

Mid-Rise Combustible Construction Annotated Changes to the 2012 Ontario Building Code (O. Reg. 332/12, amended to include O. Reg. 191/14)

This summary shows only the changes resulting from O. Reg. 191/14, as they apply to Mid-Rise Combustible Construction. Changes are highlighted, as follows:

New
Deleted

O. Reg. 191/14 Amendment

O. Reg. 191/14 comes into force on 1 January, 2015.

DIVISION B ACCEPTABLE SOLUTIONS

PART 3 FIRE PROTECTION, OCCUPANT SAFETY AND ACCESSIBILITY

Section 3.1. General

3.1.3. Multiple Occupancy Requirements

3.1.3.1. Separation of Major Occupancies

Note: On January 1, 2015, Sentence (1) is amended by striking out “Except as permitted by Sentences (2) and (3)” at the beginning and substituting “Except as provided by Sentences (2) to (5)”. (See: O. Reg. 191/14, ss. 8 (1), 168 (2))

(1) Except as permitted provided by Sentences (2) and (3) to (5), major occupancies shall be separated from adjoining major occupancies by fire separations having fire-resistance ratings conforming to Table 3.1.3.1.

Note: On January 1, 2015, Table 3.1.3.1. is revoked and the following substituted: (See: O. Reg. 191/14, ss. 8 (2), 168 (2))

Table 3.1.3.1.
Major Occupancy Fire Separations⁽¹⁾

Forming Part of Sentence 3.1.3.1.(1)

Item	Column 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
	Major Occupancy	Minimum Fire-Resistance Rating of Fire Separation, h ⁽¹⁾												
		Adjoining Major Occupancy												
		A-1	A-2	A-3	A-4	B-1	B-2	B-3	C	D	E	F-1	F-2	F-3
1.	A-1	N/A	1	1	1	2	2	2	1	1	2	N/A	2	1
2.	A-2	1	N/A	1	1	2	2	2	1 ⁽²⁾	1 ⁽³⁾	2	N/A	2	1
3.	A-3	1	1	N/A	1	2	2	2	1	1	2	N/A	2	1
4.	A-4	1	1	1	N/A	2	2	2	1	1	2	N/A	2	1
5.	B-1	2	2	2	2	N/A	2	2	2	2	2	N/A	2	2
6.	B-2	2	2	2	2	2	N/A	1	2	2	2	N/A	2	2
7.	B-3	2	2	2	2	2	1	N/A	2	2	2	N/A	2	2
8.	C	1	1 ⁽²⁾	1	1	2	2	2	N/A	1	2 ⁽⁴⁾	N/A	2	1
9.	D	1	1 ⁽³⁾	1	1	2	2	2	1	N/A	N/A	3	N/A	N/A
10.	E	2	2	2	2	2	2	2	2 ⁽⁴⁾	N/A	N/A	3	N/A	N/A
11.	F-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	3	N/A	2	2
12.	F-2	2	2	2	2	2	2	2	2	N/A	N/A	2	N/A	N/A
13.	F-3	1	1	1	1	2	2	2	1	N/A	N/A	2	N/A	N/A

Notes to Table 3.1.3.1.:

⁽¹⁾ 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.

⁽²⁾ See Sentence 3.1.3.1.(3).

⁽³⁾ See Sentence 3.1.3.1.(4).

⁽⁴⁾ See Sentence 3.1.3.1.(2).

(2) In a *building* not more than 3 storeys in *building height*, if not more than two *dwelling units* are contained together with a Group E *major occupancy*, the *fire-resistance rating* of the *fire separation* between the two *major occupancies* need not be more than 1 h.

~~(3) The *fire separations* required between *major occupancies* in Sentence (1) are permitted to be penetrated by floor openings protected in conformance with Subsection 3.2.8., except for *fire separations* for Group F, Division 1 *major occupancies* and for *mezzanines* described in Sentence 3.2.8.2.(1).~~

Note: On January 1, 2015, Sentence (3) is revoked and the following substituted: (See: O. Reg. 191/14, ss. 8 (3), 168 (2))

(3) In a *building* within the scope of Article 3.2.2.43A., a *fire separation* with a 2 h *fire-resistance rating* is required between the Group C and Group A, Division 2 *major occupancies*.

(4) In a *building* within the scope of Article 3.2.2.50A., a *fire separation* with a 2 h *fire-resistance rating* is required between the Group D and Group A, Division 2 *major occupancies*.

(5) The *fire separations* required between *major occupancies* in Sentence (1) are permitted to be penetrated by floor openings protected in conformance with Subsection 3.2.8., except for *fire separations* for Group F, Division 1 *major occupancies* and for *mezzanines* described in Sentence 3.2.8.2.(1).

3.1.3.2. Prohibition of Occupancy Combinations

(1) No *major occupancy* of Group F, Division 1 shall be contained within a *building* with any *occupancy* classified as Group A, B or C.

(2) Except as provided in Sentence (4) and Sentence 3.10.2.4.(9), not more than one *suite* of *residential occupancy* shall be contained within a *building* classified as a Group F, Division 2 *major occupancy*.

(3) A sleeping room or sleeping area shall not open directly into a room or area where food is intended to be stored, prepared, processed, distributed, served, sold or offered for sale.

(4) A Group F, Division 2 *major occupancy* is permitted in a *building* containing only *live/work units* if the *occupancy* is for the exclusive use of the occupants of the *live/work units*.

Note: On January 1, 2015, Article 3.1.3.2. is amended by adding the following Sentences: (See: O. Reg. 191/14, ss. 9, 168 (2))

(5) A *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A. shall not contain,

(a) a Group A, Division 1 or 3, Group B, or Group F, Division 1 or 2 *major occupancy*,

(b) a Group A, Division 2 or a Group E *major occupancy* above the second storey, or

(c) except as permitted by Sentence (6), a Group F, Division 3 *major occupancy*.

(6) A *storage garage* below the third storey is permitted in a *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A.

3.1.4. Combustible Construction

3.1.4.1. Combustible Materials Permitted

Note: On January 1, 2015, Sentence (1) is amended by adding "Except as required by this Part" at the beginning. (See: O. Reg. 191/14, ss. 10, 168 (2))

(1) Except as required by this Part, a *building* permitted to be of *combustible construction* is permitted to be constructed of *combustible materials*, with or without *noncombustible* components.

Note: On January 1, 2015, Subsection 3.1.4. is amended by adding the following Articles: (See: O. Reg. 191/14, ss. 11, 168 (2))

3.1.4.8. Cladding

(1) Except as permitted by Sentence 3.2.3.7.(6), cladding for a *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A. that exceeds 4 storeys in *building height* or cladding for a *fire compartment* in such a *building* shall be *noncombustible*.

3.1.4.9. Combustible Piping

(1) Except as provided by Sentence (2), *combustible* piping and tubing and associated adhesives used in a *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A. shall have a *flame-spread rating* not more than 25.

(2) Sentence (1) does not apply to,

(a) *combustible* sprinkler piping and associated adhesives,

(b) *combustible* tubing for pneumatic controls and associated adhesives, provided the tubing has an outside diameter not more than 10 mm,

(c) *combustible* piping and tubing and associated adhesives used in *public pools* and *public spas*, and

(d) *combustible* piping and tubing and associated adhesives concealed in a concrete floor slab.

3.1.7. Fire-Resistance Ratings

3.1.7.5. Rating of Supporting Construction

(1) Except as permitted by Sentence (2) and by Articles 3.2.2.20. to 3.2.2.83. for mixed types of construction, all *loadbearing* walls, columns and arches in the *storey* immediately below a floor or roof assembly required to have a *fire-resistance rating* shall have a *fire-resistance rating* not less than that required for the supported floor or roof assembly.

(2) *Loadbearing* walls, columns and arches supporting a *service room* or *service space* need not conform to Sentence (1).

Note: On January 1, 2015, Sentence (3) is amended by adding “Except for *noncombustible construction* required by Subclauses 3.2.2.43A.(2)(c)(i) and 3.2.2.50A.(2)(c)(i)” at the beginning. (See: O. Reg. 191/14, ss. 13, 168 (2))

(3) Except for *noncombustible construction* required by Subclauses 3.2.2.43A.(2)(c)(i) and 3.2.2.50A.(2)(c)(i), if an assembly is required to be of *noncombustible construction* and have a *fire-resistance rating*, it shall be supported by *noncombustible construction*.

