella pneumophila</i> <sup>(1)</sup>	10 or more CFU per mL	
Turbidity	> 15 NTU	
Temperature	> 25°C	

Notes to Table 2.7.4.1.:

(1) See Article 2.2.1.7.

6) The *alternate water source system* shall be maintained in accordance with any manufacturer's specifications.

7) If the *alternate water source system* is in use, cross connection control tests shall be performed as required by CAN/CSA-B128.1, "Design and Installation of Non-Potable Water Systems."

#### 2.7.4.2. No Other Requirements

1) *Alternate water source systems* installed prior to January 1, 2019 need not comply with any other requirements set out in Subsections 2.7.5. through 2.7.8.

#### 2.7.5. Alternate Water Source Systems

##### 2.7.5.1. Occupancy

1) Before occupancy of a *building* is permitted, an *alternate water source system* shall be commissioned in accordance with Article 2.7.5.2., and an *operating permit* shall be obtained in accordance with Article 2.7.5.3.

##### 2.7.5.2. Commissioning

1) In order to commission an *alternate water source system*

a) the treated non-*potable* water shall be tested for *E. coli*, turbidity and *Legionella pneumophila*,

i) in accordance with Article 2.2.7.1.,

ii) on water samples collected from the sampling port required by Article 2.7.6.6.,

iii) weekly for a period of 4 weeks for *E. coli* and turbidity, and

iv) once for *Legionella pneumophila*,

b) test results shall be provided to the *Chief Building Official*, and

c) written confirmation that the *alternate water source system* operates in conformance with the operating manual shall be provided to the *Chief Building Official* by the *registered professional of record*, and a cross connection control test shall be performed and witnessed by the *Chief Building Official*.

2) If a water sample required by this Article fails to meet the standards set out in Table 2.7.7.1., an additional water sample shall be collected no less than 48 hours after any cleaning or disinfection, tested, and reported.

### 2.7.5.3. Operating Permit

1) An *operating permit* shall be obtained for an *alternate water source system*.

2) The *operating permit* number assigned to the *alternate water source system* shall be posted on a sign or plate that is a minimum of 8.5 in by 11 in in size and securely fastened to the *alternate water source system* in a location that is conspicuously visible and constructed of a durable, weather resistant material.

3) The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*, in the form prescribed by the *Chief Building Official*.

### 2.7.5.4. Continued Operation

1) Once an *operating permit* has been issued, an *alternate water source system* shall operate continuously unless written approval to discontinue its use has been obtained from the *Chief Building Official* or *City Engineer*.

## 2.7.6. Design

### 2.7.6.1. Professional Design

1) An *alternate water source system* shall be designed by a *registered professional* and shall be designed to prioritize the use of non-*potable* water.

### 2.7.6.2. Pipe Sizing



1) Except as required by Sentence (2), non-*potable* distribution piping shall be sized according to Subsection 2.6.3.

2) *Dwelling units* within a *building* with an *alternate water source system* shall be equipped with

a) tank type water closets, and

b) non-*potable* distribution piping sized in conformance with the IAPMO Water Demand Calculator.

### 2.7.6.3. Continuity of Supply and Backflow Prevention

1) A secondary water supply shall be provided.

2) An *air gap* at least two times the size of the discharge opening shall be installed for the *potable* water make-up supply.

### 2.7.6.4. Cisterns

(See Article 2.4.2.2. and Note A-2.7.6.4., 2.7.6.5. and 2.7.6.6.)

1) Provision shall be made upstream of the *cistern* to remove the accumulation of particulates and impurities before they enter the *cistern*.

2) *Cisterns* shall be secured to prevent tampering and unintended or unauthorized entry either by a lockable device or another *approved* method, and all penetrations shall be sealed to prevent insect or vermin entry.

3) Water shall be withdrawn a minimum of 0.3 m from the base of the *cistern*.

### 2.7.6.5. Water Metering

(See Note A-2.7.6.4., 2.7.6.5. and 2.7.6.6.)

1) A water meter shall be installed and located within 1.5 m of the *potable* water make-up supply and shall be capable of recording the volume of *potable* water being supplied.

2) A water meter shall be installed and located on the non-*potable* water outlet prior to distribution and shall be capable of recording the volume of non-*potable* water being supplied to the distribution piping.

3) Water meters required by Sentences (1) and (2) shall be capable of displaying volumes in units of L or cubic m.

### 2.7.6.6. Water Quality Sampling and Alerts

(See Article 2.2.1.7. and Note A-2.7.6.4., 2.7.6.5. and 2.7.6.6.)

1) A sampling port, and provision for continuous in-line measurements required in order to conform with Table 2.7.7.1., shall be installed and located downstream of the water meter at the non-*potable* water outlet and prior to distribution.

2) All monitoring devices referred to in Sentence (1) shall be capable of activating an *alert* that is designed to activate continuously for the duration of the *alert* condition whenever the water quality fails to meet the standards set out in Table 2.7.7.1.

**2.7.6.7. Power Interruption**

1) If a *building* is required to have an emergency system generator, provision shall be made for the continued operation of any mandatory uses for non-*potable* water described in Sentence 2.7.1.3.(2) in the event of a power interruption.

**2.7.7. Water Quality Standards**

**2.7.7.1. Water Quality Standards, Testing, and Documentation**

- 1) Water quality shall meet the standards set out in Table 2.7.7.1.
- 2) Water quality shall be tested as set out in Table 2.7.7.1.
- 3) All test results shall be documented as set out in Table 2.7.7.1., and documentation shall be retained for no less than 24 months.

Table 2.7.7.1.  
Water Quality Standards, Testing, and Documentation  
Forming Part of Sentences 2.7.7.1.(1), (2), and (3)

Applicability	Parameter	Standard	Testing Type and Frequency	Testing Result Documentation Requirement
Any non- <i>potable</i> water source	Temperature	< 20°C	Continuous	Daily <sup>(1)</sup>
Any non- <i>potable</i> water source	Turbidity	< 10 NTU	Daily <sup>(1)</sup> , and 1 sample tested by a laboratory every 2 months with not more than 63 days between samples	Daily <sup>(1)</sup> , plus all laboratory tests
Any non- <i>potable</i> water source	<i>E. coli</i> <sup>(2)</sup>	< 100 CFU per 100 mL or < 100 MPN per 100 mL	1 sample tested every 2 months with not more than 63 days between samples	All laboratory tests
Any non- <i>potable</i> water source	<i>Legionella pneumophila</i> <sup>(2)</sup>	< 10 CFU per mL	As required by Article 2.7.5.2.	All laboratory tests

Notes to Table 2.7.7.1.:

- (1) For the purpose of this Table, the term “daily” shall mean once per day when the *building* is normally occupied.
- (2) See Article 2.2.1.7.

### 2.7.7.2. Water Quality Reporting

1) Water quality reports shall be submitted to the *Chief Building Official* before the end of the second month following the issuance of an *operating permit*, and then every 2 months thereafter, and shall include

- a) all documentation required by Sentence 2.7.7.1.(3) and
- b) except as provided in Sentence 2.7.4.2.(1), readings from the water meters required by Article 2.7.6.5.

### 2.7.7.3. Required Response to Failure to Meet Water Quality Standards

1) If a test result shows that the water quality fails to meet a standard set out in Table 2.7.7.1., the response set out in Table 2.7.7.3 shall be undertaken.

Table 2.7.7.3.  
Required Response to Failure to Meet Water Quality Standards for *Alternate Water Source Systems*  
Forming Part of Sentence 2.7.7.3.(1)

Parameter	Test Result	Required Response
Turbidity	Between 10 and 15 NTU	The <i>owner</i> shall take the appropriate corrective action as set out in the operating manual.
Temperature	20°C to 25°C	
<i>E. coli</i> <sup>(1)</sup>	100 or more CFU per 100 mL or 100 or more MPN per 100 mL	1. The <i>owner</i> shall immediately supply the <i>alternate water source system</i> with <i>potable water</i> only; 2. The <i>owner</i> shall give notice to the <i>Chief Building Official</i> within 24 hours; 3. The <i>owner</i> shall take the appropriate corrective action as set out in the operating manual; and 4. The <i>owner</i> shall perform an <i>E. coli</i> test <sup>(1)</sup> and a <i>Legionella</i> culture test <sup>(1)</sup> within 5 days, but no less than 48 hours after any cleaning or disinfection.
<i>Legionella pneumophila</i> <sup>(1)</sup>	10 or more CFU per mL	
Turbidity	> 15 NTU	
Temperature	> 25°C	

Notes to Table 2.7.7.3.:

- (1) See Article 2.2.1.7.

## 2.7.8. Operating Manual and Maintenance

### 2.7.8.1. Operating Manual

1) An operating manual shall be supplied to the *owner* or representative of the owner by the designer of the *alternate water source system* and shall be stamped by a *registered professional of record*, and shall include the following

- a) address and location of the *alternate water source system*,
- b) system designer contact details,
- c) a simplified process flow diagram,
- d) a schematic of the entire system showing locations of all system components,
- e) instructions on operating, maintaining, and inspecting the system,
- f) required frequency of maintenance and inspections,
- g) instructions on deactivating and restarting the system for repair or other purposes,
- h) details on the corrective action that shall be taken if the water quality fails to meet the standards set out in Table 2.7.7.1., and
- i) safety data sheets.

### 2.7.8.2. Maintenance

1) *Alternate water source systems* shall be maintained in accordance with the operating manual and any manufacturer's specifications.

2) Cross connection control tests shall be performed as required by CAN/CSA-B128.1, "Design and Installation of Non-Potable Water Systems."

3) A maintenance log shall be maintained and shall include

- a) the address and location of the *alternate water source system*,
- b) the name and contact information of the *owner*,
- c) a record of inspections and any maintenance performed within the last 24 months,
- d) details of any changes or alterations made to the system at any time after commissioning,
- e) a record of water quality test results as set out in Article 2.7.7.1., including the name of the person and company conducting the test,
- f) copies of water quality reports prepared and submitted in accordance with Article 2.7.7.2 within the last 24 months, and
- g) if a water quality test fails to meet a standard defined in Table 2.7.7.1., a description of the extent of the deviation from the standard, the corrective action taken, a record of any required notification, and the outcome of the corrective action, including all applicable dates and times.

### 2.7.8.3. Request for Operating Manual or Maintenance Log

1) The operating manual and the maintenance log shall be made available on such request to the *Chief Building Official* or *City Engineer*."

35. In the Notes to Part 2 in Book II, Division B, Council renumbers Note A-2.7.6.7, 2.7.6.8 and 2.7.6.9 as Note A-2.7.6.4, 2.7.6.5 and 2.7.6.6.

36. In Book II, Division B, Table 2.8.1.1., Council:

a) adds, in correct numerical order, as follows:

“

<b>2.2.1.7. Microbiological Testing</b>	
(1)	[F40,F41,F43,F81,F82-OS3.4,OH5]
(2)	[F40,F41,F43,F81,F82-OS3.4,OH5]
(3)	[F30,F40,F41,F43,F81,F82-OS3.1,OS3.4,OH1.1,OH2.1,OH2.3,OH5]

”  
;

b) strikes out all of the rows for section “2.2.5.1. Asbestos-Cement Pipe and Fittings”, including the title, and substitutes as follows:

“

<b>2.2.5.1. Fibrocement Pipe and Fittings</b>	
(1)	[F20-OH2.1] [F20-OP5]
(3)	[F40-OH2.4] [F41,F43-OP5] as it applies to the installation of piping

”  
;

c) adds, in correct numerical order, as follows:

“

<b>2.2.5.15. Cellular Core PVC Pipe and Fittings</b>	
(1)	[F20-OH2.1,OH2.2,OH2.3] [F20-OP5]
(2)	[F20-OH2.1,OH2.2,OH2.3] [F20-OP5]

”  
;

d) adds a new row under the title “2.2.10.6. Supply and Waste Fittings”, in the correct numerical order, as follows:

“

(7)	[F40,F41,F43,F46,F71,F81,F82-OS3.4,OH1.1,OH2.3,OH5]
-----	---

”  
;

e) strikes out all of the rows for section “2.2.10.8. Direct Flush Valves”, including the title, and substitutes as follows:

“

<b>2.2.10.8. Direct Flush Valves</b>	
(1)	[F81-OH2.1] (a), (b) and (e) [F81-OP5]

”  
;

f) adds, in correct numerical order, as follows:

“

<b>2.2.10.18. Flexible Water Connectors</b>	
---	--

(1)	[F81-OP5] [F46-OH2.2]
-----	--------------------------

”;  
;

- g) adds a new row under the title “2.2.11.3. Vehicle Wash Facilities”, in the correct numerical order, as follows:

“

(3)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
-----	---------------------------------------

”;  
;

- h) strikes out all of the rows for section “2.2.11.6. Cooling Towers”, including the title, and substitutes as follows:

