

2015 National Building Code of Canada (NBC)

2018 Revisions and Errata Package

Selected replacement pages have been produced for the NBC.

Please print and insert in your copy of the Code.

Revisions and Errata

Issued by the Canadian Commission on Building and Fire Codes

The Change Summary table that follows describes revisions, errata and editorial modifications that apply to the National Building Code of Canada 2015:

- Revisions are changes deemed urgent that were posted for public review from November 6, 2017 to January 2, 2018 and have been approved by the Canadian Commission on Building and Fire Codes.
- Errata are corrections to existing text.
- Editorial updates are provided for information purposes only.
- Editorial changes are modifications that improve clarity.

Code pages containing revisions and/or errata are identified with the words “Amended Page” in the footer; pages with editorial modifications and index pages with changes are not flagged.

Code users should contact their local authority having jurisdiction to find out if these revisions and errata apply in their province or territory.

Change Summary — National Building Code of Canada 2015

Division	Code Reference	Change	Date (Y-M-D)	Description of Change
Volume 1				
Preface		editorial update	2018-09-28	In first paragraph, reference to National Energy Code of Canada for Buildings 2015 was updated to read "2017"
A	A-1.4.1.2.(1)	erratum	2018-09-28	Entry for "ASTC and STC:" references to decibels were deleted
	A-1.4.1.2.(1)	editorial update	2018-09-28	Entry for "Dangerous Goods:" text in third paragraph was updated to read "The NBC 2015 nomenclature uses a descriptive approach to classifying dangerous goods, which is similar to the one used by ..."
B	1.3.1.1.(1)	revision	2018-09-28	Date stated in Sentence was revised to read "30 June 2017"
	Table 1.3.1.2.	revision	2018-09-28	Document references were updated as applicable to reflect more recent editions published as of June 30, 2017
	3.1.9.4.(2)	editorial change	2018-09-28	Sentence was revised to read "... forming part of an assembly required to have a <i>fire-resistance rating</i> need not conform to Sentence (1), provided ..."
	3.1.11.5.(3)	erratum	2018-09-28	The word "construction" was italicized in the term " <i>combustible construction</i> "
	3.2.4.18.(11)	revision	2018-09-28	Clause (d) was revised to read "... systems referred to in Articles 3.2.4.22. and 3.2.4.23. have ..."
	3.2.4.22.	revisions	2018-09-28	Article was revised as follows: Title was revised to read "Voice Communication Systems for High Buildings" Sentence (1) was revised to read "... required by Subsection 3.2.6. shall ..." Sentences (7), (8) and (10) were moved to new Article 3.2.4.23. with revisions
	3.2.4.23.	revision	2018-09-28	Article was added
	3.4.3.2.(6)	erratum	2018-09-28	Reference to Note in Clause (a) was corrected to read "... (see Note A-3.4.3.2.(6)(a)), ..." and reference to Note after Sentence was corrected to read "(See Note A-3.4.3.2.(6).)"
	3.6.5.1.(1)	revision	2018-09-28	Reference to "asbestos-cement" was deleted
	3.8.3.14.(1)	erratum	2018-09-28	Clause (a) was corrected to read "... with the rim located ..."

Change Summary — National Building Code of Canada 2015 (Continued)

Division	Code Reference	Change	Date (Y-M-D)	Description of Change
B (continued)	Table 3.10.1.1.	errata (unless otherwise indicated)	2018-09-28	Table was corrected as follows: Sentence 3.1.8.14.(6): entry was deleted Sentence 3.1.11.5.(3): "[F02,F03-OS1.2] [F04-OS1.3]" was added Sentence 3.2.2.50.(2): "[F02-OS1.2]" was replaced by "[F04-OS1.3]", and "[F02-OP1.2]" was replaced by "[F04-OP1.3]" Sentence 3.2.2.53.(2): application statement for "[F03-OP1.2] [F04-OP1.2,OP1.3]" was corrected to read "... and to Clause (c)." Sentence 3.2.2.58.(2): "[F02-OS1.2]" was replaced by "[F04-OS1.3]", and "[F02-OP1.2]" was replaced by "[F04-OP1.3]" Article 3.2.3.2.: entry was deleted Sentence 3.2.4.22.(7): entry was deleted Sentence 3.2.4.22.(8): entry was deleted Article 3.2.4.23.: entry was added as follows: "3.2.4.23. One-way Voice Communication Systems (1) [F11-OS1.5] (2) [F11-OS1.5] (3) [F11-OS1.5]" Sentence 3.3.1.13.(1): "(d) [F10-OS3.7]" was added Sentence 3.3.1.13.(2): "[F30-OS3.1]" was deleted Sentence 3.3.6.2.(3): "[F01,F02,F03,F81-OP1.1,OP1.2]" was added Sentence 3.7.3.1.(1): "[F01,F02-OS1.1]" and "[F01,F02-OP1.1]" were assigned to Clause (b) Sentence 3.8.3.6.(7): "[F30,F73-OS3.1]" was corrected to read "[F30-OS3.1]" Article 3.9.1.2.: entry was added as follows: "3.9.1.2. Application (1)(d) [F02-OS1.1]" Sentence 3.9.2.2.(3): "[F12-OP3.1]" was replaced by "[F56-OH3.1]"
	A-3.2.4.4.(2)	revision	2018-09-28	Text was revised to read "... in combination with Article 3.2.4.22. or 3.2.4.23., ..."
	A-3.2.4.22.(1)(b)	erratum	2018-09-28	Text was corrected to read "... Annex D of NFPA 72, ..."
	A-3.8.3.6.(6) and (7)	erratum	2018-09-28	Text was corrected to read "... identified with the International Symbol of Access or, ..."
	Figure 4.1.6.5.-A	erratum	2018-09-28	In second equation from top, symbol " β_1 " was corrected to read " β "
	4.1.6.5.(3)	erratum	2018-09-28	In last equation, term " $0.8S$ " was corrected to read " $0.8S_s$ "
	Table 4.1.6.10.	erratum	2018-09-28	In second equation from bottom of fifth column, term " x_h " in the numerator was corrected to read " h "
	4.1.7.2.	erratum	2018-09-28	"(See Note A-4.1.7.2.)" was added after Article title
	4.1.7.8.(4)	erratum	2018-09-28	In the definition of \bar{V} , symbol " C_{eH} " was deleted from the variable expression
	4.1.8.1.(2)	erratum	2018-09-28	In Clause (b), symbol " N_{60} " was replaced by " \bar{N}_{60} ", and symbol " S_u " was replaced by " s_u "
	4.1.8.4.(8)	erratum	2018-09-28	The term "soils" was italicized
	Table 4.1.8.6.	erratum	2018-09-28	Superscript reference to Table Note (4) was added after title and deleted from "Notes" column
	Table 4.1.8.9.	erratum	2018-09-28	Subtitle was corrected to read "Forming Part of Sentences 4.1.8.9.(1) and (5)"
	4.1.8.14.(1)	erratum	2018-09-28	Sentence was restructured into clauses, and Clause (a) was corrected to read "... separated by a distance equal to at least the square root ..."
	4.1.8.18.(13)	erratum	2018-09-28	Reference to Note was corrected to read "(See Note A-4.1.8.18.(13).)"
	4.1.8.18.(14)	erratum	2018-09-28	Reference to Note was corrected to read "(See Note A-4.1.8.18.(14) and (15).)"
	4.1.8.18.(15)	erratum	2018-09-28	Reference to Note at the end of Clause (c) was moved after Sentence and corrected to read "(See Note A-4.1.8.18.(14) and (15).)"
	Table 4.5.1.1.	errata	2018-09-28	Table was corrected as follows: Sentence 4.1.6.2.(8): "shape accumulation factor" was corrected to read "accumulation factor", and "(a) to (e)" was corrected to read "(a) to (f)" Sentence 4.1.8.16.(2): application statements were deleted

Change Summary — National Building Code of Canada 2015 (Continued)

Division	Code Reference	Change	Date (Y-M-D)	Description of Change
B (continued)	Figure A-4.1.6.7.(1)	erratum	2018-09-28	In equation at bottom of Figure, symbol "xd" was corrected to read "x _d "
	A-4.1.7.2.(1) and (2)	erratum	2018-09-28	Note designation was corrected to read "A-4.1.7.2."
	A-4.1.8.18.(14)	erratum	2018-09-28	Note designation was corrected to read "A-4.1.8.18.(13)"
	A-4.1.8.18.(15) and (16)(c)	erratum	2018-09-28	Note designation was corrected to read "A-4.1.8.18.(14) and (15)"
	A-5.8.	erratum	2018-09-28	Change bar was added in the margin to indicate the addition of the text "and from spaces where noise may be generated"
	6.2.1.7.(1)	revision	2018-09-28	Sentence was revised to read "Asbestos shall not be used in HVAC systems and equipment."
	Table 6.10.1.1.	errata	2018-09-28	Table was corrected as follows: Sentence 6.2.1.2.(2): "[F40,F44,F50-OH1.1]" was corrected to read "[F40,F50-OH1.1]", and "[F44-OS3.4]" was deleted Sentence 6.2.1.2.(3): "[F40,F44,F50-OH1.1]" was corrected to read "[F40,F43,F44,F50-OH1.1]" Sentence 6.3.2.9.(2): "[F44,F81-OH1.1]" was corrected to read "[F81-OH1.1]", and "[F41,F44-OH1.1]" was added Sentence 6.3.2.10.(8): "[F40,F44,F50,F52-OH1.1]" was corrected to read "[F52-OH1.1]" Sentence 6.3.2.10.(9): "[F40,F44,F50,F52-OH1.1]" was corrected to read "[F52-OH1.1]", and "[F01-OS1.1]" and "[F01-OP1.1]" were deleted Sentence 6.3.2.14.(1): "[F81,F43-OH1.1]" was corrected to read "[F40,F50-OH1.1]", and "[F30-OS3.3]" was deleted Sentence 6.3.2.15.(1): entry was deleted Sentence 6.3.4.2.(1): "[F01-OP1.1]" was added and all Clause references were deleted
	Appendix C	erratum	2018-09-28	In section titled "Snow Loads", the term "unit weight" was corrected to read "specific weight"
	Table D-1.1.2.	revision	2018-09-28	Document references were updated as applicable to reflect more recent editions published as of June 30, 2017
	D-4.3.1.	revision	2018-09-28	Reference to "asbestos cement" was deleted
C	1.2.1.1.(2)	erratum	2018-09-28	Sentence was corrected to read "... in Parts 2 and 3 of Division A."
Volume 2				
B	9.8.1.4.(1)	erratum	2018-09-28	Term "walkways" was romanized
	9.10.4.4.(1)	erratum	2018-09-28	Sentence was corrected to read "... for elevator machinery, stairways or <i>service rooms</i> , ..."
	9.10.19.5.(2)	revision	2018-09-28	Sentence was revised to read "...shall be wirelessly interconnected or interconnected by hard-wiring ...", and "(See Note A-9.10.19.5.(2).)" was added after Sentence
	9.13.3.2.(2)	revision	2018-09-28	Clause (b) was revised to read "... where non-fibered and non-asbestos-fibered (Types I and III) asphalt roll roofing are permitted,"
	9.20.4.	editorial change	2018-09-28	Article 9.20.4.2. was deleted because content was duplicated in Sentence 9.20.4.3.(3), and title of Article 9.20.4.3. was updated to read "Masonry Units"
	9.23.13.1.(2)	erratum	2018-09-28	Subclause (a)(ii) was corrected to read "... complying with Subsection 9.23.17. ..."
	9.25.2.3.(6)	revision	2018-09-28	Clause (a) was deleted
	9.26.1.2.(2)	erratum	2018-09-28	Clause (a) was corrected to read "... of this Section, ..."
	Table 9.26.3.1.	revision	2018-09-28	Row for "Asbestos-Cement Corrugated Sheets" was deleted
	9.27.5.1.	revision	2018-09-28	Sentence (1) was revised to read "Except as permitted by Sentences (2) to (4), ...", and Sentences (5) and (6) were deleted
	9.27.5.3.(1)	revision	2018-09-28	Sentence was revised to read "Except as permitted in Sentence 9.27.5.1.(4), ..."
	Table 9.27.5.4.	erratum	2018-09-28	In first column, first entry under "Wood shingles" was corrected to read "up to 200 mm in width"

Change Summary — National Building Code of Canada 2015 (Continued)

Division	Code Reference	Change	Date (Y-M-D)	Description of Change
B (continued)	9.30.5.1.(1)	revision	2018-09-28	Reference to "vinyl-asbestos" was deleted
	9.33.4.8.(1)	revision	2018-09-28	Sentence was revised to read "Asbestos shall not be used in air distribution systems or equipment."
	9.33.6.2.(1)	revision	2018-09-28	Reference to "asbestos-cement" was deleted
	Table 9.36.4.2.	erratum	2018-09-28	In last column, entry for gas-fired components with input ≥ 22 kW was corrected to read " $E_g \geq 80\%$ and standby loss \leq rated input ⁽⁴⁾ /800 + 16.57· $\sqrt{(V)}$ "
	9.36.5.6.(8)	erratum	2018-09-28	Sentence was corrected to read "... in accordance with Sentence 9.36.2.3.(1)."
	9.36.5.11.(19)	editorial change	2018-09-28	Sentence was updated to read "... that is lower than the flow rate of ..."
	Table 9.37.1.1.	errata (unless otherwise indicated)	2018-09-28	Table was corrected as follows: Sentence 9.7.3.1.(3): "[F55-OH1.1]" was corrected to read "[F42,F55-OH1.1]", and "[F42-OH2.5]" was added Sentence 9.8.4.7.(2): entry was deleted Sentence 9.8.4.7.(3): "[F10-OS3.7]" was deleted Sentence 9.10.13.14.(1): "[F03-OS1.2,OS1.3]" was corrected to read "[F03-OS1.3]", and "[F03-OP1.2,OP1.3]" was corrected to read "[F03-OP1.3]" Sentence 9.10.17.10.(1): "(a),(b),(c)" was deleted Sentence 9.10.17.10.(2): "[F01-OS1.1]" was corrected to read "[F05-OS1.5]", and "[F01-OP1.1]" was deleted Sentence 9.13.2.2.(1): "[F40-OH1.1]" was deleted Sentence 9.13.2.2.(2): "[F40-OH1.1]" and application statement were deleted, and application statement for "[F61-OH1.1,OH1.2,OH1.3]" was deleted Sentence 9.13.2.3.(1): "[F40-OH1.1]" was deleted Sentence 9.13.2.3.(2): "[F40-OH1.1]" was deleted Sentence 9.13.2.3.(3): "[F40-OH1.1]" was deleted Sentence 9.13.2.3.(4): "[F40-OH1.1]" and application statement were deleted, and application statement for "[F61-OH1.1,OH1.2,OH1.3]" was deleted Sentence 9.13.2.3.(5): "[F40-OH1.1]" and application statement were deleted, and application statement for "[F61-OH1.1,OH1.2,OH1.3]" was deleted Sentence 9.13.2.3.(6): "[F40-OH1.1]" and application statement were deleted Sentence 9.13.2.4.(1): "[F40-OH1.1]" and application statement were deleted, and application statement for "[F61-OH1.1,OH1.2,OH1.3]" was deleted Sentence 9.13.2.4.(2): "[F40-OH1.1]" was deleted Sentence 9.13.2.4.(3): "[F40-OH1.1]" was deleted Sentence 9.13.3.3.(1): "[F40-OH1.1]" was deleted Sentence 9.13.3.3.(2): "[F40-OH1.1]" was deleted Sentence 9.13.3.3.(3): "[F40-OH1.1]" and application statement were deleted Sentence 9.13.3.3.(4): "[F40-OH1.1]" and application statement were deleted Sentence 9.13.3.3.(5): "[F40-OH1.1]" and application statement were deleted Sentence 9.13.3.4.(1): "[F40-OH1.1]" was deleted Sentence 9.13.3.4.(2): "[F40-OH1.1]" was deleted Sentence 9.13.3.4.(4): "[F40-OH1.1]" was deleted Article 9.20.4.2.: existing entry was deleted Sentence 9.20.4.2.(3) (formerly 9.20.4.3.(3)): application statements for "[F20-OS2.3]" and "[F20-OP2.3]" were corrected to read "... environmental separator or are exposed to moisture." Sentence 9.27.5.1.(5): entry was deleted Sentence 9.27.5.1.(6): entry was deleted
		editorial change		
		erratum		
		revision		
		revision		

Change Summary — National Building Code of Canada 2015 (Continued)

Division	Code Reference	Change	Date (Y-M-D)	Description of Change
B (continued)				<p>Article 9.27.13.1.: entry was deleted</p> <p>Sentence 9.32.1.3.(1): "[F50,F44,F40-OH1.1]" was corrected to read "[F40,F44,F50,F52-OH1.1]", and "[F52,F50-OH1.1]" and "[F44-OS3.4]" were deleted</p> <p>Sentence 9.32.1.3.(2): "[F81-OP1.1]", "[F40,F80-OH1.1]" and "[F63,F80-OS2.3]" were added</p> <p>Sentence 9.32.1.3.(3): "[F44,F50,F40-OH1.1]" was corrected to read "[F40,F44,F50,F52-OH1.1]", and "[F52,F50-OH1.1]" and "[F44-OS3.4]" were deleted</p> <p>Article 9.36.2.8.: entry was added as follows: "(2) [F92-OE1.1]"</p> <p>Article 9.36.2.10.: entries were added as follows:</p> <p>"(7) [F90-OE1.1]"</p> <p>"(8) [F90-OE1.1]"</p> <p>"(9) [F90-OE1.1]"</p> <p>"(10) [F90-OE1.1]"</p> <p>"(11) [F90-OE1.1]"</p> <p>"(12) [F90-OE1.1]"</p> <p>"(13) [F90-OE1.1]"</p> <p>"(14) [F90-OE1.1]"</p> <p>"(15) [F90-OE1.1]"</p> <p>"(16) [F90-OE1.1]"</p> <p>Sentence 9.36.3.6.(1): "[F92-OE1.1]" was corrected to read "[F95-OE1.1]"</p> <p>Sentence 9.36.3.8.(3): entry was deleted</p> <p>Sentence 9.36.5.3.(1): entry was deleted</p> <p>Sentence 9.36.5.4.(1): entry was deleted</p> <p>Sentence 9.36.5.11.(7): entry was deleted</p> <p>Sentence 9.36.5.12.(2): entry was deleted</p>
	A-9.4.2.2.	erratum	2018-09-28	In the last paragraph, the term "unit weight" was corrected to read "specific weight"
	Figure A-9.8.4.7.	erratum	2018-09-28	In plan view, label for top arrow was corrected to read "660 mm min. ...", and label for bottom arrow was corrected to read "190 mm min. ..."
	A-9.10.19.5.(2)	revision	2018-09-28	Note was added
Volumes 1 and 2				
Index	Letter A	errata	2018-09-28	"Apparent sound transmission class (ASTC)": "5.8.1.2." and "9.11.1.2." were added to "calculation of", and "compliance, 5.8.1.3., 9.11.1.3." was added
		revision	2018-09-28	"Asbestos-cement pipe": entry was deleted
	Letter S	errata	2018-09-28	"Sound transmission class (STC)": "9.11.1.2." was added to "calculation of", and "9.11.1.3." was added to "compliance"

Sometimes a single design will be used as an alternative solution to several sets of acceptable solutions in Division B. In this case, the level of performance required of the alternative solution should be at least equivalent to the overall level of performance established by all the applicable sets of acceptable solutions taken as a whole.

Each provision in Division B has been analyzed to determine what it is intended to achieve. The resultant intent statements clarify what undesirable results each provision seeks to preclude. These statements are not a legal component of the Code, but are advisory in nature, and can help Code users establish performance targets for alternative solutions. They are published as part of the online Code subscriptions and as a separate electronic document entitled "Supplement to the NBC 2015: Intent Statements," which is available on NRC's Web site.

Areas of Performance

A subset of the acceptable solutions in Division B may establish criteria for particular types of designs (e.g. certain types of materials, components, assemblies, or systems). Often such subsets of acceptable solutions are all attributed to the same objective: Fire Safety for example. In some cases, the designs that are normally used to satisfy this subset of acceptable solutions might also provide some benefits that could be related to some other objective: Fire Protection of the Building for example. However, if none of the applicable acceptable solutions are linked to Objective OP1, Fire Protection of the Building, it is not necessary that alternative solutions proposed to replace these acceptable solutions provide a similar benefit related to Fire Protection of the Building. In other words, the acceptable solutions in Division B establish acceptable levels of performance for compliance with the Code only in those areas defined by the objectives and functional statements attributed to the acceptable solutions.

Applicable Acceptable Solutions

In demonstrating that an alternative solution will perform as well as a design that would satisfy the applicable acceptable solutions in Division B, its evaluation should not be limited to comparison with the acceptable solutions to which an alternative is proposed. It is possible that acceptable solutions elsewhere in the Code also apply. The proposed alternative solution may be shown to perform as well as the most apparent acceptable solution which it is replacing but may not perform as well as other relevant acceptable solutions. For example, an innovative sheathing material may perform adequately as sheathing in a wall system that is braced by other means but may not perform adequately as sheathing in a wall system where the sheathing must provide the structural bracing. All applicable acceptable solutions should be taken into consideration in demonstrating the compliance of an alternative solution.

A-1.3.3.4.(1) Buildings Divided by Firewalls. This concept relates to the provisions directly regulated by this Code and does not apply to electrical service entrance requirements, which are regulated by other documents.

A-1.3.3.4.(2) Buildings on Sloping Sites. Application of the definition of grade to stepped buildings on sloping sites often results in such buildings being designated as being greater than 4 storeys in building height even though there may be only 2, 3 or 4 storeys at any one location. Figure A-1.3.3.4.(2) illustrates this application compared to a similar building on a flat site.

Under Sentence 1.3.3.4.(2), Building A can be considered as being 4 storeys in building height instead of 7 storeys in building height. Both Building A and B are comparable with regard to fire safety and egress.

This relaxation applies to the determination of building height only. All other requirements continue to apply as appropriate.

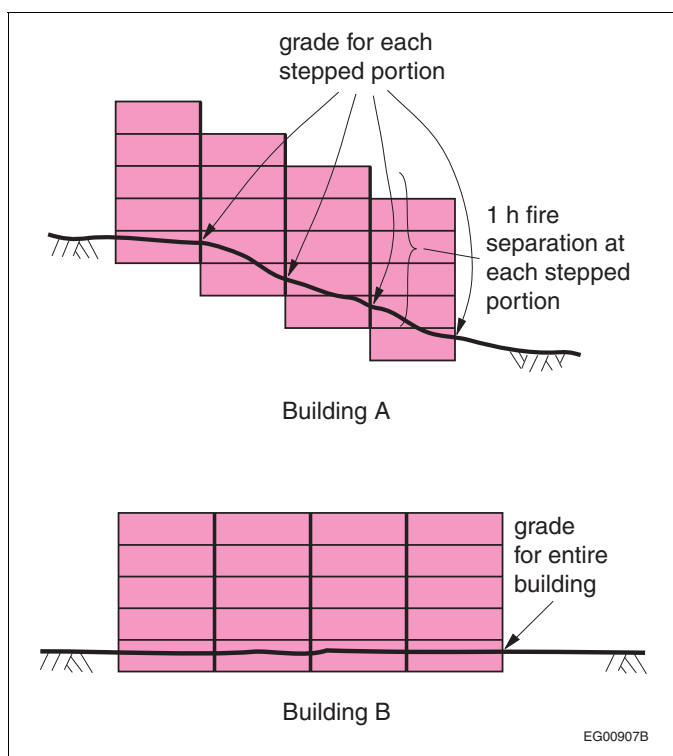


Figure A-1.3.3.4.(2)
Application of the definition of grade

A-1.4.1.2.(1) Defined Terms.

ASTC and STC

The higher the ASTC or STC rating, the more the assembly or the system of assemblies protects occupants from noise in adjacent spaces.

These ratings, which are determined in accordance with ASTM E 413, "Classification for Rating Sound Insulation," roughly describe the noise reduction provided by the separating floor or wall, or in the case of the ASTC rating, by the system of separating and adjoining walls and floors.

Care Occupancy

Support services rendered by or through care facility management refer to services provided by the organization that is responsible for the care for a period exceeding 24 consecutive hours. They do not refer to services provided by residents of dwelling units or suites, or to services arranged directly by residents of dwelling units or suites with outside agencies.

In the context of care occupancies, these services may include a daily assessment of the resident's functioning, awareness of their whereabouts, the making of appointments for residents and reminding them of those appointments, the ability and readiness to intervene if a crisis arises for a resident, supervision in areas of nutrition or medication, and provision of transient medical services. Services may also include activities of daily living such as bathing, dressing, feeding, and assistance in the use of washroom facilities, etc. No actual treatment is provided by or through care facility management.

Dangerous Goods

In previous editions of the NBC, the terminology used to identify dangerous goods came from "Transportation of Dangerous Goods Regulations (TDGR)." The TDGR apply solely to the adequate identification of hazards related to dangerous goods in the contexts of transportation and emergency response.

Dangerous goods in the workplace are identified in accordance with the "Workplace Hazardous Materials Information System (WHMIS)," established in accordance with the "Hazardous Products Act." The WHMIS identification system is specifically designed with the users of the product in mind.

This edition of the NBC identifies dangerous goods as products regulated by the TDGR or classified under the WHMIS. In order to harmonize these two nomenclatures for dangerous goods, class descriptors were developed taking into consideration both the TDGR and WHMIS classification systems. The NBC 2015 nomenclature uses a descriptive approach to classifying dangerous goods, which is similar to the one used by the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) developed by the United Nations (UN). Canada has actively participated in the development of the GHS and has committed to its implementation through the TDGR and WHMIS regulations.

The NBC 2015 nomenclature takes a common sense approach that corresponds more closely to how people refer to dangerous goods on a daily basis, blending TDGR and WHMIS terminology without using nondescript numbers and letters as previously found in the NBC, TDGR and WHMIS.

Table A-1.4.1.2.(1)
UN, TDGR, WHMIS and NBC Class Descriptors for Dangerous Goods

UN	TDGR	WHMIS	NBC 2015
1	Explosives	Explosives	Explosives
2	Gases	Gases under pressure	Compressed gases
2.1	Flammable gases	Flammable gases; Flammable aerosols	Flammable gases; Flammable aerosols
2.2	Non-flammable, non-toxic gases	Gases under pressure	Non-flammable, non-toxic gases
2.2 (5.1)	—	Oxidizing gases	Oxidizing gases
2.3	Toxic gases	—	Toxic gases
3	Flammable liquids	Flammable liquids	Flammable liquids
4.1	Flammable solids	Flammable solids	Flammable solids
4.2	Substances liable to spontaneous combustion	Pyrophoric liquids; pyrophoric solids	Pyrophoric materials
4.3	Water-reactive substances	Substances and mixtures which, in contact with water, emit flammable gases	Water-reactive substances
5.1	Oxidizing substances	Oxidizing liquids; oxidizing solids	Oxidizers
5.2	Organic peroxides	Organic peroxides	Organic peroxides
6.1	Toxic substances	(1)	Toxic substances
6.2	Infectious substances	(1)	Infectious materials
7	Radioactive materials	Not covered by GHS	Radioactive materials
8	Corrosives	(2)	Corrosives
9	Miscellaneous products, substances, or organisms	(2)	Miscellaneous dangerous goods
—	—	Previously Class F	Dangerously reactive materials

Notes to Table A-1.4.1.2.(1):

(1) The WHMIS has various descriptors for this Class of products based on their toxicity.

(2) The WHMIS has various descriptors for this Class of products based on the nature of the danger presented by the product.

Exit

Exits include doors or doorways leading directly into an exit stair or directly to the outside. In the case of an exit leading to a separate building, exits also include vestibules, walkways, bridges or balconies.

Farm Building

Farm buildings as defined in Article 1.4.1.2. include, but are not limited to, produce storage and packing facilities, livestock and poultry housing, milking centres, manure storage facilities, grain bins, silos, feed preparation centres, farm workshops, greenhouses, farm retail centres, and horse riding, exercise and training facilities. Farm buildings may be classed as low or high human occupancy, depending on the occupant load.

Examples of farm buildings likely to be classed as low human occupancy as defined in Article 1.2.1.2. of the National Farm Building Code of Canada 1995. are livestock and poultry housing, manure and machinery storage facilities and horse exercise and training facilities where no bleachers or viewing area are provided.

Examples of farm buildings that would be classed as other than low human occupancy include farm retail centres for feeds, horticultural and livestock produce, auction barns and show areas where bleachers or other public facilities are provided. Farm work centres where the number of workers frequently exceeds the limit for low human occupancy will also be in this category.

It is possible to have areas of both high and low human occupancy in the same building provided that the structural safety and fire separation requirements for high human occupancy are met in the part thus designated.

Fire Separation

It is generally understood that the term “fire” refers to all products of combustion, including heat and smoke. Although a fire separation is not always required to have a fire-resistance rating, it should act as a barrier to the spread of smoke and fire until some type of response is initiated. If the fire-resistance rating of a fire separation is permitted to be waived on the basis of the presence of an automatic sprinkler system, it is nonetheless the intent of the Code that the fire separation be constructed so that it will remain in place and act as a barrier against the spread of smoke until the sprinklers have actuated.

Flight

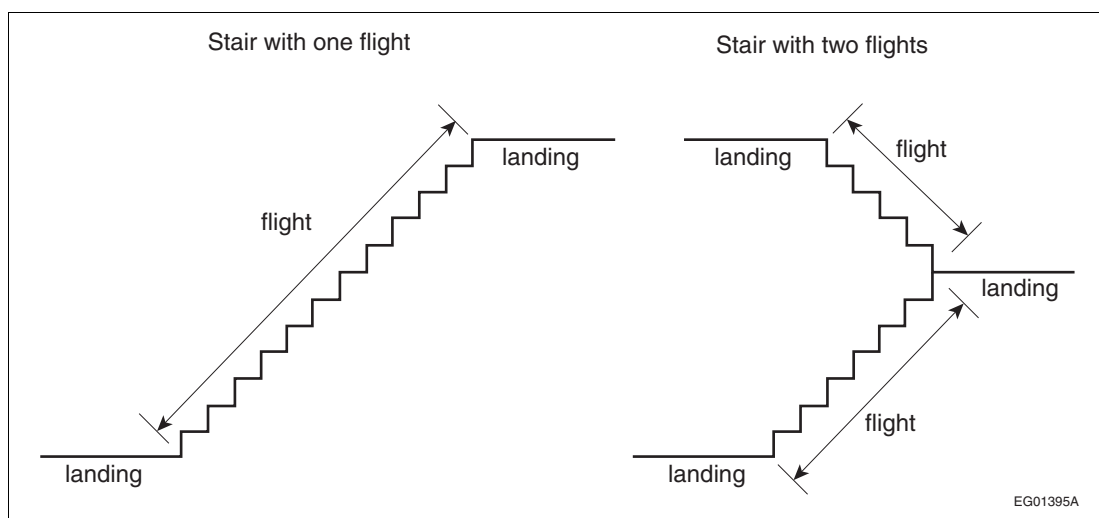


Figure A-1.4.1.2.(1)-A
Flight

Grade

Localized depressions that need not be considered in the determination of the elevation of grade include such features as vehicle and pedestrian entrances and other minor depressions that do not affect accessibility for firefighting or evacuation.

Mechanically Vented

The definition of this term is intended to include all types of appliances and venting systems that rely entirely on fans to evacuate the products of combustion. Systems variously referred to as “forced draft,”

Part 1

General

Section 1.1. General

1.1.1. Application

1.1.1.1. Application

1) This Part applies to all *buildings* covered in this Code. (See Article 1.1.1.1. of Division A.)

1.1.2. Objectives and Functional Statements

1.1.2.1. Attributions to Acceptable Solutions

1) For the purpose of compliance with this Code as required in Clause 1.2.1.1.(1)(b) of Division A, the objectives and functional statements attributed to the acceptable solutions in Division B shall be the objectives and functional statements identified in Sections 3.10., 4.5., 5.10., 6.4., 7.2., 8.3. and 9.37. (See Note A-1.1.2.1.(1).)

1.1.3. Climatic and Seismic Data

1.1.3.1. Climatic and Seismic Values

1) The climatic and seismic values required for the design of *buildings* under this Code shall be in conformance with the values established by the *authority having jurisdiction* or, in the absence of such data, with Sentence (2) and the climatic and seismic values in Appendix C. (See Note A-1.1.3.1.(1).)

2) The outside winter design temperatures determined from Appendix C shall be those listed for the January 2.5% values. (See Note A-1.1.3.1.(2).)

1.1.3.2. Depth of Frost Penetration

1) Depth of frost penetration shall be established on the basis of local experience.

1.1.4. Fire Safety Plan

1.1.4.1. Fire Safety Plan

1) Where a fire safety plan is required, it shall conform to Section 2.8. of Division B of the NFC.

Section 1.2. Terms and Abbreviations

1.2.1. Definitions of Words and Phrases

1.2.1.1. Non-defined Terms

1) Words and phrases used in Division B that are not included in the list of definitions in Article 1.4.1.2. of Division A shall have the meanings that are commonly assigned to them in the context in which they are used, taking into account the

specialized use of terms by the various trades and professions to which the terminology applies.

2) Where objectives and functional statements are referred to in Division B, they shall be the objectives and functional statements described in Parts 2 and 3 of Division A.

3) Where acceptable solutions are referred to in Division B, they shall be the provisions stated in Parts 3 to 9.

1.2.1.2. Defined Terms

1) The words and terms in italics in Division B shall have the meanings assigned to them in Article 1.4.1.2. of Division A.

1.2.2. Symbols and Other Abbreviations

1.2.2.1. Symbols and Other Abbreviations

1) The symbols and other abbreviations in Division B shall have the meanings assigned to them in Article 1.4.2.1. of Division A and Article 1.3.2.1.

Section 1.3. Referenced Documents and Organizations

1.3.1. Referenced Documents

1.3.1.1. Effective Date

1) Unless otherwise specified herein, the documents referenced in this Code shall include all amendments, revisions, reaffirmations, reapprovals, addenda and supplements effective to 30 June 2017.

1.3.1.2. Applicable Editions

1) Where documents are referenced in this Code, they shall be the editions designated in Table 1.3.1.2.

Table 1.3.1.2.
Documents Referenced in the National Building Code of Canada 2015⁽¹⁾
Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
AAMA	501-05	Test for Exterior Walls	A-5.9.3.
AAMA	501.1-05	Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure	A-5.9.3.
AAMA	501.2-09	Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems	A-5.9.3.
AAMA	501.4-09	Recommended Static Test Method for Evaluating Curtain Wall and Storefront Systems Subjected to Seismic and Wind Induced Interstory Drifts	A-5.9.3.
AAMA	501.5-07	Thermal Cycling of Exterior Walls	A-5.9.3. A-5.9.3.3.(1)
AAMA	501.6-09	Recommended Dynamic Test Method For Determining The Seismic Drift Causing Glass Fallout From A Wall System	A-4.1.8.18.(14) and (15) A-5.9.3.
ACGIH	28th Edition	Industrial Ventilation: A Manual of Recommended Practice for Design	6.2.1.1.(1) 6.3.2.14.(2) A-6.3.1.6.

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
AHAM	ANSI/AHAM RAC-1-1982	Room Air Conditioners	Table 9.36.3.10.
AHRI	ANSI/AHRI 210/240-2008	Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment	Table 9.36.3.10.
AHRI	1060 (I-P)-2013	Performance Rating of Air-to-Air Exchangers for Energy Recovery Ventilation Equipment	9.36.3.8.(4)
AHRI	BTS-2000	Efficiency of Commercial Space Heating Boilers	Table 9.36.3.10.
AISI	S201-12	North American Standard for Cold-Formed Steel Framing - Product Data	9.24.1.2.(1)
ANSI	A208.1-2009	Particleboard	9.23.15.2.(3) 9.29.9.1.(1) 9.30.2.2.(1)
ANSI/CSA	ANSI Z21.10.3-2013/CSA 4.3-2013	Gas-Fired Water Heaters, Volume III, Storage Water Heaters With Input Ratings Above 75,000 Btu Per Hour, Circulating and Instantaneous	Table 9.36.4.2.
ANSI/CSA	ANSI Z21.56-2013/CSA 4.7-2013	Gas-Fired Pool Heaters	Table 9.36.4.2.
ANSI/CSA	ANSI Z83.8-2013/CSA 2.6-2013	Gas Unit Heaters, Gas Packaged Heaters, Gas Utility Heaters and Gas-Fired Duct Furnaces	Table 9.36.3.10.
ASCE	ASCE/SEI 7-10	Minimum Design Loads for Buildings and Other Structures	A-4.1.8.18.(14) and (15)
ASCE	ASCE/SEI 8-02	Design of Cold-Formed Stainless Steel Structural Members	A-4.3.4.2.(1)
ASCE	ASCE/SEI 49-12	Wind Tunnel Testing for Buildings and Other Structures	4.1.7.12.(1)
ASHRAE	1997	ASHRAE Handbook – Fundamentals	A-9.32.3.11.
ASHRAE	2013	ASHRAE Handbook – Fundamentals	A-9.36.2.4.(1) Table A-9.36.2.4.(1)-D
ASHRAE	Guideline 12-2000	Minimizing the Risk of Legionellosis Associated with Building Water Systems	6.3.2.15.(4) 6.3.2.16.(3)
ASHRAE	ANSI/ASHRAE 62-2001	Ventilation for Acceptable Indoor Air Quality (except Addendum n)	6.3.1.1.(2) A-9.25.5.2.
ASHRAE	ANSI/ASHRAE 62.1-2007	Ventilation for Acceptable Indoor Air Quality	6.3.2.2.(1)
ASHRAE	ANSI/ASHRAE 103-2007	Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers	Table 9.36.3.10.
ASHRAE	ANSI/ASHRAE 140-2011	Evaluation of Building Energy Analysis Computer Programs	9.36.5.4.(8)
ASME/CSA	ASME A17.1-2010/CSA B44-10	Safety Code for Elevators and Escalators	3.2.6.7.(2) 3.5.2.1.(1) 3.5.2.1.(2) 3.5.2.1.(3) 3.5.4.2.(1) A-3.5.2.1.(1) Table 4.1.5.11. Table 4.1.8.18.
ASME	B18.6.1-1981	Wood Screws (Inch Series)	Table 5.9.1.1. 9.23.3.1.(3) A-9.23.3.1.(3)
ASTM	A 123/A 123M-13	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products	Table 5.9.1.1. Table 9.20.16.1.
ASTM	A 153/A 153M-09	Zinc Coating (Hot-Dip) on Iron and Steel Hardware	Table 5.9.1.1. Table 9.20.16.1.
ASTM	A 252-10	Welded and Seamless Steel Pipe Piles	4.2.3.8.(1)
ASTM	A 283/A 283M-13	Low and Intermediate Tensile Strength Carbon Steel Plates	4.2.3.8.(1)
ASTM	A 390-06	Zinc-Coated (Galvanized) Steel Poultry Fence Fabric (Hexagonal and Straight Line)	Table 9.10.3.1.-B

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
ASTM	A 653/A 653M-13	Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process	Table 5.9.1.1. 9.3.3.2.(1)
ASTM	A 792/A 792M-10	Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process	9.3.3.2.(1)
ASTM	A 1008/A 1008M-13	Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable	4.2.3.8.(1)
ASTM	A 1011/A 1011M-14	Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength	4.2.3.8.(1)
ASTM	C 4-04	Clay Drain Tile and Perforated Clay Drain Tile	Table 5.9.1.1. 9.14.3.1.(1)
ASTM	C 27-98	Fireclay and High-Alumina Refractory Brick	9.21.3.4.(1)
ASTM	C 73-10	Calcium Silicate Brick (Sand-Lime Brick)	Table 5.9.1.1. 9.20.2.1.(1)
ASTM	C 126-13	Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units	Table 5.9.1.1. 9.20.2.1.(1)
ASTM	C 177-13	Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus	9.36.2.2.(1)
ASTM	C 212-14	Structural Clay Facing Tile	Table 5.9.1.1. 9.20.2.1.(1)
ASTM	C 260/C 260M-10a	Air-Entraining Admixtures for Concrete	9.3.1.8.(1)
ASTM	C 411-11	Hot-Surface Performance of High-Temperature Thermal Insulation	3.6.5.4.(4) 3.6.5.5.(1) 9.33.6.4.(4) 9.33.8.2.(2)
ASTM	C 412M-11	Concrete Drain Tile (Metric)	Table 5.9.1.1. 9.14.3.1.(1)
ASTM	C 444M-03	Perforated Concrete Pipe (Metric)	Table 5.9.1.1. 9.14.3.1.(1)
ASTM	C 494/C 494M-13	Chemical Admixtures for Concrete	9.3.1.8.(1)
ASTM	C 516-08e1	Vermiculite Loose Fill Thermal Insulation	A-9.25.2.4.(5)
ASTM	C 518-10	Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	9.36.2.2.(1)
ASTM	C 553-13	Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications	Table 5.9.1.1.
ASTM	C 612-14	Mineral Fiber Block and Board Thermal Insulation	Table 5.9.1.1.
ASTM	C 700-13	Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated	Table 5.9.1.1. 9.14.3.1.(1)
ASTM	C 726-12	Mineral Wool Roof Insulation Board	Table 5.9.1.1. 9.25.2.2.(1)
ASTM	C 754-11	Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products	Table A-9.11.1.4.-A Table A-9.11.1.4.-B Table A-9.11.1.4.-C Table A-9.11.1.4.-D
ASTM	C 834-10	Latex Sealants	Table 5.9.1.1. 9.27.4.2.(2)
ASTM	C 840-13	Application and Finishing of Gypsum Board	Table 5.9.1.1.
ASTM	C 920-14	Elastomeric Joint Sealants	Table 5.9.1.1. 9.27.4.2.(2)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
ASTM	C 954-11	Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness	9.24.1.4.(1)
ASTM	C 991-08e1	Flexible Fibrous Glass Insulation for Metal Buildings	Table 5.9.1.1.
ASTM	C 1002-07	Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs	Table 5.9.1.1. 9.24.1.4.(1) 9.29.5.7.(1)
ASTM	C 1177/C 1177M-13	Glass Mat Gypsum Substrate for Use as Sheathing	3.1.5.14.(6) 3.1.5.15.(4) Table 5.9.1.1. Table 9.23.17.2.-A A-9.27.13.2.(2)(a)
ASTM	C 1178/C 1178M-13	Coated Glass Mat Water-Resistant Gypsum Backing Panel	3.1.5.14.(6) 3.1.5.15.(4) Table 5.9.1.1. 9.29.5.2.(1)
ASTM	C 1184-13	Structural Silicone Sealants	Table 5.9.1.1. 9.27.4.2.(2)
ASTM	C 1193-13	Use of Joint Sealants	A-Table 5.9.1.1. A-9.27.4.2.(1)
ASTM	C 1299-03	Selection of Liquid-Applied Sealants	A-Table 5.9.1.1. A-9.27.4.2.(1)
ASTM	C 1311-10	Solvent Release Sealants	Table 5.9.1.1. 9.27.4.2.(2)
ASTM	C 1330-02	Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants	Table 5.9.1.1. 9.27.4.2.(3)
ASTM	C 1363-11	Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus	A-5.9.4.1.(1) 9.36.2.2.(4)
ASTM	C 1396/C 1396M-14	Gypsum Board	3.1.5.14.(6) 3.1.5.15.(4) Table 5.9.1.1. Table 9.23.17.2.-A 9.29.5.2.(1) Table 9.29.5.3.
ASTM	C 1472-10	Calculating Movement and Other Effects When Establishing Sealant Joint Width	A-Table 5.9.1.1. A-9.27.4.2.(1)
ASTM	C 1658/C 1658M-13	Glass Mat Gypsum Panels	3.1.5.14.(6) Table 5.9.1.1.
ASTM	D 323-08	Vapor Pressure of Petroleum Products (Reid Method)	1.4.1.2.(1) ⁽⁴⁾
ASTM	D 1037-12	Evaluating Properties of Wood-Base Fiber and Particle Panel Materials	A-9.23.15.2.(4)
ASTM	D 1143/D 1143M-07	Deep Foundations Under Static Axial Compressive Load	A-4.2.7.2.(2)
ASTM	D 1227-95	Emulsified Asphalt Used as a Protective Coating for Roofing	Table 5.9.1.1. 9.13.2.2.(2) 9.13.3.2.(2)
ASTM	D 2178/D 2178M-13a	Asphalt Glass Felt Used in Roofing and Waterproofing	Table 5.9.1.1.
ASTM	D 2898-10	Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing	3.1.4.8.(2) 3.1.5.5.(3) 3.1.5.24.(1) 3.2.3.7.(4) 9.10.14.5.(3) 9.10.15.5.(3)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
ASTM	D 3019-08	Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, Asbestos-Fibered, and Non-Asbestos-Fibered	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
ASTM	D 4479/D 4479M-07e1	Asphalt Roof Coatings – Asbestos-Free	Table 5.9.1.1. 9.13.2.2.(2) 9.13.3.2.(2) Table 9.26.2.1.-B
ASTM	D 4637/D 4637M-12	EPDM Sheet Used In Single-Ply Roof Membrane	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
ASTM	D 4811/D 4811M-06	Nonvulcanized (Uncured) Rubber Sheet Used as Roof Flashing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
ASTM	D 5456-10a	Evaluation of Structural Composite Lumber Products	3.1.11.7.(4)
ASTM	D 6878/D 6878M-11a	Thermoplastic Polyolefin Based Sheet Roofing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
ASTM	E 90-09	Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements	5.8.1.2.(1) 5.8.1.4.(1) 9.11.1.2.(1)
ASTM	E 96/E 96M-13	Water Vapor Transmission of Materials	5.5.1.2.(3) 9.13.2.2.(2) 9.25.4.2.(1) 9.25.5.1.(1) 9.30.1.2.(1)
ASTM	E 283-04	Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen	5.9.3.4.(2) A-5.9.3.4.(2)
ASTM	E 330/E 330M-02	Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference	A-5.9.3.2.(1)
ASTM	E 331-00	Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference	5.9.3.5.(2) A-5.9.3.5.(2)
ASTM	E 336-11	Measurement of Airborne Sound Attenuation between Rooms in Buildings	5.8.1.2.(2) 5.8.1.4.(7) 9.11.1.2.(2) A-9.11.
ASTM	E 413-10	Classification for Rating Sound Insulation	A-1.4.1.2.(1) ⁽⁴⁾ 5.8.1.2.(1) 5.8.1.2.(2) 5.8.1.4.(7) 5.8.1.5.(3) 9.11.1.2.(1) 9.11.1.2.(2)
ASTM	E 492-09e1	Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine	A-9.11.
ASTM	E 547-00	Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference	5.9.3.5.(2) A-5.9.3.5.(2)
ASTM	E 597-95	Determining a Single Number Rating of Airborne Sound Insulation for Use in Multi-Unit Building Specifications	A-9.11.
ASTM	E 736-00e1	Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members	Table 9.10.3.1.-B
ASTM	E 783-02	Field Measurement of Air Leakage Through Installed Exterior Windows and Doors	A-5.9.2.3.(1) A-5.9.3.4.(2)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
ASTM	E 1007-13b	Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures	A-9.11.
ASTM	E 1105-00	Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference	A-5.9.2.3.(1) A-5.9.3.5.(2)
ASTM	E 1300-12ae1	Determining Load Resistance of Glass in Buildings	4.3.6.1.(1) 9.6.1.3.(1)
ASTM	E 2178-13	Air Permeance of Building Materials	5.4.1.2.(1)
ASTM	E 2190-10	Insulating Glass Unit Performance and Evaluation	Table 5.9.1.1. 9.6.1.2.(1)
ASTM	E 2357-11	Determining Air Leakage of Air Barrier Assemblies	9.36.2.9.(1) A-9.36.2.9.(1)
ASTM	F 476-14	Security of Swinging Door Assemblies	9.7.5.2.(2) A-9.7.5.2.(2)
ASTM	F 1667-13	Driven Fasteners: Nails, Spikes, and Staples	9.23.3.1.(1) 9.26.2.3.(1) 9.29.5.6.(1)
AWPA	M4-11	Care of Preservative-Treated Wood Products	4.2.3.2.(2)
BNQ	BNQ 3624-115/2016	Polyethylene (PE) Pipe and Fittings for Soil and Foundation Drainage	Table 5.9.1.1. 9.14.3.1.(1)
CCBFC	NRCC 35951	Guidelines for Application of Part 3 of the National Building Code of Canada to Existing Buildings	A-1.1.1.1.(1) ⁽⁴⁾
CCBFC	NRCC 38730	Model National Energy Code of Canada for Houses 1997	A-9.36.3.10.(1) A-9.36.4.2.(1)
CCBFC	NRCC 38732	National Farm Building Code of Canada 1995	1.1.1.1.(3) ⁽⁴⁾ A-1.4.1.2.(1) ⁽⁴⁾ A-Table 4.1.2.1. A-5.1.2.1.(1)
CCBFC	NRCC 40383	User's Guide – NBC 1995, Fire Protection, Occupant Safety and Accessibility (Part 3)	A-1.1.1.1.(1) ⁽⁴⁾
CCBFC	NRCC 43963	User's Guide – NBC 1995, Application of Part 9 to Existing Buildings	A-1.1.1.1.(1) ⁽⁴⁾
CCBFC	NRC-CONST-56215	National Energy Code of Canada for Buildings 2017	A-2.1.1.2.(6) ⁽⁴⁾ A-2.2.1.1.(1) ⁽⁴⁾ A-3.2.1.1.(1) ⁽⁴⁾ 9.36.1.3.(1) 9.36.1.3.(4) 9.36.3.1.(2) 9.36.4.1.(2) A-9.36.1.3. A-9.36.2.4.(1) A-9.36.3.10.(1) A-9.36.4.2.(1) A-9.36.5.2. A-2.2.8.1.(1) ⁽⁵⁾

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
CCBFC	NRCC 56192	National Fire Code of Canada 2015	1.4.1.2.(1) ⁽⁴⁾ A-1.1.1.1.(1) ⁽⁴⁾ 2.1.1.2.(4) ⁽⁴⁾ A-2.2.1.1.(1) ⁽⁴⁾ A-3.2.1.1.(1) ⁽⁴⁾ 1.1.4.1.(1) 3.1.13.1.(1) 3.2.3.21.(1) 3.2.5.16.(1) 3.3.1.2.(1) 3.3.1.10.(1) 3.3.2.3.(1) 3.3.2.16.(1) 3.3.4.3.(4) 3.3.5.2.(1) 3.3.6.1.(1) 3.3.6.3.(1) 3.3.6.3.(2) 3.3.6.4.(1) 3.3.6.4.(2) 3.3.6.6.(1) 3.7.3.1.(1) A-3.1.2.3.(1) A-3.2.4.6.(2) A-3.2.6. A-3.2.7.8.(3) A-3.3. A-3.3.1.7.(1) A-3.3.3.1.(1) A-3.3.6.1.(1) A-3.9.3.1.(1) 6.3.4.2.(3) 6.3.4.3.(1) 6.3.4.4.(1) 6.9.1.2.(1) 8.1.1.1.(3) 8.1.1.3.(1) 9.10.20.4.(1) 9.10.21.8.(1)
CCBFC	NRCC 56193	National Plumbing Code of Canada 2015	2.1.1.2.(4) ⁽⁴⁾ A-2.2.1.1.(1) ⁽⁴⁾ A-3.2.1.1.(1) ⁽⁴⁾ A-4.1.6.4.(3) 5.6.2.2.(2) 6.3.2.15.(3) 6.3.2.15.(5) 7.1.2.1.(1) 9.31.6.2.(1) 9.36.3.11.(2) 9.36.4.3.(2) A-9.36.5.8.(5) Appendix C

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
CCBFC	NRCC 56194	Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B)	A-1.1.1.1.(1) ⁽⁴⁾ A-4.1.1.3.(1) A-4.1.1.3.(2) A-4.1.2.1. A-4.1.2.1.(1) A-4.1.3. A-4.1.3.2.(2) A-4.1.3.2.(4) A-4.1.3.2.(5) A-4.1.3.3.(2) A-4.1.3.4.(1) A-4.1.3.5.(1) A-4.1.3.5.(3) A-4.1.3.6.(1) A-4.1.3.6.(2) A-4.1.3.6.(3) A-4.1.5.8. A-4.1.5.17. A-4.1.6.2. A-4.1.6.3.(2) A-4.1.6.4.(1) A-4.1.7.2. A-4.1.7.3.(5)(c) A-4.1.7.3.(10) A-4.1.7.9.(1) A-4.1.8.2.(1) A-4.1.8.3.(4) A-4.1.8.3.(6) A-4.1.8.3.(7)(b) and (c) A-4.1.8.3.(8) A-4.1.8.4.(3) and Table 4.1.8.4.-A A-Table 4.1.8.5. A-Table 4.1.8.6. A-4.1.8.7.(1) A-4.1.8.9.(4) A-4.1.8.9.(5) A-4.1.8.10.(4) A-4.1.8.10.(5) A-4.1.8.10.(7) A-4.1.8.11.(3) A-4.1.8.12.(1)(a) A-4.1.8.12.(1)(b) A-4.1.8.12.(3) A-4.1.8.12.(4)(a) A-4.1.8.13.(4) A-4.1.8.15.(1) A-4.1.8.15.(3) A-4.1.8.15.(4) A-4.1.8.15.(5) A-4.1.8.15.(6) A-4.1.8.15.(7) A-4.1.8.15.(8)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
CCBFC	NRCC 56194	Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B) (continued)	A-4.1.8.16.(1) A-4.1.8.16.(4) A-4.1.8.16.(6)(a) A-4.1.8.16.(7) A-4.1.8.16.(8)(a) A-4.1.8.16.(10) A-4.1.8.17.(1) A-4.1.8.18. A-4.1.8.18.(13) A-4.1.8.18.(14) and (15) A-4.1.8.19.(3)(a) A-4.1.8.19.(4) and 4.1.8.21.(5) A-4.1.8.21.(4)(a) A-4.2.4.1.(3) A-4.2.4.1.(5) A-4.2.5.1.(1) A-4.2.6.1.(1) A-4.2.7.2.(1) A-4.3.6.1.(1) A-4.4.2.1.(1) A-5.1.4.2. A-5.2.2.2.(4)
CGSB	CAN/CGSB-1.501-M89	Method for Permeance of Coated Wallboard	5.5.1.2.(2) 9.25.4.2.(5)
CGSB	CAN/CGSB-7.2-94	Adjustable Steel Columns	9.17.3.4.(1) A-9.17.3.4.
CGSB	CAN/CGSB-10.3-92	Air Setting Refractory Mortar	9.21.3.4.(2) 9.21.3.9.(1) 9.22.2.2.(2)
CGSB	CAN/CGSB-11.3-M87	Hardboard	Table 5.9.1.1. 9.27.9.1.(2) 9.29.7.1.(1) 9.30.2.2.(1)
CGSB	CAN/CGSB-11.5-M87	Hardboard, Precoated, Factory Finished, for Exterior Cladding	Table 5.9.1.1. 9.27.9.1.(1)
CGSB	CAN/CGSB-12.1-M90	Tempered or Laminated Safety Glass	3.3.1.19.(3) 3.4.6.15.(1) 3.4.6.15.(3) Table 5.9.1.1. 9.6.1.2.(1) 9.6.1.4.(1) 9.8.8.7.(1)
CGSB	CAN/CGSB-12.2-M91	Flat, Clear Sheet Glass	Table 5.9.1.1. 9.6.1.2.(1)
CGSB	CAN/CGSB-12.3-M91	Flat, Clear Float Glass	Table 5.9.1.1. 9.6.1.2.(1)
CGSB	CAN/CGSB-12.4-M91	Heat Absorbing Glass	Table 5.9.1.1. 9.6.1.2.(1)
CGSB	CAN/CGSB-12.8-97	Insulating Glass Units	Table 5.9.1.1. 9.6.1.2.(1)
CGSB	CAN/CGSB-12.10-M76	Glass, Light and Heat Reflecting	Table 5.9.1.1. 9.6.1.2.(1)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
CGSB	CAN/CGSB-12.11-M90	Wired Safety Glass	3.3.1.19.(3) 3.4.6.15.(1) 3.4.6.15.(3) Table 5.9.1.1. 9.6.1.2.(1) 9.6.1.4.(1) 9.8.8.7.(1)
CGSB	CAN/CGSB-12.20-M89	Structural Design of Glass for Buildings	4.3.6.1.(1) 9.6.1.3.(1) A-9.6.1.3.(2)
CGSB	CAN/CGSB-19.22-M89	Mildew-Resistant Sealing Compound for Tubs and Tiles	9.29.10.5.(1)
CGSB	37-GP-9Ma-1983	Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-A
CGSB	CAN/CGSB-37.50-M89	Hot-Applied, Rubberized Asphalt for Roofing and Waterproofing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
CGSB	CAN/CGSB-37.51-M90	Application for Hot-Applied Rubberized Asphalt for Roofing and Waterproofing	9.26.15.1.(1)
CGSB	CAN/CGSB-37.54-95	Polyvinyl Chloride Roofing and Waterproofing Membrane	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
CGSB	37-GP-55M-1979	Application of Sheet Applied Flexible Polyvinyl Chloride Roofing Membrane	9.26.16.1.(1)
CGSB	37-GP-56M-1985	Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
CGSB	CAN/CGSB-37.58-M86	Membrane, Elastomeric, Cold-Applied Liquid, for Non-Exposed Use in Roofing and Waterproofing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
CGSB	CAN/CGSB-41.24-95	Rigid Vinyl Siding, Soffits and Fascia	Table 5.9.1.1. 9.27.12.1.(1)
CGSB	CAN/CGSB-51.25-M87	Thermal Insulation, Phenolic, Faced	Table 9.23.17.2.-A 9.25.2.2.(1)
CGSB	51-GP-27M-1979	Thermal Insulation, Polystyrene, Loose Fill	9.25.2.2.(1)
CGSB	CAN/CGSB-51.32-M77	Sheathing, Membrane, Breather Type	Table 5.9.1.1. 9.20.13.9.(1) Table 9.26.2.1.-A 9.27.3.2.(1)
CGSB	CAN/CGSB-51.33-M89	Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction	Table 5.9.1.1. 9.25.4.2.(4)
CGSB	CAN/CGSB-51.34-M86	Vapour Barrier, Polyethylene Sheet for Use in Building Construction	Table 5.9.1.1. 9.13.2.2.(2) 9.18.6.2.(1) 9.25.3.2.(2) 9.25.3.6.(1) 9.25.4.2.(3)
CGSB	CAN/CGSB-51.71-2005	Depressurization Test	9.32.3.8.(7)
CGSB	CAN/CGSB-71.26-M88	Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems	A-9.23.4.2.(2) Table A-9.23.4.2.(2)-C
CGSB	CAN/CGSB-82.6-M86	Doors, Mirrored Glass, Sliding or Folding, Wardrobe	9.6.1.2.(2) A-9.6.1.2.(2)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
CGSB	CAN/CGSB-93.1-M85	Sheet, Aluminum Alloy, Prefinished, Residential	Table 5.9.1.1. 9.27.11.1.(4) A-9.27.11.1.(3) and (4)
CGSB	CAN/CGSB-93.2-M91	Prefinished Aluminum Siding, Soffits, and Fascia, for Residential Use	3.2.3.6.(5) Table 5.9.1.1. 9.10.14.5.(8) 9.10.14.5.(12) 9.10.15.5.(7) 9.10.15.5.(11) 9.27.11.1.(3) A-9.27.11.1.(3) and (4)
CGSB	CAN/CGSB-93.3-M91	Prefinished Galvanized and Aluminum-Zinc Alloy Steel Sheet for Residential Use	Table 5.9.1.1. 9.27.11.1.(2)
CGSB	CAN/CGSB-93.4-92	Galvanized Steel and Aluminum-Zinc Alloy Coated Steel Siding, Soffits and Fascia, Prefinished, Residential	Table 5.9.1.1. 9.27.11.1.(1)
CGSB	CAN/CGSB-149.10-M86	Determination of the Airtightness of Building Envelopes by the Fan Depressurization Method	9.36.5.10.(11) A-9.36.5.10.(11)
CISC/ICCA	2013	Crane-Supporting Steel Structures: Design Guide	A-4.1.3.2.(2)
CMHC	1993	Testing of Fresh Air Mixing Devices	A-9.32.3.4.
CMHC	1988	Air Permeance of Building Materials	Table A-9.25.5.1.(1)
CSA	CAN/CSA-6.19-01	Residential Carbon Monoxide Alarming Devices	6.9.3.1.(2) 9.32.3.9.(2) 9.32.3.9.(3)
CSA	A23.1-14	Concrete Materials and Methods of Concrete Construction	4.2.3.6.(1) 4.2.3.9.(1) Table 5.9.1.1. 9.3.1.1.(1) 9.3.1.1.(4) 9.3.1.3.(1) 9.3.1.4.(1)
CSA	A23.3-14	Design of Concrete Structures	Table 4.1.8.9. 4.3.3.1.(1) A-4.1.3.2.(4) A-4.1.8.16.(1) A-4.1.8.16.(4) A-4.3.3.1.(1)
CSA	A23.4-16	Precast Concrete – Materials and Construction	A-4.3.3.1.(1)
CSA	CAN/CSA-A82-14	Fired Masonry Brick Made from Clay or Shale	Table 5.9.1.1. 9.20.2.1.(1)
CSA	CAN/CSA-A82.27-M91	Gypsum Board	3.1.5.14.(6) 3.1.5.15.(4)
CSA	A82.30-M1980	Interior Furring, Lathing and Gypsum Plastering	9.29.4.1.(1)
CSA	A82.31-M1980	Gypsum Board Application	3.2.3.6.(5) 9.10.9.2.(4) 9.10.12.4.(3) 9.10.14.5.(8) 9.10.14.5.(12) 9.10.15.5.(7) 9.10.15.5.(11) 9.29.5.1.(2) Table 9.10.3.1.-A Table 9.10.3.1.-B
CSA	CAN3-A93-M82	Natural Airflow Ventilators for Buildings	Table 5.9.1.1. 9.19.1.2.(5)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
CSA	A123.1-05/A123.5-05	Asphalt Shingles Made From Organic Felt and Surfaced with Mineral Granules/Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules	Table 5.9.1.1. Table 9.26.2.1.-B
CSA	CAN/CSA-A123.2-03	Asphalt-Coated Roofing Sheets	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
CSA	A123.3-05	Asphalt Saturated Organic Roofing Felt	Table 5.9.1.1. Table 9.26.2.1.-B
CSA	CAN/CSA-A123.4-04	Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems	Table 5.9.1.1. 9.13.2.2.(2) 9.13.3.2.(2) Table 9.26.2.1.-B
CSA	A123.17-05	Asphalt Glass Felt Used in Roofing and Waterproofing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
CSA	CAN/CSA-A123.21-10	Dynamic Wind Uplift Resistance of Membrane-Roofing Systems	5.2.2.2.(4) A-5.2.2.2.(4)
CSA	A123.22-08	Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection	Table 9.26.2.1.-B
CSA	CAN3-A123.51-M85	Asphalt Shingle Application on Roof Slopes 1:3 and Steeper	Table 5.9.1.1. 9.26.1.3.(1)
CSA	CAN3-A123.52-M85	Asphalt Shingle Application on Roof Slopes 1:6 to Less Than 1:3	Table 5.9.1.1. 9.26.1.3.(1)
CSA	A165.1-14	Concrete Block Masonry Units	Table 5.9.1.1. 9.15.2.2.(1) 9.17.5.1.(1) 9.20.2.1.(1) 9.20.2.6.(1) Table A-9.11.1.4.-A
CSA	A165.2-14	Concrete Brick Masonry Units	Table 5.9.1.1. 9.20.2.1.(1)
CSA	A165.3-14	Prefaced Concrete Masonry Units	Table 5.9.1.1. 9.20.2.1.(1)
CSA	A179-14	Mortar and Grout for Unit Masonry	Table 5.9.1.1. 9.15.2.2.(3) 9.20.3.1.(1)
CSA	CAN/CSA-A220 Series-06	Concrete Roof Tiles	Table 5.9.1.1. Table 9.26.2.1.-B 9.26.17.1.(1)
CSA	A277-16	Procedure for Certification of Prefabricated Buildings, Modules, and Panels	A-1.1.1.1.(2) ⁽⁴⁾
CSA	CAN/CSA-A324-M88	Clay Flue Liners	9.21.3.3.(1)
CSA	A370-14	Connectors for Masonry	A-9.21.4.5.(2)
CSA	A371-14	Masonry Construction for Buildings	Table 5.9.1.1. 9.15.2.2.(3) 9.20.3.2.(7) 9.20.15.2.(1)
CSA	CAN/CSA-A405-M87	Design and Construction of Masonry Chimneys and Fireplaces	9.21.3.5.(1) 9.22.1.4.(1) 9.22.5.2.(2)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
CSA	AAMA/WDMA/CSA 101/I.S.2/A440-11	NAFS – North American Fenestration Standard/Specification for Windows, Doors, and Skylights	5.9.2.2.(1) A-5.3.1.2. A-5.9.2.3.(1) A-5.9.3.1.(1) Table 9.7.3.3. 9.7.4.1.(1) 9.7.4.2.(1) 9.7.5.1.(1) 9.7.5.3.(1) 9.36.2.9.(3) A-9.7.4.2.(1)
CSA	A440S1-17	Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-11, NAFS – North American Fenestration Standard/Specification for Windows, Doors, and Skylights	5.9.2.2.(1) 5.9.3.5.(3) A-5.9.2.2. A-5.9.3.5.(3) 9.7.4.2.(1) 9.36.2.9.(3) A-9.7.4.2.(1)
CSA	A440.2-14/A440.3-14	Fenestration Energy Performance/User Guide to CSA A440.2-14, Fenestration Energy Performance	Table 9.7.3.3. 9.36.2.2.(3) A-Table 9.36.2.7.-A
CSA	A440.2-14	Fenestration Energy Performance	A-5.3.1.2. A-5.9.3.3.(1) A-9.7.4.2.(1)
CSA	A440.3-14	User Guide to CSA A440.2-14, Fenestration Energy Performance	A-5.3.1.2.
CSA	CAN/CSA-A440.4-07	Window, Door, and Skylight Installation	A-5.9.2.3.(1) 9.7.6.1.(1) A-9.7.4.2.(1)
CSA	A660-10	Certification of Manufacturers of Steel Building Systems	4.3.4.3.(1)
CSA	A3001-13	Cementitious Materials for Use in Concrete	Table 5.9.1.1. 9.3.1.2.(1) 9.28.2.1.(1)
CSA	B51-14	Boiler, Pressure Vessel, and Pressure Piping Code	6.2.1.5.(1) 9.31.6.2.(2) 9.33.5.2.(1)
CSA	B52-13	Mechanical Refrigeration Code	6.2.1.5.(1) 9.33.5.2.(1)
CSA	CAN/CSA-B72-M87	Installation Code for Lightning Protection Systems	3.6.1.3.(1)
CSA	B111-1974	Wire Nails, Spikes and Staples	9.23.3.1.(1) 9.26.2.3.(1) 9.29.5.6.(1) A-Table 9.23.3.5.-B
CSA	B139-09	Installation Code for Oil-Burning Equipment	6.2.1.5.(1) 9.31.6.2.(2) 9.33.5.2.(1)
CSA	B140.12-03	Oil-Burning Equipment: Service Water Heaters for Domestic Hot Water, Space Heating, and Swimming Pools	Table 9.36.4.2.
CSA	B149.1-10	Natural Gas and Propane Installation Code	6.2.1.5.(1) 9.10.22.1.(1) 9.31.6.2.(2) 9.33.5.2.(1) A-9.10.22.
CSA	CAN/CSA-B182.1-15	Plastic Drain and Sewer Pipe and Pipe Fittings	Table 5.9.1.1. 9.14.3.1.(1)
CSA	CAN/CSA-B211-00	Energy Efficiency of Oil-Fired Storage Tank Water Heaters	Table 9.36.4.2.