3.1.10. Firewalls

3.1.10.2. Rating of Firewalls

(1) A *firewall* that separates a *building* or *buildings* with *floor areas* containing a Group E or a Group F, Division 1 or 2 *major occupancy* shall be constructed as a *fire separation of noncombustible construction* having a *fire-resistance rating* not less than 4 h, except that where the upper portion of a *firewall* separates *floor areas* containing other than Group E or Group F, Division 1 or 2 *major occupancies*, the *fire-resistance rating* of the upper portion of the *firewall* is permitted to be not less than 2 h.

(2) A *firewall* that separates a *building* or *buildings* with *floor areas* containing *major occupancies* other than Group E or Group F, Division 1 or 2 shall be constructed as a *fire separation of noncombustible construction* having a *fire-resistance rating* not less than 2 h.

(3) Except as permitted by Sentence (4), the required *fire-resistance rating* of a *firewall*, except for *closures*, shall be provided by masonry or concrete.

(4) A *firewall* permitted to have a *fire-resistance rating* not more than 2 h need not be constructed of masonry or concrete provided,

- (a) the assembly providing the *fire-resistance rating* is protected against damage that would compromise the integrity of the assembly,
- (b) the design conforms to Article 4.1.5.17.,
- (c) the level of performance of the *firewall* is not less than of masonry or concrete in the areas of,
 - (i) performance during fire conditions,
 - (ii) mechanical damage during the normal use of the *building*, and
 - (iii) resistance to damage from moisture,
- (d) the *firewall* separates *buildings* or *buildings* with *floor areas* that do not contain,
 - (i) a Group B, Division 1 *major occupancy*, or
 - (ii) a Group B, Division 2 *major occupancy*, and

Note: On January 1, 2015, Clause (e) is revoked and the following substituted: (See: O. Reg. 191/14, ss. 15, 168 (2))

(e) the *firewall* does not separate a *building* regulated by the provisions of Subsection 3.2.6. or a *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A. from another *building* unless the *buildings* on both sides of the *firewall* are *sprinklered*.

3.1.11. Fire Blocks in Concealed Spaces

3.1.11.5. Fire Blocks in Horizontal Concealed Spaces

(1) Except for a crawl space conforming to Sentence 3.1.11.6.(1), a horizontal concealed space within a floor assembly or roof assembly of *combustible construction*, in which sprinklers are not installed, shall be separated by construction conforming to Article 3.1.11.7. into compartments not more than,

- (a) 600 m² 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) 300 m² 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.

(2) A concealed space in an exterior cornice, a mansard style roof, a balcony or a *canopy* in which exposed construction materials within the space have a *flame-spread rating* more than 25, shall be separated by construction conforming to Article 3.1.11.7.,

- (a) at locations where the concealed space extends across the ends of required vertical *fire separations*, and
- (b) so that the maximum dimension in the concealed space is not more than 20 m.

Note: On January 1, 2015, Article 3.1.11.5. is amended by adding the following Sentences: (See: O. Reg. 191/14, ss. 16, 168 (2))

(3) Except as provided by Sentence (4), a horizontal concealed space within a floor assembly or roof assembly of *combustible construction* in a *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A. shall be separated by construction conforming to Article 3.1.11.7. into compartments not more than,

- (a) 600 m² 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) 300 m² 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.

(4) Sentence (3) does not apply if the horizontal concealed space within the floor assembly or roof assembly is entirely filled with *noncombustible* insulation such that any air gap between the top of the insulation and the underside of the floor or roof deck does not exceed 50 mm.

3.1.15. Roof Covering

3.1.15.1. Roof Covering Classification

(1) A roof covering classification shall be determined in conformance with CAN/ULC-S107, “Fire Tests of Roof Coverings”.

3.1.15.2. Roof Coverings

Note: On January 1, 2015, Sentence (1) is amended by striking out “Except as permitted by Sentence (2)” at the beginning and substituting “Except as provided by Sentences (2) and (3)”. (See: O. Reg. 191/14, ss. 18 (1), 168 (2))

(1) Except as **permitted provided** by Sentences (2) and (3), every roof covering shall have a Class A, B or C classification as determined in accordance with Article 3.1.15.1.

(2) A roof covering is not required to have a Class A, B or C classification for,

- (a) a tent,
- (b) an *air-supported structure*, or
- (c) a *building* of Group A, Division 2 *occupancy* not more than 2 *storeys* in *building height* and not more than 1 000 m² in *building area*, provided the roof covering is underlaid with *noncombustible* material.

Note: On January 1, 2015, Article 3.1.15.2. is amended by adding the following Sentence: (See: O. Reg. 191/14, ss. 18 (2), 168 (2))

(3) *Combustible* roof coverings on *buildings* within the scope of Article 3.2.2.43A. or 3.2.2.50A. shall have a Class A classification.

Section 3.2. Building Fire Safety

3.2.2. Building Size and Construction Relative to Occupancy

3.2.2.6. Multiple Major Occupancies

Note: On January 1, 2015, Sentence (1) is amended by striking out “Except as permitted by Articles 3.2.2.7. and 3.2.2.8.” at the beginning and substituting “Except as permitted by Articles 3.2.2.7. and 3.2.2.8. and Sentences 3.2.2.43A.(5) and 3.2.2.50A.(4)”. (See: O. Reg. 191/14, ss. 19, 168 (2))

(1) Except as permitted by Articles 3.2.2.7. and 3.2.2.8. **and Sentences 3.2.2.43A.(5) and 3.2.2.50A.(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*.

3.2.2.7. Superimposed Major Occupancies

Note: On January 1, 2015, Sentence (1) is amended by striking out “Except as permitted by Article 3.2.2.8.” at the beginning and substituting “Except as permitted by Article 3.2.2.8. and Sentences 3.2.2.43A.(5) and 3.2.2.50A.(4)”. (See: O. Reg. 191/14, ss. 20, 168 (2))

(1) Except as permitted by Article 3.2.2.8. **and Sentences 3.2.2.43A.(5) and 3.2.2.50A.(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* was of that *major occupancy*.

(2) If one *major occupancy* is located above another *major occupancy*, the *fire-resistance rating* of the floor assembly between the *major occupancies* shall be determined on the basis of the requirements of this Subsection for the lower *major occupancy*.

3.2.2.10. Streets

(1) Every *building* shall face a *street* located in conformance with the requirements of Articles 3.2.5.4 and 3.2.5.5 for access routes.

(2) For the purposes of Subsections 3.2.2. and 3.2.5. an access route conforming to Subsection 3.2.5. is permitted to be considered as a *street*.

Note: On January 1, 2015, Sentences (3) to (5) are revoked and the following substituted: (See: O. Reg. 191/14, ss. 21, 168 (2))

(3) A *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A. is considered to face one *street* provided not less than 10% of the *building* perimeter is located within 15 m of a *street* or *streets*.

(4) A *building* is considered to face two *streets* provided not less than 50% of the *building* perimeter is located within 15 m of the *street* or *streets*.

(5) A *building* is considered to face three *streets* provided not less than 75% of the *building* perimeter is located within 15 m of the *street* or *streets*.

(6) Enclosed spaces, tunnels, bridges and similar structures, even though used for vehicular or pedestrian traffic, are not considered as *streets* for the purpose of this Part.

3.2.2.17. Sprinklers in Lieu of Roof Rating

Note: On January 1, 2015, Sentence (1) is amended by adding "Except as provided by Sentence (2)" at the beginning in the portion before Clause (a). (See: O. Reg. 191/14, ss. 22 (1), 168 (2))

(1) Except as provided by Sentence (2), the requirements in Articles 3.2.2.20. to 3.2.2.83. for roof assemblies to have a *fire-resistance rating* are permitted to be waived provided,

(a) the *building* is *sprinklered*,

(b) the sprinkler system in Clause (a) is electrically supervised in conformance with Sentence 3.2.4.10.(3), and

(c) the operation of the sprinkler system in Clause (a) will cause a signal to be transmitted to the fire department in conformance with Sentence 3.2.4.8.(4).

Note: On January 1, 2015, Article 3.2.2.17. is amended by adding the following Sentence: (See: O. Reg. 191/14, ss. 22 (2), 168 (2))

(2) The *fire-resistance rating* of roof assemblies required by Clause 3.2.2.43A.(2)(b) or 3.2.2.50A.(2)(b) is not permitted to be waived.

