flipchart. When asked by the Facilitator, the spokesperson will explain the group's answer, which forms the basis for class discussion.

The course only requires the latest edition of the following documents:

1. 2012 Building Code Compendium, Volume 1 and 2.

The above documents are available for purchase through:

Downtown ServiceOntario
777 Bay St., Market Level
Toronto, ON M5G 2C8

Tel: 1-800-668-9938, 416-326-5300
Fax: 613-545-4223

https://www.publications.serviceontario.ca

Government Service
110 Laurier Ave. West
Ottawa, ON K1P 1J1
Tel. 1-800-268-7095

COURSE OVERVIEW

As stated earlier, the course is organized into fifteen modules. The modules are described as follows:

Module 1	Introduction and Instructions, Administrative Requirements (Div. A, Div. B, Part 1, Div. C, SA-1)
Module 2	General Fire Protection, Occupancy, Noncombustibile Construction, Fire-Resistance, Flame-Spread, Smoke Developed Classifications | (Section 3.1.)
Module 3	Supplementary Standard SB-2 - Fire Performance Ratings

The meanings assigned to other 'Symbols and Abbreviations' used in the Code are found in Division A, Part 1, Sentence 1.4.2.1.(1). As examples, the letter 'h' means 'hour' in Clause 3.2.2.23.(2)(c) and 'hours' in Clause 3.8.1.3.(2)(b); the expression '1 in 2' means a slope of 1 vertical unit to 2 horizontal units.

BASIC RULES FOR READING THE CODE - SCOPE AND APPLICATION OF CODE REQUIREMENTS

Individual requirements within the Code do not apply to every building. Guidance in the application of each of the 12 Parts of Division B to a particular building is found in Division A, Part 1, Subsection 1.1.2., "Application of Division B".

For instance, Division A, Part 1, Sentence 1.1.2.1.(1) informs us that Parts 1, 7 and 12 apply to every building. On the other hand, Division A, Part 1, Sentence 1.1.2.4.(1) reveals that Part 9 would apply to buildings of residential, business, low and medium hazard industrial, and mercantile occupancies of three storeys or less in building height and having a building area not exceeding 600 m^2.

In another instance, Division A, Part 1, Subclauses 1.1.2.2.(1)(b)(i) to (iv) indicate that a building of residential, business, low and medium hazard industrial or mercantile occupancy would be governed by Part 3, instead of Part 9, if the building area exceeded 600 m^2 or the building height exceeded 3 storeys.

It becomes very clear that one does not jump from Part 9 to Part 3, or from Part 3 to Part 9, unless the Code provides direction to that effect. Consider Division B, Articles 3.1.7.1. and 9.10.3.1. as one example and Articles 3.1.8.10. and 9.10.13.2. as a second example.

In the first instance, Division B, Sentence 9.10.3.1.(1) informs us that a fire-resistance rating can be determined in conformance with the test methods described in Part 3, thus in this instance, the requirements of Article 3.1.7.1. may be applied to a building regulated by Part 9.

In the second instance, Sentence 3.1.8.10.(4) informs us that in schools a door assembly conforming to Articles 9.10.13.2. and 9.10.13.3. is permitted as a closure in a fire separation having a fire-resistance rating of 30 minutes. Thus in this instance, a provision of Part 9 is deemed to form part of a Part 3 requirement.

DEALING WITH 'AND'

The word '**and**' found at the end of the second last Clause of a Sentence with multiple Clauses means that the requirements of **every** Clause apply to the Sentence.

Example:

In Division B, Sentence 3.2.8.7.(2) reads:

In a building containing an interconnected floor space

a) waterflow alarm signals from sprinkler systems shall be transmitted to the fire department in conformance with Sentence 3.2.4.8.(4), and

b) sprinkler systems shall be electrically supervised as required in Sentence 3.2.4.10.(3).

Sentence 3.2.8.7.(2) informs us that in a building containing an interconnected floor space, the sprinkler systems shall have two things:

1. water flow alarm signals shall be transmitted to the fire department, **AND**

2. be electrically supervised.

DEALING WITH 'OR'

The word '**or**' found at the end of the second last Clause of a Sentence with multiple Clauses means that the requirement of the Sentence is satisfied by **any** Clause as applied individually.

Example:

In Division B, Sentence 3.2.9.4.(7) reads:

A hose is permitted to penetrate an exit in order to provide the required coverage to

a) a service room referred to in Sentence 3.2.9.1.(4),

b) a roof-top enclosure referred to in Sentence 3.2.9.1.(5),

c) a room not more than 50 m^2 in area, or

d) a room or group of rooms in a sprinklered floor area not more than 200 m^2.

A, Section 1.2, Compliance. Functional statements are a list of 65 statements which describe the intent of the Code requirements described in Division B as they relate to one or more of the objective statements previously identified.

OBJECTIVES AND FUNCTIONAL STATEMENTS ATTRIBUTED TO THE ACCEPTABLE SOLUTIONS IN DIVISION B

For the purposes of complying with the Code, as required by Division A, Sentence 1.2.1.1.(2), the objectives and functional statements attributed to the acceptable solutions in Division B are listed in Tables 3 to 12 of MMAH Supplementary Standard SA-1.

Table 3 relates to Division B, Part 3 requirements; Table 4 relates to Division B, Part 4 requirements, etc.

ADMINISTRATIVE DIVISIONS

DIVISION C, PART 1

Section 1.1 Administration, Article 1.1.1.1. indicates that the Code shall be administered in conformance with the Building Code Act. Section 1.2 Design and General Review. Section 1.3 Permits and Inspections, describes the requirements for permits. Sentence 1.3.1.1.(1) Requirements for Permits, Sentence 1.3.1.4.(1) Permits under Section 10 of the Act and Sentence 1.3.1.5.(1) Conditional Permits. Subsection 1.3.3., Occupancy of Buildings, should be reviewed by Complex Building course participants, as well as Subsection 1.3.5., Notices and Inspections.

The participants should be familiar with all of Part 1.

DIVISION C, PART 2

ALTERNATIVE SOLUTIONS, DISPUTES, RULINGS AND INTERPRETATIONS

Section 2.1 entitled "Alternative Solutions" indicates in Subsection 2.1.1., the documentation for alternative solutions required to be provided to the chief building official or registered code agency. The documentation provided must identify the applicable objectives, functional statements and acceptable solutions and establish on the basis of either past performance, tests or other evaluations, that the proposed alternative solution will achieve the level of performance required under Article 1.2.1.1. of Division A, which is the compliance Article for compliance with Division B previously described. The

DEFINITIONS

The definitions below relate to the content in this module and are from Part 1 of the Code. Definitions form an integral part of a requirement when the requirement includes a defined term. Defined terms are found in the Code and are identified in *italics* text. Defined terms will not be shown in italics in this module, other than in this section.

Building area

Building area means the greatest horizontal area of a building above grade within the outside surface of exterior walls or within the outside surface of exterior walls and the centre line of firewalls.

Closure

Closure means a device or assembly for closing an opening through a fire separation or an exterior wall, such as a door, a shutter, wired glass or glass block, and includes all components such as hardware, closing devices, frames and anchors.

Combustible

Combustible means that a material fails to meet the acceptance criteria of CAN/ULC-S114, Test for Determination of Noncombustibility in Building Materials@.

Combustible construction

Combustible construction means that type of construction that does not meet the requirements for noncombustible construction.

Fire compartment

Fire compartment means an enclosed space in a building that is separated from all other parts of the building by enclosing construction that provides a fire separation that may be required to have a fire-resistance rating.

Fire damper

Fire damper means a closure which consists of a normally held open damper installed in an air distribution system or in a wall or floor assembly, and designed to close automatically in the event of a fire in order to maintain the integrity of the fire separation.

Fire protection rating

Fire protection rating means the time in minutes or hours that a closure will withstand the passage of flame when exposed to fire

Noncombustible

Noncombustible means that a material meets the acceptance criteria of CAN/ULC-S114, Test for Determination of Non-combustibility in Building Materials.

Noncombustible construction

Noncombustible construction means that type of construction in which a degree of fire safety is attained by the use of noncombustible materials for structural members and other building assemblies.