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
CSA	B212-00	Energy Utilization Efficiencies of Oil-Fired Furnaces and Boilers	Table 9.36.3.10.
CSA	B214-16	Installation Code for Hydronic Heating Systems	6.2.1.1.(1) 9.33.4.2.(1) A-9.36.3.4.(1)
CSA	B355-09	Lifts for Persons with Physical Disabilities	3.8.3.7.(1)
CSA	B365-17	Installation Code for Solid-Fuel-Burning Appliances and Equipment	6.2.1.5.(1) 9.22.10.2.(1) 9.31.6.2.(2) 9.33.5.3.(1) A-9.33.1.1.(2) A-9.33.5.3.
CSA	B415.1-10	Solid-Fuel-Burning Heating Appliances	Table 9.36.3.10.
CSA	B651-12	Accessible Design for the Built Environment	3.8.3.1.(1) Table 3.8.3.1. A-3.8.3.1.(1)
CSA	C22.1-12	Canadian Electrical Code, Part I	3.3.6.2.(4) 3.6.1.2.(1) 3.6.2.1.(6) 3.6.2.7.(1) A-3.1.4.3.(1)(b)(i) A-3.2.4.20.(7)(a) A-3.3.6.2.(4) 6.2.1.5.(1) 9.31.6.2.(2) 9.33.5.2.(1) 9.34.1.1.(1) A-9.10.22. A-9.34.2. A-9.35.2.2.(1)
CSA	C22.2 No. 0.3-09	Test Methods for Electrical Wires and Cables	3.1.4.3.(1) 3.1.4.3.(3) 3.1.5.21.(1) 3.1.5.21.(3) 9.34.1.5.(1)
CSA	C22.2 No. 113-10	Fans and Ventilators	9.32.3.10.(7)
CSA	C22.2 No. 141-10	Emergency Lighting Equipment	3.2.7.4.(2) 3.4.5.1.(3) 9.9.11.3.(3) 9.9.12.3.(7)
CSA	CAN/CSA-C22.2 No. 150-M89	Microwave Ovens	A-9.10.22.
CSA	C22.2 No. 211.0-03	General Requirements and Methods of Testing for Nonmetallic Conduit	3.1.5.23.(1)
CSA	CAN/CSA-C22.2 No. 262-04	Optical Fiber Cable and Communication Cable Raceway Systems	3.1.5.23.(1)
CSA	CAN/CSA-C191-04	Performance of Electric Storage Tank Water Heaters for Domestic Hot Water Service	Table 9.36.4.2.
CSA	CAN/CSA-C260-M90	Rating the Performance of Residential Mechanical Ventilating Equipment	9.32.3.10.(1) 9.32.3.10.(2) Table 9.32.3.10.-B
CSA	C282-15	Emergency Electrical Power Supply for Buildings	3.2.7.5.(1)
CSA	C368.1-14	Energy Performance of Room Air Conditioners	Table 9.36.3.10.

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
CSA	CAN/CSA-C439-09	Rating the Performance of Heat/Energy-Recovery Ventilators	9.32.3.10.(4) 9.32.3.10.(5) 9.36.3.8.(4) 9.36.3.9.(3) A-9.36.3.9.(3)
CSA	C448 Series-13	Design and Installation of Earth Energy Systems	9.33.5.2.(1)
CSA	C656-14	Split-System and Single-Package Air Conditioners and Heat Pumps	Table 9.36.3.10.
CSA	CAN/CSA-C745-03	Energy Efficiency of Electric Storage Tank Water Heaters and Heat Pump Water Heaters	Table 9.36.4.2.
CSA	CAN/CSA-C746-06	Rating Large and Single Packaged Vertical Air Conditioners and Heat Pumps	Table 9.36.3.10.
CSA	C748-13	Direct-Expansion (DX) Ground-Source Heat Pumps	Table 9.36.3.10.
CSA	CAN/CSA-C749-07	Performance of Dehumidifiers	Table 9.36.3.10.
CSA	C828-13	Thermostats Used with Individual Room Electric Space Heating Devices	9.36.3.6.(3)
CSA	CAN/CSA-C13256-1-01	Water-Source Heat Pumps - Testing and Rating for Performance - Part 1: Water-to-Air and Brine-to-Air Heat Pumps (Adopted ISO 13256-1:1998, with Canadian Deviations)	Table 9.36.3.10.
CSA	CAN/CSA-C13256-2-01	Water-Source Heat Pumps - Testing and Rating for Performance - Part 2: Water-to-Water and Brine-to-Water Heat Pumps (Adopted ISO 13256-2:1998, with Canadian Deviations)	Table 9.36.3.10.
CSA	F280-12	Determining the Required Capacity of Residential Space Heating and Cooling Appliances	9.33.5.1.(1) A-9.36.3.2.(1) A-9.36.5.15.(5)
CSA	CAN/CSA-F326-M91	Residential Mechanical Ventilation Systems	9.32.3.1.(1) A-9.32.3.1.(1) A-9.32.3.5. A-9.32.3.7. A-9.32.3.8. A-9.33.6.13.
CSA	G30.18-09	Carbon Steel Bars for Concrete Reinforcement	9.3.1.1.(4)
CSA	G40.21-13	Structural Quality Steel	4.2.3.8.(1) Table 5.9.1.1. 9.23.4.3.(2)
CSA	G401-14	Corrugated Steel Pipe Products	Table 5.9.1.1. 9.14.3.1.(1)
CSA	CAN/CSA-O80 Series-08	Wood Preservation	3.1.4.5.(1) 4.2.3.2.(1) 4.2.3.2.(2) Table 5.9.1.1.
CSA	CAN/CSA-O80.1-08	Specification of Treated Wood	9.3.2.9.(5)
CSA	CAN/CSA-O80.2-08	Processing and Treatment	4.2.3.2.(1)
CSA	CAN/CSA-O80.3-08	Preservative Formulations	4.2.3.2.(1)
CSA	O80.15-97	Preservative Treatment of Wood for Building Foundation Systems, Basements, and Crawl Spaces by Pressure Processes	4.2.3.2.(1)
CSA	O86-14	Engineering Design in Wood	Table 4.1.8.9.(6) 4.3.1.1.(1) A-5.1.4.1.(6)(b) and (c) A-9.15.2.4.(1) A-9.23.4.2.
CSA	O112.9-10	Evaluation of Adhesives for Structural Wood Products (Exterior Exposure)	Table 9.10.3.1.-B

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
CSA	O112.10-08	Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure)	Table 9.10.3.1.-B
CSA	O118.1-08	Western Red Cedar Shakes and Shingles	Table 5.9.1.1. Table 9.26.2.1.-B 9.27.7.1.(1)
CSA	O118.2-08	Eastern White Cedar Shingles	Table 5.9.1.1. Table 9.26.2.1.-B 9.27.7.1.(1)
CSA	O121-08	Douglas Fir Plywood	Table 5.9.1.1. 9.23.15.2.(1) 9.23.16.2.(1) Table 9.23.17.2.-A 9.27.8.1.(1) 9.30.2.2.(1) Span Table 9.23.12.3.-A Span Table 9.23.12.3.-B Span Table 9.23.12.3.-C
CSA	CAN/CSA-O122-16	Structural Glued-Laminated Timber	Span Table 9.23.4.2.-K Span Table 9.23.12.3.-D
CSA	CAN/CSA-O132.2 Series-90	Wood Flush Doors	9.7.4.3.(4)
CSA	O141-05	Softwood Lumber	Table 5.9.1.1. 9.3.2.6.(1) A-9.3.2.1.(1)
CSA	O151-09	Canadian Softwood Plywood	Table 5.9.1.1. 9.23.15.2.(1) 9.23.16.2.(1) Table 9.23.17.2.-A 9.27.8.1.(1) 9.30.2.2.(1) Span Table 9.23.12.3.-A Span Table 9.23.12.3.-B Span Table 9.23.12.3.-C
CSA	O153-13	Poplar Plywood	Table 5.9.1.1. 9.23.15.2.(1) 9.23.16.2.(1) Table 9.23.17.2.-A 9.27.8.1.(1) 9.30.2.2.(1)
CSA	O177-06	Qualification Code for Manufacturers of Structural Glued-Laminated Timber	4.3.1.2.(1) Span Table 9.23.4.2.-K Span Table 9.23.12.3.-D
CSA	O325-07	Construction Sheathing	Table 5.9.1.1. Table 9.23.13.6. 9.23.15.2.(1) 9.23.15.4.(2) 9.23.16.2.(1) 9.23.16.3.(2) 9.29.9.1.(2) 9.29.9.2.(5) Span Table 9.23.12.3.-A Span Table 9.23.12.3.-B Span Table 9.23.12.3.-C

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
CSA	O437.0-93	OSB and Waferboard	Table 5.9.1.1. 9.23.15.2.(1) 9.23.15.4.(2) 9.23.16.2.(1) 9.23.16.3.(2) Table 9.23.17.2.-A 9.27.10.1.(1) 9.29.9.1.(2) 9.30.2.2.(1) Span Table 9.23.12.3.-A Span Table 9.23.12.3.-B Span Table 9.23.12.3.-C A-9.23.15.4.(2)
CSA	CAN/CSA-P.2-13	Measuring the Annual Fuel Utilization Efficiency of Residential Gas-Fired or Oil-Fired Furnaces and Boilers	Table 9.36.3.10.
CSA	CAN/CSA-P.3-04	Measuring Energy Consumption and Determining Efficiencies of Gas-Fired Storage Water Heaters	Table 9.36.4.2.
CSA	P.6-09	Measuring Thermal Efficiency of Gas-Fired Pool Heaters	Table 9.36.4.2.
CSA	CAN/CSA-P.7-10	Measuring Energy Loss of Gas-Fired Instantaneous Water Heaters	Table 9.36.4.2.
CSA	CAN/CSA-P.8-09	Thermal Efficiencies of Industrial and Commercial Gas-Fired Package Furnaces	Table 9.36.3.10.
CSA	CAN/CSA-P.9-11	Performance of Combined Space and Water Heating Systems (Combos)	9.36.3.10.(3) Table 9.36.3.10. Table 9.36.4.2. Table 9.36.5.15.-C
CSA	P.10-07	Performance of Integrated Mechanical Systems for Residential Heating and Ventilation	9.36.3.9.(2) Table 9.36.3.10. Table 9.36.4.2. Table 9.36.5.15.-C
CSA	CAN/CSA-P.11-07	Measuring Efficiency and Energy Consumption of Gas-Fired Unit Heaters	Table 9.36.3.10.
CSA	S6-14	Canadian Highway Bridge Design Code	A-Table 4.1.5.3. A-Table 4.1.5.9.
CSA	S16-14	Design of Steel Structures	Table 4.1.8.9. 4.3.4.1.(1) A-4.1.5.11. A-Table 4.1.8.9. A-4.3.4.1.(1)
CSA	S37-13	Antennas, Towers, and Antenna-Supporting Structures	4.1.6.15.(1) 4.1.7.11.(1)
CSA	S136-16	North American Specification for the Design of Cold-Formed Steel Structural Members (using the Appendix B provisions applicable to Canada)	4.1.8.1.(5) Table 4.1.8.9. 4.3.4.2.(1)
CSA	CAN/CSA-S157-05/S157.1-05	Strength Design in Aluminum/Commentary on CSA S157-05, Strength Design in Aluminum	4.3.5.1.(1)
CSA	S269.1-1975	Falsework for Construction Purposes	4.1.1.3.(4)
CSA	S269.2-16	Access Scaffolding for Construction Purposes	4.1.1.3.(4)
CSA	CAN/CSA-S269.3-M92	Concrete Formwork	4.1.1.3.(4)
CSA	S304-14	Design of Masonry Structures	Table 4.1.8.9. 4.3.2.1.(1) A-5.1.4.1.(6)(b) and (c)
CSA	S307-M1980	Load Test Procedure for Wood Roof Trusses for Houses and Small Buildings	9.23.14.11.(5)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
CSA	S367-12	Air-, Cable-, and Frame-Supported Membrane Structures	4.4.1.1.(1)
CSA	S406-16	Permanent Wood Foundations for Housing and Small Buildings	9.15.2.4.(1) 9.16.5.1.(1) A-9.15.2.4.(1)
CSA	S413-14	Parking Structures	4.4.2.1.(1)
CSA	S478-95	Guideline on Durability in Buildings	A-5.1.4.2.
CSA	S832-14	Seismic Risk Reduction of Operational and Functional Components (OFCs) of Buildings	A-Table 4.1.8.18.
CSA	Z32-09	Electrical Safety and Essential Electrical Systems in Health Care Facilities	3.2.7.3.(4) 3.2.7.6.(1) A-3.2.7.6.(1)
CSA	Z240 MH Series-16	Manufactured Homes	A-1.1.1.1.(2) ⁽⁴⁾
CSA	Z240.2.1-09	Structural Requirements for Manufactured Homes	A-1.1.1.1.(2) ⁽⁴⁾ 9.12.2.2.(6) 9.15.1.3.(1)
CSA	Z240.10.1-16	Site Preparation, Foundation, and Installation of Buildings	A-1.1.1.1.(2) ⁽⁴⁾ 9.15.1.3.(1) 9.23.6.3.(1)
CSA	CAN/CSA-Z317.2-10	Special Requirements for Heating, Ventilation, and Air-Conditioning (HVAC) Systems in Health Care Facilities	6.2.1.1.(1) 6.3.2.15.(1)
CSA	CAN/CSA-Z662-15	Oil and Gas Pipeline Systems	3.2.3.22.(1)
CSA	Z7396.1-12	Medical Gas Pipeline Systems – Part 1: Pipelines for Medical Gases, Medical Vacuum, Medical Support Gases, and Anaesthetic Gas Scavenging Systems	3.7.3.1.(1)
CTI	STD-201RS-04	Certification of Water-Cooling Tower Thermal Performance	Table 9.36.3.10.
CWC	BPS No. 1-2000	Moisture and Wood-Frame Buildings	A-5.6.2.1.
CWC	1997	Introduction to Wood Building Technology	A-9.27.3.8.(4)
CWC	2000	Wood Reference Handbook	A-9.27.3.8.(4)
CWC	2009	The Span Book	A-9.23.4.2.
CWC	2014	Engineering Guide for Wood Frame Construction	9.4.1.1.(1) 9.23.13.1.(2) 9.23.13.2.(2) 9.23.13.3.(2) A-9.4.1.1. A-9.23.13.1.
DOE	10 CFR, Part 430-2011	Energy, Energy Conservation Program for Consumer Products	Table 9.36.4.2.
DOE	10 CFR, Part 431-2011	Energy, Energy Efficiency Program for Certain Commercial and Industrial Equipment	Table 9.36.4.2.
ECC	2013	EIFS Practice Manual	A-5.9.4.1.(1) A-9.27.13.1.(1)
EPA	40 CFR, Part 60-2008	Protection of Environment, Standards of Performance for New Stationary Sources	Table 9.36.3.10.
EPA	625/R-92/016 (1994)	Radon Prevention in the Design and Construction of Schools and Other Large Buildings	A-5.4.1.1. 6.2.1.1.(1)
FEMA	450-1-2003	NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures	A-4.1.8.18.(14) and (15)
FEMA	P-750-2009	NEHRP Recommended Seismic Provisions for New Buildings and Other Structures	A-4.1.8.18.(14) and (15)
FLL	2008	Guidelines for the Planning, Construction and Maintenance of Green Roofing	A-5.6.1.2.(2)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
FPI	Project 43-10C-024 (1988)	Deflection Serviceability Criteria for Residential Floors	A-9.23.4.2.(2)
FPI/RDH	SP-53-2013	Guide for Designing Energy-Efficient Building Enclosures for Wood-Frame Multi-Unit Residential Buildings in Marine to Cold Climate Zones in North America	A-5.6.2.1.
HC	H46-2/90-156E	Exposure Guidelines for Residential Indoor Air Quality	A-6.3.1.6. A-9.25.5.2.
HC	2007	Radon: A Guide for Canadian Homeowners	A-5.4.1.1. A-6.2.1.1. A-9.13.4.3.
HC	R.S.C., 1985, c. H-3	Hazardous Products Act	A-1.4.1.2.(1) ⁽⁴⁾ A-9.25.2.2.(2)
HC	Hazardous Products Act, Part II	Workplace Hazardous Materials Information System (WHMIS)	A-1.4.1.2.(1) ⁽⁴⁾ A-3.3.1.2.(1)
HC	SOR/2015-17	Hazardous Products Regulations	1.4.1.2.(1) ⁽⁴⁾ A-3.3.1.2.(1)
HC	2004	Fungal Contamination in Public Buildings: Health Effects and Investigation Methods	A-5.5.1.1.
HC	2008	Guide for Radon Measurements in Public Buildings (Schools, Hospitals, Care Facilities, Detention Centres)	A-5.4.1.1. A-6.2.1.1.
HC	2008	Guide for Radon Measurements in Residential Dwellings (Homes)	A-9.13.4.3.
HPVA	ANSI/HPVA HP-1-2009	Hardwood and Decorative Plywood	Table 5.9.1.1. 9.27.8.1.(1) 9.30.2.2.(1)
HRAI	SAR-G1	HRAI Digest 2005	6.2.1.1.(1) 9.32.2.3.(4) 9.32.3.2.(1) 9.33.4.1.(1) A-9.36.3.2.(1) A-9.36.3.2.(2) A-9.36.3.4.(1)
HVI	HVI Publication 911	Certified Home Ventilating Products Directory	A-9.36.3.9.(3)
HVI	HVI Publication 915-2013	Loudness Testing and Rating Procedure	9.32.3.10.(2) Table 9.32.3.10.-B
HVI	HVI Publication 916-2013	Airflow Test Procedure	9.32.3.10.(1)
ICC	400-2012	Design and Construction of Log Structures	9.36.2.2.(5) A-9.36.2.2.(5)
IEC	60268-16:2011	Sound System Equipment – Part 16: Objective Rating of Speech Intelligibility by Speech Transmission Index	A-3.2.4.22.(1)(b)
ISO	3864-1:2011	Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs and safety markings	3.4.5.1.(2) 9.9.11.3.(2)
ISO	7010:2011	Graphical symbols – Safety colours and safety signs – Registered safety signs	3.4.5.1.(2) A-3.4.5.1.(2)(c) 9.9.11.3.(2)
ISO	7240-19:2007	Fire Detection and Alarm Systems – Part 19: Design, Installation, Commissioning and Service of Sound Systems for Emergency Purposes	A-3.2.4.22.(1)(b)
ISO	7731:2003(E)	Ergonomics – Danger signals for public and work areas – Auditory danger signals	A-3.2.4.22.(1)(b)
ISO	8201:1987(E)	Acoustics – Audible emergency evacuation signal	3.2.4.18.(2) A-3.2.4.18.(2)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
ISO	10848:2006	Acoustics - Laboratory Measurement of the Flanking Transmission of Airborne and Impact Sound Between Adjoining Rooms	5.8.1.4.(2) 5.8.1.4.(3) 5.8.1.5.(2) 5.8.1.5.(3)
ISO	15712-1:2005	Building Acoustics - Estimation of Acoustic Performance of Buildings From the Performance of Elements - Part 1: Airborne Sound Insulation Between Rooms	5.8.1.4.(1) 5.8.1.4.(2) 5.8.1.4.(4) 5.8.1.4.(5) 5.8.1.4.(6) 5.8.1.5.(1) 5.8.1.5.(2) 5.8.1.5.(5) 5.8.1.5.(6)
NEMA	SB 50-2008	Emergency Communications Audio Intelligibility Applications Guide	A-3.2.4.22.(1)(b)
NFPA	2010 Edition	Fire Protection Guide to Hazardous Materials	A-6.9.1.2.(1)
NFPA	2008	Fire Protection Handbook, Twentieth Edition	A-3.2.2.2.(1) A-3.6.2.7.(5)
NFPA	13-2013	Installation of Sprinkler Systems	3.1.9.1.(4) 3.2.4.8.(2) 3.2.4.15.(1) 3.2.5.12.(1) 3.3.2.14.(3) A-3.1.11.5.(3) A-3.2.4.9.(3)(f) A-3.2.5.12.(1) A-3.2.5.12.(6) A-3.2.5.13.(1) A-3.2.8.2.(3) 9.10.9.6.(11)
NFPA	13D-2016	Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes	3.2.4.1.(2) 3.2.5.12.(3) A-3.2.5.12.(2) A-3.2.5.12.(6) A-3.2.5.13.(1) 9.10.18.2.(3)
NFPA	13R-2013	Installation of Sprinkler Systems in Low-Rise Residential Occupancies	3.2.5.12.(2) A-3.2.5.12.(2) A-3.2.5.12.(6) A-3.2.5.13.(1)
NFPA	14-2013	Installation of Standpipe and Hose Systems	3.2.5.9.(1) 3.2.5.10.(1)
NFPA	20-2016	Installation of Stationary Pumps for Fire Protection	3.2.4.9.(4) 3.2.5.18.(1) A-3.2.4.9.(3)(f)
NFPA	30-2012	Flammable and Combustible Liquids Code	A-6.9.1.2.(1)
NFPA	30A-2015	Motor Fuel Dispensing Facilities and Repair Garages	A-6.9.1.2.(1)
NFPA	32-2016	Drycleaning Plants	A-6.9.1.2.(1)
NFPA	33-2016	Spray Application Using Flammable or Combustible Materials	A-6.9.1.2.(1)
NFPA	34-2015	Dipping, Coating, and Printing Processes Using Flammable or Combustible Liquids	A-6.9.1.2.(1)
NFPA	35-2016	Manufacture of Organic Coatings	A-6.9.1.2.(1)
NFPA	36-2017	Solvent Extraction Plants	A-6.9.1.2.(1)
NFPA	40-2016	Storage and Handling of Cellulose Nitrate Film	A-6.9.1.2.(1)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
NFPA	51-2018	Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting, and Allied Processes	A-6.9.1.2.(1)
NFPA	51A-2012	Acetylene Cylinder Charging Plants	A-6.9.1.2.(1)
NFPA	55-2016	Compressed Gases and Cryogenic Fluids Code	A-6.9.1.2.(1)
NFPA	61-2017	Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities	A-6.9.1.2.(1)
NFPA	68-2013	Explosion Protection by Deflagration Venting	3.3.6.4.(2) A-3.6.2.7.(5) A-6.9.1.2.(1)
NFPA	69-2014	Explosion Prevention Systems	A-3.6.2.7.(5) A-6.9.1.2.(1)
NFPA	72-2016	National Fire Alarm and Signaling Code	A-3.2.4.22.(1)(b)
NFPA	80-2013	Fire Doors and Other Opening Protectives	3.1.8.5.(2) 3.1.8.12.(2) 3.1.8.16.(1) 3.1.9.1.(5) A-3.1.8.1.(2) A-3.2.8.2.(3) 9.10.9.6.(13) 9.10.13.1.(1)
NFPA	80A-2012	Protection of Buildings from Exterior Fire Exposures	A-3
NFPA	82-2014	Incinerators and Waste and Linen Handling Systems and Equipment	6.2.2.1.(1) 9.10.10.5.(2)
NFPA	85-2015	Boiler and Combustion Systems Hazards Code	A-6.9.1.2.(1)
NFPA	86-2015	Ovens and Furnaces	A-6.9.1.2.(1)
NFPA	88A-2015	Parking Structures	A-6.9.1.2.(1)
NFPA	91-2010	Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids	6.3.4.3.(1) A-6.9.1.2.(1)
NFPA	96-2014	Ventilation Control and Fire Protection of Commercial Cooking Operations	3.2.4.8.(2) 3.6.3.5.(1) A-3.3.1.2.(2) A-3.6.3.5. 6.3.1.7.(1) A-6.9.1.2.(1) A-9.10.1.4.(1)
NFPA	101-2015	Life Safety Code	3.3.2.1.(2) 3.3.2.1.(3) A-3.3.2.1.(2)
NFPA	105-2013	Smoke Door Assemblies and Other Opening Protectives	3.1.8.5.(3) 3.1.8.5.(7)
NFPA	204-2015	Smoke and Heat Venting	A-6.9.1.2.(1)
NFPA	211-2016	Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances	6.3.3.2.(2) 6.3.3.3.(1)
NFPA	303-2016	Marinas and Boatyards	A-6.9.1.2.(1)
NFPA	307-2016	Construction and Fire Protection of Marine Terminals, Piers, and Wharves	A-6.9.1.2.(1)
NFPA	409-2016	Aircraft Hangars	A-6.9.1.2.(1)
NFPA	415-2016	Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways	A-6.9.1.2.(1)
NFPA	484-2015	Combustible Metals	A-6.9.1.2.(1)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
NFPA	654-2013	Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids	A-6.9.1.2.(1)
NFPA	655-2017	Prevention of Sulfur Fires and Explosions	A-6.9.1.2.(1)
NFPA	664-2012	Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities	A-6.9.1.2.(1)
NFPA	1710-2010	Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments	A-3.2.3.1.(8)
NFRC	100-2010	Determining Fenestration Product U-factors	9.36.2.2.(3)
NFRC	200-2010	Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence	9.36.2.2.(3)
NLGA	2014	Standard Grading Rules for Canadian Lumber	9.3.2.1.(1) A-9.3.2.1.(1) Table A-9.3.2.1.(1)-A A-Table 9.3.2.1. A-9.3.2.8.(1) A-9.23.10.4.(1)
NLGA	SPS-1-2013	Fingerjoined Structural Lumber	Table 9.10.3.1.-A A-9.23.10.4.(1)
NLGA	SPS-3-2013	Fingerjoined "Vertical Stud Use Only" Lumber	Table 9.10.3.1.-A A-9.23.10.4.(1)
NRC-IRC	CBD 222	Airtight Houses and Carbon Monoxide Poisoning	A-9.33.1.1.(2)
NRC-IRC	CBD 230	Applying Building Codes to Existing Buildings	A-1.1.1.1.(1) ⁽⁴⁾
NRC-IRC	CBD 231	Moisture Problems in Houses	A-9.25.3.1.(1)
NRC-IRC	1988	Performance and Acceptability of Wood Floors – Forintek Studies	A-9.23.4.2.(2)
NRCA	2005	The NRCA Waterproofing Manual	A-5.6.2.1.
NRCA	2015	The NRCA Roofing Manual: Membrane Roof Systems	A-5.6.2.1.
NRCA	2nd Edition, 2009	Vegetative Roof Systems Manual	A-5.6.1.2.(2)
NRCan	R.S.C., 1985, c. E-17	Explosives Act	3.3.6.2.(3)
NRC Const.	2005	A Guide for the Wind Design of Mechanically Attached Flexible Membrane Roofs	A-5.2.2.2.(4)
NRC Const.	RR-331-2013	Guide to Calculating Airborne Sound Transmission in Buildings	A-5.8.1.4.
NYCDH	2008	Guidelines on Assessment and Remediation of Fungi in Indoor Environments	A-5.5.1.1.
OMMAH	2012	2012 Building Code Compendium, Volume 2, Supplementary Standard SB-7, Guards for Housing and Small Buildings	A-9.8.8.2.
SMACNA	ANSI/SMACNA 006-2006	HVAC Duct Construction Standards – Metal and Flexible	9.33.6.5.(2) A-9.36.3.2.(2)
SMACNA	2012	Architectural Sheet Metal Manual, Seventh Edition	A-5.6.2.1.
SPRI	ANSI/GRHC/SPRI VR-1-2011	Investigating Resistance to Root Penetration on Vegetative Roofs	5.6.1.2.(2)
SPRI	ANSI/SPRI WD-1-2008	Wind Design Standard Practice for Roofing Assemblies	A-5.2.2.2.(4)
TC	SOR/96-433	Canadian Aviation Regulations – Part III	4.1.5.13.(1)
TC	SOR/2016-95	Transportation of Dangerous Goods Regulations (TDGR)	1.4.1.2.(1) ⁽⁴⁾ A-1.4.1.2.(1) ⁽⁴⁾ A-3.3.1.2.(1)
TIAC	2013	Mechanical Insulation Best Practices Guide	A-6.3.2.5.
TPIC	2014	Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses (Limit States Design)	9.23.14.11.(6)
TWC	1993	Details of Air Barrier Systems for Houses	Table A-9.25.5.1.(1)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
TWC	1995	High-Rise Residential Construction Guide	A-5.6.2.1.
UL	ANSI/UL 300-2005	Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment	6.9.1.3.(1)
UL	731-1995	Oil-Fired Unit Heaters	Table 9.36.3.10.
UL	ANSI/UL-1784-04	Air Leakage Tests of Door Assemblies and Other Opening Protectives	3.1.8.4.(4)
ULC	CAN/ULC-S101-14	Fire Endurance Tests of Building Construction and Materials	3.1.5.7.(2) 3.1.5.14.(5) 3.1.5.14.(6) 3.1.5.15.(3) 3.1.5.15.(4) 3.1.7.1.(1) 3.1.11.7.(1) 3.2.3.8.(1) 3.2.6.5.(6) A-3.1.5.14.(5)(d) A-3.2.6.5.(6)(b) 9.10.16.3.(1) Table 9.10.3.1.-B
ULC	CAN/ULC-S102-10	Test for Surface Burning Characteristics of Building Materials and Assemblies	3.1.5.24.(1) 3.1.12.1.(1) Table 9.23.17.2.-A 9.29.5.2.(1)
ULC	CAN/ULC-S102.2-10	Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies	3.1.12.1.(2) 3.1.13.4.(1)
ULC	CAN/ULC-S102.3-07	Fire Test of Light Diffusers and Lenses	3.1.13.4.(1)
ULC	CAN/ULC-S102.4-10	Test for Fire and Smoke Characteristics of Electrical Wiring, Cables and Non-Metallic Raceways	3.1.4.3.(2) 3.1.5.21.(2) 3.1.5.23.(2)
ULC	CAN/ULC-S104-15	Fire Tests of Door Assemblies	3.1.8.4.(1) 3.2.6.5.(3)
ULC	CAN/ULC-S105-16	Fire Door Frames Meeting the Performance Required by CAN/ULC-S104	9.10.13.6.(1)
ULC	CAN/ULC-S106-15	Fire Tests of Window and Glass Block Assemblies	3.1.8.4.(1)
ULC	CAN/ULC-S107-10	Fire Tests of Roof Coverings	3.1.15.1.(1)
ULC	CAN/ULC-S109-14	Flame Tests of Flame-Resistant Fabrics and Films	3.1.6.5.(1) 3.1.16.1.(1) 3.6.5.2.(2) 3.6.5.3.(1) 9.33.6.3.(1)
ULC	CAN/ULC-S110-13	Test for Air Ducts	3.6.5.1.(2) 3.6.5.1.(5) 9.33.6.2.(2) 9.33.6.2.(4)
ULC	CAN/ULC-S111-13	Fire Tests for Air Filter Units	6.3.2.13.(1) 9.33.6.14.(1)
ULC	CAN/ULC-S112-10	Fire Test of Fire Damper Assemblies	3.1.8.4.(1) A-3.2.6.6.(1)
ULC	CAN/ULC-S112.1-10	Leakage Rated Dampers for Use in Smoke Control Systems	3.1.8.4.(3) 6.3.2.7.(3)
ULC	CAN/ULC-S112.2-07	Fire Test of Ceiling Firestop Flap Assemblies	3.6.4.3.(2) 9.10.13.14.(1)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
ULC	CAN/ULC-S113-16	Wood Core Doors Meeting the Performance Required by CAN/ULC-S104 for Twenty Minute Fire Rated Closure Assemblies	9.10.13.2.(1) A-9.10.9.3.(2) A-9.10.13.2.(1)
ULC	CAN/ULC-S114-05	Test for Determination of Non-Combustibility in Building Materials	1.4.1.2.(1) ⁽⁴⁾
ULC	CAN/ULC-S115-11	Fire Tests of Firestop Systems	3.1.5.19.(3) 3.1.9.1.(1) 3.1.9.1.(2) 3.1.9.1.(3) 3.1.9.4.(1) 3.1.9.5.(4) 9.10.9.6.(2) 9.10.9.7.(3)
ULC	CAN/ULC-S124-06	Test for the Evaluation of Protective Coverings for Foamed Plastic	3.1.5.15.(2) A-3.1.5.14.(5)(d)
ULC	CAN/ULC-S126-14	Test for Fire Spread Under Roof-Deck Assemblies	3.1.14.1.(1) 3.1.14.2.(1)
ULC	CAN/ULC-S134-13	Fire Test of Exterior Wall Assemblies	3.1.5.5.(1) 9.10.14.5.(2) 9.10.15.5.(2) 9.10.15.5.(3)
ULC	ULC-S135-04	Test Method for the Determination of Combustibility Parameters of Building Materials Using an Oxygen Consumption Calorimeter (Cone Calorimeter)	3.1.5.1.(2)
ULC	CAN/ULC-S138-06	Test for Fire Growth of Insulated Building Panels in a Full-Scale Room Configuration	3.1.5.7.(1) 3.1.5.7.(3)
ULC	CAN/ULC-S139-12	Fire Test for Evaluation of Integrity of Electrical Power, Data and Optical Fibre Cables	3.2.7.10.(2) 3.2.7.10.(3)
ULC	CAN/ULC-S143-14	Fire Tests for Non-Metallic Electrical and Optical Fibre Cable Raceway Systems	3.1.5.23.(1)
ULC	CAN/ULC-S144-12	Fire Resistance Test – Grease Duct Assemblies	3.6.3.5.(2) A-3.6.3.5.
ULC	ULC-S332-93	Burglary Resisting Glazing Material	A-9.7.5.2.(1)
ULC	ULC-S505-1974	Fusible Links for Fire Protection Service	3.1.8.10.(2)
ULC	CAN/ULC-S524-14	Installation of Fire Alarm Systems	3.1.8.11.(3) 3.1.8.14.(3) 3.2.4.5.(1) 3.2.4.20.(8) 3.2.4.20.(13) A-3.2.4.7.(4) A-3.2.4.18.(8) and (9) A-3.2.4.20.(8) 9.10.19.4.(3) 9.10.19.6.(2)
ULC	CAN/ULC-S526-16	Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories	A-3.2.4.19.(2)
ULC	CAN/ULC-S531-14	Smoke Alarms	3.2.4.20.(2) 9.10.19.1.(1)
ULC	CAN/ULC-S537-13	Verification of Fire Alarm Systems	3.2.4.5.(2)
ULC	CAN/ULC-S540-13	Residential Fire and Life Safety Warning Systems: Installation, Inspection, Testing and Maintenance	3.2.4.21.(1) 9.10.19.8.(1)
ULC	CAN/ULC-S553-14	Installation of Smoke Alarms	3.2.4.20.(11) 9.10.19.3.(2)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
ULC	CAN/ULC-S561-13	Installation and Services for Fire Signal Receiving Centres and Systems	3.2.4.7.(4) A-3.2.4.7.(4)
ULC	CAN/ULC-S572-17	Photoluminescent and Self-Luminous Exit Signs and Path Marking Systems	3.4.5.1.(3) 3.4.5.1.(4) A-3.4.5.1.(4) 9.9.11.3.(3) 9.9.11.3.(4)
ULC	CAN/ULC-S610-M87	Factory-Built Fireplaces	9.22.8.1.(1)
ULC	ULC-S628-93	Fireplace Inserts	9.22.10.1.(1)
ULC	CAN/ULC-S629-16	650°C Factory-Built Chimneys	9.33.10.2.(1)
ULC	CAN/ULC-S639-M87	Steel Liner Assemblies for Solid-Fuel Burning Masonry Fireplaces	9.22.2.3.(1)
ULC	CAN/ULC-S701.1-17	Thermal Insulation, Polystyrene Boards	Table 5.9.1.1. 9.15.4.1.(1) Table 9.23.17.2.-A 9.25.2.2.(1) Table A-9.36.2.4.(1)-D
ULC	CAN/ULC-S702-14	Mineral Fibre Thermal Insulation for Buildings	Table 5.9.1.1. A-5.9.1.1.(1) Table 9.23.17.2.-A 9.25.2.2.(1) Table A-9.36.2.4.(1)-D
ULC	CAN/ULC-S703-09	Cellulose Fibre Insulation for Buildings	Table 5.9.1.1. 9.25.2.2.(1) Table A-9.36.2.4.(1)-D
ULC	CAN/ULC-S704-11	Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced	Table 5.9.1.1. Table 9.23.17.2.-A 9.25.2.2.(1) Table A-9.36.2.4.(1)-D
ULC	CAN/ULC-S705.1-15	Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Material Specification	Table 5.9.1.1. 9.25.2.2.(1) Table A-9.36.2.4.(1)-D
ULC	CAN/ULC-S705.2-05	Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Application	Table 5.9.1.1. 9.25.2.5.(1)
ULC	CAN/ULC-S706.1-16	Wood Fibre Insulating Boards for Buildings	Table 5.9.1.1. 9.23.16.7.(3) Table 9.23.17.2.-A 9.25.2.2.(1) 9.29.8.1.(1)
ULC	CAN/ULC-S710.1-11	Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 1: Material Specification	Table 5.9.1.1. 9.36.2.10.(6)
ULC	CAN/ULC-S711.1-11	Thermal Insulation – Bead-Applied Two Component Polyurethane Air Sealant Foam, Part 1: Material Specification	Table 5.9.1.1. 9.36.2.10.(6)
ULC	CAN/ULC-S712.1-17	Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam - Material Specification	Table A-9.36.2.4.(1)-D
ULC	CAN/ULC-S716.1-12	Exterior Insulation and Finish Systems (EIFS) - Materials and Systems	5.9.4.1.(1) A-5.9.4.1.(1) 9.27.13.1.(1) 9.27.13.2.(1) A-9.27.13.2.(2)(a)
ULC	CAN/ULC-S716.2-12	Exterior Insulation and Finish Systems (EIFS) - Installation of EIFS Components and Water Resistive Barrier	A-5.9.4.1.(1) 9.27.13.3.(1)
ULC	CAN/ULC-S716.3-12	Exterior Insulation and Finish System (EIFS) - Design Application	A-5.9.4.1.(1) 9.27.13.3.(1)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number ⁽²⁾	Title of Document ⁽³⁾	Code Reference
ULC	CAN/ULC-S741-08	Air Barrier Materials – Specification	5.4.1.2.(1) 9.36.2.10.(1)
ULC	CAN/ULC-S742-11	Air Barrier Assemblies – Specification	9.36.2.9.(1) A-9.36.2.9.(1) A-9.36.2.10.(5)(b)
ULC	CAN/ULC-S770-15	Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams	Table A-9.36.2.4.(1)-D
ULC	CAN/ULC-S1001-11	Integrated Systems Testing of Fire Protection and Life Safety Systems	3.2.9.1.(1) A-3.2.9.1.(1) 9.10.1.2.(1)
ULC	ULC/ORD-C199P-2002	Combustible Piping for Sprinkler Systems	3.2.5.13.(2) 3.2.5.13.(5)
ULC	ULC/ORD-C1254.6-1995	Fire Testing of Restaurant Cooking Area Fire Extinguishing System Units	6.9.1.3.(1)
U.S. Congress		National Appliance Energy Conservation Act of 1987	Table 9.36.4.2. Table 9.36.5.16.
WCLIB	No. 17 (2004)	Standard Grading Rules	A-Table 9.3.2.1.
WWPA	2011	Western Lumber Grading Rules	A-Table 9.3.2.1.

Notes to Table 1.3.1.2.:

- (1) See Table D-1.1.2. in Appendix D for the list of standards referenced therein.
- (2) Some documents may have been reaffirmed or reapproved. Check with the applicable issuing agency for up-to-date information.
- (3) Some titles have been abridged to omit superfluous wording.
- (4) Code reference is in Division A.
- (5) Code reference is in Division C.
- (6) Notwithstanding the requirement stated in Article 4.3.1.1., Update 1 to CSA O86-14 is not permitted to be used in the application of Subsection 4.1.8.

1.3.2. Organizations

1.3.2.1. Abbreviations of Proper Names

1) The abbreviations of proper names in this Code shall have the meanings assigned to them in this Article.

- AAMA American Architectural Manufacturers Association
(www.aamanet.org)
- ACGIH American Conference of Governmental Industrial Hygienists
(www.acgih.org)
- AHAM Association of Home Appliance Manufacturers (www.aham.org)
- AHRI Air-Conditioning, Heating and Refrigeration Institute
(www.ahrinet.org)
- AISI American Iron and Steel Institute (www.steel.org)
- ANSI American National Standards Institute (www.ansi.org)
- ASCE American Society of Civil Engineers (www.asce.org)
- ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers (www.ashrae.org)
- ASME American Society of Mechanical Engineers (www.asme.org)
- ASTM American Society for Testing and Materials International
(www.astm.org)
- AWPA American Wood Protection Association (www.awpa.com)

BIA	Brick Industry Association (www.bia.org)
BNQ	Bureau de normalisation du Québec (www.bnq.qc.ca)
CAN	National Standard of Canada designation (The number or name following the CAN designation represents the agency under whose auspices the standard is issued.) CAN3 designates CSA CAN4 designates ULC
CCBFC	Canadian Commission on Building and Fire Codes (see NRC)
CCME	Canadian Council of Ministers of the Environment (www.ccme.ca)
CGSB	Canadian General Standards Board (www.tpsgc-pwgsc.gc.ca/ongc-cgsb/index-eng.html)
CHC	Canadian Hydronics Council (www.ciph.com)
CISC	Canadian Institute of Steel Construction (www.cisc.ca)
CMHC	Canada Mortgage and Housing Corporation (www.cmhc.ca)
CRCA	Canadian Roofing Contractors' Association (www.roofingcanada.com)
CSA	CSA Group (www.csagroup.org)
CTI	Cooling Technology Institute (www.cti.org)
CWC	Canadian Wood Council (www.cwc.ca)
DOE	Department of Energy (www.energy.gov)
EC	Environment Canada (www.ec.gc.ca)
ECC	EIFS Council of Canada (www.eifscouncil.org)
EPA	Environmental Protection Agency (U.S.) (www.epa.gov)
FEMA	Federal Emergency Management Agency (www.fema.gov)
FLL	German Landscape Research, Development and Construction Society (www.fll.de/shop/english-publications.html)
FPI	FPInnovations – Wood Products (formerly FCC – Forintek Canada Corporation) (www.fpinnovations.ca)
GRHC	Green Roofs for Healthy Cities (www.greenroofs.org)
HC	Health Canada (www.hc-sc.gc.ca)
HPVA	Hardwood Plywood & Veneer Association (www.hpva.org)
HRAI	Heating, Refrigeration and Air Conditioning Institute of Canada (www.hrai.ca)
HVI	Home Ventilating Institute (www.hvi.org)
ICC	International Code Council (www.iccsafe.org)
IEC	International Electrotechnical Commission (www.iec.ch)
ISO	International Organization for Standardization (www.iso.org)
NBC	National Building Code of Canada 2015
NCMA	National Concrete Masonry Association (www.ncma.org)
NECB	National Energy Code of Canada for Buildings 2017
NEMA	National Electrical Manufacturers Association (www.nema.org)
NFC	National Fire Code of Canada 2015
NFPA	National Fire Protection Association (www.nfpa.org)
NFRC	National Fenestration Rating Council (www.nfrc.org)
NLGA	National Lumber Grades Authority (www.nlga.org)
NPC	National Plumbing Code of Canada 2015
NRC	National Research Council of Canada (Ottawa, Ontario K1A 0R6; www.nrc-cnrc.gc.ca)

NRCA	National Roofing Contractors Association (www.nrca.net)
NRCan	Natural Resources Canada (www.nrcan.gc.ca)
NRC Const. ..	NRC Construction (former name of the NRC Construction Research Centre) (www.nrc.gc.ca/construction)
NRC-IRC	National Research Council, Institute for Research in Construction (former name of the NRC Construction Research Centre) (www.nrc.gc.ca/construction)
NYCDH	New York City Department of Health and Mental Hygiene (www.nyc.gov/health)
OMMAH	Ontario Ministry of Municipal Affairs and Housing (www.mah.gov.on.ca)
SEI	Structural Engineering Institute (www.asce.org/structural-engineering/structural-engineering)
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association (www.smacna.org)
SPRI	Single Ply Roofing Industry (www.spri.org)
TC	Transport Canada (www.tc.gc.ca)
TIAC	Thermal Insulation Association of Canada (www.tiac.ca)
TPIC	Truss Plate Institute of Canada (www.tpic.ca)
TWC	Tarion Warranty Corporation (formerly Ontario New Home Warranty Program) (www.tarion.com)
UL	Underwriters Laboratories Inc. (www.ul.com)
ULC	ULC Standards (canada.ul.com/ulcstandards)
WCLIB	West Coast Lumber Inspection Bureau (www.wclib.org)
WWPA	Western Wood Products Association (www.wwpa.org)

3.1.8.19. Temperature Rise and Area Limits Waived

1) The temperature rise limits and glass area limits required by Articles 3.1.8.17. and 3.1.8.18. are waived for a *closure* between an *exit* enclosure and an enclosed vestibule or corridor, provided

- a) the vestibule or corridor is separated from the remainder of the *floor area* by a *fire separation* having a *fire-resistance rating* not less than 45 min,
- b) the *fire separation* required by Clause (a) contains no wired glass or glass block within 3 m of the *closure* into the *exit* enclosure, and
- c) the vestibule or corridor contains no *occupancy*.

(See Note A-3.1.8.19.(1).)

3.1.9. Penetrations in Fire Separations and Fire-Rated Assemblies

(See Note A-3.1.9.)

3.1.9.1. Fire Stops

1) Except as provided in Sentences (2) to (5) and Article 3.1.9.4., penetrations of a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* shall be

- a) sealed by a *fire stop* that, 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
- b) cast in place (see Note A-3.1.9.1.(1)(b)).

(See also Article 3.1.9.5. for requirements regarding penetrations by *combustible* drain, waste and vent piping.)

2) Penetrations of a *firewall* or a horizontal *fire separation* that is required to have a *fire-resistance rating* in conformance with Article 3.2.1.2. shall be sealed at the penetration by a *fire stop* that, when subjected to the fire test method in CAN/ULC-S115, "Fire Tests of Firestop Systems," has an FT rating not less than the *fire-resistance rating* for the *fire separation*.

3) Penetrations of a *fire separation* in conformance with Sentence 3.6.4.2.(2) shall be sealed by a *fire stop* that, when subjected to the fire test method in CAN/ULC-S115, "Fire Tests of Firestop Systems," has an FT rating not less than the *fire-resistance rating* for the *fire separation* of the assembly.

4) Sprinklers are permitted to penetrate a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* without having to meet the *fire stop* requirements of Sentences (1) to (3), provided the annular space created by the penetration of a fire sprinkler is covered by a metal escutcheon plate in accordance with NFPA 13, "Installation of Sprinkler Systems."

5) Unless specifically designed with a *fire stop*, *fire dampers* are permitted to penetrate a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* without having to meet the *fire stop* requirements of Sentences (1) to (3), provided the *fire damper* is installed in conformance with NFPA 80, "Fire Doors and Other Opening Protectives."

3.1.9.2. Combustibility of Service Penetrations

1) Except as permitted by Articles 3.1.9.3. and 3.1.9.5., pipes, ducts, electrical outlet boxes, totally enclosed raceways or other similar service equipment that penetrate an assembly required to have a *fire-resistance rating* shall be *noncombustible*, unless the assembly was tested incorporating that service equipment. (See Note A-3.1.9.2.(1).)

3.1.9.3. Penetration by Wires, Cables and Outlet Boxes

1) Optical fibre cables and electrical wires and cables in totally enclosed *noncombustible* raceways are permitted to penetrate an assembly required to have a *fire-resistance rating* without being incorporated in the assembly at the time of testing as required by Article 3.1.9.2.

2) Except as permitted by Sentence (3), totally enclosed non-metallic raceways conforming to Article 3.1.5.23., optical fibre cables, and electrical wires and cables, single or grouped, with *combustible* insulation, jackets or sheathes that conform to the requirements of Clause 3.1.5.21.(1)(a) and that are not installed in totally enclosed *noncombustible* raceways are permitted to penetrate an assembly required to have a *fire-resistance rating* without being incorporated in the assembly at the time of testing as required by Article 3.1.9.2., provided the overall diameter of the single or grouped wires or cables, or the raceways is not more than 25 mm.

3) Single conductor metal sheathed cables with *combustible* jacketing that are more than 25 mm in overall diameter are permitted to penetrate a *fire separation* required to have a *fire-resistance rating* without being incorporated in the assembly at the time of testing as required by Article 3.1.9.2., provided the cables are not grouped and are spaced a minimum of 300 mm apart.

4) *Combustible* totally enclosed raceways that are embedded in a concrete floor slab are permitted in an assembly required to have a *fire-resistance rating* without being incorporated in the assembly at the time of testing as required by Article 3.1.9.2., provided the concrete cover between the raceway and the bottom of the slab is not less than 50 mm.

5) *Combustible* outlet boxes are permitted in an assembly required to have a *fire-resistance rating* without being incorporated in the assembly at the time of testing as required by Article 3.1.9.2., provided the opening through the membrane into the box is not more than 0.016 m².

3.1.9.4.

Penetration by Outlet Boxes

(See Note A-3.1.9.4.)

1) Except as provided in Sentence (2), outlet boxes are permitted to penetrate the membrane of an assembly required to have a *fire-resistance rating*, provided they are sealed at the penetration by a *fire stop* that has an FT rating not less than the *fire-resistance rating* of the *fire separation* when subjected to the fire test method in CAN/ULC-S115, "Fire Tests of Firestop Systems."

2) Except as provided in Sentences 3.1.9.1.(2) and (3), *noncombustible* outlet boxes that penetrate a vertical *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* need not conform to Sentence (1), provided

- a) they do not exceed
 - i) 0.016 m² in area, and
 - ii) an aggregate area of 0.065 m² in any 9.3 m² of surface area, and
- b) the annular space between the membrane and the *noncombustible* electrical outlet boxes does not exceed 3 mm.

3) In addition to the requirements of Sentence (2), outlet boxes on opposite sides of a vertical *fire separation* having a *fire-resistance rating* shall be separated by

- a) a horizontal distance of not less than 600 mm, or
- b) a *fire block* conforming to Article 3.1.11.7.

3.1.9.5.

Combustible Piping Penetrations

1) *Combustible* sprinkler piping is permitted to penetrate a *fire separation* provided the *fire compartments* on each side of the *fire separation* are sprinklered.

2) *Combustible* water distribution piping is permitted to penetrate a *fire separation* that is required to have a *fire-resistance rating* without being incorporated in the assembly at the time of testing as required by Article 3.1.9.2., provided the piping is protected at the penetration with a *fire stop* in conformance with Sentence (4).

3) Except as permitted by Sentences (4) to (5), *combustible* piping shall not be used in a drain, waste and vent piping system if any part of that system penetrates

- a) a *fire separation* required to have a *fire-resistance rating*, or
- b) a membrane that forms part of an assembly required to have a *fire-resistance rating*.

that when these *smoke detectors* are actuated, the elevators will automatically return directly to an alternate floor level.

2) *Smoke detectors* required by Sentence (1) shall be designed as part of the *building* fire alarm system.

3) The alternate floor recall feature required by Sentence (1) is not required if the *floor area* containing the recall level is *sprinklered* throughout.

3.2.4.15. System Monitoring

1) An automatic sprinkler system shall be equipped with waterflow detecting devices and, if an annunciator is required by Article 3.2.4.8., shall be installed so that each device serves

- a) not more than one *storey*, and
- b) an area on each *storey* that is not more than the system area limits as specified in NFPA 13, "Installation of Sprinkler Systems."

2) Waterflow-detecting devices required by Sentence (1) shall be connected to the fire alarm system so that, upon its actuation, an *alert signal* or an *alarm signal* is initiated.

3) The actuation of each waterflow detecting device required by Sentence (1) shall be indicated separately on the fire alarm system annunciator.

3.2.4.16. Manual Stations

1) Except as permitted by Sentences (2) and (3), where a fire alarm system is installed, a manual station shall be installed in every *floor area* near

- a) every principal entrance to the *building*, and
- b) every *exit*.

(See Note A-3.2.4.16.(1).)

2) In a *building* that is *sprinklered* throughout, a manual station is not required at an exterior egress doorway from a *suite* that does not lead to an interior shared *means of egress* in a hotel or motel not more than 3 *storeys* in *building height*, provided each *suite* is served by an exterior *exit* facility leading directly to ground level.

3) In a *building* that is *sprinklered* throughout, a manual station is not required at an exterior egress doorway from a *dwelling unit* that does not lead to an interior shared *means of egress* in a *building* not more than 3 *storeys* in *building height* containing only *dwelling units*, provided each *dwelling unit* is served by an exterior *exit* facility leading directly to ground level.

4) In a *building* referred to in Sentences (2) or (3), manual stations shall be installed near doorways leading from shared interior corridors to the exterior.

5) Where a fire alarm system is installed, a manually operated fire alarm station shall be installed on the roof at each *exit* from a helicopter landing area.

3.2.4.17. Alert and Alarm Signals

1) In a 2-stage fire alarm system described in Sentence 3.2.4.4.(2), the same audible signal devices are permitted to be used to sound the *alert signals* and the *alarm signals*.

2) If audible signal devices with voice reproduction capabilities are intended for paging and similar voice message use, other than during a fire emergency, they shall be installed so that *alert signals* and *alarm signals* take priority over all other signals.

3) Audible signal devices forming part of a fire alarm or voice communication system shall not be used for playing music or background noise.

3.2.4.18. Audibility of Alarm Systems

(See Note A-3.2.4.18.)