~~3.2.2.43. Group C, up to 6 Storeys, Sprinklered~~

Note: On January 1, 2015, the heading to Article 3.2.2.43. is revoked and the following substituted: (See: O. Reg. 191/14, ss. 23, 168 (2))

3.2.2.43. Group C, up to 6 Storeys, Sprinklered, Noncombustible Construction

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

(a) except as permitted by Sentence 3.2.2.7.(1), the *building* is *sprinklered*,

(b) it is not more than 6 *storeys* in *building height*, and

(c) it has a *building area*,

(i) that is not limited if the *building* is not more than 2 *storeys* in *building height*,

(ii) not more than 12 000 m² if 3 *storeys* in *building height*,

(iii) not more than 9 000 m² if 4 *storeys* in *building height*,

(iv) not more than 7 200 m² if 5 *storeys* in *building height*, or

(v) not more than 6 000 m² if 6 *storeys* in *building height*.

(2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and,

(a) except as permitted by Sentence (3), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 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 1 *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including floors over *basements*, which 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*.

Note: On January 1, 2015, Subsection 3.2.2. is amended by adding the following Article: (See: O. Reg. 191/14, ss. 24, 168 (2))

3.2.2.43A. Group C, up to 6 Storeys, Sprinklered, Combustible Construction

- (1) A *building* classified as Group C is permitted to conform to Sentence (2) provided,
- (a) it is *sprinklered*,
 - (b) it is not more than 6 *storeys* in *building height*,
 - (c) it has a height of not more than 18 m, measured between the floor level of the *first storey* and the floor level of the uppermost *storey* or *mezzanine* that is not a rooftop enclosure provided for elevator machinery, a stairway or a *service room* used for no purpose other than for service to the *building*, and
 - (d) it has a *building area* of not more than,
 - (i) 9 000 m² if 1 *storey* in *building height*,
 - (ii) 4 500 m² if 2 *storeys* in *building height*,
 - (iii) 3 000 m² if 3 *storeys* in *building height*,
 - (iv) 2 250 m² if 4 *storeys* in *building height*,
 - (v) 1 800 m² if 5 *storeys* in *building height*, or
 - (vi) 1 500 m² if 6 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction*, used singly or in combination, and,
- (a) except as permitted by Sentence (3), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) roof assemblies shall have a *fire-resistance rating* not less than 1 h,
 - (c) except as provided by Sentence (4), where the roof assembly has a height greater than 25 m measured from the floor level of the *first storey* to the highest point of the roof assembly, the roof assembly shall,
 - (i) be of *noncombustible construction*, or
 - (ii) be constructed of *fire-retardant treated wood* conforming to Article 3.1.4.5.,
 - (d) *mezzanines* shall have a *fire-resistance rating* not less than 1 h,
 - (e) the *fire separation* of *exits* described in Sentence 3.4.4.1.(3) shall be of *noncombustible construction*, and
 - (f) *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 1 *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including floors over *basements*, which 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) The construction of non-contiguous roof assemblies at different elevations is permitted to be evaluated separately to determine which roof assemblies are required to be constructed in accordance with Clause (2)(c).
- (5) Group A, Division 2 *major occupancies*, Group E *major occupancies* and *storage garages* located in a *building* within the scope of this Article are permitted to be constructed in accordance with this Article provided they are located below the third *storey* of the *building*.

Note: On January 1, 2015, Subsection 3.2.2. is amended by adding the following Article: (See: O. Reg. 191/14, ss. 25, 168 (2))

3.2.2.50A. Group D, up to 6 Storeys, Sprinklered, Combustible Construction

- (1) A building classified as Group D is permitted to conform to Sentence (2) provided,
- (a) it is *sprinklered*,
 - (b) it is not more than 6 storeys in building height,
 - (c) it has a height of not more than 18 m, measured between the floor level of the *first storey* and the floor level of the uppermost *storey* or *mezzanine* that is not a rooftop enclosure provided for elevator machinery, a stairway or a *service room* used for no purpose other than for service to the *building*, and
 - (d) it has a *building area* of not more than,
 - (i) 18 000 m² if 1 *storey* in building height,
 - (ii) 9 000 m² if 2 *storeys* in building height,
 - (iii) 6 000 m² if 3 *storeys* in building height,
 - (iv) 4 500 m² if 4 *storeys* in building height,
 - (v) 3 600 m² if 5 *storeys* in building height, or
 - (vi) 3 000 m² if 6 *storeys* in building height.
- (2) The building referred to in Sentence (1) is permitted to be of *combustible 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 1 h,
 - (b) roof assemblies shall have a *fire-resistance rating* not less than 1 h,
 - (c) except as provided by Sentence (3), where the roof assembly has a height greater than 25 m measured from the floor level of the *first storey* to the highest point of the roof assembly, the roof assembly shall,
 - (i) be of *noncombustible construction*, or
 - (ii) be constructed of *fire-retardant treated wood* conforming to Article 3.1.4.5.,
 - (d) *mezzanines* shall have a *fire-resistance rating* not less than 1 h,
 - (e) the *fire separation* of *exits* described in Sentence 3.4.4.1.(3) shall be of *noncombustible construction*, and
 - (f) *loadbearing walls*, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.
- (3) The construction of non-contiguous roof assemblies at different elevations is permitted to be evaluated separately to determine which roof assemblies are required to be constructed in accordance with Clause (2)(c).
- (4) Group A, Division 2 *major occupancies*, Group E *major occupancies* and *storage garages* located in a building within the scope of this Article are permitted to be constructed in accordance with this Article provided they are located below the third *storey* of the building.

3.2.2.51. Group D, up to 6 Storeys, Sprinklered

Note: On January 1, 2015, the heading to Article 3.2.2.51. is revoked and the following substituted: (See: O. Reg. 191/14, ss. 26, 168 (2))

3.2.2.51. Group D, up to 6 Storeys, Sprinklered, Noncombustible Construction

- (1) A building classified as Group D is permitted to conform to Sentence (2) provided,
- (a) except as permitted by Sentence 3.2.2.7.(1), the building is *sprinklered*,
 - (b) it is not more than 6 storeys in building height, and
 - (c) it has a *building area*,
 - (i) that is not limited if the building is not more than 2 storeys in building height,
 - (ii) not more than 14 400 m² if 3 storeys in building height,
 - (iii) not more than 10 800 m² if 4 storeys in building height,
 - (iv) not more than 8 640 m² if 5 storeys in building height, or
 - (v) not more than 7 200 m² if 6 storeys in building height.
- (2) Except as permitted by Article 3.2.2.16., the building referred to in Sentence (1) shall be of *noncombustible construction*, and,
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 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.

3.2.3. Spatial Separation and Exposure Protection

3.2.3.7. Construction of Exposing Building Face

Note: On January 1, 2015, Sentence (1) is amended by striking out “Except as provided in Sentences (3) and (4)” at the beginning and substituting “Except as provided by Sentences (3) to (6)”. (See: O. Reg. 191/14, ss. 27 (1), 168 (2))

(1) Except as provided in Sentences (3) ~~and (4)~~ to (6) and Articles 3.2.3.10. and 3.2.3.11, the *fire-resistance rating*, construction and cladding for *exposing building faces* of *buildings* or *fire compartments* shall comply with Table 3.2.3.7.

(2) Reserved

Note: On January 1, 2015, Sentence (3) is amended by striking out “Except as provided in Sentence (4)” at the beginning and substituting “Except as provided by Sentences (4) to (6)”. (See: O. Reg. 191/14, ss. 27 (2), 168 (2))

(3) Except as provided ~~in~~ by Sentences (4) to (6), cladding for *buildings* or *fire compartments* where the maximum permitted area of *unprotected openings* is more than 10% of the *exposing building face* need not be *noncombustible* where the wall assembly complies with the requirements of Sentences 3.1.5.5.(1), (3) and (4) when tested in conformance with CAN/ULC-S134, “Fire Test of Exterior Wall Assemblies”.