Occupancy

Occupancy means the use or intended use of a building or part of a building for the shelter or support of persons, animals or property.

Partition

Partition means an interior wall, one storey, or part storey in height that is not loadbearing.

BUILDING CLASSIFICATION (3.1.2.)

The following definitions are taken from Division A, Article 1.4.1.2. of the Code, for the following occupancies:

Assembly

Assembly occupancy (A1, A2, A3 and A4): the occupancy or use of a building or part of a building by a gathering of persons for civic, political, travel, religious, social, education, recreational or similar purposes or for the consumption of food or drink.

Detention Occupancy

Group B, Division 1: means an occupancy in which persons are under restraint or are incapable of self preservation because of security measures not under their control.

Care and treatment occupancy

Group B, Division 2: an occupancy in which persons receive special care and treatment.

Care Occupancy

Group B, Division 3: means an occupancy in which special care is provided by a facility, directly through its staff or indirectly through another provider, to residents of the facility,

a) who require special care because of cognitive or physical limitations, and

b) who, as a result of those limitations, would be incapable of evacuating the occupancy, if necessary, without the assistance of another person.

Residential Occupancy

Residential occupancy (C): means an occupancy in which sleeping accommodation is provided to residents who are not harboured for the purpose of receiving special care or treatment and are not involuntarily detained.

Business and personal service

Business and personal service occupancy (D): the occupancy or use of a building or part of a building for the transaction of business or the provision of professional or personal services.

Mercantile

Mercantile occupancy (E): the occupancy or use of a building or part of a building for the displaying or selling of retail goods, wares or merchandise.

Industrial

Industrial occupancy (F1, F2 and F3): the occupancy or use of a building or part of a building for the assembling, fabricating, manufacturing, processing, repairing or storing of goods and materials.

Table 3.1.2.1 shows that some groups are broken down into divisions, for a more precise description of major occupancies.

You may have noticed, from the definition provided in the introduction to this module, that having a 'major occupancy' does not prevent subsidiary occupancies in the building.

The dividing line between a major occupancy and a subsidiary occupancy is not always clear-cut. Judgement and a clear understanding of concepts and terminology must be used to arrive at the appropriate classification.

Minimum Fire-Resistance Rating of Fire Separations Between Adjoining Major Occupancies

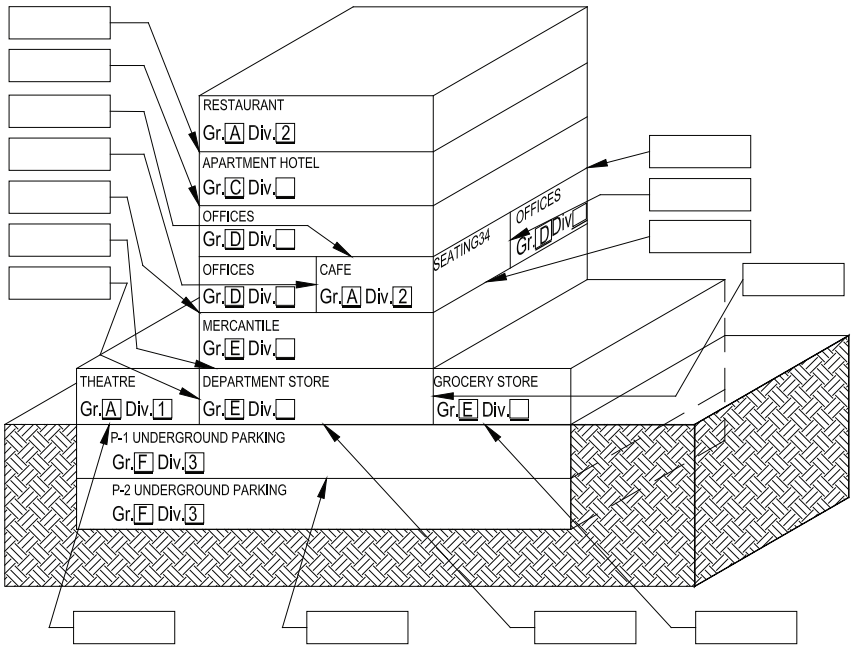


FIGURE 2-1

Schematic of uses for a multi-storey building not regulated by Subsection 3.2.6.
Indicate fire-resistance ratings (in hours) beside arrows.

Table 2-1 can be used as a reference for determining the minimum required fire-resistance rating for a fire separation between adjoining major occupancies.

TABLE 2-1

Minimum Fire-Resistance Ratings Between Major Occupancies

Major Occupancy	Adjoining Major Occupancy	Minimum Fire-Resistance Rating of Fire Separation
A1	E	2 h
A1	F3	1 h
A2	C	1 h
B2	B3	1 h
B3	C	2 h
C	D	1 h
C	E	2 h plus 3.1.3.1.(2)
D	C	1 h
D	E	not required
E	A1	2 h
E	A2	2 h
E	F1	3 h
E	F3	not required
C	A2	1 h or 2 h. See 3.1.3.1.(3)

Note: Not all major occupancy combinations are shown.

NONCOMBUSTIBLE CONSTRUCTION (3.1.5.)

Buildings are classified in accordance with Subsection 3.2.2. in order to prevent fire spread and collapse caused by the effects of fire. The requirement to have the building constructed of noncombustible materials is determined from this Subsection. The principal factors involved in classification are building height, building area and occupancy. The occupancy of the building has a direct relationship with the probable fire loads that can be expected, under normal use, in the building. The building height and building area are measures used to determine the building exiting and firefighting potential.

3. Construction Requiring an FRR but Not Required to Act as a Fire Separation
    - The assembly is built of materials that comply with the type of construction required for the building.
    - Openings are not protected.
    - The material, assembly of materials or structural member must possess a verifiable FRR.

In the Large Building - 2012 Course, the concept of fire separation and fire-resistance ratings is further investigated. The continuity of vertical fire separations and horizontal service spaces is also investigated in the Large Building Course.

STOP

CLOSURES (3.1.8.4., 3.1.8.5.)

GENERAL OVERVIEW

Most fire separations have openings through them. When this is the case, proper installation of closures is necessary to ensure that the fire compartment is effectively separated from the rest of the building. When assessing the adequacy of closures, the following must be taken into consideration:

- The labeled fire protection rating (FPR) of the closure
- Installation of a labeled frame
- Installation of labeled hardware
- Recognition of various referenced standards associated with closures
- The treatment accorded to untested closures.

The required fire protection rating of the closure is dependent on the fire-resistance rating of the fire separation in which it is installed [Table 3.1.8.4.].

FRAME INSTALLATION

The frame is part of the closure that ensures the integrity of a fire separation at an opening. In a fire, a metal door will curve in the direction of the fire. The same holds true for fire windows or shutters. As a result, the frame for these closures must be securely anchored into the wall.

1. 3.1.13.2.(4) & (5): 10% of total wall area, not counting combustible doors and glazing in non-A1, FSR ≤ 150.
2. 3.1.13.2.(4) & (5): 10% of total ceiling area, not counting skylights, light diffusers and lenses in non-A1, FSR ≤ 150.
3. Article 3.1.13.10.: up to 10% of total wall/ceiling area FSR ≤ 150.
4. 3.1.13.2.(4) & (5): 25% of total wall area, not counting combustible doors and glazing in non-A1, FSR ≤ 150.
5. Sentence 3.1.13.2.(3): no limit on FSR where door is in a dwelling unit.
6. Clause 3.1.13.6.(1)(b), or upper half of wall FSR ≤ 25 and lower half of wall FSR ≤ 150.
7. Articles 3.2.2.36. 3.2.2.41. Require sprinklers.

