PROVINCE OF BRITISH COLUMBIA

REGULATION OF THE MINISTER OF NATURAL GAS DEVELOPMENT AND MINISTER RESPONSIBLE FOR HOUSING AND DEPUTY PREMIER

Building Act

Ministerial Order No. M 307

I, Rich Coleman, Minister of Natural Gas Development and Minister Responsible for Housing and Deputy Premier, order that the attached UBC Tall Wood Building Regulation is made.

DEPOSITED

September 29, 2015

B.C. REG. 182/2015

SEP 2 8 2015

Date

Minister of Natural Gas Development and Minister Responsible for Housing and Deputy Premier

(This part is for administrative purposes only and is not part of the Order.)

Authority under which Order is made:

Act and section: *Building Act*, S.B.C. 2015, c. 2, s. 3

Other:

September 25, 2015 R/680/2015/17

UBC TALL WOOD BUILDING REGULATION

Definitions

1 In this regulation:

"modified building code" means the British Columbia Building Code Regulation referred to in section 2 (1) with the modifications and additions referred to in that section;

"Student Residence at Brock Commons" means the building constructed or to be constructed on DISTRICT LOT 3044 GROUP 1 NEW WESTMINSTER DISTRICT EXCEPT FIRSTLY; PART ON PLAN 6147 SECONDLY; PART ON PLAN 9301 THIRDLY; PART ON PLAN BCP6556 FOURTHLY; PART ON PLAN BCP23719.

Regulation by modified building code

2 (1) The British Columbia Building Code Regulation, B.C. Reg. 264/2012, as it read on January 1, 2015, applies to the Student Residence at Brock Commons with the modifications and additions set out in the attached Schedule.

(2) No building regulations other than this regulation and the modified building code apply to the Student Residence at Brock Commons.

(3) A reference to the British Columbia Building Code, however described, in a letter of assurance required by the modified building code is deemed to be a reference to the modified building code.

Additional requirements

3 (1) The Student Residence at Brock Commons must be no more than 18 storeys in building height.

(2) The first storey

(a) must be a Group A, Division 2 major occupancy, and

(b) must not contain commercial cooking equipment.

(3) The other storeys must be Group C major occupancies.

(4) The Student Residence at Brock Commons must be located on ground classified as Site Class C according to Table 4.1.8.4.A. in Division B of the modified building code.

(5) The definitions in the modified building code apply to this section.

SCHEDULE

1 For the purposes of section 2 (1) of this regulation, Book I (General) of the British Columbia Building Code established by the British Columbia Building Code Regulation, B.C. Reg. 264/2012, as that regulation read on January 1, 2015, is modified and added to as set out in this Schedule.

Division 1 – Changes to Division A

2 Article 1.2.1.1. of Division A is amended by adding the following Sentence:

4) Despite Clause (1)(b), an alternative solution shall not be used in place of an acceptable solution set out in Article 3.1.9.1., 3.2.2.23., 3.2.2.47., 3.2.6.2., 4.1.8.4., 4.1.8.9., 4.1.8.11., 4.1.8.12., 4.1.8.13., 4.1.8.15., 4.1.8.16. or 4.1.8.18. or Sentence 7.1.3.2.(2).

Division 2 – Changes to Division B

3 Table 1.3.1.2. of Division B is amended by repealing the following items:

ASTM	C 1396/C 1396M-11	Gypsum Board	3.1.5.12.(4) Table 5.10.1.1. Table 9.23.17.2.A. 9.29.5.2.(1) Table 9.29.5.3.