Note: On January 1, 2015, Sentences (4) to (6) are revoked and the following substituted: (See: O. Reg. 191/14, ss. 27 (3), 168 (2))

(4) Except as provided by Sentence (6), cladding for *buildings* or *fire compartments* where the maximum permitted area of *unprotected openings* is more than 10% but not more than 25% of the *exposing building face* need not be *noncombustible* where the wall assembly complies with Article 3.1.5.5.

~~(4)~~ (5) Except as provided by Sentence (6), cladding for *buildings* or *fire compartments* where the maximum permitted area of *unprotected openings* is more than 25% but not more than 50% of the *exposing building face* need not be *noncombustible* where,

- (a) the *limiting distance* is greater than 5 m,
- (b) the *building* or *fire compartment* and all *combustible attic* or *roof spaces* are *sprinklered*,
- (c) the cladding,
 - (i) conforms to Subsection 9.27.6., 9.27.7., 9.27.8., 9.27.9. or 9.27.10.,
 - (ii) is installed without furring members, or on furring not more than 25 mm thick, over gypsum sheathing at least 12.7 mm thick or over masonry, and
 - (iii) after conditioning in conformance with ASTM D 2898, “Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing”, has a *flame-spread rating* not greater than 25 on the exterior face when tested in accordance with Sentence 3.1.12.1.(1), or
- (d) the cladding,
 - (i) conforms to Subsection 9.27.12.,
 - (ii) is installed with or without furring members over gypsum sheathing at least 12.7 mm thick or over masonry,
 - (iii) has a *flame-spread rating* not greater than 25 when tested in accordance with Sentence 3.1.12.1.(2), and
 - (iv) does not exceed 2 mm in thickness exclusive of fasteners, joints and local reinforcements, ~~or~~

(e) the wall assembly complies with Article 3.1.5.5.

~~(5) Where Table 3.2.3.7. permits an area of *unprotected openings* of more than 10% but not more than 25% of the *exposing building face*, the requirements for *noncombustible* cladding are waived for wall assemblies that comply with Article 3.1.5.5.~~

(6) Subject to Sentence (7), cladding for *buildings* within the scope of Article 3.2.2.43A. or 3.2.2.50A. that exceed 4 *storeys* in *building height* or for *fire compartments* in such *buildings* where the maximum permitted area of *unprotected openings* is more than 10% of the *exposing building face* need not be *noncombustible* where the wall assembly complies with the requirements of Sentences 3.1.5.5.(3) and (4) when tested in accordance with CAN/ULC-S134, “Fire Test of Exterior Wall Assemblies”.

(7) A wall assembly described in Sentence (6) that includes *combustible* cladding of *fire-retardant treated wood* shall be tested for fire exposure after the cladding has been conditioned in conformance with ASTM D2898, “Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing”.

~~(6)~~ (8) The construction requirements for the *exposing building face* that are listed in Table 3.2.3.7. shall be satisfied before the area of *unprotected openings* may be increased as permitted by Sentence 3.2.3.12.(1).

Note: On January 1, 2015, Table 3.2.3.7. is revoked and the following substituted: (See: O. Reg. 191/14, ss. 27 (4), 168 (2))

Table 3.2.3.7.
Minimum Construction Requirements for Exposing Building Faces
 Forming Part of Sentences 3.2.3.7.(1) ~~(5)~~ and ~~(6)~~ (8)

Item	Column 1 <i>Occupancy Classification of Building or Fire Compartment</i>	Column 2 <i>Maximum Area of Unprotected Openings Permitted, % of Exposing Building Face Area</i>	Column 3 <i>Minimum Required Fire-Resistance Rating</i>	Column 4 <i>Type of Construction Required</i>	Column 5 <i>Type of Cladding Required</i>
1.	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 or Noncombustible</i>	<i>Noncombustible</i>
		> 25 to 50	45 min	<i>Combustible or Noncombustible</i>	<i>Noncombustible</i>
		> 50 to < 100	45 min	<i>Combustible or Noncombustible</i>	<i>Combustible or Noncombustible</i> ⁽¹⁾
2.	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 or Noncombustible</i>	<i>Noncombustible</i>
		> 25 to 50	1 h	<i>Combustible or Noncombustible</i>	<i>Noncombustible</i>
		> 50 to < 100	1 h	<i>Combustible or Noncombustible</i>	<i>Combustible or Noncombustible</i> ⁽¹⁾

Notes to Table 3.2.3.7.:

⁽¹⁾ Cladding for buildings over 4 storeys in building height within the scope of Article 3.2.2.43A. or 3.2.2.50A. or for fire compartments in such buildings is required to be noncombustible.

3.2.3.12. Area Increase for Unprotected Openings

Note: On January 1, 2015, Sentence (1) is amended by striking out “Sentence 3.2.3.7.(6)” in the portion before Clause (a) and substituting “Sentence 3.2.3.7.(8)”. (See: O. Reg. 191/14, ss. 28, 168 (2))

(1) Except as required by Sentence 3.2.3.7. ~~(6)~~ (8), the maximum area of *unprotected openings* in any *exposing building face* or *fire compartment* of a *building* that is not *sprinklered* is permitted to be doubled if the openings are glazed with,

- (a) glass block conforming to the requirements of Article 3.1.8.14., or
- (b) wired glass assemblies conforming to MMAH Supplementary Standard SB-2, “Fire Performance Ratings”.

3.2.5. Provisions for Firefighting

3.2.5.6. Access Route Design

- (1) A portion of a roadway or yard provided as a required access route for fire department use shall,
 - (a) have a clear width not less than 6 m, unless it can be shown that lesser widths are satisfactory,
 - (b) have a centreline radius not less than 12 m,
 - (c) have an overhead clearance not less than 5 m,
 - (d) have a change of gradient not more than 1 in 12.5 over a minimum distance of 15 m,
 - (e) be designed to support the expected loads imposed by firefighting equipment and be surfaced with concrete, asphalt or other material designed to permit accessibility under all climatic conditions,
 - (f) have turnaround facilities for any dead-end portion of the access route more than 90 m long, and
 - (g) be connected with a public thoroughfare.

Note: On January 1, 2015, Article 3.2.5.6. is amended by adding the following Sentence: (See: O. Reg. 191/14, ss. 31, 168 (2))

(2) A *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A. shall have no portion of the required access route more than 20 m below the floor level of the uppermost *storey* or *mezzanine* that is not a rooftop enclosure provided for elevator machinery, a stairway or a *service room* used for no purpose other than for service to the *building*.

3.2.5.13. Automatic Sprinkler Systems

(1) Except as provided by Sentences (2) to (4), an automatic sprinkler system shall be designed, constructed, installed and tested in conformance with NFPA 13, “Installation of Sprinkler Systems”.

(2) NFPA 13R, “Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height”, is permitted to be used for the design, construction, installation and testing of an automatic sprinkler system installed in a *building*,

(a) of *residential occupancy* that is not more than 4 *storeys* in *building height*, or

(b) of Group B, Division 3 *occupancy* that contains sleeping accommodation for not more than 10 persons and not more than six occupants require assistance in evacuation in case of an emergency.

Note: On January 1, 2015, Sentence (3) is amended by striking out “Except as required by Sentence (8)” at the beginning and substituting “Except as required by Sentence (9)”. (See: O. Reg. 191/14, ss. 32 (1), 168 (2))

(3) Except as required by Sentence ~~(8)~~ (9), NFPA 13D, “Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes”, is permitted to be used for the design, construction, installation and testing of an automatic sprinkler system installed in a *building of residential occupancy* that contains not more than two *dwelling units*.

(4) If a *building* contains fewer than nine sprinklers, the water supply for these sprinklers is permitted to be supplied from the domestic water system for the *building* provided the required flow for the sprinklers can be met by the domestic system.

(5) If a water supply serves both an automatic sprinkler system and a system serving other equipment, control valves shall be provided so that either system can be shut off independently.

Note: On January 1, 2015, Sentence (6) is amended by striking out “Notwithstanding” at the beginning and substituting “Despite”. (See: O. Reg. 191/14, ss. 32 (2), 168 (2))

(6) ~~Notwithstanding~~ **Despite** the requirements of the standards referenced in Sentences (1) and (2) for the installation of automatic sprinkler systems, sprinklers shall not be omitted in any room or closet in the *storey* immediately below a roof assembly if the *fire-resistance rating* of the roof assembly is waived as permitted by Article 3.2.2.17.