Table 3.1.13.7.
Flame-Spread Rating and Smoke Developed Classification in a High Building

Forming Part of Sentence 3.1.13.7.(1) and (2)

Location or Element	Maximum Flame-Spread Rating			Maximum Smoke Developed Classification		
	Wall Surface	Ceiling Surface (1)	Floor Surface	Wall Surface	Ceiling Surface (1)	Floor Surface
Exit stairways, vestibules to exit stairs and lobbies described in Sentence 3.4.4.2.(2)	25	25	25	50	50	50
Corridors not within suites	(2)	(2)	300	100	50	500
Elevator cars and vestibules	25	25	300	100	100	300
Service spaces and service rooms	25	25	25	50	50	50
Other locations and elements	(2)	(2)	No limit	300	50	No limit
Column 1	2	3	4	5	6	7

Note to Table 3.1.13.7.:

(1)See Sentence 3.1.13.4.(1) for lighting elements.

(2)Other requirements of this Part apply.

STOP

EXERCISE #2-5

1. According to Article 3.1.13.7. in an unsprinklered building regulated by 3.2.6., the maximum frame-spread rating, X and smoke developed classification, Y for the floor surface of an elevator car is expressed (X/Y):

   a) 25/50

   b) 25/100

   c) 25/300

   d) 300/300

Closure

Closure means a device or assembly for closing an opening through a fire separation or an exterior wall, such as a door, a shutter, wired glass or glass block, and includes all components such as hardware, closing devices, frames and anchors.

Combustible

Combustible means that a material fails to meet the acceptance criteria of CAN/ULC-S114,"Test for Determination of Noncombustibility in Building Materials".

Combustible construction

Combustible construction means that type of construction that does not meet the requirements for noncombustible construction.

Fire damper

Fire damper means a closure which consists of a normally held open damper installed in an air distribution system or in a wall or floor assembly, and designed to close automatically in the event of a fire in order to maintain the integrity of the fire separation.

Fire protection rating

Fire protection rating means the time in minutes or hours that a closure will withstand the passage of flame when exposed to fire under specified conditions of test and performance criteria, or as otherwise prescribed in this Code.

Fire-resistance rating

Fire-resistance rating means the time in minutes or hours that a material or assembly of materials will withstand the passage of flame and the transmission of heat when exposed to fire under specified conditions of test and performance criteria, or as determined by extension or interpretation of information derived from that test as prescribed in this Code.

Fire separation

Fire separation means a construction assembly that acts as a barrier against the spread of fire.

Firewall

Firewall means a type of fire separation of noncombustible construction which subdivides a building or separates adjoining buildings to resist the spread of fire and which has a fire-resistance

rating as prescribed in this Code and has structural stability to remain intact under fire conditions for the required fire-rated time.

Flame spread rating

Flame spread rating means an index or classification indicating the extent of spread-of-flame on the surface of a material or an assembly of materials as determined in a standard fire test as prescribed in this Code.

Noncombustible

Noncombustible means that a material meets the acceptance criteria of CAN/ULC-S114, "Test for Determination of Noncombustibility in Building Materials".

Noncombustible construction

Noncombustible construction means that type of construction in which a degree of fire safety is attained by the use of noncombustible materials for structural members and other building assemblies.

Partition

Partition means an interior wall, one storey, or part storey in height that is not loadbearing.

3.3 FIRE-RESISTANCE RATINGS (SECTION 3.1.7.)

Fire-resistance ratings are the ratings assigned to materials, and assemblies of materials, when tested in accordance with the Standard CAN/ULC-S101-M, "Fire Endurance Tests of Building Construction and Materials" [3.1.7.1.(1)].

The ratings are expressed as a period of time (i.e. 30 min, 45 min, 1 h, 12 h, 2 h, etc.) and represent the period of time that a test assembly has withstood the passage of flame and transmission of heat when exposed to fire under specified conditions of test and performance criteria.

The test applies to floors, roofs, walls, partitions, columns and beams. It also applies to ceiling assemblies and protective membranes for foamed plastics (thermal barriers).

Materials and assemblies of materials are also permitted to be assigned fire-resistance ratings on the basis of the MMAH Supplementary Standard SB-2 [3.1.7.1.(2)].

Articles 3.1.7.2. and 3.1.7.3. describe the conditions for waiving the temperature rise limits in CAN/ULC-S101on exterior walls and the exposure conditions for floors, roofs and ceilings, firewalls and exterior walls.

3.4 FIRE PERFORMANCE RATINGS (SB-2)

MMAH Supplementary Standard SB-2 forms part of the Building Code. The information contained in SB-2 is referenced throughout Part 3 and Part 9.

In this section, we will examine the contents of MMAH Supplementary Standard SB-2 as it relates to the requirements found in Part 3.

We will study the methods used for calculating fire-resistance ratings, using 'generic materials' that can be described using referenced product standards. We will learn how to use the Tables providing ratings of materials for flame-spread, smoke developed classifications, and noncombustibility. The Large Buildings course provides further review of SB-2.

OBJECTIVES

- Provide an understanding of where to locate information on fire-resistance ratings, flame-spread ratings, smoke developed classifications, noncombustibility and protection of openings in fire-rated assemblies.
- Calculate equivalent thicknesses.
- Calculate fire-resistance ratings of assemblies using the 'component additive method'.
- Calculate M/D ratios for steel columns.
- Reference applicable standards.

Read SB-2, page 1 from beginning to 1.1.1.(3).

SB-2 is formatted into 6 sections. The contents of these sections are summarized in Table 3-1.

Steel Column

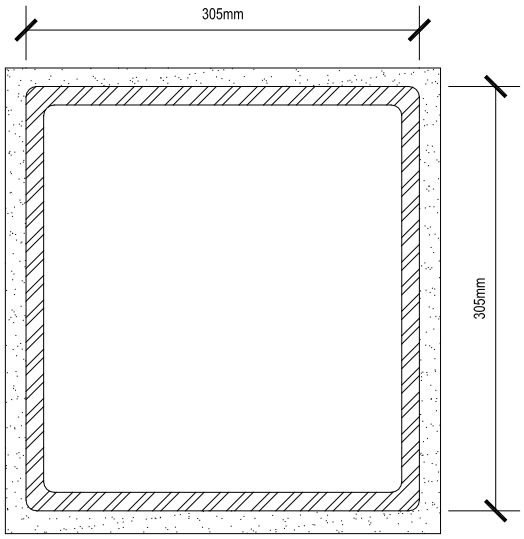


FIGURE 3-3

3.8 BEAMS

The Large Buildings - 2012 course provides information on the fire-resistance ratings for individual protected steel beams.

Public way

Public way means a sidewalk, street, highway, square or other open space to which the public has access, as of right or by invitation, expressed or implied.

Residential occupancy

Residential occupancy (C): means an occupancy in which sleeping accommodation is provided to residents who are not harboured for the purpose of receiving special care or treatment and are not involuntarily detained.

Service room

Service room means a room provided in a building to contain equipment associated with building services.

Service space

Service space means space provided in a building to facilitate or conceal the installation of building service facilities such as chutes, ducts, pipes, shafts or wires.

Sprinklered

Sprinklered means equipped with a system of automatic sprinklers.

Storage garage

Storage garage means a building or part of a building that is intended for the storage or parking of motor vehicles and that contains no provision for the repair or servicing of motor vehicles.

Storey

Storey means, except for the purposes of Part 7 of Division B, the portion of a building that is situated between the top of any floor and the top of the floor next above it, or that is situated between the top of the floor and the ceiling above the floor, if there is no floor above.

Street

Street means any highway, road, boulevard, square or other improved thoroughfare that is 9 m or more in width, that has been dedicated or deeded for public use and that is accessible to fire department vehicles and equipment.