1) Audible signal devices forming part of a fire alarm system shall be installed in a *building* so that

- a) *alarm signals* are clearly audible throughout the *floor area*, and
- b) *alert signals* are clearly audible in continuously staffed locations, and where there are no continuously staffed locations, throughout the *floor area*.

(See Note A-3.2.4.18.(1).)

2) The sound pattern of an *alarm signal* shall conform to the temporal pattern defined in Clause 4.2 of ISO 8201, "Acoustics – Audible emergency evacuation signal." (See Note A-3.2.4.18.(2).)

3) The sound patterns of *alert signals* shall be significantly different from the temporal patterns of *alarm signals*. (See Note A-3.2.4.18.(3).)

4) The fire *alarm signal* sound pressure level shall be not more than 110 dBA in any normally occupied area. (See Note A-3.2.4.18.(4).)

5) The sound pressure level in a sleeping room from a fire alarm audible signal device shall be not less than 75 dBA in a *building* of *residential* or *care occupancy* when any intervening doors between the device and the sleeping room are closed. (See Note A-3.2.4.18.(5).)

6) Except as required by Sentence (5), the sound pressure level from a fire alarm system's audible signal device within a *floor area* shall be not less than 10 dBA above the ambient noise level without being less than 65 dBA.

7) Except as permitted by Sentence (11), audible signal devices located within a *dwelling unit* shall include a means for them to be manually silenced for a period of not more than 10 min, after which time the devices shall restore themselves to normal operation. (See Note A-3.2.4.18.(7).)

8) Audible signal devices within a *dwelling unit* or a *suite* of *residential* or *care occupancy* shall be connected to the fire alarm system

- a) in a manner such that a single open circuit at one device will not impair the operation of other audible signal devices on that same circuit that serve the other *dwelling units* or *suites* of *residential* or *care occupancy*, or
- b) on separate signal circuits that are not connected to the devices in any other *dwelling unit*, *public corridor* or *suite* of *residential* or *care occupancy*.

(See Note A-3.2.4.18.(8) and (9).)

9) In a *building* or part thereof classified as a *residential* or *care occupancy*,

- a) separate circuits shall be provided for audible signal devices on each *floor area*, and
- b) audible signal devices within *dwelling units* or *suites* of *residential* or *care occupancy* shall be wired on separate signal circuits from those not within *dwelling units* or *suites* of *residential* or *care occupancy*.

(See Note A-3.2.4.18.(8) and (9).)

10) Audible signal devices shall be installed in a *service space* referred to in Sentence 3.2.1.1.(8) and shall be connected to the fire alarm system.

11) Audible signal devices within *dwelling units* that are wired on separate signal circuits need not include a means for silencing as required by Sentence (7) provided the fire alarm system includes a provision for an automatic signal silence within *dwelling units*, where

- a) the automatic signal silence cannot occur within the first 60 s of operation or within the zone of initiation,
- b) a subsequent alarm elsewhere in the *building* will reactuate the silenced audible signal devices within *dwelling units*,
- c) after a period of not more than 10 min, the silenced audible signal devices will be restored to continuous audible signal if the alarm is not acknowledged, and
- d) the voice communication systems referred to in Articles 3.2.4.22. and 3.2.4.23. have a provision to override the automatic signal silence to

allow the transmission of voice messages through silenced audible signal device circuits that serve the *dwelling units*.
(See Note A-3.2.4.18.(7).)

12) If a 2-stage fire alarm system has been installed with an automatic signal silence as described in Sentence (11), the system shall be designed so that any silenced audible signal devices serving *dwelling units* are reactivated whenever an *alarm signal* is required to be transmitted as part of the second stage. (See Note A-3.2.4.18.(7).)

3.2.4.19. Visual Signals

- 1)** Visual signal devices shall be installed in addition to *alarm signals*
- a) in *buildings* or portions thereof intended for use primarily by persons with a hearing impairment,
 - b) in *assembly occupancies* in which music and other sounds associated with performances could exceed 100 dBA,
 - c) in any *floor area* in which the ambient noise level is more than 87 dBA, and
 - d) in any *floor area* in which the occupants
 - i) use ear protection devices,
 - ii) are located in an audiometric booth, or
 - iii) are located in sound-insulating enclosures.

2) Visual signal devices required by Sentence (1) shall be installed so that the signal from at least one device is visible throughout the *floor area* or portion thereof in which they are installed. (See Note A-3.2.4.19.(2).)

3.2.4.20. Smoke Alarms

1) Except as provided in Article 3.2.4.21., *smoke alarms* shall be installed in accordance with this Article.

2) Except as required by Sentence (5) and permitted by Sentence (8), *smoke alarms* conforming to CAN/ULC-S531, "Smoke Alarms," shall be installed in each *dwelling unit* and, except for *care, treatment* or *detention occupancies* required to have a fire alarm system, in each sleeping room not within a *dwelling unit* or *suite of care occupancy*.

3) At least one *smoke alarm* shall be installed on each *storey* of a *dwelling unit* or *suite of care occupancy*.

4) On any *storey* of a *dwelling unit* containing sleeping rooms, a *smoke alarm* shall be installed

- a) in each sleeping room, and
- b) in a location between the sleeping rooms and the remainder of the *storey*, and if the sleeping rooms are served by a hallway, the *smoke alarm* shall be located in the hallway.

5) Where a *care occupancy* has individual *suites* for residents, a *smoke alarm* shall be installed

- a) in each sleeping room, and
- b) in a location between the sleeping rooms and the remainder of the *suite*, and if the sleeping rooms are served by a corridor within the *suite*, the *smoke alarm* shall be located in the corridor.

6) A *smoke alarm* shall be installed on or near the ceiling.

7) Except as permitted in Sentence (8), *smoke alarms* referred in Sentence (2) shall

- a) be installed with permanent connections to an electrical circuit (see Note A-3.2.4.20.(7)(a)),
- b) have no disconnect switch between the overcurrent device and the *smoke alarm*, and
- c) in case the regular power supply to the *smoke alarm* is interrupted, be provided with a battery as an alternative power source that can continue to provide power to the *smoke alarm* for a period of no less than 7 days in the normal condition, followed by 4 minutes of alarm.

8) *Suites of residential occupancy* are permitted to be equipped with *smoke detectors* in lieu of *smoke alarms*, provided the *smoke detectors*

- a) are capable of independently sounding audible signals within the individual *suites*,
- b) except as permitted in Sentence (9), are installed in conformance with CAN/ULC-S524, "Installation of Fire Alarm Systems," and
- c) form part of the fire alarm system.

(See Note A-3.2.4.20.(8).)

9) *Smoke detectors* permitted to be installed in lieu of *smoke alarms* as stated in Sentence (8) are permitted to sound localized alarms within individual *suites*, and need not sound an alarm throughout the rest of the *building*.

10) If more than one *smoke alarm* is required in a *dwelling unit*, the *smoke alarms* shall be wired so that the actuation of one *smoke alarm* will cause all *smoke alarms* within the *dwelling unit* to sound.

11) A *smoke alarm* required by Sentence (2) shall be installed in conformance with CAN/ULC-S553, "Installation of Smoke Alarms."

12) Except as permitted in Sentence (13), a manually operated silencing device shall be incorporated within the circuitry of a *smoke alarm* installed in a *dwelling unit* so that it will silence the signal emitted by the *smoke alarm* for a period of not more than 10 min, after which the *smoke alarm* will reset and again sound the alarm if the level of smoke in the vicinity is sufficient to reactuate the *smoke alarm*.

13) *Suites of residential occupancy* equipped with *smoke detectors* installed to CAN/ULC-S524, "Installation of Fire Alarm Systems," as part of the fire alarm system in lieu of *smoke alarms* as permitted by Sentence (8), need not incorporate the manually operated device required in Sentence (12). (See Note A-3.2.4.20.(8).)

14) The sound patterns of *smoke alarms* shall

- a) meet the temporal patterns of *alarm signals* (see Note A-3.2.4.18.(2)), or
- b) be a combination temporal pattern and voice relay.

3.2.4.21. Residential Fire Warning Systems

1) Except where a fire alarm system is installed or required in a *building*, *smoke detectors* forming part of a residential fire warning system installed in conformance with CAN/ULC-S540, "Residential Fire and Life Safety Warning Systems: Installation, Inspection, Testing and Maintenance," are permitted to be installed in lieu of all *smoke alarms* required by Article 3.2.4.20., provided the system

- a) is capable of sounding audible signals in accordance with Articles 9.10.19.2. and 9.10.19.5.,
- b) is powered in accordance with Article 9.10.19.4., and
- c) is provided with a silencing device in accordance with Article 9.10.19.6.

3.2.4.22. Voice Communication Systems for High Buildings

1) A voice communication system required by Subsection 3.2.6. shall

- a) consist of a two-way means of communication with the central alarm and control facility and to the mechanical control centre from each *floor area*, and
- b) be capable of broadcasting prerecorded, synthesized, or live messages from the central alarm and control facility that are audible and intelligible in all parts of the *building*, except that this requirement does not apply to elevator cars (see Note A-3.2.4.22.(1)(b)).

2) The voice communication system referred to in Sentence (1) shall include a means to silence the *alarm signal* in a single stage fire alarm system while voice instructions are being transmitted, but only after the *alarm signal* has initially sounded for not less than 30 s.

3) The voice communication system referred to in Sentence (1) shall include a means to silence the *alert signal* and the *alarm signal* in a 2-stage fire alarm system while

voice instructions are being transmitted, but only after the *alert signal* has initially sounded for not less than

- a) 10 s in hospitals that have supervisory personnel on duty for twenty-four hours each day, or
- b) 30 s for all other *occupancies*.

4) The voice communication system referred to in Clause (1)(b) shall be designed so that the *alarm signal* in a 2-stage fire alarm system can be selectively transmitted to any zone or zones while maintaining an *alert signal* or selectively transmitting voice instructions to any other zone or zones in the *building*.

5) The 2-way communication system referred to in Clause (1)(a) shall be installed so that emergency telephones are located in each *floor area* near *exit* stair shafts.

6) Visual signal devices required by Sentence 3.2.4.19.(1) shall continue to emit a visible signal while voice instructions are being transmitted.

7) Where the facility is not equipped with staff trained to provide instructions over the loudspeakers, a pre-recorded message shall be provided.

3.2.4.23. One-Way Voice Communication Systems

1) Except for Group B, Division 1 and Group F, Division 1 *major occupancies*, where a fire alarm system is required under Subsection 3.2.4., a one-way voice communication system shall be installed in *buildings* where a 2-stage fire alarm system is installed and whose *occupant load* exceeds 1 000.

2) The one-way voice communication system required by Sentence (1) shall consist of loudspeakers that are

- a) operated from the central alarm and control facility or, in the absence of such a facility, from a designated area, and
- b) except in elevator cars, designed and located so that transmitted messages are audible and intelligible in all parts of the *building*.

(See Note A-3.2.4.22.(1)(b).)

3) Where the facility is not equipped with staff trained to provide instructions over the loudspeakers, a pre-recorded message shall be provided.

4) The one-way voice communication system required by Sentence (1) shall meet the silencing and transmission requirements of Sentences 3.2.4.22.(2) to (4) and (6).

3.2.5. Provisions for Firefighting

(See Note A-3.)

3.2.5.1. Access to Above-Grade Storeys

1) Except for *storeys* below the *first storey*, direct access for firefighting shall be provided from the outdoors to every *storey* that is not *sprinklered* throughout and whose floor level is less than 25 m above *grade*, by at least one unobstructed window or access panel for each 15 m of wall in each wall required to face a *street* by Subsection 3.2.2.

2) An opening for access required by Sentence (1) shall

- a) have a sill no higher than 900 mm above the inside floor, and
- b) be not less than 1 100 mm high by not less than
 - i) 550 mm wide for a *building* not designed for the storage or use of *dangerous goods*, or
 - ii) 750 mm wide for a *building* designed for the storage or use of *dangerous goods*.

3) Access panels above the *first storey* shall be readily openable from both inside and outside, or the opening shall be glazed with plain glass.

3.2.5.2. Access to Basements

1) Direct access from at least one *street* shall be provided from the outdoors in a *building* that is not *sprinklered* to each *basement* having a horizontal dimension more than 25 m.

- 2) The access required by Sentence (1) is permitted to be provided by
 - a) doors, windows or other means that provide an opening not less than 1 100 mm high and 550 mm wide, with a sill no higher than 900 mm above the inside floor, or
 - b) an interior stairway immediately accessible from the outdoors.

3.2.5.3. Roof Access

- 1) On a *building* more than 3 storeys in *building height* where the slope of the roof is less than 1 in 4, all main roof areas shall be provided with direct access from the *floor areas* immediately below, either by
 - a) a stairway, or
 - b) a hatch not less than 550 mm by 900 mm with a fixed ladder.

3.2.5.4. Access Routes

- 1) A *building* which is more than 3 storeys in *building height* or more than 600 m² in *building area* shall be provided with access routes for fire department vehicles
 - a) to the *building* face having a principal entrance, and
 - b) to each *building* face having access openings for firefighting as required by Articles 3.2.5.1. and 3.2.5.2.(See Note A-3.2.5.4.(1).)

3.2.5.5. Location of Access Routes

- 1) Access routes required by Article 3.2.5.4. shall be located so that the principal entrance and every access opening required by Articles 3.2.5.1. and 3.2.5.2. are located not less than 3 m and not more than 15 m from the closest portion of the access route required for fire department use, measured horizontally from the face of the *building*.
- 2) Access routes shall be provided to a *building* so that
 - a) for a *building* provided with a fire department connection, a fire department pumper vehicle can be located adjacent to the hydrants referred to in Article 3.2.5.15.,
 - b) for a *building* not provided with a fire department connection, a fire department pumper vehicle can be located so that the length of the access route from a hydrant to the vehicle plus the unobstructed path of travel for the firefighter from the vehicle to the *building* is not more than 90 m, and
 - c) the unobstructed path of travel for the firefighter from the vehicle to the *building* is not more than 45 m.
- 3) The unobstructed path of travel for the firefighter required by Sentence (2) from the vehicle to the *building* shall be measured from the vehicle to the fire department connection provided for the *building*, except that if no fire department connection is provided, the path of travel shall be measured to the principal entrance of the *building*.
- 4) If a portion of a *building* is completely cut off from the remainder of the *building* so that there is no access to the remainder of the *building*, the access routes required by Sentence (2) shall be located so that the unobstructed path of travel from the vehicle to one entrance of each portion of the *building* is not more than 45 m.

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 centre-line 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,

- 6)** The required *exit* width for *exit* stairs that serve *interconnected floor space* designed in accordance with Articles 3.2.8.3. to 3.2.8.8. shall be cumulative, unless
- a) the stairs provide not less than 0.3 m² of area of treads and landings for each occupant of the *interconnected floor space* (see Note A-3.4.3.2.(6)(a)), or
 - b) *protected floor spaces* conforming to Article 3.2.8.5. are provided at each floor level and the *protected floor space* on a floor level has not less than 0.5 m² of space for each occupant of that floor level of the *interconnected floor space*.
- (See Note A-3.4.3.2.(6).)
- 7)** If more than one *exit* is required, every *exit* shall be considered as contributing not more than one half of the required *exit* width.
- 8)** The minimum widths of *exits* shall conform to Tables 3.4.3.2.-A and 3.4.3.2.-B.

Table 3.4.3.2.-A
Minimum Widths of Exit Corridors, Passageways, Ramps, Stairs and Doorways
in Group A, Group B, Division 1, and Groups C, D, E and F Occupancies
 Forming Part of Sentence 3.4.3.2.(8)

Occupancy Classification	Exit Corridors and Passageways, mm	Ramps, mm	Stairs, mm	Doorways, mm
Group A, Group B, Division 1, Group C, Group D, Group E, Group F	1 100	1 100	900 ⁽¹⁾ 1 100 ⁽²⁾	800

Notes to Table 3.4.3.2.-A:

- (1) Serving not more than 2 *storeys* above the lowest *exit level* or not more than 1 *storey* below the lowest *exit level*.
- (2) Serving more than 2 *storeys* above the lowest *exit level* or more than 1 *storey* below the lowest *exit level*.

Table 3.4.3.2.-B
Minimum Widths of Exit Corridors, Passageways, Ramps, Stairs and Doorways in Group B, Division 2 and Division 3 Occupancies
 Forming Part of Sentence 3.4.3.2.(8)

Occupancy Classification	Exit Corridors and Passageways, mm	Ramps, mm		Stairs, mm		Doorways, mm	
		Not serving patients' or residents' sleeping rooms ⁽¹⁾	Serving patients' or residents' sleeping rooms ⁽¹⁾	Not serving patients' or residents' sleeping rooms ⁽¹⁾	Serving patients' or residents' sleeping rooms ⁽¹⁾	Not serving patients' or residents' sleeping rooms ⁽¹⁾	Serving patients' or residents' sleeping rooms ⁽¹⁾
Group B, Division 2	1 100	1 100	1 650	900 ⁽²⁾ 1 100 ⁽³⁾	1 650	850	1 050
Group B, Division 3							
with more than 10 residents	1 100	1 100	1 100	900 ⁽²⁾ 1 100 ⁽³⁾	1 100 ⁽²⁾ 1 650 ⁽³⁾	850	850
with not more than 10 residents	1 100	1 100	1 100	900 ⁽²⁾ 1 100 ⁽³⁾	900 ⁽²⁾ 1 100 ⁽³⁾	850	850

Notes to Table 3.4.3.2.-B:

- (1) Minimum widths of ramps, stairs and doorways do not apply within individual *suites of care occupancy*.
- (2) Serving not more than 2 *storeys* above the lowest *exit level* or not more than 1 *storey* below the lowest *exit level*.
- (3) Serving more than 2 *storeys* above the lowest *exit level* or more than 1 *storey* below the lowest *exit level*.

3.4.3.3. Exit Width Reduction

- 1)** Except as permitted by Sentences (2) and (4), no fixture, turnstile or construction shall project into or be fixed within the required width of an *exit*.
- 2)** Swinging doors in their swing shall not reduce the required width of *exit* stairs or landings to less than 750 mm or reduce the width of an *exit* passageway to less than the minimum required width.

3) Doors shall be installed so that, when open, they do not diminish nor obstruct the required width of the *exit*.

4) Handrails and construction below handrails, including handrail supports and stair stringers, shall not project more than 100 mm into the required width of a *means of egress*.

3.4.3.4. Headroom Clearance

(See Note A-3.4.3.4.)

1) Except as permitted by Sentences (4) and (5), every *exit* shall have a clear height over the clear width of the *exit* of not less than 2 050 mm.

2) The clear height of stairways shall be measured vertically over the clear width of the stairway, from the straight line tangent to the tread and landing nosings to the lowest element above. (See Note A-9.8.7.4.)

3) The clear height of landings shall be measured within the clear width of the landing vertically to the lowest element above.

4) Except as permitted by Sentence (5), the headroom clearance for doorways shall be not less than 2 030 mm.

5) No door closer or other device shall be installed so as to reduce the headroom clearance of a doorway to less than 1 980 mm.

3.4.4. Fire Separation of Exits

3.4.4.1. Fire-Resistance Rating of Exit Separations

1) Except as permitted by Sentences (2), 3.3.5.4.(3), 3.4.4.2.(2) and 3.4.4.3.(1), 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.

3) 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).

3.4.4.2. Exits through Lobbies

1) Except as permitted by Sentence (2), no *exit* from a *floor area* above or below the *first storey* shall lead through a lobby.

2) Not more than one *exit* from a *floor area* is permitted to lead through a lobby, provided

- a) the lobby floor is not more than 4.5 m above *grade*,
- b) the path of travel through the lobby to the outdoors is not more than 15 m,
- c) the adjacent rooms or premises having direct access to the lobby do not contain a *care, residential* or *industrial occupancy*,
- d) the lobby is not located within an *interconnected floor space* other than as described in Sentence 3.2.8.2.(6),
- e) the lobby conforms to the requirements for *exits*, except that
 - i) rooms other than *service rooms* and storage rooms are permitted to open onto the lobby,
 - ii) the *fire separation* between the lobby and a room used for the sole purpose of control and supervision of the *building* need not have a *fire-resistance rating*,

3.6.4.2. Fire Separations for Horizontal Service Spaces

1) Except as provided in Article 3.6.3.5., a *horizontal service space* that penetrates a required vertical *fire separation* shall be separated from the remainder of the *building* it serves in conformance with Sentence (2).

2) If a *horizontal service space* or other concealed space is located above a required vertical *fire separation* other than a vertical shaft, this space need not be divided at the *fire separation* as required by Article 3.1.8.3. provided the construction between this space and the space below is a *fire separation* with a *fire-resistance rating* equivalent to that required for the vertical *fire separation*, except that the *fire-resistance rating* is permitted to be not less than 30 min if the vertical *fire separation* is not required to have a *fire-resistance rating* more than 45 min. (See Note A-3.6.4.2.(2).)

3.6.4.3. Plenum Requirements

1) A concealed space used as a *plenum* within a floor assembly or within a roof assembly need not conform to Sentence 3.1.5.18.(1) and Article 3.6.5.1., provided

- a) all materials within the concealed space have a *flame-spread rating* not more than 25 and a smoke developed classification not more than 50, except for
 - i) tubing for pneumatic controls,
 - ii) optical fibre cables and electrical wires and cables with *combustible* insulation, jackets or sheathes that are used for the transmission of voice, sound or data and conform to Sentences 3.1.4.3.(2) and 3.1.5.21.(2),
 - iii) totally enclosed non-metallic raceways with an FT6 rating, when tested in accordance with Clause 3.1.5.23.(1)(a), in *buildings* required to be of *noncombustible construction*, and
 - iv) totally enclosed non-metallic raceways with an FT4 rating, when tested in accordance with Clause 3.1.5.23.(1)(a), in *buildings* permitted to be of *combustible construction*, and
- b) the supports for the ceiling membrane are of *noncombustible* material having a melting point not below 760°C.

2) If a concealed space referred to in Sentence (1) is used as a return-air *plenum* and incorporates a ceiling membrane that forms part of the required *fire-resistance rating* of the assembly, every opening through the membrane shall be protected by a *fire stop flap* that

- a) stops the flow of air into the concealed space in the event of a fire,
- b) is supported in a manner that will maintain the integrity of the ceiling membrane for the duration of time required to provide the required *fire-resistance rating*,
- c) conforms to CAN/ULC-S112.2, "Fire Test of Ceiling Firestop Flap Assemblies," and
- d) activates at a temperature approximately 30°C above the normal maximum temperature that occurs in the return-air *plenum*, whether the air duct system is operating or shut down.

3.6.4.4. Attic or Roof Space Access

1) An *attic or roof space* more than 600 mm high shall be provided with access from the floor immediately below by a hatchway not less than 550 mm by 900 mm or by a stairway.

3.6.4.5. Horizontal Service Space Access

1) A *horizontal service space*, consisting of ceiling and duct spaces, which is more than 1 200 mm high and 600 mm wide shall have inspection doors not less than 300 mm in both horizontal and vertical dimensions placed so that the entire interior of the duct or space can be viewed.

3.6.4.6. Crawl Space Access

1) A crawl space shall have at least one access opening not less than 550 mm by 900 mm.

3.6.5. Air Duct and Plenum Systems**3.6.5.1. Duct Materials**

- 1)** Except as permitted by Sentences (2) to (5) and Article 3.6.4.3., all ducts, duct connectors, associated fittings and *plenums* used in air duct systems shall be constructed of steel, aluminum alloy, copper, clay or other *noncombustible* material.
- 2)** Except as permitted by Sentence (3), ducts, associated fittings and *plenums* are permitted to contain *combustible* material provided they
 - a) conform to the appropriate requirements for Class 1 duct materials in CAN/ULC-S110, "Test for Air Ducts,"
 - b) conform to Article 3.1.5.18. in a *building* required to be of *noncombustible construction*,
 - c) conform to Subsection 3.1.9.,
 - d) are used only in horizontal runs in a *building* required to be of *noncombustible construction*,
 - e) are not used in vertical runs serving more than 2 *storeys* in a *building* permitted to be of *combustible construction*, and
 - f) are not used in air duct systems in which the air temperature could be more than 120°C.
- 3)** *Combustible* ducts which are part of a duct system conveying only ventilation air and are contained entirely within a *dwelling unit* need not comply with the requirements of Sentences (1) and (2).
- 4)** Duct sealants shall have a *flame-spread rating* not more than 25 and a smoke developed classification not more than 50.
- 5)** Duct connectors that contain *combustible* materials and that are used between ducts and air outlet units shall
 - a) conform to the appropriate requirements for Class 1 air duct materials in CAN/ULC-S110, "Test for Air Ducts,"
 - b) be not more than 4 m long,
 - c) be used only in horizontal runs, and
 - d) not penetrate a required *fire separation*.

3.6.5.2. Vibration Isolation Connectors

- 1)** Except as permitted by Sentence (2), vibration isolation connectors in air duct systems shall be *noncombustible*.
- 2)** *Combustible* fabric vibration isolation connectors are permitted provided they
 - a) are not more than 250 mm long,
 - b) comply with the flame-resistance requirements of CAN/ULC-S109, "Flame Tests of Flame-Resistant Fabrics and Films," and
 - c) are not used in a location where they are exposed to heated air or radiation from heat sources that could cause the exposed surface temperature to be more than 120°C.

3.6.5.3. Tape

- 1)** Tape used to seal joints in air ducts, *plenums* and other parts of air duct systems shall meet the flame-resistance requirements for fabric in CAN/ULC-S109, "Flame Tests of Flame-Resistant Fabrics and Films."

3.6.5.4. Coverings, Linings, Adhesives and Insulation

- 1)** Coverings, linings and associated adhesives and insulation for air ducts, *plenums* and other parts of air duct systems that would have an exposed surface temperature more than 120°C when exposed to heated air or radiation from heat sources shall be of *noncombustible* material.

- vi) where the door swings outward, is provided with a horizontal, D-shaped, visually contrasting door pull not less than 140 mm long located on the inside such that its midpoint is 200 mm to 300 mm from the hinged side of the door and 800 mm to 1 000 mm above the floor (see Note A-3.8.3.11.(1)(c)(vi)), and
- vii) is provided with a horizontal, D-shaped, visually contrasting door pull not less than 140 mm long located on the outside such that its midpoint is 120 mm to 220 mm from the latch side and 800 mm to 1 000 mm above the floor,
- d) have a water closet located so that the distance between the centre line of the fixture and the wall on one side is 460 mm to 480 mm,
- e) be equipped with an L-shaped grab bar that
 - i) is mounted on the side wall closest to the water closet,
 - ii) has horizontal and vertical components not less than 760 mm long mounted with the horizontal component 750 mm to 850 mm above the floor and the vertical component 150 mm in front of the water closet (see Note A-3.8.3.11.(1)(e)(ii)), and
 - iii) complies with Article 3.7.2.8.,
- f) be equipped with either one grab bar at least 600 mm long and centred over the water closet, or two grab bars at least 300 mm long and located either side of the flush valve, that
 - i) conform to Article 3.7.2.8.,
 - ii) are mounted on the rear wall, and
 - iii) are mounted at the same height as the grab bar on the side wall or 100 mm above the top of the attached water tank, if applicable,
- g) be equipped with a coat hook mounted not more than 1 200 mm above the floor on a side wall and projecting not more than 50 mm from the wall, and
- h) be equipped with a toilet paper dispenser mounted on the side wall closest to the water closet such that
 - i) the bottom of the dispenser is 600 mm to 800 mm above the floor, and
 - ii) the closest edge of the dispenser is 300 mm from the front of the water closet.

3.8.3.12. Universal Washrooms

(See Note A-3.8.3.12.)

- 1) A universal washroom shall
 - a) be served by a *barrier-free* path of travel,
 - b) have a door complying with Article 3.8.3.6. that
 - i) has a latch-operating mechanism located 900 mm to 1 000 mm above the floor that complies with Clause 3.8.3.8.(1)(b) and is capable of being locked from the inside, and released from the outside in case of emergency, and
 - ii) if it is an outward swinging door that is not self-closing, has a door pull not less than 140 mm long located on the inside so that its midpoint is not less than 200 mm and not more than 300 mm from the hinged side of the door and not less than 900 mm and not more than 1 000 mm above the floor (see Note A-3.8.3.11.(1)(c)(vi)),
 - c) have one lavatory conforming to Article 3.8.3.15.,
 - d) have one water closet conforming to Article 3.8.3.13. and Clause 3.8.3.11.(1)(d), with a clear floor space at least 900 mm wide that is parallel and adjacent to the open side of the water closet,
 - e) have grab bars conforming to Clauses 3.8.3.11.(1)(e) and (f),
 - f) have a coat hook conforming to Clause 3.8.3.11.(1)(g),
 - g) have a toilet paper dispenser conforming to Clause 3.8.3.11.(1)(h),

- h) unless a counter is provided, have a shelf located not more than 1 200 mm above the floor, and
- i) be designed to permit a wheelchair to turn in an open space not less than 1 500 mm in diameter.

3.8.3.13. Water Closets

- 1) A water closet for a person with physical disabilities shall
 - a) be equipped with a seat located 430 mm to 460 mm above the floor,
 - b) flush automatically or be equipped with a flushing control that
 - i) is located 500 mm to 900 mm above the floor,
 - ii) is located no more than 350 mm from the transfer side, and
 - iii) complies with Clause 3.8.3.8.(1)(b),
 - c) be equipped with a seat lid or other back support, and
 - d) where it has a tank, have a securely attached tank top.
- (See Note A-3.8.3.13.(1).)

3.8.3.14. Urinals

- 1) Urinals described in Sentence 3.8.2.8.(6) shall
 - a) be wall-mounted, with the rim located not more than 430 mm above the floor,
 - b) be adjacent to an accessible route,
 - c) have a clear width of approach of 800 mm centred on the urinal and unobstructed by privacy screens,
 - d) have no step in front of it,
 - e) have a flush control that
 - i) is automatic, or
 - ii) complies with Clause 3.8.3.8.(1)(b) and is located 900 mm to 1 100 mm above the floor, and
 - f) have a vertically mounted grab bar installed on each side that
 - i) complies with Article 3.7.2.8.,
 - ii) is not less than 600 mm long, with its centre line 1 000 mm above the floor, and
 - iii) is located not more than 380 mm from the centre line of the urinal.

3.8.3.15. Lavatories and Mirrors

- 1) Lavatories required by Sentence 3.8.2.8.(7) shall
 - a) be equipped with faucets complying with Sentence 3.7.2.3.(4),
 - b) be located so that the distance between the centre line of the lavatory and any side wall is not less than 460 mm,
 - c) have a rim height not more than 865 mm above the floor,
 - d) have a clearance beneath the lavatory not less than
 - i) 760 mm wide,
 - ii) 735 mm high at the front edge,
 - iii) 685 mm high at a point 200 mm back from the front edge, and
 - iv) 230 mm high over the distance from a point 280 mm to a point 430 mm back from the front edge,
- (see Note A-3.8.3.15.(1)(d))
- e) have insulated water supply and drain pipes where these pipes are exposed (see Note A-3.8.3.15.(1)(e)),
 - f) have a soap dispenser that
 - i) is automatic, or
 - ii) complies with Clause 3.8.3.8.(1)(b) and is located not more than 1 100 mm above the floor, within 500 mm from the front of the lavatory (see Note A-3.8.3.15.(1)(f)), and
 - g) have a towel dispenser or other hand-drying equipment located close to the lavatory, not more than 1 200 mm above the floor in an area that is accessible to persons in wheelchairs.

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.1.4.2. Protection of Foamed Plastics	
(1)	[F01-OS1.1] [F02-OS1.2] [F01-OP1.1] [F02-OP1.2]
(2)	[F01-OS1.1] [F02-OS1.2] [F01-OP1.1] [F02-OP1.2]
3.1.4.3. Wires and Cables	
(1)	[F02-OS1.2] [F02-OP1.2]
(2)	[F02-OS1.2] [F02-OP1.2]
(3)	[F02-OS1.2] [F02-OP1.2]
3.1.4.5. Fire-Retardant-Treated Wood	
(1)	[F02-OS1.2] [F02-OP1.2]
3.1.4.8. Exterior Cladding	
(1)	[F02,F03-OP3.1]
3.1.5.1. Noncombustible Materials	
(1)	[F02-OS1.2] [F02-OP1.2]
3.1.5.5. Combustible Cladding on Exterior Walls	
(2)	[F03,F02-OP3.1]
3.1.5.21. Wires and Cables	
(2)	[F02-OS1.2] [F02-OP1.2]
(3)	[F02-OS1.2] [F02-OP1.2]
3.1.5.23. Non-metallic Raceways	
(1)	[F02-OS1.2] [F02-OP1.2]
(2)	[F02-OS1.2] [F02-OP1.2]
3.1.6.2. Restrictions	
(1)	[F10,F12,F36-OS3.7] [F20-OS2.2]
(2)	[F10,F36-OS3.7] Applies to portion of Code text: "An <i>air-supported structure</i> shall not be used for Groups B, C, ... <i>major occupancies</i> or for classrooms." [F01,F02,F36-OS1.5] Applies to portion of Code text: "An <i>air-supported structure</i> shall not be used for ... Group F, Division 1 <i>major occupancies</i> ..."
(3)	[F10-OS3.7]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.1.6.3. Clearance to Other Structures	
(2)	(a) [F03-OS1.2] (b) [F10-OS3.7] (a) [F03-OP3.1]
3.1.6.4. Clearance to Flammable Material	
(1)	[F01-OS1.1] [F03-OS1.2] [F01-OP1.1] [F03-OP1.2]
3.1.6.5. Flame Resistance	
(1)	[F02-OS1.2]
3.1.6.6. Emergency Air Supply	
(1)	[F20-OS3.7]
3.1.6.7. Electrical Systems	
(1)	[F34-OP1.1] [F34-OS3.3] [F34-OS1.1]
(2)	[F81-OP1.1] [F81-OS1.1]
3.1.7.1. Determination of Ratings	
(1)	[F03-OS1.2] [F04-OS1.3] [F03-OP1.2] [F04-OP1.3]
3.1.7.5. Rating of Supporting Construction	
(1)	[F04-OS1.3] [F04-OP1.3]
(3)	[F04-OS1.3] [F04-OP1.3]
3.1.8.1. General Requirements	
(1)	(a) [F03-OS1.2] (a) [F03-OP1.2]
(2)	[F03-OS1.2] Applies to the requirement that openings in <i>fire separations</i> be protected with <i>closures</i> , shafts or other means. [F03-OP1.2] Applies to the requirement that openings in <i>fire separations</i> be protected with <i>closures</i> , shafts or other means.
3.1.8.2. Combustible Construction Support	
(1)	[F04-OS1.2] [F04-OP1.2]
3.1.8.3. Continuity of Fire Separations	
(1)	[F03-OS1.2] [F03-OP1.2]
(2)	[F03-OS1.2] [F03-OP1.2]
(3)	(a) [F03-OS1.2] (a) [F03-OP1.2] (b) [F03-OS1.2] (b) [F03-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(4)	[F03-OS1.2] [F03-OP1.2]
3.1.8.4. Determination of Ratings and Classifications	
(1)	[F03-OS1.2] [F03-OP1.2]
(2)	[F03-OS1.2] [F03-OP1.2]
(3)	[F03-OS1.2] [F03-OP1.2]
(4)	[F03-OS1.2] [F03-OP1.2]
3.1.8.5. Installation of Closures	
(2)	[F03-OS1.2] [F03-OP1.2]
(3)	[F03-OS1.2] [F03-OP1.2]
(4)	[F81-OS1.2] [F81-OP1.2]
(5)	[F81-OP1.2] [F81-OS1.2]
(6)	[F03-OS1.2] [F03-OP1.2]
(7)	[F03-OS1.2] [F03-OP1.2]
3.1.8.6. Maximum Openings	
(1)	[F03-OS1.2] [F03-OP1.2]
(2)	[F03-OS1.2] [F03-OP1.2]
3.1.8.7. Location of Fire Dampers and Smoke Dampers	
(1)	[F03-OS1.2] [F03-OP1.2]
(2)	[F03-OS1.2] [F03-OP1.2]
3.1.8.10. Installation of Fire Dampers	
(1)	[F04-OS1.2] [F04-OP1.2]
(2)	[F03-OS1.2] [F03-OP1.2]
(3)	[F03-OS1.2] [F03-OP1.2]
(4)	[F03-OS1.2] [F03-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(5)	[F82-OS1.2] Applies to portion of Code text: "A tightly fitted access door shall be installed for each <i>fire damper</i> to provide access for the inspection of the damper ..." [F82-OP1.2] Applies to portion of Code text: "A tightly fitted access door shall be installed for each <i>fire damper</i> to provide access for the inspection of the damper ..." [F82-OH1.2] Applies to portion of Code text: "A tightly fitted access door shall be installed for each <i>fire damper</i> to provide access for ... the resetting of the release device."
3.1.8.11. Installation of Smoke Dampers	
(1)	[F03-OS1.2] [F03-OP1.2]
(2)	[F03-OS1.2] [F03-OP1.2]
(3)	[F03-OS1.2] [F03-OP1.2]
(4)	[F03-OS1.2] [F03-OP1.2]
(5)	[F82-OS1.2] Applies to portion of Code text: "A tightly fitted access door shall be installed for each smoke damper to provide access for the inspection of the damper ..." [F82-OH1.2] Applies to portion of Code text: "A tightly fitted access door shall be installed for each smoke damper to provide access for the inspection of the damper ..." [F82-OP1.2] Applies to portion of Code text: "A tightly fitted access door shall be installed for each fire damper to provide access for the ... resetting of the release device."
3.1.8.12. Twenty-Minute Closures	
(3)	[F03-OS1.2] [F03-OP1.2]
3.1.8.13. Self-closing Devices	
(1)	[F03-OS1.2] [F03-OP1.2]
3.1.8.14. Hold-Open Devices	
(1)	[F03-OS1.2] [F03-OP1.2]
(2)	[F03-OS1.2] [F03-OP1.2]
(3)	[F03-OS1.2] [F03-OP1.2]
(4)	[F03-OS1.2] [F03-OP1.2]
(5)	[F03-OS1.2] [F03-OP1.2]
3.1.8.15. Door Latches	
(1)	[F03-OS1.2] [F03-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.1.8.16. Wired Glass and Glass Block	
(3)	[F04-OS1.2] Applies to portion of Code text: "Glass blocks permitted by Sentence (1) shall be ... reinforced with steel reinforcement in each horizontal joint."
	[F04-OP1.2] Applies to portion of Code text: "Glass blocks permitted by Sentence (1) shall be ... reinforced with steel reinforcement in each horizontal joint."
3.1.8.17. Temperature Rise Limit for Doors	
(1)	[F03,F31-OS1.2] [F05-OS1.5]
	[F03-OP1.2]
3.1.8.18. Area Limits for Wired Glass and Glass Block	
(1)	[F05-OS1.5] [F31-OS1.2]
	[F30-OS3.1]
(2)	[F05-OS1.5] [F31-OS1.2]
3.1.9.1. Fire Stops	
(1)	[F03-OS1.2] [F04-OS1.3]
	[F03-OP1.2] [F04-OP1.3]
(2)	[F03-OS1.2]
	[F03-OP3.1]
	[F03-OP1.2]
(3)	[F03-OS1.2]
	[F03-OP1.2]
3.1.9.2. Combustibility of Service Penetrations	
(1)	[F03-OS1.2] [F02,F04-OS1.3] Applies to portion of Code text: "Except as permitted by Articles 3.1.9.3. and 3.1.9.5., pipes, ducts, electrical outlet boxes, totally enclosed raceways or other similar service equipment that penetrate an assembly required to have a <i>fire-resistance rating</i> shall be <i>noncombustible</i> ..."
	[F03-OP1.2] [F02,F04-OP1.3] Applies to portion of Code text: "Except as permitted by Articles 3.1.9.3. and 3.1.9.5., pipes, ducts, electrical outlet boxes, totally enclosed raceways or other similar service equipment that penetrate an assembly required to have a <i>fire-resistance rating</i> shall be <i>noncombustible</i> ..."
3.1.9.4. Penetration by Outlet Boxes	
(1)	[F03-OS1.2]
	[F03-OP1.2]
(3)	[F03-OS1.2]
	[F03-OP1.2]
3.1.9.5. Combustible Piping Penetrations	
(3)	[F03-OS1.2] [F02,F04-OS1.3]
	[F03-OP1.2] [F02,F04-OP1.3]
3.1.9.6. Openings through a Membrane Ceiling	
(1)	[F04-OS1.3]
	[F04-OP1.3]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.1.10.1. Prevention of Firewall Collapse	
(1)	[F04-OP1.2]
	[F04-OS1.2]
	[F04-OP3.1]
(2)	[F03,F04-OP1.2]
	[F03,F04-OS1.2]
	[F03,F04-OP3.1]
(4)	[F04-OS1.2]
	[F04-OP1.2]
	[F04-OP3.1]
3.1.10.2. Rating of Firewalls	
(1)	[F03-OS1.2] Applies to portion of Code text: "A <i>firewall</i> that separates a <i>building</i> or <i>buildings</i> with <i>floor areas</i> containing a Group E or a Group F, Division 1 or 2 <i>major occupancy</i> shall be constructed as a <i>fire separation of noncombustible construction</i> having a <i>fire-resistance rating</i> not less than 4 h ..."
	[F03-OP1.2] Applies to portion of Code text: "A <i>firewall</i> that separates a <i>building</i> or <i>buildings</i> with <i>floor areas</i> containing a Group E or a Group F, Division 1 or 2 <i>major occupancy</i> shall be constructed as a <i>fire separation of noncombustible construction</i> having a <i>fire-resistance rating</i> not less than 4 h ..."
	[F03-OP3.1] Applies to portion of Code text: "A <i>firewall</i> that separates a <i>building</i> or <i>buildings</i> with <i>floor areas</i> containing a Group E or a Group F, Division 1 or 2 <i>major occupancy</i> shall be constructed as a <i>fire separation of noncombustible construction</i> having a <i>fire-resistance rating</i> not less than 4 h ..."
(2)	[F03-OS1.2]
	[F03-OP1.2]
	[F03-OP3.1]
(3)	[F80,F04-OP1.2]
	[F80,F04-OS1.2]
	[F80,F04-OP1.3]
(4)	[F80,F04-OP1.2]
	[F80,F04-OS1.2]
	[F80,F04-OP3.1]
3.1.10.3. Continuity of Firewalls	
(1)	[F03-OS1.2] Applies to portion of Code text: "A <i>firewall</i> shall extend from the ground continuously through, or adjacent to, all <i>storeys</i> of a <i>building</i> or <i>buildings</i> so separated ..."
	[F03-OP1.2] Applies to portion of Code text: "A <i>firewall</i> shall extend from the ground continuously through, or adjacent to, all <i>storeys</i> of a <i>building</i> or <i>buildings</i> so separated ..."
	[F03-OP3.1] Applies to portion of Code text: "A <i>firewall</i> shall extend from the ground continuously through, or adjacent to, all <i>storeys</i> of a <i>building</i> or <i>buildings</i> so separated ..."
3.1.10.4. Parapets	
(1)	[F03-OP1.2]
	[F03-OS1.2]
	[F03-OP3.1]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.1.10.5. Maximum Openings	
(1)	[F03-OP1.2] Applies to portion of Code text: "... the aggregate width of openings shall be not more than 25% of the entire length of the <i>firewall</i> ."
	[F03-OS1.2] Applies to portion of Code text: "... the aggregate width of openings shall be not more than 25% of the entire length of the <i>firewall</i> ."
	[F03-OP3.1] Applies to portion of Code text: "... the aggregate width of openings shall be not more than 25% of the entire length of the <i>firewall</i> ."
3.1.10.7. Combustible Projections	
(1)	[F03-OP1.2] Applies to portion of Code text: " <i>Combustible</i> material shall not extend across the end of a <i>firewall</i> ..."
	[F03-OS1.2] Applies to portion of Code text: " <i>Combustible</i> material shall not extend across the end of a <i>firewall</i> ..."
	[F03-OP3.1] Applies to portion of Code text: " <i>Combustible</i> material shall not extend across the end of a <i>firewall</i> ..."
(2)	[F03-OS1.2]
	[F03-OP1.2]
	[F03-OP3.1]
3.1.11.1. Separation of Concealed Spaces	
(1)	[F03-OS1.2]
	[F03-OP1.2]
3.1.11.2. Fire Blocks in Wall Assemblies	
(1)	[F03-OS1.2]
	[F03-OP1.2]
3.1.11.3. Fire Blocks between Nailing and Supporting Elements	
(1)	[F03-OS1.2]
	[F03-OP1.2]
(2)	[F03-OS1.2]
	[F03-OP1.2]
3.1.11.4. Fire Blocks between Vertical and Horizontal Spaces	
(1)	[F03-OS1.2]
	[F03-OP1.2]
3.1.11.5. Fire Blocks in Horizontal Concealed Spaces	
(1)	[F03,F04-OS1.2]
	[F03,F04-OP1.2]
(2)	[F03,F04-OS1.2]
	[F03,F04-OP1.2]
(3)	[F02,F03-OP1.2] [F04-OP1.3]
	[F02,F03-OS1.2] [F04-OS1.3]
3.1.11.6. Fire Blocks in Crawl Spaces	
(1)	[F03,F04-OS1.2]
	[F03,F04-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.1.11.7. Fire Block Materials	
(1)	[F04-OS1.2]
	[F04-OP1.2]
(5)	[F04-OP1.2]
	[F04-OS1.2]
(6)	[F03-OP1.2]
	[F03-OS1.2]
3.1.12.1. Determination of Ratings	
(1)	[F02-OS1.2]
	[F02-OP1.2]
(2)	[F02-OS1.2]
	[F02-OP1.2]
3.1.13.2. Flame-Spread Rating	
(1)	[F02-OS1.2]
	[F02-OP1.2]
3.1.13.5. Skylights	
(1)	[F02-OS1.5]
3.1.13.6. Corridors	
(1)	[F02-OS1.2,OS1.5]
	[F02-OP1.2]
(5)	[F02-OS1.2,OS1.5]
	[F02-OP1.2]
(6)	[F02-OS1.2]
	[F02-OP1.2]
3.1.13.7. High Buildings	
(1)	[F02-OS1.2]
	[F02-OP1.2]
3.1.13.9. Underground Walkways	
(1)	[F02-OS1.2]
	[F02-OP3.1]
3.1.13.10. Exterior Exit Passageway	
(1)	[F02-OS1.5]
3.1.13.11. Elevator Cars	
(1)	[F02-OS1.2]
	[F02-OP1.2]
(2)	[F02-OS1.2]
	[F02-OP1.2]
3.1.14.1. Fire-Retardant-Treated Wood Roof Systems	
(1)	[F02-OS1.2]
	[F02-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.2.45. Group B, Division 3, up to 2 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	(a),(c) [F03-OS1.2] [F04-OS1.2,OS1.3] (a),(c) [F03-OP1.2] [F04-OP1.2,OP1.3] (b),(c) [F04-OS1.3] (b),(c) [F04-OP1.3]
3.2.2.46. Group B, Division 3, One Storey, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
3.2.2.47. Group C, Any Height, Any Area, Sprinklered	
(2)	[F02-OS1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..." [F02-OP1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..." [F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> shall be <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> shall be <i>sprinklered</i> throughout ..." (b),(d) [F03-OS1.2] [F04-OS1.2,OS1.3] (b),(d) [F03-OP1.2] [F04-OP1.2,OP1.3] (c),(d) [F04-OS1.3] (c),(d) [F04-OP1.3]
3.2.2.48. Group C, up to 6 Storeys, Sprinklered, Noncombustible Construction	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	[F02-OS1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..." [F02-OP1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..." (a),(c) [F03-OS1.2] [F04-OS1.2,OS1.3] (a),(c) [F03-OP1.2] [F04-OP1.2,OP1.3] (b),(c) [F04-OS1.3] (b),(c) [F04-OP1.3]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.2.49. Group C, up to 3 Storeys, Noncombustible Construction	
(2)	[F02-OS1.2] Applies to portion of Code text: "The <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..." [F02-OP1.2] Applies to portion of Code text: "The <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..." [F03-OS1.2] [F04-OS1.2,OS1.3] Applies to portion of Code text: "a) ... floor assemblies shall be <i>fire separation</i> with a <i>fire-resistance rating</i> not less than 1 h, ..." and to Clause (d). [F03-OP1.2] [F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... floor assemblies shall be <i>fire separations</i> with a <i>fire-resistance rating</i> not less than 1 h, ..." and to Clause (d). (b),(d) [F04-OS1.3] (b),(d) [F04-OP1.3] (c),(d) [F04-OS1.3] (c),(d) [F04-OP1.3]
3.2.2.50. Group C, up to 6 Storeys, Sprinklered	
(1)	(a) [F02,F04-OS1.2,OS1.3] (a) [F02,F04-OP1.2,OP1.3]
(2)	[F03-OS1.2] [F04-OS1.2,OS1.3] Applies to portion of Code text: "a) ... floor assemblies shall be <i>fire separations</i> with a <i>fire-resistance rating</i> not less than 1 h, ..." and to Clause (e). [F03-OP1.2] [F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... floor assemblies shall be <i>fire separations</i> with a <i>fire-resistance rating</i> not less than 1 h, ..." and to Clause (e). (b),(d),(e) [F04-OS1.3] (b),(d),(e) [F04-OP1.3] [F04-OS1.3] Applies to portion of Code text: "... c) ... the roof assembly shall be constructed of <i>noncombustible construction</i> or <i>fire-retardant-treated wood</i> conforming to Article 3.1.4.5., ..." [F04-OP1.3] Applies to portion of Code text: "... c) ... the roof assembly shall be constructed of <i>noncombustible construction</i> or <i>fire-retardant-treated wood</i> conforming to Article 3.1.4.5., ..."
3.2.2.51. Group C, up to 4 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	[F03-OS1.2] [F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... floor assemblies shall be <i>fire separations</i> with a <i>fire-resistance rating</i> not less than 1 h, ..." and to Clause (c). [F03-OP1.2] [F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... floor assemblies shall be <i>fire separations</i> with a <i>fire-resistance rating</i> not less than 1 h, ..." and to Clause (c). (b),(c) [F04-OS1.3] (b),(c) [F04-OP1.3]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.2.52. Group C, up to 3 Storeys, Increased Area	
(2)	[F03-OS1.2] [F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... floor assemblies shall be <i>fire separations</i> with a <i>fire-resistance rating</i> not less than 1 h, ..." and to Clause (d).
	[F03-OP1.2] [F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... floor assemblies shall be <i>fire separations</i> with a <i>fire-resistance rating</i> not less than 1 h, ..." and to Clause (d).
	(b),(d) [F04-OS1.3]
	(b),(d) [F04-OP1.3]
	(c),(d) [F04-OS1.3]
	(c),(d) [F04-OP1.3]
3.2.2.53. Group C, up to 3 Storeys	
(2)	[F03-OS1.2] [F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... floor assemblies shall be <i>fire separations</i> with a <i>fire-resistance rating</i> not less than 45 min, ..." and to Clause (c).
	[F03-OP1.2] [F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... floor assemblies shall be <i>fire separations</i> with a <i>fire-resistance rating</i> not less than 45 min, ..." and to Clause (c).
	(b),(c) [F04-OS1.3]
	(b),(c) [F04-OP1.3]
3.2.2.54. Group C, up to 3 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
	[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	[F03-OS1.2] [F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... floor assemblies shall be <i>fire separations</i> with a <i>fire-resistance rating</i> not less than 45 min, ..." and to Clause (c).
	[F03-OP1.2] [F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... floor assemblies shall be <i>fire separations</i> with a <i>fire-resistance rating</i> not less than 45 min, ..." and to Clause (c).
	(b),(c) [F04-OS1.3]
	(b),(c) [F04-OP1.3]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.2.55. Group D, Any Height, Any Area, Sprinklered	
(2)	[F02-OS1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."
	[F02-OP1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."
	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> shall be <i>sprinklered</i> throughout ..."
	[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> shall be <i>sprinklered</i> throughout ..."
	(b),(d) [F03-OS1.2] [F04-OS1.2,OS1.3]
	(b),(d) [F03-OP1.2] [F04-OP1.2,OP1.3]
	(c),(d) [F04-OS1.3]
	(c),(d) [F04-OP1.3]
3.2.2.56. Group D, up to 6 Storeys	
(2)	[F02-OS1.2] Applies to portion of Code text: "The <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."
	[F02-OP1.2] Applies to portion of Code text: "The <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."
	(a),(d) [F03-OS1.2] [F04-OS1.2,OS1.3]
	(a),(d) [F03-OP1.2] [F04-OP1.2,OP1.3]
	(b),(d) [F04-OS1.3]
	(b),(d) [F04-OP1.3]
	[F04-OS1.3] Applies to portion of Code text: "... c) roof assemblies shall have a <i>fire-resistance rating</i> not less than 1 h ..." and to Clause (d).
	[F04-OP1.3] Applies to portion of Code text: "... c) roof assemblies shall have a <i>fire-resistance rating</i> not less than 1 h, ..." and to Clause (d).
3.2.2.57. Group D, up to 6 Storeys, Sprinklered, Noncombustible Construction	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
	[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	[F02-OS1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."
	[F02-OP1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."
	(a),(c) [F03-OS1.2] [F04-OS1.2,OS1.3]
	(a),(c) [F03-OP1.2] [F04-OP1.2,OP1.3]
	(b),(c) [F04-OS1.3]
	(b),(c) [F04-OP1.3]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.2.58. Group D, up to 6 Storeys, Sprinklered	
(1)	(a) [F02,F04-OS1.2,OS1.3] (a) [F02,F04-OP1.2,OP1.3]
(2)	(a),(e) [F03-OS1.2] [F04-OS1.3,OS1.2] (a),(e) [F03-OP1.2] [F04-OP1.2,OP1.3] (b),(d),(e) [F04-OS1.3] (b),(d),(e) [F04-OP1.3] [F04-OS1.3] Applies to portion of Code text: "... c) ... the roof assembly shall be constructed of <i>noncombustible construction</i> or <i>fire-retardant-treated wood</i> conforming to Article 3.1.4.5., ..." [F04-OP1.3] Applies to portion of Code text: "...c)... the roof assembly shall be constructed of <i>noncombustible construction</i> or <i>fire-retardant-treated wood</i> conforming to Article 3.1.4.5., ..."
3.2.2.59. Group D, up to 4 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	(a),(c) [F03-OS1.2] [F04-OS1.2,OS1.3] (a),(c) [F03-OP1.2] [F04-OP1.2,OP1.3] (b),(c) [F04-OS1.3] (b),(c) [F04-OP1.3]
3.2.2.60. Group D, up to 3 Storeys	
(2)	[F04-OS1.3] Applies to portion of Code text: "... c) roof assemblies shall have, if of <i>combustible construction</i> , a <i>fire-resistance rating</i> not less than 45 min, ..." and to Clause (d). [F04-OP1.3] Applies to portion of Code text: "... c) roof assemblies shall have, if of <i>combustible construction</i> , a <i>fire-resistance rating</i> not less than 45 min, ..." and to Clause (d). (a) [F03-OS1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> . (a) [F03-OP1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> . (a),(d) [F03-OS1.2] [F04-OS1.2,OS1.3] (a),(d) [F03-OP1.2] [F04-OP1.2,OP1.3] (b),(d) [F04-OS1.3] (b),(d) [F04-OP1.3]
3.2.2.61. Group D, up to 3 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	(a) [F03-OS1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> . (a) [F03-OP1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> . (a),(c) [F03-OS1.2] [F04-OS1.2,OS1.3] (a),(c) [F03-OP1.2] [F04-OP1.2,OP1.3] (b),(c) [F04-OS1.3] (b),(c) [F04-OP1.3]
3.2.2.62. Group D, up to 2 Storeys	
(2)	(a) [F03-OS1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> . (a) [F03-OP1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> . [F03-OS1.2] [F04-OS1.2,OS1.3] [F03-OP1.2] [F04-OP1.2,OP1.3]
3.2.2.63. Group D, up to 2 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	(a) [F03-OS1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> . (a) [F03-OP1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> . [F03-OS1.2] [F04-OS1.2,OS1.3] [F03-OP1.2] [F04-OP1.2,OP1.3]
3.2.2.64. Group E, Any Height, Any Area, Sprinklered	
(2)	[F02-OS1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..." [F02-OP1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..." [F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> shall be <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> shall be <i>sprinklered</i> throughout ..." (b),(d) [F03-OS1.2] [F04-OS1.2,OS1.3] (b),(d) [F03-OP1.2] [F04-OP1.2,OP1.3] (c),(d) [F04-OS1.3] (c),(d) [F04-OP1.3]
3.2.2.65. Group E, up to 4 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	(a),(c) [F03-OS1.2] [F04-OS1.2,OS1.3] (a),(c) [F03-OP1.2] [F04-OP1.2,OP1.3] (b),(c) [F04-OS1.3] (b),(c) [F04-OP1.3]
3.2.2.66. Group E, up to 3 Storeys	
(2)	(a),(e) [F03-OS1.2] [F04-OS1.2,OS1.3] (a),(e) [F03-OP1.2] [F04-OP1.2,OP1.3] (b),(d) [F04-OS1.3] (b),(d) [F04-OP1.3] (c),(d) [F04-OS1.3] (c),(d) [F04-OP1.3]
3.2.2.67. Group E, up to 3 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	(a),(d) [F03-OS1.2] [F04-OS1.2,OS1.3] (a),(d) [F03-OP1.2] [F04-OP1.2,OP1.3] (b),(c) [F04-OS1.3] (b),(c) [F04-OP1.3]
3.2.2.68. Group E, up to 2 Storeys	
(2)	[F03-OS1.2] [F04-OS1.2,OS1.3] (a),(b) [F03-OP1.2] [F04-OP1.2,OP1.3]
3.2.2.69. Group E, up to 2 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	[F03-OS1.2] [F04-OS1.2,OS1.3] (a),(b) [F03-OP1.2] [F04-OP1.2,OP1.3]
3.2.2.70. Group F, Division 1, up to 4 Storeys, Sprinklered	
(2)	(c),(d) [F04-OP1.3] [F02-OS1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..." [F02-OP1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..." [F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> shall be <i>sprinklered</i> throughout ..." [F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> shall be <i>sprinklered</i> throughout ..." (b),(d) [F03-OS1.2] [F04-OS1.2,OS1.3] (b),(d) [F03-OP1.2] [F04-OP1.2,OP1.3] (c),(d) [F04-OS1.3]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.2.71. Group F, Division 1, up to 3 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
	[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	[F02-OS1.2] Applies to portion of Code text: "The <i>building</i> referred to in Sentence (1) is permitted to be of <i>heavy timber construction</i> or <i>noncombustible construction</i> used singly or in combination ..."
	[F02-OP1.2] Applies to portion of Code text: "The <i>building</i> referred to in Sentence (1) is permitted to be of <i>heavy timber construction</i> or <i>noncombustible construction</i> used singly or in combination ..."
	[F03-OS1.2] [F04-OS1.2,OS1.3]
	[F03-OP1.2] [F04-OP1.2,OP1.3]
3.2.2.72. Group F, Division 1, up to 2 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
	[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	[F03-OS1.2] Applies to portion of Code text: "... a) [<i>noncombustible</i>] floor assemblies shall be <i>fire separations</i> ..."
	[F03-OP1.2] Applies to portion of Code text: "... a) [<i>noncombustible</i>] floor assemblies shall be <i>fire separations</i> ..."
	[F03-OS1.2] [F04-OS1.2,OS1.3]
	[F03-OP1.2] [F04-OP1.2,OP1.3]
3.2.2.74. Group F, Division 2, Any Height, Any Area, Sprinklered	
(2)	[F02-OS1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."
	[F02-OP1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."
	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> shall be <i>sprinklered</i> throughout ..."
	[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> shall be <i>sprinklered</i> throughout ..."
	(b),(d) [F03-OS1.2] [F04-OS1.2,OS1.3]
	(b),(d) [F03-OP1.2] [F04-OP1.2,OP1.3]
	(c),(d) [F04-OS1.3]
	(c),(d) [F04-OP1.3]
3.2.2.75. Group F, Division 2, up to 4 Storeys, Increased Area, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
	[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	<p>[F02-OS1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."</p> <p>[F02-OP1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."</p> <p>(a),(c) [F03-OS1.2] [F04-OS1.2,OS1.3]</p> <p>(a),(c) [F03-OP1.2] [F04-OP1.2,OP1.3]</p> <p>(b),(c) [F04-OS1.3]</p> <p>(b),(c) [F04-OP1.3]</p>
3.2.2.76. Group F, Division 2, up to 3 Storeys	
(2)	<p>(a),(e) [F03-OS1.2] [F04-OS1.2,OS1.3]</p> <p>(a),(e) [F03-OP1.2] [F04-OP1.2,OP1.3]</p> <p>(b),(d) [F04-OS1.3]</p> <p>(b),(d) [F04-OP1.3]</p> <p>[F04-OS1.3] Applies to portion of Code text: "... c) roof assemblies shall have, if of <i>combustible construction</i>, a <i>fire-resistance rating</i> not less than 45 min ..." and to Clause (d).</p> <p>[F04-OP1.3] Applies to portion of Code text: "... c) roof assemblies shall have, if of <i>combustible construction</i>, a <i>fire-resistance rating</i> not less than 45 min, ..." and to Clause (d).</p>
3.2.2.77. Group F, Division 2, up to 4 Storeys, Sprinklered	
(1)	<p>[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."</p> <p>[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."</p>
(2)	<p>(a),(d) [F03-OS1.2] [F04-OS1.2,OS1.3]</p> <p>(a),(d) [F03-OP1.2] [F04-OP1.2,OP1.3]</p> <p>(b),(c) [F04-OS1.3]</p> <p>(b),(c) [F04-OP1.3]</p>
3.2.2.78. Group F, Division 2, up to 2 Storeys	
(2)	<p>(a) [F03-OS1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i>.</p> <p>(a) [F03-OP1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i>.</p> <p>[F03-OS1.2] [F04-OS1.2,OS1.3]</p> <p>[F03-OP1.2] [F04-OP1.2,OP1.3]</p>
3.2.2.79. Group F, Division 2, up to 2 Storeys, Sprinklered	
(1)	<p>[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."</p> <p>[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."</p>