Note: On January 1, 2015, Sentences (7) and (8) are revoked and the following substituted: (See: O. Reg. 191/14, ss. 32 (3), 168 (2))

(7) **Despite** the requirements of the standards referenced in Sentences (1) and (2) for the installation of automatic sprinkler systems, sprinklers shall be provided for all balconies and decks forming part of a *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A., other than,

(a) balconies or decks that are not more than 610 mm in depth measured perpendicular to the exterior wall of the *building*, or

(b) decks on the uppermost roof of the *building*.

~~(7)~~ (8) Sprinklers in elevator machine rooms shall have a temperature rating not less than that required for an intermediate temperature classification and shall be protected against physical damage.

~~(8)~~ (9) The sprinkler system described in Sentence (3) shall be provided with a minimum 20 min water supply when installed in a retirement home regulated under the *Retirement Homes Act, 2010*.

3.2.7. Lighting and Emergency Power Systems

3.2.7.4. Emergency Power for Lighting

(1) An emergency power supply shall be,

(a) provided to maintain the emergency lighting required by this Subsection from a power source such as batteries or generators that will continue to supply power in the event that the regular power supply to the *building* is interrupted, and

(b) so designed and installed that upon failure of the regular power it will assume the electrical load automatically for a period of,

(i) 2 h for a *building* within the scope of Subsection 3.2.6.,

~~(ii) 1 h for a *building* of Group B major occupancy classification that is not within the scope of Subsection 3.2.6., and~~

~~(iii) 30 min for a *building* of any other occupancy.~~

Note: On January 1, 2015, Clause (b) is amended by striking out “and” at the end of Subclause (ii) and by revoking Subclause (iii) and substituting the following: (See: O. Reg. 191/14, ss. 34, 168 (2))

(iii) 1 h for a *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A., and

(iv) 30 min for any other *building*.

(2) If self-contained emergency lighting units are used, they shall conform to CSA C22.2 No. 141, “Emergency Lighting Equipment”.

3.2.7.8. Emergency Power for Fire Alarm Systems

(1) Fire alarm systems, including those incorporating a voice communication system, shall be provided with an emergency power supply conforming to Sentences (2) to (4).

(2) The emergency power supply required by Sentence (1) shall be supplied from,

- (a) a generator,
- (b) batteries, or
- (c) a combination of the items described in Clauses (a) and (b).

(3) The emergency power supply required by Sentence (1) shall be capable of providing,

- (a) supervisory power for not less than 24 h, and
- (b) immediately following, emergency power under full load for not less than,
 - (i) 2 h for a *building* within the scope of Subsection 3.2.6.,
 - (ii) 1 h for a *building* classified as Group B *major occupancy* that is not within the scope of Subsection 3.2.6.,

Note: On January 1, 2015, Subclauses (iii) and (iv) are revoked and the following substituted: (See: O. Reg. 191/14, ss. 36, 168 (2))

(iii) 1 h for a *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A.,

~~(iii)~~ (iv) 5 min for a *building* not required to be equipped with an annunciator, and

~~(iv)~~ (v) 30 min for any other *building*.

(4) The emergency power supply required by Sentence (1) shall be designed so that, in the event of a failure of the normal power source, there is an immediate automatic transfer to emergency power with no loss of information.

Section 3.4. Exits

3.4.4. Fire Separation of Exits

3.4.4.1. Fire-Resistance Rating of Exit Separations

Note: On January 1, 2015, Sentence (1) is amended by striking out “Except as permitted by Sentences (2), (4), 3.3.5.4.(3)” at the beginning of the portion before Clause (a) and substituting “Except as provided by Sentences (2), (3) and (5) and Sentences 3.3.5.4.(3)”. (See: O. Reg. 191/14, ss. 40 (1), 168 (2))

(1) Except as permitted by Sentences (2), ~~(4), (3) and (5)~~ and Sentences 3.3.5.4.(3), 3.4.4.2.(2), 3.4.4.3.(1) and 3.13.3.1.(3), every *exit* shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than that required by Subsection 3.2.2., but not less than 45 min, for,

- (a) the floor assembly above the *storey*, or
- (b) the floor assembly below the *storey*, if there is no floor assembly above.

(2) The *fire-resistance rating* of the *fire separation* referred to in Sentence (1) need not be more than 2 h.

Note: On January 1, 2015, Sentences (3) and (4) are revoked and the following substituted: (See: O. Reg. 191/14, ss. 40 (2), 168 (2))

(3) In a *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A., the *fire-resistance rating* of the *fire separation* referred to in Sentence (1) shall not be less than 1.5 h.

~~(3)~~ (4) If an *exit* stair in an assembly hall or *theatre* serves more than one balcony level, the *exit* stair shall be separated from the remainder of the *building* in conformance with Sentence (1).

~~(4)~~ (5) The path of *exit* travel may lead from an *exit* door or *exit* enclosure through *open air* parking that is located below a roof or floor assembly that is part of the *building* served by the *exit* door or *exit* enclosure where,

- (a) the portion of the path of *exit* travel that leads through the *open air* parking is not more than 9 m in length measured from the *exit* door to a point at ground level at the perimeter of the *building*,
- (b) measures are taken to prevent vehicles intended to park in spaces adjacent to the path of *exit* travel from encroaching on the path of *exit* travel, and
- (c) an alternate *means of egress* not leading through the *open air* parking is available from the interior side of the door opening onto the path of *exit* travel through the *open air* parking area.

Note: On January 1, 2015, the heading to Section 3.17. is revoked and the following substituted: (See: O. Reg. 191/14, ss. 50, 168 (2))

Section 3.17. Additional Requirements for ~~Change of Use Existing Buildings~~

3.17.1. Scope

Note: On January 1, 2015, Article 3.17.1.1. is revoked and the following substituted: (See: O. Reg. 191/14, ss. 51, 168 (2))

3.17.1.1. Application

(1) This Section applies where proposed *construction*,

(a) in respect of an existing *building* will result in any of the following changes of use of all or part of the *building*:

(i) a change of the *major occupancy* of all or part of a *building* that is designated with a “Y” in Table 1.3.1.4. of Division C,

(ii) a *suite* of a Group C *major occupancy* is converted into more than one *suite* of a Group C *major occupancy*,

(iii) a *suite* or part of a *suite* of a Group A, Division 2 or a Group A, Division 4 *major occupancy* is converted to a *gaming premises*,

(iv) a *farm building* or part of a *farm building* is changed to a *major occupancy*,

(v) a *building* or part of a *building* is changed to a *post-disaster building*,

(vi) a *building* or part of a *building* is changed to a retirement home regulated under the *Retirement Homes Act, 2010*, or

(vii) the use of a *building* or part of a *building* is changed and the previous *major occupancy* of the *building* or part of the *building* cannot be determined, **or**

(b) in respect of an existing *building of combustible construction* will extend the *building* by adding a *storey* or *storeys* such that the extended *building* will be more than four *storeys* in *building height*.

(2) For the purposes of this Section and Sentences 11.4.2.1.(1) and 11.4.2.5.(4), the changes of use set out in **Clauses (1)(b) to (d) and (f)** ~~Subclauses (1)(a)(ii) to (iv) and (vi)~~ shall also be deemed to constitute a change in *major occupancy*.

(3) The requirements of this Section are in addition to the requirements of other Parts of this Division as they apply to the proposed *construction*.

3.17.2. Additional Construction

3.17.2.1. Change of Use and Compensating Construction

Note: On January 1, 2015, Sentence (1) is amended by striking out “Clauses 3.17.1.1.(1)(a) to (d) and (f)” and substituting “Subclauses 3.17.1.1.(1)(a)(i) to (iv) and (vi)”. (See: O. Reg. 191/14, ss. 52, 168 (2))

(1) Where proposed *construction* will result in a change of use described in ~~Clauses 3.17.1.1.(1)(a) to (d) and (f)~~ **Subclauses 3.17.1.1.(1)(a)(i) to (iv) and (vi)**, additional *construction* shall be required in order that the *building* or part of a *building* subject to the change of use conforms to the requirements of Subsection 3.2.6. and Sections 3.7., 3.11. and 3.12. as they apply to the new *major occupancy* that the *building* or part of a *building* is to support.

(2) For the purposes of this Article, existing *buildings* shall be classified as to their *construction* and *occupancy* as provided for in Sentence 11.2.1.1.(1).