CSA	CAN/CSA-A23.3-04	Design of Concrete Structures	Table 4.1.8.9. 4.3.3.1.(1)

CSA	CAN/CSA-A82.27-M91	Gypsum Board	3.1.5.12.(4) Table 5.10.1.1. Table 9.23.17.2.A. 9.29.5.2.(1)

CSA	O86-09	Engineering Design in Wood	Table 4.1.8.9. 4.3.1.1.(1)

CSA	S16-09	Design of Steel Structures	Table 4.1.8.9. 4.3.4.1.(1)

CSA	S304.1-04	Design of Masonry Structures	Table 4.1.8.9. 4.3.2.1.(1)

NFPA	13-2013	Installation of Sprinkler Systems	2.2.7.1.(1)(4) 3.1.9.1.(4) 3.2.4.9.(2) 3.2.4.16.(1) 3.2.5.12.(1) 3.3.2.13.(3) 9.10.9.6.(11)

ULC	CAN/ULC-S134-92	Fire Test of Exterior Wall Assemblies	3.1.5.5.(1) 3.2.2.50.(3) 3.2.3.7.(3) 9.10.14.5.(2) 9.10.15.5.(2) 9.10.15.5.(3)

and by substituting the following:

ASTM	C 1396/C 1396M-11	Gypsum Board	3.1.5.12.(4) 3.2.2.47.(8) Table 5.10.1.1. Table 9.23.17.2.A. 9.29.5.2.(1) Table 9.29.5.3.

CSA	A23.3-14	Design of Concrete Structures	Table 4.1.8.9. 4.3.3.1.(1)

CSA	CAN/CSA-A82.27-M91	Gypsum Board	3.1.5.12.(4) 3.2.2.47.(8) Table 5.10.1.1. Table 9.23.17.2.A. 9.29.5.2.(1)

CSA	O86-14	Engineering Design in Wood	Table 4.1.8.9. 4.3.1.1.(1)

CSA	S16-14	Design of Steel Structures	Table 4.1.8.9. 4.3.4.1.(1)

CSA	S304-14	Design of Masonry Structures	Table 4.1.8.9. 4.3.2.1.(1)

NFPA	13-2013	Installation of Sprinkler Systems	2.2.7.1.(1)(4) 3.1.9.1.(4) 3.2.2.47.(6) 3.2.4.9.(2) 3.2.4.16.(1) 3.2.5.12.(1) 3.3.2.13.(3) 9.10.9.6.(11)

ULC	CAN/ULC-S134-92	Fire Test of Exterior Wall Assemblies	3.1.5.5.(1) 3.2.2.47.(7) 3.2.2.50.(3) 3.2.3.7.(3) 9.10.14.5.(2) 9.10.15.5.(2) 9.10.15.5.(3)

4 Clause 3.1.9.1.(1)(a) is repealed and the following substituted:

a) sealed by a *fire stop* that

i) when subjected to the fire test method in CAN/ULC-S115, "Fire Tests of Firestop Systems," has an F rating not less than the *fire-protection rating* required for *closures* in the *fire separation* in conformance with Table 3.1.8.4., or

ii) is designed and constructed in conformance with good fire-protection engineering practice, .

5 Article 3.2.2.8. is repealed and the following substituted:

3.2.2.8. [Reserved] .

6 Sentence 3.2.2.23.(2) is repealed and the following substituted:

2) The *building* referred to in Sentence (1) shall be of *noncombustible construction*, and

a) the *building* shall be *sprinklered* throughout,

b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,

c) the *building* shall have no *mezzanines*, and

d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

7 Sentences 3.2.2.47.(2) and (3) are repealed and the following substituted:

2) Except as permitted by Sentences (4) to (6), the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and

a) the *building* shall be *sprinklered* throughout,

b) in addition to conforming to Article 3.2.5.12., the *building* shall be provided with

i) a minimum of 19 m^3 of reserve water stored on site, and

ii) a mechanism for automatically supplying the reserve water to the sprinkler system if the supply from the public water main is interrupted,

c) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,

d) the *building* shall have no *mezzanines*,

e) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly,

f) notwithstanding Articles 3.3.1.1. and 3.3.4.2., wall assemblies separating *dwelling units* shall be *fire separations* with a *fire-resistance rating* not less than 2 h, and

g) notwithstanding Article 3.4.4.1., *exit* stairs shall be separated from the remainder of the *building* by a *fire separation* of *noncombustible construction* with a *fire-resistance rating* not less than 2 h.

3) [Reserved.]