“

<b>2.2.11.6. Cooling Towers</b>	
(1)	[F40,F41,F43,F46,F81,F82-OS3.4,OH1.1,OH2.2,OH5,OP5]
(2)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH1.1,OH2.2,OH5,OP5,OE1.2]
(4)	[F40,F41,F43,F46,F81,F82-OS3.4,OH1.1,OH2.2,OH5,OP5]
(5)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH1.1,OH2.2,OH5,OP5,OE1.2]
(7)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(8)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(9)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(10)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(11)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH1.1,OH2.2,OH5,OP5,OE1.2]

”;  
;

- i) strikes out all of the rows for section “2.2.11.7. Indoor and Outdoor Decorative Water Features”, including the title, and substitutes as follows:

“

<b>2.2.11.7. Decorative Water Features</b>	
(1)	[F40,F41,F43,F46,F81,F82-OS3.4,OH1.1,OH2.2,OH5,OP5]

(2)	[F30-OS3.1,OS3.4,OH2.2,OH2.4,OH5]
(3)	[F40,F41,F43,F46,F81,F82-OS3.4,OH1.1,OH2.2,OH5,OP5]
(5)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH1.1,OH2.2,OH5,OP5,OE1.2]
(7)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(8)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(9)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(10)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(11)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH1.1,OH2.2,OH5,OP5,OE1.2]

”;

j) adds, in correct numerical order, as follows:

“

<b>2.4.2.4. Connections to Storm Drainage Systems</b>	
(2)	[F30,F62,F81,F82-OS3.1,OP5]

”; and

k) strikes out all of the rows commencing with “2.7.1.1. Not Permitted”, including the titles, up to and including the last row of the table, and substitutes as follows:

“

<b>2.7.1.1. General</b>	
(1)	[F46-OH2.2]
<b>2.7.1.2. Non-potable Water Sources</b>	
(1)	[F40,F43,F46,F81-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(2)	[F40,F43,F46,F81-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
<b>2.7.1.3. Non-potable Water Uses</b>	
(1)	[F130-OE1.2]
(2)	[F130-OE1.2]
(3)	[F46,F70-OS3.4,OH2.2,OH2.3]
(4)	[F81-OS3.2]
<b>2.7.2.1. Piping and Outlet Identification</b>	
(1)	[F46-OH2.2]
(2)	[F46-OH2.2]
(3)	[F46-OH2.2]
<b>2.7.3.1. Pipes</b>	

(1)	[F46-OH2.2]
<b>2.7.3.2. Outlets</b>	
(1)	[F46-OH2.2]
<b>2.7.4.1. Requirements for Alternate Water Source Systems Installed Prior to January 1, 2019</b>	
(1)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(2)	[F81-OH2.2]
(3)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(4)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(5)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(6)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(7)	[F46,F81,F82-OS3.4,OH2.1,OH2.2,OH5]
<b>2.7.5.1. Occupancy</b>	
(1)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
<b>2.7.5.2. Commissioning</b>	
(1)	[F46,F81,F82-OS3.4,OH2.1,OH2.2,OH5]
(2)	[F46,F81,F82-OS3.4,OH2.1,OH2.2,OH5]
<b>2.7.5.3. Operating Permit</b>	
(1)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(3)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH1.1,OH2.2,OH5,OE1.2]
<b>2.7.5.4. Continued Operation</b>	
(1)	[F81,F82,F130-OH5,OP5,OE1.2]
<b>2.7.6.1. Professional Design</b>	
(1)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
<b>2.7.6.2. Pipe Sizing</b>	
(1)	[F71,F72-OH2.1,OH2.3]
(2)	[F71,F72-OH2.1,OH2.3]
<b>2.7.6.3. Continuity of Supply and Backflow Prevention</b>	
(1)	[F71,F72-OH2.1,OH2.3]
(2)	[F46,F81,F82-OS3.4,OH2.1,OH2.2,OH5]
<b>2.7.6.4. Cisterns</b>	
(1)	[F40,F81-OH2.1,OH2.3]
(2)	[F40,F81-OH2.1,OH2.3]
(3)	[F40,F81-OH2.1,OH2.3]
<b>2.7.6.5. Water Metering</b>	
(1)	[F130-OE1.2]
<b>2.7.6.6. Water Quality Sampling and Alerts</b>	
(1)	[F82-OS3.4,OH2.1,OH2.3,OH5]
(2)	[F82-OS3.4,OH2.1,OH2.3,OH5]



<b>2.7.6.7. Power Interruption</b>	
(1)	[F71,F72,F81-OS3.4,OH2.1,OH2.3,OH5]
<b>2.7.7.1. Water Quality Standards, Testing, and Documentation</b>	
(1)	[F40,F43,F71,F72,F81,F82-OS3.4,OH2.1,OH2.3,OH5]
(2)	[F40,F43,F71,F72,F81,F82-OS3.4,OH2.1,OH2.3,OH5]
(3)	[F40,F43,F71,F72,F81,F82-OS3.4,OH2.1,OH2.3,OH5]
<b>2.7.7.2. Water Quality Reporting</b>	
(1)	[F40,F43,F71,F72,F81,F82-OS3.4,OH2.1,OH2.3,OH5]
<b>2.7.7.3. Required Response to Failure to Meet Water Quality Standards</b>	
(1)	[F40,F43,F71,F72,F81,F82-OS3.4,OH2.1,OH2.3,OH5]
<b>2.7.8.1. Operating Manual</b>	
(1)	[F82-OS3.4,OH2.1,OH2.3,OH5,OE1.2]
<b>2.7.8.2. Maintenance</b>	
(1)	[F82-OS3.4,OH2.1,OH2.3,OH5,OE1.2]
(2)	[F46,F81,F82-OS3.4,OH2.1,OH2.2,OH5]
(3)	[F82-OS3.4,OH2.1,OH2.3,OH5,OE1.2]
<b>2.7.8.3. Request for Operating Manual or Maintenance Log</b>	
(1)	[F82-OS3.4,OH2.1,OH2.3,OH5,OE1.2]

”.

37. In Book II, Division C, Council strikes out Article 1.6.3.7. and substitutes as follows:

“1.6.3.7. Authorization for Use

1) No person shall use a plumbing system or sprinkler system until it has been authorized for use by the *Chief Building Official*.”.

38. In Book I, Division B, Council strikes out in Table 1.3.1.2. the By-law References for the row “ASHRAE Guideline 12-2000” and substitutes as follows:

“6.2.1.1.(1)  
6.3.2.15.(11)  
6.3.2.16.(1)”.

39. In Book I, Division B, Council strikes out in Table 1.3.1.2. the By-law Reference “6.3.2.15.(1)” for the row “CSA CAN/CSA-Z317.2-10” and substitutes “6.3.2.15.(7)”.

40. In Book I, Division B, Council adds a new row in Table 1.3.1.2. in correct alphabetical order, as follows:

“

Issuing Agency	Document Number	Title of Document	By-law Reference
ANSI/ASHRAE	188-2018	Legionellosis: Risk Management for Building Water Systems	A-6.2.1.1.

41. In Sentence 6.2.1.1.(1) in Book I, Division B, Council:

- a) in Clause (h), strikes out “and” at the end of the Clause;
- b) in Clause (i), strikes out “.” at the end of the Clause and substitutes “,” and”; and
- c) adds a new Clause (j) as follows:

“(j) ASHRAE Guideline 12, “Minimizing the Risk of Legionellosis Associated with Building Water Systems.””.

42. In the Notes to Part 6 in Book I, Division B, Council adds the following new Note, in the correct numerical order:

“Note A-6.2.1.1. Good Engineering Practice.

#### Legionella Control

HVAC designers should either develop a water management plan or complete a formal risk and hazard assessment to determine what measures are required for the control of legionella. The risk and hazard assessment should include inspections of the building and its surroundings to locate potential sources of legionella and to identify equipment or systems that could promote the growth and spread of legionella. The assessment should also evaluate the risk to building occupants that is associated with any identified equipment or systems, taking into account their design, location and operating conditions.

Further information on minimizing the growth and spread of legionella can be found in the following publications:

- ANSI/ASHRAE 188-2018, “Legionellosis: Risk Management for Building Water Systems,”
- “Developing a Water Management Program to Reduce Legionella Growth & Spread in Buildings” (U.S. Centers for Disease Control and Prevention, 2017),
- “Legionella and Legionnaires’ Disease: A Policy Overview” (European Agency for Safety and Health at Work, 2011),
- “Legionella and the Prevention of Legionellosis” (World Health Organization, 2007),
- “Legionnaires’ Disease: Technical Guidance: Part 1: The Control of Legionella Bacteria in Evaporative Cooling Systems, and Part 3: The Control of Legionella Bacteria in Other Risk Systems” (U.K. Health and Safety Executive, 2013), and
- “Recognition, Evaluation and Control of Legionella in Building Water Systems” (American Industrial Hygiene Association, 2015).”.

43. In Sentence 6.3.1.6.(1) of Book I, Division B, Council strikes out “that are released”.

44. In Note A-6.3.1.6. Indoor Air Contaminants in the Notes to Part 6 in Book I, Division B, Council:

- a) strikes out “cafeteria dishwasher drainage leaks.”;
- b) strikes out “infectious”;
- c) strikes out “legionnaires’ disease” and substitutes “legionellosis”; and

d) adds a new item (c) to the second paragraph as follows:

“c) HVAC systems that generate condensate or introduce liquid water into the airstream in the ducts require adequate drainage of excess water and, in some cases, a means of capturing air-entrained water droplets. These measures reduce the potential for bio-contaminants, including legionella, to proliferate in stagnant water and for water droplets containing bio-contaminants to be introduced into the airstream and contaminate the indoor environment. (See also Article 6.3.2.2.)”

45. In Book I, Division B, Council strikes out Article 6.3.2.2. and substitutes the following;

**“6.3.2.2. Drain Pans**  
(See Note A-6.3.2.2.)

1) HVAC systems that generate condensate or introduce liquid water into the airstream in the ducts shall be equipped with drain pans that are

a) designed in accordance with Section 5.10, Drain Pans, of ANSI/ASHRAE 62.1, "Ventilation for Acceptable Indoor Air Quality,"

b) provided with an outlet that is piped to the outside of the airstream in a location where condensate can be safely disposed of,

c) installed so that water does not stagnate and drains from the pan, and

d) designed and installed so as to be accessible for cleaning and maintenance.

2) Drain pans and associated piping shall be constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms.”

46. In the Notes to Part 6 in Book I, Division B, Council adds the following new Note, in the correct numerical order:

**“Note A-6.3.2.2. Stagnant Water in Drain Pans.**

It is important to eliminate stagnant water as it can promote the proliferation of disease-causing micro-organisms, such as legionella. Of particular concern is the potential for legionella bacteria in water to become airborne in water droplets or mist that can be inhaled by humans or can contaminate other water sources or systems.”

47. In Table 6.3.2.9. in Book I, Division B, Council adds “an evaporative heat rejection system such as an” before “evaporative cooling tower”.

48. In Book I, Division B, Council strikes out Article 6.3.2.15. and substitutes the following:

**“6.3.2.15. Evaporative Cooling Towers, Evaporative Fluid Coolers and Evaporative Condensers (Evaporative Heat Rejection Systems)**  
(See Article 2.2.11.6. of Division B of Book II (Plumbing Systems) of this By-law.)

- 1) Evaporative heat rejection systems shall
  - a) incorporate a drift eliminator or other means to minimize the dispersion of entrained water droplets, and
  - b) have a design discharge velocity that does not exceed the maximum discharge velocity recommended by the manufacturer.
- 2) Evaporative heat rejection systems shall be designed so that water continuously circulates through all parts of the system that are normally wetted when the system is operating.
- 3) Evaporative heat rejection systems and their components shall be constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms and that are compatible with disinfectants, biocides and other cleaning agents.
- 4) Evaporative heat rejection systems shall be installed such that
  - a) no discharge air bypasses the drift eliminator or other means referred to in Clause (1)(a), and
  - b) the systems are accessible for cleaning, inspection and maintenance.
- 5) Deleted.
- 6) Except as provided in Sentence (7), air discharged from evaporative heat rejection systems shall discharge away from the building, so as to not re-enter it, to a distance not less than
  - a) 2.15 m above sidewalks and driveways,
  - b) 7.6 m from outdoor air intakes,
  - c) 3 m horizontally or vertically from exterior doors and operable windows, and
  - d) 3 m horizontally or vertically from occupiable outdoor spaces, excluding maintenance spaces.(See Note A-6.3.2.15.(6) and (7).)
- 7) Air discharged from evaporative heat rejection systems in health care facilities shall discharge away from the building in compliance with CAN/CSA-Z317.2, "Special Requirements for Heating, Ventilation, and Air-Conditioning (HVAC) Systems in Health Care Facilities." (See Note A-6.3.2.15.(6) and (7).)
- 8) Deleted.
- 9) Air intakes of evaporative heat rejection systems shall incorporate protective measures to minimize the entrainment of vegetation and other organic matter.
- 10) Deleted.
- 11) Water treatment systems and equipment for controlling the proliferation of disease-causing micro-organisms shall
  - a) be provided in accordance with Section 7.6.2. of ASHRAE Guideline 12, "Minimizing the Risk of Legionellosis Associated with Building Water Systems," and
  - b) include means for drainage, dilution, cleaning, and application of chemicals for the control of scale, corrosion and biological contamination.(See Note A-6.3.2.15.(11).)
- 12) Deleted.