3.17.2.2. Performance Level and Compensating Construction

(1) The *performance level* of a *building* after *construction* shall not be less than the *performance level* of the *building* prior to *construction*.

Note: On January 1, 2015, Sentence (2) is amended by striking out “and 11.4.2.5.” at the end and substituting “11.4.2.5. and 11.4.2.6.” (See: O. Reg. 191/14, ss. 53 (1), 168 (2))

(2) For the purposes of Sentence (1), reduction of *performance level* shall be determined in accordance with Articles 11.4.2.1., 11.4.2.3., **and** 11.4.2.5. **and** 11.4.2.6.

Note: On January 1, 2015, Sentence (3) is amended by striking out “and 11.4.3.6.” at the end and substituting “11.4.3.6. and 11.4.3.7.” (See: O. Reg. 191/14, ss. 53 (2), 168 (2))

(3) Where proposed *construction* would reduce the *performance level* of an existing *building*, compensating *construction* shall be required in conformance with Articles 11.4.3.1., 11.4.3.2., 11.4.3.4., **and** 11.4.3.6. **and** 11.4.3.7.

(4) Section 11.5. applies in respect of the requirements of Sentences 11.4.3.4.(1), (3) and (4).

PART 4 STRUCTURAL DESIGN

Section 4.1. Structural Loads and Procedures

4.1.8. Earthquake Load and Effects

4.1.8.10. Additional System Restrictions

(1) Except as required by Clause (2)(b), structures with a Type 6 irregularity, Discontinuity in Capacity – Weak Storey, as described in Table 4.1.8.6., are not permitted unless $I_E F_a S_a(0.2)$ is less than 0.2 and the forces used for design of the SFRS are multiplied by $R_d R_o$.

(2) *Post-disaster buildings* shall,

- (a) not have any irregularities conforming to Types 1, 3, 4, 5 and 7 as described in Table 4.1.8.6., in cases where $I_E F_a S_a(0.2)$ is equal to or greater than 0.35,
- (b) not have a Type 6 irregularity as described in Table 4.1.8.6.,
- (c) have an SFRS with an R_d of 2.0 or greater, and
- (d) have no *storey* with a lateral stiffness that is less than that of the *storey* above it.

Note: On January 1, 2015, Sentence (3) is revoked and the following substituted: (See: O. Reg. 191/14, ss. 54, 168 (2))

(3) For *buildings* having fundamental lateral periods, T_a , of 1.0 s or greater, and where $I_E F_v S_a(1.0)$ is greater than 0.25, **walls forming shear walls that are other than wood-based and** part of the SFRS shall be continuous from their top to the *foundation* and shall not have irregularities of Type 4 or 5 as described in Table 4.1.8.6.

(4) 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 of shear walls with wood-based panels, braced frames or moment-resisting frames as defined in Table 4.1.8.9. **within the continuous wood construction shall not have irregularities of Type 4 or 5 as described in Table 4.1.8.6.**

4.1.8.11. Equivalent Static Force Procedure for Structures Satisfying the Conditions of Article 4.1.8.7.

- (1) The static loading due to earthquake motion shall be determined according to the procedures given in this Article.
- (2) The minimum lateral earthquake force, V , shall be calculated using the formula,

$$V = S (T_a) M_v I_E W / (R_d R_o)$$

except,

- (a) for walls, coupled walls and wall-frame systems, V shall not be less than,

$$S (4.0) M_v I_E W / (R_d R_o)$$

- (b) for moment-resisting frames, braced frames and other systems, V shall not be less than,

$$S (2.0) M_v I_E W / (R_d R_o)$$

- (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,

$$\frac{2}{3} S(0.2) I_E W / (R_d R_o)$$

(3) The fundamental lateral period, T_a , in the direction under consideration in Sentence (2) shall be determined as,

- (a) for moment-resisting frames that resist 100% of the required lateral forces and where the frame is not enclosed by or adjoined by more rigid elements that would tend to prevent the frame from resisting lateral forces, and where h_n is in metres,

- (i) $0.085 (h_n)^{3/4}$ for steel moment frames,
- (ii) $0.075 (h_n)^{3/4}$ for concrete moment frames, or
- (iii) $0.1 N$ for other moment frames,

- (b) $0.025 h_n$ for braced frames where h_n is in metres,

- (c) $0.05 (h_n)^{3/4}$ for shear wall and other structures where h_n is in metres, or

- (d) other established methods of mechanics using a structural model that complies with the requirements of Sentence 4.1.8.3.(8), except that,

- (i) for moment-resisting frames, T_a shall not be taken greater than 1.5 times that determined in Clause (a),
- (ii) for braced frames, T_a shall not be taken greater than 2.0 times that determined in Clause (b),
- (iii) for shear wall structures, T_a shall not be greater than 2.0 times that determined in Clause (c),
- (iv) for other structures, T_a shall not be taken greater than that determined in Clause (c), and

- (v) for the purpose of calculating the deflections, the period without the upper limit specified in Subclauses (d)(i) to (iv) may be used, except that, for walls, coupled walls and wall-frame systems, T_a shall not exceed 4.0 s, and for moment-resisting frames, braced frames, and other systems, T_a shall not exceed 2.0 s.

(4) The weight, W , of the *building* shall be calculated using the formula,

$$W = \sum_{i=1}^n W_i$$

(5) The higher mode factor, M_v , and its associated base overturning moment reduction factor, J , shall conform to Table 4.1.8.11.

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

Forming Part of Sentence 4.1.8.11.(5)

Item	Column 1 $S_a(0.2)/S_a(2.0)$	Column 2 Type of Lateral Resisting System	Column 3 M_v For $T_a \leq 1.0$	Column 4 M_v For $T_a = 2.0$	Column 5 M_v For $T_a \geq 4.0$	Column 6 J For $T_a \leq 0.5$	Column 7 J For $T_a = 2.0$	Column 8 J For $T_a \geq 4.0$
1.	< 8.0	Moment-resisting frames	1.0	1.0	⁽³⁾	1.0	0.9	⁽³⁾
		Coupled walls ⁽⁴⁾	1.0	1.0	1.0	1.0	0.9	0.8
		Braced frames	1.0	1.0	⁽³⁾	1.0	0.8	⁽³⁾
		Walls, wall-frame systems	1.0	1.2	1.6	1.0	0.6	0.5
		Other systems ⁽⁵⁾	1.0	1.2	⁽³⁾	1.0	0.6	⁽³⁾
2.	≥ 8.0	Moment-resisting frames	1.0	1.2	⁽³⁾	1.0	0.7	⁽³⁾
		Coupled walls ⁽⁴⁾	1.0	1.2	1.2	1.0	0.7	0.6
		Braced frames	1.0	1.5	⁽³⁾	1.0	0.6	⁽³⁾
		Walls, wall-frame systems	1.0	2.2	3.0	1.0	0.4	0.3
		Other systems ⁽⁵⁾	1.0	2.2	⁽³⁾	1.0	0.4	⁽³⁾

Notes to Table 4.1.8.11.:

⁽¹⁾ For values of M_v between fundamental lateral periods, T_a , of 1.0 s and 2.0 s and between 2.0 s and 4.0 s, the product $S(T_a) \cdot M_v$ shall be obtained by linear interpolation.

⁽²⁾ Values of J between fundamental lateral periods, T_a , of 0.5 s and 2.0 s and between 2.0 s and 4.0 s shall be obtained by linear interpolation.

⁽³⁾ For fundamental lateral periods, T_a , greater than 2.0 s, use the values for $T_a = 2.0$.

⁽⁴⁾ 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.

⁽⁵⁾ For hybrid systems, values corresponding to walls must be used or a dynamic analysis must be carried out as per Article 4.1.8.12.

(6) The total lateral seismic force, V , shall be distributed such that a portion, F_t , shall be assumed to be concentrated at the top of the *building*, where F_t is equal to $0.07 T_a V$ but need not exceed $0.25 V$ and may be considered as zero, where the fundamental lateral period, T_a , does not exceed 0.7 s; the remainder, $V - F_t$, shall be distributed along the height of the *building*, including the top level, in accordance with the formula,

$$F_x = (V - F_t) W_x h_x / \left(\sum_{i=1}^n W_i h_i \right)$$

(7) The structure shall be designed to resist overturning effects caused by the earthquake forces determined in Sentence (6) and the overturning moment at level x , M_x , shall be determined using the formula,

$$M_x = J_x \sum_{i=x}^n F_i (h_i - h_x)$$

where,

$$J_x = 1.0 \text{ for } h_x \geq 0.6h_n, \text{ and}$$

$$J_x = J + (1 - J)(h_x / 0.6h_n) \text{ for } h_x < 0.6h_n$$

where,

J = base overturning moment reduction factor conforming to Table 4.1.8.11.