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	<p>(a) [F03-OS1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i>.</p> <p>(a) [F03-OP1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i>.</p> <p>[F03-OS1.2] [F04-OS1.2,OS1.3]</p> <p>[F03-OP1.2] [F04-OP1.2,OP1.3]</p>
3.2.2.80. Group F, Division 3, Any Height, Any Area, Sprinklered	
(2)	<p>[F02-OS1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."</p> <p>[F02-OP1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."</p> <p>[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> shall be <i>sprinklered</i> throughout ..."</p> <p>[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> shall be <i>sprinklered</i> throughout ..."</p> <p>(b),(d) [F03-OS1.2] [F04-OS1.2,OS1.3]</p> <p>(b),(d) [F03-OP1.2] [F04-OP1.2,OP1.3]</p> <p>(c),(d) [F04-OS1.3]</p> <p>(c),(d) [F04-OP1.3]</p>
3.2.2.81. Group F, Division 3, up to 6 Storeys	
(2)	<p>[F02-OS1.2] Applies to portion of Code text: "The <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i>..."</p> <p>[F02-OP1.2] Applies to portion of Code text: "The <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."</p> <p>(a),(d) [F03-OS1.2] [F04-OS1.2,OS1.3]</p> <p>(a),(d) [F03-OP1.2] [F04-OP1.2,OP1.3]</p> <p>(b),(d) [F04-OS1.3]</p> <p>(b),(d) [F04-OP1.3]</p> <p>(c),(d) [F04-OS1.3]</p> <p>(c),(d) [F04-OP1.3]</p>
3.2.2.82. Group F, Division 3, up to 6 Storeys, Sprinklered	
(1)	<p>[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."</p> <p>[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."</p>
(2)	<p>[F02-OS1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."</p> <p>[F02-OP1.2] Applies to portion of Code text: "... the <i>building</i> referred to in Sentence (1) shall be of <i>noncombustible construction</i> ..."</p> <p>(a),(c) [F03-OS1.2] [F04-OS1.2,OS1.3]</p> <p>(a),(c) [F03-OP1.2] [F04-OP1.2,OP1.3]</p> <p>(b),(c) [F04-OS1.3]</p> <p>(b),(c) [F04-OP1.3]</p>

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.2.83. Group F, Division 3, up to 4 Storeys	
(2)	[F04-OS1.3] Applies to portion of Code text: "... c) roof assemblies shall have, if of <i>combustible construction</i> , a <i>fire-resistance rating</i> not less than 45 min ..." and to Clause (d).
	[F04-OP1.3] Applies to portion of Code text: "... c) roof assemblies shall have, if of <i>combustible construction</i> , a <i>fire-resistance rating</i> not less than 45 min, ..." and to Clause (d).
	(a) [F03-OS1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> .
	(a) [F03-OP1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> .
	(a),(d) [F03-OS1.2] [F04-OS1.2,OS1.3]
	(a),(d) [F03-OP1.2] [F04-OP1.2,OP1.3]
	(b),(d) [F04-OS1.3]
	(b),(d) [F04-OP1.3]
3.2.2.84. Group F, Division 3, up to 4 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
	[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	(a) [F03-OS1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> .
	(a) [F03-OP1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> .
	(a),(c) [F03-OS1.2] [F04-OS1.2,OS1.3]
	(a),(c) [F03-OP1.2] [F04-OP1.2,OP1.3]
	(b),(c) [F04-OS1.3]
	(b),(c) [F04-OP1.3]
3.2.2.85. Group F, Division 3, up to 2 Storeys	
(2)	(a) [F03-OS1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> .
	(a) [F03-OP1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> .
	[F03-OS1.2] [F04-OS1.2,OS1.3]
	[F03-OP1.2] [F04-OP1.2,OP1.3]
3.2.2.86. Group F, Division 3, up to 2 Storeys, Sprinklered	
(1)	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
	[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
(2)	(a) [F03-OS1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> .
	(a) [F03-OP1.2] Applies to the requirement that <i>noncombustible</i> floor assemblies be <i>fire separations</i> .
	[F03-OS1.2] [F04-OS1.2,OS1.3]
	[F03-OP1.2] [F04-OP1.2,OP1.3]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.2.87. Group F, Division 3, One Storey	
(1)	[F02-OS1.2] Applies to portion of Code text: "A <i>building</i> classified as Group F, Division 3 is permitted to be of <i>heavy timber construction</i> or <i>noncombustible construction</i> used singly or in combination ..."
	[F02-OP1.2] Applies to portion of Code text: "A <i>building</i> classified as Group F, Division 3 is permitted to be of <i>heavy timber construction</i> or <i>noncombustible construction</i> used singly or in combination ..."
3.2.2.88. Group F, Division 3, One Storey, Sprinklered	
(1)	[F02-OS1.2] Applies to portion of Code text: "A <i>building</i> classified as Group F, Division 3 is permitted to be of <i>heavy timber construction</i> or <i>noncombustible construction</i> used singly or in combination ..."
	[F02-OP1.2] Applies to portion of Code text: "A <i>building</i> classified as Group F, Division 3 is permitted to be of <i>heavy timber construction</i> or <i>noncombustible construction</i> used singly or in combination ..."
	[F02,F04-OS1.2,OS1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
	[F02,F04-OP1.2,OP1.3] Applies to portion of Code text: "... a) ... the <i>building</i> is <i>sprinklered</i> throughout ..."
3.2.2.89. Group F, Division 3, One Storey, Any Area, Low Fire Load Occupancy	
(2)	[F02-OS1.2]
	[F02-OP1.2]
3.2.2.90. Group F, Division 3, Storage Garages up to 22 m High	
(1)	[F02-OS1.2] Applies to portion of Code text: "A <i>building</i> used as a <i>storage garage</i> with all <i>storeys</i> constructed as <i>open-air storeys</i> and having no other <i>occupancy</i> above it is permitted to have its floor, wall, ceiling and roof assemblies constructed without a <i>fire-resistance rating</i> provided it is: a) of <i>noncombustible construction</i> ..."
	[F02-OP1.2] Applies to portion of Code text: "A <i>building</i> used as a <i>storage garage</i> with all <i>storeys</i> constructed as <i>open-air storeys</i> and having no other <i>occupancy</i> above it is permitted to have its floor, wall, ceiling and roof assemblies constructed without a <i>fire-resistance rating</i> provided it is: a) of <i>noncombustible construction</i> ..."
3.2.3.1. Limiting Distance and Area of Unprotected Openings	
(1)	[F03-OP3.1]
(5)	[F03-OP3.1]
(6)	[F03-OP3.1]
(8)	[F03-OP3.1]
(9)	[F03-OP3.1]
(10)	[F03-OP3.1]
3.2.3.4. Party Wall	
(1)	[F03-OP3.1]
3.2.3.5. Wall with Limiting Distance Less Than 1.2 m	
(1)	[F03-OP3.1]
(2)	[F03-OP3.1]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.3.6. Combustible Projections	
(1)	[F03-OP3.1]
(2)	[F03-OP3.1]
(3)	[F03-OP3.1]
(5)	[F03-OP3.1]
3.2.3.7. Construction of Exposing Building Face	
(1)	[F03,F02-OP3.1]
(2)	[F03,F02-OP3.1]
(3)	[F02,F03-OP3.1]
(4)	[F03,F02-OP3.1]
3.2.3.8. Protection of Exterior Building Face	
(1)	[F03,F02-OP3.1]
3.2.3.9. Protection of Structural Members	
(1)	[F04-OS1.3]
	[F04-OP1.3]
3.2.3.10. Unlimited Unprotected Openings	
(1)	[F03-OP3.1]
(2)	[F03-OP3.1]
3.2.3.11. Low Fire Load, One Storey Building	
(1)	(b) [F03-OP3.1]
	(a) [F04-OP3.1]
3.2.3.12. Area Increase for Unprotected Openings	
(1)	[F03-OP3.1]
3.2.3.13. Protection of Exit Facilities	
(4)	[F06-OS1.2] [F05-OS1.5]
	[F06-OP1.2]
3.2.3.14. Wall Exposed to Another Wall	
(1)	[F03-OS1.2]
	[F03-OP1.2]
	[F03-OP3.1]
(2)	[F03-OS1.2]
	[F03-OP1.2]
	[F03-OP3.1]
3.2.3.15. Wall Exposed to Adjoining Roof	
(1)	[F03-OS1.2]
	[F03-OP1.2]
3.2.3.16. Protection of Soffits	
(1)	[F03-OS1.2]
	[F03-OP1.2]
(2)	[F03-OS1.2]
	[F03-OP1.2]
(3)	[F03-OS1.2]
	[F03-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(4)	[F02-OS1.2]
	[F02-OP1.2]
3.2.3.17. Canopy Protection for Vertically Separated Openings	
(1)	[F03-OS1.2]
	[F03-OP1.2]
(2)	[F03-OS1.2]
	[F03-OP1.2]
(3)	[F02-OS1.2]
	[F02-OP1.2]
3.2.3.18. Covered Vehicular Passageway	
(1)	[F03-OP3.1]
(2)	[F02-OP3.1]
3.2.3.19. Walkway between Buildings	
(1)	[F03-OP3.1]
(2)	[F02-OP3.1]
(3)	[F02,F12-OP3.1]
3.2.3.20. Underground Walkway	
(1)	[F01,F02-OP3.1]
(2)	[F03-OP3.1]
(3)	[F02-OP3.1] Applies to portion of Code text: "An underground walkway shall be of <i>noncombustible construction</i> ..."
	[F80-OP2.3] Applies to portion of Code text: "An underground walkway shall be ... suitable for an underground location."
(4)	(a) [F05-OS1.5] [F06-OS1.2]
	(b) [F10-OS1.5] [F12-OS1.2]
3.2.3.22. Installation of Service Lines Under Buildings	
(1)	[F01-OS1.1]
	[F01-OP1.1]
3.2.4.1. Determination of Requirement for a Fire Alarm System	
(1)	[F11-OS1.5] [F13-OS1.5,OS1.2]
	[F13-OP1.2]
(4)	[F11-OS1.5]
3.2.4.2. Continuity of Fire Alarm System	
(1)	[F11-OS1.5]
(2)	[F11-OS1.5]
(3)	[F11-OS1.5]
(4)	[F10-OS1.5] [F03-OS1.2]
(5)	[F11,F13-OS1.2]
(6)	[F11-OS1.5]
3.2.4.3. Types of Fire Alarm Systems	
(1)	(a) [F11-OS1.5]
	(b) [F11-OS1.4] [F13-OS1.5]
	(c),(d) [F11-OS1.5]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.4.4. Description of Fire Alarm Systems	
(1)	[F11-OS1.5]
(2)	(a) [F11-OS1.4] [F13-OS1.5] (b),(c) [F11-OS1.5]
(3)	[F13-OS1.5]
(4)	[F13-OS1.5]
3.2.4.5. Installation and Verification of Fire Alarm Systems	
(1)	[F11,F81-OS1.5] [F13,F12,F81-OS1.5,OS1.2] [F12,F11-OS3.7] Applies to voice communication systems.
(2)	[F82-OS1.5]
3.2.4.6. Silencing of Alarm Signals	
(1)	[F11-OS1.5]
(2)	[F81,F34-OS1.5]
3.2.4.7. Signals to Fire Department	
(1)	[F13-OS1.5,OS1.2] [F13-OP1.2]
(2)	[F13-OS1.5,OS1.2] [F13-OP1.2]
(3)	[F13-OS1.5,OS1.2] [F13-OP1.2]
(4)	[F81,F13-OS1.5,OS1.2] [F81,F13-OP1.2]
(5)	[F13-OS1.5,OS1.2] [F13-OP1.2]
(6)	[F13-OP1.2] [F13-OS1.2]
3.2.4.8. Annunciator and Zone Indication	
(1)	[F12-OS1.5,OS1.2]
(2)	[F12-OS1.5,OS1.2]
(4)	[F12-OS1.2,OS1.5]
(7)	[F12-OS1.5,OS1.2]
3.2.4.9. Electrical Supervision	
(1)	[F82-OS1.5,OS1.2]
(2)	[F82-OS1.2] [F82-OP1.2]
(3)	(a),(d),(e),(f),(g) [F82-OS1.2] (a),(d),(e),(f),(g) [F82-OP1.2] (b),(c) [F82-OS1.5]
(4)	[F81-OP1.2] [F82-OS1.2]
(5)	[F82-OS1.2] [F82-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.4.10. Fire Detectors	
(1)	[F11-OS1.5]
(2)	[F11-OS1.5]
(3)	[F02-OS1.2] [F11-OS1.5]
(4)	[F11-OS1.5]
3.2.4.11. Smoke Detectors	
(1)	[F11-OS1.5]
(3)	[F12-OS1.5]
(4)	[F10-OS1.5]
(5)	[F11-OS1.5]
(7)	[F11-OS1.4,OS1.5]
3.2.4.12. Prevention of Smoke Circulation	
(1)	[F03-OS1.2]
3.2.4.13. Vacuum Cleaning System Shutdown	
(1)	[F03-OS1.2]
3.2.4.14. Elevator Emergency Return	
(1)	[F10-OS1.5]
(2)	[F11-OS1.5]
(3)	[F02-OS1.2]
3.2.4.15. System Monitoring	
(1)	[F11-OS1.5] [F12-OS1.5,OS1.2] [F12-OP1.2]
(2)	[F11-OS1.5] [F13-OS1.5,OS1.2] [F13-OP1.2]
(3)	[F12-OS1.2,OS1.5] [F12-OP1.2]
3.2.4.16. Manual Stations	
(1)	[F11-OS1.5]
(2)	[F02-OS1.2] [F12-OS1.2,OS1.5] [F10-OS1.5]
(3)	[F02-OS1.2] [F12-OS1.2,OS1.5] [F10-OS1.5]
(4)	[F11-OS1.5]
(5)	[F11-OS1.5]
3.2.4.17. Alert and Alarm Signals	
(2)	[F11-OS1.5]
(3)	[F11-OS1.5]
3.2.4.18. Audibility of Alarm Systems	
(1)	[F11-OS1.5]
(2)	[F11-OS1.5]
(3)	[F11-OS1.5]
(4)	[F33-OS3.5]
(5)	[F11-OS1.5]
(6)	[F11-OS1.5]
(7)	[F11,F81-OS1.5]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(8)	[F11,F81-OS1.5]
(9)	[F11,F81-OS1.5]
(10)	[F11-OS1.5]
(12)	[F11-OS1.5]
3.2.4.19. Visual Signals	
(1)	[F11-OS1.5]
(2)	[F11-OS1.5]
3.2.4.20. Smoke Alarms	
(2)	[F81,F11-OS1.5]
(3)	[F11-OS1.5]
(4)	[F11-OS1.5]
(5)	[F11-OS1.5]
(6)	[F11-OS1.5]
(7)	[F11,F81-OS1.5]
(8)	[F11,F81-OS1.5]
(10)	[F11-OS1.5]
(11)	[F81,F11-OS1.5]
(12)	[F11,F81-OS1.5]
(14)	[F11-OS1.5]
3.2.4.21. Residential Fire Warning Systems	
(1)	[F11,F81-OS1.5]
3.2.4.22. Voice Communication Systems for High Buildings	
(1)	[F12,F11-OS3.7]
(2)	[F11-OS1.5]
(3)	[F11-OS1.5] [F13-OS1.4,OS1.5]
(4)	[F11-OS1.5]
(5)	[F12-OS3.7]
(6)	[F11-OS1.5]
(7)	[F11-OS1.5]
3.2.4.23. One-Way Voice Communication Systems	
(1)	[F11-OS1.5]
(2)	[F11-OS1.5]
(3)	[F11-OS1.5]
3.2.5.1. Access to Above-Grade Storeys	
(1)	[F12-OS1.5,OS1.2] [F12-OP1.2]
(2)	[F12-OS1.5,OS1.2] [F12-OP1.2]
(3)	[F12-OS1.5,OS1.2] [F12-OP1.2]
3.2.5.2. Access to Basements	
(1)	[F12-OS1.5,OS1.2] [F12-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	[F12-OS1.5,OS1.2] [F12-OP1.2]
3.2.5.3. Roof Access	
(1)	[F12-OS1.2] [F12-OP1.2]
3.2.5.4. Access Routes	
(1)	[F12-OS1.5,OS1.2] [F12-OP1.2]
3.2.5.5. Location of Access Routes	
(1)	[F12-OS1.5,OS1.2] [F06-OS1.1] [F12-OP1.2]
(2)	[F12-OS1.2] [F12-OP1.2]
(4)	[F12-OS1.2] [F12-OP1.2]
3.2.5.6. Access Route Design	
(1)	[F12-OS1.2] [F12-OP1.2]
(2)	[F02,F12-OS1.2] [F02,F12,F03-OP1.2] [F02,F12,F03-OP3.1]
3.2.5.7. Water Supply	
(1)	[F02-OS1.2] [F02-OP1.2] [F02-OP3.1]
3.2.5.8. Standpipe Systems	
(1)	[F02-OS1.2] [F02-OP1.2]
3.2.5.9. Standpipe System Design	
(1)	[F02-OS1.2] [F02-OP1.2]
(2)	[F12-OS1.2] [F12-OP1.2]
(5)	[F02-OS1.2] [F02-OP1.2]
(6)	[F12-OS1.2] [F12-OP1.2]
3.2.5.10. Hose Connections	
(1)	[F03-OS1.2] [F05,F06-OS1.5,OS1.2] [F03,F06-OP1.2]
(3)	[F12-OS1.2] [F12-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(4)	[F02-OS1.2] [F02-OP1.2]
3.2.5.11. Hose Stations	
(1)	[F02-OS1.2] [F02-OP1.2]
(2)	[F02-OS1.2] [F02-OP1.2]
(3)	[F02,F12-OS1.2] [F02,F12-OP1.2]
(4)	[F03-OS1.2] [F03-OP1.2]
(5)	[F10-OS1.5]
(6)	[F02-OS1.2] [F02-OP1.2]
(7)	[F01-OS1.1]
3.2.5.12. Automatic Sprinkler Systems	
(1)	[F02,F81,F82-OS1.2] [F02,F81,F82-OP1.2]
(2)	[F02,F81-OS1.2] [F02,F81-OP1.2]
(3)	[F02,F81-OS1.2] [F02,F81-OP1.2]
(4)	[F02-OS1.2] [F02-OP1.2]
(5)	[F81-OS1.2] [F81-OP1.2]
(6)	[F02-OS1.2] [F02-OP1.2]
(7)	[F03-OS1.2] [F03-OP1.2] [F03-OP3.1]
(8)	[F81-OS3.3,OS3.6]
3.2.5.13. Combustible Sprinkler Piping	
(2)	[F02,F81-OS1.2] [F02,F81-OP1.2]
(3)	[F06-OS1.2] [F06-OP1.2]
(4)	[F06-OS1.2] [F06-OP1.2]
3.2.5.14. Sprinklered Service Space	
(1)	[F02-OS1.2] [F02-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	[F12-OS1.2] [F12-OP1.2]
(3)	[F11-OS1.5] [F12-OS1.5,OS1.2] [F12-OP1.2]
3.2.5.15. Fire Department Connections	
(1)	[F12-OS1.2] [F12-OP1.2]
(2)	[F12-OS1.2] [F12-OP1.2]
3.2.5.16. Portable Fire Extinguishers	
(1)	[F02,F12,F81-OS1.2] [F02,F12,F81-OP1.2]
(2)	[F12-OS1.2] [F12-OP1.2]
3.2.5.17. Protection from Freezing	
(1)	[F81-OS1.2] [F81-OP1.2]
3.2.5.18. Fire Pumps	
(1)	[F02,F81-OS1.2] [F81-OS1.4] [F02,F81-OP1.2] [F81-OP1.4]
3.2.6.2. Limits to Smoke Movement	
(1)	[F02-OS1.2,OS1.5] [F02-OP1.2]
(2)	[F06-OS1.2,OS1.5] [F05-OS1.5] [F06-OP1.2]
(3)	[F06-OS1.5,OS1.2] [F05-OS1.5] [F06-OP1.2]
(4)	[F03-OS1.2,OS1.5] [F03-OP1.2]
(5)	[F03-OS1.2,OS1.5] [F03-OP1.2]
(6)	[F03,F12-OS1.2,OS1.5] [F03,F12-OP1.2]
3.2.6.3. Connected Buildings	
(1)	[F03-OS1.2,OS1.5] [F03-OP1.2] [F03-OP3.1]
3.2.6.4. Emergency Operation of Elevators	
(1)	[F12-OS1.2,OS1.5] [F12-OP1.2]
(2)	[F12-OS1.2,OS1.5] [F12-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(3)	[F12-OS1.2,OS1.5] [F12-OP1.2]
(4)	[F12-OS1.2,OS1.5] [F12-OP1.2]
3.2.6.5. Elevator for Use by Firefighters	
(1)	[F12,F06-OS1.2,OS1.5] [F12,F06-OP1.2]
(2)	[F12-OS1.2,OS1.5] [F12-OP1.2]
(3)	[F06-OS1.2,OS1.5] [F06-OP1.2]
(4)	[F12-OS1.2,OS1.5] [F12-OP1.2]
(5)	[F12-OS1.2,OS1.5] [F12-OP1.2]
(6)	[F06-OS1.2,OS1.5] [F06-OP1.2]
3.2.6.6. Venting to Aid Firefighting	
(1)	[F06-OS1.2,OS1.5] [F06-OP1.2]
(2)	[F30-OS3.1]
(3)	[F12-OS1.2,OS1.5] [F12-OP1.2]
(4)	[F03-OS1.2] [F12-OS1.2,OS1.5]
3.2.6.7. Central Alarm and Control Facility	
(1)	[F12-OS1.2,OS1.5] [F12-OP1.2]
(2)	[F12-OS1.2,OS1.5] [F11-OS1.5] [F12-OP1.2]
3.2.6.8. Voice Communication System	
(1)	[F12,F11-OS3.7]
3.2.6.9. Testing	
(1)	[F82-OS1.2,OS1.5] [F82-OP1.2]
3.2.7.1. Minimum Lighting Requirements	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
3.2.7.2. Recessed Lighting Fixtures	
(1)	[F01-OS1.1,OS1.2] [F01-OP1.1,OP1.2]
3.2.7.3. Emergency Lighting	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(3)	[F30-OS3.1] [F10-OS3.7]
(4)	[F30-OS3.1] [F10-OS3.7]
3.2.7.4. Emergency Power for Lighting	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30,F81-OS3.1] [F10,F81-OS3.7]
3.2.7.5. Emergency Power Supply Installation	
(1)	[F81,F06,F11,F02,F03,F10,F12-OS1.2,OS1.5] [F81,F06,F02,F03-OP1.2] [F81,F06,F02-OP3.1] [F81,F30-OS3.1] [F81,F11,F10,F12-OS3.7]
3.2.7.6. Emergency Power for Treatment Occupancies	
(1)	[F81,F06,F11,F02,F03,F10,F12-OS1.2,OS1.5] [F81,F06,F02,F03-OP1.2] [F81,F06,F02-OP3.1] [F81,F30-OS3.1] [F81,F11,F10,F12-OS3.7]
3.2.7.7. Fuel Supply Shut-off Valves	
(1)	[F12-OS1.1,OS1.2] Applies to the requirement for a suitably identified shut-off valve outside the <i>building</i> . [F12-OP1.2] Applies to the requirement for a suitably identified shut-off valve outside the <i>building</i> . [F12-OH5] Applies to the requirement for a suitably identified shut-off valve outside the <i>building</i> . [F81-OS1.2,OS1.5] Applies to the requirement for a suitably identified separate shut-off valve. [F81-OS3.1,OS3.7] Applies to the requirement for a suitably identified separate shut-off valve.
3.2.7.8. Emergency Power for Fire Alarm Systems	
(1)	[F11-OS1.5] [F13-OS1.5,OS1.2] [F13-OP1.2] Applies to the requirement for fire alarm systems, including those with a voice communication system, to be provided with an emergency power supply.
(2)	[F11-OS1.5] [F13-OS1.2,OS1.5] [F13-OP1.2]
(3)	[F11-OS1.5] [F13-OS1.5,OS1.2] [F13-OP1.2]
(4)	[F13-OP1.2] [F11-OS1.5] [F13-OS1.2,OS1.5]
3.2.7.9. Emergency Power for Building Services	
(1)	[F12,F02,F03-OS1.5,OS1.2] [F12,F02,F03-OP1.2] (b) [F02-OP3.1] (a) [F36-OS3.6] [F12,F10-OS3.7]
(2)	[F12-OS1.5,OS1.2] [F12-OP1.2] [F36-OS3.6] [F12-OS3.7]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.7.10. Protection of Electrical Conductors	
(2)	[F06-OS1.2,OS1.5] [F06-OP1.2]
(3)	[F06-OS1.2,OS1.5] [F06-OP1.2]
(4)	[F06-OS1.2,OS1.5] [F06-OP1.2]
(6)	[F06-OS1.2,OS1.5] [F06-OP1.2]
(8)	[F06-OS1.2,OS1.5] [F06-OP1.2]
(10)	[F06-OS1.4] [F06-OP1.2] [F10-OS3.7]
3.2.8.1. Application	
(1)	[F03,F06-OS1.2] [F05-OS1.5] [F03,F06-OP1.2]
3.2.8.2. Exceptions to Special Protection	
(3)	[F03-OS1.2] [F03-OP1.2]
(5)	[F02,F03-OS1.2] [F02,F03-OP1.2]
3.2.8.3. Sprinklers	
(1)	[F02-OS1.2] [F02-OP1.2]
3.2.8.4. Vestibules	
(1)	[F06-OS1.2] [F05-OS1.5] [F06,F03-OP1.2]
3.2.8.5. Protected Floor Space	
(1)	[F05-OS1.2] [F06-OS1.5]
3.2.8.6. Draft Stops	
(1)	[F02-OS1.2] [F11-OS1.5] [F13-OS1.5,OS1.2] [F02,F13-OP1.2]
3.2.8.7. Mechanical Exhaust System	
(1)	[F03-OS1.5,OS1.2] [F03-OP1.2]
(2)	[F12-OS1.5,OS1.2] [F12-OP1.2]
3.2.8.8. Combustible Content Limits	
(1)	[F02-OS1.2] [F02-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.2.9.1. Testing	
(1)	[F02,F81,F82-OS1.2,OS1.5] [F02,F81,F82-OP1.2]
3.3.1.1. Separation of Suites	
(1)	[F03-OS1.2] [F03-OP1.2]
(3)	[F02-OS1.2] [F02-OP1.2]
3.3.1.2. Hazardous Substances, Equipment and Processes	
(1)	[F01,F02,F03-OS1.1,OS1.2] [F01,F02,F03-OP1.1,OP1.2] [F43-OS3.4]
(3)	[F43-OS3.7] [F05-OS1.5]
3.3.1.3. Means of Egress	
(3)	[F10-OS3.7]
(4)	[F10,F12,F05,F06-OS3.7]
(5)	[F10,F12-OS3.7]
(6)	[F10,F12,F05,F06-OS3.7]
(7)	[F10,F12,F05,F06-OS3.7]
(8)	[F05-OS1.5]
(9)	[F10,F12,F05,F06-OS3.7]
3.3.1.4. Public Corridor Separations	
(1)	[F03,F05-OS1.5] [F06-OS1.5,OS1.2] [F03,F06-OP1.2]
(2)	[F03,F05-OS1.5] [F06-OS1.5,OS1.2] [F03,F06-OP1.2]
(3)	[F03,F05-OS1.5] [F06-OS1.2,OS1.5] [F03,F06-OP1.2]
(4)	(a),(b) [F03,F05,F10-OS1.5] [F06,F12-OS1.2,OS1.5] (c) [F03,F05-OS1.5] [F03,F06-OS1.5,OS1.2] (a),(b) [F03,F06,F12-OP1.2] (c) [F03,F06-OP1.2]
3.3.1.5. Egress Doorways	
(1)	[F10,F05-OS1.5]
(2)	[F05,F10-OS1.5]
3.3.1.6. Travel Distance	
(1)	[F10-OS1.5]
3.3.1.7. Protection on Floor Areas with a Barrier-Free Path of Travel	
(1)	[F10,F05-OS1.5] (a) [F06-OS1.5]
(2)	[F03-OS1.2] [F06-OS1.5]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(4)	(a) [F10,F73-OS1.5] (b),(c) [F10-OS1.5]
3.3.1.9. Corridors	
(1)	[F10,F12-OS3.7]
(2)	[F10,F12-OS3.7]
(3)	[F30,F73-OS3.1]
(5)	[F10,F12-OS3.7]
(6)	(a) [F10,F12-OS3.7] (b) [F05-OS1.5] [F06-OS1.5,OS1.2]
3.3.1.11. Door Swing	
(1)	[F10-OS3.7]
(2)	[F10-OS3.7]
(3)	[F10-OS3.7]
(4)	[F10-OS3.7]
3.3.1.12. Sliding Doors	
(1)	(b) [F10-OS3.7]
3.3.1.13. Doors and Door Hardware	
(1)	(a),(b) [F10,F12-OS3.7] (c) [F10-OS3.7] [F30-OS3.1] (d) [F10-OS3.7]
(2)	[F10-OS3.7]
(3)	[F10-OS3.7]
(4)	[F10-OS3.7]
(5)	[F10-OS3.7] [F73-OA1]
(8)	[F12-OS3.7]
(9)	[F12-OS3.7]
(10)	[F12-OS3.7]
3.3.1.16. Tapered Treads in a Curved Flight	
(2)	[F30-OS3.1] [F10-OS3.7]
(3)	[F30-OS3.1] [F10-OS3.7]
(4)	[F30-OS3.1] [F10-OS3.7]
3.3.1.17. Capacity of Access to Exits	
(2)	[F10-OS3.7]
(3)	[F10-OS3.7]
(4)	[F10-OS3.7]
(6)	[F10-OS3.7]
3.3.1.18. Guards	
(1)	[F30-OS3.1]
(2)	[F30-OS3.1]
(3)	[F30-OS3.1]
(4)	[F30-OS3.1]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.3.1.19. Transparent Doors and Panels	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
(3)	[F20-OS3.1]
(4)	[F30-OS3.1] [F10-OS3.7]
(6)	[F30-OS3.1] [F10-OS3.7]
(8)	[F30-OS3.1]
3.3.1.20. Exhaust Ventilation and Explosion Venting	
(1)	[F01-OS1.1]
(2)	(a) [F02-OS1.2] (a) [F02-OP1.2]
(3)	[F02-OS1.3] Applies to the requirement for explosion-relief devices and vents. [F02-OP1.3] Applies to the requirement for explosion-relief devices and vents.
3.3.1.21. Janitors' Rooms	
(1)	[F03-OS1.2] [F03-OP1.2]
(3)	[F02-OS1.2] [F02-OP1.2]
3.3.1.22. Common Laundry Rooms	
(1)	[F03-OS1.2] [F03-OP1.2]
(3)	[F02-OS1.2] [F02-OP1.2]
3.3.1.23. Obstructions	
(1)	[F10-OS3.7]
3.3.1.24. Signs in Service Spaces	
(1)	[F10-OS3.7]
3.3.1.25. Welding and Cutting	
(1)	[F03,F02-OS1.2] [F03,F02-OP1.2]
3.3.2.1. Scope	
(2)	[F30-OS3.1] [F10-OS3.7]
(3)	[F30-OS3.1] [F10-OS3.7]
3.3.2.2. Fire Separations	
(1)	[F03-OS1.2]
(3)	[F03-OS1.2] Applies where space under tiers of seats is not <i>sprinklered</i> . [F03-OS1.2] Applies where space under tiers of seats is <i>sprinklered</i> .
3.3.2.4. Fixed Seats	
(1)	[F30-OS3.1] [F10-OS3.7]
(3)	[F10-OS3.7]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.3.2.5. Aisles	
(2)	[F10-OS3.7]
(4)	[F10-OS3.7]
(5)	[F10-OS3.7]
(6)	[F10-OS3.7]
(7)	[F10-OS3.7]
(8)	[F10-OS3.7] [F30-OS3.1]
(9)	[F10-OS3.7] [F30-OS3.1]
(10)	[F10-OS3.7] [F30-OS3.1]
(11)	[F10-OS3.7] [F30-OS3.1]
(12)	[F10-OS3.7] [F30-OS3.1]
(13)	[F10-OS3.7] [F30-OS3.1]
(14)	[F10-OS3.7] [F30-OS3.1]
(15)	[F10-OS3.7] [F30-OS3.1]
(16)	[F10-OS3.7] [F30-OS3.1]
3.3.2.6. Corridors	
(1)	[F03,F05-OS1.5] [F06-OS1.5,OS1.2] [F03,F06-OP1.2]
(3)	[F03,F05-OS1.5] [F06-OS1.5,OS1.2] [F03,F06-OP1.2]
(4)	[F10-OS3.7]
3.3.2.7. Doors	
(1)	[F10-OS3.7]
3.3.2.8. Fixed Bench-Type Seats without Arms	
(1)	[F10-OS3.7] [F10-OS3.7]
3.3.2.10. Handrails in Aisles with Steps	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
3.3.2.11. Outdoor Places of Assembly	
(1)	[F10-OS3.7]
(2)	[F10-OS3.7]
(3)	[F10-OS3.7]
(5)	[F10-OS3.7]
3.3.2.12. Bleachers	
(1)	[F10-OS3.7] [F30-OS3.1]
(2)	[F10-OS3.7] [F30-OS3.1]
(4)	[F10-OS3.7] [F30-OS3.1]
(5)	[F30-OS3.1]
3.3.2.13. Libraries	
(1)	[F03-OS1.2] [F03-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	[F02-OS1.2] [F02-OP1.2]
3.3.2.14. Stages for Theatrical Performances	
(1)	[F02-OS1.2] [F02-OP1.2]
(2)	[F03-OS1.2] [F03-OP1.2]
(3)	[F03-OS1.2] [F03-OP1.2]
(4)	[F03-OS1.2] [F03-OP1.2]
(5)	[F02-OS1.2] [F06-OS1.2,OS1.5] [F02,F06-OP1.2]
(6)	[F03-OS1.2,OS1.5] [F03-OP1.2]
3.3.2.15. Risers for Stairs	
(1)	[F30-OS3.1]
3.3.2.16. Storage Rooms	
(1)	[F12-OS1.2] [F12-OP1.2]
3.3.3.2. Separations between Care, Treatment or Detention Occupancies and Repair Garages	
(1)	[F44-OS3.4] [F03-OS1.2]
3.3.3.3. Corridors	
(1)	[F10-OS3.7]
(2)	[F10-OS3.7]
(3)	[F10,F12-OS3.7]
(4)	(a) [F10-OS3.7] (b) [F10,F12-OS3.7]
3.3.3.4. Doorway Width	
(1)	[F10,F12-OS3.7]
(2)	[F10,F12-OS3.7]
3.3.3.5. Compartments and Fire Separations	
(2)	[F05-OS1.5] [F06-OS1.5,OS1.2] [F06-OP1.2]
(4)	[F05-OS1.2] [F06-OS1.2,OS1.5] [F03,F06-OP1.2]
(6)	[F10-OS1.5]
(7)	[F10-OS1.5]
(8)	[F03,F05-OS1.2] [F06-OS1.5]
(12)	[F03,F05-OS1.2] [F06-OS1.5]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(16)	[F02,F03-OS1.2] [F44-OS1.1] [F02,F03-OP1.2]
3.3.3.6. Areas of Refuge	
(1)	[F03-OS1.2]
3.3.3.7. Contained Use Areas	
(2)	[F03-OS1.2] [F06-OS1.5,OS1.2] [F03,F06-OP1.2]
(3)	[F02-OS1.2] [F06-OS1.5,OS1.2] [F02,F06-OP1.2]
(4)	[F02-OS1.2] [F06-OS1.5,OS1.2] [F02,F06-OP1.2]
(5)	[F10-OS3.7]
3.3.4.2. Fire Separations	
(1)	[F03-OS1.2] [F05-OS1.5] [F06-OS1.5,OS1.2] [F03,F06-OP1.2]
(4)	[F02,F03-OS1.2] [F44-OS1.1] (a),(b) [F02,F03-OP1.2]
(5)	[F03-OS1.2] [F01-OS1.1] (a) [F03-OP1.2] [F44-OS3.4]
3.3.4.3. Storage Rooms	
(1)	[F02-OS1.2] [F02-OP1.2]
(2)	[F03-OS1.2] [F03-OP1.2]
(4)	[F12-OS1.2] [F12-OP1.2]
3.3.4.4. Egress from Dwelling Units	
(2)	[F10,F05-OS3.7]
(3)	[F10-OS3.7]
(4)	[F05-OS1.2,OS1.5]
(5)	[F10,F05-OS3.7]
(6)	[F10,F05-OS3.7]
3.3.4.5. Automatic Locking Prohibition	
(1)	[F10-OS3.7]
3.3.4.8. Protection of Openable Windows	
(1)	[F30-OS3.1]
3.3.5.2. Fire Extinguishing Systems	
(1)	[F03-OS1.2] [F03-OP1.2]
3.3.5.3. Basements	
(1)	[F12-OS1.2,OS1.5] [F01-OS1.1] [F12-OP1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	[F06-OS1.5,OS1.2] Applies to the separation of entrances to <i>basements</i> and to rooms containing <i>building</i> services from the remainder of the <i>building</i> . [F06-OP1.2] Applies to the separation of entrances from the remainder of the <i>building</i> . [F05-OS1.5] [F06-OS1.2,OS1.5] Applies to the separation of <i>exits</i> from the remainder of the <i>building</i> . [F06-OP1.2] Applies to the separation of <i>exits</i> from the remainder of the <i>building</i> .
(3)	[F44-OS1.1]
3.3.5.4. Repair and Storage Garages	
(2)	[F30-OS3.1] [F10,F12-OS3.7]
(5)	[F30-OS3.1]
(6)	[F30-OS3.1]
(8)	[F02-OS1.2] [F02-OP1.2]
3.3.5.5. Repair Garage Separation	
(1)	[F03-OS1.2] [F03-OP1.2]
3.3.5.6. Storage Garage Separation	
(1)	[F03-OS1.2] [F03-OP1.2]
3.3.5.7. Vestibules	
(4)	[F44-OS3.4] [F44-OS1.1]
3.3.5.8. Dispensing of Fuel	
(1)	[F01-OS1.1]
(2)	[F01-OS1.1]
3.3.5.9. Multiple-Tenant Self-Storage Warehouses	
(1)	[F03-OS1.2] [F03-OP1.2]
3.3.6.2. Storage of Dangerous Goods	
(1)	[F03-OP1.2] [F03-OS1.2]
(2)	[F03-OS1.2] [F03-OP1.2]
(3)	[F01,F02,F03,F81-OS1.1,OS1.2] [F01,F02,F03,F81-OP1.1,OP1.2]
(4)	[F01-OS1.1] [F01-OP1.1]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.3.6.3. Indoor Storage of Anhydrous Ammonia and Flammable, Toxic and Oxidizing Gases	
(1)	(a) [F03-OS1.2] [F44-OS1.1]
	(a) [F03-OP1.2]
	(a) [F44-OS1.2,OS1.5,OS1.1] Applies to gas-tight <i>fire separations</i> .
	(b) [F12-OS1.2] [F01-OS1.1] [F02-OS1.3]
	(b) [F02-OP1.3]
	(c) [F12-OS1.1]
	(d) [F44-OS1.1]
(2)	(a) [F03-OP1.2]
	(a) [F03-OS1.2] [F44-OS1.1]
	(a) [F44-OS1.2,OS1.5,OS1.1] Applies to gas-tight <i>fire separations</i> .
	(b) [F12-OS1.2] [F01-OS1.1]
	(c) [F12-OS1.1]
	(d) [F44-OS1.1]
3.3.6.4. Storage and Dispensing Rooms for Flammable Liquids and Combustible Liquids	
(1)	[F03-OS1.2]
	[F03-OP1.2]
(2)	[F02-OS1.3]
	[F02-OP1.3]
3.3.6.5. Tire Storage	
(1)	[F03-OS1.2]
	[F03-OP1.2]
3.3.6.6. Ammonium Nitrate Storage	
(2)	[F01-OS1.1] [F02,F12-OS1.2]
	[F01-OP1.1] [F02,F12-OP1.2]
(3)	[F03-OS1.2] [F01-OS1.1]
	[F03-OP1.2] [F01-OP1.1]
(4)	[F12,F02-OS1.1]
	[F12,F02-OP1.2]
(5)	[F44-OH5]
	[F01-OS1.1] [F02-OS1.2]
	[F43-OS3.4]
(6)	[F01,F81-OS1.1]
3.3.6.7. Flooring Materials	
(1)	[F43-OS3.4]
	[F44-OH5]
	[F01-OS1.1]
3.3.6.8. Fire Separations in Process Plants	
(1)	[F03-OP1.2]
	[F03-OS1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.3.6.9. Basements and Pits	
(1)	[F01-OS1.1]
	[F01-OP1.1]
3.4.1.2. Separation of Exits	
(1)	[F10,F12,F05,F06-OS3.7]
	[F12,F06-OP1.2]
	[F12,F06-OS1.5,OS1.2]
(2)	[F10-OS3.7]
3.4.1.5. Exterior Exit Passageways	
(1)	[F10-OS3.7]
3.4.1.6. Restricted Use of Horizontal Exits	
(1)	[F10-OS3.7]
(2)	[F10,F05-OS3.7]
3.4.1.7. Slide Escapes	
(1)	[F10-OS3.7]
3.4.1.9. Mirrors near Exits	
(1)	[F10-OS3.7] [F30-OS3.1]
3.4.1.10. Combustible Glazing in Exits	
(1)	[F05-OS1.2] [F06-OS1.2,OS1.5]
	[F03,F06-OP1.2]
3.4.2.1. Minimum Number of Exits	
(1)	[F10,F12,F05,F06-OS3.7]
	[F12,F06-OS1.2]
	[F12,F06-OP1.2]
(3)	[F10-OS3.7]
3.4.2.2. Means of Egress from Mezzanines	
(1)	[F05-OS1.5]
3.4.2.3. Distance between Exits	
(1)	[F10,F05-OS1.5]
(4)	[F10-OS3.7]
3.4.2.4. Travel Distance	
(3)	[F10-OS3.7]
3.4.2.5. Location of Exits	
(1)	[F10-OS3.7]
(3)	[F10-OS3.7]
3.4.2.6. Principal Entrances	
(1)	[F10-OS3.7]
(2)	[F10-OS3.7]
3.4.3.1. Exit Width Based on Occupant Load	
(2)	[F10-OS3.7]
3.4.3.2. Exit Width	
(1)	[F10-OS3.7]
(2)	[F10-OS3.7]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(3)	[F10-OS3.7]
(6)	[F10-OS3.7]
(7)	[F10-OS3.7]
(8)	[F12,F10-OS3.7] [F30-OS3.1]
	[F12-OP1.2]
	[F12-OS1.2]
3.4.3.3. Exit Width Reduction	
(1)	[F10,F12-OS3.7] [F30-OS3.1]
	[F12-OP1.2]
	[F12-OS1.2]
(2)	[F10,F12-OS3.7]
	[F12-OP1.2]
	[F12-OS1.2]
(3)	[F10,F12-OS3.7]
	[F12-OP1.2]
	[F12-OS1.2]
(4)	[F10,F12-OS3.7]
	[F12-OP1.2]
	[F12-OS1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	[F03-OS1.2,OS1.3]
	[F03-OP1.2,OP1.3]
3.6.4.4. Attic or Roof Space Access	
(1)	[F01,F02,F12-OS1.2]
	[F01,F02,F12-OP1.2]
3.6.4.5. Horizontal Service Space Access	
(1)	[F01,F02,F12-OS1.2]
	[F01,F02,F12-OP1.2]
3.6.4.6. Crawl Space Access	
(1)	[F01,F02,F12-OS1.2]
	[F01,F02,F12-OP1.2]
3.6.5.1. Duct Materials	
(1)	[F01,F02-OS1.2]
(2)	[F02-OS1.2]
(4)	[F02-OS1.2]
(5)	[F02-OS1.2]
3.6.5.2. Vibration Isolation Connectors	
(1)	[F01,F02-OS1.2]
(2)	[F02-OS1.2]
3.6.5.3. Tape	
(1)	[F02-OS1.2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.6.5.4. Coverings, Linings, Adhesives and Insulation	
(1)	[F02-OS1.2]
(2)	[F02-OS1.2]
(3)	[F02-OS1.2]
(4)	[F02-OS1.2]
(5)	[F02-OS1.2]
(6)	[F02-OS1.2]
(7)	[F01,F02-OS1.2]
3.6.5.5. Insulation and Coverings	
(1)	[F01,F02-OS1.2]
(2)	[F02-OS1.2]
(3)	[F02-OS1.2]
(4)	[F02-OS1.2]
3.6.5.6. Clearance of Ducts and Plenums	
(2)	[F01-OS1.2]
(3)	[F01-OS1.2]
(4)	[F01-OS1.2]
(5)	[F01-OS1.2]
3.6.5.7. Supply, Return, Intake and Exhaust-Air Openings	
(1)	[F02-OS1.2]
3.6.5.8. Return-Air System	
(1)	[F02-OS1.2]
(2)	[F01,F02-OS1.2]
(3)	[F01,F02-OS1.2]
(4)	[F01,F02-OS1.2]
3.7.1.1. Room and Space Height	
(1)	[F30-OS3.1]
3.7.2.1. Plumbing and Drainage Systems	
(1)	[F72-OH2.1]
(2)	[F72-OH2.1]
3.7.2.2. Water Closets	
(1)	[F72-OH2.1] Applies to portion of Code text: "... water closets shall be provided ..."
(6)	[F72-OH2.1]
(7)	[F72-OH2.1]
(8)	[F72-OH2.1]
(9)	[F72-OH2.1]
(10)	[F72-OH2.1]
(11)	[F72-OH2.1]
(12)	[F72-OH2.1]
(13)	[F72-OH2.1]
(14)	[F72-OH2.1]
(15)	[F72-OH2.1]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(16)	[F72-OH2.1]
3.7.2.3. Lavatories	
(1)	[F71-OH2.3]
(3)	[F30-OS3.1]
(4)	[F71-OH2.3]
3.7.2.4. Mobile Home Facilities	
(1)	[F72-OH2.1] [F71-OH2.3]
(2)	[F72-OH2.1]
(3)	[F71-OH2.3] Applies to the minimum number of laundry trays or similar facilities, and of bathtubs or showers for each sex.
3.7.2.5. Safety Glass	
(1)	[F20-OS3.1]
3.7.2.6. Surface Protection	
(1)	[F72-OH2.1] [F40-OH2.4]
(2)	[F72-OH2.1] [F40-OH2.4]
3.7.2.7. Floor Drain	
(1)	[F40-OH2.4] [F30-OS3.1]
3.7.2.8. Grab Bars	
(1)	[F20-OS3.1]
3.7.2.9. Bathtubs	
(1)	[F74-OA2] (b) [F31-OS3.2] (d) [F30-OS3.1]
3.7.3.1. Medical Gas Piping	
(1)	[F43,F81,F82-OS3.4] (b) [F01,F02-OS1.1] (b) [F01,F02-OP1.1]
3.8.2.2. Entrances	
(1)	[F73-OA1]
(2)	[F73-OA1]
(5)	[F73-OA1]
3.8.2.3. Areas Requiring a Barrier-Free Path of Travel	
(1)	[F73-OA1]
(3)	[F74-OA2]
3.8.2.4. Access to Storeys Served by Escalators and Moving Walks	
(1)	[F73-OA1]
(2)	[F73-OA1]
3.8.2.5. Access to Parking Areas and Exterior Passenger-Loading Zones	
(1)	[F73-OA1]
(2)	[F73-OA1]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.8.2.7. Power Door Operators	
(1)	[F73-OA1]
3.8.2.8. Plumbing Facilities	
(1)	[F74-OA2] [F72-OH2.1] [F71-OH2.3]
(3)	[F72-OH2.1] [F73-OA1]
3.8.2.10. Signs and Indicators	
(1)	[F74-OA2]
(2)	[F74-OA2]
3.8.2.11. Counters and Counters for Telephones	
(1)	[F74-OA2]
(2)	[F74-OA2]
3.8.3.2. Barrier-Free Path of Travel	
(1)	[F73-OA1]
(2)	(a),(b) [F30-OS3.1] (a),(b) [F73-OA1] (c),(d) [F73-OA1] (e),(f) [F73-OA1] (e),(f) [F30-OS3.1] (c),(d) [F30-OS3.1]
(4)	[F73-OA1]
3.8.3.3. Exterior Walks	
(1)	(a) [F73-OA1] (a) [F30-OS3.1] (b) [F73-OA1]
3.8.3.4. Exterior Passenger-Loading Zones	
(1)	(a) [F74-OA2] (b) [F73-OA1] (c) [F74-OA2]
3.8.3.5. Ramps	
(1)	(b),(e) [F73-OA1] (d) [F30-OS3.1] (c) [F73-OA1] (d) [F73-OA1] (b),(e) [F30-OS3.1] (c) [F30-OS3.1]
(4)	(a) [F73-OA1] (b) and (c) [F30-OS3.1]
(5)	[F30-OS3.1]
3.8.3.6. Doorways and Doors	
(2)	[F73-OA1]
(3)	[F74-OA2]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(4)	[F74-OA2] [F10-OS3.7]
(5)	[F74-OA2] [F10-OS3.7]
(6)	[F73-OA1]
(7)	[F30-OS3.1]
(8)	[F73-OA1]
(10)	[F30-OS3.1] [F73-OA1]
(11)	[F73-OA1]
(12)	[F30-OS3.1] [F73-OA1]
(14)	[F73-OA1]
3.8.3.7. Passenger-Elevating Devices	
(1)	[F30-OS3.1] [F10-OS3.7]
3.8.3.8. Controls	
(1)	[F74-OA2] [F10-OS3.7]
3.8.3.9. Accessibility Signs	
(1)	[F74-OA2] [F73-OA1]
3.8.3.10. Drinking Fountains	
(1)	[F74-OA2]
3.8.3.11. Water-Closet Stalls	
(1)	[F74-OA2] [F72-OH2.1] (c)(i) [F74-OA2] (e) and (f) [F30,F20-OS3.1] (g) [F30-OS3.1] Applies to portion of Code text: "... be equipped with a coat hook ... projecting not more than 50 mm from the wall ..."
3.8.3.12. Universal Washrooms	
(1)	[F74-OA2] (b) [F10-OS3.7] (f) [F30-OS3.1] Applies to the requirement for a coat hook. (h) [F74-OA2] Applies to the requirement for a shelf. [F72-OH2.1] [F71-OH2.3] (b) [F74-OA2] Applies to portion of Code text: "... b) ... a door capable of being locked from the inside ..."
3.8.3.13. Water Closets	
(1)	[F74-OA2] [F72-OH2.1]

Table 3.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
3.8.3.14. Urinals	
(1)	[F74-OA2] (f) [F30-OS3.1]
3.8.3.15. Lavatories and Mirrors	
(1)	[F74-OA2] [F71-OH2.3] (e) [F31-OS3.2]
(2)	[F74-OA2]
3.8.3.16. Showers	
(1)	[F74-OA2] (d),(e) [F30-OS3.1] (f) [F30-OS3.1] (h) [F31-OS3.2]
3.8.3.17. Bathtubs	
(1)	[F74-OA2]
3.8.3.18. Assistive Listening Devices	
(1)	[F74-OA2] [F11-OS3.7]
3.8.3.19. Counters	
(1)	[F74-OA2]
3.8.3.20. Shelves or Counters for Telephones	
(1)	[F74-OA2]
(2)	[F74-OA2]
3.8.3.21. Spaces in Seating Area	
(1)	[F74-OA2] Applies to entire Sentence except for portion of Code text: "... without infringing on egress from any row of seating or any aisle requirements ..." [F30-OS3.1] Applies to portion of Code text: "... level, or level with removable seats ..." (d) [F10-OS3.7]
3.9.1.2. Application	
(1)	(d) [F02-OS1.1]
3.9.2.2. Spatial Separation	
(2)	[F12-OP3.1]
(3)	[F56-OH3.1]
3.9.3.1. Safety Requirements Within Floor Areas	
(2)	[F02-OS1.2]
(3)	[F03-OS1.2] [F03-OP1.2]
(6)	[F02-OP1.2]
3.9.3.2. Sanitary Facilities	
(1)	[F72-OH2.1] [F71-OH2.3]

Table 3.10.1.1. (Continued)

Notes to Table 3.10.1.1.:

(1) See Parts 2 and 3 of Division A.

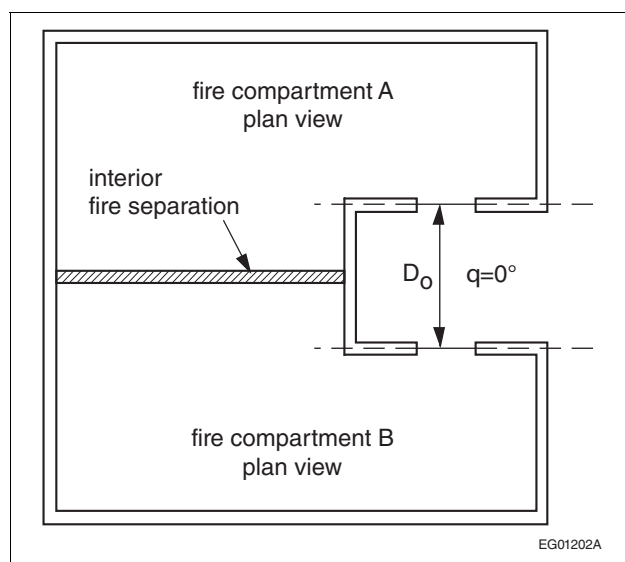


Figure A-3.2.3.14.(1)-B
Openings in walls that are parallel to one another

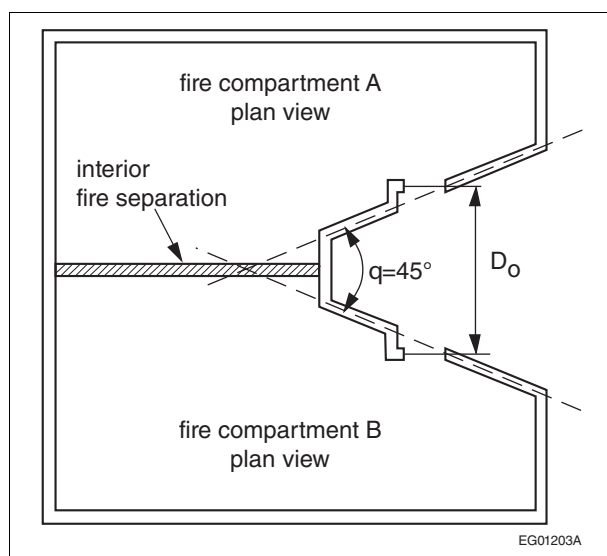


Figure A-3.2.3.14.(1)-C
Openings in walls with an included angle of 45°

A-3.2.4. Fire Alarm System. The term “fire alarm system” used in this Subsection applies to fire alarm systems with or without voice communication capability.

A-3.2.4.4.(1) Single Stage Fire Alarm System. This requirement, in combination with Article 3.2.4.22., is intended to allow for the provision of voice communication capability as an integral part of a single stage fire alarm system.

A-3.2.4.4.(2)(c) Fire Alarm Alert Signal. In a 2-stage fire alarm system described in Sentence 3.2.4.4.(2), the alert signal may be transmitted to audible signal devices in designated locations or to audible signal devices throughout the building. If actuated, the second stage alarm signal in a 2-stage fire alarm system may sound throughout all zones in the building. All manual station key switches would typically initiate the alarm signal.

Sentence 3.2.4.4.(2) also allows the implementation of a “zoned 2-stage” sequence of operation, whereby the alarm signal sounds in the zone of key switch actuation (and perhaps in the adjacent zones, which may be the storey above and the storey below) and the alert signal sounds throughout the rest of the building. This sequencing would be created automatically by the fire alarm control unit.

The key or special device referred to in Clause 3.2.4.4.(2)(c) should be immediately available to all persons on duty who have been given authority to sound an alarm signal.

A-3.2.4.4.(2) Two-Stage Fire Alarm System. Sentence 3.2.4.4.(2), in combination with Article 3.2.4.22. or 3.2.4.23., is intended to allow for the provision of voice communication capability as an integral part of a 2-stage fire alarm system.

A-3.2.4.6.(2) Access to Silencing Switches. This requirement is intended to prevent easy access to silencing switches. The satisfactory operation of a fire alarm system to alert the occupants of a building to an emergency is predicated on the assumption that the alarm signal will be silenced only after responsible staff have verified that no emergency exists. Details on the emergency procedures to be used in case of fire are contained in the NFC.

A-3.2.4.7.(4) Design and Installation of Fire Department Notification. In some jurisdictions, the fire department may utilize, or have available, a municipal fire alarm system or equipment intended for receiving notification by means of a direct connection. If used, it is expected that these systems and installations conform to the requirements of Sentence (4) so as to achieve and provide a uniform and reliable level of service. It is also intended that a proprietary central station as well as a fire brigade used by a large corporation, university campus or similar site comply with Sentence (4).

CAN/ULC-S561, "Installation and Services for Fire Signal Receiving Centres and Systems," which is referenced in Sentence 3.2.4.7.(4), and CAN/ULC-S524, "Installation of Fire Alarm Systems," which is referenced in Sentence 3.2.4.5.(1), go hand-in-hand: conformity to CAN/ULC-S561 entails conformity with the fire alarm system components required in that standard, which include the fire alarm transmitter (signal transmitting unit), the interconnections, and the communication path.

A-3.2.4.7.(5)(b) Emergency Telephone Number. In many municipalities an emergency telephone number, for example 911, is used for all emergency services and it is preferable to post that number.

A-3.2.4.8.(2) Fire Alarm Zones. Alarm initiating devices referred to in this Sentence include fire detectors, waterflow switches and manual stations. If a room or space in a building extends through more than one storey of the building, as in the case of multi-level dwelling units and machinery rooms, judgment must be exercised in the zoning and annunciation of the fire detectors in that room or space. In general, the lowest storey on which access is provided into the room or space should be indicated on the annunciator to avoid unnecessary delays for the responding firefighters. Consideration should also be given to the use of numbers or letters on the annunciator that correspond to those used in the building elevators.

A-3.2.4.9.(3)(f) Supervision for Fire Pumps. Specific electrical supervision for fire pumps is stated in NFPA 20, "Installation of Stationary Pumps for Fire Protection," which is referenced in NFPA 13, "Installation of Sprinkler Systems."

A-3.2.4.11.(1) Smoke Detector Location. In the design and installation of the smoke detection system, consideration must be given to all features which could have a bearing on the location and sensitivity of the detectors, including ceiling height, sloped ceilings, diffusion from air conditioning and ventilating currents, obstructions, baffles, and other pertinent physical configurations that might interfere with the proper operation of the system.

A-3.2.4.11.(3) Visible Signals. If staff located in each zone or compartment can see each sleeping room door, visible signals may be located above each door. If staff cannot see every door, it is intended that the visible signals be provided at the location where the staff are normally in attendance. The audible signal is intended to alert staff of the need to check the visible signals.

A-3.2.4.16.(1) Manual Station. Only one manual station need be provided near a group of doors serving as a principal entrance or as a single exit facility.

A-3.2.4.18. Acoustic Measurement and Terminology. The following notes on acoustic measurement and terminology are intended to assist in the application of the requirements for audibility of fire alarm system sounding devices.