13) Evaporative heat rejection systems shall be provided with access openings, service platforms, fixed ladders and fall-restraint connections to allow inspection, maintenance and testing, and a sampling port shall be installed at a point in the recirculation loop just prior to the point where treatment chemicals are injected.”.

49. In the Notes to Part 6 in Book I, Division B, Council adds the following new Notes, in the correct numerical order:

**“Note A-6.3.2.15.(6) and (7) Minimum Distances.**

Ensuring adequate distance between the air discharge locations of evaporative heat rejection systems and certain outdoor spaces and building components minimizes the potential for contamination of the air of occupiable spaces. For example, if a building’s ventilation air intake were located too close to an air discharge location of an evaporative heat rejection system, warm discharge air and associated drift, which could contain biological contaminants, could be introduced to the indoor environment through the air intake.

The minimum distances stated in Sentences 6.3.2.15.(6) and (7) may need to be increased where warranted by local conditions such as prevailing winds, adjacent structures, or special processes being carried out, any of which would make further analysis necessary. (See also Sentence 6.3.3.1.(2).)

**Note A-6.3.2.15.(11) Assessment of System and Make-Up Water.**

The chemical characteristics of the water in the evaporative heat rejection system and of the make-up water should be assessed to select a suitable water treatment system.”.

50. In Book I, Division B, Council strikes out Article 6.3.2.16. and substitutes the following;

**“6.3.2.16. Evaporative Air Coolers, Misters, Atomizers, Air Washers and Humidifiers**  
(See Article 2.2.11.7. of Division B of Book II (Plumbing Systems) of this By-law.)

1) Evaporative air coolers, misters, atomizers, air washers and humidifiers shall be designed in accordance with Sections 8 and 9 of ASHRAE Guideline 12, “Minimizing the Risk of Legionellosis Associated with Building Water Systems.”

2) Systems referred to in Sentence (1) shall

- a) be designed so that water continuously circulates through all parts of the system that are normally wetted when the system is operating, and
- b) incorporate a method of preventing water stagnation within the system itself and the internal plumbing when the system is not operating.

(See Note A-6.3.2.16.(2).)

3) All components of systems referred to in Sentence (1), including filters and evaporation media, shall be constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms.

4) Associated sumps shall

- a) be constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms,
- b) include auxiliary drains to prevent the overflow of water into ductwork, and

c) be installed so that they can be flushed, drained, cleaned and disinfected.

- 5) Where misters, atomizers or air washers are used in ductwork, the affected duct section shall be
- a) designed to ensure drainage of unevaporated and accumulated water, and
  - b) constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms.

6) Deleted.”.

51. In the Notes to Part 6 in Book I, Division B, Council adds the following new Notes, in the correct numerical order:

“Note A-6.3.2.16.(2) Prevention of Water Stagnation.

Common strategies to prevent water stagnation include flushing, providing an inactivity drain, and periodic activation even with no load.

Note A-6.3.2.16.(6) Assessment of Make-Up Water.

The chemical characteristics of the make-up water should be assessed to ensure that any chemicals added to a system referred to in Sentence 6.3.2.16.(1) for precipitation control, disinfection or another purpose will not adversely affect the system.”.

52. In Book I, Division B, Table 6.10.1.1., Council

- a) strikes out all of the rows for section “6.2.1.1. Good Engineering Practice”, including the title, and substitutes as follows:

“

<b>6.2.1.1. Good Engineering Practice</b>	
(1)	(a) to (e) [F31,F51-OP1.1]
	(a) to (c) and (e) to (i) [F40,41,F50,F51,F54,F63-OH1.1]
	(a), (b), (c), (e), (f), (g), (h) [F50,F51,F52,F54,F63-OH1.2,OH1.3]
	[F31,F50,F51,F52,F54,F63-OS3.2,OS3.4]
	(d) [F01-OS-1.1]

”;

- b) strikes out all of the rows for section “6.3.2.2. Drain Pans”, including the title, and substitutes as follows:

“

<b>6.3.2.2. Drain Pans</b>	
(1)	[F40,F41,F44,F50,F82-OH1.1]
(2)	[F40,F41,F44,F50-OH1.1]

”;

- c) strikes out all of the rows for section “6.3.2.15. Evaporative Cooling Towers, Evaporative Fluid Coolers and Evaporative Condensers”, including the title, and substitutes as follows:

“

<b>6.3.2.15. Evaporative Cooling Towers, Evaporative Fluid Coolers and Evaporative Condensers</b>	
---	--

(1)	[F40,F41,F50-OH1.1]
(2)	[F40,F41,F50-OH1.1]
(3)	[F40,F41,F50-OH1.1]
(4)	[F40,F41,F50-OH1.1]
(6)	[F40,F41,F50-OH1.1]
(9)	[F40,F41,F50-OH1.1]
(11)	[F40,F41,F50-OH1.1]
(13)	[F40,F41,F50,F82-OH1.1]
	[F82-OS3.1]

”; and

- d) strikes out all of the rows for section “6.3.2.15. Evaporative Cooling Towers, Evaporative Fluid Coolers and Evaporative Condensers”, including the title, and substitutes as follows:

“

<b>6.3.2.16. Evaporative Air Coolers, Misters, Atomizers, Air Washers and Humidifiers</b>	
(1)	[F40,F41,F50-OH1.1]
(2)	[F40,F41,F50-OH1.1]
(3)	[F40,F41,F50-OH1.1]
(4)	[F40,F41,F50-OH1.1]
	[F40,F41,F50,F82-OH1.1]
(5)	[F40,F41,F50-OH1.1]

”.

53. In Sentence 2.2.11.6.(6) of Book II, Division B, Council:
- in Clause (c) strikes out “and” at the end of the Clause;
  - renumbers Clause (d) as Clause (e); and
  - inserts a new Clause (d) as follows:

“d) at minimum, while the *cooling tower* is in operation, each calendar month of operation, with not more than 33 days between sample, and”.

54. In Sentence 2.2.11.6.(7) of Book II, Division B, Council:
- in Clause (b) strikes out “and” at the end of the Clause;
  - renumbers Clause (c) as Clause (d); and
  - inserts a new Clause (c) as follows:

“c) at minimum, while the *decorative water feature* is in operation, every 2 calendar months of operation, with not more than 63 days between samples, and”.

55. In Book II, Division B, Council strikes out Article 2.7.7.1 and substitutes the following:

**“2.7.7.1. Water Quality Standards, Testing, and Documentation**

- Water quality shall meet the standards set out in Table 2.7.7.1.
- Water quality shall be tested as set out in Table 2.7.7.1.

3) All test results shall be documented as set out in Table 2.7.7.1., and documentation shall be retained for no less than 24 months.

Table 2.7.7.1.  
Water Quality Standards, Testing, and Documentation  
Forming Part of Sentences 2.7.7.1.(1), (2), and (3)

Applicability	Parameter	Standard	Testing Type and Frequency	Testing Result Documentation Requirement
Any non-potable water source	Temperature	< 20°C	Continuous	Daily <sup>(1)</sup>
Any non-potable water source	Turbidity	< 10 NTU	Daily <sup>(1)</sup> , and 1 sample tested by a laboratory every 2 months with not more than 63 days between samples	Daily <sup>(1)</sup> , plus all laboratory tests
Any non-potable water source	<i>E. coli</i> <sup>(2)</sup>	< 100 CFU per 100 mL or < 100 MPN per 100 mL	1 sample tested every 2 months with not more than 63 days between samples	All laboratory tests
Any non-potable water source	<i>Legionella pneumophila</i> <sup>(2)</sup>	< 10 CFU per mL	1 laboratory sample tested every 2 months, with not more than 63 days between samples	All laboratory tests

Notes to Table 2.7.7.1.:

(1) For the purpose of this Table, the term “daily” shall mean once per day when the *building* is normally occupied.

(2) See Article 2.2.1.7.”.

56. In Book II, Division C, Council strikes out Article 1.6.9.3. and substitutes the following:

**“1.6.9.3. Application Requirements**

1) To obtain an *operating permit*, the *owner* shall file an application in writing in the form prescribed by the *Chief Building Official* and be certified under the Environmental Operators Certification Program.”.

57. In Part C – Operating Permits, in the Schedule of Fees of Division C of Book II, Council strikes out:

“For each OPERATING PERMIT.....\$00.00”



and substitutes:

“For the first OPERATING PERMIT relating to equipment or systems  
in a BUILDING.....\$250.00  
For each additional OPERATING PERMIT relating to equipment or systems  
in the same BUILDING.....\$100.00”.

58. A decision by a court that any part of this By-law is illegal, void, or unenforceable severs that part from this By-law, and is not to affect the balance of this By-law.

59. This By-law is to come into force and take effect on January 1, 2021, except that sections 53, 54, 55, 56 and 57 are to come into force and effect on January 1, 2022.

ENACTED by Council this \_\_\_\_\_ day of \_\_\_\_\_, 2020

\_\_\_\_\_  
Mayor

\_\_\_\_\_  
Acting City Clerk

**A By-law to amend Gas Fitting By-law No. 3507  
Regarding the Safety Standards Act and the Gas Safety Regulation**

Following the Standing Committee on City Finance and Services on June 10, 2020, Council resolved to amend the Gas Fitting By-law No. 3507 to reflect the Provincial legislation governing gas safety and to make various housekeeping amendments to the Fee Schedule, with provisions to come into force and take effect upon enactment, except the section amending the Fee Schedule (section 4), which will come into force and take effect on October 1, 2020. The attached By-law will accomplish Council's resolution.

Director of Legal Services  
June 23, 2020

## BY-LAW NO.

### **A By-law to amend Gas Fitting By-law No. 3507 Regarding the Safety Standards Act and the Gas Safety Regulation**

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This By-law amends the indicated provisions of Gas Fitting By-law No. 3507.
2. Council strikes out sections 2 through 11 and substitutes the following:
  - “2. In this By-law, unless the context otherwise requires:
    - “appliance” has the same meaning as in the *Gas Safety Regulation* (BC);
    - “fully detached dwelling” has the same meaning as in the *Gas Safety Regulation* (BC);
    - “gas” has the same meaning as in the *Gas Safety Regulation* (BC);
    - “gas equipment” has the same meaning as in the *Gas Safety Regulation* (BC);
    - “gas system” has the same meaning as in the *Gas Safety Regulation* (BC);
    - “homeowner” has the same meaning as in the *Gas Safety Regulation* (BC);
    - “meter” has the same meaning as in the *Gas Safety Regulation* (BC);
    - “regulated work” has the same meaning as in the *Safety Standards Act* (BC);
    - “safety manager” has the same meaning as in the *Safety Standards Act* (BC);
    - “safety officer” has the same meaning as in the *Safety Standards Act* (BC); and
    - “service meter” has the same meaning as in the *Gas Safety Regulation* (BC).
3. A person must obtain a gas permit before performing the following kinds of regulated work in respect of gas equipment or gas systems:
  - (a) regulated work in a fully detached dwelling serviced by an individual service meter and supplied with gas at a pressure of 14.0 kPa gauge or less; and
  - (b) regulated work in any premises other than a fully detached dwelling, if:
    - (i) the meter is supplied with gas as a pressure of 14.0 kPa gauge or less, and
    - (ii) the total connected load for the meter is 120 kW or less.
4. Gas permits will only be issued to individuals who are authorized to perform the regulated work under the *Gas Safety Regulation* (BC).

5. Despite section 4, a gas permit may be issued to a homeowner to perform regulated work with respect to gas equipment in a fully detached dwelling if:
  - (a) no person is being paid to do, or assist the owner in doing, the work; and
  - (b) no part of the dwelling is rented to any person.
6. At the time of applying for a gas permit, an applicant must pay the applicable fee as set out in the Fee Schedule attached to this By-law.
7. On payment of any additional required fee, a safety manager or safety officer may amend a permit to allow additional regulated work to be performed under the permit.
8. If a reinspection of any work performed under the permit is required for any reason, including reinspections required due to faulty work or materials, or incomplete work, a permit holder must pay the reinspection fee as set out in the Fee Schedule attached to this By-law.
9. A permit may be revoked if, in the opinion of a safety manager or a safety officer:
  - (a) the work authorized by the permit is not commenced within ninety days from the date of the issue of the permit;
  - (b) the work authorized by the permit, though commenced, is not continuously and actively carried out thereafter; or
  - (c) the work authorized by the permit has been substantially discontinued for a period of 180 days.”.
3. Council renumbers sections 12, 12A, and 12B as sections 10, 11 and 12, respectively.
4. Council strikes out the Fee Schedule in Appendix A, and substitutes the Fee Schedule set out in Appendix A attached to this By-law.
5. A decision by a court that any part of this By-law is illegal, void, or unenforceable severs that part from this By-law, and is not to affect the balance of this By-law.
6. This By-law is to come into force and take effect on the date of its enactment, except that section 4 comes into force and takes effect on October 1, 2020.