TABLE 4-2

ARTICLES 3.2.2.2. THROUGH 3.2.2.19		
Article	**Title**	**Description**
3.2.2.2.	Special and Unusual Structures	Addresses buildings which cannot be categorized in a building classification within Articles 3.2.2.20. to 3.2.2.83.
3.2.2.3.	Exceptions to Structural Fire Protection	Identifies structural members which are exempted from requiring fire protection.
3.2.2.4.	Buildings with Multiple Major Occupancies	States that building height and area are applied in determining construction requirements. If multiple major occupancies are present, this Article mandates the application of Articles 3.2.2.5. through 3.2.2.8.
3.2.2.5.	Applicable Building Height and Area	For a building containing multiple major occupancies, the building height and building area of the entire building must be applied.
3.2.2.6.	Multiple Major Occupancies	Except for "superimposed" major occupancies (and those waived in Article 3.2.2.8.) the most conservative construction classification requirements must be applied when a building contains multiple major occupancies. (1)
3.2.2.7.	Superimposed Major Occupancies	The construction classification of each major occupancy must be assessed as though the entire building were of that occupancy (except those waived in Article 3.2.2.8.) The fire-resistance rating required for the floor separating superimposed major occupancies is based on the ratings required for the lower major occupancy. (1)
3.2.2.8.	Exceptions for Major Occupancies	- Major occupancy designation is waived if the total area of the occupancy within a floor area of the storey is not more than10%. - The exception does not apply to Group F, Division 1 or 2 occupancies. - Rooftop helicopter landing pads are not considered major occupancies provided they do not exceed 10% of the area of the roof.
3.2.2.9.	Crawl Spaces	Regulates crawl spaces relative to whether they must be considered as basements.
3.2.2.10.	Streets	Identifies the criteria for determining the number of streets serving a building.
3.2.2.11.	Exterior Balconies	Exterior balconies must be of the same construction type as required for the occupancy classification of the building.

TABLE 4-2

ARTICLES 3.2.2.2. THROUGH 3.2.2.19		
Article	**Title**	**Description**
3.2.2.12.	Exterior Passageways	Elevated exterior passageways forming part of the means of egress must meet the construction requirements for mezzanines.
3.2.2.13.	Occupancy of Roof	The portion of a roof supporting an occupancy must be constructed with the same fire separation requirements for floor assemblies required in Articles 3.2.2.20 to 3.2.2.83.
3.2.2.14.	Roof-Top Enclosures	Regulates the type of construction of roof-top enclosures.
3.2.2.15.	Storeys below Ground	Regulates the fire-resistance ratings required for floor assemblies forming part of storeys below grade.
3.2.2.16.	Heavy Timber Roof Permitted	Provides permission for use of heavy timber construction for a roof, under certain circumstances.
3.2.2.17.	Sprinklers in Lieu of Roof Rating	Permits the waiver of roof rating requirements of Articles 3.2.2.20. through 3.2.2.83. provided the criteria of Sentence 3.2.2.17.(1) are met. (2)
3.2.2.18.	Automatic Sprinkler System Required	Sprinkler systems required by Articles 3.2.2.20. though 3.2.2.83. must meet the requirements of Articles 3.2.4.7. through 3.2.4.9. and Article 3.2.5.13.
3.2.2.19.	Buildings Containing Impeded Egress Zones	Permits the waiver of Articles 3.2.2.36. and 3.2.2.37. for buildings containing impeded egress zones under specific conditions.

Articles 3.2.2.20. through 3.2.2.83. contain construction classification requirements based on major occupancy classification.

Table 4-3 of Module 4 provides summary information on the general organization of the construction classification requirements.

(1) Sentences 3.2.2.43A(5) and 3.2.2.50A(4) permit certain major occupancies to be constructed in accordance with the requirements of these articles.

(2) Roof rating is not waived for roof assemblies required by Clause 3.2.2.43A(2)(b) or 3.2.2.50A(2)(b).

TABLE 4-3

FORMAT OF ARTICLES 3.2.2.20. THROUGH 3.2.2.83.			
Size	**Building Type**	**Reference**	**Size Limits**
Large	Group A, Division 1	3.2.2.20.	Any height, any area, sprinklered
↓		3.2.2.21.	1 storey, limited area
Smaller		3.2.2.22.	1 storey
Large	Group A, Division 2	3.2.2.23.	Any height, any area, sprinklered
↓		3.2.2.24.	up to 6 storeys, any area, sprinklered
Smaller		3.2.2.25.	Up to 2 storeys
		3.2.2.26.	up to 2 storeys, increased area, sprinklered
		3.2.2.27.	up to 2 storeys, sprinklered
		3.2.2.28.	1 storey
Large	Group A, Division 3	3.2.2.29.	Any height, any area (if Subsection 3.2.6., sprinklered)
↓	Group A, Division 4		
Smaller		3.2.2.30.	Up to 2 storeys
		3.2.2.31.	Up to 2 storeys, sprinklered
		3.2.2.32.	1 storey, increased area
		3.2.2.33.	1 storey, sprinklered
		3.2.2.34.	1 storey
		3.2.2.35.	1 storey - all buildings, sprinkler in all spaces below seats used for occupancy
Large	Group B, Division 1	3.2.2.36.	Any height, any area, sprinklered
↓		3.2.2.37.	Up to 3 storeys, sprinklered
Smaller	Group B, Division 2	3.2.2.38.	Any height, any area, sprinklered
	Group B, Division 3	3.2.2.39.	Up to 3 storeys, sprinklered
		3.2.2.40.	Up to 2 storeys, sprinklered
		3.2.2.41.	One storey, sprinklered
Large	Group C	3.2.2.42.	Any height, any area, sprinklered
↓		3.2.2.43.	Up to 6 storeys, sprinklered, noncombustible
Smaller		3.2.2.43A.	Up to 6 storeys, sprinklered, combustible
		3.2.2.44.	Up to 4 storeys, noncombustible construction (1)
		3.2.2.45.	Up to 4 storeys, sprinklered
		3.2.2.46.	Up to 3 storeys, increased area (1)
		3.2.2.47.	Up to 3 storeys (1)
		3.2.2.48.	Up to 3 storeys, sprinklered

Large ↓ Smaller	Group D	3.2.2.49.	Any height, any area (if under Subsection 3.2.6., sprinklered)
		3.2.2.50.	Up to 6 storeys
		3.2.2.50A.	Up to 6 storeys, sprinklered, combustible
		3.2.2.51.	Up to 6 storeys, sprinklered
		3.2.2.52.	Up to 4 storeys, sprinklered
		3.2.2.53.	Up to 3 storeys
		3.2.2.54.	Up to 3 storeys, sprinklered
		3.2.2.55.	Up to 2 storeys
		3.2.2.56.	Up to 2 storeys, sprinklered
Large ↓ Smaller	Group E	3.2.2.57.	Any height, any area, sprinklered
		3.2.2.58.	Up to 4 storeys, sprinklered
		3.2.2.59.	Up to 3 storeys
		3.2.2.60.	Up to 3 storeys, sprinklered
		3.2.2.61.	Up to 2 storeys
		3.2.2.62.	Up to 2 storeys, sprinklered
Large ↓ Smaller	Group F, Division 1	3.2.2.63.	Up to 4 storeys, sprinklered
		3.2.2.64.	Up to 3 storeys, sprinklered
		3.2.2.65.	Up to 2 storeys, sprinklered
		3.2.2.66.	1 storey
Large ↓ Smaller	Group F, Division 2	3.2.2.67.	Any height, any area, sprinklered
		3.2.2.68.	Up to 6 storeys
		3.2.2.69.	Up to 4 storeys, increased area
		3.2.2.70.	Up to 4 storeys
		3.2.2.71.	Up to 2 storeys
		3.2.2.72.	Up to 2 storeys, sprinklered
Large ↓ Smaller	Group F, Division 3	3.2.2.73.	Any height, any area (if under Subsection 3.2.6., sprinklered)
		3.2.2.74.	Up to 6 storeys
		3.2.2.75.	Up to 6 storeys, sprinklered
		3.2.2.76.	Up to 4 storeys
		3.2.2.77.	Up to 4 storeys, sprinklered
		3.2.2.78.	Up to 2 storeys
		3.2.2.79.	Up to 2 storeys, sprinklered
		3.2.2.80.	1 storey
		3.2.2.81.	1storey, sprinklered
		3.2.2.82.	1 storey, any area, low fire load
		3.2.2.83.	Storage garages, up to 22 m high

TABLE 4-4

DETERMINATION OF CONSTRUCTION CLASSIFICATION			
Step	**Action**	**Description**	**Considerations**
3	List construction requirements	Contained within Articles 3.2.2.20. through 3.2.2.83. Sentence (2) of each Article will contain the applicable construction classification requirements. **Attention:** construction requirements within an Article may be dependent upon multiple factors (i.e. building height, building area, number of streets).	1. Subsequent Sentences may be provided, in addition to Sentence (2), which contain requirements applicable to the building. If provided, these Sentences must be applied, as appropriate, to the respective building.
4	Consider exceptions and special conditions	Apply Articles 3.2.2.2., 3.2.2.3., and 3.2.2.9. through 3.2.2.19. As appropriate.	