The background or ambient measurement should be a spatial averaged A-weighted equivalent sound level measured for 60 s. This can be obtained using an integrating sound level meter with the integration time set

A-3.2.4.18.(5) Residential Sound Level. In a building in which corridors or hallways serve more than one suite or dwelling unit, there will be situations in which an audible signal device cannot be placed in the corridor or hallway to alert persons sleeping in suites and dwelling units, because the sound level in the vicinity of the device would exceed that permitted by Sentence 3.2.4.18.(4). In these situations it will be necessary to supplement the building fire alarm system with an audible signal device in the suite or dwelling unit. These devices could be piezoelectric devices similar to the sounding units in many smoke alarms, subject to the device emitting the appropriate temporal pattern required by Sentence 3.2.4.18.(2).

A-3.2.4.18.(7) Disconnect Device for Dwelling Units. In order to minimize the annoyance caused by false and unwanted alarms, the disconnect will permit a person to silence the local audible device within the dwelling unit. At that time the person would be aware of sounds from devices in common spaces and could plan appropriate action. The disconnect will reduce the possibility of tampering with the audible devices.

A-3.2.4.18.(8) and (9) Signal Circuits. Clause 3.2.4.18.(8)(a) permits Class A wiring, or Class B wiring with signal circuit isolators located outside of the suites, to serve audible signal devices within residential suites.

Clause 3.2.4.18.(8)(b) permits a separate signal circuit to serve each suite without the need for signal circuit isolators or Class A wiring.

Open circuits and Class A and Class B wiring circuits are terms defined in CAN/ULC-S524, "Installation of Fire Alarm Systems."

A-3.2.4.19.(2) Visual Alarm Signal. CAN/ULC-S526, "Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories," applies to visual signalling units. This document is referenced by the most recent standard for the installation of fire alarm systems and would automatically apply. Current Canadian technology does not integrate visual and audible alarms to have the same temporal pattern. Visual and audible alarms should have as close a temporal pattern as possible but without interference beats that might have a deleterious effect on some persons. Visual signalling devices with the same temporal pattern as required for audible devices are available from some sources and they should become available in Canada. Not all units that comply with the ULC standard will have sufficient power to adequately cover large areas; care will have to be taken to specify units with adequate power when large spaces are being designed.

A-3.2.4.20.(7)(a) Smoke Alarm Installation. CSA C22.1, "Canadian Electrical Code, Part I," permits a smoke alarm to be installed on most residential circuits that carry lighting outlets and receptacles. It is the intent of the NBC that any other item on a circuit with a smoke alarm should be unlikely to be overloaded and trip the breaker with a resultant loss of power that is not sufficiently annoying for the breaker to be restored to the on position. It is considered that an interior bathroom light or a kitchen light fulfills this intent, but that circuits restricted to receptacles do not fulfill this intent.

A-3.2.4.20.(8) Smoke Detectors in lieu of Smoke Alarms. It is intended that the smoke detector in this application will function as per the requirements of a smoke alarm; specifically, it will be a localized alarm to that suite. The advantage of this type of installation is that the detector would be monitored by the fire alarm panel, which would provide notification to supervisory personnel and be inspected as per CAN/ULC-S524, "Installation of Fire Alarm Systems."

A-3.2.4.22.(1)(b) Voice Messages. The concept of intelligibility expressed in Clause 3.2.4.22.(1)(b) is intended to mean that a person with average hearing and cognitive abilities is able to understand the messages that are transmitted into the space occupied by the person. There is no absolute measure to predetermine the effect of loudspeakers and it may be necessary, once the building has been furnished and occupied, to increase the number of loudspeakers to improve the quality of the messages.

The intelligibility of the message depends on the speech level, the background level, and the reverberation time of the space. ISO 7731, "Ergonomics – Danger signals for public and work areas – Auditory danger signals," addresses audibility. The standard suggests that an A-weighted sound level at least 15 dBA above the ambient is required for audibility, but allows for more precise calculations using octave or 1/3 octave band frequencies to tailor the alarm signal for particular ambient noise conditions. Design of the alarm system is limited to ensuring that all areas receive an adequately loud alarm signal.

If a public address system is to be used to convey instructions during an emergency, then the requirements of the system are less straightforward. In general, however, a larger number of speakers operating at lower sound levels would be required.

Additional guidance on how to design and evaluate the intelligibility of a communication system can be found in the following documents:

- IEC 60268-16, "Sound System Equipment – Part 16: Objective Rating of Speech Intelligibility by Speech Transmission Index"
- ISO 7240-19, "Fire Detection and Alarm Systems – Part 19: Design, Installation, Commissioning and Service of Sound Systems for Emergency Purposes"
- NEMA SB 50, "Emergency Communications Audio Intelligibility Applications Guide"
- Annex D of NFPA 72, "National Fire Alarm and Signaling Code"

A-3.2.5.4.(1) Fire Department Access for Detention Buildings. Buildings of Group B, Division 1 used for housing persons who are under restraint include security measures that would prevent normal access by local fire departments. These security measures include fencing around the building site, exterior walls without openings or openings which are either very small or fitted with bars, and doors that are equipped with security hardware that would prevent easy entry. These buildings would have firefighting equipment installed and the staff would be trained to handle any small incipient fires. It is expected that appropriate fire safety planning would be undertaken in conjunction with local fire departments in order that special emergencies could be handled in a cooperative manner.

A-3.2.5.6.(1) Fire Department Access Route. The design and construction of fire department access routes involves the consideration of many variables, some of which are specified in the requirements in the Code. All these variables should be considered in relation to the type and size of fire department vehicles available in the municipality or area where the building will be constructed. It is appropriate, therefore, that the local fire department be consulted prior to the design and construction of access routes.

A-3.2.5.7.(1) Water Supply. The intent of Sentence 3.2.5.7.(1) is that an adequate water supply for firefighting be readily available and of sufficient volume and pressure to enable emergency response personnel to control fire growth so as to enable the safe evacuation of occupants and the conduct of search and rescue operations, prevent the fire from spreading to adjacent buildings, and provide a limited measure of property protection.

The water supply requirements for buildings containing internal fire suppression systems, including sprinkler systems and standpipe systems, are contained in specific standards referenced in the Code. Compliance with the referenced standard, including any variations made by this Code, is deemed to satisfy the intent of Sentence 3.2.5.7.(1). However, it will be necessary to verify that an adequate source of water is available at the building site to meet the required quantities and pressures.

For a building with no internal fire suppression system, the determination of the minimum requirements applicable to the water supply for firefighting is relevant mainly to building sites not serviced by municipal water supply systems. For building sites serviced by municipal water supply systems, where the water supply duration is not a concern, water supply flow rates at minimum pressures is the main focus of this provision. However, where municipal water supply capacities are limited, it may be necessary for buildings to have supplemental water supplies on site or readily available.

The sources of water supply for firefighting purposes may be natural or developed. Natural sources may include ponds, lakes, rivers, streams, bays, creeks, and springs. Developed sources may include aboveground tanks, elevated gravity tanks, cisterns, swimming pools, wells, reservoirs, aqueducts, artesian wells, tankers, hydrants served by a public or private water system, and canals. Consideration should be given to ensuring that water sources will be accessible to fire department equipment under all climatic conditions.

The volume of on-site water supply is dependent on the building size, construction, occupancy, exposure and environmental impact potential, and should be sufficient to allow at least 30 minutes of fire department hose stream use.

A-3.2.5.9.(5)(c) Fire Department Pumping Equipment. Availability of appropriate pumping equipment from the local fire department or, in the case of industrial plants or complexes, from their fire brigade, is considered sufficient to meet the intent of this requirement.

A-3.2.5.11.(2) Hose Stations. A building that is partially sprinklered may have some floor areas where local sprinklers are installed that do not cover the entire floor area. It is intended that hose stations be provided in these floor areas to allow emergency responders to fight fires that cannot be controlled by local sprinklers.

A-3.8.3.6.(4) Lever Handles. Lever handles are usable by most persons with limited hand mobility and will meet the intent of this requirement. Lever handles with an end return towards the door are less prone to catch the clothing of someone passing through the doorway.

A-3.8.3.6.(6) and (7) Doors with Power Operators. Doors equipped with a power operator actuated by a pressure plate identified with the International Symbol of Access or, where security is required, by a key, card or radio transmitter, and that can otherwise be opened manually, meet the intent of the requirement. The location of these actuating devices should ensure that a wheelchair will not interfere with the operation of the door once it is actuated. Swinging doors equipped with power operators which are actuated automatically and open into passing pedestrian traffic should be provided with a guard or other device designed to prevent pedestrians from stepping in the swing area of the door. These guards or devices should be detectable by blind persons. For example, inverted U-shaped guards should have an additional rail at a height not more than 680 mm so that it is detectable by the long cane. These doors should also have a device (mat or other sensor) on the swing side to prevent the door from opening if someone is standing in the swing area.

A-3.8.3.6.(9) Air Pressure Differences. Differences in air pressure on opposite sides of a door may be due to the operation of mechanical systems such as those associated with smoke control. So-called “stack action” in buildings in winter can also cause differential pressures due to the buoyancy of warm air. Stack action is usually most noticeable between stairwells and the remainder of the building, and at the entrances to buildings; the taller the building, the greater the effect. Doors with automatic closers have to operate with sufficient opening force to allow the return action to overcome the differential pressure.

A-3.8.3.6.(10) Delayed Action on Door Closers. In some circumstances, closers with a delay feature which keeps the door open for several seconds before it begins to close might be desirable. However, closers with this feature have limited back-check, a feature of a normal door closer where resistance to opening increases as the door reaches the full arc of swing. Doors equipped with a delayed action closer are therefore more susceptible to damage should the door be opened with too much force or should someone try to force it closed, thinking the closer has failed to operate. Delayed action closers are not recommended for such occupancies as schools.

A-3.8.3.6.(11) Clearance at Doorways. Sufficient clearance must be provided on the latch side of doors for a user to operate the door-opening mechanism and open the door without interference from the wheelchair. This is particularly important for a door swinging towards the approach side. See Figure A-3.8.3.6.(11).

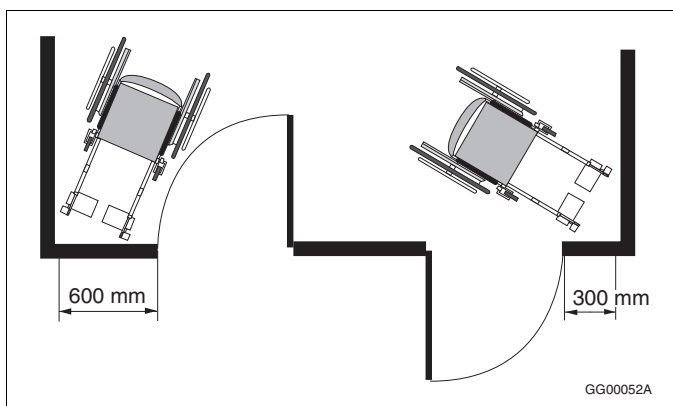


Figure A-3.8.3.6.(11)
Doorway clearance

A-3.8.3.9.(1) Accessibility Signs. The International Symbol of Access shown in Figure A-3.8.3.9.(1)-A indicates to persons with physical disabilities that they will have reasonable freedom of movement within a building so signed. The symbol is usually white on a blue background; where these colours do not stand out, the sign can be set on a white background. An arrow can be added to indicate direction or the location of an accessible space or facility.



Figure A-3.8.3.9.(1)-A
Signs indicating accessible facilities

The International Symbol of Access for Hearing Loss shown in Figure A-3.8.3.9.(1)-B, which indicates accessibility for persons with hearing loss, should be used to indicate the availability of variable volume controls on telephones, assistive listening systems, and text telephones (TT). These latter devices may also be referred to as teletypewriters (TTY) or telecommunications devices for the deaf (TDD).

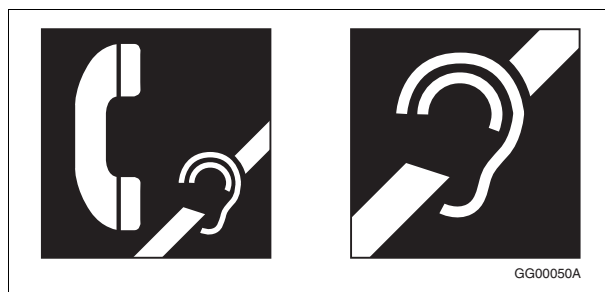


Figure A-3.8.3.9.(1)-B
Signs for assistive listening facilities

A-3.8.3.11.(1)(c)(v) Water-closet Stalls. Doors to water-closet stalls for persons with physical disabilities should swing outward, preferably against a side wall.

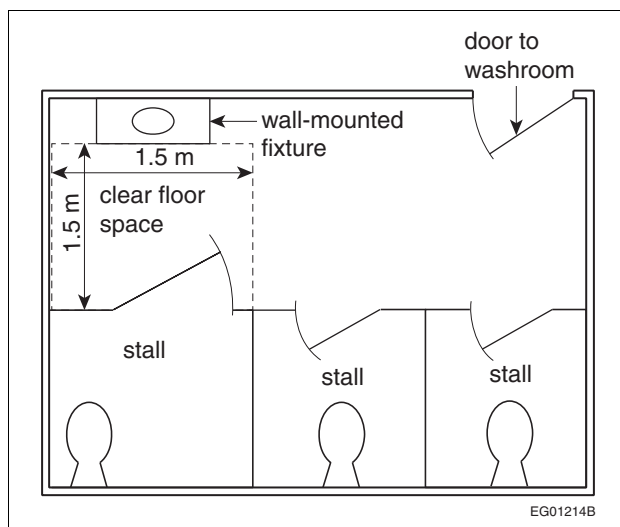


Figure A-3.8.3.11.(1)(c)(v)
Water-closet stalls

x_d = length of drift determined in accordance with Sentence (2) and as shown in Figure 4.1.6.5.-A.

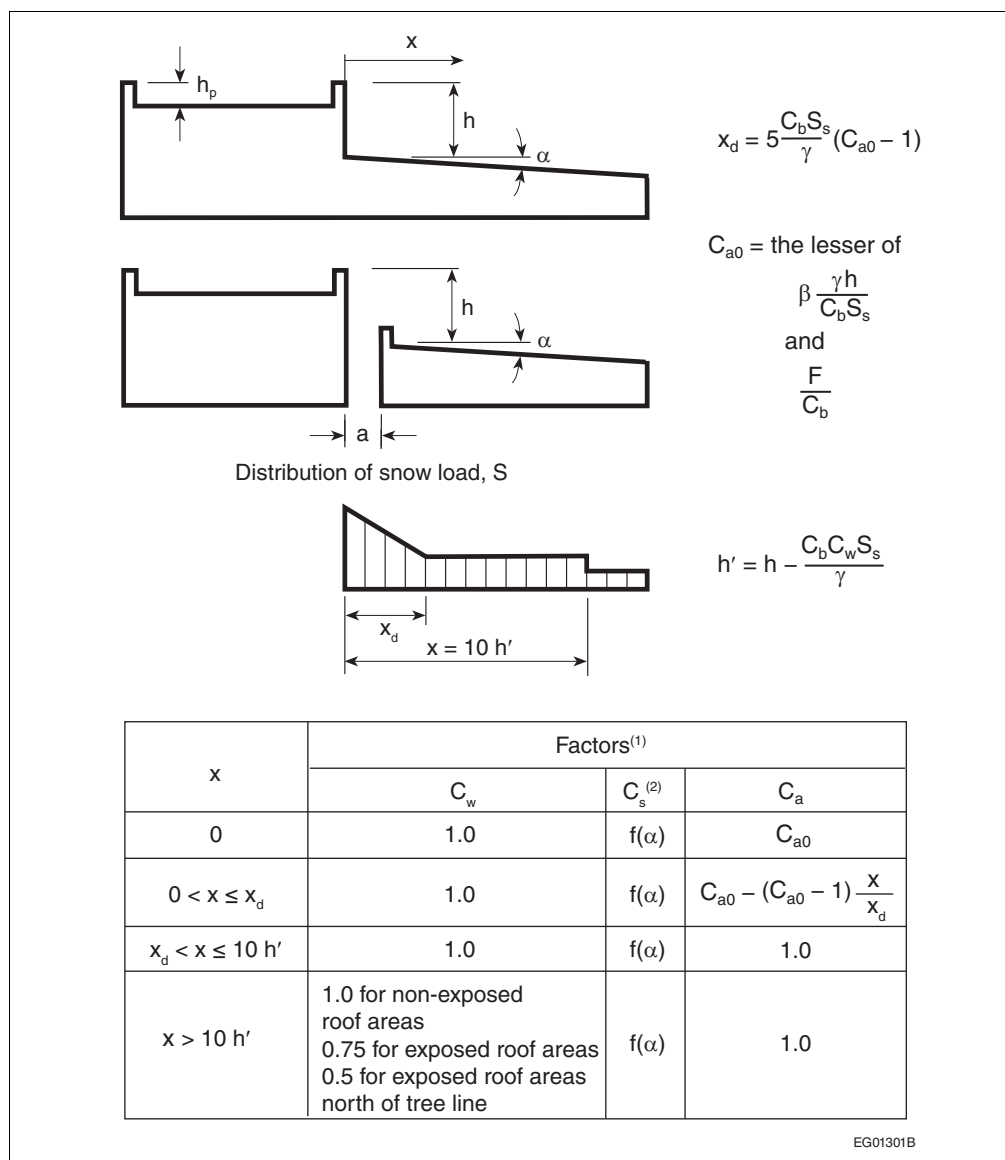
2) The length of the drift, x_d , shall be calculated as follows:

$$x_d = 5 \frac{C_b S_s}{\gamma} (C_{a0} - 1)$$

where

γ = specific weight of snow as specified in Article 4.1.6.13.

Figure 4.1.6.5.-A
Snow load factors for lower level roofs
Forming Part of Sentences 4.1.6.5.(1) and (3) and 4.1.6.6.(1)



Notes to Figure 4.1.6.5.-A:

- (1) If $a > 5$ m or $h \leq 0.8 S_s / \gamma$, drifting from the higher roof need not be considered.
- (2) For lower roofs with parapets, $C_s = 1.0$, otherwise it varies as a function of slope α as defined in Sentences 4.1.6.2.(5) and (6).

- 3)** The value of C_{a0} for each of Cases I, II, and III shall be the lesser of

$$C_{a0} = \beta \frac{\gamma h}{C_b S_s}$$

and

$$C_{a0} = \frac{F}{C_b}$$

where

β = 1.0 for Case I, and 0.67 for Cases II and III,

h = difference in elevation between the lower roof surface and the top of the parapet on the upper roof as shown in Figure 4.1.6.5.-A, and

$$F = 0.35\beta \sqrt{\frac{\gamma(l_{cs} - 5h'_p)}{S_s}} + C_b, \text{ but } F \leq 5 \text{ for } C_{ws} = 1.0$$

where

C_{ws} = value of C_w applicable to the source of drifting,

l_{cs} = characteristic length of the source area for drifting, defined as $l_{cs} = 2w_s - \frac{w_s^2}{l_s}$, where w_s and l_s are respectively the shorter and longer dimensions of the relevant source areas for snow drifting shown in Figure 4.1.6.5.-B for Cases I, II and III, and

$$h'_p = h_p - \left(\frac{0.8S_s}{\gamma} \right), \text{ but } 0 \leq h'_p \leq \left(\frac{l_{cs}}{5} \right)$$

where

h_p = height of the roof perimeter parapet of the source area, to be taken as zero unless all the roof edges of the source area have parapets.

- 4)** The value of C_{a0} shall be the highest of Cases I, II and III, considering the different roof source areas for drifting snow, as specified in Sentence (3) and Figure 4.1.6.5.-B.

4) For arch roofs with a slope at the edge $\alpha_e > 30^\circ$ (see Figure 4.1.6.10.-A and Table 4.1.6.10.), C_a shall be

- a) taken as 0 on the upwind side of the peak, and
- b) on the downwind side of the peak,
 - i) for the part of the roof between the peak and point where the slope $\alpha = 30^\circ$, taken as

$$C_a = \frac{xh}{0.06C_b x_{30} b} \text{ for } 0.05 < \frac{h}{b} \leq 0.12, \text{ and}$$

$$C_a = \frac{2x}{C_b x_{30}} \text{ for } \frac{h}{b} > 0.12$$

where

x, h, b = as specified in Sentence (2), and

x_{30} = value of x where the slope $\alpha = 30^\circ$, and

- ii) for the part of the roof where the slope $\alpha > 30^\circ$, taken as

$$C_a = \frac{h}{0.06C_b b} \text{ for } 0.05 < \frac{h}{b} \leq 0.12, \text{ and}$$

$$C_a = \frac{2}{C_b} \text{ for } \frac{h}{b} > 0.12$$

5) Except as provided in Sentence (6), C_a for curved roofs shall be determined in accordance with the requirements for arch roofs stated in Sentences (3) and (4).

Table 4.1.6.10.
Load Cases for Arch Roofs, Curved Roofs and Domes
Forming Part of Sentences 4.1.6.10.(3), (4) and (9)

Load Case	Range of Application	Factors			
		All Arch or Curved Roofs and Domes	Arch and Curved Roofs		Domes
		C_w	C_a Upwind Side	C_a Downwind Side	C_a Downwind Side
Case I	All values of h/b	As stated in 4.1.6.2.(3) and (4)	1.0	1.0	1.0
Case II	Slope at edge $\leq 30^\circ$ $h/b > 0.05$ all values of x	1.0	0.0	$C_a = \frac{xh}{0.03C_b b^2} \text{ for } \frac{h}{b} \leq 0.12$ $C_a = \frac{4x}{C_b b} \text{ for } \frac{h}{b} > 0.12$	$C_a(x, y) = C_a(x, 0) \left(1 - \frac{y}{r}\right)$
	Slope at edge $> 30^\circ$ $h/b > 0.05$ $0 < x < x_{30}$	1.0	0.0	$C_a = \frac{xh}{0.06C_b x_{30} b} \text{ for } \frac{h}{b} \leq 0.12$ $C_a = \frac{2x}{C_b x_{30}} \text{ for } \frac{h}{b} > 0.12$	
	Slope at edge $> 30^\circ$ $h/b > 0.05$ $x \geq x_{30}$	1.0	0.0	$C_a = \frac{h}{0.06C_b b} \text{ for } \frac{h}{b} \leq 0.12$ $C_a = \frac{2}{C_b} \text{ for } \frac{h}{b} > 0.12$	

6) Where the slope, α , of a curved roof at its peak is greater than 10° , C_a shall be determined in accordance with the requirements for gable roofs stated in Article 4.1.6.9. using a slope equal to the mean slope of the curved roof.

- 7)** For domes of circular plan form (see Figure 4.1.6.10.-B), C_a shall
- along the central axis parallel to the wind, vary in the same way as for an arch roof with the same rise-to-span ratio, h/b , and
 - off this axis, vary according to

$$C_a(x, y) = C_a(x, 0) \left(1 - \frac{y}{r}\right)$$

where

$C_a(x, y)$ = value of C_a at location (x, y) ,

$C_a(x, 0)$ = value of C_a on the central axis parallel to the wind,

x = distance along the central axis parallel to the wind,

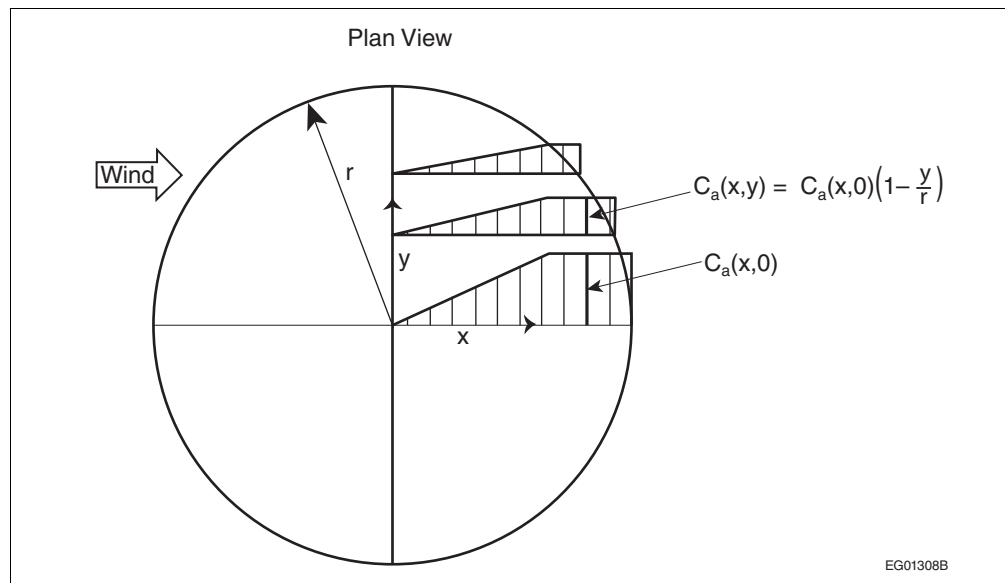
y = horizontal coordinate normal to the x direction, and

r = radius of dome.

8) For all arch roofs, curved roofs and domes, the slope factor, C_{sr} , shall be as prescribed in Sentences 4.1.6.2.(5) and (6).

9) For all arch roofs, curved roofs and domes, the wind exposure factor, C_{wr} , shall be as prescribed in Table 4.1.6.10.

Figure 4.1.6.10.-B
Unbalanced snow accumulation factor on a circular dome
Forming Part of Sentence 4.1.6.10.(7)



Notes to Figure 4.1.6.10.-B:

- Refer to Table 4.1.6.10. for applicable values of C_w and Sentences 4.1.6.2.(5) and (6) for applicable values of C_s .
- Refer to Sentences 4.1.6.10.(3) and (4) for the calculation of $C_a(x, 0)$.

4.1.6.11. Snow Loads Due to Sliding

1) Except as provided in Sentence (2), where an upper roof, or part thereof, slopes downwards with a slope $\alpha > 0$ towards a lower roof, the snow load, S , on the lower roof, determined in accordance with Articles 4.1.6.2. and 4.1.6.5., shall be augmented in accordance with Sentence (3) to account for the additional load resulting from sliding snow.

4.1.7. Wind Load**4.1.7.1. Specified Wind Load**

1) The specified wind loads for a *building* and its components shall be determined using the Static, Dynamic or Wind Tunnel Procedure as stated in Sentences (2) to (5).

2) For the design of *buildings* that are not dynamically sensitive, as defined in Sentence 4.1.7.2.(1), one of the following procedures shall be used to determine the specified wind loads:

- a) the Static Procedure described in Article 4.1.7.3.,
- b) the Dynamic Procedure described in Article 4.1.7.8., or
- c) the Wind Tunnel Procedure described in Article 4.1.7.12.

3) For the design of *buildings* that are dynamically sensitive, as defined in Sentence 4.1.7.2.(2), one of the following procedures shall be used to determine the specified wind loads:

- a) the Dynamic Procedure described in Article 4.1.7.8., or
- b) the Wind Tunnel Procedure described in Article 4.1.7.12.

4) For the design of *buildings* that may be subject to wake buffeting or channelling effects from nearby *buildings*, or that are very dynamically sensitive, as defined in Sentence 4.1.7.2.(3), the Wind Tunnel Procedure described in Article 4.1.7.12., shall be used to determine the specified wind loads.

5) For the design of cladding and secondary structural members, one of the following procedures shall be used to determine the specified wind loads:

- a) the Static Procedure described in Article 4.1.7.3., or
- b) the Wind Tunnel Procedure described in Article 4.1.7.12.

6) Computational fluid dynamics shall not be used to determine the specified wind loads for a *building* and its components. (See Note A-4.1.7.1.(6).)

4.1.7.2. Classification of Buildings

(See Note A-4.1.7.2.)

1) Except as provided in Sentences (2) and (3), a *building* is permitted to be classified as not dynamically sensitive.

2) A *building* shall be classified as dynamically sensitive if

- a) its lowest natural frequency is less than 1 Hz and greater than 0.25 Hz,
- b) its height is greater than 60 m, or
- c) its height is greater than 4 times its minimum effective width, where the effective width, w , of a *building* shall be taken as

$$w = \frac{\sum h_i w_i}{\sum h_i}$$

where the summations are over the height of the *building* for a given wind direction, h_i is the height above grade to level i , and w_i is the width normal to the wind direction at height h_i ; the minimum effective width is the lowest value of the effective width considering all wind directions.

3) A *building* shall be classified as very dynamically sensitive if

- a) its lowest natural frequency is less than or equal to 0.25 Hz, or
- b) its height is more than 6 times its minimum effective width as defined in Clause (2)(c).

4.1.7.3. Static Procedure

1) The specified external pressure or suction due to wind on part or all of a surface of a *building* shall be calculated as follows:

$$p = I_w q C_e C_t C_g C_p$$

where

- p = specified external pressure acting statically and in a direction normal to the surface, considered positive when the pressure acts towards the surface and negative when it acts away from the surface,
- I_w = importance factor for wind load, as provided in Table 4.1.7.3.,
- q = reference velocity pressure, as provided in Sentence (4),
- C_e = exposure factor, as provided in Sentences (5) and (7),
- C_t = topographic factor, as provided in Article 4.1.7.4.,
- C_g = gust effect factor, as provided in Sentence (8), and
- C_p = external pressure coefficient, as provided in Articles 4.1.7.5. and 4.1.7.6.

Table 4.1.7.3.
Importance Factor for Wind Load, I_w
 Forming Part of Sentences 4.1.7.3.(1) and (3)

Importance Category	Importance Factor, I_w	
	ULS	SLS
Low	0.8	0.75
Normal	1	0.75
High	1.15	0.75
Post-disaster	1.25	0.75

2) The net wind load for the *building* as a whole shall be the algebraic difference of the loads on the windward and leeward surfaces, and in some cases, may be calculated as the sum of the products of the external pressures or suctions and the areas of the surfaces over which they are averaged as provided in Sentence (1).

3) The net specified pressure due to wind on part or all of a surface of a *building* shall be the algebraic difference, such as to produce the most critical effect, of the external pressure or suction calculated in accordance with Sentence (1) and the specified internal pressure or suction due to wind calculated as follows:

$$p_i = I_w q C_{ei} C_t C_{gi} C_{pi}$$

where

- p_i = specified internal pressure acting statically and in a direction normal to the surface, either as a pressure directed towards the surface or as a suction directed away from the surface,
- I_w, q, C_t = as defined in Sentence (1),
- C_{ei} = exposure factor for internal pressure, as provided in Sentence (7),
- C_{gi} = internal gust effect factor, as provided in Sentence (10), and
- C_{pi} = internal pressure coefficient, as provided in Article 4.1.7.7.

4) The reference velocity pressure, q , shall be the appropriate value determined in conformance with Subsection 1.1.3., based on a probability of being exceeded in any one year of 1 in 50.

5) The exposure factor, C_e , shall be based on the reference height, h , determined in accordance with Sentence (6), for the surface or part of the surface under consideration and shall be

- a) $(h/10)^{0.2}$ but not less than 0.9 for open terrain, where open terrain is level terrain with only scattered *buildings*, trees or other obstructions, open water or shorelines thereof,
- b) $0.7(h/12)^{0.3}$ but not less than 0.7 for rough terrain, where rough terrain is suburban, urban or wooded terrain extending upwind from the *building* uninterrupted for at least 1 km or 20 times the height of the *building*, whichever is greater, or
- c) an intermediate value between the two exposures defined in Clauses (a) and (b) in cases where the site is less than 1 km or 20 times the height of the

4.1.7.8. Dynamic Procedure

1) For the application of the Dynamic Procedure, the provisions of Article 4.1.7.3. shall be followed, except that the exposure factor, C_e , shall be as prescribed in Sentences (2) and (3), and the gust effect factor, C_g , shall be as prescribed in Sentence (4), when determining the wind loads on the main structural system.

2) For *buildings* in open terrain, as defined in Clause 4.1.7.3.(5)(a), the value of C_e for the design of the main structural system shall be calculated as follows:

$$C_e = \left(\frac{h}{10} \right)^{0.28}, \text{ but } 1.0 \leq C_e \leq 2.5$$

(See Note A-4.1.7.8.(2) and (3).)

3) For *buildings* in rough terrain, as defined in Clause 4.1.7.3.(5)(b), the value of C_e for the design of the main structural system shall be calculated as follows:

$$C_e = 0.5 \left(\frac{h}{12.7} \right)^{0.50}, \text{ but } 0.5 \leq C_e \leq 2.5$$

(See Note A-4.1.7.8.(2) and (3).)

4) For the design of the main structural system, C_g shall be calculated as follows:

$$C_g = 1 + g_p \frac{\sigma}{\mu}$$

where

g_p = peak factor calculated as $\sqrt{2 \ln(\nu T)} + \frac{0.577}{\sqrt{2 \ln(\nu T)}}$, and

$$\sigma/\mu = \sqrt{\frac{K}{C_{eH}} \left(B + \frac{sF}{\beta} \right)},$$

where

ν = average fluctuation rate calculated as $f_{nD} \sqrt{\frac{sF}{sF + \beta B}}$,

$T = 3\,600$ s,

$K = 0.08$ for open terrain and 0.10 for rough terrain,

C_{eH} = exposure factor evaluated at reference height $h = H$,

B = background turbulence factor, a function of w/H determined from Figure 4.1.7.8.,

s = size reduction factor calculated as $\frac{\pi}{3} \left[\frac{1}{1 + \frac{8f_n H}{3V_H}} \right] \left[\frac{1}{1 + \frac{10f_n W}{V_H}} \right]$,

F = gust energy ratio calculated as $\frac{x_0^2}{(1+x_0^2)^{4/3}}$, where $x_0 = (1\,220 f_n/V_H)$, and

β = damping ratio, which shall be determined by a rational method, or may be taken to be 0.01 for steel structures, 0.02 for concrete structures, and 0.015 for composite structures,

where

f_{nD} = natural frequency of vibration of the *building* in the along-wind direction, in Hz,

f_n = lowest natural frequency of the *building*, in Hz, as defined in Sentences 4.1.7.2.(2) and (3),

H = height of the *building*,

w = effective width of windward face of the *building* calculated as $\frac{\sum h_i w_i}{\sum h_i}$, where w_i = width normal to wind direction at height h_i , and

V_H = mean wind speed at the top of the structure, in m/s, calculated as $\bar{V} \sqrt{C_{eH}}$,

where

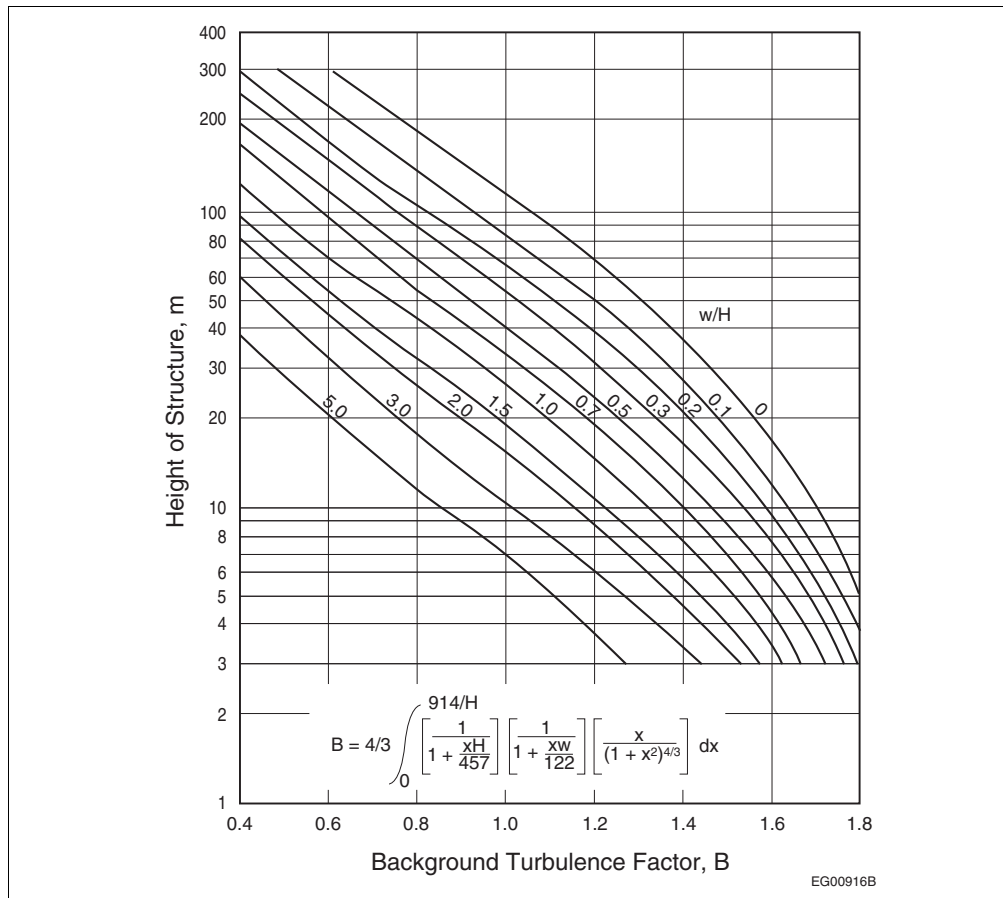
\bar{V} = reference wind speed at a height of 10 m, in m/s, calculated as $\sqrt{\frac{2 \cdot I_W \cdot q}{\rho}}$,

where

I_W = importance factor,

q = reference velocity pressure, in Pa, and
 ρ = air density = 1.2929 kg/m³.
 (See Note A-4.1.7.8.(4).)

Figure 4.1.7.8.
Background turbulence factor, B
 Forming Part of Sentence 4.1.7.8.(4)



4.1.7.9. Full and Partial Wind Loading

1) Except where the wind loads are derived from the combined $C_p C_g$ values determined in accordance with Article 4.1.7.6., *buildings* and structural members shall be capable of withstanding the effects of the following loads:

- the full wind loads acting along each of the 2 principal horizontal axes considered separately,
- the wind loads described in Clause (a) but with 100% of the load removed from any one portion of the area,
- the wind loads described in Clause (a) but with both axes considered simultaneously at 75% of their full value, and
- the wind loads described in Clause (c) but with 50% of these loads removed from any portion of the area.

(See Note A-4.1.7.9.(1).)

4.1.7.10. Interior Walls and Partitions

1) In the design of interior walls and *partitions*, due consideration shall be given to differences in air pressure on opposite sides of the wall or *partition* which may result from

- pressure differences between the windward and leeward sides of a *building*,

- b) stack effects due to a difference in air temperature between the exterior and interior of the *building*, and
- c) air pressurization by the mechanical services of the *building*.

4.1.7.11. Exterior Ornamentations, Equipment and Appendages

(See Note A-4.1.7.11.)

1) The effects of wind loads on exterior ornamentations, equipment and appendages, including the increase in exposed area as a result of ice buildup as prescribed in CSA S37, "Antennas, Towers, and Antenna-Supporting Structures," shall be considered in the structural design of the connections and the *building*.

2) Where there are a number of similar components, the net increase in force is permitted to be based on the total area for all similar components as opposed to the summation of forces of individual elements.

4.1.7.12. Wind Tunnel Procedure

1) Except as provided in Sentences (2) and (3), wind tunnel tests on scale models to determine wind loads on *buildings* shall be conducted in accordance with ASCE/SEI 49, "Wind Tunnel Testing for Buildings and Other Structures."

2) Where an adjacent *building* provides substantial sheltering effect, the wind loads for the main structural system shall be no lower than 80% of the loads determined from tests referred to in Sentence (1) with the effect of the sheltering *building* removed as applied to

- a) the base shear force for *buildings* with a ratio of height to minimum effective width, as defined in Sentence 4.1.7.2.(2), less than or equal to 1.0, or
- b) the base moment for *buildings* with a ratio of height to minimum effective width greater than 1.0.

3) For the design of cladding and secondary structural members, the exterior wind loads determined from the wind tunnel tests shall be no less onerous than those determined by analysis in accordance with Article 4.1.7.3. using the following assumptions:

- a) $C_p = \pm 0.72$ and $C_g = 2.5$, where the *building's* height is greater than 20 m or greater than its minimum effective width, and
- b) $C_p C_g = 80\%$ of the values for zones w and r provided in Article 4.1.7.6., where the *building's* height is less than or equal to 20 m and no greater than its minimum effective width.

4.1.8. Earthquake Load and Effects

4.1.8.1. Analysis

1) Except as permitted in Sentence (2), the deflections and specified loading due to earthquake motions shall be determined according to the requirements of Articles 4.1.8.2. to 4.1.8.22.

2) Where $I_E F_s S_a(0.2)$ and $I_E F_s S_a(2.0)$ are less than 0.16 and 0.03 respectively, the deflections and specified loading due to earthquake motions are permitted to be determined in accordance with Sentences (3) to (15), where

- a) I_E is the earthquake importance factor and has a value of 0.8, 1.0, 1.3 and 1.5 for *buildings* of Low, Normal, High and Post-Disaster importance respectively,
- b) F_s is the site coefficient based on the average \bar{N}_{60} or s_u as defined in Article 4.1.8.2., for the top 30 m of *soil* below the footings, pile caps, or mat *foundations* and has a value of
 - i) 1.0 for *rock* sites or when $\bar{N}_{60} > 50$ or $s_u > 100$ kPa,
 - ii) 1.6 when $15 \leq \bar{N}_{60} \leq 50$ or $50 \text{ kPa} \leq s_u \leq 100 \text{ kPa}$, and
 - iii) 2.8 for all other cases, and
- c) $S_a(T)$ is the 5% damped spectral response acceleration value for period T, determined in accordance with Subsection 1.1.3.

- 3)** The structure shall have a clearly defined
- Seismic Force Resisting System (SFRS) to resist the earthquake loads and their effects, and
 - load path (or paths) that will transfer the inertial forces generated by the earthquake to the *foundations* and supporting ground.
- 4)** An unreinforced masonry SFRS shall not be permitted where
- I_E is greater than 1.0, or
 - the height above *grade* is greater than or equal to 30 m.
- 5)** The height above *grade* of SFRS designed in accordance with CSA S136, "North American Specification for the Design of Cold-Formed Steel Structural Members (using the Appendix B provisions applicable to Canada)," shall be less than 15 m.
- 6)** Earthquake forces shall be assumed to act horizontally and independently about any two orthogonal axes.
- 7)** The minimum lateral earthquake design force, V_s , at the base of the structure in the direction under consideration shall be calculated as follows:

$$V_s = F_s S_a(T_s) I_E W_t / R_s$$

where

$S_a(T_s)$ = value of S_a at T_s determined by linear interpolation between the value of S_a at 0.2 s, 0.5 s, and 1.0 s, and
 = $S_a(0.2)$ for $T_s \leq 0.2$ s,

W_t = sum of W_i over the height of the *building*, where W_i is defined in Article 4.1.8.2., and

$R_s = 1.5$, except $R_s = 1.0$ for structures where the *storey* strength is less than that in the *storey* above and for an unreinforced masonry SFRS,

where

T_s = fundamental lateral period of vibration of the *building*, as defined in Article 4.1.8.2.,

= $0.085(h_n)^{3/4}$ for steel moment frames,

= $0.075(h_n)^{3/4}$ for concrete moment frames,

= 0.1 N for other moment frames,

= $0.025h_n$ for braced frames, and

= $0.05(h_n)^{3/4}$ for shear walls and other structures,

where

h_n = height above the base, in m, as defined in Article 4.1.8.2.,
 except that V_s shall not be less than $F_s S_a(1.0) I_E W_t / R_s$ and, in cases where $R_s = 1.5$, V_s need not be greater than $F_s S_a(0.5) I_E W_t / R_s$.

- 8)** The total lateral earthquake design force, V_s , shall be distributed over the height of the *building* in accordance with the following formula:

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

where

F_x = force applied through the centre of mass at level x ,

W_x W_i = portion of W that is located at or is assigned to level x or i respectively, and

h_x h_i = height, in m, above the base of level x and level i as per Article 4.1.8.2.

- 9)** Accidental torsional effects applied concurrently with F_x shall be considered by applying torsional moments about the vertical axis at each level for each of the following cases considered separately:

a) $+0.1D_{nx}F_x$ and

b) $-0.1D_{nx}F_x$.

- 10)** Deflections obtained from a linear analysis shall include the effects of torsion and be multiplied by R_s/I_E to get realistic values of expected deflections.

4.1.8.12. Dynamic Analysis Procedure

1) Except as provided in Articles 4.1.8.19. and 4.1.8.21., 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) (see Note A-4.1.8.12.(1)(a)), or
- b) Non-linear Dynamic Analysis, in which case a special study shall be performed (see Note A-4.1.8.12.(1)(b)).

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.(9).

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.(9). (See Note A-4.1.8.12.(3).)

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.(7) multiplied by $R_d R_o / I_E$, shall be combined with the effects determined by dynamic analysis (see Note A-4.1.8.12.(4)(a)), or
- b) if B , as defined in Sentence 4.1.8.11.(10), 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} , shall be 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 larger of the following factors to obtain the design elastic base shear, V_{ed} :

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

$$S(0.5) / S(T_a) \leq 1.0$$

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 .

8) Except as required by Sentence (9) or (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).

12) For *buildings* constructed with more than 4 *storeys* of continuous wood construction, having a timber SFRS consisting of shear walls with wood-based panels or braced or moment-resisting frames as defined in Table 4.1.8.9., and whose

fundamental lateral period, T_a , is determined in accordance with Clause 4.1.8.11.(3)(d), the design base shear, V_d , shall be taken as the larger value of V_d determined in accordance with Sentence (7) and 100% of V . (See Note A-4.1.8.10.(4).)

4.1.8.13. Deflections and Drift Limits

1) Except as provided in Sentences (5) and (6), lateral deflections of a structure shall be calculated in accordance with the loads and requirements defined in this Subsection.

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 $R_d R_o / I_E$ and increased as required in Sentences 4.1.8.10.(6) and 4.1.8.16.(1) to give realistic values of anticipated deflections.

3) Based on the lateral deflections calculated in Sentences (2), (5) and (6), the largest interstorey deflection at any level shall be limited to $0.01 h_s$ for *post-disaster buildings*, $0.02 h_s$ for High Importance Category *buildings*, and $0.025 h_s$ for all other *buildings*.

4) The deflections calculated in Sentence (2) shall be used to account for sway effects as required by Sentence 4.1.3.2.(12). (See Note A-4.1.8.13.(4).)

5) The lateral deflections of a seismically isolated structure shall be calculated in accordance with Article 4.1.8.20.

6) The lateral deflections of a structure with supplemental energy dissipation shall be calculated in accordance with Article 4.1.8.22.

4.1.8.14. Structural Separation

1) Adjacent structures shall be

- a) separated by a distance equal to at least the square root of the sum of the squares of their individual deflections calculated in Sentence 4.1.8.13.(2), or
- b) connected to each other.

2) The method of connection required in Sentence (1) shall take into account the mass, stiffness, strength, ductility and anticipated motion of the connected *buildings* and the character of the connection.

3) Rigidly connected *buildings* shall be assumed to have the lowest $R_d R_o$ value of the *buildings* connected.

4) *Buildings* with non-rigid or energy-dissipating connections require special studies.

4.1.8.15. Design Provisions

1) Except as provided in Sentences (2) and (3), diaphragms, collectors, chords, struts and connections shall be designed so as not to yield, and the design shall account for the shape of the diaphragm, including openings, and for the forces generated in the diaphragm due to the following cases, whichever one governs (see Note A-4.1.8.15.(1)):

- a) forces due to loads determined in Article 4.1.8.11. or 4.1.8.12. applied to the diaphragm are increased to reflect the lateral load capacity of the SFRS, plus forces in the diaphragm due to the transfer of forces between elements of the SFRS associated with the lateral load capacity of such elements and accounting for discontinuities and changes in stiffness in these elements, or
- b) a minimum force corresponding to the design-based shear divided by N for the diaphragm at level x .

2) Steel deck roof diaphragms in *buildings* of less than 4 storeys or wood diaphragms that are designed and detailed according to the applicable referenced design standards to exhibit ductile behaviour shall meet the requirements of Sentence (1), except that they may yield and the forces shall be

- a) for wood diaphragms acting in combination with vertical wood shear walls, equal to the lateral earthquake design force,

- e) connections for non-structural elements or components of Category 1, 2 or 3 of Table 4.1.8.18. attached to the side of a *building* and above the first level above *grade* shall satisfy the following requirements:
 - i) for connections where the body of the connection is ductile, the body shall be designed for values of C_p , A_r and R_p given in Table 4.1.8.18., and all of the other parts of the connection, such as anchors, welds, bolts and inserts, shall be capable of developing 2.0 times the nominal yield resistance of the body of the connection, and
 - ii) connections where the body of the connection is not ductile shall be designed for values of $C_p = 2.0$, $R_p = 1.0$ and A_r given in Table 4.1.8.18., and
- f) a ductile connection is one where the body of the connection is capable of dissipating energy through cyclic inelastic behaviour.

8) Floors and roofs acting as diaphragms shall satisfy the requirements for diaphragms stated in Article 4.1.8.15.

9) Lateral deflections of elements or components shall be based on the loads defined in Sentence (1) and lateral deflections obtained from an elastic analysis shall be multiplied by R_p/I_E to give realistic values of the anticipated deflections.

10) The elements or components shall be designed so as not to transfer to the structure any forces unaccounted for in the design, and rigid elements such as walls or panels shall satisfy the requirements of Sentence 4.1.8.3.(6).

11) Seismic restraint for suspended equipment, pipes, ducts, electrical cable trays, etc. shall be designed to meet the force and displacement requirements of this Article and be constructed in a manner that will not subject hanger rods to bending.

12) Isolated suspended equipment and components, such as pendent lights, may be designed as a pendulum system provided that adequate chains or cables capable of supporting 2.0 times the weight of the suspended component are provided and the deflection requirements of Sentence (10) are satisfied.

13) Free-standing steel pallet storage racks are permitted to be designed to resist earthquake effects using rational analysis, provided the design achieves the minimum performance level required by Subsection 4.1.8. (See Note A-4.1.8.18.(13).)

14) Except as provided in Sentence (15), the relative displacement of glass in glazing systems, D_{fallout} , shall be equal to the greater of

- a) $D_{\text{fallout}} \geq 1.25 I_E D_p$, where
 - D_{fallout} = relative displacement at which glass fallout occurs, and
 - D_p = relative earthquake displacement that the component must be designed to accommodate, calculated in accordance with Article 4.1.8.13. and applied over the height of the glass component, or

- b) 13 mm.

(See Note A-4.1.8.18.(14) and (15).)

15) Glass need not comply with Sentence (14), provided at least one of the following conditions is met:

- a) $I_E F_a S_a(0.2) < 0.35$,
- b) the glass has sufficient clearance from its frame such that $D_{\text{clear}} \geq 1.25 D_p$ calculated as follows:

$$D_{\text{clear}} = 2C_1 (1 + h_p C_2 / (b_p C_1))$$

where

- D_{clear} = relative horizontal displacement measured over the height of the glass panel, which causes initial glass-to-frame contact,
- C_1 = average of the clearances on both sides between the vertical glass edges and the frame,
- h_p = height of the rectangular glass panel,

C_2 = averages of the top and bottom clearances between the horizontal glass edges and the frame, and

b_p = width of the rectangular glass panel,

- c) the glass is fully tempered, monolithic, installed in a *non-post-disaster building*, and no part of the glass is located more than 3 m above a walking surface, or
- d) the glass is annealed or heat-strengthened laminated glass in a single thickness with an interlayer no less than 0.76 mm and captured mechanically in a wall system glazing pocket with the perimeter secured to the frame by a wet, glazed, gunable, curing, elastomeric sealant perimeter bead of 13 mm minimum glass contact width.

(See Note A-4.1.8.18.(14) and (15).)

16) For structures with supplemental energy dissipation, the following criteria shall apply:

- a) the value of $S_a(0.2)$ used in Sentence (1) shall be determined from the mean 5% damped floor spectral acceleration values at 0.2 s by averaging the individual 5% damped floor spectra at the base of the structure determined using Non-Linear Dynamic Analysis, and
- b) the value of F_a used in Sentence (1) shall be 1.

4.1.8.19. Seismic Isolation

1) For the purposes of this Article and Article 4.1.8.20., the following terms shall have the meanings stated herein:

- a) “seismic isolation” is an alternative seismic design concept that consists of installing an isolation system with low horizontal stiffness, thereby substantially increasing the fundamental period of the structure;
- b) “isolation system” is a collection of structural elements at the level of the isolation interface that includes all individual isolator units, all structural elements that transfer force between elements of the isolation system, all connections to other structural elements, and may also include a wind-restraint system, energy-dissipation devices, and a displacement restraint system;
- c) “seismically isolated structure” includes the upper portion of the structure above the isolation system, the isolation system, and the portion of the structure below the isolation system;
- d) “isolator unit” is a structural element of the isolation system that permits large lateral deformations under lateral earthquake design forces and is characterized by vertical-load-carrying capability combined with increased horizontal flexibility and high vertical stiffness, energy dissipation (hysteretic or viscous), self-centering capability, and lateral restraint (sufficient elastic stiffness) under non-seismic service lateral loads;
- e) “isolation interface” is the boundary between the isolated upper portion of the structure above the isolation system and the lower portion of the structure below the isolation system; and
- f) “wind-restraint system” is the collection of structural elements of the isolation system that provides restraint of the seismically isolated structure for wind loads and is permitted to be either an integral part of the isolator units or a separate device.

2) Every seismically isolated structure and every portion thereof shall be analyzed and designed in accordance with

- a) the loads and requirements prescribed in this Article and Article 4.1.8.20.,
- b) other applicable requirements of this Subsection, and
- c) appropriate engineering principles and current engineering practice.

(See Note A-4.1.8.19.(2).)

3) For the analysis and modeling of the seismically isolated structure, the following criteria shall apply:

- a) a three-dimensional Non-linear Dynamic Analysis of the structure shall be performed in accordance with Article 4.1.8.12. (see Note A-4.1.8.19.(3)(a)),
- b) unless verified from rational analysis, the inherent equivalent viscous damping—excluding the hysteretic damping provided by the isolation

Table 4.5.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
4.1.3.6. Vibration	
(1)	[F22-OP2.4]
	[F22-OH4]
(2)	[F20-OS2.1]
	[F20-OP2.1,OP2.4] [F22-OP2.4]
	[F22-OH4]
4.1.4.1. Dead Loads	
(2)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(3)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(5)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(6)	[F20-OS2.1] [F22-OS2.4,OS2.5]
4.1.5.1. Loads Due to Use of Floors and Roofs	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
	[F22-OH4]
4.1.5.2. Uses Not Stipulated	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
	[F22-OH4]
4.1.5.3. Full and Partial Loading	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
	[F22-OH4]
4.1.5.4. Loads for Occupancy Served	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
	[F22-OH4]
4.1.5.5. Loads on Exterior Areas	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
	[F22-OH4]
(2)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
	[F22-OH4]
(3)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
	[F22-OH4]
(4)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
	[F22-OH4]

Table 4.5.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
4.1.5.7. More Than One Occupancy	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
	[F22-OH4]
4.1.5.8. Variation with Tributary Area	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
	[F22-OH4]
4.1.5.9. Concentrated Loads	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
4.1.5.10. Sway Forces in Assembly Occupancies	
(1)	[F20-OS2.1]
	[F20-OP2.1,OP2.4]
4.1.5.11. Crane-Supporting Structures and Impact of Machinery and Equipment	
(1)	[F20-OS2.1]
	[F20-OP2.1,OP2.4] [F22-OP2.4]
(3)	[F20-OS2.1]
	[F20-OP2.1,OP2.4]
(4)	[F20-OS2.1]
	[F20-OP2.1,OP2.4]
(5)	[F20-OS2.1]
	[F20-OP2.1,OP2.4]
4.1.5.12. Bleachers	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(3)	[F20-OS2.4]
4.1.5.13. Helicopter Landing Areas	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
4.1.5.14. Loads on Guards and Handrails	
(1)	[F20-OS2.1]
(2)	[F20-OS2.1]
(3)	[F20-OS2.1,OS2.4]
(4)	[F22-OS2.4]
(6)	[F20-OS2.1]
(7)	[F20-OS2.1]
4.1.5.15. Loads on Vehicle Guardrails	
(1)	[F20-OS2.1]
4.1.5.16. Loads on Walls Acting As Guards	
(1)	[F20-OS2.1]

Table 4.5.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
4.1.5.17. Firewalls	
(1)	[F20-OS1.2]
	[F20-OP1.2]
	[F20-OP3.1]
(2)	[F04-OS1.2]
	[F04-OP1.2]
	[F04-OP3.1]
4.1.6.2. Specified Snow Load	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(2)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(3)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(5)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(6)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(7)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(8)	[F20-OS2.1] Applies to portion of Code text: "The accumulation factor, C_a , shall be 1.0, ..."
	[F20-OP2.1] [F22-OP2.4] Applies to portion of Code text: "The accumulation factor, C_a , shall be 1.0, ..."
	(a) to (f) [F20-OS2.1] Applies to roof shapes and configurations that call for a higher accumulation factor.
	(a) to (f) [F20-OP2.1] [F22-OP2.4] Applies to roof shapes and configurations that call for a higher accumulation factor.
(9)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
4.1.6.3. Full and Partial Loading	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(2)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
4.1.6.4. Specified Rain Load	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(2)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(4)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
4.1.6.5. Multi-level Roofs	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]

Table 4.5.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(3)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(4)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
4.1.6.6. Horizontal Gap between a Roof and a Higher Roof	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
4.1.6.7. Areas Adjacent to Roof Projections	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
4.1.6.8. Snow Drift at Corners	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(2)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
4.1.6.9. Gable Roofs	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(2)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(4)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
4.1.6.10. Arch Roofs, Curved Roofs and Domes	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(2)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(3)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(4)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(5)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(6)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(7)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]

Table 4.5.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
4.1.8.16. Foundation Provisions	
(1)	[F22-OS2.3,OS2.4]
	[F22-OP2.3,OP2.4]
(2)	[F20-OS2.1]
	[F20-OP2.1]
(5)	[F20-OS2.2,OS2.4]
	[F20-OP2.2,OP2.4]
(6)	(a) [F22-OS2.4]
	(a) [F22-OP2.4]
	(b) [F22-OS2.4]
	(b) [F22-OP2.4]
	(c) [F20-OS2.4]
	(c) [F20-OP2.4]
(7)	[F20-OS2.1]
	[F20-OP2.1,OP2.4]
(8)	(a) [F20-OS2.1]
	(a) [F20-OP2.1]
	(b) [F22-OS2.4]
	(b) [F22-OP2.4]
(9)	[F20-OS2.4]
	[F20-OP2.4]
(10)	[F20-OS2.2] [F22-OS2.4]
	[F20-OP2.2] [F22-OP2.4]
4.1.8.17. Site Stability	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
4.1.8.18. Elements of Structures, Non-structural Components and Equipment	
(1)	[F20,F22-OS2.4]
	[F20-OP2.3] [F22-OP2.3,OP2.4]
(4)	[F20,F22-OS2.4]
	[F20,F22-OP2.3,OP2.4]
(5)	[F20,F22-OS2.1]
	[F20,F22-OP2.1,OP2.4]
(6)	[F20,F22-OS2.4]
	[F20,F22-OP2.3,OP2.4]

Table 4.5.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(7)	[F20,F22-OS2.4] Applies to portion of Code text: "Connections to the structure of elements and components listed in Table 4.1.8.18. shall be designed to support the component or element for gravity loads, shall conform to the requirements of Sentence 4.1.8.18.(1) ..."
	[F20,F22-OP2.3,OP2.4] Applies to portion of Code text: "Connections to the structure of elements and components listed in Table 4.1.8.18. shall be designed to support the component or element for gravity loads, shall conform to the requirements of Sentence 4.1.8.18.(1)..."
	(a) [F20,F22-OS2.4]
	(a) [F20,F22-OP2.3,OP2.4]
	(b),(c) [F20,F22-OS2.4]
	(b),(c) [F20,F22-OP2.3,OP2.4]
	(d) [F20,F22-OS2.4]
	(d) [F20,F22-OP2.3,OP2.4]
	(e) [F20,F22-OS2.4]
	(e) [F20,F22-OP2.3,OP2.4]
(9)	[F22-OS2.3,OS2.4]
	[F22-OP2.3,OP2.4]
(10)	[F22-OS2.1,OS2.3,OS2.4]
	[F22-OP2.1,OP2.3,OP2.4]
(11)	[F20-OS2.1] [F22-OS2.4]
	[F20,F22-OP2.3,OP2.4]
(12)	[F20-OS2.1] [F22-OS2.3]
	[F20-OP2.1] [F22-OP2.3]
(14)	[F22-OS2.4]
(16)	[F20,F22-OS2.4]
	[F20-OP2.3] [F22-OP2.3,OP2.4]
4.1.8.19. Seismic Isolation	
(2)	[F20-OS2.1] [F22-OS2.4]
	[F20-OP2.1] [F22-OP2.4]
(3)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(4)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
4.1.8.20. Seismic Isolation Design Provisions	
(1)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(2)	[F20-OS2.1]
	[F20-OP2.1] [F22-OP2.4]
(3)	[F20-OS2.1] [F22-OS2.4]
	[F20-OP2.1] [F22-OP2.4]
(4)	[F20-OS2.1] [F22-OS2.4]
	[F20-OP2.1] [F22-OP2.4]

Table 4.5.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(5)	[F20-OS2.1] [F22-OS2.4] [F20-OP2.1] [F22-OP2.4]
(6)	[F20-OS2.1] [F22-OS2.4] [F20-OP2.1] [F22-OP2.4]
(7)	[F20-OS2.1] [F20-OP2.1] [F22-OP2.4]
(9)	[F20-OS2.1] [F22-OS2.4] [F20-OP2.1] [F22-OP2.4]
(10)	[F22-OS2.4] [F22-OP2.3,OP2.4]
4.1.8.21. Supplemental Energy Dissipation	
(2)	[F20-OS2.1] [F22-OS2.4] [F20-OP2.1] [F22-OP2.4]
(4)	[F20-OS2.1] [F20-OP2.1] [F22-OP2.4]
(5)	[F20-OS2.1] [F20-OP2.1] [F22-OP2.4]
4.1.8.22. Supplemental Energy Dissipation Design Considerations	
(1)	[F20-OS2.1] [F22-OS2.4] [F20-OP2.1] [F22-OP2.4]
(3)	[F20-OS2.1] [F22-OS2.4] [F20-OP2.1] [F22-OP2.4]
(4)	[F20-OS2.1] [F22-OS2.4] [F20-OP2.1] [F22-OP2.4]
(5)	[F20-OS2.1] [F22-OS2.4] [F20-OP2.1] [F22-OP2.4]
(6)	[F20-OS2.1] [F20-OP2.1] [F22-OP2.4]
(7)	[F20-OS2.1] [F22-OS2.4] [F20-OP2.1] [F22-OP2.4]
(8)	[F20-OS2.1] [F22-OS2.4] [F20-OP2.1] [F22-OP2.4]
4.2.2.1. Subsurface Investigation	
(1)	[F20-OS2.2,OS2.6] [F21-OS2.6] [F20-OP2.2] [F21-OP2.6] [F21-OP4.1,OP4.4]
4.2.2.3. Field Review	
(1)	[F20-OS2.2,OS2.6] [F21-OS2.6] [F20-OP2.2] [F21-OP2.5] [F21-OP4.1,OP4.4]

Table 4.5.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
4.2.2.4. Altered Subsurface Condition	
(1)	[F20-OS2.2,OS2.6] [F21-OS2.6] [F20-OP2.2] [F21-OP2.6] [F21-OP4.1,OP4.4]
(2)	[F20-OS2.2,OS2.6] [F21-OS2.6] [F20-OP2.2] [F21-OP2.6] [F21-OP4.1,OP4.4]
4.2.3.2. Preservation Treatment of Wood	
(1)	[F80-OS2.3] [F80-OP2.3]
(2)	[F82-OS2.3] [F82-OP2.3]
4.2.3.4. Prevention of Deterioration of Masonry	
(1)	[F80-OS2.3] [F80-OP2.3]
4.2.3.6. Protection Against Chemical Attack	
(1)	[F80-OS2.3] [F80-OP2.3]
4.2.3.8. Steel Piles	
(1)	[F20-OS2.3] [F20-OP2.3]
4.2.3.9. High Strength Steel Tendons	
(1)	[F20,F80-OS2.5,OS2.6] [F20,F80-OP2.6,OP2.5] [F20,F80-OP4.1,OP4.4]
4.2.3.10. Corrosion of Steel	
(1)	[F80-OS2.3] [F80-OP2.3] [F80-OP4.1]
4.2.4.1. Design Basis	
(1)	[F20-OS2.2,OS2.6] [F21-OS2.6] [F20-OP2.2] [F21-OP2.5] [F21-OP4.1,OP4.4]
(5)	[F21-OS2.5] [F21-OP2.4,OP2.5]
4.2.4.2. Subsurface Investigation	
(1)	[F20-OS2.2,OS2.6] [F21-OS2.6] [F20-OP2.2] [F21-OP2.6] [F21-OP4.1,OP4.4]
4.2.4.3. Identification	
(1)	[F20-OS2.2,OS2.6] [F21-OS2.6] [F20-OP2.2] [F21-OP2.6] [F21-OP4.1,OP4.4]

A-4.1.8.16.(10) Liquefaction. Information on liquefaction can be found in the Commentary entitled Design for Seismic Effects in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-4.1.8.17.(1) Slope Stability. Information on slope instability can be found in the Commentary entitled Design for Seismic Effects in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-4.1.8.18. Elements of Structures, Non-structural Components and Equipment. Information on the requirements of Article 4.1.8.18. can be found in the Commentary entitled Design for Seismic Effects in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-Table 4.1.8.18. Non-structural Components and Equipment. The failure or detachment of non-structural components and equipment during an earthquake can present a major threat to life safety. The design requirements presented in Article 4.1.8.18. are intended to ensure that such components and their connections to the building will retain their integrity during strong ground shaking. Guidelines for the seismic risk reduction of such components are given in CSA S832, “Seismic Risk Reduction of Operational and Functional Components (OFCs) of Buildings.”