ENACTED by Council this \_\_\_\_\_ day of \_\_\_\_\_, 2020

\_\_\_\_\_  
Mayor

\_\_\_\_\_  
Acting City Clerk

## Appendix A

### Fee Schedule

#### **Installations**

One, two or three appliances	\$212.00
Each additional appliance	\$67.00
Each replacement water heater, gas range, furnace or boiler	\$50.00

Each additional gas meter of a multifamily dwelling (same appliance count)	\$50.00
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#### **Piping Permits** (no appliances)

For first 60 m of piping or part thereof	\$212.00
Every 30 m or part thereof exceeding the first 60 m	\$81.90

#### **Reinspections**

For each reinspection	\$212.00
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**EXPLANATION****A By-law to amend  
Zoning and Development By-law No. 3575  
regarding floor space below finished grade**

Following the Public Hearing on November 5, 2019, Council resolved to amend the Zoning and Development By-law to repair and clarify the regulations for the construction of basements and cellars in new houses. The Director of Planning has advised that there are no prior to conditions and enactment of the attached By-law will implement Council's resolution.

Director of Legal Services  
June 23, 2020

**BY-LAW NO. \_\_\_\_\_**

**A By-law to amend  
Zoning and Development By-law No. 3575  
regarding floor space below finished grade**

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This By-law amends the indicated provisions of the Zoning and Development By-law.

2. In section 3.2, Council:

(a) inserts the following as a new section 3.2.11:

“3.2.11 The Director of Planning, on the advice of the Chief Building Official, may relax any necessary provisions in an RS district schedule in order to permit additional above grade floor area if soil or hydrological conditions on a site are not suitable to below grade construction, provided that:

(a) the soil or hydrological conditions are documented to the satisfaction of the Director of Planning; and

(b) the area of all floors at or above finished grade does not exceed a floor space ratio of 0.6.”; and

(b) renumbers the existing 3.2.11 as 3.2.12.

3. Council strikes out section 10.21 and substitutes:

“10.21 **Living Accommodation Below Finished Grade**

10.21.1 In the case of multiple dwellings:

(a) living accommodation may be located below finished grade provided the floor is no more than 0.8 m below the finished grade of the adjoining ground, except that the Director of Planning may increase this dimension to 1.5 m subject to applicable policies and guidelines; and

(b) where existing utility, recreational or storage areas are located below finished grade, a minimum of 20% of the floor area below finished grade shall be retained for such uses, except that the Director of Planning may allow a lesser amount where the Director of Planning is satisfied that adequate utility, recreational and storage space is provided elsewhere in the building.

10.21.2 Storage rooms shall be excluded from the provisions of section 10.21.1.

10.21.3 In the case of a one-family dwelling, one-family dwelling with secondary suite, two-family dwelling, two-family dwelling with secondary suite, or two-family dwelling with lock-off unit:

(a) a secondary suite, lock-off unit or bedroom may be located in a basement; and

(b) no portion of a living room, kitchen, dining room or bedroom can be located 1.5 m or more below the finished grade of the adjoining ground.

10.21.4 In the case of a one-family dwelling or a one-family dwelling with secondary suite existing prior to June 23, 2020, a secondary suite, lock-off unit or bedroom may be located in a cellar, provided that the cellar is no more than 1.83 m below the average finished grade.”.

4. In the RS-1 District Schedule, Council strikes out section 4.3.4 and substitutes:

“4.3.4 Notwithstanding the height limitation in section 4.3.1, the Director of Planning may permit a building to exceed a height of 9.5 m but not to exceed a height of 10.7 m provided that:

(a) for all uses other than one-family dwelling with secondary suite, the Director of Planning considers:

(i) the impact of the increased height on views from surrounding development,

(ii) the extent to which the increased height improves the roof lines of the building, and

(iii) the effect of the increased height on adjacent properties and the character of the area; and

(b) for one-family dwelling with secondary suite:

(i) all roofs, except roofs covering only the first storey, have no flat portions, have a minimum slope of 7:12 ratio over the whole roof area and are limited to gable, hip or gambrel roofs, and

(ii) the Director of Planning considers the relationship between the height of the floors above the basement floor and the adjacent finished grade.”.



5. In the RS-1, RS-3 and RS-3A, and RS-5 District Schedules, Council strikes out section 4.17.2 and substitutes:

“4.17.2 There shall be no more than:

- (a) one separate and distinct front entrance to a one-family dwelling; and
- (b) two separate and distinct front entrances to a one-family dwelling with secondary suite.”.

6. In the RS-6 and RS-7 District Schedules, Council strikes out section 4.17.3 and substitutes:

“4.17.3 There shall be no more than:

- (a) one separate and distinct front entrance to a one-family dwelling; and
- (b) two separate and distinct front entrances to a one-family dwelling with secondary suite.”.

7. In the RS-1, RS-3 and RS-3A, and RS-5 District Schedules, Council strikes out section 4.17.4 and substitutes:

“4.17.4 The surface of the ground adjoining a building can be lowered only for the purpose of providing:

- (a) a window well for a basement or a cellar, provided that the lowered surface does not extend more than 1.0 m from the surface of a wall;
- (b) a sunken entrance for a basement, provided that:
  - (i) the portion of the building abutting the lowered surface faces either the front street or the rear property line,
  - (ii) the lowered surface does not extend more than 3.1 m into the required front or rear yard, measured from the street-facing wall and including stair runs or vertical change in grade between the basement and the existing grade, and
  - (iii) the sum of the widths of all lowered surfaces abutting the building is not greater than half the width of the building or 4.6 m, whichever is the lesser; or
- (c) a sunken entrance for a cellar in buildings existing prior to June 23, 2020, provided that:
  - (i) it complies with sections 4.17.4(b)(i) through (iii), and

- (ii) the depth of the lowered surface does not exceed 1.83 m below the average finished grade.”.

8. In the RS-6 District Schedule, Council strikes out section 4.17.5 and substitutes:

“4.17.5 The surface of the ground adjoining a building can be lowered only for the purpose of providing:

- (a) a window well for a basement or a cellar, provided that the lowered surface does not extend more than 1.0 m from the surface of a wall;
- (b) a sunken entrance for a basement, provided that:
  - (i) the portion of the building abutting the lowered surface faces either the front street or the rear property line,
  - (ii) the lowered surface does not extend more than 3.1 m into the required front or rear yard, measured from the street-facing wall and including stair runs or vertical change in grade between the basement and the existing grade, and
  - (iii) the sum of the widths of all lowered surfaces abutting the building is not greater than half the width of the building or 4.6 m, whichever is the lesser; or
- (c) a sunken entrance for a cellar in buildings existing prior to June 23, 2020, provided that:
  - (i) it complies with sections 4.17.5(b)(i) through (iii), and
  - (ii) the depth of the lowered surface does not exceed 1.83 m below the average finished grade.”.

9. In the RS-1 and RS-5 District Schedules, Council strikes out section 4.17.5 and substitutes:

“4.17.5 Notwithstanding section 4.17.2 or section 4.17.3, the Director of Planning may, on the advice of the Chief Building Official, permit one additional entrance facing a front yard or a side yard if it provides access to a building existing prior to March 14, 1989.”.

10. In the RS-3 and RS-3A Districts Schedule, Council:

- (a) strikes out section 4.17.5 and substitutes:

“4.17.5 Notwithstanding section 4.17.2, the Director of Planning may, on the advice of the Chief Building Official, permit one additional entrance facing a front yard or a side yard if it provides access to a building existing prior to March 14, 1989.”; and

- (b) adds a new section 4.17.6 as follows:

“4.17.6 Exterior windows in a secondary suite or lock off unit must have:

- (a) a minimum total glazing area of 10% of the total floor area of the room, in each of the kitchen, living room and dining room; and
- (b) a minimum total glazing area of 5% of the total floor area of the room, in all other rooms, except bathrooms and laundry rooms.”.

11. In the RS-6 District Schedule, Council strikes out section 4.17.6 and substitutes:

“4.17.6 Notwithstanding section 4.17.3 or 4.17.4, the Director of Planning may, on the advice of the Chief Building Official, permit one additional entrance facing a front yard or a side yard if it provides access to a building existing prior to March 14, 1989.”.

12. In the RS-7 District Schedule, Council strikes out section 4.17.5 and substitutes:

“4.17.5 Notwithstanding section 4.17.3 or 4.17.4, the Director of Planning may, on the advice of the Chief Building Official, permit one additional entrance facing a front yard or a side yard if it provides access to a building existing prior to March 14, 1989.”.

13. A decision by a court that any part of this By-law is illegal, void, or unenforceable severs that part from this By-law, and is not to affect the balance of this By-law.

14. This By-law is to come into force and take effect on the date of its enactment.

ENACTED by Council this \_\_\_\_\_ day of \_\_\_\_\_, 2020

\_\_\_\_\_  
Mayor

\_\_\_\_\_  
Acting City Clerk

**A By-law to amend  
CD-1 (1) By-law No. 3568**

Following the Public Hearing on May 28, 2020, Council resolved to amend CD-1 (1) for 650 West 41st Avenue (Oakridge Centre) to update the sub-areas and corresponding height diagrams, add floor area exclusions for structures and amenities, and update the family housing requirements. The Director of Planning has advised that there are no prior to conditions, and enactment of the attached By-law will implement Council's resolution.

Director of Legal Services  
June 23, 2020

650 West 41st Avenue  
(Oakridge Centre)

**BY-LAW NO.**

**A By-law to amend CD-1 (1) By-law No. 3568**

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This By-law amends the indicated provisions of By-law No. 3568.
2. In section 3, Council strikes out “16 sub-areas” and substitutes “15 sub-areas”.
3. In section 3, Council strikes out Figure 1 – Sub-Areas and substitutes the following:

“Figure 1 – Sub-Areas



4. Council strikes out section 5.2 and substitutes the following:  
“5.2 The design and layout of at least 35% of the dwelling units not used for social housing must:
  - (a) be suitable for family housing;
  - (b) comply with Council’s “Family Room: Housing Mix Policy for Rezoning Projects” requiring:”

- (i) a minimum of 35% family units (units having two or more bedrooms) in residential strata housing, including a minimum 25% two-bedroom units and a minimum 10% three-bedroom units; and
- (ii) a minimum of 35% family units with two or more bedrooms in secured market rental housing;
- (c) comply with Council's "High-Density Housing for Families with Children Guidelines". "

5. Council renumbers section 5.3 as section 5.4, and adds a new section 5.3 as follows:

"5.3 The design and layout of at least 50% of the dwelling units used for social housing must:

- (a) be suitable for family housing;
- (b) include two or more bedrooms; and
- (c) comply with Council's "High Density Housing for Families with Children Guidelines". "

6. Council strikes out section 6.9 and substitutes the following:

"6.9 Computation of floor area may exclude:

- (a) indoor amenity areas, except that the total exclusion for indoor amenity areas must not exceed 2,600 m<sup>2</sup>;
- (b) interior public space providing access to the Oakridge-41st Canada Line Station, except that:
  - (i) the excluded area must not exceed 3,000 m<sup>2</sup>, and
  - (ii) the Director of Planning must first consider all applicable policies and guidelines adopted by Council;
- (c) outdoor areas underneath building overhangs at grade or park level, except that they must remain unenclosed for the life of the building and the Director of Planning must first approve the design of the building;
- (d) roof-mounted solar panels, and rooftop trellis and glass covered outdoor amenity areas, except that they must remain unenclosed for the life of the building and the Director of Planning must first approve the design of the structure;
- (e) accessory buildings and structures for Park or Playground use, or uses which in the opinion of the Director of Planning are similar to

the foregoing, including canopies and mechanical screening, except that the Director of Planning must first approve the design of the accessory building or structure; and

- (f) 8,781 m<sup>2</sup> of the portion of the Parking Garage above geodetic mall elevation existing as of June 23, 2020, used for off-street parking and loading, except that the rooftop portion may be used for Park or Playground uses.”.

7. Council strikes out the table in section 7.2 and substitutes the following:

“

<b>Sub-Area</b>	<b>Maximum building heights (in meters)</b>
1	143.9 m
2	166.3 m
3	191.9 m
5	213.2 m
6	186.3 m
7	191.9 m
8	149.0 m
9	116.0 m
10	127.2 m
11	115.4 m
12	194.9 m
13	221.5 m
14	184.2 m
15	112.9 m
16	118.2 m

”.

8. A decision by a court that any part of this By-law is illegal, void, or unenforceable severs that part from this By-law, and is not to affect the balance of this By-law.

9. This By-law is to come into force and take effect on the date of its enactment.

ENACTED by Council this \_\_\_\_\_ day of \_\_\_\_\_, 2020

\_\_\_\_\_ Mayor

\_\_\_\_\_ Acting City Clerk

**A By-law to amend Parking By-law No. 6059  
Re: 650 West 41st Avenue (Oakridge Centre)**

Following the Public Hearing on May 28, 2020, Council resolved to amend the Parking By-law to add a minimum parking requirement applicable to all commercial uses across the site, and to correct a minor housekeeping error. The Director of Planning has advised that there are no prior to conditions, and enactment of the attached By-law will implement Council's resolution.