TABLE 4-5

APPLICATION OF ARTICLES 3.2.2.4 TO 3.2.2.8.				
Occupancy Configuration	**Aggregate area, as % of floor area within storey**	**Multiple Major Occupancy for Application of 3.2.2.20. to 3.2.2.83.**	**Outcome**	**References**
Single Major Occupancy	N/A	No	- Apply Articles 3.2.2.20. to 3.2.2.83. as applicable based on building height and area	Sentence 3.2.2.4.(1)
Multiple Major Occupancies	>10% (or Group F, Div 1, Div 2 of any %)	Yes	- Apply 3.2.2.20. to 3.2.2.83. as applicable - Most restrictive requirements apply to whole building, except Articles 3.2.2.43A. and 3.2.2.50A.	Sentences 3.2.2.4.(2) 3.2.2.6.(1) 3.2.2.8.(1) Figure 4-9
	<10%	No	- Apply Articles 3.2.2.20. to 2.2.83. as applicable	Sentences 3.2.2.4(2) 3.2.2.8.(1)

TABLE 4-5

APPLICATION OF ARTICLES 3.2.2.4 TO 3.2.2.8.				
Occupancy Configuration	**Aggregate area, as % of floor area within storey**	**Multiple Major Occupancy for Application of 3.2.2.20. to 3.2.2.83.**	**Outcome**	**References**
Superimposed Major Occupancies	>10% (or Group F, Div1, 2 of any %; or, helipad >10% of roof area)	Yes	- Apply 3.2.2.20. to 3.2.2.83. as applicable - Apply each major occupancy as though the entire building was of that occupancy classification, except Articles 3.2.2.43A. and 3.2.2.50A. - Fire-resistance rating of floor assembly separating each major occupancy based on rating requirement of lower major occupancy, except Articles 3.2.2.43A. and 3.2.2.50A.	Sentence 3.2.2.4.(2) Articles 3.2.2.7. 3.2.2.8. Figure 4-10 Figure 4-11
	<10% (or helipad <10% of roof area)	No	- Apply 3.2.2.20. to 3.2.2.83. as applicable	Sentence 3.2.2.4.(2) Article 3.2.2.8.

The Large Buildings - 2012 course includes an additional Table which looks at Articles 3.2.2.4. to 3.2.2.8. individually.

Direct firefighter access from the outside is required to each basement that is not sprinklered and that has a horizontal dimension greater than 25 m. The requirement does not apply to sprinklered basements (refer to Figure 5-2) [3.2.5.2.(1)].

In a sprinklered building, storeys above grade and basement levels are permitted to be accessed through a single building entrance.

Article 3.2.5.4. "Access Routes" requires buildings that exceed three storeys in building height, or exceed 600 m^2 in building area, to be provided with a fire access route to the principal entrance and to each building face of unsprinklered floor areas that are required to have direct exterior firefighter access required by Articles 3.2.5.1. and 3.2.5.2.

Where a building is required to face two or more streets, refer to Article 3.2.2.10. "Streets" to determine the percentage of the building perimeter that is required to face a street or streets. A building within the scope of Articles 3.2.2.43A. or 3.2.2.50A. is considered to face one street provided not less than 10% of the building is located within 15m of a street or streets. A building is considered to face two streets if not less than 50% of the building perimeter is located within 15 m of a street or streets. A building is considered to face three streets if not less than 75% of the building perimeter is located within 15 m of a street or streets. The building perimeter that is required to face a street(s) is required by Sentence 3.2.5.5.(1) to be located at least 3 m but not more than 15 m from the street(s) (refer to Figure 5-3).

For the purpose of Article 3.2.2.10. requirements, a fire access route designed in compliance with Subsection 3.2.5. is considered a street.

Article 3.2.5.5., "Location of Access Routes" and Article 3.2.5.6., "Access Route Design" provide minimum dimensional design requirements for fire access routes.

- Article 3.2.5.5. outlines distance requirements between a fire route, fire department connections, building entrances, fire trucks and hydrants. Refer to Figure 5-4.

- Article 3.2.5.6. "Access Route Design" outlines dimensional criteria of the fire route, such as minimum required width, maximum permitted centre line radius, slope, load capacity, turnaround facilities for dead-end segments, overhead clearances and for a building with the scope of Articles 3.2.2.43A. or 3.2.2.50A. have no portion of the access route more than 20m below the floor level of the uppermost storey or mezzanine

Examples of dimensional criteria are illustrated in Figure 5-6 on the next page.

As previously stated, buildings must face at least one street. The street(s) required to be faced is/are mandated by Sentence 3.2.2.10. (1) to comply with the fire access route design requirements of Articles 3.2.5.5. and 3.2.5.6.

STOP

WATER SUPPLY

Article 3.2.5.7. "Water Supply" requires an "adequate water supply for firefighting" to be provided for every building. Article 3.2.5.7. refers to A-3.2.5.7 in the Appendix for guidance in determining adequate water supply for firefighting purposes.

Sentence (2) requires that fire hydrants be located within 90 m, measured horizontally from the exterior wall, of any portion of the building perimeter that is required to face a street. For example, 50% of a building perimeter faces a street or streets, and is considered to face two streets; that 50% of the building perimeter is required to be within 90 m of a fire hydrant, measured horizontally from the building face.

SPRINKLER SYSTEMS

This section of the module identifies sprinkler requirements not only in Subsection 3.2.5. but from other areas in Part 3 of the Code.

Article 3.2.5.13. "Automatic Sprinkler Systems", Article 3.2.5.14. "Combustible Sprinkler Piping", and Article 3.2.5.15. "Sprinklered Service Space" provide design and installation requirements for sprinkler systems.

In general, the above three Articles amend the requirements of NFPA 13, "Installation of Sprinkler Systems" requirements.

The nine Sentences under Article 3.2.5.13, "Automatic Sprinkler Systems" are summarized as:

1. Except as permitted in Sentences (2), (3) and (4), sprinkler systems are required to comply with the design, construction, installation and testing requirements of NFPA 13.

2. NFPA 13R, "Installation of Sprinkler Systems in Residential Occupancies Up To and Including Four Stories in Height" is permitted to be used in a building of residential occupancy that is not more than four storeys in building height, and Group B-3 occupancies that contain sleeping accommodation for not more than 10 persons with not more than 6 requiring emergency evacuation assistance.

3. NFPA 13D, "Installation of Sprinkler Systems in One and Two Storey Dwellings and Mobile Homes" is permitted to be used in a building of residential occupancy that contains not more than two dwelling units, refer to Sentence 9.

4. Where fewer than nine sprinkler heads serve a building, the water supply is permitted to be supplied from the domestic water supply provided that the required flow for the sprinklers can be met by the domestic system.

5. Separate water control valves are required for sprinkler systems and other equipment that are served by the same water supply.

6. Despite the requirements of NFPA 13, and NFPA 13R, sprinklers are required in any room or closet in the storey immediately below a roof assembly that is not fire rated as a result of the waiver in Article 3.2.2.17 for sprinklered buildings that are electrically supervised and alarm signals are transmitted to the fire department.

7. Despite the requirements of NFPA 13, and NFPA 13R, sprinklers shall be provided for all balconies and decks forming part of a building, other than balconies or decks that are not more than 610 mm in depth measured perpendicular to the exterior wall of the building, or decks on the uppermost roof of the building.

8. Sprinklers in elevator machine rooms are required to have a minimum intermediate temperature rating and they are to be protected against physical damage.

9. Sprinkler system installed in a retirement home, under The Retirement Homes Act, 2010, shall be provided with a minimum 20 min water supply.

COMBUSTIBLE SPRINKLER PIPING

Sentence 3.2.5.14.(1) limits the use of combustible sprinkler piping to wet systems in residential occupancies and other light hazard occupancies. An example of a light hazard occupancy is Group D, "Business and Personal Services".