(8) Torsional effects that are concurrent with the effects of the forces mentioned in Sentence (6) and are caused by the simultaneous actions of the following torsional moments shall be considered in the design of the structure according to Sentence (10):

- (a) torsional moments introduced by eccentricity between the centres of mass and resistance and their dynamic amplification, and
- (b) torsional moments due to accidental eccentricities.

(9) Torsional sensitivity shall be determined by calculating the ratio B_x for each level x according to the following equation for each orthogonal direction determined independently:

$$B_x = \delta_{\max} / \delta_{\text{ave}}$$

where,

B = maximum of all values of B_x in both orthogonal directions, except that the B_x for one-storey penthouses with a weight less than 10% of the level below need not be considered,

δ_{\max} = maximum storey displacement at the extreme points of the structure, at level x in the direction of the earthquake induced by the equivalent static forces acting at distances $\pm 0.10 D_{nx}$ from the centres of mass at each floor, and

δ_{ave} = average of the displacements at the extreme points of the structure at level x produced by the above-mentioned forces.

(10) Torsional effects shall be accounted for as follows:

(a) for a *building* with $B \leq 1.7$ or where $I_E F_a S_a(0.2)$ is less than 0.35, by applying torsional moments about a vertical axis at each level throughout the *building*, derived for each of the following load cases considered separately,

(i) $T_x = F_x(e_x + 0.10 D_{nx})$, and

(ii) $T_x = F_x(e_x - 0.10 D_{nx})$

where F_x is the lateral force at each level determined according to Sentence (6) and where each element of the *building* is designed for the most severe effect of the above load cases, or

(b) for a *building* with $B > 1.7$, in cases where $I_E F_a S_a(0.2)$ is equal to or greater than 0.35, by a Dynamic Analysis Procedure as specified in Article 4.1.8.12.

Note: On January 1, 2015, Article 4.1.8.11. is amended by adding the following Sentence: (See: O. Reg. 191/14, ss. 55, 168 (2))

(11) Where the fundamental lateral period, T_a , is determined by Clause (3)(d) and the *building* is constructed with more than 4 storeys of continuous wood construction and having a timber SFRS of shear walls with wood-based panels, braced frames or moment-resisting frames as defined in Table 4.1.8.9., the lateral earthquake force, V , as determined by Sentence (2) shall be multiplied by 1.2, but need not exceed that determined by Clause (2)(c).

4.1.8.12. Dynamic Analysis Procedure

(1) The Dynamic Analysis Procedure shall be in accordance with one of the following methods:

(a) Linear Dynamic Analysis by either the Modal Response Spectrum Method or the Numerical Integration Linear Time History Method using a structural model that complies with the requirements of Sentence 4.1.8.3.(8), or

(b) Nonlinear Dynamic Analysis, in which case a special study shall be performed.

(2) The spectral acceleration values used in the Modal Response Spectrum Method shall be the design spectral acceleration values, $S(T)$, defined in Sentence 4.1.8.4.(7).

(3) The ground motion histories used in the Numerical Integration Linear Time History Method shall be compatible with a response spectrum constructed from the design spectral acceleration values, $S(T)$, defined in Sentence 4.1.8.4.(7).

(4) The effects of accidental torsional moments acting concurrently with the lateral earthquake forces that cause them shall be accounted for by the following methods:

(a) the static effects of torsional moments due to $(\pm 0.10 D_{nx})F_x$ at each level x , where F_x is either determined from the elastic dynamic analysis or determined from Sentence 4.1.8.11.(6) multiplied by $R_d R_o / I_E$, shall be combined with the effects determined by dynamic analysis, or

(b) if B , as defined in Sentence 4.1.8.11.(9), is less than 1.7, it is permitted to use a three-dimensional dynamic analysis with the centres of mass shifted by a distance of $-0.05 D_{nx}$ and $+0.05 D_{nx}$.

(5) Except as provided in Sentence (6), the design elastic base shear, V_{ed} , is equal to the elastic base shear, V_e , obtained from a Linear Dynamic Analysis.

(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 following factor to obtain the design elastic base shear, V_{ed} :

$$\frac{2S(0.2)}{3S(T_a)} \leq 1.0$$

(7) The design elastic base shear, V_{ed} , shall be multiplied by the importance factor, I_E , as determined in Article 4.1.8.5., and shall be divided by $R_d R_o$, as determined in Article 4.1.8.9., to obtain the design base shear, V_d .

Note: On January 1, 2015, Sentence (8) is amended by striking out "Except as required by Sentence (9)" at the beginning and substituting "Except as required by Sentences (9) and (12)". (See: O. Reg. 191/14, ss. 56 (1), 168 (2))

(8) Except as required by Sentences (9) and (12), if the base shear, V_d , obtained in Sentence (7) is less than 80% of the lateral earthquake design force, V , of Article 4.1.8.11., V_d shall be taken as 0.8 V .

(9) For irregular structures requiring dynamic analysis in accordance with Article 4.1.8.7., V_d shall be taken as the larger of the V_d determined in Sentence (7) and 100% of V .

(10) Except as required by Sentence (11), the values of elastic storey shears, storey forces, member forces, and deflections obtained from the Linear Dynamic Analysis, including the effect of accidental torsion determined in Sentence (4), shall be multiplied by V_d / V_e to determine their design values, where V_d is the base shear.

(11) For the purpose of calculating deflections, it is permitted to use a value for V based on the value for T_a determined in Clause 4.1.8.11.(3)(d) to obtain V_d in Sentences (8) and (9).

Note: On January 1, 2015, Article 4.1.8.12. is amended by adding the following Sentence: (See: O. Reg. 191/14, ss. 56 (2), 168 (2))

(12) Buildings with more than 4 storeys of continuous wood construction and having a timber SFRS of shear walls with wood-based panels, braced frames or moment-resisting frames as defined in Table 4.1.8.9., having a fundamental lateral period, T_a , as determined in Clause 4.1.8.11.(3)(d), shall have the base shear, V_d , taken as the larger of the base shear obtained in Sentence (7) and 100% of the lateral earthquake design force, V , as determined in Article 4.1.8.11.

PART 7 PLUMBING

Section 7.1. General

Note: On January 1, 2015, Section 7.1. is amended by adding the following Subsection: (See: O. Reg. 191/14, ss. 64, 168 (2))

7.1.7. Accommodating Movement

7.1.7.1. Structural Movement

(1) Plumbing shall be designed and installed to accommodate the maximum relative structural movement provided for in the construction of the building.

PART 10 CHANGE OF USE

Section 10.3. Requirements

10.3.2. Performance Level

10.3.2.2. Reduction in Performance Level

Note: On January 1, 2015, Sentence (7) is revoked and the following substituted: (See: O. Reg. 191/14, ss. 128, 168 (2))

(7) Except as provided in Sentence (8), the performance level of a building or part of a building is reduced in an existing building constructed of combustible construction where,

- (a) the occupancy is changed to a residential occupancy in all or part of the building, and
 - (b) if the building was new, it would have been required to be of noncombustible construction or to be constructed in accordance with Article 3.2.2.43A. or 3.2.2.50A.
 - (b) if the building was new, it would have been required to be constructed of noncombustible construction.
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PART 11 RENOVATION

Section 11.4. Performance Level Evaluation and Compensating Construction

11.4.2. Reduction in Performance Level

11.4.2.3. Change of Major Occupancy

(1) Except as provided in Sentence 11.4.2.5.(4), the performance level of an existing building is reduced where proposed construction will result in,

- (a) the change of the major occupancy of all or part of an existing building to another major occupancy of a greater hazard index,
- (b) the conversion of a suite of a Group C major occupancy into more than one suite of Group C major occupancy,
- (c) the conversion of a suite or part of a suite of a Group A, Division 2 or a Group A, Division 4 major occupancy into a gaming premises,
- (d) the change of a farm building or part of a farm building to a major occupancy,
- (e) the change of a building or part of a building to a post-disaster building,
- (f) the change of a building or part of a building to a retirement home regulated under the Retirement Homes Act, 2010, or
- (g) the change in use of a building or part of a building where the previous major occupancy of the building or part of the building cannot be determined.