Director of Legal Services  
June 23, 2020



650 West 41st Avenue  
(Oakridge Centre)

**BY-LAW NO.**

**A By-law to amend Parking By-law No. 6059  
with regard to CD-1 Districts Parking Requirements**

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This By-law amends the indicated provisions of the Parking By-law.
2. Council amends Schedule C (CD-1 Districts Parking Requirements) by striking out the entry for 650 West 41st Avenue and substituting the following:

“

Address	By-law No.	CD-1 No.	Parking Requirements
650 West 41st Avenue	3568	CD-1 (1)	<p>Parking, loading and bicycle spaces in accordance with by-law requirements on September 19, 2018, except that:</p> <p>(a) there shall be a minimum of 0.40 residential parking spaces per dwelling unit plus one space for each 285 m<sup>2</sup> of gross floor area and a maximum of 0.55 residential parking spaces per dwelling unit plus one space for each 220 m<sup>2</sup> of gross floor area;</p> <p>(b) the General Manager of Planning and Development Services or General Manager of Engineering Services may allow for substitution of shared vehicles and shared vehicle parking spaces for required parking spaces at a ratio of 1:5, on conditions satisfactory to that city official;</p> <p>(c) Class A residential loading spaces shall be provided at a rate of 0.01 space per dwelling unit up to and including 300 dwelling units and at a rate of 0.008 space per dwelling unit for any number of units greater than 300 units; and</p> <p>(d) for Commercial Uses under section 4.2.5, a minimum of one vehicle parking space for each 45 m<sup>2</sup> of gross floor area shall be provided, except that where a Traffic Demand Management Plan has been approved for those Uses, a minimum of one vehicle parking space for each 65 m<sup>2</sup> shall be provided.</p>

”

3. A decision by a court that any part of this By-law is illegal, void, or unenforceable severs that part from this By-law, and is not to affect the balance of this By-law.

4. This By-law is to come into force and take effect on the date of its enactment.

ENACTED by Council this day of , 2020

\_\_\_\_\_  
Mayor

\_\_\_\_\_  
Acting City Clerk

**EXPLANATION**

**Debenture By-law  
Re: Street Work**

The attached By-law authorizes the issue of Debentures to finance the property owners' share of certain street work projects, and the annual charge equal to the debt charges of the Debentures against the properties benefited by the local improvements.

Director of Legal Services  
June 23, 2020

**BY-LAW NO. \_\_\_\_\_**

**A By-law to contract a debt by the issue and sale of Debentures in the aggregate principal amount of \$126,404.07, for certain local improvement street work projects, including lane paving, and for imposing an annual special rate on real property specially benefited by such local improvements**

**PREAMBLE**

Council has deemed it desirable and necessary to carry out certain street work projects, including four lane paving and one speed hump (the "Works") as local improvements.

The Collector of Taxes for the City of Vancouver (the "City") has prepared and certified a schedule (the "Schedule") on April 29, 2020, describing and designating the Works as numbers 1 to 5 inclusive, has captioned that Schedule with a reference to this By-law, and has deposited the Schedule, together with the detailed Court of Revision sheets which support and form part of the Schedule, in the office of the Collector of Taxes.

Council declares the Schedule to form part of this By-law, as if expressly embodied herein.

Council deems that the Works will specially benefit the real property (the "Assessable Real Property") designated and described in the Schedule.

The City has completed construction of the Works.

The City has determined that the Assessable Real Property produces the total number of feet, more or less, of frontage and flankage assessable on the adjacent respective streets, as shown in the Schedule, after deducting the width of street intersections and exempt properties, shown by the statement of frontage and flankage liable for assessment as finally settled.

The owner of the Assessable Real Property must bear that portion of the cost of the Works, payable by assessments and amounting to \$126,404.07, according to the Schedule, which amount does not exceed by more than 10% the amount estimated by the City to be borne by such owners.

There are that certain specified number of feet frontage and flankage of the Assessable Real Property, as shown in the Schedule upon which it will be required to levy the annual special rates set out in the Schedule, sufficient to raise annually the amounts the City will apply toward payment of interest and principal on the debt referred to in this By-law.

Council deems it expedient to borrow a certain amount of money and to contract a debt by the issue and sale of debentures of the City in the aggregate principal amount of \$126,404.07, bearing interest at the rate of 6% per annum, secured on the credit of the City at large, to defray that part of the cost of the Works payable by annual special assessments.

According to the last revised averaged assessment roll, the value of all the real property in the City liable to taxation is \$384,101,744,453.

As of the day following the enactment date of this By-law, the total amount of the existing debenture debt of the City is \$932,086,097.94 exclusive of debts incurred for local improvements secured by special rates or assessments, of which none of the principal or interest is in arrears as at that date.

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. To defray that part of the cost of the Work payable by annual special rates under this By-law, the City will contract a debt by the issue and sale of debentures (the "Debentures") of the City in the aggregate principal amount of \$126,404.07, secured on the general credit of the City, which Debentures will be in substantially the form and substance set out in Schedule A to this By-law.
2. The debt secured by the Debentures will bear interest at the rate of 6% per annum, payable on June 23, 2020 and on June 23 of each year, after that during the term of the Debentures.
3. The Debentures will be fully-registered Debentures without coupons.
4. The Debentures will bear the common seal of the City and the facsimile signature of the City's Mayor, the City Treasurer, Deputy City Treasurer, or such other person as a by-law may designate will sign the Debentures.
5. The Debentures will be in denominations equivalent to each of the amounts set out under the column "Principal Payment" in Schedule B to this By-law, will bear the date "June 23, 2020", and will be payable in each of the years 2020 to 2034, both inclusive, in the respective principal amounts set out under the column "Principal Payment" in Schedule B.
6. The Debentures will be payable as to both principal and interest at the office of the City Treasurer, City Hall, Vancouver, British Columbia, Canada.

7. Council hereby imposes in each of the years 2020 to 2034, both inclusive, an annual special rate per foot, as respectively shown in the Schedule for the Works, on the Assessable Real Property, according to the frontage and flankage of such Assessable Real Property, in addition to all other rates and taxes, which special rate will be sufficient to produce annually the respective amounts set out under the column "Total Annual Payment" in Schedule B.

8. The Collector of Taxes will insert the amounts referred to in section 7, in the real property tax roll, in each of the years 2020 to 2034, both inclusive, and such amounts will be payable to and collected by the Collector of Taxes in the same manner as other rates on the real property tax roll.

9. The debentures will contain the endorsement referred to in section 252 of the *Vancouver Charter*.

10. Council hereby authorizes the City to carry out the purposes set out in this By-law for the issue of the Debentures.

11. The schedules attached to this By-law form part of this By-law.

12. References in this By-law to money are to lawful currency of Canada.

13. This By-law is to come into force and take effect on the date of its enactment.

ENACTED by Council this \_\_\_\_\_ day of \_\_\_\_\_, 2020

\_\_\_\_\_  
Mayor

\_\_\_\_\_  
Acting City Clerk

THIS IS SCHEDULE "A" REFERRED TO IN  
BY-LAW NO. \_\_\_\_\_ OF THE CITY OF VANCOUVER

CANADA

PROVINCE OF BRITISH COLUMBIA

CITY OF VANCOUVER

SERIAL DEBENTURE

NO.

Under the provisions of the Vancouver Charter, and amendments thereto, and  
By-law No. \_\_\_\_\_ KNOW ALL MEN BY THESE PRESENTS:

That the City of Vancouver, Province of British Columbia, is indebted to and for value received promises to pay to the registered holder hereof, on the \_\_\_\_\_ day of \_\_\_\_\_, the sum of \_\_\_\_\_ Dollars (\$) of lawful money of Canada at the Office of the City Treasurer, City Hall, Vancouver, British Columbia, and to pay interest thereon at the rate of six per centum (6%) per annum, payable on the 23<sup>rd</sup> day of June in each year during the term of the Debenture, commencing in the year 2020, at the said place, and the City of Vancouver is hereby held and firmly bound and its faith and credit and taxing power are hereby pledged for the prompt payment of the principal and interest of this Debenture at maturity.

This Debenture, or any interest therein, shall not, after a memorandum of ownership has been endorsed thereon by the City Treasurer, be transferable except by entry by the City Treasurer or his Deputy in the Debenture Registry Book of the City of Vancouver.

This Debenture is issued by the City of Vancouver under and by authority of and in full compliance with the provisions of the laws of the Province of British Columbia, including the Vancouver Charter, and amendments thereto, and By-law No. (\_\_\_\_\_) duly and legally passed by the Council of the City of Vancouver.

THIS IS SCHEDULE "A" REFERRED TO IN  
BY-LAW NO. \_\_\_\_\_ OF THE CITY OF VANCOUVER

It is hereby certified, recited and declared that all acts, conditions and things necessary to be done and to exist precedent to and in the issuance of this Debenture have been properly done, fulfilled and performed and do exist in regular and in due form as required by the laws of the Province of British Columbia, and that the total indebtedness of the City of Vancouver, including the Debentures authorized by the said By-law does not exceed any statutory limitations, and provision has been made to levy taxes sufficient to pay the interest promptly as it matures and to pay the principal of this Debenture when due.

IN WITNESS WHEREOF the City of Vancouver has caused these presents to be sealed with the Common Seal of the City of Vancouver, to bear the facsimile signature of its Mayor, to be signed by its authorized signing officer and to be dated the 23<sup>rd</sup> day of June, 2020.

\_\_\_\_\_  
Mayor

\_\_\_\_\_  
Authorized Signing Officer



THIS IS SCHEDULE "A" REFERRED TO IN  
BY-LAW NO. \_\_\_\_\_ OF THE CITY OF VANCOUVER

DATE OF  
REGISTRATION

NAME AND ADDRESS OF  
REGISTERED OWNER

SIGNATURE OF  
TREASURER

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THIS IS SCHEDULE "B" REFERRED TO IN  
BY-LAW NO. \_\_\_\_\_ OF THE CITY OF VANCOUVER

BY-LAW		LANE PAVEMENT	6.00%	15 YEARS
YEAR	DEBENTURES OUTSTANDING	PRINCIPAL PAYMENT	INTEREST PAYMENT	TOTAL ANNUAL PAYMENT
2020	126,404.07	12,278.22	0.00	12,278.22
2021	114,125.85	5,430.67	6,847.55	12,278.22
2022	108,695.18	5,756.51	6,521.71	12,278.22
2023	102,938.67	6,101.90	6,176.32	12,278.22
2024	96,836.77	6,468.01	5,810.21	12,278.22
2025	90,368.76	6,856.09	5,422.13	12,278.22
2026	83,512.67	7,267.46	5,010.76	12,278.22
2027	76,245.21	7,703.51	4,574.71	12,278.22
2028	68,541.70	8,165.72	4,112.50	12,278.22
2029	60,375.98	8,655.66	3,622.56	12,278.22
2030	51,720.32	9,175.00	3,103.22	12,278.22
2031	42,545.32	9,725.50	2,552.72	12,278.22
2032	32,819.82	10,309.03	1,969.19	12,278.22
2033	22,510.79	10,927.57	1,350.65	12,278.22
2034	11,583.22	11,583.22	695.00	12,278.22
		<u>126,404.07</u>	<u>57,769.23</u>	<u>184,173.30</u>

**EXPLANATION****A By-law to amend the Vacancy Tax By-law No. 11674  
Regarding a Housekeeping Amendment**

Enactment of the attached By-law will correct an inadvertent error made when section 3.5 of the By-law was amended in March 2019, adding back the qualifier “during the vacancy reference period”.

Director of Legal Services  
June 23, 2020

**BY-LAW NO. \_\_\_\_\_**

**A By-law to amend the Vacancy Tax By-law No. 11674  
Regarding a Housekeeping Amendment**

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This By-law amends the indicated provisions of the Vacancy Tax By-law No. 11674.
2. In section 3.5, Council adds “, during the vacancy tax period,” after “for a parcel of residential property if”.
3. A decision by a court that any part of this By-law is illegal, void, or unenforceable severs that part from this By-law, and is not to affect the balance of this By-law.
4. This By-law is to come into force and take effect on the date of its enactment.

ENACTED by Council this \_\_\_\_\_ day of \_\_\_\_\_, 2020

\_\_\_\_\_  
Mayor

\_\_\_\_\_  
Acting City Clerk

**EXPLANATION****Authorization to enter into a Housing Agreement  
Re: 3429-3469 Fraser Street**

After the Public Hearing on October 1, 2019, Council approved in principle the land owner's application to rezone the above noted property from C-2 (Commercial) District to CD-1 (Comprehensive Development) District, subject to, among other things, a Housing Agreement being entered into by the City and the land owner, on terms satisfactory to the General Manager of Arts, Culture and Community Services and the Director of Legal Services. The Housing Agreement was accepted and executed by the applicant, and the City now seeks enactment of a By-law as contemplated by section 565.2 of the Vancouver Charter, to authorize such Housing Agreement and to authorize the City to enter into the Housing Agreement with the land owner.