Sentences 3.2.5.14.(2), (3) and (4) provide installation restrictions for combustible sprinkler piping.

DRY STANDPIPE NOT CONNECTED TO WATER SUPPLY

A dry standpipe system that is not connected to a water supply is not considered by Sentence 3.2.9.2.(2) as fulfilling the requirements of standpipe system design by the Code.

DRY STANDPIPE

If freezing of piping may occur, a dry standpipe system is permitted by Sentence 3.2.9.2.(8) provided that listed devices are used to:

- automatically admit water to the system by the opening of a hose valve, and
- transmit a signal to an attended location.

WATER SUPPLY AND PRESSURE (SEE APPENDIX A)

If more than one standpipe is provided, the total water supply need not be more than 30 L/s (1800 L/min.) [Sentence 3.2.9.2.(3)].

The residual water pressure at the design flow rate at the hydraulically most remote hose connection of a standpipe system that is required to be installed in a building is permitted by Sentence 3.2.9.2.(4) to be less than 450 kPa provided that:

- the building is sprinklered,
- the water supply at the base of the sprinkler riser is capable of meeting the design flow rate and pressure demand of the sprinkler system, including the inside and outside hose allowance, and
- fire protection equipment (fire department pumper) is available to deliver, by means of the fire department connection, the full demand flow rate at a residual water pressure of 450 kPa at the hydraulically most remote hose connection of the standpipe system.

FIRE DEPARTMENT CONNECTIONS AND FIRE PUMPS

A fire department connection is required by Sentence 3.2.9.2.(5) to be provided for every standpipe system.

Pumps having a rated net head pressure greater than 280 kPa and their controllers are required by Sentence 3.2.9.2.(6) to be listed and labeled.

Couplings for hoses or other fittings used in connection with such couplings are required by Sentence 3.2.9.2.(7) to conform to CAN/ULC-S513 "Threaded Couplings for 38 mm and 65 mm Fire

Hose" or CAN/ULC-S543 "Internal Lug Quick Connect Couplings for Fire Hose".

SUPERVISORY SIGNAL ANNUNCIATION FOR VALVES

If a fire alarm system in a building has an annunciator, each valve, except for hose valves (38 mm and 65 mm hose connections) controlling water supplies in a standpipe system is required by Sentence 3.2.9.5.(1) to be equipped with an electrically supervised switch for transmitting a signal for individual annunciation in the event of movement of the valve handle.

EXERCISE #5-4

Circle the correct answer and cite applicable Code requirement.

1. In a sprinklered building, the Code permits the residual water pressure in a standpipe system to be less than 450 kPa under a set of conditions. Which one of the following is a specific part of that set of conditions?

   a) The water supply for the sprinkler system is sufficient to meet the flow demands at the base of the riser for the sprinkler system + the inside and outside hose allowance demand.

   b) provided that the demand does not exceed 1890 L/min

   c) any dry standpipes are connected to a water supply

   d) is only applicable for the 65 mm hose connection.

_____ [_____]

2. Based on Article 3.2.9.2., dry standpipe systems are:

   a) not permitted by the Code,

   b) permitted by the Code provided it is connected to a water source,

   c) required by the Code to be pressurized with nitrogen,

   d) are only permitted in sprinklered buildings.

_____ [_____]

STOP

HOSE CONNECTIONS

If a standpipe system is required by Article 3.2.9.1. "Where Required" in a building, 38 mm diameter hose connections are required by Sentence 3.2.9.3.(1) to be provided in each storey of the building.

6.1 INTRODUCTION (SECTION 11.5)

Section 11.5 specifically addresses Compliance Alternatives.

A Compliance Alternative is a substitute measure permitted in a renovation project where the Chief Building Official is satisfied that the required compliance with new construction requirements of the Code (Division B, Parts 3, 4, 6 or 8) is impractical due to structural or construction difficulties or is detrimental to the preservation of a heritage building [11.5.1.1.(1)].

The application of a Compliance Alternative to a Part 9 or Part 12 building requirement needs only to meet the condition that the required new construction requirement is impractical [11.5.1.1.(2)].

The performance level of the building after construction must not be less than the performance level of the building prior to construction [Article 11.3.1.1.] where an existing building system is materially altered or repaired.

Compliance Alternative is a defined term and will be defined in the next section.

The requirements of Section 11.5 are alternatives to the requirements of "other Parts of the Code" as they apply to the proposed construction.

In the Large Buildings - 2012 course, the additional requirements for change of use in Section 3.17 are reviewed.

OBJECTIVES

- Demonstrate the ability to find, understand and apply the Code requirements related to Section 11.5.
- Demonstrate comprehension of applying 11.5.1 series of Tables in Section 11.5.
- Reference applicable standards.

STOP

6.5 COMPLIANCE ALTERNATIVES (ARTICLE 11.5.1.)

Compliance Alternatives shown in Tables 11.5.1.1.A, 11.5.1.1.B, 11.5.1.1.C, 11.5.1.1.D/E, and 11.5.1.1.F may be substituted for a requirement contained in Parts 3, 4, 6 or 8, where the Chief Building Official is satisfied that compliance with the requirement is impracticable because of structural or construction difficulties, or that it is detrimental to the preservation of a heritage building.

Compliance Alternatives shown in Tables 11.5.1.1.A, 11.5.1.1.B, 11.5.1.1.C, 11.5.1.1.D/E, and 11.5.1.1.F may be substituted for a requirement contained in Parts 9 or 12 without satisfying the Chief Building Official that compliance with the requirement is impracticable. Each Table applies to a specific occupancy or occupancies as follows:

- Table 11.5.1.1.A - Assembly Occupancies
- Table 11.5.1.1.B - Care, Care and Treatment or Detention Occupancies
- Table 11.5.1.1.C - Residential Occupancies
- Table 11.5.1.1.D/E - Business/Mercantile Occupancies
- Table 11.5.1.1.F - Industrial Occupancies

Each Table has three columns:

- The first column is the "Compliance Alternative" number reference,
- The second column is the "Code Requirements" that is permitted to be substituted, and
- The third column is the Part 11 "Compliance Alternative" that is permitted for the "Code Requirements" in the second column.

For example:

Table 11.5.1.1.A		
NUMBER	PART 3 REQUIREMENTS	PART 3 COMPLIANCE ALTERNATIVE
A22	3.2.5.3.(1) and (2)	Existing Acceptable

It should be noted that not all Code requirements are listed in the Tables, since Compliance Alternatives do not exist for every Code Requirement.

7.12 DESIGN CONSTRUCTION AND

INSTALLATION OF ANCHORAGE

SYSTEMS AND FIXED LADDERS(SB-8)

Fixed ladders that are installed to provide access to the roof of a building are required by Sentence 3.6.1.5.(1) to have their attachment and anchorage systems designed and installed in accordance with the MMAH Supplementary Standard SB-8.

The design live load should be divided into two concentrated loads of 1.1 KN for each attachment.

Ice, wind, rigging, impact and dead loads must be considered in the design, and a safety factor of 4:1 should be applied for normal usage.

Expansion anchors should be avoided in masonry walls. Through-bolted connections or an equivalent must be used in masonry walls. Attachment anchor bolts should be a minimum of 12 mm in diameter.

The maximum spacing of attachments for a steel ladder is 3 metres.

To provide an improved margin of safety, there should be two means of anchorage at the top of the ladders. If a ladder has to be attached to an existing wall, the structural soundness of the walls should be investigated.

Take 10 minutes to read Supplementary Standard SB-8 and answer the following questions. Provide references with answers where applicable. Discuss answers with your group to obtain a consensus.

EXERCISE #7-2

1. What is the minimum design live load between two consecutive attachments in a fixed ladder?

_____

_____ [_____]

A voice communication system is required in buildings with:

- the floor level of the top storey more than 36 m above grade,
- a Group B, Division 2 or 3 occupancy above the third storey, or
- a floor area or part of a floor area located above the third storey is designed or intended for use as a Group B, Division 2 or 3 occupancy.