(2) For the purpose of this Article and Sentences 11.4.2.1.(1) and 11.4.2.5.(4), the change of use set out in Clauses (1)(b) to (g) is also deemed to constitute a change in major occupancy.

(3) The *performance level* of an existing *building* is reduced where the early warning and evacuation systems requirements of other Parts for the proposed *major occupancy* exceed those of the existing *building*.

(4) The *performance level* of an existing *building* is reduced where the proposed *major occupancy* in the *building* is not separated from the adjoining *major occupancies* by *fire separations* having *fire-resistance ratings* conforming to Tables 3.1.3.1. and 11.4.3.4.B.

Note: On January 1, 2015, Sentence (5) is amended by striking out “to be constructed of noncombustible construction” at the end and substituting “to be of noncombustible construction or to be constructed in accordance with Article 3.2.2.43A. or 3.2.2.50A.” (See: O. Reg. 191/14, ss. 130, 168 (2))

(5) The *performance level* of an existing *building* is reduced where the *occupancy* of all or part of an existing *building* of *combustible construction* is changed to a new *major occupancy* that would require the *building*, if it were a new *building*, to be ~~constructed~~ of noncombustible construction or to be constructed in accordance with Article 3.2.2.43A. or 3.2.2.50A.

(6) Despite Clause (1)(a), the *performance level* of an existing *building* is reduced where proposed *construction* will result in the change of the *major occupancy* of all or part of an existing *building* to a Group C *major occupancy* in a *building* over 3 *storeys* in *building height*, except in a *building* conforming to Subclause 3.2.2.44.(1)(a)(ii) and having an egress facility conforming to Sentence 3.3.4.4.(8).

Note: On January 1, 2015, Subsection 11.4.2. is amended by adding the following Article: (See: O. Reg. 191/14, ss. 131, 168 (2))

11.4.2.6. Extension of Buildings of Combustible Construction

(1) The *performance level* of an existing *building* of *combustible construction* is reduced where the existing *building* is extended by adding a *storey* or *storeys* such that the extended *building* will be more than four *storeys* in *building height*.

11.4.3. Compensating Construction

11.4.3.4. Change in Major Occupancy

(1) Where the *performance level* of an existing *building* is reduced under Clause 11.4.2.3.(1)(a), (b), (c), (d), (e) or (g), additional upgrading shall be required in conformance with Table 11.4.3.4.A. and so that the *construction index* of the *building* is increased to at least equal the *hazard index* of the new *major occupancy* that the *building* is to support.

(2) A *building* or part of the *building* subject to a change of *major occupancy* shall conform to the requirements of Subsection 3.2.6., Sections 3.7., 3.11., 3.12., Sentences 6.2.2.1.(2), 6.2.3.9.(1) and 6.2.4.7.(10), Subsections 9.5.1. and 9.5.3. to 9.5.10., Section 9.7., Subsection 9.10.17., Sections 9.31. and 9.32., and Subsections 9.34.1. to 9.34.3. as they apply to the new *major occupancy* that the *building* or part of the *building* is to support.

(3) Where the *performance level* of an existing *building* is reduced under Sentence 11.4.2.3.(3), the *building* shall be evaluated, and the early warning and evacuation systems shall be upgraded, in conformance with the applicable requirements of Table 11.4.3.3.

(4) Where the *performance level* of an existing *building* is reduced under Sentence 11.4.2.3.(4), upgrading of the *fire separations* shall be required in conformance with the applicable requirements of Article 3.1.3.1. and Table 11.4.3.4.B.

Note: On January 1, 2015, Sentence (5) is revoked and the following substituted: (See: O. Reg. 191/14, ss. 132, 168 (2))

(5) Where the *performance level* is reduced under Sentence 11.4.2.3.(5), the requirement for the *building* to be of noncombustible construction or to be constructed in accordance with Article 3.2.2.43A. or 3.2.2.50A. is satisfied if the *building* is sprinklered.

(6) Where the *performance level* is reduced under Sentence 11.4.2.3.(6), the *storey* subject to the change shall be sprinklered.

(7) Where the *performance level* of an existing *building* is reduced under Clause 11.4.2.3.(1)(f), the following requirements apply:

- (a) the retirement home shall be sprinklered,
- (b) a voice communication system conforming to Article 3.2.4.23. shall be provided in the *building*, if Clause 3.2.6.8.(1)(b) or (c), as applicable, requires that such a voice communication system be provided in the *building*, and
- (c) doors to *suites* and sleeping rooms not within *suites* in the retirement home, other than doors leading directly to the exterior, shall be equipped with self-closing devices.

Note: On January 1, 2015, Subsection 11.4.3. is amended by adding the following Article: (See: O. Reg. 191/14, ss. 133, 168 (2))

11.4.3.7. Extension of Buildings of Combustible Construction

(1) Where the *performance level* of an existing *building* is reduced under Article 11.4.2.6., the *building* shall be sprinklered.

DIVISION C ADMINISTRATIVE PROVISIONS

PART 1 GENERAL

Section 1.3. Permits and Inspections

1.3.3. Occupancy of Buildings

Note: On January 1, 2015, Subsection 1.3.3. is amended by adding the following Article: (See: O. Reg. 191/14, ss. 152, 168 (2))

1.3.3.5. Occupancy Permit — Buildings within the scope of Article 3.2.2.43A. or 3.2.2.50A.

(1) No person shall occupy or permit to be occupied a *building* within the scope of Article 3.2.2.43A. or 3.2.2.50A. of Division B, or part of it, unless the *chief building official* or a person designated by the *chief building official* has issued a permit authorizing occupation of the *building* or part of it in accordance with Sentence (3).

(2) This Article does not apply in respect of the occupancy of an existing *building*, or part of it, that has been subject to extension or material alteration or repair.

(3) The *chief building official* or a person designated by the *chief building official* shall issue a permit authorizing occupation of a *building* described in Sentence (1), where,

- (a) the structure of the *building* is completed to the roof,
- (b) the *building* envelope, including, but not limited to, cladding, roofing, windows, doors, assemblies requiring *fire-resistance ratings, closures, insulation, vapour barriers* and air barriers, is complete,
- (c) the walls enclosing the space to be occupied are completed, including balcony *guards*,
- (d) all required *fire separations* and *closures* are completed,
- (e) all required *exits* are completed, including all *fire separations, doors, door hardware, self-closing devices, guards* and handrails,
- (f) all shafts including *closures* are completed,
- (g) measures have been taken to prevent access to parts of the *building* and site that are incomplete or still under construction,
- (h) floors, halls, lobbies and required *means of egress* are free of loose materials and other hazards,
- (i) if *service rooms* should be in operation, required *fire separations* and *closures* are completed,
- (j) all *building drains, building sewers, water systems, drainage systems* and *venting systems* are complete and tested as operational for the *storeys* to be occupied,
- (k) required lighting, heating and electrical supply are provided for the *suites, rooms* and common areas to be occupied,
- (l) required lighting in corridors, stairways and *exits* is completed and operational,
- (m) required standpipe, sprinkler and fire alarm systems are complete and operational, together with required pumper connections for such standpipes and sprinklers,
- (n) required *smoke alarms* and carbon monoxide alarms are complete and operational,
- (o) required fire extinguishers have been installed,
- (p) main garbage rooms, chutes and ancillary services are completed to all *storeys* to be occupied,
- (q) required firefighting access routes have been provided and are accessible, and
- (r) the *sewage system* has been completed and is operational.

(4) Where a *registered code agency* has been appointed to perform the functions described in clause 4.1 (4) (b) or (c) of the Act in respect of the *construction* of a *building* described in Sentence (1), the *chief building official* or a person designated by the *chief building official* shall issue the permit referred to in Sentence (3) after receipt of a *certificate for the occupancy of a building described in Sentence 1.3.3.5.(1) of Division C* issued by the *registered code agency* in respect of the *building*.

This annotated version of the mid-rise combustibles construction amendments to the 2012 Ontario Building Code arising from O. Reg. 191/14 was prepared for convenience only.

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