Director of Legal Services  
June 23, 2020

3429-3469 Fraser Street

**BY-LAW NO.**

**A By-law to enact a Housing Agreement  
for 3429-3469 Fraser Street**

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. Council authorizes the City to enter into a Housing Agreement with the owner of certain lands described as:

No PID

LOT 1 BLOCK 68 DISTRICT LOT 301 PLAN EPP102125

in substantially the form and substance of the Housing Agreement attached to this By-law, and also authorizes the Director of Legal Services to execute the agreement on behalf of the City, and to deliver it to the owner on such terms and conditions as the Director of Legal Services deems fit.

2. This By-law is to come into force and take effect on the date of its enactment.

ENACTED by Council this \_\_\_\_\_ day of \_\_\_\_\_, 2020

---

Mayor

---

Acting City Clerk

**LAND TITLE ACT**  
**FORM C (Section 233) CHARGE**  
**GENERAL INSTRUMENT - PART 1 Province of British Columbia**

PAGE 1 OF 20 PAGES

Your electronic signature is a representation that you are a designate authorized to certify this document under section 168.4 of the *Land Title Act*, RSBC 1996 c.250, that you certify this document under section 168.4(4) of the act, and that an execution copy, or a true copy of that execution copy, is in your possession.

1. APPLICATION: (Name, address, phone number of applicant, applicant's solicitor or agent)

Kornfeld LLP

Barristers &amp; Solicitors

1100-505 Burrard Street

Vancouver

BC V7X 1M5

File No. RIZ032DEV191

Housing Agreement and Building Use Covenant

Tel. No. (604) 331-8300 / LTO #010448

Deduct LTSA Fees? Yes 

2. PARCEL IDENTIFIER AND LEGAL DESCRIPTION OF LAND:

[PID]

[LEGAL DESCRIPTION]

**NO PID NMBR LOT 1 BLOCK 68 DISTRICT LOT 301 PLAN EPP102125**

STC? YES

Related Plan Number: **EPP102125**

3. NATURE OF INTEREST

CHARGE NO.

ADDITIONAL INFORMATION

**SEE SCHEDULE**

4. TERMS: Part 2 of this instrument consists of (select one only)

(a)  Filed Standard Charge Terms D.F. No.(b)  Express Charge Terms Annexed as Part 2

A selection of (a) includes any additional or modified terms referred to in Item 7 or in a schedule annexed to this instrument.

5. TRANSFEROR(S):

**SEE SCHEDULE**

6. TRANSFEREE(S): (including postal address(es) and postal code(s))

**CITY OF VANCOUVER**

453 WEST 12TH AVENUE

VANCOUVER

BRITISH COLUMBIA

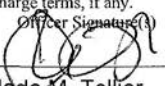
V5Y 1V4

CANADA

7. ADDITIONAL OR MODIFIED TERMS:

8. EXECUTION(S): This instrument creates, assigns, modifies, enlarges, discharges or governs the priority of the interest(s) described in Item 3 and the Transferor(s) and every other signatory agree to be bound by this instrument, and acknowledge(s) receipt of a true copy of the filed standard charge terms, if any.

Officer Signature(s)

  
 Jada M. Tellier

Barrister &amp; Solicitor

Kornfeld LLP

1100-505 Burrard Street

Vancouver, BC

V7X 1M5

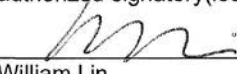
Phone: 604-331-8300

Execution Date

Y	M	D
20	06	11

Transferor(s) Signature(s)

 RIZE ALLIANCE (FRASER & 19TH)  
 PROPERTIES LTD. by its  
 authorized signatory(ies):

  
 William Lin

## OFFICER CERTIFICATION:

Your signature constitutes a representation that you are a solicitor, notary public or other person authorized by the *Evidence Act*, R.S.B.C. 1996, c.124, to take affidavits for use in British Columbia and certifies the matters set out in Part 5 of the *Land Title Act* as they pertain to the execution of this instrument.

Officer Signature(s)

Execution Date

Transferor / Borrower / Party Signature(s)

\_\_\_\_\_

Y	M	D
20		
20	06	11
20		

CITY OF VANCOUVER by its  
authorized signatory(ies):

Print Name: \_\_\_\_\_

Print Name: \_\_\_\_\_



**Jim M.J. Alam**  
*Barrister and Solicitor*  
1900 - 885 West Georgia St.  
Vancouver, BC V6C 3H4  
Telephone: 604-891-3645

*FEDERAL*  
COAST CAPITAL SAVINGS CREDIT  
UNION by its authorized signatory(ies):

Print Name: \_\_\_\_\_

**John Muth**  
Senior Manager  
Commercial Real Estate

Print Name: \_\_\_\_\_

**Ben Dodman**  
Manager  
Commercial Real Estate

GARDENIA INVESTMENTS LTD. by its  
authorized signatory(ies):

Print Name: \_\_\_\_\_

Print Name: \_\_\_\_\_

OFFICER CERTIFICATION:

Your signature constitutes a representation that you are a solicitor, notary public or other person authorized by the *Evidence Act*, R.S.B.C. 1996, c.124, to take affidavits for use in British Columbia and certifies the matters set out in Part 5 of the *Land Title Act* as they pertain to the execution of this instrument.



LAND TITLE ACT  
FORM D  
EXECUTIONS CONTINUED

Officer Signature(s)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**JOHN V LEE**  
Lawyer & Notary Public  
6235-4000 No. 3 Road,  
Richmond, B.C. Canada, V6X 0J8  
Tel: 604-238-7388  
Fax: 604-238-7383

Execution Date

Y	M	D
20		
20		
20	11	06

Transferor / Borrower / Party Signature(s)

CITY OF VANCOUVER by its  
authorized signatory(ies):

\_\_\_\_\_  
Print Name:

\_\_\_\_\_  
Print Name:

COAST CAPITAL SAVINGS CREDIT  
UNION by its authorized signatory(ies):

\_\_\_\_\_  
Print Name:

\_\_\_\_\_  
Print Name:

GARDENIA INVESTMENTS LTD. by its  
authorized signatory(ies):

\_\_\_\_\_  
Print Name: Joseph Lee

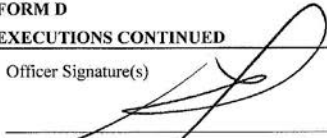
\_\_\_\_\_  
Print Name:

OFFICER CERTIFICATION:

Your signature constitutes a representation that you are a solicitor, notary public or other person authorized by the *Evidence Act*, R.S.B.C. 1996, c.124, to take affidavits for use in British Columbia and certifies the matters set out in Part 5 of the *Land Title Act* as they pertain to the execution of this instrument.

LAND TITLE ACT  
FORM D  
EXECUTIONS CONTINUED

Officer Signature(s)



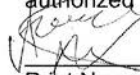
**MATTHEW TOLAN**  
*Barrister & Solicitor*  
**BORDEN LADNER GERVAIS LLP**  
1200 Waterfront Centre, 200 Burrard Street  
P.O. Box 48600, Vancouver, Canada V7X 1T2  
604-640-4186

Execution Date

Y	M	D
20	06	12

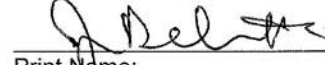
Transferor / Borrower / Party Signature(s)

GROSVENOR TRUE NORTH  
SERVICES CANADA LIMITED by its  
authorized signatory(ies):



**ALEX HENDERSON**  
SENIOR VICE-PRESIDENT

Print Name: CO-INVESTMENT



Print Name: **JAMES DELMOTTE**

OFFICER CERTIFICATION:

Your signature constitutes a representation that you are a solicitor, notary public or other person authorized by the *Evidence Act*, R.S.B.C. 1996, c.124, to take affidavits for use in British Columbia and certifies the matters set out in Part 5 of the *Land Title Act* as they pertain to the execution of this instrument.

LAND TITLE ACT  
FORM E

## SCHEDULE

PAGE 4 OF 20 PAGES

NATURE OF INTEREST	CHARGE NO.	ADDITIONAL INFORMATION
Covenant		Section 219 Covenant Entire Instrument
Priority Agreement		granting the above Covenant priority over Mortgage CA6529170 and Assignment of Rents CA6529171 Page 19
Priority Agreement		granting the above Covenant priority over Mortgage CA6529172 and Assignment of Rents CA6529173 Page 20
Priority Agreement		granting the above Covenant priority over Mortgages CA6529575 and CA6529577 and Assignments of Rent CA6529576 and CA6529578 Page 21
NATURE OF INTEREST	CHARGE NO.	ADDITIONAL INFORMATION
NATURE OF INTEREST	CHARGE NO.	ADDITIONAL INFORMATION

**LAND TITLE ACT  
FORM E**

**SCHEDULE**

ENTER THE REQUIRED INFORMATION IN THE SAME ORDER AS THE INFORMATION MUST APPEAR ON THE FREEHOLD TRANSFER FORM, MORTGAGE FORM, OR GENERAL INSTRUMENT FORM.

**5. TRANSFEROR(S):**

RIZE ALLIANCE (FRASER & 19TH) PROPERTIES LTD. (INC. NO. BC1144375)

COAST CAPITAL SAVINGS CREDIT UNION (INC. NO. FI-146) (as to priority agreement)

GARDENIA INVESTMENTS LTD. (INC. NO. BC0103992) (as to priority agreement)

GROSVENOR TRUE NORTH SERVICES CANADA LIMITED (INC. NO. BC1048212) (as to priority agreement)

## TERMS OF INSTRUMENT - PART 2

HOUSING AGREEMENT AND BUILDING USE COVENANT  
FOR MARKET RENTAL HOUSING

3429-3469 FRASER STREET

## WHEREAS:

- A. It is understood and agreed that this instrument and Agreement will be read as follows:
- I. the Transferor, RIZE ALLIANCE (FRASER & 19<sup>TH</sup>) PROPERTIES LTD., is called the "Owner", as more particularly defined in Section 1.1; and
  - II. the Transferee, CITY OF VANCOUVER, is called the "City" or the "City of Vancouver" when referring to corporate entity continued under the *Vancouver Charter*, and "Vancouver" when referring to geographic location;
- B. The Owner is the registered owner of the Lands;
- C. The Owner made an application to rezone the Lands (the "Rezoning Application") from C-2 (Commercial) District to CD-1 (Comprehensive Development) District to permit the development of a six-storey mixed-use building with 104 secured market rental residential units and, after a public hearing to consider the Rezoning Application, the Rezoning Application was approved by City Council in principle, subject to, among other things, fulfilment of the following condition:
- "9. Make arrangements to the satisfaction of the General Manager of Community Services and the Director of Legal Services to enter into a Housing Agreement and/or Section 219 Covenant to secure all 104 residential units as secured market rental housing units pursuant to the City's Rental 100 Program, for the longer of 60 years or the life the building, subject to a no-separate-sales covenant, a non-stratification covenant, that none of such units will be rented for less than one month at a time, and such other terms and conditions as the General Manager of Planning, Urban Design and Sustainability and the Director of Legal Services may require.*
- Note to Applicant: This condition will be secured by a Housing Agreement to be entered into by the City at by-law enactment pursuant to section 565.2 of the Vancouver Charter and/or a Section 219 Covenant."*
- (the "Rental Housing Condition"); and
- D. The Owner is entering into this Agreement to satisfy the foregoing condition.