4) Notwithstanding Sentence 3.1.5.1.(1), *storeys* 3 through 18 of the *building* referred to in Sentence (1) are permitted to include *combustible* floor assemblies provided those assemblies are

a) constructed of mass wood cross-laminated timber having a minimum thickness of 150 mm, and

b) protected by

i) a concrete topping not less than 40 mm thick, and

ii) an underlying thermal barrier consisting of a minimum of three layers of gypsum board conforming to Sentence (8), at least one of which is mechanically fastened directly to the underside of the timber.

5) Notwithstanding Sentence 3.1.5.1.(1), *storeys* 2 through 18 of the *building* referred to in Sentence (1) are permitted to include *combustible loadbearing* columns provided those columns are

a) constructed of mass wood glued-laminated timber having a cross-sectional dimension of not less than 265 mm × 215 mm, and

b) protected by being

i) encapsulated by a thermal barrier consisting of a minimum of four layers of gypsum board conforming to Sentence (8) that are mechanically fastened directly to the column,

ii) located entirely within a vertical *fire separation* with a *fire-resistance rating* not less than 2 h and encapsulated by a thermal barrier consisting of a minimum of three layers of gypsum board conforming to Sentence (8) that are mechanically fastened directly to the column, or

iii) located entirely within a single *fire compartment* with a *fire-resistance rating* not less than 2 h that is on the 18th *storey*, has

an area that does not exceed 15% of the *floor area* of that *storey* and contains no *dwelling units* or cooking facilities.

6) Notwithstanding Sentence 3.1.5.1.(1), the *building* referred to in Sentence (1) is permitted to have *combustible* projections at the *first storey* provided they are canopies that are

a) *sprinklered* in accordance with NFPA 13, "Installation of Sprinkler Systems,"

b) constructed of mass wood cross-laminated timber having a thickness of not less than 80 mm or mass wood glued-laminated timber having a cross-sectional dimension of not less than 80 mm × 152 mm, and

c) not greater than 4 m in depth measured from the exterior face of the cladding to the outermost edge of the canopy.

7) Notwithstanding Sentence 3.1.5.1.(1), the *building* referred to in Sentence (1) is permitted to have wood framing elements in exterior non-*loadbearing* wall assemblies provided those assemblies

a) satisfy the criteria of Sentences 3.1.5.5.(3) and (4) when subjected to testing in conformance with CAN/ULC-S134, "Fire Test of Exterior Wall Assemblies," and

b) incorporate a minimum of one layer of gypsum board conforming to Sentence (8) between the wood framing elements and the interior *floor area.*

8) The gypsum board referred to in Clauses (4)(b), (5)(b) and (7)(b) shall be Type X gypsum board not less than 15.9 mm thick, with all joints either backed or taped and filled, conforming to

a) ASTM C 1396/C 1396M, "Gypsum Board," or

b) CAN/CSA A82.27M, "Gypsum Board."

8 Sentence 3.2.6.2.(3) is repealed and the following substituted:

3) A *building* referred to in Sentence (1) shall include a mechanical smoke control system designed so that, assuming an outdoor temperature equal to the January design temperature on a 2.5% basis determined in accordance with Subsection 1.1.3.,

a) within 1 min after the *building* fire alarm is actuated and for 2 h after the time of actuation, each *exit* stair enclosure will not, with any two doors open, contain more than 1% by volume of contaminated air from the fire floor, and

b) within 5 min after the *building* fire alarm is actuated and for 2 h after the time of actuation, the air pressure in each *exit* stair enclosure will not, with all doors closed, be less than 12 Pa greater at the door farthest from the source of the supply air than the air pressure in each of the *public corridors* that the *exit* stair enclosure serves.