8.9 EMERGENCY POWER FOR BUILDING SERVICES/PROTECTION OF ELECTRICAL CONDUCTORS

The following high building emergency systems are expected to operate under full load for at least 2 hours after the start of a fire to enable safe evacuation or redistribution of building occupants and to conduct firefighting operations [Sentence 3.2.7.9.(1)]:

- firefighters' elevators
- other elevators serving storeys above the first storey in buildings exceeding 36 m in height
- mechanical and electrical equipment installed to limit smoke movement between storeys and into exit stair and firefighters' elevator shafts
- firefighting water supply if dependent on electrical power
- smoke venting fans.

To assist with the continued operation of emergency systems during a fire, critical electrical conductors serving emergency systems are required to be protected from exposure to fire in accordance with Article 3.2.7.10.

Electrical conductors for fire alarm systems and emergency equipment, described above, shall provide a circuit intergrity rating of at least 1 h when tested in accordance with ULC-S139, including the hose stream test [Sentence 3.2.7.10.(2)]. Electrical power conductors that serve mechanical systems described in Clause 3.2.7.10.(1)(c) are required to provide a circuit integrity rating of 2 h when tested in accordance with ULC-S139. Refer to Figure 8-3.

space occupied by interior walls and partitions, but not including exits, vertical service spaces and their enclosing assemblies. (Refer to the Large Buildings - 2012 course for further information)

Fire separation

Fire separation means a construction assembly that acts as a barrier against the spread of fire.

The Appendix note to this definition explains that a fire separation may or may not have a fire-resistance rating. Thus, where the Code waives the fire-resistance rating, the assembly must still function as a fire separation, even if it has a 0 h fire-resistance rating. (Refer to the Large Buildings - 2012 course for further information)

Means of egress

Means of egress includes exits and access to exits and means a continuous path of travel provided for the escape of persons from any point in a building or in a contained open space to a separate building, an open public thoroughfare, or an exterior open space protected from fire exposure from the building and that has access to an open public thoroughfare.

Public corridor

Public corridor means a corridor that provides access to exit from more than one suite.

The term "corridor used by the public" is not a defined term but is treated similar to a public corridor.

Suite

Suite means a single room or series of rooms of complementary use, operated under a single tenancy, and includes dwelling units, individual guest rooms in motels, hotels, boarding houses, rooming houses and dormitories and individual stores and individual or complementary rooms for business and personal services occupancies. Additional explanatory material is available in the Building Code Appendix A-1.4.1.2.

Section Organization

Section 3.3. is divided into five Subsections.

The first, Subsection 3.3.1., deals with requirements that apply to all floor areas.

In dealing with the general requirements that apply to all

occupancies, for this portion of the module we have organized these requirements into three categories:

- Fire separations
- Egress requirements from rooms and suites
- Design criteria for egress and building components.

Article 3.3.1.7. deals with protection of floor areas above or below the first storey with a barrier-free path of travel in buildings.

The remaining Subsections 3.3.2. to 3.3.5. each deal with a specific occupancy classification that requires special rules to address their unique characteristics or conditions. These occupancies are:

3.3.2 Assembly Occupancies (i.e. Group A)

3.3.3 Care, Care and Treatment or Detention Occupancies (i.e. Group B)

3.3.4 Residential Occupancies (i.e. Group C)

3.3.5 Industrial Occupancies (i.e. Group F)

STOP

10.3 FIRE SEPARATIONS

There are three types of fire separations addressed in Section 3.3. They are fire separations of:

- suites of rooms based on major occupancy or tenancy (suites)
- public corridors or corridors used by the public (note: what is normally referred to as a mall is actually a public corridor)
- specific types of rooms, uses related to specific major occupancies.

SEPARATION OF SUITES

Article 3.3.1.1. is a general requirement that suites shall be separated from adjoining suites by a 1 h fire separation.

The Code permits a reduction in the rating to : less than 1 h for certain buildings [Sentence 3.3.1.1.(2)]. Refer to the Large Building - 2012 course for further information.

- Business and personal service occupancies (Group D) are exempt from this requirement [Sentence 3.3.1.1.(1)].
- The fire separation requirement is waived in a sprinklered building for the following occupancies, if they are served by a public corridor that is more than 9 m in unobstructed width with a ceiling height not less than 4 m, and not more than one-half the required egress doors open into the public corridor (i.e. normally considered a mall) for the entire length of the corridor between exits [Clause 3.3.1.4.(4)(b)]:
  - business and personal service occupancies
  - mercantile occupancies
  - fast food outlets without seating for patrons
  - any combination of the above.

SEPARATION OF PUBLIC CORRIDORS

Article 3.3.1.4. requires public corridors to be separated from the remainder of the building by a fire separation having a ¾ h fire-resistance rating. There are various exceptions to this general rule. Read Sentences 3.3.1.4.(3) to (5) and Sentence 3.3.1.9.(6). Refer to the Large Buildings - 2012 course for further information.

SEPARATION OF CORRIDOR USED BY THE PUBLIC

For certain types of major occupancies, like assembly occupancies and care and detention occupancies, the building or floor area is occupied by a single tenant. The corridors that function as a means of egress for these floor areas do not fit into the strict definition of public corridor. The Code addresses these corridors in Subsections 3.3.2. and 3.3.3. that deal with specific life safety requirements that are unique to certain major occupancies. The Code refers to these corridors as 'corridors used by the public'. This term is not a defined term. These corridors function and serve the same purpose as public corridors. Throughout the Code, particularly in Section 3.4., "Exits", you will find that both types of corridors are referred to and generally are treated equally (i.e. what applies to one can be applied to the other). Refer to the Large Buildings - 2012 course for further information.

STOP

4. A public corridor serves a dwelling unit and four offices on the second floor of a three storey unsprinklered commercial building with five offices on the third floor. Each tenant space is 200 m^2. The building is regulated by Articles 3.2.2.53. and 3.2.2.46. What fire separation is required for the public corridor on the third floor?

   a) 0 h if of noncombustible construction

   b) 3/4 h fire separation

   c) 1 h fire separation

   d) no separation required

[ ]

CORRIDOR SEPARATIONS FOR SPECIFIC MAJOR OCCUPANCIES

Assembly Occupancies

Article 3.3.2.5. of the Code commences with the general requirement that a corridor used by the public in an assembly occupancy must be separated from the remainder of the building by a fire separation having a 1 h fire-resistance rating. Exceptions or reduced ratings may apply as for public corridors. Refer to the Large Buildings - 2012 course for further information.

Care, Care and Treatment or Detention Occupancy

These occupancies have unique requirements due to the specialized nature of their operation.

FIRE SEPARATIONS FOR SPECIFIC USES

There are specific types of rooms or uses that the Code addresses individually. Janitors' rooms and common laundry rooms are addressed in the general requirements of Subsection 3.3.1. [Articles 3.3.1.20. and 3.3.1.21.].

Other uses, such as rooms in theatres, with seating over 200 persons, an auto repair shop in a school, contained use areas, patient rooms in hospitals and nursing homes, multi-storey dwelling units in a residential building, storage rooms in residential occupancies, repair garages and storage garages, are addressed under the major occupancy requirements in Subsections 3.3.2. to 3.3.5.

A contained use area shall be separated from the remainder of the building by a 1 h fire separation [Sentence 3.3.3.7.(2)].

10.4 MEANS OF EGRESS AND EGRESS DOORWAYS

The terms 'means of egress', 'access to exits' and 'exits' are often confused. Means of egress is the entire route from within a floor area to the exterior of the building, whereas access to exit is made up of the components of the route from within the floor area to an exit such as the egress door, corridor, ramps, stair, etc. that comprises the means of egress.

Exit is generally an exit stair shaft, a door to an exit stair shaft or to the exterior, or a door through a firewall leading to a separate building. It is important to remember that when the Code refers to an egress door, it is not necessarily referring to an exit door.

The primary function of both means of egress and access to exit is to ensure that occupants of a building are provided with a safe path of travel out of a room, floor area or building in any emergency condition. Subsection 3.3.1. outlines the requirements for providing one or more means of egress from rooms and suites of rooms from within floor areas.