A-4.1.8.18.(13) Storage Racks. Free-standing steel pallet storage racks contain only materials typically loaded by forklift. They are designed to store loaded pallets, however in some cases, the stored material does not sit on a pallet. There is no occupancy within the racks. Information on racks can be found in the Commentary entitled Design for Seismic Effects in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-4.1.8.18.(14) and (15) Glass Fallout and Failure. Information on glass fallout and testing for glass fallout can be found in AAMA 501.6, “Recommended Dynamic Test Method For Determining The Seismic Drift Causing Glass Fallout From A Wall System.” Every surface other than inaccessible areas or areas where occupancy is prevented or access is prevented should be considered a “walking surface.” Additional information can be found in ASCE/SEI 7, “Minimum Design Loads for Buildings and Other Structures,” in FEMA P-750, “NEHRP Recommended Seismic Provisions for New Buildings and Other Structures,” and FEMA 450-1, “NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures,” and related commentaries, and in the Commentary entitled Design for Seismic Effects in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-4.1.8.19.(2) Design Review. It is strongly recommended that a design review of the seismically isolated structure and its isolation system be carried out by an independent team of professional engineers and geoscientists experienced in seismic analysis methods and the theory and application of seismic isolation. The design review should include, but not be limited to, the following:

- (a) site-specific spectra,
- (b) ground motion time histories,
- (c) modeling and analyses,
- (d) testing program and results, and
- (e) final design of all structural framing elements and isolation system components.

A-4.1.8.19.(3)(a) Non-Linear Dynamic Analysis. Three-dimensional Non-Linear Dynamic Analysis is a complex process requiring special expertise. Guidance on Non-linear Dynamic Analysis can be found in the Commentary entitled Design for Seismic Effects in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-4.1.8.19.(4) and 4.1.8.21.(5) Ground Motion Time Histories. Ground motion time histories and their horizontal and vertical components must be appropriately selected and scaled according to accepted practice. Further information on ground motion time histories can be found in the Commentary entitled Design for Seismic Effects in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-4.1.8.21.(2) Design Review. It is strongly recommended that a design review of the structure and the supplementary energy dissipation system be carried out by an independent team of professional engineers and geoscientists experienced in seismic analysis methods and the theory and application of supplementary energy dissipation. The design review should include, but not be limited to, the following:

- (a) ground motion time histories,
- (b) modeling and analyses,
- (c) testing program and results, and

(d) final design of all structural framing elements and supplemental energy dissipation system components.

A-4.1.8.21.(4)(a) Non-linear Dynamic Analysis. Three-dimensional Non-linear Dynamic Analysis is a complex process requiring special expertise. Guidance on Non-linear Dynamic Analysis can be found in the Commentary entitled Design for Seismic Effects in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-4.2.2.1.(1) Subsurface Investigation. Where acceptable information on subsurface conditions already exists, the investigation may not require further physical subsurface exploration or testing.

A-4.2.2.3.(1) Responsibilities of the Designer as Defined in Part 4. In certain situations, such as when the design is highly technical, it may be necessary for the “other suitably qualified person” to be someone responsible to the designer. In such cases the authority having jurisdiction may wish to order that the review be done by the designer.

A-4.2.4.1.(1) Innovative Designs. It is important that innovative approaches to foundation design be carried out by a person especially qualified in the specific method applied and that the design provide a level of safety and performance at least equivalent to that provided for or implicit in the design carried out by the methods referred to in Part 4. Provision must be made for monitoring the subsequent performance of such structures so that the long-term sufficiency of the design can be evaluated.

A-4.2.4.1.(3) Ultimate Limit States for Foundations. Information on ultimate limit states for foundations, including terminology and resistance factors, can be found in the Commentary entitled Foundations in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-4.2.4.1.(5) Design of Foundations for Differential Movements. Information on the design of foundations for differential movements can be found in the Commentary entitled Foundations in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-4.2.4.4.(1) Depth of Foundations. When adfreezing has occurred and subsequent freezing results in soil expansion beneath this area, the resulting uplift effect is sometimes referred to as frost jacking.

A heated building that is insulated to prevent heat loss through the foundation walls should be considered as an unheated structure unless the effect of the insulation is taken into account in determining the maximum depth of frost penetration.

A-4.2.5.1.(1) Excavations. Information on excavations can be found in the Commentary entitled Foundations in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-4.2.6.1.(1) Shallow Foundations. Information on shallow foundations can be found in the Commentary entitled Foundations in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-4.2.7.1.(1) Deep Foundation Units. A deep foundation unit can be pre-manufactured or cast-in-place; it can be driven, jacked, jetted, screwed, bored or excavated; it can be of wood, concrete or steel or a combination thereof.

A-4.2.7.2.(1) Deep Foundations. Information on deep foundations can be found in the Commentary entitled Foundations in the “Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B).”

A-4.2.7.2.(2) Load Testing of Piles. ASTM D 1143/D 1143M, “Deep Foundations Under Static Axial Compressive Load,” defines routine load test procedures that have been extensively used.

A-4.3.3.1.(1) Precast Concrete. CSA A23.3, “Design of Concrete Structures,” requires precast concrete members to conform to CSA A23.4, “Precast Concrete – Materials and Construction.”

The degree of protection against precipitation ingress needed in any particular case and the approach taken to provide that protection will depend on

- the exterior loads imposed on the assembly
- the materials selected for the backing assembly,
- the use of the enclosed space, and
- the level of maintenance that will be acceptable to the owners.

Where exterior loads are greater, it may be prudent to select a precipitation protection system whose small failures will not be as likely to have an immediate impact on the building or its occupants. For example, drained and vented wall and vented roof assemblies are typical for low-rise residential buildings. More robust drained and vented wall assemblies are recommended for mid- and high-rise buildings where the cost of maintenance and repair could be high.

Where materials with a greater resistance to moisture are used in the assembly, a less rugged precipitation protection system or a less rigorous maintenance schedule may be acceptable. This might be the case, for example, where the wall or backing wall is concrete or masonry.

For spaces that are not intended for ongoing human occupancy, some rainwater leakage may not be of particular concern. This may be the case for certain warehouse spaces for example, depending on how the spaces are used and conditioned.

Information on the installation of flashing to drain water to the exterior of roof and wall assemblies may be found in a number of publications including, but not limited to:

- “Architectural Sheet Metal Manual,” Sheet Metal and Air-Conditioning Contractors National Association, Inc.
- “High-Rise Residential Construction Guide,” Tarion Warranty Corporation (formerly Ontario New Home Warranty Program)
- Technical Notes, National Concrete Masonry Association
- Roofing Specifications, Canadian Roofing Contractors’ Association
- “The NRCA Roofing Manual: Membrane Roof Systems” and “The NRCA Waterproofing Manual,” National Roofing Contractors Association
- Technical Notes on Brick Construction, Brick Industry Association

Environmental separators installed in buildings of wood construction that exceed 4 storeys can be subjected to increased loading due to the height of the building. As such, certain design considerations may require different approaches from the common ones used by industry for buildings of 4 storeys or less. These considerations include, but are not limited to, the following:

- air barrier assemblies,
- fenestration selection,
- protection from precipitation,
- differential movement due to wood shrinkage,
- roofing selection and design, and
- risk of deterioration due to longer exposure of materials to the elements during construction.

Information on environmental separators and the loading to which they are subjected when installed in buildings of wood construction, as well as recommendations on dealing with differential movement, can be found in the following publications, among others:

- “Moisture and Wood-Frame Buildings,” Canadian Wood Council
- “Guide for Designing Energy-Efficient Building Enclosures for Wood-Frame Multi-Unit Residential Buildings in Marine to Cold Climate Zones in North America,” FPInnovations and RDH Building Engineering Ltd.

A-5.7. Protection from Interior Sources of Water. Protection similar to that prescribed in Section 5.7. may be required where interior assemblies are in contact with water (such as site-built showers, steam rooms, swimming pool areas) and where adjacent interior spaces need to be protected from the transfer of water through these assemblies.

A-5.7.1.2.(2) Drainage. Water should be directed away from the building and, ultimately, to a municipal drainage system, drainage ditch, swale, or other acceptable water management means. This can be accomplished by setting the building grade higher than the surrounding grades, by sloping the grade away from the building, by installing a surface water drainage system, or by a combination of these approaches. The chosen approach should follow generally accepted guidelines, such as the Rational Method of Stormwater Design by David B. Thompson, or other design methods acceptable to the authority having jurisdiction.

A-5.7.3.3.(1)(a) Imperfections. Examples of imperfections include shrinkage cracks, air holes, honeycombing, form-tie cone holes, and form joint ridges.

A-5.7.3.4.(1) Dampproofing. Dampproofing refers to the application of a material or materials to an environmental separation assembly to protect it and the interior space against the transfer of moisture due to the mechanisms of water vapour transmission, capillary action and pressure differences other than hydrostatic pressure.

A dampproofed assembly should be designed such that it can provide short-term resistance to the ingress of water due to occasional hydrostatic pressure from ground water.

A-5.8. Required Protection from Noise. Section 5.8. applies to the separation of dwelling units from other dwelling units and from spaces where noise may be generated with regard to sound transmission irrespective of Clause 5.1.2.1.(1)(b), which deals with the separation of dissimilar environments. It is understood that, at any time, there is the potential for sound levels to be quite different in adjoining dwelling units.

A-5.8.1.2. Using ASTC in lieu of STC. A designer may choose to use an ASTC rating of equal or higher numerical value than the required STC to show compliance where STC ratings are required.

An ASTC measurement or calculation will always yield a value equal to or lower than the STC for the same configuration, as the ASTC includes flanking transmission.

A-5.8.1.4. Methods of Calculating ASTC. The technical concepts, terminology, and calculation procedures relating to the detailed and simplified ASTC calculation methods are discussed in detail, with numerous worked examples, in the NRC publication entitled "Guide to Calculating Airborne Sound Transmission in Buildings." This Guide includes references to readily-available sources of pertinent data.

For many common constructions, the calculations required by Article 5.8.1.4. can be performed using software tools, such as soundPATHS, which is available on NRC's Web site.

The simplified calculation method may not always identify the prominent flanking paths. Furthermore, it corresponds more closely with the results of the detailed calculation method where the separating assembly and the flanking constructions are both constructed according to the same method, i.e. either both are lightweight construction (steel or wood framing) or both are heavyweight construction (masonry or concrete).

A-5.9.1.1.(1) Selection of Materials and Components and Compliance with Referenced Standards. It is important to note that Sentence 5.9.1.1.(1) is stated in such a way that the selection of materials and components is not limited to those traditionally recognized as serving particular functions or those for which a standard is identified in Table 5.9.1.1. This approach permits more flexibility than is provided by similar requirements in Part 9. As long as the selected material meets the performance requirements stated elsewhere in Part 5, the material may be used to serve the required function.

However, where the selected material or component, or its installation, falls within the scope of any of the standards listed in Table 5.9.1.1., the material, component or installation must comply with that standard. For example, if some resistance to heat transfer is required between two interior spaces and standard partition construction will provide the necessary resistance, the installation of one of the "thermal insulation" materials identified in the standard list is not required. If, on the other hand, one decides to install glass fibre insulation, the material must conform to CAN/ULC-S702, "Mineral Fibre Thermal Insulation for Buildings."

A-Table 5.9.1.1. Selection and Installation of Sealants. Analysis of many sealant joint failures indicates that the majority of failures can be attributed to improper joint preparation and deficient installation of the sealant and various joint components. The following ASTM guidelines describe several aspects that should be considered when applying sealants in unprotected environments to achieve a durable application:

- ASTM C 1193, "Use of Joint Sealants,"
- ASTM C 1299, "Selection of Liquid-Applied Sealants," and
- ASTM C 1472, "Calculating Movement and Other Effects When Establishing Sealant Joint Width."

The sealant manufacturer's literature should always be consulted for recommended procedures and materials.

Part 6

Heating, Ventilating and Air-conditioning

Section 6.1. General

6.1.1. Application

6.1.1.1. Scope

- 1) The scope of this Part shall be as described in Subsection 1.3.3. of Division A.

6.1.1.2. Application

- 1) This Part applies to systems and equipment for heating, ventilating and air-conditioning services.

6.1.2. Definitions

6.1.2.1. Defined Terms

- 1) Words that appear in italics are defined in Article 1.4.1.2. of Division A.

6.1.3. Plans and Specifications

6.1.3.1. Required Plans and Specifications

- 1) Plans, specifications and other information for heating, ventilating and air-conditioning systems shall conform to Subsection 2.2.6. of Division C.

Section 6.2. Planning

6.2.1. General

6.2.1.1. Good Engineering Practice

(See Note A-6.2.1.1.)

- 1) Heating, ventilating and air-conditioning systems, including mechanical refrigeration equipment, shall be designed, constructed and installed in conformance with good engineering practice such as that described in, but not limited to,
 - a) the ASHRAE Handbooks and Standards,
 - b) the HRAI Digest,
 - c) the Hydronics Institute Manuals,
 - d) the NFPA Standards,
 - e) the SMACNA Manuals,
 - f) "Industrial Ventilation: A Manual of Recommended Practice for Design" published by the ACGIH,
 - g) CSA B214, "Installation Code for Hydronic Heating Systems,"
 - h) CAN/CSA-Z317.2, "Special Requirements for Heating, Ventilation, and Air-Conditioning (HVAC) Systems in Health Care Facilities," and
 - i) EPA 625/R-92/016, "Radon Prevention in the Design and Construction of Schools and Other Large Buildings."

6.2.1.2. Outdoor Design Conditions

- 1) The outdoor conditions to be used in designing heating, ventilating and air-conditioning systems shall be determined in conformance with Subsection 1.1.3.
- 2) Except as provided in Sentence 6.3.2.14.(1), the outdoor air quality conditions of the geographic area of the *building* site to be used in designing ventilation systems shall conform to appropriate provincial or territorial requirements or, in the absence of such requirements, shall be equal to or less than the maximum acceptable levels stated in the Canada-wide Standards for Particulate Matter (PM) and Ozone as follows:
 - a) a 24 hour average of 30 µg/m³ for particulate matter that is 2.5 µm or less in diameter (PM_{2.5}), and
 - b) an 8 hour average of 65 ppb for ground-level ozone.(See Note A-6.2.1.2.(2).)
- 3) The outdoor air quality conditions of the local area of the *building* site to be used in designing ventilation systems shall conform to appropriate provincial or territorial requirements or, in the absence of such requirements, to the requirements of Sentence 6.3.2.14.(2). (See Note A-6.2.1.2.(3).)

6.2.1.3. Expansion, Contraction and System Pressure

- 1) Heating and cooling systems shall be designed to allow for expansion and contraction of the heat transfer fluid and to maintain the system pressure within the rated working pressure limits of all components of the system.

6.2.1.4. Structural Movement

(See Note A-6.2.1.4.)

- 1) Mechanical systems and equipment shall be designed and installed to accommodate the maximum relative structural movement provided for in the construction of the *building*.

6.2.1.5. Installation Standards

- 1) Except as provided in Articles 6.9.4.2. and 6.3.1.5., the installation of heating and air-conditioning equipment, including mechanical refrigeration equipment, and including provisions for mounting, clearances and air supply, shall conform to appropriate provincial or territorial requirements or, in the absence of such requirements, to the requirements of
 - a) CSA B51, "Boiler, Pressure Vessel, and Pressure Piping Code,"
 - b) CSA B52, "Mechanical Refrigeration Code,"
 - c) CSA B139, "Installation Code for Oil-Burning Equipment,"
 - d) CSA B149.1, "Natural Gas and Propane Installation Code,"
 - e) CSA B365, "Installation Code for Solid-Fuel-Burning Appliances and Equipment," or
 - f) CSA C22.1, "Canadian Electrical Code, Part I."

6.2.1.6. Installation – General

- 1) Equipment requiring periodic maintenance and forming part of a heating, ventilating or air-conditioning system shall be installed with provision for access for inspection, maintenance, repair and cleaning. (See Note A-6.2.1.6.(1).)
- 2) Mechanical equipment shall be provided with guards so as to prevent injury.
- 3) Heating, ventilating or air-conditioning systems shall be protected from freezing if they may be adversely affected by freezing temperatures.

6.2.1.7. Asbestos

- 1) Asbestos shall not be used in HVAC systems and equipment.

- c) have no disconnect switch between the overcurrent device and the CO alarm, where the CO alarm is powered by the electrical system serving the *suite* (see Note A-6.9.3.1.(2)(c)), and
 - d) be mechanically fixed at a height above the floor as recommended by the manufacturer.
- 3)** Where a fuel-burning *appliance* is installed in a *suite* of *residential occupancy* or in a *suite* of *care occupancy*, a CO alarm shall be installed
- a) inside each bedroom, or
 - b) outside each bedroom, within 5 m of each bedroom door, measured following corridors and doorways.
- 4)** Where a fuel-burning *appliance* is installed in a *service room* that is not in a *suite* of *residential occupancy* nor in a *suite* of *care occupancy*, a CO alarm shall be installed
- a) either inside each bedroom, or if outside, within 5 m of each bedroom door, measured following corridors and doorways, in every *suite* of *residential occupancy* or *suite* of *care occupancy* that shares a wall or floor/ceiling assembly with the *service room*, and
 - b) in the *service room*.
- 5)** For each *suite* of *residential occupancy* or *suite* of *care occupancy* that shares a wall or floor/ceiling assembly with a *storage garage* or that is adjacent to an attic or crawl space to which the *storage garage* is also adjacent, a CO alarm shall be installed
- a) inside each bedroom, or
 - b) outside each bedroom, within 5 m of each bedroom door, measured following corridors and doorways.

6.9.4. Ash Storage

6.9.4.1. Ash Storage Bins

- 1)** Every ash storage bin shall be constructed of *noncombustible* material.
- 2)** Every opening in an ash storage bin shall be protected by a tight-fitting metal door with metal frame securely fastened to the bin.

6.9.4.2. Fireplaces

- 1)** Fireplaces shall conform to the requirements of Section 9.22.

Section 6.10. Objectives and Functional Statements

6.10.1. Objectives and Functional Statements

6.10.1.1. Attributions to Acceptable Solutions

- 1)** For the purpose of compliance with this Code as required in Clause 1.2.1.1.(1)(b) of Division A, the objectives and functional statements attributed to the acceptable solutions in this Part shall be the objectives and functional statements listed in Table 6.10.1.1. (See Note A-1.1.2.1.(1).)

Table 6.10.1.1.
Objectives and Functional Statements Attributed to the
Acceptable Solutions in Part 6
 Forming Part of Sentence 6.10.1.1.(1)

Functional Statements and Objectives ⁽¹⁾	
6.2.1.1. Good Engineering Practice	
(1)	(a) to (e) [F31,F51-OP1.1]
	(a) to (c) and (e) to (i) [F40,F50,F51,F52,F54,F63-OH1.1]
	(a),(b),(c),(e),(f),(g),(h) [F50,F51,F52,F54,F63-OH1.2,OH1.3]
	[F31,F50,F51,F52,F54,F63-OS3.2,OS3.4]
	(d) [F01-OS1.1]
6.2.1.2. Outdoor Design Conditions	
(2)	[F40,F50-OH1.1]
(3)	[F40,F43,F44,F50-OH1.1]
	[F44-OS3.4]
6.2.1.3. Expansion, Contraction and System Pressure	
(1)	[F20-OS3.2]
6.2.1.4. Structural Movement	
(1)	[F23-OS3.1]
	[F51,F63,F50-OH1.1,OH1.2,OH1.3]
6.2.1.5. Installation Standards	
(1)	[F43-OS1.1]
	[F43-OS3.4]
	[F43-OP1.1]
6.2.1.6. Installation – General	
(1)	[F82-OS1.1]
	[F82-OS3.4]
	[F82-OP1.1]
(2)	[F31-OS3.1]
(3)	[F81-OS3.2,OS3.3,OS3.4]
	[F81-OS1.1]
6.2.1.7. Asbestos	
(1)	[F43-OH1.1]
6.2.2.1. Applicable Standard	
(1)	[F81-OS1.1]
6.2.3.1. Solid Fuel Storage Bins	
(1)	[F30-OH2.1]
(2)	[F01-OS1.1]
	[F01-OP1.1]
6.3.1.1. Required Ventilation	
(1)	[F50,F31,F63,F51,F54,F52-OS1.1]
	[F50,F31,F63,F51,F54,F52-OP1.1]
(2)	[F50-OH1.1]
6.3.1.2. Crawl Spaces and Attic or Roof Spaces	
(1)	[F61,F63,F41-OH1.1,OH1.3]

Table 6.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
6.3.1.3. Natural Ventilation	
(1)	[F50-OH1.1]
(2)	[F50-OH1.1]
6.3.1.4. Ventilation of Storage Garages	
(1)	[F50,F44-OS3.4]
(2)	[F44-OS3.4]
(3)	[F44-OS3.4]
(4)	[F50,F44-OS3.4]
(5)	[F50,F44-OH1.1]
	[F50,F44-OS3.4]
6.3.1.6. Indoor Air Contaminants	
(1)	[F44-OS3.4]
	[F44-OH1.1]
(2)	[F44-OH1.1]
(3)	[F52-OH1.1]
6.3.1.7. Commercial Cooking Equipment	
(1)	[F01,F44-OS1.1]
	[F01,F44-OP1.1]
6.3.2.2. Drain Pans	
(1)	[F41,F44,F50-OH1.1]
6.3.2.3. Materials in Air Duct Systems	
(2)	[F20,F80-OH1.1,OH1.2]
(3)	[F81,F44-OS3.4]
	[F81-OH1.1]
(4)	[F20,F80-OH1.1,OH1.2]
6.3.2.4. Connections in Air Duct Systems	
(1)	[F81-OH1.1,OH1.2]
	[F81,F44-OS3.4]
6.3.2.5. Duct Coverings and Linings	
(2)	[F81-OH1.1,OH1.2]
	[F81-OS1.1]
	[F81-OP1.1]
6.3.2.7. Interconnection of Systems	
(1)	[F44-OS1.1]
	[F40-OH1.1]
(2)	[F81,F44-OH1.1]
	[F81,F44-OS1.1]
	[F81,F44-OP1.1]
(3)	[F81,F44-OH1.1]
6.3.2.8. Makeup Air	
(1)	[F50,F81-OH1.1]
	[F44,F81-OS3.4]

Table 6.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	[F81-OH1.1] [F81,F44-OS3.4]
(3)	[F81-OH1.2]
6.3.2.9. Supply, Return, Intake and Exhaust Air Openings	
(1)	[F30-OS3.1] [F81-OH1.2]
(2)	[F81-OH1.1] [F81,F44-OS3.4] [F41,F44-OH1.1]
(3)	[F44,F81-OH1.1] [F44,F81-OS3.4]
(4)	[F81-OH1.1]
(5)	[F82,F81-OH1.1] [F82-OS3.4]
6.3.2.10. Exhaust Ducts and Outlets	
(1)	[F44-OH1.1]
(2)	[F44-OH1.1]
(3)	[F81-OH1.1] [F81-OH1.2]
(4)	[F81-OH1.1] [F81-OH1.2]
(5)	[F81-OH1.1]
(6)	[F81-OH1.1]
(7)	[F81-OS1.1]
(8)	[F52-OH1.1] [F01-OS1.1] [F01-OP1.1]
(9)	[F52-OH1.1]
(10)	[F81-OH1.1]
(11)	[F81,F44-OH1.1] [F81,F44-OS1.1]
(12)	[F81,F44-OH1.1]
(13)	[F81-OH1.2] [F81,F44-OH1.1]
6.3.2.11. Return-Air System	
(3)	[F10-OS1.5]
6.3.2.12. Underground Ducts	
(1)	(a) [F44,F81-OH1.2,OH1.3] (b) [F44,F81-OH1.1] (c) [F44,F81-OH1.1]
(2)	[F81-OH1.1,OH1.2,OH1.3]

Table 6.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
6.3.2.13. Filters	
(1)	[F80-OS1.1] [F80-OP1.1]
(2)	[F30-OS3.3] [F81,F43-OH1.1]
6.3.2.14. Cleaning Devices	
(1)	[F40,F50-OH1.1]
(2)	[F40,F43,F44,F50-OH1.1] [F44-OS3.4]
6.3.2.15. Evaporative Cooling Towers, Evaporative Fluid Coolers and Evaporative Condensers	
(2)	[F41,F44-OH1.1]
(3)	[F46,F81-OH2.2]
(4)	[F41,F44-OH1.1] [F46,F81-OH2.2]
(5)	[F81-OH2.1]
(6)	[F82-OH1.1]
6.3.2.16. Evaporative Air Coolers, Misters, Atomizers, Air Washers and Humidifiers	
(1)	[F80,F81-OS1.1] [F80,F81-OP1.1]
(2)	[F82-OH1.1]
(3)	[F44-OH1.1]
6.3.2.17. Fans and Associated Air-Handling Equipment	
(1)	[F81,F44-OH1.1] [F81,F44-OS3.4]
(2)	[F81-OH1.1]
6.3.3.1. Requirement for Venting	
(2)	[F40,F44,F50-OH1.1]
6.3.3.2. Masonry or Concrete Chimneys	
(2)	[F01-OS1.1] [F01-OP1.1]
6.3.3.3. Metal Smoke Stacks	
(1)	[F01-OS1.1] [F01-OP1.1]
6.3.3.4. Access Ladders	
(1)	[F20,F80-OS3.1]
(2)	[F30-OS3.1]
6.3.4.2. General Ventilation	
(1)	[F01-OS1.1] [F01-OP1.1] [F02-OP1.2] [F02-OS1.2] [F81,F82-OS1.1]
(2)	[F11,F81-OS1.1]

Table 6.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
6.3.4.3. Enclosure Exhaust Ventilation	
(1)	(a),(c),(d) [F01-OS1.1]
	(b) [F02-OP1.2]
	(e) [F12-OP1.1,OP1.2]
	(a) [F02-OP1.2]
	(b) [F02-OS1.2] [F81-OS1.1]
	(e) [F12-OS1.1,OS1.2]
	(a) [F02-OS1.2]
	(a) [F01-OS1.1]
6.3.4.4. Enclosure Construction	
(1)	(a) [F02-OS1.2] Applies to portion of Code text: "... be constructed of <i>noncombustible</i> materials ..."
	(b) [F02-OP1.2]
	(a) [F02-OP1.2] Applies to portion of Code text: "... be constructed of <i>noncombustible</i> materials ..."
	(a) [F80-OS3.4] Applies to portion of Code text: "... be constructed of ... materials ... chemically resistant to the <i>dangerous goods</i> vapours and particles being exhausted ..."
	(b) [F02-OS1.2] [F82-OS1.1]
	(a) [F80-OS1.1] Applies to portion of Code text: "... be constructed of ... materials ... chemically resistant to the <i>dangerous goods</i> vapours and particles being exhausted ..."
	(a) [F01-OS1.1] Applies to portion of Code text: "... be constructed of ... materials compatible with ... the <i>dangerous goods</i> vapours and particles being exhausted ..."
(3)	[F02-OS1.2]
	[F02-OP1.2]
6.4.1.2. Appliances Installed Outside the Building	
(1)	[F81-OP1.1]
	[F81-OH1.1]
	[F81-OS1.1]
6.4.2.1. Clearances	
(1)	[F01-OP1.1]
	[F01-OS1.1]
6.4.3.1. Lining or Backing	
(1)	[F01-OS1.1]
	[F01-OP1.1]
(2)	[F01-OS1.1]
6.5.1.1. Insulation and Coverings	
(2)	[F20,F30-OS3.2,OS3.4]
(3)	[F31-OS3.2]
6.6.1.1. Cooling Units	
(1)	[F43,F81-OS3.4]
6.7.1.1. Piping Materials and Installation	
(1)	[F20-OS3.2,OS3.4]
(2)	[F21-OH1.1]

Table 6.10.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(3)	[F20-OS2.2]
6.7.1.2. Clearances	
(1)	[F01-OS1.1]
	[F01-OP1.1]
6.7.1.3. Surface Temperature	
(1)	[F31-OS3.2]
6.7.1.4. Protection	
(1)	[F01-OS1.1]
	[F01-OP1.1]
6.7.2.1. Storage Bins	
(1)	[F30,F31,F43-OS3.2,OS3.4]
(2)	[F01-OS1.1]
	[F01-OP1.1]
6.8.1.1. Access Openings	
(1)	[F36-OS3.6]
6.8.1.2. Openings in Air Duct Systems	
(1)	[F81-OH1.1,OH1.2]
	[F81,F44-OS3.4]
(2)	[F82-OS1.1]
6.8.1.3. Odour Removal Equipment	
(1)	[F82-OH1.1]
(2)	[F82-OH1.1]
6.9.1.2. Hazardous Gases, Dusts or Liquids	
(1)	[F01-OP1.1]
	[F01-OS1.1]
(2)	[F01-OS1.1]
	[F01-OP1.1]
6.9.1.3. Commercial Cooking Equipment	
(1)	[F02,F81-OS1.2]
	[F02,F81-OP1.2]
6.9.3.1. Carbon Monoxide Alarms	
(2)	(a),(b),(d) [F44-OS3.4]
	(c) [F81-OS3.4]
(3)	[F44-OS3.4]
(4)	[F44-OS3.4]
(5)	[F44-OS3.4]
6.9.4.1. Ash Storage Bins	
(1)	[F01-OS1.1]
	[F01-OP1.1]
(2)	[F01-OS1.1]
	[F01-OP1.1]

Notes to Table 6.10.1.1.:⁽¹⁾ See Parts 2 and 3 of Division A.

The 2.5% January design temperature is the value ordinarily used in the design of heating systems. In special cases, when the control of inside temperature is more critical, the 1% value may be used. Other temperature-dependent climatic design parameters may be considered for future issues of this document.

July Design Temperatures

A building and its cooling and dehumidifying system should be designed to maintain the inside temperature and humidity at certain pre-determined levels. To achieve this, it is necessary to know the most severe weather conditions under which the system is expected to function satisfactorily. Failure to maintain the inside temperature and humidity at the pre-determined levels will usually not be serious if the increases in temperature and humidity are not great and the duration is not long. The outside conditions used for design should, therefore, not be the most severe in many years, but should be the somewhat less severe conditions that are occasionally but not greatly exceeded.

The summer design temperatures in this Appendix are based on an analysis of July air temperatures and humidities. Wind and solar radiation also affect the inside temperature of most buildings and may, in some cases, be more important than the outside air temperature. More complete summer and winter design information can be obtained from Environment Canada.

The July design dry-bulb and wet-bulb temperatures were reviewed and updated using hourly temperature observations from 480 stations for a 25-year period up to 2006. These data are consistent with data shown for Canadian locations in the 2009 Handbook of Fundamentals⁽³⁾ published by ASHRAE. As with January design temperatures, data from the most recent 25-year period were analyzed to reflect any recent climatic changes or variations. The 2.5% values used for the dry- and wet-bulb design conditions represent percentiles of the cumulative frequency distribution of hourly dry- and wet-bulb temperatures and correspond to July temperatures that are higher for 19 hours on average over the long term.

Heating Degree-Days

The rate of consumption of fuel or energy required to keep the interior of a small building at 21°C when the outside air temperature is below 18°C is roughly proportional to the difference between 18°C and the outside temperature. Wind speed, solar radiation, the extent to which the building is exposed to these elements and the internal heat sources also affect the heat required and may have to be considered for energy-efficient design. For average conditions of wind, radiation, exposure, and internal sources, however, the proportionality with the temperature difference generally still holds.

Since the fuel required is also proportional to the duration of the cold weather, a convenient method of combining these elements of temperature and time is to add the differences between 18°C and the mean temperature for every day in the year when the mean temperature is below 18°C. It is assumed that no heat is required when the mean outside air temperature for the day is 18°C or higher.

Although more sophisticated computer simulations using other forms of weather data have now almost completely replaced degree-day-based calculation methods for estimating annual heating energy consumption, degree-days remain a useful indicator of relative severity of climate and can form the basis for certain climate-related Code requirements.

The degree-days below 18°C were compiled for 1300 stations for the 25-year period ending in 2006. This analysis period is consistent with the one used to derive the design temperatures described above and with the approach used by ASHRAE.⁽³⁾

A difference of only one Celsius degree in the mean annual temperature will cause a difference of 250 to 350 in the Celsius degree-days. Since differences of 0.5 of a Celsius degree in the mean annual temperature are quite likely to occur between two stations in the same town, heating degree-days cannot be relied on to an accuracy of less than about 100 degree-days.

Heating degree-day values for the core areas of larger cities can be 200 to 400 degree-days less (warmer) than for the surrounding fringe areas. The observed degree-days, which are based on daily temperature observations, are often most representative of rural settings or the fringe areas of cities.

Climatic Data for Energy Consumption Calculations

The climatic elements tabulated in this Appendix represent commonly used design values but do not include detailed climatic profiles, such as hourly weather data. Where hourly values of weather data are needed for the purpose of simulating the annual energy consumption of a building, they can be obtained from multiple sources, such as Environment Canada, Natural Resources Canada, the Regional Conservation Authority and

other such public agencies that record this information. Hourly weather data are also available from public and private agencies that format this information for use with annual energy consumption simulation software; in some cases, these data have been incorporated into the software.

Snow Loads

The roof of a building should be able to support the greatest weight of snow that is likely to accumulate on it in many years. Some observations of snow on roofs have been made in Canada, but not enough to form the basis for estimating roof snow loads throughout the country. Similarly, observations of the weight, or water equivalent, of the snow on the ground have not been available in digital form in the past. The observations of roof loads and water equivalents are very useful, as noted below, but the measured depth of snow on the ground is used to provide the basic information for a consistent set of snow loads.

The estimation of the design snow load on a roof from snow depth observations involves the following steps:

1. The depth of snow on the ground, which has an annual probability of exceedance of 1-in-50, is computed.
2. The appropriate specific weight is selected and used to convert snow depth to loads, S_s .
3. The load, S_r , which is due to rain falling on the snow, is computed.
4. Because the accumulation of snow on roofs is often different from that on the ground, adjustments are applied to the ground snow load to provide a design snow load on a roof.

The annual maximum depth of snow on the ground has been assembled for 1618 stations for which data has been recorded by the Atmospheric Environment Service (AES). The period of record used varied from station to station, ranging from 7 to 38 years. These data were analyzed using a Gumbel extreme value distribution fitted using the method of moments⁽⁴⁾ as reported by Newark et al.⁽⁵⁾ The resulting values are the snow depths, which have a probability of 1-in-50 of being exceeded in any one year.

The specific weight of old snow generally ranges from 2 to 5 kN/m³, and it is usually assumed in Canada that 1 kN/m³ is the average for new snow. Average specific weights of the seasonal snow pack have been derived for different regions across the country⁽⁶⁾ and an appropriate value has been assigned to each weather station. Typically, the values average 2.01 kN/m³ east of the continental divide (except for 2.94 kN/m³ north of the treeline), and range from 2.55 to 4.21 kN/m³ west of the divide. The product of the 1-in-50 snow depth and the average specific weight of the seasonal snow pack at a station is converted to the snow load (SL) in units of kilopascals (kPa).

Except for the mountainous areas of western Canada, the values of the ground snow load at AES stations were normalized assuming a linear variation of the load above sea level in order to account for the effects of topography. They were then smoothed using an uncertainty-weighted moving-area average in order to minimize the uncertainty due to snow depth sampling errors and site-specific variations. Interpolation from analyzed maps of the smooth normalized values yielded a value for each location in Table C-2, which could then be converted to the listed code values (S_s) by means of an equation in the form:

$$S_s = \text{smooth normalized SL} + bZ$$

where b is the assumed rate of change of SL with elevation at the location and Z is the location's elevation above mean sea level (MSL). Although they are listed in Table C-2 to the nearest tenth of a kilopascal, values of S_s typically have an uncertainty of about 20%. Areas of sparse data in northern Canada were an exception to this procedure. In these regions, an analysis was made of the basic SL values. The effects of topography, variations due to local climates, and smoothing were all subjectively assessed. The values derived in this fashion were used to modify those derived objectively.

For the mountainous areas of British Columbia, Yukon, and the foothills area of Alberta, a more complex procedure was required to account for the variation of loads with terrain and elevation. Since the AES observational network often does not have sufficient coverage to detail this variability in mountainous areas, additional snow course observations were obtained from the provincial and territorial governments of British Columbia, Yukon, and Alberta. The additional data allowed detailed local analysis of ground snow loads on a valley-by-valley basis. Similar to other studies, the data indicated that snow loads above a critical or reference level increased according to either a linear or quadratic relation with elevation. The determination of whether the increase with elevation was linear or quadratic, the rate of the increase and the critical or reference elevation were found to be specific to the valley and mountain ranges considered. At valley levels below the critical elevation, the loads generally varied less significantly with elevation. Calculated valley- and range-specific regression relations were then used to describe the increase of load with elevation and to normalize the AES snow observations to a critical or reference level. These normalized values were smoothed using a weighted moving-average.

Appendix D

Fire-Performance Ratings

Section D-1 General

The content of this Appendix was prepared on the recommendations of the Standing Committee on Fire Protection, which was established by the Canadian Commission on Building and Fire Codes (CCBFC) for this purpose.

D-1.1. Introduction

D-1.1.1. Scope

- 1)** This fire-performance information is presented in a form closely linked to the performance requirements and the minimum materials specifications of this Code.
- 2)** The ratings have been assigned only after careful consideration of all available literature on assemblies of common building materials, where they are adequately identified by description. The assigned values based on this information will, in most instances, be conservative when compared to the ratings determined on the basis of actual tests on individual assemblies.
- 3)** The fire-performance information set out in this Appendix applies to materials and assemblies of materials that comply in all essential details with the minimum structural design standards described in Part 4. Additional requirements, where appropriate, are described in other Sections of this Appendix.
- 4)** Section D-2 assigns fire-resistance ratings for walls, floors, roofs, columns and beams related to CAN/ULC-S101, "Fire Endurance Tests of Building Construction and Materials," and describes methods for determining these ratings.
- 5)** Section D-3 assigns flame-spread ratings and smoke developed classifications for surface materials related to CAN/ULC-S102, "Test for Surface Burning Characteristics of Building Materials and Assemblies," and CAN/ULC-S102.2, "Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies."
- 6)** Section D-4 describes noncombustibility in building materials when tested in accordance with CAN/ULC-S114, "Test for Determination of Non-Combustibility in Building Materials."
- 7)** Section D-5 contains requirements for the installation of fire doors and fire dampers in fire-rated stud wall assemblies.
- 8)** Section D-6 contains background information regarding fire test reports, obsolete materials and assemblies, assessment of archaic assemblies and the development of the component additive method.

D-1.1.2. Referenced Documents

- 1)** Where documents are referenced in this Appendix, they shall be the editions designated in Table D-1.1.2.

This information is included for explanatory purposes only and does not form part of the requirements. The bold face reference numbers that introduce each item do not relate to specific requirements in this Division.

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

Issuing Agency	Document Number ⁽¹⁾	Title of Document ⁽²⁾	Code Reference
ANSI	A208.1-2009	Particleboard	D-3.1.1.
ASTM	C 330/C 330M-13	Lightweight Aggregates for Structural Concrete	D-1.4.3.
ASTM	C 840-13	Application and Finishing of Gypsum Board	D-2.3.9.
ASTM	C 1396/C 1396M-14	Gypsum Board	D-1.5.1. D-3.1.1.
CCBFC	NRCC 30629	Supplement to the National Building Code of Canada 1990	D-6.2. D-6.3. D-6.4.
CGSB	4-GP-36M-1978	Carpet Underlay, Fiber Type	D-3.1.1.
CGSB	CAN/CGSB-4.129-97	Carpets for Commercial Use	D-3.1.1.
CGSB	CAN/CGSB-11.3-M87	Hardboard	D-3.1.1.
CGSB	CAN/CGSB-92.2-M90	Trowel or Spray Applied Acoustical Material	D-2.3.4.
CSA	A23.1-14/A23.2-14	Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete	D-1.4.3.
CSA	A23.3-14	Design of Concrete Structures	D-2.1.5. D-2.6.6. D-2.8.2.
CSA	CAN/CSA-A82-14	Fired Masonry Brick Made from Clay or Shale	D-2.6.1.
CSA	A82.22-M1977	Gypsum Plasters	D-3.1.1.
CSA	CAN/CSA-A82.27-M91	Gypsum Board	D-1.5.1. D-3.1.1.
CSA	A82.30-M1980	Interior Furring, Lathing and Gypsum Plastering	D-1.7.2. D-2.3.9. D-2.5.1.
CSA	A165.1-14	Concrete Block Masonry Units	D-2.1.1.
CSA	O86-14	Engineering Design in Wood	D-2.11.2.
CSA	O112.10-08	Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure)	D-2.3.6.
CSA	O121-08	Douglas Fir Plywood	D-3.1.1.
CSA	O141-05	Softwood Lumber	D-2.3.6. D-2.4.1.
CSA	O151-09	Canadian Softwood Plywood	D-3.1.1.
CSA	O153-13	Poplar Plywood	D-3.1.1.
CSA	O325-07	Construction Sheathing	D-3.1.1.
CSA	O437.0-93	OSB and Waferboard	D-3.1.1.
CSA	S16-14	Design of Steel Structures	D-2.6.6.
NFPA	80-2013	Fire Doors and Other Opening Protectives	D-5.2.1.
ULC	CAN/ULC-S101-14	Fire Endurance Tests of Building Construction and Materials	D-1.1.1. D-1.12.1. D-2.3.2.
ULC	CAN/ULC-S102-10	Test for Surface Burning Characteristics of Building Materials and Assemblies	D-1.1.1.
ULC	CAN/ULC-S102.2-10	Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies	D-1.1.1. D-3.1.1.
ULC	CAN/ULC-S112.2-07	Fire Test of Ceiling Firestop Flap Assemblies	D-2.3.10. D-2.3.11.

Table D-1.1.2. (Continued)

Issuing Agency	Document Number ⁽¹⁾	Title of Document ⁽²⁾	Code Reference
ULC	CAN/ULC-S114-05	Test for Determination of Non-Combustibility in Building Materials	D-1.1.1. D-4.1.1. D-4.2.1.
ULC	CAN/ULC-S702-14	Mineral Fibre Thermal Insulation for Buildings	D-2.3.4. D-2.3.5. D-2.6.1.
ULC	CAN/ULC-S703-09	Cellulose Fibre Insulation for Buildings	D-2.3.4.
ULC	CAN/ULC-S706.1-16	Wood Fibre Insulating Boards for Buildings	D-3.1.1.

Notes to Table D-1.1.2.:

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

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

D-1.1.3. Applicability of Ratings

The ratings shown in this document apply if more specific test values are not available. The construction of an assembly that is the subject of an individual test report must be followed in all essential details if the fire-resistance rating reported is to be applied for use with this Code.

D-1.1.4. Higher Ratings

The authority having jurisdiction may allow higher fire-resistance ratings than those derived from this Appendix, where supporting evidence justifies a higher rating. Additional information is provided in summaries of published test information and the reports of fire tests carried out by NRC, which are included in Section D-6, Background Information.

D-1.1.5. Additional Information on Fire Rated Assemblies

Assemblies containing materials for which there is no nationally recognized standard are not included in this Appendix. Many such assemblies have been rated by Underwriters Laboratories (UL), Underwriters' Laboratories of Canada (ULC), or Intertek Testing Services NA Ltd. (ITS).

D-1.2. Interpretation of Test Results**D-1.2.1. Limitations**

1) The fire-performance ratings set out in this Appendix are based on those that would be obtained from the standard methods of test described in the Code. The test methods are essentially a means of comparing the performance of one building component or assembly with another in relation to its performance in fire.

2) Since it is not practicable to measure the fire resistance of constructions in situ, they must be evaluated under some agreed test conditions. A specified fire-resistance rating is not necessarily the actual time that the assembly would endure in situ in a building fire, but is that which the particular construction must meet under the specified methods of test.

3) Considerations arising from departures in use from the conditions established in the standard test methods may, in some circumstances, have to be taken into account by the designer and the authority having jurisdiction. Some of these conditions are covered at present by the provisions of the Code.

4) For walls and partitions, the stud spacings previously specified as 16 or 24 inch have been converted to 400 and 600 mm, respectively, for consistency with other metric values; however, the use of equivalent imperial dimensions for stud spacing is permitted.

D-1.3. Concrete**D-1.3.1. Aggregates in Concrete**

Low density aggregate concretes generally exhibit better fire performance than natural stone aggregate concretes. A series of tests on concrete masonry walls, combined with mathematical analysis of the test results, has allowed further distinctions between certain low density aggregates to be made.

D-1.4. Types of Concrete**D-1.4.1. Description**

- 1) For purposes of this Appendix, concretes are described as Types S, N, L, L₁, L₂, L40S, L₁20S or L₂20S as described in Sentences (2) to (8).
- 2) Type S concrete is the type in which the coarse aggregate is granite, quartzite, siliceous gravel or other dense materials containing at least 30% quartz, chert or flint.
- 3) Type N concrete is the type in which the coarse aggregate is cinders, broken brick, blast furnace slag, limestone, calcareous gravel, trap rock, sandstone or similar dense material containing not more than 30% of quartz, chert or flint.
- 4) Type L concrete is the type in which all the aggregate is expanded slag, expanded clay, expanded shale or pumice.
- 5) Type L₁ concrete is the type in which all the aggregate is expanded shale.
- 6) Type L₂ concrete is the type in which all the aggregate is expanded slag, expanded clay or pumice.
- 7) Type L40S concrete is the type in which the fine portion of the aggregate is sand and low density aggregate in which the sand does not exceed 40% of the total volume of all aggregates in the concrete.
- 8) Type L₁20S and Type L₂20S concretes are the types in which the fine portion of the aggregate is sand and low density aggregate in which the sand does not exceed 20% of the total volume of all aggregates in the concrete.

D-1.4.2. Determination of Ratings

Where concretes are described as being of Type S, N, L, L₁ or L₂, the rating applies to the concrete containing the aggregate in the group that provides the least fire resistance. If the nature of an aggregate cannot be determined accurately enough to place it in one of the groups, the aggregate shall be considered as being in the group that requires a greater thickness of concrete for the required fire resistance.

D-1.4.3. Description of Aggregates

- 1) The descriptions of the aggregates in Type S and Type N concretes apply to the coarse aggregates only. Coarse aggregate for this purpose means that retained on a 5 mm sieve using the method of grading aggregates described in CSA A23.1/A23.2, "Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete."
- 2) Increasing the proportion of sand as fine aggregate in low density concretes requires increased thicknesses of material to produce equivalent fire-resistance ratings. Low density aggregates for Type L and Types L-S concretes used in loadbearing components shall conform to ASTM C 330/C 330M, "Lightweight Aggregates for Structural Concrete."
- 3) Non-loadbearing low density components of vermiculite and perlite concrete, in the absence of other test evidence, shall be rated on the basis of the values shown for Type L concrete.

D-1.5. Gypsum Board**D-1.5.1. Types of Gypsum Board**

- 1) Where the term "gypsum board" is used in this Appendix, it is intended to include—in addition to gypsum board—gypsum backing board and gypsum base for veneer plaster as described in
 - a) CAN/CSA-A82.27-M, "Gypsum Board," or
 - b) ASTM C 1396/C 1396M, "Gypsum Board."

D-3.1.6. Limitations and Conditions

1) The propagation of flame along a surface in the standard test involves some finite depth of the material or materials behind the surface, and this involvement extends to the depth to which temperature variations are to be found during the course of the test; for many commonly used lining materials, such as wood, the depth involved is about 25 mm.

2) For all the combustible materials described in Table D-3.1.1.-A, a minimum dimension is shown, and this represents the thickness of the test samples on which the rating has been based; when used in greater thicknesses than that shown, these materials may have a slightly lower flame-spread rating, and thinner specimens may have higher flame-spread ratings.

3) No rating has been included for foamed plastic materials because it is not possible at this time to identify these products with sufficient accuracy on a generic basis. Materials of this type that melt when exposed to the test flame generally show an increase in flame-spread rating as the thickness of the test specimen increases.

D-3.1.7. Referenced Standards

In Tables D-3.1.1.-A and D-3.1.1.-B, the standards applicable to the materials described are noted because the ratings depend on conformance with these specifications.

Section D-4 Noncombustibility

D-4.1. Test Method**D-4.1.1. Determination of Noncombustibility**

1) Noncombustibility is required of certain components of buildings by the provisions of this Code, which specifies noncombustibility by reference to CAN/ULC-S114, "Test for Determination of Non-Combustibility in Building Materials."

2) The test to which reference is made in Sentence (1) is severe, and it may be assumed that any building material containing even a small proportion of combustibles will itself be classified as combustible. The specimen, 38 mm by 51 mm, is exposed to a temperature of 750°C in a small furnace. The essential criteria for noncombustibility are that the specimen does not flame or contribute to temperature rise.

D-4.2. Materials Classified as Combustible**D-4.2.1. Combustible Materials**

Most materials from animal or vegetable sources will be classed as combustible by CAN/ULC-S114, "Test for Determination of Non-Combustibility in Building Materials," and wood, wood fibreboard, paper, felt made from animal or vegetable fibres, cork, plastics, asphalt and pitch would therefore be classed as combustible.

D-4.2.2. Composite Materials

Materials that consist of combustible and noncombustible elements in combination will in many cases also be classed as combustible, unless the proportion of combustibles is very small. Some mineral wool insulations with combustible binder, cinder concrete, cement and wood chips and wood-fibred gypsum plaster would also be classed as combustible.

D-4.2.3. Effect of Chemical Additives

The addition of a fire-retardant chemical is not sufficient to change a combustible product to a noncombustible product.

D-4.3. Materials Classified as Noncombustible**D-4.3.1. Typical Examples**

Noncombustible materials include brick, ceramic tile, concrete made from Portland cement with noncombustible aggregate, plaster made from gypsum with noncombustible aggregate, metals commonly used in buildings, glass, granite, sandstone, slate, limestone and marble.

Section D-5 Protection of Openings in Fire-Rated Assemblies**D-5.1. Scope****D-5.1.1. Installation Information**

1) The information in this Section specifies requirements for the installation of fire doors and fire dampers in gypsum-board-protected stud wall assemblies.

D-5.2. Installation of Fire Doors and Fire Dampers**D-5.2.1. References**

1) Fire doors and fire dampers in gypsum-board-protected steel stud non-loadbearing walls required to have a fire-resistance rating shall be installed in conformance with Section 9.24. of this Code and the applicable requirements of NFPA 80, "Fire Doors and Other Opening Protectives."

2) Fire doors and fire dampers in gypsum-board-protected wood stud walls required to have a fire-resistance rating shall be installed in conformance with Section 9.23. of this Code and the applicable requirements of NFPA 80, "Fire Doors and Other Opening Protectives."

Section D-6 Background Information**D-6.1. Fire Test Reports**

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

- (1) M. Galbreath, Flame Spread Performance of Common Building Materials. Technical Paper No. 170, Division of Building Research, National Research Council Canada, Ottawa, April 1964. NRCC 7820.
- (2) M. Galbreath and W.W. Stanzak, Fire Endurance of Protected Steel Columns and Beams. Technical Paper No. 194, Division of Building Research, National Research Council Canada, Ottawa, April 1965. NRCC 8379.
- (3) T.Z. Harmathy and W.W. Stanzak, Elevated-Temperature Tensile and Creep Properties of Some Structural and Prestressing Steels. American Society for Testing and Materials, Special Technical Publication 464, 1970, p. 186 (DBR Research Paper No. 424) NRCC 11163.
- (4) T.Z. Harmathy, Thermal Performance of Concrete Masonry Walls in Fire. American Society for Testing and Materials, Special Technical Publication 464, 1970, p. 209 (DBR Research Paper No. 423) NRCC 11161.
- (5) L.W. Allen, Fire Endurance of Selected Non-Loadbearing Concrete Masonry Walls. DBR Fire Study No. 25, Division of Building Research, National Research Council Canada, Ottawa, March 1970. NRCC 11275.
- (6) A. Rose, Comparison of Flame Spread Ratings by Radiant Panel, Tunnel Furnace, and Pittsburgh-Corning Apparatus. DBR Fire Study No. 22, Division of Building Research, National Research Council Canada, Ottawa, June 1969. NRCC 10788.
- (7) T.T. Lie and D.E. Allen, Calculation of the Fire Resistance of Reinforced Concrete Columns. DBR Technical Paper No. 378, Division of Building Research, National Research Council Canada, Ottawa, August 1972. NRCC 12797.
- (8) W.W. Stanzak, Column Covers: A Practical Application of Sheet Steel as a Protective Membrane. DBR Fire Study No. 27, Division of Building Research, National Research Council Canada, Ottawa, February 1972. NRCC 12483.
- (9) W.W. Stanzak, Sheet Steel as a Protective Membrane for Steel Beams and Columns. DBR Fire Study No. 23, Division of Building Research, National Research Council Canada, Ottawa, November 1969. NRCC 10865.

3) *Heat detectors* and *smoke detectors* described in Sentence (2) are not required in *dwelling units* or in *sprinklered buildings* in which the sprinkler system is electrically supervised and equipped with a water flow alarm.

9.10.18.5. Smoke Detectors in Recirculating Air-Handling Systems

1) Except for a recirculating air system serving not more than one *dwelling unit*, where a fire alarm system is required to be installed, every recirculating air-handling system shall be designed to prevent the circulation of smoke upon a signal from a duct-type *smoke detector* where such system supplies more than one *suite* on the same floor or serves more than 1 *storey*.

9.10.18.6. Portions of Buildings Considered as Separate Buildings

1) Except as provided in Sentence (2), where a vertical *fire separation* having a *fire-resistance rating* of not less than 1 h separates a portion of a *building* from the remainder of the *building* and there are no openings through the *fire separation* other than those for piping, tubing, wiring and conduit, the requirements for fire alarm and detection systems may be applied to each portion so separated as if it were a separate *building*.

2) The permission in Sentence (1) to consider separated portions of a *building* as separate *buildings* does not apply to *service rooms* and storage rooms.

9.10.18.7. Central Vacuum Systems

1) Central vacuum cleaning systems serving more than one *suite* or *storey* in *buildings* equipped with a fire alarm system shall be designed to shut down upon activation of the fire alarm system.

9.10.18.8. Open-Air Storage Garages

1) A fire alarm system is not required in a *storage garage* conforming to Article 3.2.2.90. provided there are no other *occupancies* in the *building*.

9.10.19. Smoke Alarms

9.10.19.1. Required Smoke Alarms

1) Except as permitted by Article 9.10.19.8., *smoke alarms* conforming to CAN/ULC-S531, "Smoke Alarms," shall be installed in

- a) each *dwelling unit*,
- b) each sleeping room not within a *dwelling unit*, and
- c) ancillary spaces and common spaces not in *dwelling units* in a house with a *secondary suite*.

9.10.19.2. Sound Patterns of Smoke Alarms

1) The sound patterns of *smoke alarms* shall

- a) meet the temporal patterns of *alarm signals* (see Note A-3.2.4.18.(2)), or
- b) be a combination of temporal pattern and voice relay.

9.10.19.3. Location of Smoke Alarms

1) Within *dwelling units*, sufficient *smoke alarms* shall be installed so that

- a) there is at least one *smoke alarm* installed on each *storey*, including *basements*, and
- b) on any *storey* of a *dwelling unit* containing sleeping rooms, a *smoke alarm* is installed
 - i) in each sleeping room, and
 - ii) in a location between the sleeping rooms and the remainder of the *storey*, and if the sleeping rooms are served by a hallway, the *smoke alarm* shall be located in the hallway.