NOW THEREFORE THIS AGREEMENT WITNESSES that for good and valuable consideration (the receipt and sufficiency of which the parties hereby acknowledge and agree to) the Owner and the City, pursuant to Section 565.2 of the *Vancouver Charter* and Section 219 of the *Land Title Act*, agree as follows in respect of the use of the Lands and the Building:

**ARTICLE 1  
DEFINITIONS AND INTERPRETATION**

- 1.1 **Definitions.** Terms defined in this Section 1.1, unless specifically otherwise provided in this Agreement, will have the following meanings:
- (a) **"Agreement"** means this housing agreement and building use covenant, including the foregoing Recitals;
  - (b) **"Building"** means any new building or structure built on the Lands as contemplated by the Development Permit, and includes any portion of any such building or structure, but does not include temporary buildings or structures on the Lands during the period of, and required for the purposes of, any construction contemplated by the Development Permit;
  - (c) **"Building Permit"** means any building permit issued by the City authorizing the building of the Building as contemplated by the Development Permit;
  - (d) **"City"** and **"City of Vancouver"** have the meaning ascribed to those terms in Recital A(ii);
  - (e) **"City Manager"** means the chief administrator from time to time of the City and his successors in function and their respective nominees;
  - (f) **"City Personnel"** means any and all of the elected and appointed officials, and officers, employees, agents, nominees, delegates, permittees, contractors, subcontractors and volunteers of the City;
  - (g) **"Commencement Date"** means the date as of which this Agreement has been executed by all parties to it;
  - (h) **"Development"** means the development on the Lands described in Recital C and approved by the Development Permit;
  - (i) **"Development Permit"** means a development permit issued by the City at any time following date this Agreement is fully executed by the parties, authorizing the Development on the Lands or any portion of the Lands as contemplated by the Rezoning;
  - (j) **"Director of Legal Services"** means the chief administrator from time to time of the Legal Services Department of the City and her/his successors in function and their respective nominees;
  - (k) **"General Manager of Planning, Urban Design and Sustainability"** means the chief administrator from time to time of the City's Planning, Urban Design and Sustainability Department and his/her successors in function and their respective nominees;
  - (l) **"Housing Unit"** means a self-contained residential unit, comprised of two or more rooms, including toilet, bathing and cooking facilities;

- (m) "**Land Title Act**" means the *Land Title Act*, R.S.B.C. 1996, c. 250;
- (n) "**Lands**" means the parcel of land situate in Vancouver, British Columbia, and legally described in Item 2 in the Form C attached hereto, and includes any lots or parcels into which such land is consolidated or further subdivided;
- (o) "**Losses**" means any and all damages, losses, fines, penalties, costs (including legal costs on a solicitor and own client basis), actions, causes of action, claims, demands, liabilities, indirect or consequential damages (including loss of profit and loss of use and damages arising out of delays) and expenses of every nature or kind whatsoever;
- (p) "**Occupancy Permit**" means a permit issued by the City authorizing the use and occupation of the Building or any other development or partial development on the Lands contemplated by the Development Permit;
- (q) "**Owner**" means the registered owner of the Lands as of the Commencement Date, namely Rize Alliance (Fraser & 19<sup>th</sup>) Properties Ltd., and all of its permitted assigns, successors and successors in title to the Lands or any part thereof;
- (r) "**Related Person**" means, where the registered or beneficial owner of the Rental Housing Units is:
  - (i) a corporation (as that term is defined in the *Business Corporations Act* (British Columbia)), then a Related Person is:
    - A. an officer, director or shareholder of such corporation or of another entity which is a shareholder of such corporation; or
    - B. the spouse, parent, child, sibling, niece or nephew of any such officer, director or shareholder referred to in paragraph A; and
  - (ii) an individual, then a Related Person is the spouse, parent, child, sibling, niece or nephew of such individual;
- (s) "**Rental Housing**" means a Housing Unit which is not occupied by the registered or beneficial owner of the same or by a Related Person, but which is made available by such owner to the general public, at arms' length, for use as rental accommodation in accordance with this Agreement, reasonably prudent landlord-tenant practices for rental residential accommodation and any and all laws applicable thereto, including, without limitation, residential tenancy and human rights legislation in British Columbia;
- (t) "**Rental Housing Units**" has the meaning ascribed to that term in Section 2.1(c), and "**Rental Housing Unit**" means any one of such units;
- (u) "**Rental Housing Unit Parcel**" means one legal titled air space parcel which contains all of, and only, the Rental Housing Units other than any related common service and amenity area and systems and including without limitation parking for the Rental Housing Units;

- (v) "Replacement Rental Housing Unit" has the meaning ascribed to that term in section 2.1(j) and "Replacement Rental Housing Units" means all of such units;
- (w) "*Residential Tenancy Act*" means the *Residential Tenancy Act*, S.B.C. 2002, c. 78;
- (x) "Rezoning" means the rezoning of the Lands described in Recital C of this Agreement;
- (y) "Term" means the term of this Agreement, which will commence on the Commencement Date and will end on the later of:
  - (i) the date as of which the Building is demolished or substantially destroyed; or
  - (ii) 60 years from the date when the final Occupancy Permit is issued for the Building or Rental Housing Unit Parcel, as applicable;
- (z) "Vancouver" has the meaning ascribed to that term in Recital A(ii); and
- (aa) "*Vancouver Charter*" means the *Vancouver Charter*, S.B.C. 1953, c. 55.

1.2 Interpretation. In this Agreement:

- (a) Party. Any reference to a party herein will be deemed to include the heirs, executors, administrators, successors, assigns, employees, servants, agents, officers, contractors, licensees and invitees of such parties wherever the context so permits or requires.
- (b) Singular; Gender. Wherever the singular or masculine or neuter is used in this Agreement, the same will be construed to mean the plural or the feminine or body corporate or politic, and vice versa, as the context or the parties so require.
- (c) Captions and Headings. The captions and headings appearing in this Agreement have been inserted as a matter of convenience and for reference only and in no way define, limit or enlarge the scope or meaning of this Agreement or any of the provisions hereof.
- (d) References. References to the or this "Agreement" and the words "hereof" "herein" and similar words refer to this Agreement as a whole and not to any section or subsection or other subdivision hereof and any reference in this Agreement to a designated Recital, Section, subsection or other subdivision is a reference to the designated Recital, Section, subsection or subdivision hereof.
- (e) Governing Law. This Agreement will be governed by and construed in accordance with the laws of the Province of British Columbia and the laws of Canada applicable in British Columbia. Any reference to a statute is to the statute and its regulations in force on the date the Form C General Instrument - Part 1 is fully executed and to subsequent amendments to or replacements of the statute or regulations.
- (f) Legislation. Any reference to a statute includes and is a reference to such statute and to the regulations made pursuant thereto, with all amendments made thereto



and as in force from time to time, and to any statute and regulations that may be passed which have the effect of supplementing or superseding such statutes and regulations.

- (g) Time. Time shall be of the essence of this Agreement and each part of it. If any party expressly or impliedly waives this requirement, that party may reinstate it by delivering notice to the other party(ies). If a time is specified in this Agreement for observing or performing any obligation, such time shall be local Vancouver, British Columbia time.

## ARTICLE 2 RESTRICTIONS ON USE, SALE AND SUBDIVISION

### 2.1 The Owner covenants and agrees that:

- (a) throughout the Term, the Lands and the Building will not be used in any way that is inconsistent with the terms of this Agreement;
- (b) if it carries out any development on the Lands after the Commencement Date, it will construct, fit and finish, at its sole cost and expense, the Building to contain one hundred and four (104) Housing Units (or such other similar amount as may be approved at the Development Permit stage), in accordance with this Agreement, the Rental Housing Condition, the conditions of the Development Permit, the Building Permit and all applicable City by-laws and policies, all to the satisfaction of the City;
- (c) throughout the Term, not less than all of the Housing Units will be used only for the purpose of providing Rental Housing (the “**Rental Housing Units**”), and not less than thirty-five percent (35%) of the Rental Housing Units will have at least two (2) bedrooms and will be designed to be suitable for families with children;
- (d) throughout the Term, it will not rent, licence to use or sublet, nor will it allow to be rented, licenced to use or sublet, any Rental Housing Unit (or Replacement Rental Housing Unit, as applicable) for a term of less than one month at a time;
- (e) throughout the Term, except by way of a tenancy agreement to which the *Residential Tenancy Act* applies, it will not suffer, cause or permit, beneficial or registered title to any Rental Housing Unit (or Replacement Rental Housing Unit, as applicable) to be sold or otherwise transferred unless title to every Rental Housing Unit (or Replacement Rental Housing Unit, as applicable) is sold or otherwise transferred together and as a block to the same owner, and subject further to Section 8.9;
- (f) throughout the Term, it will not suffer, cause or permit the Lands or the Building (or any replacement building(s) on the Lands, as applicable) or any part thereof, to be subdivided, whether by subdivision plan, strata plan or otherwise, without the prior written consent of the Director of Legal Services;
- (g) throughout the Term, any sale of a Rental Housing Unit (or Replacement Rental Housing Unit, as applicable) in contravention of the covenant in Section 2.1(e), and any subdivision of the Lands or the Building (or any replacement building(s) on the

Lands, as applicable) or any part thereof, in contravention of the covenant in Section 2.1(f), will in each case be of no force or effect, and the City will be entitled to the cancellation of the registration of any offending transfer of title or plan, as the case may be, at the Owner's expense;

- (h) throughout the Term, it will insure, or cause to be insured, the portion of the Building containing the Rental Housing Units and all parts thereof to the full replacement cost against perils normally insured against in Vancouver by reasonable and prudent owners of similar buildings and lands;
- (i) throughout the Term, it will keep and maintain the portion of the Building containing the Rental Housing Units and all parts thereof in good repair and in a safe, clean, neat and tidy condition, reasonable wear and tear excepted. If the Rental Housing Units (or Replacement Rental Housing Unit, as applicable) or any part of any thereof are/is damaged (and not demolished or substantially destroyed, as determined by an architect satisfactory to the City and the Owner), before the end of the Term, the Owner will promptly restore and repair the same whenever and as often as damage occurs, to at least as good a state and condition as existed before such damage occurred; and
- (j) if the Building is destroyed or demolished before the end of the 60<sup>th</sup> anniversary of the date when the final Occupancy Permit is issued for the Building or Rental Housing Unit Parcel, as applicable, then any replacement building(s) built on the Lands (together with any remaining undestroyed or undemolished building) will also contain not less than the same number and type of replacement Rental Housing Units as the Building formerly contained, which replacement Rental Housing Units will also be used only for the purpose of providing Rental Housing (each such replacement Rental Housing Unit hereinafter referred to as a "Replacement Rental Housing Unit"), in accordance with the terms of this Agreement and the applicable by-laws of the City.

### ARTICLE 3 SUBDIVISION OF THE LANDS

- 3.1 Subject to compliance by the Owner with all applicable requirements of the Approving Officer, the Director of Legal Services, this Agreement and all applicable laws and by-laws, the City will not unreasonably withhold its consent to a subdivision of the Lands by the deposit of an air space plan provided that all of, and only, the Rental Housing Units are contained within the Rental Housing Parcel.
- 3.2 The Owner covenants and agrees with the City in respect of the use of the Lands and the Building, that:
  - (a) following a subdivision to create the Rental Housing Unit Parcel and the issuance of a final Occupancy Permit for the Rental Housing Unit Parcel, the Owner may apply to the City for a partial discharge of this Agreement with respect to any parcel or parcels other than the Rental Housing Unit Parcel and the City will, on request of the Owner, execute and deliver a registrable discharge of this Agreement in respect of all parcels other than the Rental Housing Unit Parcel; provided that:

- (i) the Director of Legal Services is satisfied that such discharge will not unreasonably alter, restrict or limit the City's rights and the Owner's agreements and obligations in respect of the Rental Housing Units pursuant to this Agreement;
- (ii) any such discharge will be in form and substance acceptable to the Director of Legal Services and will be prepared by the Owner at its cost;
- (iii) the City will have a reasonable amount of time to execute and return any such discharge; and
- (iv) the preparation and registration of any such discharge will be without cost to the City.

**ARTICLE 4  
OCCUPANCY RESTRICTION ON THE LANDS**

- 4.1 The Owner covenants and agrees with the City in respect of the use of the Lands and the Building, that:
- (a) the Owner will not apply for any Occupancy Permit in respect of, and will not suffer or permit the occupation of, the Building, and will take no action, directly or indirectly, to compel the issuance of any Occupancy Permit for the Building, until such time as the Owner has delivered, to the General Manager of Planning, Urban Design and Sustainability, in form and substance satisfactory to the General Manager of Planning, Urban Design and Sustainability, proof that the insurance, consistent with the requirements of Section 2.1(h), is in force and effect; and
  - (b) the City will be under no obligation to issue any Occupancy Permit for the Building or any part thereof, notwithstanding completion of construction of the Building until such time as the Owner has complied with Section 4.1(a).
- 4.2 Without limiting the general scope of ARTICLE 6, the Owner does hereby waive, remise and release absolutely any and all claims against the City and City Personnel for any Losses that may derive from the withholding of an Occupancy Permit for the Building until there is compliance with the provisions of this ARTICLE 4.

**ARTICLE 5  
ENFORCEMENT**

- 5.1 This Agreement may be enforced by mandatory and prohibitory orders of the court. In any action to enforce this Agreement if the City is entitled to court costs, it shall be entitled to court costs on a solicitor and own client basis.

**ARTICLE 6  
RELEASE AND INDEMNITY**

- 6.1 Release and Indemnity. Subject to Section 6.2, the Owner hereby:
- (a) releases and discharges the City and all City Personnel from all Losses which may arise or accrue to the Owner and covenants and agrees to indemnify and save

harmless the City and all City Personnel from and against all Losses which may arise, accrue or be incurred by the City or any City Personnel or which are made by any person, firm or corporation against the City or any City Personnel or which the City or any City Personnel may pay, incur, sustain or be put to:

- (i) by reason of the City or City Personnel:
  - A. reviewing, accepting or approving the design, specifications, materials and methods for construction of the Rental Housing Units;
  - B. withholding any permit pursuant to this Agreement; or
  - C. exercising any of its rights under any Section 219 covenant or other right granted to the City pursuant to this Agreement; or
- (ii) that otherwise arise out of, or would not have been incurred but for this Agreement;

whether or not such Losses are the result of, or relate in any way to any negligent acts or omissions on the part of the City or the City Personnel, except to the extent any such Losses are the result of any gross negligence or wrongful intentional acts on the part of the City or City Personnel; and

- (b) covenants and agrees to indemnify and save harmless the City and City Personnel, from and against all Losses which may arise or accrue to any person, firm or corporation against the City or any City Personnel or which the City or any City Personnel may pay, incur, sustain or be put to, by reason of:
  - (i) any negligent act or omission or wilful misconduct of the Owner or any of those whom the Owner is responsible for at law in connection with the observance and performance of the obligations of the Owner under this Agreement; or
  - (ii) any default in the due observance and performance of the obligations and responsibilities of the Owner under this Agreement,

except to the extent any such Losses are the result of any gross negligence or wrongful intentional acts on the part of the City or City Personnel

The indemnities in this ARTICLE 6 will be both personal covenants of the Owner and integral parts of the Section 219 covenants granted in this Agreement.