9 Sentence 4.1.8.2.(1) is amended

(a) by repealing the definition of "F_a" and substituting the following:

F_a = site coefficient for application in Subsection 4.1.8., as defined in Sentence 4.1.8.4.(7), ,

(b) by adding the following definitions:

F(PGA) = site coefficient for PGA, as defined in Sentence 4.1.8.4.(5),

F(PGV) = site coefficient for PGV, as defined in Sentence 4.1.8.4.(5),

F(T) = site coefficient for spectral acceleration, as defined in Sentence 4.1.8.4.(5), ,

(c) by repealing the definition of "F_v" and substituting the following:

F_v = site coefficient for application in Subsection 4.1.8., as defined in Sentence 4.1.8.4.(7), ,

(d) by adding the following definitions:

PGA_{ref} = reference PGA for determining F(T), F(PGA) and F(PGV) is defined as 1 PGA,

PGV = Peak Ground Velocity, in m/s, as defined in Sentence 4.1.8.4.(1), , *and*

(e) by striking out "$\overline{V}_s$" and substituting "$\overline{V}_{s30}$".

10 Sentence 4.1.8.4.(1) is repealed and the following substituted:

1) The peak ground acceleration (PGA), the peak ground velocity (PGV) and the 5% damped spectral response acceleration values, $S_a(T)$, for the reference ground conditions (Site Class C in Table 4.1.8.4.A.) for periods T of 0.2 s, 0.5 s, 1.0 s, 2.0 s, 5.0 s and 10.0 s shall be determined in accordance with Subsection 1.1.3. and are based on a 2% probability of exceedance in 50 years.

11 Article 4.1.8.4. and Table 4.1.8.4.A. are amended by striking out "$\overline{V}_s$" wherever it appears and substituting "$\overline{V}_{s30}$".

12 The Notes to Table 4.1.8.4.A. are amended by repealing Note (2) and substituting the following:

(2) Where $\overline{V}_{s30}$ has been measured in situ, the F(T) values are permitted to be multiplied by the factor $[0.04 + (1500/\overline{V}_{s30})^{1/2}]$.

13 Article 4.1.8.4. is amended by repealing Sentences (4) to (7), including Tables 4.1.8.4.B. and 4.1.8.4.C., and substituting the following:

4) [Reserved.]

5) The value of the site coefficient for design spectral acceleration at period T, F(T), and of similar coefficients F(PGA) and F(PGV) shall be 1.0.

6) [Reserved.]

7) For all applications in Subsection 4.1.8., $F_a = F(0.2)$ and $F_v = F(1.0)$.

8) [Reserved.]

9) The design spectral acceleration values of S(T) shall be determined as follows, using linear interpolation for intermediate values of T:

$S(T) = F(0.2)S_a(0.2)$ or $F(0.5)S_a(0.5)$, whichever is larger for $T \leq 0.2$ s

$= F(0.5)S_a(0.5)$ for $T = 0.5$ s

$= F(1.0)S_a(1.0)$ for $T = 1.0$ s

$= F(2.0)S_a(2.0)$ for $T = 2.0$ s

$= F(5.0)S_a(5.0)$ for $T = 5.0$ s

$= F(10.0)S_a(10.0)$ for $T \geq 10.0$ s .

14 Table 4.1.8.9. is amended

(a) by striking out "Restrictions[(2)]" ***and substituting*** "Restrictions[(2)(3)]",

(b) by striking out "Steel Structures Designed and Detailed According to CSA S16[(3)]" ***and substituting*** "Steel Structures Designed and Detailed According to CSA S16[(4)]",

(c) by repealing the following rows:

Ductile coupled walls	4.0	1.7	NL	NL	NL	NL	NL
Ductile partially coupled walls	3.5	1.7	NL	NL	NL	NL	NL

and substituting the following:

Ductile coupled walls	4.0	1.7	NL	NL	NL	NL	NL
Moderately ductile coupled walls	2.5	1.4	NL	NL	NL	60	60
Ductile partially coupled walls	3.5	1.7	NL	NL	NL	NL	NL
Moderately ductile partially coupled walls	2.0	1.4	NL	NL	NL	60	60

, and

(d) by repealing the following rows:

Conventional construction							
Moment-resisting frames	1.5	1.3	NL	NL	15	NP	NP
Shear walls	1.5	1.3	NL	NL	40	30	30

and substituting the following:

Conventional construction							
Moment-resisting frames	1.5	1.3	NL	NL	20	15	10[(5)]
Shear walls	1.5	1.3	NL	NL	40	30	30
Two-way slabs without beams	1.3	1.3	20	15	NP	NP	NP

15 The Notes to Table 4.1.8.9. are amended

(a) in Note (2) by striking out "an SFRS; height may be limited in other Parts of the Code." *and substituting* "an SFRS." *and by adding* "above *grade*" *after* "maximum height limits", *and*

(b) by renumbering Note (3) as Note (4) and by adding the following Notes:

(3) Height may be limited in other Parts of the Code.