(See Note A-9.10.19.3.(1).)

2) A *smoke alarm* required by Sentence (1) shall be installed in conformance with CAN/ULC-S553, "Installation of Smoke Alarms."

3) *Smoke alarms* required in Article 9.10.19.1. and Sentence (1) shall be installed on or near the ceiling.

9.10.19.4. Power Supply

1) Except as provided in Sentences (2) and (3), *smoke alarms* described in Sentence 9.10.19.1.(1) shall

- a) be installed with permanent connections to an electrical circuit (see Note A-3.2.4.20.(7)(a)),
- b) have no disconnect switch between the overcurrent device and the *smoke alarm*, and
- c) in case the regular power supply to the *smoke alarm* is interrupted, be provided with a battery as an alternative power source that can continue to provide power to the *smoke alarm* for a period of no less than 7 days in the normal condition, followed by 4 minutes of alarm.

2) Where the *building* is not supplied with electrical power, *smoke alarms* are permitted to be battery-operated.

3) *Suites of residential occupancy* are permitted to be equipped with *smoke detectors* in lieu of *smoke alarms*, provided the *smoke detectors*

- a) are capable of independently sounding audible signals within the individual *suites*,
 - b) except as permitted in Sentence (4), are installed in conformance with CAN/ULC-S524, "Installation of Fire Alarm Systems," and
 - c) form part of the fire alarm system.
- (See Note A-3.2.4.20.(8).)

4) *Smoke detectors* permitted to be installed in lieu of *smoke alarms* as stated in Sentence (3) are permitted to sound localized alarms within individual *suites*, and need not sound an alarm throughout the rest of the *building*.

9.10.19.5. Interconnection of Smoke Alarms

1) Where more than one *smoke alarm* is required in a *dwelling unit*, the *smoke alarms* shall be wired so that the activation of one alarm will cause all alarms within the *dwelling unit* to sound.

2) *Smoke alarms* in a house with a *secondary suite* shall be wirelessly interconnected or interconnected by hard-wiring so that the activation of any one *smoke alarm* causes all *smoke alarms* within the house with a *secondary suite* to sound. (See Note A-9.10.19.5.(2).)

9.10.19.6. Silencing of Smoke Alarms

1) Except as permitted in Sentence (2), a manually operated device shall be incorporated within the circuitry of a *smoke alarm* installed in a *dwelling unit* so that the signal emitted by the *smoke alarm* can be silenced for a period of not more than 10 min, after which the *smoke alarm* will reset and sound again if the level of smoke in the vicinity is sufficient to re-actuate it.

2) *Suites of residential occupancy* equipped with *smoke detectors* installed to CAN/ULC-S524, "Installation of Fire Alarm Systems," which are part of the fire alarm system in lieu of *smoke alarms* as permitted in Sentence 9.10.19.4.(3), need not incorporate the manually operated device required in Sentence (1).

9.10.19.7. Instructions for Maintenance and Care

1) Where instructions are necessary to describe the maintenance and care required for *smoke alarms* to ensure continuing satisfactory performance, they shall be posted in a location where they will be readily available to the occupants for reference.

- iii) a liquid-applied or spray-applied asphalt-based emulsion dampproofing, or
- iv) a type III hot-applied asphalt.

9.13.2.3. Preparation of Surface

- 1) The area in which dampproofing is to be carried out shall be kept free of water during the application and curing of the dampproofing system.
- 2) The surface to be dampproofed shall be prepared in accordance with the instructions of the dampproofing material manufacturer.
- 3) Where the dampproofing material is to be applied on insulating concrete form (ICF) walls, the instructions of the ICF wall manufacturer shall be followed.
- 4) Unit masonry walls to be dampproofed shall be parged on the exterior face below ground level with not less than 6 mm of mortar conforming to Section 9.20. covered over the footing.
- 5) Concrete walls to be dampproofed shall have holes and recesses sealed with cement mortar or a mastic or sealant that is suitable for vertical applications and compatible with the dampproofing material.
- 6) The surface required to be dampproofed shall be clean and dry and free of ice, snow, frost, dust, dirt, oil, grease, cracks, projections and depressions, loose particles and debris that could be detrimental to the performance of the material to be applied.

9.13.2.4. Application of Dampproofing Material

- 1) Exterior dampproofing shall be applied from finished ground level to the top of the exterior of the footing.
- 2) Unless otherwise stated in this Subsection, dampproofing shall be installed in accordance with the manufacturer's instructions with regard to
 - a) surface priming,
 - b) conditions during application,
 - c) application quantity and rate, and
 - d) curing times.
- 3) Joints, cracks and penetrations shall be sealed to maintain the continuity of the dampproofing, where the dampproofing material is not capable of bridging such discontinuities.

9.13.2.5. Moisture Protection for Interior Finishes

(See Note A-9.13.2.5.)

- 1) The interior surface of *foundation* walls below ground level shall be protected by means that minimize the ingress of moisture from the *foundation* wall into interior spaces, where
 - a) a separate interior finish is applied to a concrete or unit masonry wall that is in contact with the *soil*, or
 - b) wood members are placed in contact with such walls for the installation of insulation or finish.
- 2) Except as provided in Sentence (3), where the protection of interior finishes required in Sentence (1) consists of membranes or coatings,
 - a) the membrane or coating shall extend from the *basement* floor surface up to the highest extent of the interior insulation or finish, but not higher than the exterior finished ground level, and
 - b) no membrane or coating with a permeance less than 170 ng/(Pa·s·m²) shall be applied to the interior surface of the *foundation* wall above ground level between the insulation and the *foundation* wall.
- 3) Where insulation functions as both moisture protection for interior finishes and as a *vapour barrier* in accordance with Subsection 9.25.4., it shall be applied over the entire interior surface of the *foundation* wall.

9.13.2.6. Dampproofing of Floors-on-Ground

- 1)** Where dampproofing is installed below the floor, it shall consist of
 - a) polyethylene not less than 0.15 mm thick with joints lapped not less than 100 mm,
 - b) type S roll roofing with joints lapped not less than 100 mm, or
 - c) rigid extruded/expanded polystyrene with sealed or ship-lapped joints that has
 - i) sufficient compressive strength to support the floor assembly, and
 - ii) a water vapour permeance complying with Clause 9.13.2.2.(2)(a).
- 2)** Where dampproofing is installed between a floor-on-ground and a finished floor, it shall consist of
 - a) rigid extruded/expanded polystyrene with sealed or ship-lapped joints that has
 - i) sufficient compressive strength to support the floor assembly, and
 - ii) a water vapour permeance complying with Clause 9.13.2.2.(2)(b), or
 - b) polyethylene not less than 0.05 mm thick with joints lapped not less than 100 mm.

9.13.3. Waterproofing**9.13.3.1. Required Waterproofing**

- 1)** Where hydrostatic pressure occurs, waterproofing is required for assemblies separating interior space from the ground to prevent the ingress of water into *building* assemblies and interior spaces.
- 2)** Waterproofing is required for roofs of underground structures to prevent the ingress of water into *building* assemblies and interior spaces.

9.13.3.2. Waterproofing Materials

- 1)** Materials installed to provide required waterproofing shall be
 - a) compatible with adjoining materials, and
 - b) resistant to mechanisms of deterioration that may reasonably be expected, given the nature, function and exposure of the materials.
- 2)** Materials used for exterior waterproofing shall conform to
 - a) ASTM D 1227, "Emulsified Asphalt Used as a Protective Coating for Roofing," in which case, they shall be installed in accordance with Sentence 9.13.3.3.(3),
 - b) ASTM D 3019, "Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, Asbestos-Fibered, and Non-Asbestos-Fibered," where non-fibered and non-asbestos-fibered (Types I and III) asphalt roll roofing are permitted,
 - c) ASTM D 4479/D 4479M, "Asphalt Roof Coatings – Asbestos-Free," in which case, they shall be installed in accordance with Sentence 9.13.3.3.(3) and with reinforcing material,
 - d) ASTM D 4637/D 4637M, "EPDM Sheet Used In Single-Ply Roof Membrane,"
 - e) ASTM D 4811/D 4811M, "Nonvulcanized (Uncured) Rubber Sheet Used as Roof Flashing,"
 - f) ASTM D 6878/D 6878M, "Thermoplastic Polyolefin Based Sheet Roofing,"
 - g) CGSB 37-GP-9Ma, "Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing," where a primer is required,
 - h) CAN/CGSB-37.50-M, "Hot-Applied, Rubberized Asphalt for Roofing and Waterproofing,"
 - i) CAN/CGSB-37.54, "Polyvinyl Chloride Roofing and Waterproofing Membrane,"
 - j) CGSB 37-GP-56M, "Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing,"

5) Except as provided in Sentence (6), mortar shall be used and placed in final position

- a) within 1.5 h after mixing when the air temperature is 25°C or higher, or
- b) within 2.5 h after mixing when the air temperature is less than 25°C.

6) Mortar and grout containing a set-control admixture shall be manufactured off-site in a batching plant and shall be used and placed in final position within a time not exceeding the useful life stipulated by the manufacturer.

7) Grout used for reinforced masonry shall be placed in accordance with the requirements of CSA A371, "Masonry Construction for Buildings."

Table 9.20.3.2.-A
Mortar Use
Forming Part of Sentence 9.20.3.2.(1)

Location	Building Element	Mortar Type
Exterior, Above Ground	Loadbearing walls and columns	S
	Non-loadbearing walls and columns	N or S
	Parapets, chimneys, masonry veneer	N or S
Exterior, At or Below Ground	Foundation walls and columns	S
Interior	Loadbearing walls and columns	N
	Non-loadbearing walls and columns	N

Table 9.20.3.2.-B
Mortar Mix Proportions (by volume)
Forming Part of Sentence 9.20.3.2.(3)

Mortar Type	Portland Cement	Lime	Masonry Cement Type N	Masonry Cement Type S	Fine Aggregate (damp, loose-state sand)
Type S	1	½	-	-	3½ to 4½
	-	-	-	1	2¼ to 3
	½	-	1	-	3½ to 4½
Type N	1	1	-	-	4½ to 6
	-	-	1	-	2¼ to 3

Table 9.20.3.2.-C
Grout Mix Proportions (by volume)
Forming Part of Sentence 9.20.3.2.(4)

Portland Cement	Lime	Fine Aggregate (sand)	Coarse Aggregate
1	0 to 1/10	2¼ to 3 times the sum of the cement and lime volumes	1 to 2 times the sum of the cement and lime volumes

9.20.4. Mortar Joints

9.20.4.1. Thickness

1) Except as provided in Sentence (2), mortar joint thickness for burned clay brick and concrete masonry units shall be 10 mm.

2) Permitted tolerances in head and bed joints shall be not more than ± 5 mm.

9.20.4.2. Masonry Units

1) Hollow masonry units shall be laid with mortar applied to head and bed joints of both inner and outer face shells.

2) Vertically aligned webs of hollow masonry units shall be laid in a full bed of mortar

- a) under the starting course,
- b) in all courses of columns, and
- c) where adjacent to cells or cavities that are to be filled with grout.

3) Except for head joints left open for weep holes and ventilation, *solid masonry units* shall be laid with full head and bed joints.

9.20.5. Masonry Support

9.20.5.1. Masonry Support

1) All masonry shall be supported on masonry, concrete or steel, except that masonry veneer walls may be supported on *foundations* of wood frame constructed in conformance with Sentence 9.15.2.4.(1). (See Note A-9.20.5.1.(1).)

2) Every masonry wall shall be at least as thick as the wall it supports, except as otherwise permitted in Article 9.20.12.2.

9.20.5.2. Lintels or Arches

1) Masonry over openings shall be supported by steel, masonry or reinforced concrete lintels, or masonry arches.

- 2)** Steel angle lintels supporting masonry veneer above openings shall
- a) conform to Table 9.20.5.2., and
 - b) have a bearing length not less than 90 mm.

Table 9.20.5.2.
Maximum Allowable Spans for Steel Lintels Supporting Masonry Veneer
Forming Part of Sentence 9.20.5.2.(2)

Minimum Angle Size, mm			Maximum Allowable Spans, m		
Vertical Leg	Horizontal Leg	Thickness	Supporting 75 mm Brick	Supporting 90 mm Brick	Supporting 100 mm Stone
89	76	6.4	2.55	—	—
89	89	6.4	2.59	2.47	2.30
102	89	6.4	2.79	2.66	2.48
127	89	7.9	3.47	3.31	3.08
127	89	11	3.64	3.48	3.24

3) Steel angle lintels supporting masonry other than veneer, masonry and reinforced concrete lintels, and masonry arches shall be designed in accordance with Part 4 to support the imposed load.

4) Steel angle lintels supporting masonry shall be prime painted or otherwise protected from corrosion.

9.20.6. Thickness and Height

9.20.6.1. Thickness of Exterior Walls

1) Masonry exterior walls, other than *cavity walls*, in 1-storey buildings and the top storeys of 2- and 3-storey buildings shall be not less than 140 mm thick, provided the walls are not more than 2.8 m high at the eaves and 4.6 m high at the peaks of gable ends.

2) The exterior walls of the bottom storeys of 2-storey buildings, and exterior walls of the bottom 2 storeys of 3-storey buildings shall be not less than 190 mm thick.

4) The upper runner required in Sentence (3) shall be bent at each end to extend upwards not less than 150 mm and fastened to the adjacent studs.

5) A gypsum board filler piece, the width and length of the runner, shall be provided between the door frame referred to in Sentence (3) and the adjacent runner.

9.24.3.3. Orientation of Studs

1) Steel studs shall be installed with webs at right angles to the wall face and, except at openings, shall be continuous for the full wall height.

9.24.3.4. Support for Cladding Materials

1) Corners and intersections of walls shall be constructed to provide support for the cladding materials.

9.24.3.5. Framing around Openings

1) Studs shall be doubled on each side of every opening where such openings involve more than one stud space, and shall be tripled where the openings in exterior walls exceed 2.4 m in width.

2) Studs described in Sentence (1) shall be fastened together by screws, crimping or welding to act as a single structural unit in resisting transverse loads.

9.24.3.6. Attachment of Studs to Runners

1) Studs shall be attached to runners by screws, crimping or welding around wall openings and elsewhere where necessary to keep the studs in alignment during construction.

2) Where clearance for expansion is required in Article 9.24.3.2., attachment required in Sentence (1) shall be applied between studs and bottom runners only.

9.24.3.7. Openings for Fire Dampers

1) Openings for *fire dampers* in *non-loadbearing fire separations* required to have a *fire-resistance rating* shall be framed with double studs on each side of the opening.

2) The sill and header for openings described in Sentence (1) shall consist of a runner track with right angle bends made on each end so as to extend 300 mm above the header or below the sill and fastened to the studs.

3) The openings described in Sentence (1) shall be lined with a layer of gypsum board not less than 12.7 mm thick fastened to stud and runner webs.

Section 9.25. Heat Transfer, Air Leakage and Condensation Control

9.25.1. General

9.25.1.1. Scope and Application

1) This Section is concerned with heat, air and water vapour transfer and measures to control condensation.

2) All walls, ceilings and floors separating *conditioned space* from unconditioned space, the exterior air or the ground shall be

- a) provided with
 - i) thermal insulation conforming to Subsection 9.25.2. and Section 9.36.,

- ii) an air barrier conforming to Subsection 9.25.3. and Section 9.36., and
- iii) a vapour barrier conforming to Subsection 9.25.4., and
- b) constructed in such a way that the properties and relative position of all materials conform to Subsection 9.25.5.

3) Insulation and sealing of heating and ventilating ducts shall conform to Sections 9.32., 9.33. and 9.36.

9.25.2. Thermal Insulation

9.25.2.1. Required Insulation

1) All walls, ceilings and floors separating heated space from unheated space, the exterior air or the exterior *soil* shall be provided with sufficient thermal insulation to prevent moisture condensation on their room side during the winter and to ensure comfortable conditions for the occupants. (See Note A-9.1.1.1.(1).)

9.25.2.2. Insulation Materials

1) Except as required in Sentence (2), thermal insulation shall conform to the requirements of

- a) ASTM C 726, "Mineral Wool Roof Insulation Board,"
- b) CAN/CGSB-51.25-M, "Thermal Insulation, Phenolic, Faced,"
- c) CGSB 51-GP-27M, "Thermal Insulation, Polystyrene, Loose Fill,"
- d) CAN/ULC-S701.1, "Thermal Insulation, Polystyrene Boards,"
- e) CAN/ULC-S702, "Mineral Fibre Thermal Insulation for Buildings,"
- f) CAN/ULC-S703, "Cellulose Fibre Insulation for Buildings,"
- g) CAN/ULC-S704, "Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced,"
- h) CAN/ULC-S705.1, "Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Material Specification," or
- i) CAN/ULC-S706.1, "Wood Fibre Insulating Boards for Buildings."

2) The *flame-spread ratings* requirements contained in the standards listed in Sentence (1) shall not apply. (See Note A-9.25.2.2.(2).)

3) Insulation in contact with the ground shall be inert to the action of *soil* and water and shall be such that its insulative properties are not significantly reduced by moisture.

9.25.2.3. Installation of Thermal Insulation

1) Insulation shall be installed so that there is a reasonably uniform insulating value over the entire face of the insulated area.

2) Insulation shall be applied to the full width and length of the space between furring or framing.

3) Except where the insulation provides the principal resistance to air leakage, thermal insulation shall be installed so that at least one face is in full and continuous contact with an element with low air permeance. (See Note A-9.25.2.3.(3).)

4) Insulation on the interior of *foundation* walls enclosing a crawl space shall be applied so that there is not less than 50 mm clearance above the crawl space floor, if the insulation is of a type that may be damaged by water.

5) Insulation around concrete slabs-on-ground shall be located so that heat from the *building* is not restricted from reaching the ground beneath the perimeter, where exterior walls are not supported by footings extending below frost level.

6) Where insulation is exposed to the weather and subject to mechanical damage, it shall be protected with not less than

- a) 6 mm preservative-treated plywood, or
- b) 12 mm cement parging on wire lath applied to the exposed face and edge.

9.26.2.3. Nails

- 1)** Nails used for roofing shall be corrosion-resistant roofing or shingle nails conforming to
 - a) ASTM F 1667, "Driven Fasteners: Nails, Spikes, and Staples," or
 - b) CSA B111, "Wire Nails, Spikes and Staples."
- 2)** Nails shall have sufficient length to penetrate through, or 12 mm into, roof sheathing.
- 3)** Nails used with asphalt roofing shall have a head diameter of not less than 9.5 mm and a shank thickness of not less than 2.95 mm.
- 4)** Nails used with wood shingles or shakes shall have a head diameter of not less than 4.8 mm and a shank thickness of not less than 2.0 mm and shall be stainless steel, aluminum or hot-dipped galvanized. (See Note A-9.26.2.3.(4).)

9.26.2.4. Staples

- 1)** Staples used to apply asphalt or wood shingles shall be corrosion-resistant and shall be driven with the crown parallel to the eaves.
- 2)** Staples used with asphalt shingles shall be not less than 19 mm long, 1.6 mm diam or thickness, with not less than a 25 mm crown, except that an 11 mm crown may be used as provided in Sentence 9.26.7.4.(2).
- 3)** Staples used with wood shingles shall be not less than 29 mm long, 1.6 mm diam or thickness, with not less than a 9.5 mm crown and shall be stainless steel or aluminum. (See Note A-9.26.2.3.(4).)

9.26.3. Slope of Roofed Surfaces

9.26.3.1. Slope

- 1)** Except as provided in Sentences (2) and (3), the slopes on which roof coverings may be applied shall conform to Table 9.26.3.1.
- 2)** Asphalt and gravel or coal tar and gravel roofs may be constructed with lower slopes than required in Sentence (1) when effective drainage is provided by roof drains located at the lowest points on the roofs.
- 3)** Profiled metal roof cladding systems specifically designed for low-slope applications are permitted to be installed with lower slopes than required by Sentence (1), provided they are installed in conformance with the manufacturer's written recommendations.
- 4)** Except where back-slope will not adversely affect adjacent supported or supporting constructions due to water ingress, roofs and constructions that effectively serve as roofs shall be constructed with sufficient slope away from
 - a) exterior walls, and
 - b) *guards* that are connected to the roof, or to a construction that effectively serves as a roof, by more than pickets or posts.(See Notes A-9.26.1.1.(1), A-9.26.4.1. and A-9.27.3.8.(4).)
- 5)** The slope required by Sentence (4) shall be sufficient to maintain a positive slope
 - a) after expected shrinkage of the *building* frame, where these surfaces are supported by exterior walls and exterior columns (see Note A-9.27.3.8.(4)), and
 - b) once design loading is taken into consideration, where these surfaces are cantilevered from exterior walls.

Table 9.26.3.1.
Roofing Types and Slope Limits
 Forming Part of Sentence 9.26.3.1.(1)

Type of Roofing	Minimum Slope	Maximum Slope
Asphalt Shingles		
Low slope application	1 in 6	no limit
Normal application	1 in 3	no limit
Built-up Roofing		
Asphalt base (without gravel)	1 in 25	1 in 2
Asphalt base (gravelled)	1 in 50 ⁽¹⁾	1 in 4
Coal-tar base (gravelled)	1 in 50 ⁽¹⁾	1 in 25
Cold process	1 in 25	1 in 1.33
Cedar Shakes	1 in 3	no limit
Clay Tile	1 in 2	no limit
Glass Fibre Reinforced Polyester Roofing Panels	1 in 4	no limit
Modified Bituminous Membranes	1 in 50	1 in 4
Profiled Metal Roofing	1 in 4 ⁽¹⁾	no limit
Roll Roofing		
480 mm wide selvage asphalt roofing	1 in 6	no limit
Cold application felt	1 in 50	1 in 1.33
Smooth and mineral surfaced	1 in 4	no limit
Sheet Metal Shingles	1 in 4 ⁽¹⁾	no limit
Slate Shingles	1 in 2	no limit
Wood Shingles	1 in 4	no limit

Notes to Table 9.26.3.1.:

⁽¹⁾ See Sentence 9.26.3.1.(3).

9.26.4. Flashing at Intersections

9.26.4.1. Required Flashing at Intersections

(See Notes A-9.26.4.1. and A-9.26.1.1.(1).)

1) Except where the omission of flashing will not adversely affect adjacent supported or supporting constructions, flashing shall be installed at junctions between roofs and

- a) walls that rise above the roof, and
- b) *guards* that are connected to the roof by more than pickets or posts.

2) For the purpose of Sentence (1), roofs shall include platforms that effectively serve as roofs with respect to the accumulation or drainage of precipitation.

9.26.4.2. Materials

1) Sheet metal flashing shall consist of not less than

- a) 1.73 mm thick sheet lead,
- b) 0.33 mm thick galvanized steel,
- c) 0.33 mm thick copper,
- d) 0.35 mm thick zinc, or
- e) 0.48 mm thick aluminum.

9.26.4.3. Valley Flashing

1) Where sloping surfaces of shingled roofs intersect to form a valley, the valley shall be flashed.

2) Valley flashing shall be installed over continuous sheathing.

- b) every horizontal offset in the cladding, and
- c) every horizontal line where the cladding substrates change and where
 - i) the substrates differ sufficiently for stresses to be concentrated along that line, or
 - ii) the installation of the cladding on the lower substrate may compromise the drainage of moisture from behind the cladding above.

(See Note A-9.27.3.8.(1).)

2) Flashing need not be installed as described in Sentence (1)

- a) where the upper cladding elements overlap the lower cladding elements by not less than 25 mm,
- b) where
 - i) the cladding above and below the joint is installed outboard of a drained and vented air space (see Clause 9.27.2.2.(1)(a)), and
 - ii) the horizontal detail is constructed so as to minimize the ingress of precipitation into the air space, or
- c) at horizontal construction joints in stucco, where
 - i) the joint is finished with an expansion-contraction strip, and
 - ii) the cladding is installed outboard of a drained and vented air space (see Clause 9.27.2.2.(1)(a)).

3) Flashing shall be installed over exterior wall openings where the vertical distance from the bottom of the eave to the top of the trim is more than one-quarter of the horizontal overhang of the eave. (See Note A-9.27.3.8.(3).)

4) Flashing described in Sentences (1) and (3) shall

- a) extend not less than 50 mm upward inboard of the sheathing membrane or sheathing installed in lieu of the sheathing membrane (see Article 9.27.3.4.),
- b) have a slope of not less than 6% toward the exterior after the expected shrinkage of the *building* frame,
- c) terminate at each end with an end-dam
 - i) with a height in millimetres not less than 25 mm or 1/10 the value of the 1-in-5 driving rain wind pressure in Pa, and
 - ii) at the height defined in Subclause (c)(i), extending to the face of the adjacent cladding,
- d) lap not less than 10 mm vertically over the *building* element below, and
- e) terminate in a drip offset not less than 5 mm outward from the outer face of the *building* element below.

(See Note A-9.27.3.8.(4).)

5) Where the sills of windows and doors installed in exterior walls are not self-flashing, flashing shall be installed between the underside of the window or door and the wall construction below. (See Note A-9.27.3.8.(5).)

9.27.4. Sealants

9.27.4.1. Required Sealants

1) Sealant shall be provided where required to prevent the entry of water into the structure.

2) Sealant shall be provided between masonry, siding or stucco and the adjacent door and window frames or trim, including sills, unless such locations are completely protected from the entry of rain.

3) Sealant shall be provided at vertical joints between different cladding materials unless the joint is suitably lapped or flashed to prevent the entry of rain. (See Articles 9.7.6.2., 9.20.13.12. and 9.28.1.5.)

9.27.4.2. Materials

- 1)** Sealants shall be
 - a) a non-hardening type suitable for exterior use,

- b) selected for their ability to resist the effects of weathering, and
 - c) compatible with and adhere to the substrate to which they are applied.
- (See Note A-9.27.4.2.(1).)

- 2)** Sealants shall conform to
- a) ASTM C 834, "Latex Sealants,"
 - b) ASTM C 920, "Elastomeric Joint Sealants,"
 - c) ASTM C 1184, "Structural Silicone Sealants," or
 - d) ASTM C 1311, "Solvent Release Sealants."

3) Backer rod shall conform to ASTM C 1330, "Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants." (See Note A-9.27.4.2.(1).)

9.27.5. Attachment of Cladding

9.27.5.1. Attachment

1) Except as permitted by Sentences (2) to (4), cladding shall be fastened to the framing members or furring members, or to blocking between the framing members.

2) Vertical lumber and stucco lath or reinforcing are permitted to be attached to sheathing only where the sheathing consists of not less than

- a) 14.3 mm lumber,
- b) 12.5 mm plywood, or
- c) 12.5 mm OSB or waferboard.

3) Vertically applied metal siding and wood shingles and shakes are permitted to be attached to the sheathing only where the sheathing consists of not less than

- a) 14.3 mm lumber,
- b) 7.5 mm plywood, or
- c) 7.5 mm OSB or waferboard.

4) Where wood shingles or shakes are applied to sheathing which is not suitable for attaching the shingles or shakes, the shingles or shakes are permitted to be attached to a wood lath not less than 38 mm by 9.5 mm thick securely nailed to the framing and applied as described in Article 9.27.7.5.

9.27.5.2. Blocking

1) Blocking for the attachment of cladding shall be not less than 38 mm by 38 mm lumber securely nailed to the framing and spaced not more than 600 mm o.c.

9.27.5.3. Furring

1) Except as permitted in Sentence 9.27.5.1.(4), furring for the attachment of cladding shall be not less than 19 mm by 38 mm lumber when applied over sheathing.

2) When applied without sheathing, furring referred to in Sentence (1) shall be not less than

- a) 19 mm by 64 mm lumber on supports spaced not more than 400 mm o.c., or
- b) 19 mm by 89 mm lumber on supports spaced not more than 600 mm o.c.

3) Furring referred to in Sentence (1) shall be

- a) securely fastened to the framing, and
- b) spaced not more than 600 mm o.c.

9.27.5.4. Size and Spacing of Fasteners

1) Nail or staple size and spacing for the attachment of cladding and trim shall conform to Table 9.27.5.4.

9.30.2.2. Materials and Thickness

- 1)** Panel-type underlay shall be not less than 6 mm thick and shall conform to
 - a) ANSI A208.1, "Particleboard,"
 - b) CAN/CGSB-11.3-M, "Hardboard,"
 - c) ANSI/HPVA HP-1, "Hardwood and Decorative Plywood,"
 - d) CSA O121, "Douglas Fir Plywood,"
 - e) CSA O151, "Canadian Softwood Plywood,"
 - f) CSA O153, "Poplar Plywood," or
 - g) CSA O437.0, "OSB and Waferboard."
- 2)** Panel-type underlay under ceramic tile applied with adhesive shall be not less than
 - a) 6 mm thick where the supports are spaced up to 300 mm o.c., and
 - b) 11 mm thick where the supports are spaced wider than 300 mm o.c.

9.30.2.3. Fastening

- 1)** Panel-type underlay shall be fastened to the subfloor with staples, annular grooved flooring nails or spiral nails, spaced not more than 150 mm o.c. along the edges and 200 mm o.c. both ways at other locations.
- 2)** Nails for panel-type underlay shall be not less than 19 mm long for 6 mm thick underlay and 22 mm long for 7.9 mm thick underlay.
- 3)** Staples for panel-type underlay shall
 - a) have not less than a 1.2 mm shank diameter or thickness with a 4.7 mm crown, and
 - b) be not less than
 - i) 22 mm long for 6 mm underlay, and
 - ii) 28 mm long for 7.9 mm and 9.5 mm underlay.

9.30.2.4. Joints Offset

- 1)** Where panel-type underlay is required to be installed over plywood, OSB or waferboard, the joints in the underlay shall be offset not less than 200 mm from the joints in the underlying subfloor.

9.30.2.5. Surface Defects

- 1)** Underlay beneath resilient or ceramic floors applied with an adhesive shall have all holes or open defects on the surface patched so that the defects will not be transmitted to the finished surface.

9.30.3. Wood Strip Flooring

9.30.3.1. Thickness

- 1)** The thickness of wood strip flooring shall conform to Table 9.30.3.1.

Table 9.30.3.1.
Thickness of Wood Strip Flooring
 Forming Part of Sentence 9.30.3.1.(1)

Type of Flooring	Max. Joist Spacing, mm	Minimum Thickness of Flooring, mm	
		With Subfloor	No Subfloor
Matched hardwood (interior use only)	400	7.9	19.0
	600	7.9	33.3
Matched softwood (interior or exterior use)	400	19.0	19.0
	600	19.0	31.7
Square edge softwood (exterior use only)	400	—	25.4
	600	—	38.1

9.30.3.2. Strip Direction and End Joints

- 1)** Wood strip flooring shall not be laid parallel to lumber subflooring unless a separate underlay is provided.
- 2)** If wood strip flooring is applied without a subfloor, it shall be laid at right angles to the joists so that the end joints are staggered and occur over supports or are end matched.
- 3)** If the flooring is end matched, it shall be laid so that no 2 adjoining strips break joints in the same space between supports and each strip bears on no fewer than 2 supports.

9.30.3.3. Nailing

- 1)** When nails are used, wood strip flooring shall be toe nailed or face nailed with not less than one nail per strip at the spacings shown in Table 9.30.3.3., except that face nailed strips more than 25 mm in width shall have at least 2 nails per strip.

Table 9.30.3.3.
Nailing of Wood Strip Flooring
 Forming Part of Sentence 9.30.3.3.(1)

Finish Floor Thickness, mm	Minimum Length of Flooring Nails, mm	Maximum Spacing of Flooring Nails, mm
7.9	38 ⁽¹⁾	200
11.1	51	300
19.0	57	400
25.4	63	400
31.7	70	600
38.1	83	600

Notes to Table 9.30.3.3.:

⁽¹⁾ See Article 9.30.3.4.

- 2)** Face nails shall be countersunk.

9.30.3.4. Staples

- 1)** Staples are permitted to be used to fasten wood strip flooring not more than 7.9 mm in thickness provided the staples are not less than 29 mm long with a shank diameter of 1.19 mm and with 4.7 mm crowns.

9.30.4. Parquet Flooring**9.30.4.1. Adhesive**

- 1)** Adhesive used to attach parquet block flooring shall be suitable for bonding wood to the applicable subfloor material.

9.30.5. Resilient Flooring**9.30.5.1. Materials**

- 1)** Resilient flooring used on concrete slabs supported on ground shall consist of asphalt, rubber, unbacked vinyl or vinyl with an inorganic type backing.
- 2)** Flooring described in Sentence (1) shall be attached to the base with a suitable waterproof and alkali-resistant adhesive.

9.33.2. Required Heating Systems**9.33.2.1. Required Heating Systems**

1) Residential *buildings* intended for use in the winter months on a continuing basis shall be equipped with heating facilities conforming to this Section.

9.33.3. Design Temperatures**9.33.3.1. Indoor Design Temperatures**

1) At the outside winter design temperature, required heating facilities shall be capable of maintaining an indoor air temperature of not less than

- a) 22°C in all living spaces,
- b) 18°C in unfinished *basements*,
- c) 18°C in common *service rooms*, ancillary spaces and *exits* in houses with a *secondary suite*, and
- d) 15°C in heated crawl spaces.

9.33.3.2. Outdoor Design Temperatures

1) The outdoor conditions to be used in designing heating and air-conditioning systems shall be determined in conformance with Article 1.1.3.1.

9.33.4. General Requirements for Heating and Air-conditioning Systems**9.33.4.1. Design of Heating and Air-conditioning Systems**

1) Heating and air-conditioning systems, including ducting, and mechanical heating and refrigeration equipment, shall be designed, constructed and installed to conform to the relevant provincial or territorial regulations or municipal bylaws or, in the absence of such regulations or bylaws, with good practice such as that described in the ASHRAE Handbooks and Standards, the HRAI Digest, the CHC Handbook on Hydronic Heating Systems, the Hydronics Institute Manuals and the SMACNA Manuals. (See also Subsection 9.32.3. for the design of systems that also provide ventilation.)

9.33.4.2. Installation of Hydronic Heating Systems

1) The installation of a hydronic heating system shall conform to applicable provincial or territorial regulations or municipal bylaws or, in the absence of such regulations or bylaws, to CSA B214, "Installation Code for Hydronic Heating Systems."

9.33.4.3. Heating System Control

1) Where a single heating system serves a house with a *secondary suite*, individual temperature controls shall be provided in each *dwelling unit* served by the system. (See Note A-9.33.4.3.(1).)

9.33.4.4. Access

1) Equipment forming part of a heating or air-conditioning system, with the exception of embedded pipes or ducts, shall be installed with provision for access for inspection, maintenance, repair and cleaning.

9.33.4.5. Protection from Freezing

1) Equipment forming part of a heating or air-conditioning system that may be adversely affected by freezing temperatures and that is located in an unheated area shall be protected from freezing.

9.33.4.6. Expansion, Contraction and System Pressure

1) Heating and cooling systems shall be designed to allow for expansion and contraction of the heat transfer fluid and to maintain the system pressure within the rated working pressure limits of all components of the system.

9.33.4.7. Structural Movement

1) Mechanical systems and equipment shall be designed and installed to accommodate the maximum amount of structural movement provided for in the construction of the *building*.

2) Where the *building* is in a location where the spectral response acceleration, $S_a(0.2)$, is greater than 0.55, heating and air-conditioning equipment with fuel or power connections shall be secured to the structure to resist overturning and displacement. (See Note A-9.31.6.2.(3).)

9.33.4.8. Asbestos

1) Asbestos shall not be used in air distribution systems or equipment.

9.33.4.9. Contaminant Transfer

1) Systems serving garages, and systems serving other occupied parts of a *dwelling unit* but located in or running through a garage, shall be designed and constructed in a manner such that means are not provided for the transfer of contaminants from the garage into other spaces in the *dwelling unit*.

9.33.5. Heating and Air-conditioning Appliances and Equipment**9.33.5.1. Capacity of Heating Appliances**

1) The required capacity of heating *appliances* located in a *dwelling unit* and serving only that *dwelling unit*, shall be determined in accordance with CSA F280, "Determining the Required Capacity of Residential Space Heating and Cooling Appliances," except that the design temperatures shall conform to Subsection 9.33.3.

9.33.5.2. Installation Standards

1) Except as provided in Articles 9.33.5.3. and 9.33.5.4., the installation of heating and air-conditioning equipment, including mechanical refrigeration equipment, and including provisions for mounting, clearances and air supply, shall conform to applicable provincial or territorial regulations or municipal bylaws or, in the absence of such regulations or bylaws, to

- a) CSA B51, "Boiler, Pressure Vessel, and Pressure Piping Code,"
- b) CSA B52, "Mechanical Refrigeration Code,"
- c) CSA B139, "Installation Code for Oil-Burning Equipment,"
- d) CSA B149.1, "Natural Gas and Propane Installation Code,"
- e) CSA C22.1, "Canadian Electrical Code, Part I," or
- f) CSA C448 Series, "Design and Installation of Earth Energy Systems."

(See also Sentence 9.33.5.3.(1).)

9.33.5.3. Design, Construction and Installation Standard for Solid-Fuel-Burning Appliances

(See Note A-9.33.5.3.)

1) The design, construction and installation, including the provision of combustion air, of solid-fuel-burning *appliances* and equipment, including *stoves*, *cooktops*, *ovens* and *space heaters*, shall conform to CSA B365, "Installation Code for Solid-Fuel-Burning Appliances and Equipment."

9.33.5.4. Fireplaces

1) Fireplaces shall conform to Section 9.22.

9.33.6. Air Duct Systems**9.33.6.1. Application**

1) The design, construction and installation of air duct distribution systems serving heating systems in which the rated heat input does not exceed 120 kW shall conform to this Subsection.

2) Air duct distribution systems in which the rated heat input exceeds 120 kW shall conform to Part 6 and Subsection 3.6.5.

9.33.6.2. Materials in Air Duct Systems

1) Except as provided in Sentences (2) to (6) and in Article 3.6.4.3., all ducts, duct connectors, associated fittings and *plenums* used in air duct systems shall be constructed of steel, aluminum alloy, copper, clay or similar *noncombustible* material.

2) Ducts, associated fittings and *plenums* are permitted to contain *combustible* material provided they

- a) conform to the appropriate requirements for Class 1 duct materials in CAN/ULC-S110, "Test for Air Ducts,"
- b) conform to Article 3.1.5.18. and Subsection 3.1.9.,
- c) are not used in vertical runs serving more than 2 *storeys*, and
- d) are not used in air duct systems in which the air temperature may exceed 120°C.

3) Duct sealants shall have a *flame-spread rating* of not more than 25 and a smoke developed classification of not more than 50.

4) Duct connectors that contain *combustible* materials and that are used between ducts and air outlet units shall

- a) conform to the appropriate requirements for Class 1 air duct materials in CAN/ULC-S110, "Test for Air Ducts,"
- b) be limited to 4 m in length,
- c) be used only in horizontal runs, and
- d) not penetrate required *fire separations*.

5) *Combustible* ducts that are part of a duct system carrying only ventilation air and that are contained entirely within a *dwelling unit* need not comply with the requirements of Sentences (1) to (4).

6) Except as provided in Sentences 9.33.6.13.(2) and (3), ducts that are part of a return-air duct system and that are contained entirely within a *dwelling unit* need not comply with the requirements of Sentences (1) to (4).

7) Materials referred to in Sentences (1) to (6), when used in a location where they may be subjected to excessive moisture, shall

- a) have no appreciable loss of strength when wet, and
- b) be corrosion-resistant.

9.33.6.3. Tape

1) Tape used for sealing duct joints in air ducts, *plenums* and other parts of air duct systems shall meet the flame-resistance requirements for fabric in CAN/ULC-S109, "Flame Tests of Flame-Resistant Fabrics and Films."

9.33.6.4. Coverings, Linings, Adhesives and Insulation

1) Coverings, linings and associated adhesives and insulation of air ducts, *plenums* and other parts of air duct systems shall be of *noncombustible* material when exposed to heated air or radiation from heat sources that would result in the exposed surface exceeding a temperature of 120°C.

- 2) Except as provided in Sentence (3), when *combustible* coverings and linings, including associated adhesives and insulation, are used, they shall have
 - a) a *flame-spread rating* of not more than 25 on any exposed surface or any surface that would be exposed by cutting through the material in any direction, and
 - b) a smoke developed classification of not more than 50.
- 3) The outer covering of ducts, *plenums* and other parts of air duct systems used within an assembly of *combustible construction* are permitted to have
 - a) an exposed surface *flame-spread rating* of not more than 75, and
 - b) a smoke developed classification greater than 50.
- 4) *Combustible* coverings and linings described in Sentences (2), (3) and (6) shall not flame, glow, smoulder or smoke when tested in accordance with the method of test in ASTM C 411, "Hot-Surface Performance of High-Temperature Thermal Insulation," at the maximum temperature to which the coverings and linings are to be exposed in service.
- 5) Except as provided in Sentences (6) and (7), foamed plastic insulation shall not be used as part of an air duct or for insulating an air duct.
- 6) Foamed plastic insulation conforming to Article 9.25.2.2. is permitted to be used to insulate a galvanized steel, stainless steel or aluminum air duct, provided
 - a) the foamed plastic insulation applied to supply ductwork is not less than 3 m from the *furnace* bonnet,
 - b) the temperature within the ductwork where the insulation is installed is not greater than 50°C,
 - c) duct joints are taped with a product conforming to Sentence 9.33.6.3.(1),
 - d) return air *plenums* are separated from the foamed plastic insulation, and
 - e) the foamed plastic insulation is protected
 - i) by one of the interior finishes described in Subsections 9.29.4. to 9.29.9.,
 - ii) provided the *building* does not contain a Group C *major occupancy*, by sheet metal that is mechanically fastened to the supporting assembly independent of the insulation, is not less than 0.38 mm thick and has a melting point of 650°C or more, or
 - iii) by any thermal barrier that meets the requirements of Clause 3.1.5.15.(2)(e).
- 7) Foamed plastic insulation is permitted to be used in a ceiling space that acts as a return air *plenum* provided the foamed plastic insulation is protected from exposure to the *plenum* in accordance with Sentence 3.1.5.14.(4).
- 8) *Combustible* coverings and linings of ducts, including associated adhesives and insulation, shall be interrupted
 - a) at the immediate area of operation of heat sources in a duct system, such as electric resistance heaters or fuel-burning heaters or *furnaces*, and
 - b) where the duct penetrates a *fire separation*.
- 9) Linings of ducts shall be installed so that they will not interfere with the operation of volume or balancing dampers or of *fire dampers*, *fire stop flaps* and other closures.

9.33.6.5. Galvanized Steel or Aluminum Supply Ducts

- 1) Galvanized steel or aluminum *supply ducts* shall conform to Table 9.33.6.5.
- 2) The design of fittings for ducts shall conform to ANSI/SMACNA 006, "HVAC Duct Construction Standards – Metal and Flexible," except that metal thicknesses shall conform to Table 9.33.6.5.

Table 9.36.3.10. (Continued)

Notes to Table 9.36.3.10.:

- (1) The symbols and abbreviations that appear in this column have the following meanings:
- AFUE = annual fuel utilization efficiency
 - COP = coefficient of performance, in W/W (COP_c = in cooling mode and COP_h = in heating mode)
 - E_c = combustion efficiency, in %
 - EER = energy efficiency ratio, in (Btu/h)/W (no metric equivalent)
 - E_t = thermal efficiency
 - FE = fireplace efficiency
 - HSPF = heating season performance factor, in watt-hours
 - ICOP = integrated coefficient of performance, in W/W
 - OTPF = overall thermal performance factor
 - SEER = seasonal energy efficiency ratio, in (Btu/h)/W (no metric equivalent)
 - TPF = thermal performance factor
- (2) No standard addresses the performance efficiency of electric *boilers*; however, their efficiency typically approaches 100%.
- (3) Includes propane.
- (4) See the exception stated in Sentence (3).
- (5) See Sentence (2).
- (6) CSA B415.1 does not apply to *stoves* with an oven whose volume is greater than 0.028 m³ and automatically fuelled *appliances*.
- (7) Minimum performance values are omitted from the Table in cases where the referenced standard itself contains such requirements.

- 2)** Natural gas and propane fireplaces shall be
- a) direct-vent (sealed), and
 - b) pilot-on-demand, interrupted or intermittent ignition systems without a standing pilot light.

3) The heat source component of combined space- and service water heating systems that are not within the scope of CAN/CSA-P.9, "Performance of Combined Space and Water Heating Systems (Combos)," shall meet the performance requirements stated in Table 9.36.3.10. for the applicable equipment type. (See Note A-9.36.3.10.(3).)

9.36.3.11. Solar Thermal Systems

1) Space-heating systems that use solar thermal technology shall conform to the manufacturer's design requirements and installation procedures.

2) Service water heating systems that use solar thermal technology shall be installed in accordance with the NPC.

3) Hot water storage tanks associated with the systems referred to in Sentence (2) shall be installed in a *conditioned space*.

9.36.4. Service Water Heating Systems**9.36.4.1. Scope and Application**

1) This Subsection is concerned with the efficient use of energy by systems used to heat service water for household use as well as for indoor pools and hot tubs.

2) Where service water heating equipment or techniques other than those described in this Subsection are used, the *building* shall be designed and constructed in accordance with the energy efficiency requirements of the NECB.

9.36.4.2. Equipment Efficiency

1) *Service water heaters, boilers, pool heaters and storage tanks* shall comply with the performance requirements stated in Table 9.36.4.2. (See Note A-9.36.4.2.(1).)

2) Hot service water storage tanks not listed in Table 9.36.4.2. shall be covered with insulation having a minimum thermal resistance of 1.8 (m²·K)/W.

Table 9.36.4.2.
Service Water Heating Equipment Performance Standards
 Forming Part of Sentences 9.36.4.2.(1) and (2)

Component	Input ⁽¹⁾	Standard	Performance Requirement ⁽²⁾
Storage-Type Service Water Heaters			
Electric	≤ 12 kW (50 L to 270 L capacity)	CAN/CSA-C191	SL ≤ 35 + 0.20V (top inlet)
			SL ≤ 40 + 0.20V (bottom inlet)
	≤ 12 kW (> 270 L and ≤ 454 L capacity)		SL ≤ (0.472V) – 38.5 (top inlet)
			SL ≤ (0.472V) – 33.5 (bottom inlet)
	>12 kW (> 75 L capacity)	ANSI Z21.10.3/CSA 4.3 and DOE 10 CFR, Part 431, Subpart G	S = 0.30 + 27/V _m
Heat pump water heaters	≤ 24 A and ≤ 250 V	CAN/CSA-C745	EF ≥ 2.0
Gas-fired ⁽³⁾	< 22 kW	CAN/CSA-P3	EF ≥ 0.67 – 0.0005V
	≥ 22 kW	ANSI Z21.10.3/CSA 4.3	E _t ≥ 80% and standby loss ≤ rated input ⁽⁴⁾ /800 + 16.57·√(V)
Oil-fired	≤ 30.5 kW	CAN/CSA-B211	EF ≥ 0.59 – 0.0005V
	> 30.5 kW	ANSI Z21.10.3/CSA 4.3 and DOE 10 CFR, Part 431, Subpart G	E _t ≥ 78% and standby loss ≤ rated input ⁽⁴⁾ /800 + 16.57·√(V)
Tankless Service Water Heaters			
Gas-fired	≤ 73.2 kW	CAN/CSA-P7	EF ≥ 0.8
	> 73.2 kW	ANSI Z21.10.3/CSA 4.3 and DOE 10 CFR, Part 431, Subpart G	E _t ≥ 80%
Oil-fired	≤ 61.5 kW ⁽⁵⁾	DOE 10 CFR, Part 430, Subpart B, Appendix E	EF ≥ 0.59 – 0.0019V _m
	Other	ANSI Z21.10.3/CSA 4.3 and DOE 10 CFR, Part 431, Subpart G	E _t ≥ 80%
Electric	—	—	⁽⁶⁾
Combined space- and water-heating systems (combos)	≤ 87.9 kW if <i>boiler-based</i> ≤ 73.2 kW if based on <i>service water heater</i>	CAN/CSA-P9	TPF = 0.65
Integrated mechanical systems	—	CSA P.10	OTPF = 0.78
Pool Heaters			
Gas-fired ⁽³⁾	< 117.2 kW	ANSI Z21.56/CSA 4.7 or CSA P.6	E _t ≥ 82%
Oil-fired	—	CSA B140.12	E _t ≥ 75%

Notes to Table 9.36.4.2.:

⁽¹⁾ 1 kW = 3412 Btu/h

⁽²⁾ The symbols and abbreviations used in this column have the following meanings:

- EF = energy factor, in %/h
- E_t = thermal efficiency with 38.9°C water temperature difference
- OTPF = overall thermal performance factor
- S = standby loss, in %/h (percentage heat content of stored water per hour)
- SL = standby loss, in W
- TPF = thermal performance factor
- V = storage volume, in L, as specified by the manufacturer
- V_m = measured storage volume, in US gallons

⁽³⁾ Includes propane.

⁽⁴⁾ Rated input is measured in watts.

⁽⁵⁾ Consistent with the U.S. Congress "National Appliance Energy Conservation Act of 1987."

⁽⁶⁾ No standard addresses the performance efficiency of electric tankless *service water heaters*; however, their efficiency typically approaches 100%.

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.4.3.1. Deflections	
(1)	[F22-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F22-OP2.1,OP2.4] [F22-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F22-OH4]
	[F22-OS3.1] Applies to floors and elements that support floors. [F22-OS3.7] Applies to walls, and elements that support walls, that contain doors or windows required for emergency egress.
	[F22-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator.
9.4.4.1. Allowable Bearing Pressures	
(1)	[F20-OS2.2] [F20-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OP2.2,OP2.4] [F20-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OH1.1,OH1.2,OH1.3] Applies to footings that support an environmental separator.
	[F20-OH4] Applies to footings that support floors and other elements that support floors.
	[F20-OS3.1] Applies to footings that support floors and other elements that support floors. [F20-OS3.7] Applies to footings that support walls that contain doors or windows required for emergency egress.
9.4.4.2. Foundation Capacity in Weaker Soil and Rock	
(1)	[F20-OS2.2] [F20-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OP2.2,OP2.4] [F20-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator.
	[F20-OH4] Applies to floors and elements that support floors.
	[F20-OS3.1] Applies to floors and elements that support floors.
(2)	[F20-OS2.2] [F20-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OP2.2,OP2.4] [F20-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator.
	[F20-OH4] Applies to floors and elements that support floors.
	[F20-OS3.1] Applies to floors and elements that support floors.

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.4.4.3. High Water Table	
(1)	[F20-OS2.2] [F20-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OP2.2,OP2.4] [F20-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator.
	[F20-OH4] Applies to floors and elements that support floors.
	[F20-OS3.1] Applies to floors and elements that support floors.
9.4.4.4. Soil Movement	
(1)	[F21-OS2.1] [F21-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F21-OP2.1,OP2.4] [F21-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F21-OH1.1,OH1.2,OH1.3] Applies to walls that support or are part of an environmental separator.
	[F21-OH4] Applies to <i>foundations</i> that support floors and other elements that support floors.
	[F21-OS3.1] Applies to footings that support floors and other elements that support floors. [F21-OS3.7] Applies to footings that support walls that contain doors or windows required for emergency egress.
9.4.4.5. Retaining Walls	
(1)	[F20-OS2.1,OS2.3] [F20-OP2.1,OP2.3,OP2.4] [F20-OH1.1,OH1.2,OH1.3] [F20-OH4] Applies to floors and elements that support floors. [F20-OS3.1] Applies to floors and elements that support floors.
9.4.4.6. Walls Supporting Drained Earth	
(1)	[F20-OS2.1,OS2.3] [F20-OP2.1,OP2.3,OP2.4] [F20-OH1.1,OH1.2,OH1.3] [F20-OH4] Applies to floors and elements that support floors. [F20-OS3.1] Applies to floors and elements that support floors. [F20-OS3.7] Applies to walls, and elements that support walls, that contain doors or windows required for emergency egress.
(2)	[F20-OS2.1,OS2.3] [F20-OP2.1,OP2.3,OP2.4] [F20-OH1.1,OH1.2,OH1.3] [F20-OH4] Applies to floors and elements that support floors. [F20-OS3.1] Applies to floors and elements that support floors. [F20-OS3.7] Applies to walls, and elements that support walls, that contain doors or windows required for emergency egress.