## 6.2 Conduct of Proceedings.

- (a) In the event that a claim is made against the City which, pursuant to the terms of this Agreement, requires the Owner to indemnify the City or City Personnel, then the City will give notice of such claim to the Owner and, subject to Section 6.2(b), the Owner will have the right, upon written notice to the City, to conduct the proceedings in defence of the claim.

- (b) Section 6.2(a) will not apply and the City will have the right to conduct the defence of any claim described in Section 6.2(a) in the following circumstances:
- (i) where the City Manager determines that the proper administration of the municipal government requires that decisions with respect to the claim be made by the City;
  - (ii) where the City Manager determines that the public interest requires that the matter be resolved in an open and public way; or
  - (iii) where, in the opinion of the City Manager, the claim is of a nature where decisions with respect to settling or defending it would create a precedent with respect to other existing or potential claims affecting or involving the City;

provided however that if the City wishes to settle any claim, the City will not do so without the prior consent of the Owner, which consent will not be unreasonably withheld. In conducting any defence or making any settlement, the City will act in a manner reasonably consistent with the manner in which the City would act in connection with the defence or settlement of claims, suits, demands, actions or proceedings which would not be indemnified against under the provisions of this Section 6.2(b); and

- (c) Regardless of whether the claim is being defended under Section 6.2(a) or Section 6.2(b), the party having conduct of the proceedings will, upon written request of the other party, provide to the other party all information in its possession relating to the proceedings which may be properly disclosed at law. If the party not having conduct of the proceedings so requests in writing in a timely fashion, the party having conduct of the proceedings will join the other party as a third party to the proceedings.

- 6.3 Survival of Release and Indemnities. The release and indemnities in this ARTICLE 6 will remain effective, and survive any modification of, or partial release or release of the covenants created by this Agreement, and any termination of this Agreement, whether by fulfilment of the covenants contained in this Agreement or otherwise.

#### ARTICLE 7 NOTICES

- 7.1 All notices, demands or requests of any kind which one party may be required or permitted to give to the other in connection with this Agreement, will be in writing and will be given by registered mail or personal delivery, addressed as set forth below. Any such notice, demand or request will be deemed given:
- (a) if made by registered mail, on the earlier of the day receipt is acknowledged by the addressee or the third day after it was mailed, except when there is a postal service disruption during such period, in which case delivery will be deemed to be completed upon actual delivery of the notice, demand or request; and
  - (b) if personally delivered, on the date when delivered,

if to the City:

**City of Vancouver**  
453 West 12th Avenue  
Vancouver, British Columbia  
V5Y 1V4

**Attention:** City Clerk, with concurrent copies to the General Manager of Planning, Urban Design and Sustainability and the Director of Legal Services

If to the Owner:

**Rize Alliance (Fraser & 19<sup>th</sup>) Properties Ltd.**  
3204-1055 Dunsmuir Street  
Vancouver, British Columbia  
V7X 1L4

**Attention:** Director of Development

or to such other address in Canada as either party may specify in writing to the other party in the manner described above, provided that if and when the owner of the Land or any part thereof should change, in the absence of any such specification, then to the address as set out in the State of Title Certificate for that particular parcel of land.

#### ARTICLE 8 MISCELLANEOUS

- 8.1 **Agreement Runs With the Lands.** The covenants and agreements set forth herein on the part of the Owner shall be covenants the burden of which shall run with and shall bind the Lands and shall attach thereto and run with each and every part into which the same may be subdivided or consolidated.
- 8.2 **Enurement.** This Agreement shall enure to the benefit of and be binding upon the City and its successors and assigns, and this Agreement shall enure to the benefit of and be binding upon the Owner and its successors and assigns.
- 8.3 **Severability.** All the obligations and covenants contained in this Agreement are severable, so that if any one or more of the obligations or covenants are held by or declared by a court of competent jurisdiction to be void or unenforceable, the balance of the obligations and covenants will remain and be binding.
- 8.4 **Vancouver Charter.** Nothing contained or implied herein will derogate from the obligations of the Owner under any other agreement with the City or, if the City so elects, prejudice or affect the City's rights, powers, duties or obligations in the exercise of its functions pursuant to the *Vancouver Charter*, and the rights, powers, duties and obligations of the City under all public and private statutes, by-laws, orders and regulations, which may be, if the City so elects, as fully and effectively exercised in relation to the Lands as if this Agreement had not been executed and delivered by the Owner and the City.
- 8.5 **Waiver.** The Owner acknowledges and agrees that no failure on the part of the City to exercise and no delay in exercising any right under this Agreement will operate as a waiver

thereof nor will any single or partial exercise by the City of any right under this Agreement preclude any other or future exercise thereof or the exercise of any other right. The remedies herein provided will be cumulative and not exclusive of any other remedies provided by law and all remedies stipulated for the City herein will be deemed to be in addition to and not, except as herein expressly stated, restrictive of the remedies of the City at law or in equity.

- 8.6 Perfection of Intention. The Owner shall, after execution hereof, do or cause to be done at its own cost and expense all things and acts necessary to ensure that this Agreement is noted on title to the Lands as a housing agreement pursuant to Section 565.2 of the *Vancouver Charter* and also registered as a charge against title to the Lands.
- 8.7 Priority of Registration. The Owner agrees to cause the registrable interests in land expressly agreed to be granted pursuant to this Agreement to be registered as first registered charges against the Lands, save only for any reservations, liens, charges or encumbrances:
- (a) contained in any grant from Her Majesty the Queen in Right of the Province of British Columbia respecting the Lands;
  - (b) registered against any of the titles to the Lands at the instance of the City, whether in favour of the City or otherwise, as a condition of the Rezoning or Development Permit; and
  - (c) which the Director of Legal Services has determined, in her/his sole discretion, may rank in priority to the registrable interests in land granted pursuant to this Agreement.
- 8.8 Further Assurances. Each party shall execute such further and other documents and instruments and do such further and other acts as may be necessary to implement and carry out the provisions and intent of this Agreement.
- 8.9 Sale or Transfer of Lands or Building. Prior to the sale or transfer of any legal or beneficial interest in the Lands charged by this Agreement, or any portion thereof (other than the transfer of an interest by way of mortgage, where the mortgagee has first granted the Section 219 Covenant contained herein priority, in form and substance satisfactory to the City, over its mortgage and other than the sale, lease or mortgage of individual strata lots and the lease or mortgage of any other property), subject always to Sections 2.1(e) and 2.1(f), the Owner will cause the purchaser/ transferee to enter into an assumption agreement with the City, in form and substance satisfactory to the Director of Legal Services, pursuant to which the purchaser/transferee will agree to be bound by all of the obligations, agreements and indemnities of the Owner under this Agreement. The provisions in this Section 8.9 will apply equally to all subsequent purchasers/ transferees (other than a mortgagee that has first granted the Section 219 Covenant contained herein priority, in form and substance satisfactory to the City, over its mortgage and other than the sale, lease or mortgage of individual strata lots and the lease or mortgage of any other property).
- 8.10 No liability after ownership ceases. Subject to Section 8.9, neither the Owner nor any successor in title to the Lands shall be liable for breaches of or non-observance or non-performance of covenants herein occurring as the same relate to any portion of the Lands

after it has ceased to be the owner of such portion, but the Owner or its successors in title, as the case may be, shall remain liable after ceasing to be the owner of any portion of the Lands for all breaches of and non-observance and non-performance of covenants herein as the same relate to such portion that occurred prior to the Owner or any successor in title, as the case may be, ceasing to be the owner of such portion.

8.11 Owner's Representations and Warranties. The Owner represents and warrants to and covenants and agrees with the City that:

- (a) it has the full and complete power, authority and capacity to enter into, execute and deliver this Agreement and to bind all legal and beneficial interests in the title to the Lands with the interests in land created hereby;
- (b) upon execution and delivery of this Agreement and registration thereof, the interests in land created hereby will encumber all legal and beneficial interests in the title to the Lands;
- (c) this Agreement will be fully and completely binding upon the Owner in accordance with its terms and the Owner will perform all of its obligations under this Agreement in accordance with its terms; and
- (d) the foregoing representations, warranties, covenants and agreement will have force and effect notwithstanding any knowledge on the part of the City whether actual or constructive concerning the status of the Owner with regard to the Lands or any other matter whatsoever.

IN WITNESS WHEREOF the parties have executed this Agreement on the Land Title Act Forms which are a part hereof.



**CONSENT AND PRIORITY INSTRUMENT**

In this consent and priority instrument:

- (a) "Existing Charges" means the Mortgage registered under number CA6529170 and the Assignment of Rents registered under number CA6529171; <sup>FEDERAL</sup>
- (b) "Existing Chargeholder" means COAST CAPITAL SAVINGS<sup>A</sup> CREDIT UNION (Incorporation No. FI-146);
- (c) "New Charges" means the registrable charges and encumbrances created by and contained in the attached Terms of Instrument - Part 2; and
- (d) words capitalized in this instrument, not otherwise defined herein, have the respective meanings ascribed to them in the attached Terms of Instrument - Part 2.

For Ten Dollars (\$10.00) and other good and valuable consideration, the receipt and sufficiency of which the Existing Chargeholder acknowledges, the Existing Chargeholder:

- (a) consents to the Owner granting the New Charges to the City; and
- (b) agrees with the City that the New Charges charge the Lands in priority to the Existing Charges in the same manner and to the same effect as if the Owner had granted the New Charges, and they had been registered against title to the Lands, prior to the grant or registration of the Existing Charges or the advance of any money under the Existing Charges.

To witness this consent and priority instrument, the Existing Chargeholder has caused its duly authorized signatories to sign the attached General Instrument - Part 1.

**CONSENT AND PRIORITY INSTRUMENT**

In this consent and priority instrument:

- (a) "Existing Charges" means the Mortgage registered under number CA6529172 and the Assignment of Rents registered under number CA6529173;
- (b) "Existing Chargeholder" means GARDENIA INVESTMENTS LTD. (Incorporation No. 0103992);
- (c) "New Charges" means the registrable charges and encumbrances created by and contained in the attached Terms of Instrument - Part 2; and
- (d) words capitalized in this instrument, not otherwise defined herein, have the respective meanings ascribed to them in the attached Terms of Instrument - Part 2.

For Ten Dollars (\$10.00) and other good and valuable consideration, the receipt and sufficiency of which the Existing Chargeholder acknowledges, the Existing Chargeholder:

- (a) consents to the Owner granting the New Charges to the City; and
- (b) agrees with the City that the New Charges charge the Lands in priority to the Existing Charges in the same manner and to the same effect as if the Owner had granted the New Charges, and they had been registered against title to the Lands, prior to the grant or registration of the Existing Charges or the advance of any money under the Existing Charges.

To witness this consent and priority instrument, the Existing Chargeholder has caused its duly authorized signatories to sign the attached General Instrument - Part 1.

**CONSENT AND PRIORITY INSTRUMENT**

In this consent and priority instrument:

- (e) "Existing Charges" means the Mortgages registered under numbers CA6529575 and CA6529577 and the Assignments of Rents registered under numbers CA6529576 and CA6529578;
- (f) "Existing Chargeholder" means GROSVENOR TRUE NORTH SERVICES CANADA LIMITED (Incorporation No. BC1048212);
- (g) "New Charges" means the registrable charges and encumbrances created by and contained in the attached Terms of Instrument - Part 2; and
- (h) words capitalized in this instrument, not otherwise defined herein, have the respective meanings ascribed to them in the attached Terms of Instrument - Part 2.

For Ten Dollars (\$10.00) and other good and valuable consideration, the receipt and sufficiency of which the Existing Chargeholder acknowledges, the Existing Chargeholder:

- (c) consents to the Owner granting the New Charges to the City; and
- (d) agrees with the City that the New Charges charge the Lands in priority to the Existing Charges in the same manner and to the same effect as if the Owner had granted the New Charges, and they had been registered against title to the Lands, prior to the grant or registration of the Existing Charges or the advance of any money under the Existing Charges.

To witness this consent and priority instrument, the Existing Chargeholder has caused its duly authorized signatories to sign the attached General Instrument - Part 1.

**END OF DOCUMENT**