(5) Limited to a maximum of 2 *storeys*.

16 Clause 4.1.8.11.(2)(c) is repealed and the following substituted:

c) for *buildings* located on a site other than Class F and having an SFRS with an R_d equal to or greater than 1.5, V need not be greater than the larger of

$$\frac{2}{3}S(0.2)I_EW/(R_dR_o) \text{ and } S(0.5)I_EW/(R_dR_o).$$

17 Table 4.1.8.11. is repealed and the following substituted:

Table 4.1.8.11.
Higher Mode Factor, M_v, and Base Overturning Reduction Factor, J(1)(2)(3)(4)

Forming Part of Sentence 4.1.8.11.(5)

S(0.2)/S(5.0)	M_v for T_a ≤ 0.5	M_v for T_a = 1.0	M_v for T_a = 2.0	M_v for T_a ≥ 5.0	J for T_a ≤ 0.5	J for T_a = 1.0	J for T_a = 2.0	J for T_a ≥ 5.0
Moment-resisting frames								
5	1	1	1	(5)(6)	1	0.97	0.92	(5)(6)
20	1	1	1	(5)(6)	1	0.93	0.85	(5)(6)
40	1	1	1	(5)(6)	1	0.87	0.78	(5)(6)
65	1	1	1.03	(5)(6)	1	0.80	0.70	(5)(6)
Coupled walls(7)								
5	1	1	1	1(8)	1	0.97	0.92	0.80(9)
20	1	1	1	1.08(8)	1	0.93	0.85	0.65(9)
40	1	1	1	1.30(8)	1	0.87	0.78	0.53(9)
65	1	1	1.03	1.49(8)	1	0.80	0.70	0.46(9)
Braced frames								
5	1	1	1	(5)(6)	1	0.95	0.89	(5)(6)
20	1	1	1	(5)(6)	1	0.85	0.78	(5)(6)
40	1	1	1	(5)(6)	1	0.79	0.70	(5)(6)
65	1	1.04	1.07	(5)(6)	1	0.71	0.66	(5)(6)
Walls, wall frame systems								
5	1	1	1	1.25(8)	1	0.97	0.85	0.55(9)
20	1	1	1.18	2.30(8)	1	0.80	0.60	0.35(9)
40	1	1.19	1.75	3.70(8)	1	0.63	0.46	0.28(9)
65	1	1.55	2.25	4.65(8)	1	0.51	0.39	0.23(9)
Other systems								
5	1	1	1	(5)(6)	1	0.97	0.85	(5)(6)
20	1	1	1.18	(5)(6)	1	0.80	0.60	(5)(6)
40	1	1.19	1.75	(5)(6)	1	0.63	0.46	(5)(6)
65	1	1.55	2.25	(5)(6)	1	0.51	0.39	(5)(6)

Notes to Table 4.1.8.11.:

(1) For intermediate values of the spectral ratio S(0.2)/S(0.5), M_v and J shall be obtained by linear interpolation.
(2) For intermediate values of the fundamental period, T_a, the product $S(T_a)\cdot M_v$ shall be obtained by linear interpolation using the M_v values obtained as in Note (1).
(3) For intermediate values of the fundamental period, T_a, J shall be obtained by linear interpolation between the J values obtained as in Note (1).
(4) For a combination of different seismic force resisting systems (SFRS) not given in Table 4.1.8.11. in the same direction under consideration, the highest M_v factor for the SFRS's and the corresponding J value shall be used.
(5) Equivalent Static method gives the minimum lateral earthquake force for certain cases. See Sentence 4.1.8.11.
(6) For fundamental lateral periods, T_a, greater than 2.0 s, use the 2.0 s values obtained as in Note (1).
(7) A "coupled" wall is a wall system with coupling beams, where at least 66% of the base overturning moment resisted by the wall system is carried by the axial tension and compression forces resulting from shear in the coupling beams.
(8) For fundamental lateral periods, T_a, greater than 4.0 s, use the 4 s value of $S(T_a)\cdot M_v$ obtained by interpolation between 2.0 s and 5.0 s using the value of M_v obtained as in Note (1).
(9) For fundamental lateral periods, T_a, greater than 4 s, use the 4 s value of J obtained by interpolation between 2 s and 5 s using the value of J obtained as in Note (1).

18 Sentence 4.1.8.12.(6) is repealed and the following substituted:

6) For structures located on sites other than Class F that have an SFRS with R_d equal to or greater than 1.5, the elastic base shear obtained from a Linear Dynamic Analysis may be multiplied by the larger of the following factors to obtain the design elastic base shear, V_{ed}:

$$\frac{2S(0.2)}{3S(T_a)} \leq 1.0 \text{ and } \frac{S(0.5)}{S(T_a)} \leq 1.0 .$$

19 Sentence 4.1.8.13.(2) is repealed and the following substituted:

2) Lateral deflections obtained from a linear elastic analysis using the methods given in Articles 4.1.8.11. and 4.1.8.12. and incorporating the effects of torsion, including accidental torsional moments, shall be multiplied by R_dR_o/I_E, and increased as required by Sentence 4.1.8.16.(1), to give realistic values of anticipated deflections.

20 Sentences 4.1.8.15.(7) and (8) are repealed and the following substituted:

7) The design forces associated with the lateral capacity of the SFRS need not exceed the forces determined in accordance with Sentence 4.1.8.7.(1) with R_dR_o taken as 1.0, unless otherwise provided by the applicable referenced design standards for elements, in which case the design forces associated with the lateral capacity of the SFRS shall not be less than the forces determined in accordance with Sentence 4.1.8.7.(1) with R_dR_o taken as 1.3. (See Appendix A.)

8) *Foundations* need not be designed to resist the lateral load overturning capacity of the SFRS, provided the design and the R_d and R_o for the type of SFRS used conform to Table 4.1.8.9. and the *foundation* is designed in accordance with Sentence 4.1.8.16.(4).

9) *Foundation* displacements and rotations shall be considered as required by Sentence 4.1.8.16.(1).

21 Article 4.1.8.16. is repealed and the following substituted:

4.1.8.16. Foundation Provisions

1) The increased displacements of the structure resulting from *foundation* movements shall be within limits for both the SFRS and the structural framing elements not considered to be part of the SFRS.

2) Except as provided in Sentences (3) and (4), *foundations* shall be designed to have a factored shear and overturning resistance greater than the lateral load capacity of the SFRS unless the requirements in Sentence (3) or Sentence (4) are satisfied.

3) The shear and overturning resistance of the *foundation* determined using a bearing stress equal to 1.5 times the factored bearing strength of the *soil* or *rock* and all other resistances equal to 1.3 times the factored resistances need not exceed the design forces determined in Sentence 4.1.8.7.(1) using an R_dR_o equal to 1.0, except that the factor of 1.3 shall not apply to the portion of the resistance to uplift or overturning resulting from gravity loads.

4) It is permitted to have a *foundation* that has a factored overturning resistance less than the lateral overturning capacity of the supported SFRS provided that all of the following requirements are met:

a) the *foundation* and the supported SFRS both must not be constrained against rotation, and

b) the design overturning moment on the *foundation* shall not be less than both

i) 75% of the overturning capacity of the supported SFRS, and

ii) the design overturning moment determined in Sentence 4.1.8.7.(1) using $R_dR_o = 2.0$.

5) The design of *foundations* shall be such that they are capable of transferring earthquake loads and effects between the *building* and the ground without exceeding the capacities of the *soil* and *rock*.