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.5.1.2. Combination Rooms	
(2)	[F10-OS3.7]
9.5.3.1. Ceiling Heights of Rooms or Spaces	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
(3)	[F30-OS3.1] [F10-OS3.7]
(4)	[F30-OS3.1] [F10-OS3.7]
9.5.3.2. Mezzanines	
(1)	[F30-OS3.1] [F10-OS3.7]
9.5.3.3. Storage Garages	
(1)	[F30-OS3.1] [F10-OS3.7]
9.5.4.1. Hallway Width	
(1)	[F10-OS3.7]
9.5.5.1. Doorway Opening Sizes	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F10-OS3.7] [F30-OS3.1]
9.5.5.2. Doorways to Public Water-Closet Rooms	
(1)	[F30-OS3.1] [F10-OS3.7]
9.5.5.3. Doorways to Rooms with a Bathtub, Shower or Water Closet	
(2)	[F74-OA2]
9.6.1.2. Material Standards for Glass	
(1)	[F20-OS2.1] [F63-OS2.3]
	(e),(h) [F63-OH1.1] [F51,F63-OH1.2]
	(g) [F03-OS1.2]
(2)	[F30-OS3.1] [F10-OS3.7]
9.6.1.3. Structural Sufficiency of Glass	
(1)	[F20-OS2.1]
(2)	[F20-OS2.1]
(3)	[F30-OS3.1] [F10-OS3.7]
9.6.1.4. Types of Glass and Protection of Glass	
(1)	[F30-OS3.1] [F10-OS3.7]
(3)	[F30-OS3.1] [F10-OS3.7]
(4)	[F30-OS3.1] [F10-OS3.7] Applies to portion of Code text: "... except that such <i>partitions</i> shall be suitably marked to indicate their existence and position."
(5)	[F30-OS3.1] [F10-OS3.7]
(6)	[F20,F30-OS3.1]
9.7.2.1. Entrance Doors	
(1)	[F42-OH2.5]
	[F51,F54-OH1.2] [F40,F61,F42-OH1.1]
	[F61,F42-OS2.3]
(2)	[F35-OS4.2]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.7.3.1. General Performance Expectations	
(1)	[F42,F55,F61,F62,F63-OH1.1] [F81-OH1.1] Applies to windows that provide required non-heating season ventilation. [F54,F55,F61,F62,F63-OH1.2] [F61,F62,F63-OH1.3]
	[F20,F55,F61-OS2.1,OS2.3]
	[F42-OH2.5]
	[F81-OS3.7]
	[F34-OS4.1]
(2)	[F81-OH1.1] Applies to skylights that provide required non-heating season ventilation. [F20,F22-OH1.3]
	[F20-OS2.1,OS2.3]
(3)	[F42,F55-OH1.1]
	[F42-OH2.5]
	[F81-OS3.7]
	[F34-OS4.1]
(4)	[F20,F22-OS2.3]
	[F30-OS3.1]
	[F20,F61-OH1.1,OH1.2]
	[F34-OS4.1]
9.7.3.2. Heat Transfer Performance	
(1)	[F51,F63-OH1.1,OH1.2]
	[F63-OS2.3]
9.7.3.3. Thermal Characteristics of Windows, Doors and Skylights	
(1)	[F63-OH1.1,OH1.2,OH1.3]
	[F63-OS2.3]
(3)	[F63-OH1.1,OH1.2,OH1.3]
	[F63-OS2.3]
(4)	[F63-OH1.1,OH1.2,OH1.3]
	[F63-OS2.3]
	[F63-OS3.1]
9.7.4.2. General	
(1)	[F20,F55,F61,F62,F63-OH1.1] [F81-OH1.1] Applies to windows that provide required non-heating season ventilation. [F54,F55,F61,F62,F63-OH1.2] [F20,F61,F62,F63-OH1.3]
	[F20,F21,F61-OS2.3]
	[F10-OS1.5] Applies where windows, doors or skylights serve bedrooms, except bedrooms that have direct access to the exterior through an <i>exit</i> door or bedrooms that are in <i>sprinklered suites</i> .
9.7.4.3. Performance Requirements	
(1)	[F20,F55,F61-OH1.1] [F55-OH1.2] [F20,F61,F62-OH1.3]
	[F40,F42,F61-OH1.1] [F54,F55,F61,F62-OH1.2] [F61,F62,F63-OH1.3]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(4)	[F40,F61,F42-OH1.1] [F51,F54-OH1.2] [F61,F42-OS2.3] [F80-OS3.7] [F80-OS4.1] [F42-OH2.5]
9.7.5.2. Resistance to Forced Entry for Doors	
(2)	[F34-OS4.1]
(3)	[F20-OS4.1]
(4)	[F34-OS4.1]
(5)	[F34-OS4.1]
(6)	[F20-OS4.1]
(7)	[F20-OS4.1]
(8)	[F34-OS4.1]
(9)	[F20-OS4.1]
9.7.5.3. Resistance to Forced Entry for Windows	
(1)	[F34-OS4.1]
9.7.6.1. Installation of Windows, Doors and Skylights	
(1)	[F20,F54,F55,F61,F63-OH1.1,OH1.2,OH1.3] [F20,F61,F63-OS2.3]
(2)	[F54,F55,F61,F63-OH1.1,OH1.2,OH1.3] [F61,F63-OS2.3]
(3)	[F55,F61,F63-OS2.3] [F55,F61,F63-OH1.1,OH1.2,OH1.3]
9.7.6.2. Sealants, Trim and Flashing	
(1)	[F61,F63-OH1.1,OH1.3] [F51,F54,F61,F63-OH1.2] [F61,F63-OS2.3]
(4)	[F80-OS2.1,OS2.3] [F80-OP2.1,OP2.3] [F80-OH1.1,OH1.2,OH1.3]
9.8.2.1. Stair Width	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
(3)	[F30-OS3.1] [F10-OS3.7]
(4)	[F30-OS3.1] [F10-OS3.7]
9.8.2.2. Height over Stairs	
(2)	[F30-OS3.1] [F10-OS3.7]
(3)	[F30-OS3.1] [F10-OS3.7]
(4)	[F30-OS3.1] [F10-OS3.7]
9.8.3.1. Permitted Configurations	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F10-OS3.7]
(3)	[F30-OS3.1] [F10-OS3.7]
(4)	[F30-OS3.1] [F10-OS3.7]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(5)	[F30-OS3.1] [F10-OS3.7]
9.8.3.2. Minimum Number of Risers	
(1)	[F30-OS3.1] [F10-OS3.7]
9.8.3.3. Maximum Height of Stairs	
(1)	[F30-OS3.1]
9.8.4.1. Dimensions for Risers	
(1)	[F30-OS3.1] [F10-OS3.7]
9.8.4.2. Dimensions for Rectangular Treads	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
9.8.4.3. Dimensions of Tapered Treads	
(1)	[F30-OS3.1] [F10-OS3.7]
(3)	[F30-OS3.1] [F10-OS3.7]
9.8.4.4. Uniformity and Tolerances for Risers, Runs and Treads	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
(3)	[F30-OS3.1] [F10-OS3.7]
(4)	[F30-OS3.1] [F10-OS3.7]
(5)	[F30-OS3.1] [F10-OS3.7]
9.8.4.5. Uniformity of Runs in Flights with Mixed Treads within Dwelling Units	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
9.8.4.6. Winders	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
9.8.4.7. Spiral Stairs	
(1)	[F30-OS3.1]
(3)	[F30-OS3.1]
9.8.4.8. Tread Nosings	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
9.8.5.2. Ramp Width	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
9.8.5.3. Height over Ramps	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
9.8.5.4. Ramp Slope	
(1)	[F30-OS3.1] [F10-OS3.7]
9.8.5.5. Maximum Rise	
(1)	[F30-OS3.1]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.8.6.2. Required Landings	
(1)	[F30-OS3.1] [F10-OS3.7]
9.8.6.3. Dimensions of Landings	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
(4)	[F30-OS3.1] [F10-OS3.7]
(5)	[F30-OS3.1] [F10-OS3.7]
(6)	[F30-OS3.1] [F10-OS3.7]
(7)	[F30-OS3.1] [F10-OS3.7]
9.8.6.4. Height over Landings	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
9.8.7.1. Required Handrails	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F10-OS3.7] [F30-OS3.1]
(5)	[F30-OS3.1] [F10-OS3.7]
9.8.7.2. Continuity of Handrails	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7] [F73-OA1]
9.8.7.3. Termination of Handrails	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
9.8.7.4. Height of Handrails	
(2)	[F30-OS3.1] [F10-OS3.7]
9.8.7.5. Ergonomic Design	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
9.8.7.6. Projections into Stairs and Ramps	
(1)	[F30-OS3.1] [F10-OS3.7]
9.8.7.7. Design and Attachment of Handrails	
(1)	[F20-OS2.1] [F20-OS3.1,OS3.7]
(2)	[F20-OS2.1] [F20-OS3.1,OS3.7]
9.8.8.1. Required Guards	
(1)	[F30-OS3.1] [F10-OS3.7]
(3)	[F30-OS3.1] [F10-OS3.7]
(4)	[F30-OS3.1]
(6)	[F30-OS3.1] [F10-OS3.7]
(7)	[F30-OS3.1] [F10-OS3.7]
(8)	[F30-OS3.1]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.8.8.2. Loads on Guards	
(1)	[F20-OS2.1]
9.8.8.3. Height of Guards	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
(3)	[F30-OS3.1] [F10-OS3.7]
(4)	[F30-OS3.1] [F10-OS3.7]
9.8.8.4. Guards for Floors and Ramps in Garages	
(1)	[F10-OS3.1]
(2)	[F20-OS2.1]
9.8.8.5. Openings in Guards	
(1)	[F30-OS3.1]
(2)	[F30-OS3.1]
(3)	[F30-OS3.1]
9.8.8.6. Design of Guards to Not Facilitate Climbing	
(1)	[F30-OS3.1]
9.8.8.7. Glass in Guards	
(1)	[F20-OS3.1,OS3.7] [F20-OS2.1]
9.8.9.1. Loads on Stairs and Ramps	
(1)	[F20-OS2.1] [F22-OH4]
9.8.9.2. Exterior Concrete Stairs	
(1)	[F22-OS3.1,OS3.7]
9.8.9.3. Exterior Wood Steps	
(1)	[F80-OS3.1,OS3.7] [F80-OS2.3]
9.8.9.4. Wooden Stair Stringers	
(1)	[F20-OS2.1] [F22-OH4]
(2)	[F22-OH4] [F20-OS2.1]
9.8.9.5. Treads	
(1)	[F22-OH4] [F20-OS2.1]
(2)	[F22-OH4] [F20-OS2.1]
9.8.9.6. Finish for Treads and Landings	
(1)	[F30-OS3.1] [F10-OS3.7]
(2)	[F30-OS3.1] [F10-OS3.7]
9.8.10.1. Design	
(1)	[F22-OS3.1,OS3.7] [F20-OS2.1]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(3)	[F03-OS1.2] [F03-OP3.1]
(4)	[F03-OS1.2] [F03-OP3.1]
9.10.12.1. Termination of Floors or Mezzanines	
(1)	[F03-OS1.5] [F03-OP1.2,OP1.4]
9.10.12.2. Location of Skylights	
(1)	[F03-OS1.2] [F03-OP1.2]
9.10.12.3. Exterior Walls Meeting at an Angle	
(1)	[F03-OS1.2] [F03-OP1.2]
(2)	[F03-OS1.2] [F03-OP1.2]
(3)	[F03-OS1.2] [F03-OP1.2]
9.10.12.4. Protection of Soffits	
(2)	[F03-OS1.2] [F03-OP1.2]
(3)	[F03-OS1.2] [F03-OP1.2]
9.10.13.1. Closures	
(1)	[F03-OS1.2] [F03-OP1.2]
9.10.13.2. Solid Core Wood Door as a Closure	
(2)	[F03-OS1.2] [F03-OP1.2]
9.10.13.5. Wired Glass as a Closure	
(2)	[F03-OS1.2] [F03-OP1.2]
(3)	[F03-OS1.2] [F03-OP1.2]
9.10.13.6. Steel Door Frames	
(1)	[F03-OS1.2] [F03-OP1.2]
9.10.13.8. Maximum Size of Opening	
(1)	[F03-OS1.2] [F03-OP1.2]
(2)	[F03-OS1.2] [F03-OP1.2]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.10.13.9. Door Latch	
(1)	[F03-OS1.2] [F03-OP1.2]
9.10.13.10. Self-closing Device	
(1)	[F03-OS1.2] [F03-OP1.2]
9.10.13.12. Service Room Doors	
(1)	[F30-OS3.1] Applies to portion of Code text: "Swing-type doors shall open into <i>service rooms</i> containing fuel-fired equipment where such doors lead to <i>public corridors</i> or rooms used for assembly ..." [F10-OS1.5] Applies to portion of Code text: "... but shall swing outward from such rooms in all other cases."
9.10.13.13. Fire Dampers	
(1)	[F03-OS1.2] [F03-OP1.2]
9.10.13.14. Fire Stop Flaps	
(1)	[F03-OS1.3] [F03-OP1.3]
9.10.13.15. Doors between Garages and Dwelling Units	
(1)	[F44-OS3.4] [F01-OS1.1]
(2)	[F44-OS3.4] [F01-OS1.1]
9.10.13.16. Door Stops	
(1)	[F81-OS1.4] [F81-OP1.4]
9.10.14.3. Limiting Distance and Fire Department Response	
(1)	[F03-OP3.1]
9.10.14.4. Openings in Exposing Building Face	
(1)	[F03-OP3.1]
(2)	[F03-OP3.1]
(3)	[F03-OP3.1]
(4)	[F03-OP3.1]
(6)	[F03-OP3.1]
(7)	[F03-OP3.1]
9.10.14.5. Construction of Exposing Building Face and Walls above Exposing Building Face	
(1)	[F02,F03-OP3.1]
(2)	[F03-OP3.1]
(3)	[F02,F03-OP3.1]
(4)	[F03-OP3.1]
(6)	[F03-OP3.1]
(7)	[F03-OP3.1]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(8)	[F02,F03-OP3.1]
(9)	[F03-OP3.1]
(10)	[F03-OP3.1]
(12)	[F03-OP3.1]
9.10.15.3. Limiting Distance and Fire Department Response	
(1)	[F03-OP3.1]
9.10.15.4. Glazed Openings in Exposing Building Face	
(1)	[F03-OP3.1]
(3)	[F03-OP3.1]
(4)	[F03-OP3.1]
9.10.15.5. Construction of Exposing Building Face of Houses	
(2)	[F02,F03-OP3.1]
(3)	[F02,F03-OP3.1]
(5)	[F03-OP3.1]
(7)	[F02,F03-OP3.1]
(8)	[F03-OP3.1]
(9)	[F03-OP3.1]
(11)	[F03-OP3.1]
9.10.16.1. Required Fire Blocks in Concealed Spaces	
(1)	[F03-OS1.2]
	[F03-OP1.2]
(2)	[F03-OS1.2]
	[F03-OP1.2]
(3)	[F03-OS1.2]
	[F03-OP1.2]
(4)	[F03-OS1.2]
	[F03-OP1.2]
(5)	[F03-OS1.2]
	[F03-OP1.2]
(6)	[F02,F03-OS1.2]
	[F02,F03-OP1.2]
(7)	[F02,F03-OS1.2]
	[F02,F03-OP1.2]
9.10.16.2. Required Fire Blocks in Wall Assemblies	
(1)	[F03-OS1.2]
	[F03-OP1.2]
9.10.16.3. Fire Block Materials	
(1)	[F03-OS1.2]
	[F03-OP1.2]
(2)	[F03-OS1.2]
	[F03-OP1.2]
(3)	[F04-OS1.2]
	[F04-OP1.2]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.10.16.4. Penetration of Fire Blocks	
(1)	[F03-OS1.2]
	[F03-OP1.2]
9.10.17.1. Flame-Spread Rating of Interior Surfaces	
(1)	[F02-OS1.2]
9.10.17.2. Ceilings in Exits or Public Corridors	
(1)	[F05-OS1.5]
9.10.17.3. Walls in Exits	
(1)	[F05-OS1.5]
(2)	[F05-OS1.5]
9.10.17.4. Exterior Exit Passageways	
(1)	[F05-OS1.5]
9.10.17.5. Walls in Public Corridors	
(1)	[F05-OS1.5]
9.10.17.9. Combustible Skylights	
(1)	[F02,F05-OS1.5]
9.10.17.10. Protection of Foamed Plastics	
(1)	[F01,F02,F05-OS1.5]
(2)	[F05-OS1.5] [F02-OS1.2]
	[F02-OP1.2]
(3)	[F01,F02-OS1.2]
9.10.18.1. Access Provided through a Firewall	
(1)	[F11-OS1.5]
9.10.18.2. Fire Alarm System Required	
(1)	[F11-OS1.5] [F13-OS1.2,OS1.5] [F03-OS1.2]
	[F13-OP1.2]
(2)	[F11-OS1.5]
9.10.18.4. Rooms and Spaces Requiring Heat Detectors or Smoke Detectors	
(1)	[F11-OS1.5]
(2)	[F11-OS1.5]
(3)	[F02-OS1.2] Applies to <i>sprinklered buildings</i> . [F11-OS1.5] Applies to the supervision of the system and the flow alarm.
9.10.18.5. Smoke Detectors in Recirculating Air-Handling Systems	
(1)	[F03-OS1.2]
9.10.18.6. Portions of Buildings Considered as Separate Buildings	
(1)	[F03-OS1.2]
(2)	[F11-OS1.2]
9.10.18.7. Central Vacuum Systems	
(1)	[F03-OS1.2]
9.10.19.1. Required Smoke Alarms	
(1)	[F81,F11-OS1.5]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.12.4.1. Support of Footings	
(1)	[F21-OH1.1,OH1.2,OH1.3]
	[F21-OS2.1] [F21-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F21-OP2.2] [F21-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F21-OH2.1] Applies to sewer-line locations beneath footings.
	[F21-OS3.1] Applies to floors and elements that support floors.
9.13.2.1. Required Dampproofing	
(1)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(2)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
9.13.2.2. Dampproofing Materials	
(1)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(2)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
9.13.2.3. Preparation of Surface	
(1)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(2)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(3)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(4)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(5)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(6)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
9.13.2.4. Application of Dampproofing Material	
(1)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(2)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(3)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
9.13.2.5. Moisture Protection for Interior Finishes	
(1)	[F61-OH1.1,OH1.2]
	[F61-OS2.3]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(3)	[F61,F80-OH1.1,OH1.2,OH1.3]
	[F61,F80-OS2.3]
9.13.2.6. Dampproofing of Floors-on-Ground	
(1)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(2)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
9.13.3.1. Required Waterproofing	
(1)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(2)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
9.13.3.2. Waterproofing Materials	
(1)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(2)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
9.13.3.3. Preparation of Surface	
(1)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(2)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(3)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(4)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(5)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
9.13.3.4. Application of Waterproofing Membranes	
(1)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(2)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(3)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
(4)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]
9.13.3.5. Floor Waterproofing System	
(1)	[F61-OH1.1,OH1.2,OH1.3]
	[F61-OS2.3]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.13.4.2. Protection from Soil Gas Ingress	
(1)	[F40-OH1.1]
(2)	[F40-OH1.1]
(3)	[F40-OH1.1]
9.13.4.3. Providing for the Rough-in for a Subfloor Depressurization System	
(1)	[F40-OH1.1]
(2)	[F40-OH1.1]
(3)	[F40-OH1.1]
9.14.2.1. Foundation Wall Drainage	
(1)	[F60-OH1.1,OH1.2,OH1.3]
	[F60-OS2.1,OS2.2,OS2.3]
	[F60-OP2.1,OP2.2,OP2.3]
(2)	(a) [F60-OH1.1,OH1.2,OH1.3] Applies where <i>foundations</i> serve as or support an environmental separator.
	(a) [F60-OS2.1]
	(a) [F60-OS2.3] Applies where <i>foundations</i> serve as or support an environmental separator.
	(b) [F21-OS2.1]
	(b) [F21-OS2.3] Applies where <i>foundations</i> serve as or support an environmental separator.
	(b) [F21-OP2.1]
	(b) [F21-OP2.3] Applies where <i>foundations</i> serve as or support an environmental separator.
	(b) [F21-OP2.4] Applies where <i>foundations</i> support walls or floors.
(b) [F21-OH1.1,OH1.2,OH1.3] Applies where <i>foundations</i> serve as or support an environmental separator.	
	(b) [F21-OH4] Applies where <i>foundations</i> support floors or elements supporting floors.
	(b) [F21-OS3.1] Applies where <i>foundations</i> support floors or elements supporting floors.
	(b) [F21-OS3.7] Applies where <i>foundations</i> support walls that contain windows or doors required for emergency egress.
9.14.3.1. Material Standards	
(1)	[F60-OH1.1,OH1.2,OH1.3]
	[F60-OS2.1,OS2.3]
	[F60-OP2.1,OP2.3]
9.14.3.2. Minimum Size	
(1)	[F60-OH1.1,OH1.2,OH1.3]
	[F60-OS2.1,OS2.2,OS2.3]
	[F60-OP2.1,OP2.2,OP2.3]
9.14.3.3. Installation	
(1)	[F60-OH1.1,OH1.2,OH1.3]
	[F60-OS2.1,OS2.2,OS2.3]
	[F60-OP2.1,OP2.2,OP2.3]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	[F60-OH1.1,OH1.2,OH1.3]
	[F60-OS2.1,OS2.2,OS2.3]
	[F60-OP2.1,OP2.2,OP2.3]
(3)	[F60-OH1.1,OH1.2,OH1.3]
	[F60-OS2.1,OS2.2,OS2.3]
	[F60-OP2.1,OP2.2,OP2.3]
(4)	[F60-OH1.1,OH1.2,OH1.3]
	[F60-OS2.1,OS2.2,OS2.3]
	[F60-OP2.1,OP2.2,OP2.3]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(3)	[F20,F21,F61-OS2.1] [F20,F21,F61-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F20,F21,F61-OP2.1,OP2.4] [F20,F21,F61-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F20,F21,F61-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator and to masonry used in <i>chimneys</i> and fireplaces.
	[F20,F21,F61-OH4] Applies to floors and elements that support floors.
	[F20,F21,F61-OS3.1] Applies to floors and elements that support floors.
	[F20,F21-OS1.2] Applies to assemblies required to provide fire resistance.
(4)	[F20,F21-OS2.1] [F20,F21-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F20,F21-OP2.1,OP2.4] [F20,F21-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F20,F21-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator and to masonry used in <i>chimneys</i> and fireplaces.
	[F20,F21-OH4] Applies to floors and elements that support floors.
	[F20,F21-OS3.1] Applies to floors and elements that support floors.
	[F20,F21-OS1.2] Applies to assemblies required to provide fire resistance.
(5)	[F20-OS2.1] [F20-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OP2.1,OP2.4] [F20-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator and to masonry used in <i>chimneys</i> and fireplaces.
	[F20-OH4] Applies to floors and elements that support floors.
	[F20-OS3.1] Applies to floors and elements that support floors.
	[F20-OS1.2] Applies to assemblies required to provide fire resistance.

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(6)	[F20-OS2.1] [F20-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OP2.1,OP2.4] [F20-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator and to masonry used in <i>chimneys</i> and fireplaces.
	[F20-OH4] Applies to floors and elements that support floors.
	[F20-OS3.1] Applies to floors and elements that support floors.
(7)	[F20,OS1.2] Applies to assemblies required to provide fire resistance.
	[F20,F21,F61-OS2.1] [F20,F21,F61-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F20,F21,F61-OP2.1,OP2.4] [F20,F21,F61-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F20,F21,F61-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator and to masonry used in <i>chimneys</i> and fireplaces.
	[F20,F21,F61-OH4] Applies to floors and elements that support floors.
	[F20,F21,F61-OS3.1] Applies to floors and elements that support floors.
	[F20,F21,F61-OS1.2] Applies to assemblies required to provide fire resistance.
9.20.4.1. Thickness	
(1)	[F20,F61-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator.
	[F20,F61-OS2.1] [F20,F61-OS2.3] Applies to elements that support or are part of an environmental separator or are exposed to moisture.
	[F20,F61-OP2.1,OP2.4] [F20,F61-OP2.3] Applies to elements that support or are part of an environmental separator or are exposed to moisture.
	[F20,F61-OS1.2] Applies to assemblies required to provide fire resistance.
	[F20,F61-OH4] Applies to floors and elements that support floors.
	[F20,F61-OS3.1] Applies to floors and elements that support floors.

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	[F20,F61-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator.
	[F20,F61-OS2.1] [F20,F61-OS2.3] Applies to elements that support or are part of an environmental separator or are exposed to moisture.
	[F20,F61-OP2.1,OP2.4] [F20,F61-OP2.3] Applies to elements that support or are part of an environmental separator or are exposed to moisture.
	[F20,F61-OS1.2] Applies to assemblies required to provide fire resistance.
	[F20,F61-OH4] Applies to floors and elements that support floors.
	[F20,F61-OS3.1] Applies to floors and elements that support floors.
9.20.4.2. Masonry Units	
(1)	[F20-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator and to masonry used in <i>chimneys</i> and fireplaces.
	[F20-OS2.1] [F20-OS2.3] Applies to elements that support or are part of an environmental separator or are exposed to moisture.
	[F20-OP2.1,OP2.4] [F20-OP2.3] Applies to elements that support or are part of an environmental separator or are exposed to moisture.
	[F20-OS1.2] Applies to assemblies required to provide fire resistance.
	[F20-OH4] Applies to floors and elements that support floors.
	[F20-OS3.1] Applies to floors and elements that support floors.
(2)	[F20-OS2.1] [F20-OS2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OP2.1,OP2.4] [F20-OP2.3] Applies to elements that support or are part of an environmental separator.
	[F20-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator and to masonry used in <i>chimneys</i> and fireplaces.
	[F20-OH4] Applies to floors and elements that support floors.
	[F20-OS3.1] Applies to floors and elements that support floors.
	[F20-OS1.2] Applies to assemblies required to provide fire resistance.

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(3)	[F20-OS2.1] [F20-OS2.3] Applies to elements that support or are part of an environmental separator or are exposed to moisture.
	[F20-OP2.1,OP2.4] [F20-OP2.3] Applies to elements that support or are part of an environmental separator or are exposed to moisture.
	[F20-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator and to masonry used in <i>chimneys</i> and fireplaces.
	[F20-OH4] Applies to floors and elements that support floors.
	[F20-OS3.1] Applies to floors and elements that support floors.
	[F20-OS1.2] Applies to assemblies required to provide fire resistance.
9.20.5.1. Masonry Support	
(1)	[F20,F21-OH1.1,OH1.2,OH1.3] Applies to elements that support or are part of an environmental separator.
	[F20,F21-OS2.1] [F20,F21-OS2.3] Applies to elements that support or are part of an environmental separator or are exposed to moisture.
	[F20,F21-OP2.1,OP2.4] [F20,F21-OP2.3] Applies to elements that support or are part of an environmental separator or are exposed to moisture.
	[F20,F21-OS1.2] Applies to assemblies required to provide fire resistance.
	[F20,F21-OH4] Applies to floors and elements that support floors.
	[F20,F21-OS3.1] Applies to floors and elements that support floors.

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.27.5.1. Attachment	
(1)	[F20-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.
	[F20-OP2.1,OP2.3,OP2.4] [F22-OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
	[F20-OH1.1,OH1.2,OH1.3] [F20,F22-OH1.1,OH1.2,OH1.3] Applies where panel-type cladding is installed to provide the required bracing.
	[F20,F22-OH4] Applies where panel-type cladding is installed to provide the required bracing of walls that support floors.
	[F20,F22-OS3.1] Applies where panel-type cladding is installed to provide the required bracing of walls that support floors.
	[F20,F22-OS3.7] Applies where panel-type cladding is installed to provide required bracing of walls that contain doors or windows required for emergency egress.
(2)	[F20-OH1.1,OH1.2,OH1.3]
	[F20-OS2.1,OS2.3]
(3)	[F20-OH1.1,OH1.2,OH1.3]
	[F20-OS2.3]
(4)	[F20-OH1.1,OH1.2,OH1.3]
	[F20-OS2.1,OS2.3]
9.27.5.2. Blocking	
(1)	[F20-OH1.1,OH1.2,OH1.3] [F20,F22-OH1.1,OH1.2,OH1.3] Applies where panel-type cladding is installed to provide the required bracing.
	[F20-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.
	[F20-OP2.1,OP2.3,OP2.4] [F22-OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
9.27.5.3. Furring	
(1)	[F20-OH1.1,OH1.2,OH1.3]
	[F20-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where furring is used for the attachment of panel-type cladding installed to provide the required bracing.
(2)	[F20-OH1.1,OH1.2,OH1.3] [F20,F22-OH1.1,OH1.2,OH1.3] Applies where furring is used for the attachment of panel-type cladding installed to provide the required bracing.
	[F20-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where furring is used for the attachment of panel-type cladding installed to provide the required bracing.

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(3)	<p>[F20-OH1.1,OH1.2,OH1.3] [F20,F22-OH1.1,OH1.2,OH1.3] Applies where furring is used for the attachment of panel-type cladding installed to provide the required bracing.</p> <p>[F20-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where furring is used for the attachment of panel-type cladding installed to provide the required bracing.</p>
9.27.5.4. Size and Spacing of Fasteners	
(1)	<p>[F20-OH1.1,OH1.2,OH1.3] [F20,F22-OH1.1,OH1.2,OH1.3] Applies to the attachment of panel-type cladding installed to provide the required bracing.</p> <p>[F20-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.</p>
9.27.5.5. Fastener Materials	
(1)	<p>[F80-OH1.1,OH1.2,OH1.3] [F80-OS2.3] [F80-OS2.3,OS2.4] Applies where panel-type cladding is installed to provide the required bracing.</p> <p>[F80-OP2.1,OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.</p>
9.27.5.6. Expansion and Contraction	
(1)	<p>[F21-OH1.1,OH1.2,OH1.3] [F21-OS2.3]</p>
9.27.5.7. Penetration of Fasteners	
(1)	<p>[F20-OH1.1,OH1.2,OH1.3] [F20-OS2.1,OS2.3]</p>
(2)	<p>[F20-OH1.1,OH1.2,OH1.3] [F20,F22-OH1.1,OH1.2,OH1.3] Applies where panel-type cladding is installed to provide the required bracing.</p> <p>[F20-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.</p> <p>[F20-OP2.1,OP2.3,OP2.4] [F22-OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.</p>
9.27.6.1. Materials	
(1)	<p>[F61,F20-OH1.1,OH1.2,OH1.3] [F62,F20-OS2.3]</p>
9.27.6.2. Thickness and Width	
(1)	<p>[F20-OH1.1,OH1.2,OH1.3] [F20-OS2.3]</p>
(2)	<p>[F20-OH1.1,OH1.2,OH1.3] [F20-OS2.3]</p>
(3)	<p>[F20-OH1.1,OH1.2,OH1.3] [F20-OS2.3]</p>

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.27.6.3. Joints	
(1)	<p>[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]</p>
(2)	<p>[F21,F61-OH1.1,OH1.2,OH1.3] [F21,F61-OS2.3]</p>
9.27.7.1. Materials	
(1)	<p>[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]</p>
(2)	<p>[F61,F20-OH1.1,OH1.2,OH1.3] [F61,F20-OS2.3]</p>
(3)	<p>[F61,F20-OH1.1,OH1.2,OH1.3] [F61,F20-OS2.3]</p>
9.27.7.2. Width	
(1)	<p>[F61,F20-OH1.1,OH1.2,OH1.3] [F61,F20-OS2.3]</p>
9.27.7.3. Fasteners	
(1)	<p>[F61,F20-OH1.1,OH1.2,OH1.3] [F61,F20-OS2.3]</p>
9.27.7.4. Offsetting of Joints	
(1)	<p>[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]</p>
(2)	<p>[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]</p>
9.27.7.5. Fastening to Lath	
(1)	<p>[F81-OH1.1,OH1.2,OH1.3] [F81-OS2.3]</p>
(2)	<p>[F62-OH1.1,OH1.2,OH1.3] [F62-OS2.3]</p>
(3)	<p>[F20-OH1.1,OH1.2,OH1.3] [F20-OS2.3]</p>
(4)	<p>[F20-OH1.1,OH1.2,OH1.3] [F20-OS2.3]</p>
(5)	<p>[F62-OH1.1,OH1.2,OH1.3] [F62-OS2.3]</p>
9.27.7.6. Exposure and Thickness	
(1)	<p>[F62,F20-OH1.1,OH1.2,OH1.3] [F62,F20-OS2.3]</p>

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.27.8.1. Material Standards	
(1)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing. [F20-OP2.1,OP2.3,OP2.4] [F22-OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
9.27.8.2. Thickness	
(1)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20,F22-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.
(2)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing. [F20-OP2.1,OP2.3] [F22-OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
9.27.8.3. Edge Treatment	
(1)	[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3] [F61-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing. [F61-OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
9.27.8.4. Panel Cladding	
(1)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20,F22-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing. [F20-OP2.1,OP2.3,OP2.4] [F22-OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
(2)	[F21-OH1.1,OH1.2,OH1.3] [F21-OS2.3]
(3)	[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]
(4)	[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]
9.27.8.5. Lapped Strip Siding	
(1)	[F21,F61-OH1.1,OH1.2,OH1.3] [F21,F61-OS2.3]
(2)	[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(3)	[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]
9.27.9.1. Material Standards	
(1)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.
(2)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20-OS2.1,OS2.3] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.
9.27.9.2. Thickness	
(1)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20,F22-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing. [F20-OP2.1,OP2.3,OP2.4] [F22-OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
(2)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20,F22-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.
(3)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20,F22-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing. [F20-OP2.1,OP2.3,OP2.4] [F22-OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
9.27.9.3. Panel Cladding	
(1)	[F20,F21,F22-OH1.1,OH1.2,OH1.3] [F20,F21,F22-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing. [F20-OP2.1,OP2.3,OP2.4] [F22-OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
(2)	[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]
(3)	[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]
9.27.9.4. Lapped Strip Siding	
(1)	[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]
9.27.9.5. Clearance	
(1)	[F21-OH1.1,OH1.2,OH1.3] [F21-OS2.1,OS2.3] [F21-OS2.1,OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing. [F21-OP2.1,OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
9.27.10.1. Material Standard	
(1)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.
9.27.10.2. Thickness	
(1)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20,F22-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.
(2)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20,F22-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing. [F20-OP2.1,OP2.3,OP2.4] [F22-OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
(3)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20,F22-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.
(4)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20,F22-OS2.1,OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing. [F20-OP2.1,OP2.3,OP2.4] [F22-OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
9.27.10.3. Panel Cladding	
(1)	[F20,F22,F80-OH1.1,OH1.2,OH1.3] [F20,F22,F80-OS2.1,OS2.3] [F20,F80-OS2.1,OS2.3,OS2.4] [F22,F80-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.
(2)	[F21-OH1.1,OH1.2,OH1.3] [F21-OS2.3]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(3)	[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]
(4)	[F61-OH1.1,OH1.2,OH1.3] [F61-OS2.3]
9.27.10.4. Clearance	
(1)	[F21-OH1.1,OH1.2,OH1.3] [F21-OS2.1,OS2.3] [F21-OS2.1,OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing. [F21-OP2.1,OP2.3,OP2.4,OP2.5] Applies where panel-type cladding is installed to provide the required bracing.
9.27.11.1. Material Standards	
(1)	[F20,F22,F61,F62-OH1.1,OH1.2,OH1.3] [F20-OS2.1,OS2.3] [F22,F61,F62-OS2.3]
(2)	[F20,F22,F61-OH1.1,OH1.2,OH1.3] [F20-OS2.1,OS2.3] [F22,F61-OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.
(3)	[F20,F22,F61-OH1.1,OH1.2,OH1.3] [F20-OS2.1,OS2.3] [F22,F61-OS2.3]
(4)	[F20,F22,F61-OH1.1,OH1.2,OH1.3] [F20-OS2.1,OS2.3] [F22,F61-OS2.3] [F20-OS2.1,OS2.3,OS2.4] [F22-OS2.3,OS2.4,OS2.5] Applies where panel-type cladding is installed to provide the required bracing.
9.27.12.1. Material Standard	
(1)	[F62,F61,F20-OH1.1,OH1.2,OH1.3] [F62,F61,F20-OS2.3]
9.27.13.2. Materials	
(1)	[F20,F61,F62-OH1.1,OH1.2,OH1.3] [F20,F61,F62-OS2.3]
(2)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20,F22-OS2.3]
9.27.13.3. Design and Installation	
(1)	[F20,F61,F62-OH1.1,OH1.2,OH1.3] [F20,F61,F62-OS2.3]
9.28.1.1. Sheathing beneath Stucco	
(1)	[F20,F22-OH1.1,OH1.2,OH1.3] [F20,F22-OS2.3]
9.28.1.2. Lath and Reinforcing	
(1)	[F20-OH1.1,OH1.2,OH1.3] [F20-OS2.3]
(2)	[F20-OH1.1,OH1.2,OH1.3] [F20-OS2.3]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(3)	[F20,F21-OS1.1]
	[F20,F21-OS2.3]
	[F20,F21-OS3.4]
	[F20,F21-OP1.1]
	[F20,F21-OH1.1]
9.28.1.3. Concrete Masonry Units	
(1)	[F80-OH1.1,OH1.2,OH1.3]
	[F80-OS2.3]
	[F80-OS1.1] Applies where stucco is applied to masonry chimneys.
	[F80-OS3.4] Applies where stucco is applied to masonry chimneys.
	[F80-OP1.1] Applies where stucco is applied to masonry chimneys.
9.28.1.4. Clearance over Ground Level	
(1)	[F80-OH1.1,OH1.2,OH1.3]
	[F80-OS2.3]
9.28.1.5. Flashing and Caulking	
(1)	[F80-OH1.1,OH1.2,OH1.3] Applies to the separation of aluminum flashing from stucco.
	[F80-OS2.3] Applies to the separation of aluminum flashing from stucco.
9.28.2.1. Portland Cement	
(1)	[F20-OH1.1,OH1.2,OH1.3]
	[F20-OS2.3]
	[F20-OS1.1] Applies where stucco is applied to masonry chimneys.
	[F20-OS3.4] Applies where stucco is applied to masonry chimneys.
	[F20-OP1.1] Applies where stucco is applied to masonry chimneys.

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(3)	[F81-OS3.1] [F81-OH1.1] Applies where finished flooring is required to provide water resistance. [F81-OS2.3] Applies where finished flooring is required to provide water resistance.
9.30.2.2. Materials and Thickness	
(1)	[F81-OS3.1] [F81-OS2.3] Applies where finished flooring is required to provide water resistance. [F81-OH1.1] Applies where finished flooring is required to provide water resistance.
(2)	[F81-OS2.3] Applies where finished flooring is required to provide water resistance. [F81-OS3.1] [F81-OH1.1] Applies where finished flooring is required to provide water resistance.
9.30.2.3. Fastening	
(1)	[F81-OS3.1] [F81-OS2.3] Applies where finished flooring is required to provide water resistance. [F81-OH1.1] Applies where finished flooring is required to provide water resistance.
(2)	[F81-OS3.1] [F81-OS2.3] Applies where finished flooring is required to provide water resistance. [F81-OH1.1] Applies where finished flooring is required to provide water resistance.
(3)	[F81-OS3.1] [F81-OS2.3] Applies where finished flooring is required to provide water resistance. [F81-OH1.1] Applies where finished flooring is required to provide water resistance.
9.30.2.4. Joints Offset	
(1)	[F81-OS3.1] [F81-OS2.3] Applies where finished flooring is required to provide water resistance. [F81-OH1.1] Applies where finished flooring is required to provide water resistance.
9.30.2.5. Surface Defects	
(1)	[F81-OS3.1] [F81-OS2.3] Applies where finished flooring is required to provide water resistance. [F81-OH1.1] Applies where finished flooring is required to provide water resistance.
9.30.3.1. Thickness	
(1)	[F30-OS3.1] [F20-OS2.1]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.30.3.2. Strip Direction and End Joints	
(1)	[F30-OS3.1]
(2)	[F20-OS2.1]
(3)	[F20-OS2.1]
9.30.3.3. Nailing	
(1)	[F30-OS3.1]
(2)	[F30-OS3.1]
9.30.3.4. Staples	
(1)	[F30-OS3.1]
9.30.4.1. Adhesive	
(1)	[F81-OS3.1]
9.30.5.1. Materials	
(1)	[F41,F80-OH1.1] [F80-OS3.1]
(2)	[F81,F80-OS3.1] [F41-OH1.1]
9.30.6.1. Substrate	
(1)	[F81-OS3.1] [F81-OH1.1] Applies where finished flooring is required to provide water resistance. [F81-OS2.3] Applies where finished flooring is required to provide water resistance.
(2)	[F81-OH1.1] Applies where finished flooring is required to provide water resistance. [F81-OS3.1] [F81-OS2.3] Applies where finished flooring is required to provide water resistance.
9.31.2.2. Corrosion Protection	
(1)	[F80-OH2.1] [F80-OS2.3]
9.31.2.3. Grab Bars	
(1)	[F20-OS3.1]
9.31.3.1. Required Water Supply	
(1)	[F70,F71-OH2.2,OH2.3]
9.31.3.2. Required Connections	
(1)	[F71-OH2.3]
(2)	[F71,F70-OH2.3]
9.31.4.1. Required Fixtures	
(1)	[F71,F70,F72-OH2.1,OH2.3]
9.31.4.2. Hot Water Supply	
(1)	[F71-OH2.3]
9.31.4.3. Floor Drains	
(1)	[F62,F40,F41-OH1.2,OH1.3] [F62-OH1.1]
(2)	[F62,F52-OH1.2,OH1.3] [F62-OH1.1]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.31.5.1. Building Sewer	
(1)	[F72-OH2.1]
9.31.5.2. Discharge of Sewage	
(1)	[F72-OH2.1]
(2)	[F72-OH2.1]
9.31.6.1. Hot Water Supply	
(1)	(a) [F40-OH2.1, OH2.4] [F71-OH2.3]
9.31.6.2. Equipment and Installation	
(1)	[F31, F30, F81-OS3.2] [F44-OS3.4]
(2)	[F44-OH1.1]
	[F01-OS1.1]
(3)	[F23-OS3.4]
	[F01-OS1.1]
9.31.6.3. Corrosion-Resistant Coating	
(1)	[F81, F80-OH2.3]
9.31.6.4. Fuel-Burning Heaters	
(1)	[F41-OH1.1]
	[F01-OS1.1]
9.31.6.5. Heating Coils	
(1)	[F31-OS3.2]
	[F71-OH2.3]
9.32.1.2. Required Ventilation	
(1)	[F40, F50, F52-OH1.1] [F51, F52-OH1.2]
(2)	[F40, F50, F52-OH1.1] [F51, F52-OH1.2]
9.32.1.3. Venting of Laundry-Drying Equipment	
(1)	[F40, F44, F50, F52-OH1.1]
	[F01-OS1.1]
	[F01-OP1.1]
(2)	[F81-OS1.1]
	[F81-OP1.1]
	[F40, F80-OH1.1]
	[F63, F80-OS2.3]
(3)	[F40, F44, F50, F52-OH1.1]
	[F01-OS1.1]
	[F01-OP1.1]
9.32.2.1. Required Ventilation	
(1)	[F40, F50, F52-OH1.1] [F51, F52-OH1.2]
9.32.2.2. Non-Heating-Season Natural Ventilation	
(1)	[F51, F52-OH1.2] [F40, F52, F50-OH1.1]
(3)	[F42-OH2.5]
	[F61, F42-OH1.1]
	[F61, F42-OS2.3]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(4)	[F80-OH2.5]
	[F80, F42-OH1.1, OH1.2]
9.32.2.3. Non-Heating-Season Mechanical Ventilation	
(1)	[F40, F50, F52-OH1.1]
(3)	[F40, F50, F52-OH1.1] [F51, F52-OH1.2]
(4)	[F40, F50, F52-OH1.1] [F51, F52-OH1.2]
9.32.3.1. Required Ventilation	
(1)	[F40, F50, F53-OS3.4]
	[F40, F50, F52-OH1.1] [F51, F52-OH1.2]
(2)	(a), (b) [F40, F50, F52-OH1.1]
	(a), (b) [F51, F52-OH1.2]
	(c) [F53-OH1.1]
	(c) [F53-OS3.4]
9.32.3.2. Design and Installation	
(1)	[F52-OS2.3]
	[F40, F52, F50-OH1.1] [F52, F51-OH1.2]
(2)	[F81-OH1.1]
(3)	[F81-OH1.1]
	[F81-OS3.4]
(4)	[F40, F43, F50, F53-OH1.1]
	[F43, F53, F82-OS3.4]
(5)	[F82-OH1.1]
(6)	[F63, F81-OH1.1]
9.32.3.3. Principal Ventilation System	
(1)	[F40, F50, F52-OH1.1] [F51, F52-OH1.2]
(2)	[F40, F50, F52-OH1.1] [F51, F52-OH1.2]
(4)	[F80, F81-OH1.1]
(5)	[F81-OH1.1]
(6)	[F81-OH1.1]
(7)	[F81-OH1.1]
(8)	[F81-OH1.1]
(9)	[F40, F50, F52-OH1.1]
(10)	[F40-OH1.1]
9.32.3.4. Ventilation Systems Used in Conjunction with Forced Air Heating Systems	
(2)	[F50, F51, F81-OH1.1] [F51, F81-OH1.2]
	[F43, F50, F81-OS3.4]
(5)	[F40, F43, F50, F52-OH1.1]
	(a) [F43, F50, F53-OS3.4]
	(b) [F43, F50, F81-OS3.4]
(6)	[F53-OH1.1]
	[F43, F50, F53-OS3.4]
	[F53, F63-OS2.3]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.33.8.1. Piping Materials and Installation	
(1)	[F20-OS3.2] [F20-OH1.1,OH1.2]
(2)	[F21,F40-OH1.1] [F21,F51-OH1.2]
(3)	[F20-OS2.2]
9.33.8.2. Insulation and Coverings	
(1)	[F80-OH1.2] [F80-OS3.2]
(2)	(a),(b) [F01-OS1.1] (a),(b) [F01-OP1.1]
(3)	(a),(b) [F01,F02-OS1.1,OS1.2] (a),(b) [F01,F02-OP1.1,OP1.2]
(4)	[F01,F02-OS1.1,OS1.2] [F01,F02-OP1.1]
(5)	[F31-OS3.2]
9.33.8.3. Clearances	
(1)	[F01-OS1.1] [F01-OP1.1]
9.33.8.4. Protection	
(1)	[F01-OS1.1] [F01-OP1.1]
(2)	[F01-OS1.1] [F01-OP1.1]
9.33.9.1. Cooling Units	
(1)	(a),(b),(c) [F43-OH1.1] [F51-OH1.2]
9.33.10.2. Factory-Built Chimneys	
(1)	[F01-OS1.1] [F44-OS3.4] [F44,F41-OH1.1] [F01-OP1.1]
9.34.1.1. Standard for Electrical Installations	
(1)	[F32-OS3.3] [F01-OS1.1] [F01-OP1.1]
9.34.1.3. Location of Equipment in Public Areas	
(1)	[F10-OS3.1] [F32-OS3.3]
9.34.1.4. Recessed Lighting Fixtures	
(1)	[F01-OS1.1]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.34.1.5. Wiring and Cables	
(1)	[F02-OS1.2] [F02-OP1.2]
9.34.2.1. Lighting of Entrances	
(1)	[F30-OS3.1] [F34-OS4.2]
9.34.2.2. Outlets in Dwelling Units	
(1)	[F30-OS3.1]
(2)	[F30-OS3.1]
9.34.2.3. Stairways	
(1)	[F30-OS3.1]
(2)	[F30-OS3.1]
9.34.2.4. Basements	
(1)	[F30-OS3.1]
(2)	[F30-OS3.1]
9.34.2.5. Storage Rooms	
(1)	[F30-OS3.1]
9.34.2.6. Garages and Carports	
(1)	[F30-OS3.1]
(2)	[F30-OS3.1]
(3)	[F30-OS3.1]
9.34.2.7. Public and Service Areas	
(1)	[F30-OS3.1]
(2)	[F30-OS3.1]
(3)	[F30-OS3.1]
9.35.2.2. Garage Floor	
(1)	[F40-OS1.1]
9.35.3.2. Protection from Damage due to Soil Movement	
(1)	[F21-OS2.3] [F21-OH1.1,OH1.2,OH1.3] [F21-OP2.3,OP2.4] [F21-OH4] Applies to floors and elements that support floors. [F21-OS3.1] Applies to floors and elements that support floors.
(2)	[F21-OS2.3] [F21-OH1.1,OH1.2,OH1.3] [F21-OP2.3,OP2.4] [F21-OH4] Applies to floors and elements that support floors. [F21-OS3.1] Applies to floors and elements that support floors.
9.35.3.4. Column Piers	
(1)	[F80-OS2.3] [F80-OP2.3]
(2)	[F20-OS2.1,OS2.2] [F20-OP2.1,OP2.2]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.35.4.2. Columns	
(1)	[F20-OS2.1]
	[F20-OP2.1]
9.35.4.3. Anchorage	
(1)	[F22-OS2.4,OS2.5]
	[F22-OP2.4,OP2.5]
9.36.2.2. Determination of Thermal Characteristics of Materials, Components and Assemblies	
(1)	[F92-OE1.1]
(2)	[F92-OE1.1]
(3)	[F92-OE1.1]
(4)	[F92-OE1.1]
(5)	[F92-OE1.1]
9.36.2.4. Calculation of Effective Thermal Resistance of Assemblies	
(1)	[F92-OE1.1]
(3)	[F92-OE1.1]
9.36.2.5. Continuity of Insulation	
(1)	[F92-OE1.1]
(2)	[F92-OE1.1]
(3)	[F92-OE1.1]
(4)	[F92-OE1.1]
(5)	[F92-OE1.1]
(6)	[F92-OE1.1]
(7)	[F92-OE1.1]
(8)	[F92-OE1.1]
9.36.2.6. Thermal Characteristics of Above-ground Opaque Building Assemblies	
(1)	[F92-OE1.1]
(2)	[F92-OE1.1]
(3)	[F92-OE1.1]
(4)	[F92-OE1.1]
9.36.2.7. Thermal Characteristics of Fenestration, Doors and Skylights	
(1)	[F92-OE1.1]
(2)	[F92-OE1.1]
(3)	[F92-OE1.1]
(4)	[F92-OE1.1]
(5)	[F92-OE1.1]
(7)	[F92-OE1.1]
(8)	[F92-OE1.1]
9.36.2.8. Thermal Characteristics of Building Assemblies Below-Grade or in Contact with the Ground	
(1)	[F92-OE1.1]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
(2)	[F92-OE1.1]
(3)	[F92-OE1.1]
(4)	[F92-OE1.1]
(5)	[F92-OE1.1]
(6)	[F92-OE1.1]
(7)	[F92-OE1.1]
(8)	[F92-OE1.1]
(9)	[F92-OE1.1]
9.36.2.9. Airtightness	
(1)	[F90-OE1.1]
(2)	[F90-OE1.1]
(3)	[F90-OE1.1]
(4)	[F90-OE1.1]
(5)	[F90-OE1.1]
(6)	[F90-OE1.1]
9.36.2.10. Construction of Air Barrier Details	
(1)	[F90-OE1.1]
(2)	[F90-OE1.1]
(3)	[F90-OE1.1]
(4)	[F90-OE1.1]
(5)	[F90-OE1.1]
(6)	[F90-OE1.1]
(7)	[F90-OE1.1]
(8)	[F90-OE1.1]
(9)	[F90-OE1.1]
(10)	[F90-OE1.1]
(11)	[F90-OE1.1]
(12)	[F90-OE1.1]
(13)	[F90-OE1.1]
(14)	[F90-OE1.1]
(15)	[F90-OE1.1]
(16)	[F90-OE1.1]
(17)	[F90-OE1.1]
9.36.2.11. Trade-off Options for Above-ground Building Envelope Components and Assemblies	
(2)	[F92-OE1.1]
(3)	[F92-OE1.1]
(4)	[F92-OE1.1]
(5)	[F92-OE1.1]
(6)	[F92-OE1.1]
(7)	[F92-OE1.1]
(8)	[F92-OE1.1]

Table 9.37.1.1. (Continued)

Functional Statements and Objectives ⁽¹⁾	
9.36.3.2. Equipment and Ducts	
(1)	[F95-OE1.1]
(3)	[F91,F93-OE1.1]
(4)	[F91,F93-OE1.1]
(5)	[F91,F93-OE1.1]
9.36.3.3. Air Intake and Outlet Dampers	
(1)	[F91,F95-OE1.1]
(2)	[F91,F95-OE1.1]
9.36.3.4. Piping for Heating and Cooling Systems	
(2)	[F93-OE1.1]
9.36.3.5. Equipment for Heating and Air-conditioning Systems	
(1)	[F98-OE1.1]
9.36.3.6. Temperature Controls	
(1)	[F95-OE1.1]
(2)	[F95,F98-OE1.1]
(3)	[F95-OE1.1]

A-9.8.4.6. Winders. Where a stair must turn, the safest method of incorporating the turn is to use a landing. Within a dwelling unit, however, where occupants are familiar with their environment, winders are an acceptable method of reducing the amount of floor area devoted to the stair and have not been shown to be more hazardous than a straight run of steps. Nevertheless, care is required to ensure that winders are as safe as possible. Experience has shown that 30° winders are the best compromise and require the least change in the natural gait of the stair user; 45° winders are also acceptable, as they are wider. The Code permits only these two angles. Although it is normal Code practice to specify upper and lower limits, in this case it is necessary to limit the winders to specific angles with no tolerance above or below these angles other than normal construction tolerances. One result of this requirement is that winder-type turns in stairs are limited to 30° or 45° (1 winder), 60° (2 winders), or 90° (2 or 3 winders). See Figure A-9.8.4.6.

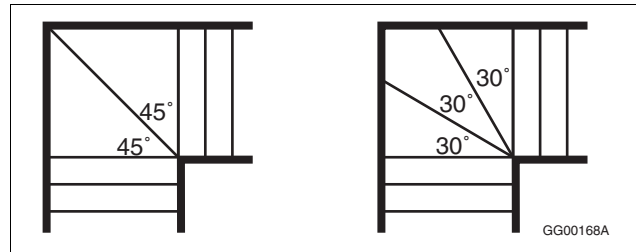


Figure A-9.8.4.6.
Winders

A-9.8.4.7. Spiral Stairs. A spiral stair is typically described as a stair with a circular plan having uniform treads that radiate from and wind around a common central post or supporting column.

In the context of the Code, the term “spiral stair” is used to describe any stair where:

- (a) the plan of the treads forms part or all of a circle,
- (b) the minimum stair width and tread depth are less than those required for curved stairs, and
- (c) the maximum riser height is greater than that permitted in all other stair configurations.

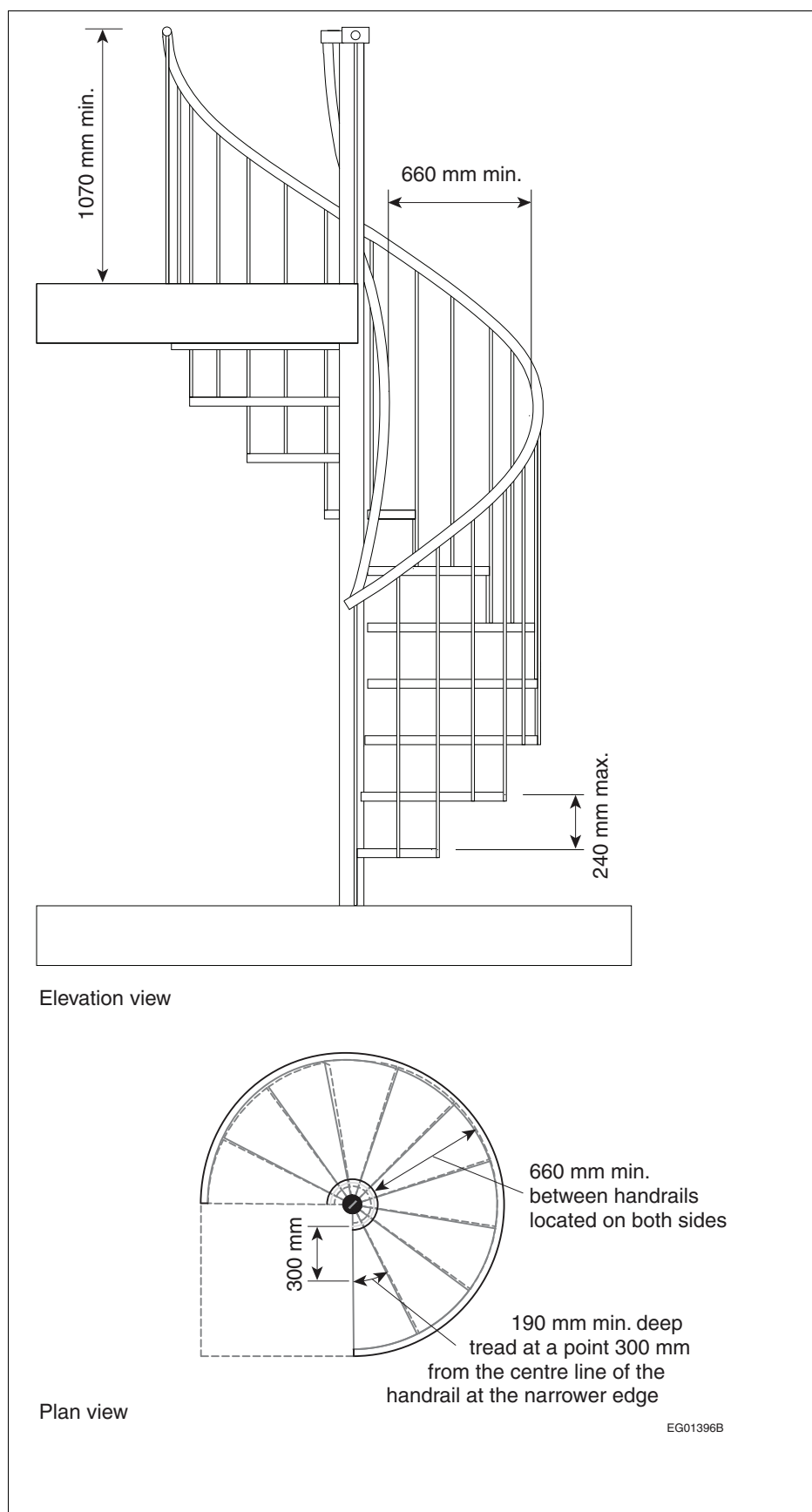


Figure A-9.8.4.7.
Spiral stairs

A-9.8.4.8. Tread Nosings. A sloped or beveled edge on tread nosings will make the tread more visible through light modeling. The sloped portion of the nosing must not be too wide so as to reduce the risk of slipping of the foot. See Figure A-9.8.4.-B.

A-9.8.7.1.(2) Wider Stairs than Required. The intent of Sentence 9.8.7.1.(2) is that handrails be installed in relation to the required exit width only, regardless of the actual width of the stair and ramp. The required handrails are provided along the assumed natural path of travel to and from the building.

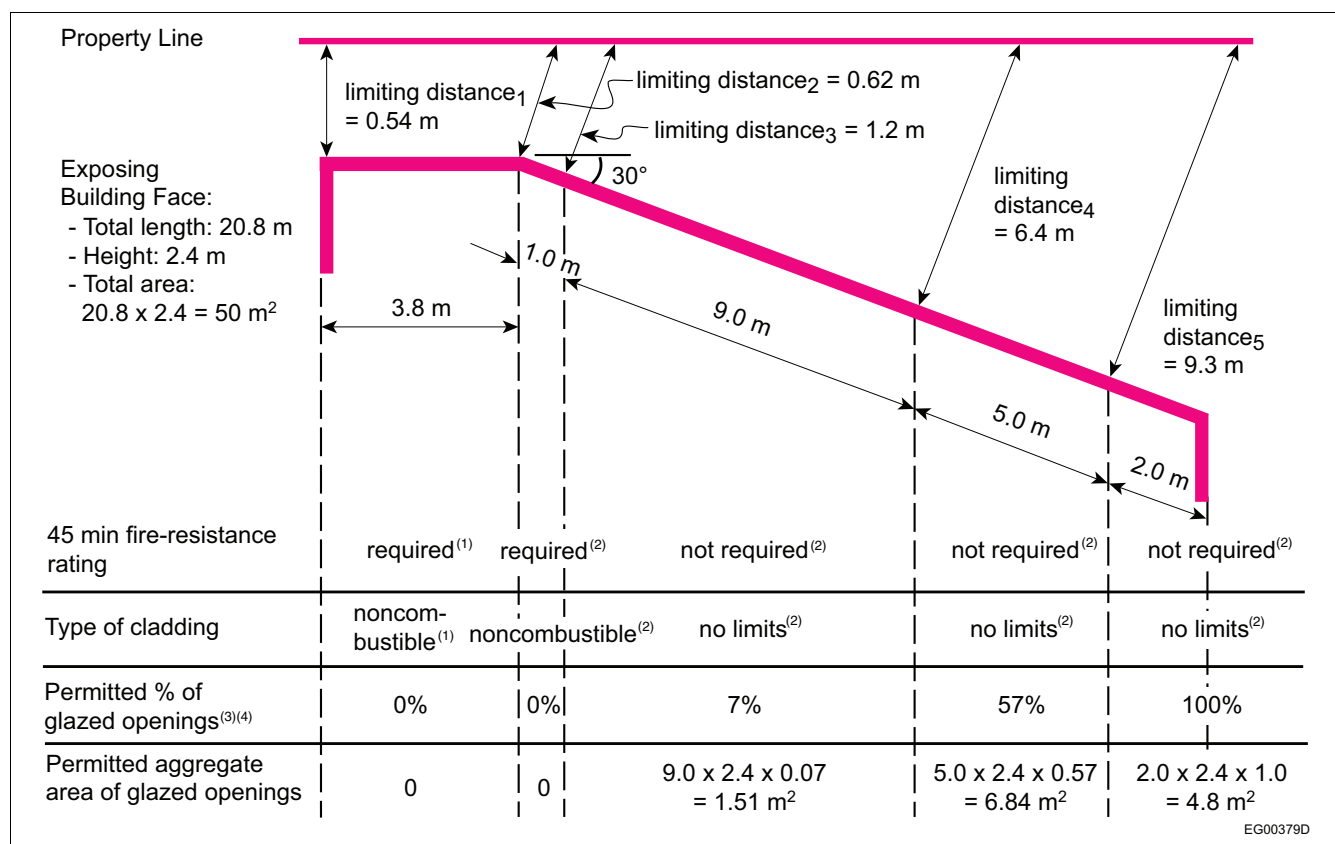


Figure A-9.10.15.4.(2)-C

Example of determination of criteria for the exposing building face of a skewed wall of a house with a different arbitrary division of the wall

Notes to Figure A-9.10.15.4.(2)-C:

- (1) See Sentence 9.10.15.5.(2).
- (2) See Sentence 9.10.15.5.(3).
- (3) See Table 9.10.15.4., Subclause 9.10.15.2.(1)(b)(iii) and Sentence 9.10.15.4.(2).
- (4) To simplify the calculations, choose the column for the lesser limiting distance nearest to the actual limiting distance. Interpolation for limiting distance is also acceptable and may result in a slightly larger permitted area of glazed openings. Interpolation can only be used for limiting distances greater than 1.2 m.

A-9.10.19.3.(1) Location of Smoke Alarms. There are two important points to bear in mind when considering where to locate smoke alarms in dwelling units:

- The most frequent point of origin for fires in dwelling units is the living area.
- The main concern in locating smoke alarms is to provide warning to people asleep in bedrooms.

A smoke alarm located in the living area and wired so as to sound another smoke alarm located near the bedrooms is the ideal solution. However, it is difficult to define exactly what is meant by “living area.” It is felt to be too stringent to require a smoke alarm in every part of a dwelling unit that could conceivably be considered a “living area” (living room, family room, study, etc.). Sentence 9.10.19.3.(1) addresses these issues by requiring at least one smoke alarm on every storey containing a sleeping room. Thus, in a dwelling unit complying with Sentence 9.10.19.3.(1), every living area will probably be located within a reasonable distance of a smoke alarm. Nevertheless, where a choice arises as to where on a storey to locate the required smoke alarm or alarms, one should be located as close as possible to a living area, provided the requirements related to proximity to bedrooms are also satisfied.

A smoke alarm is not required on each level in a split-level dwelling unit as each level does not count as a separate storey. Determine the number of storeys in a split-level dwelling unit and which levels are part of which storey as follows:

1. establish grade, which is the lowest of the average levels of finished ground adjoining each exterior wall of a building;
2. identify the first storey, which is the uppermost storey having its floor level not more than 2 m above grade;
3. identify the basement, which is the storey or storeys located below the first storey;

4. identify the second storey and, where applicable, the third storey.

As a minimum, one smoke alarm is required to be installed in each storey, preferably on the upper level of each one. As noted above, however, when the dwelling unit contains more than one sleeping area, an alarm must be installed to serve each area. Where the sleeping areas are on two levels of a single storey in a split-level dwelling unit, an additional smoke alarm must be installed so that both areas are protected. See Figure A-9.10.19.3.(1).

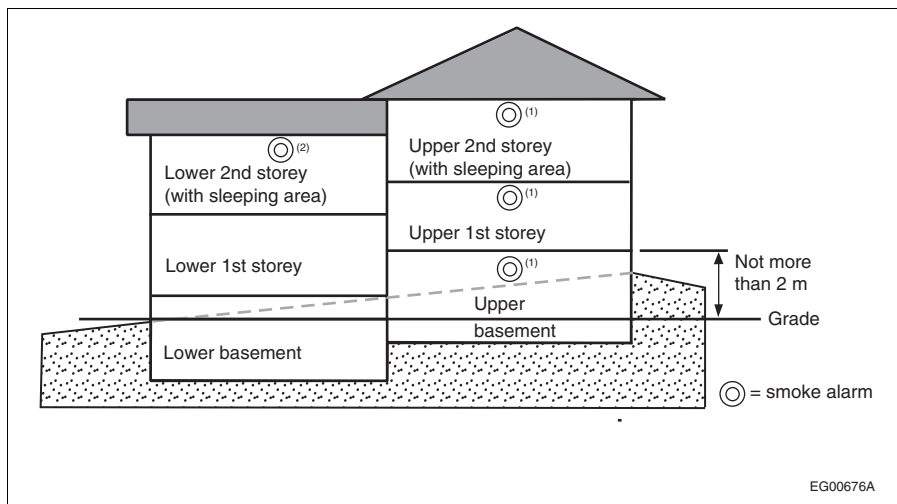


Figure A-9.10.19.3.(1)

Two-storey split-level building

Notes to Figure A-9.10.19.3.(1):

- (1) One smoke alarm required for each of the basement, first storey and second storey.
- (2) An additional smoke alarm is required on the lower level of the second storey outside the sleeping rooms.

A-9.10.19.5.(2) Interconnection of Smoke Alarms. Electrical regulations may require that separate power sources be provided for smoke alarms in the main dwelling unit and the secondary suite where the units have separate electrical services. In these situations, interconnection of smoke alarms between the units can be achieved through wireless communication.

A-9.10.20.3.(1) Fire Department Access Route Modification. In addition to other considerations taken into account in the planning of fire department access routes, special variations could be permitted for a house or residential building that is protected with an automatic sprinkler system. The sprinkler system must be designed in accordance with the appropriate NFPA standard and there must be assurance that water supply pressure and quantity are unlikely to fail. These considerations could apply to buildings that are located on the sides of hills and are not conveniently accessible by roads designed for firefighting equipment and also to infill housing units that are located behind other buildings on a given property.

A-9.10.22. Clearances from Gas, Propane and Electric Cooktops. CSA C22.1, "Canadian Electrical Code, Part I," referenced in Article 9.34.1.1., and CSA B149.1, "Natural Gas and Propane Installation Code," referenced in Article 9.10.22.1., address clearances directly above, in front of, behind and beside the appliance. Where side clearances are zero, the standards do not address clearances to building elements located both above the level of the cooktop elements or burners and to the side of the appliance. Through reference to the "Canadian Electrical Code, Part I" and the "Natural Gas and Propane Installation Code" and the requirements in Articles 9.10.22.2. and 9.10.22.3., the NBC addresses all clearances. Where clearances are addressed by the NBC and the "Canadian Electrical Code, Part I" or "Natural Gas and Propane Installation Code," conformance with all relevant criteria is achieved by compliance with the most stringent criteria.

Installation of Microwave Ovens Over Cooktops

The minimum vertical clearances stated in Article 9.10.22.2. apply only to combustible framing, finishes and cabinets. They do not apply to microwave ovens installed over cooktops nor to range hoods. The "Canadian Electrical Code, Part I" requires that microwave ovens comply with CAN/CSA-C22.2 No. 150, "Microwave Ovens." This standard includes tests to confirm that the appliance will not present a hazard when installed according to the manufacturer's instructions.

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