6) In cases where $I_EF_aS_a(0.2)$ is equal to or greater than 0.35, the following requirements shall be satisfied:

a) *piles* or *pile* caps, drilled piers, and *caissons* shall be interconnected by continuous ties in not fewer than two directions (see Appendix A),

b) *piles*, drilled piers, and *caissons* shall be embedded a minimum of 100 mm into the *pile* cap or structure, and

c) *piles*, drilled piers, and *caissons*, other than wood piles, shall be connected to the *pile* cap or structure for a minimum tension force equal to 0.15 times the factored compression load on the *pile*.

7) At sites where $I_EF_aS_a(0.2)$ is equal to or greater than 0.35, *basement* walls shall be designed to resist earthquake lateral pressures from backfill or natural ground.

8) At sites where $I_EF_aS_a(0.2)$ is greater than 0.75, the following requirements shall be satisfied:

a) *piles*, drilled piers, or *caissons* shall be designed and detailed to accommodate cyclic inelastic behaviour when the design moment in the element due to earthquake effects is greater than 75% of its moment capacity (see Appendix A), and

b) spread footings founded on *soil* defined as Site Class E or F shall be interconnected by continuous ties in not fewer than two directions.

9) Each segment of a tie between elements that is required by Clauses (6)(a) or (8)(b) shall be designed to carry by tension or compression a horizontal force at least equal to the greatest factored *pile* cap or column vertical load in the elements it connects, multiplied by a factor of 0.10 $I_E F_a S_a(0.2)$, unless it can be demonstrated that equivalent restraints can be provided by other means.

10) The potential for liquefaction of the *soil* and its consequences, such as significant ground displacement and loss of *soil* strength and stiffness, shall be evaluated based on the ground motion parameters referenced in Subsection 1.1.3. and shall be taken into account in the design of the structure and its *foundations*.

22 Sentence 4.1.8.18.(1) is amended by repealing the definition of "F_a" and substituting the following:

F_a = as defined in Sentence 4.1.8.4.(7), .

23 Article 7.1.3.2. is amended by adding the following Sentence:

2) In addition to the requirements in Sentence (1), a bathroom in a *dwelling unit* shall be equipped with a floor drain.

Division 3 – Changes to Appendix A to Division B

24 Appendix Note A-4.1.8.16.(1) in Appendix A to Division B is repealed.

25 Appendix Note A-4.1.8.16.(3)(a) is renumbered as Appendix Note A-4.1.8.16.(6)(a).

26 Appendix Note A-4.1.8.16.(4) is repealed.

27 Appendix Note A-4.1.8.16.(5)(a) is renumbered as Appendix Note A-4.1.8.16.(8)(a).

28 Appendix Notes A-4.1.8.16.(7) and A-4.1.8.16.(9) are repealed.

Division 4 – Changes to Appendix B to Division B

29 Appendix Note B-3.2.6.2.(3) in Appendix B to Division B is repealed.

Division 5 – Changes to Appendix C to Division B

30 Table C-2 in Appendix C to Division B is repealed and the following substituted:

Table C-2
Design Data for the University of British Columbia
Forming Part of Appendix C

Location	Elev., m	Design Temperature				Degree-Days Below 18°C	15 Min. Rain, mm	One Day Rain, 1/50, mm	Ann. Rain, mm	Moist. Index	Ann. Tot. Ppn., mm	Driving Rain Wind Pressures, Pa, 1/5	Snow Load, kPa, 1/50		Hourly Wind Pressures, kPa		Seismic Data							
		January		July 2.5%																				
		2.5% °C	1% °C	Dry °C	Wet °C								S_s	S_r	1/10	1/50	$S_a(0.2)$	$S_a(0.5)$	$S_a(1.0)$	$S_a(2.0)$	$S_a(5.0)$	$S_a(10.0)$	PGA	PGV
UBC	120	-6	-8	28	20	2925	10	107	1325	1.44	1400	160	1.9	0.3	0.35	0.45	0.863	0.765	0.432	0.261	0.081	0.029	0.375	0.563