For a floor area that contains more than one suite except in a dwelling unit in a building conforming to 3.2.2.44.(1)(a)(ii) [3.3.4.4.(8)], the access to exit from the room or suite shall be a doorway or doorways that:

- open directly to the exterior, or
- into a public corridor, or
- to an exterior passageway [3.3.1.3.(8)].

Except for dead-end corridors or where otherwise permitted by the Code, where the door enters the public corridor or exterior passage, it shall be possible to go in opposite directions to two separate exits [3.3.1.3.(9)].

EGRESS FROM ROOMS OR SUITES

Article 3.3.1.5. specifies the requirements for egress doors from rooms or suites of rooms. Except for dwelling units, the general rule is that a minimum of two egress doors located remote from one another (the separation distance is not specifically regulated but there are rules of thumb that can be used) are required from every room or suite, based on the following criteria:

TABLE 3.3.1.5.B

Egress in Floor Area Sprinklered Throughout

Forming Part of Sentence 3.3.1.5.(1) & (3)

Occupancy of Room or Suite	Maximum Area of Room or Suite, m^2
Group A	200
Group B, Division 1	100
Group B, Division 2	
sleeping rooms	100
other than sleeping rooms	200
Group C	150 [1]
Group D	300
Group E	200
Group F, Division 2	200
Group F, Division 3	300

Notes to Table 3.3.1.5.B:

[1] See Article 3.3.4.4. for dwelling units

Note: Where two egress doors are required from a room or suite, they shall be placed at a distance from one another equal to or greater than one-third of the maximum overall diagonal dimension of the room or suite to be served, measured as the shortest distance that smoke would have to travel between the nearest egress door. 3.3.1.5.(2)

EGRESS FROM MEZZANINES

There are specific egress requirements for mezzanines that are similar but different from the general requirement for rooms or suites [see Sentences 3.3.1.5.(2) and (3)].

Except for mezzanines within dwelling units, these requirements apply to mezzanines that are not required to terminate at a vertical fire separation by Article 3.2.8.2. (see Figure 10-2).

5. What is the minimum height of a guard at the foot of a stepped aisle serving a balcony in a theatre?

   a) 660 mm

   b) 760 mm

   c) 920 mm

   d) 1,070 mm

[ ]

STOP

10.6 SPECIAL REQUIREMENTS

PROTECTION ON FLOOR AREAS WITH A BARRIER-FREE PATH OF TRAVEL

Article 3.3.1.7. provides requirements to ensure that persons with physical or sensory disabilities are provided with additional measures in fire or other life threatening emergencies to compensate for their inability to evacuate a building through the normal means of exit stairs. These requirements apply to storeys above or below the first storey in buildings that are not sprinklered.

Clause 3.3.1.7.(1)(a) permits an elevator that is designed similar to a firefighters' elevator in high-rise buildings as one acceptable option. This elevator must be accessible via a public corridor or vestibule that is separated from the remainder of the building by a 1 h or : 45 min fire separation required by Clauses 3.2.6.5.(3)(b) or (c).

The elevator shaft must be pressurized if the building is over three storeys in building height and is not sprinklered [3.3.1.7.(1)(a)(iii) and 3.3.1.7.(3)].

Another option is to create at least two zones to act as areas of refuge. The travel distance from any point in one zone to another zone must comply with the travel distance requirements for exits and each zone must contain a barrier-free path of travel to an exit.

The final option available only to residential occupancies is

2. What is the total number of pedestrian entrances required to be barrier-free in a building that contains a total of (6) six entrances, where (4) four of the entrances serve mercantile occupancies, and (2) two entrances serve an assembly occupancy which is completely separated from the remainder of the building (i.e. assembly occupancy is not accessible via entrances serving mercantile occupancies)? Why?

_____

_____

_____ [ ]

3. If at a required barrier-free entrance there are six exterior doors, all doors are required to be designed in accordance with Section 3.8. True or false?

_____

_____

_____ [ ]

4. The Code requires a barrier-free path of travel to be provided with an unobstructed space not less than 1,800 mm x 1,800 mm at certain intervals to allow persons in wheel chairs to pass one another. What is the maximum interval for these spaces.

   a) 25 m

   b) 30 m

   c) 45 m

   d) 60 m

_____

_____ [ ]

STOP

10.7.4 OCCUPANCY REQUIREMENTS

Generally a barrier-free path of travel is required throughout the entrance storey, and within every normally occupied floor areas and roof top amenity spaces, except to those occupancies, rooms, space or portions of floor areas which are exempt from accessibility requirements.

EXERCISE #10-7

Read Subsection 3.8.2. and answer the following questions.

1. Other than as required by Sentence 3.8.2.1.(5), the provision of a barrier-free path of travel for residential occupancies applies to which of the following:

   a) into suites that are located in storeys above the entrance storey and not served by an elevator

   b) into suites served by an elevator

   c) within all portions of suites served by an elevator

   d) egress from suites served by an elevator

_____

_____ [ ]

2. When is a balcony in a dwelling suite required to be barrier-free accessible? (Hint: Review requirements of Article 3.3.1.7.)

_____

_____ [ ]

3. Consider a two storey shopping mall with a public corridor and a food court area with washrooms located within 45 m of the food court area. How many universal washrooms are required?

   a) 0

   b) 1

   c) 3

   d) 2

_____

_____ [ ]

4. Consider a strip mall with individual mercantile suites. Which mercantile suites do not require a barrier-free washroom?

_____

_____ [_____]

_____

_____ [_____]

STOP

10.7.5 DESIGN STANDARDS

Specific criteria is prescribed by the Code for the design of facilities provided in a barrier-free path of travel to serve persons requiring assistance. Major design components of Subsection 3.8.3. are identified for discussion purposes.

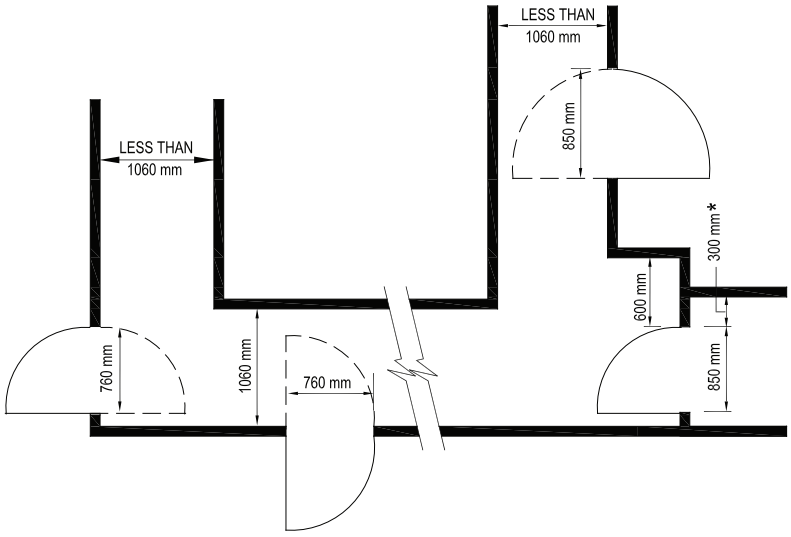
DOORWAYS AND DOORS

All doorways in a barrier-free path of travel are required to provide a clear width of 860 mm [3.8.3.3.(1)]. Standard wheelchairs range from 584 mm to 685 mm in width.

Clear width is defined as the width of the doorway measured with the door in the open position. As such, the minimum width of a door in a barrier-free path of travel should be approximately 915 mm to ensure the minimum clear width of 860 mm (note that door widths may have to be increased to allow for any projecting exit hardware).

Sufficient clearance on the latch side of the door is required to permit a person in a wheelchair to approach and open a door, unless the door is equipped with a power door operator. Where a door swings away from the approach side, a 300 mm clearance to the latch side of the door is required. Where a door swings toward the approach side, a 600 mm clearance to the latch side of the door is required. 300 mm clearnace to the catch side of sliding door and on both sides of the door [3.8.3.3.(10)]. This requirement does not apply within residential suites except as described in Clause 3.8.2.1.(5).
See Figure 10-5.

Where residential suites are located on a barrier-free storey, doorways serving bedrooms and washrooms are regulated [3.8.3.3.(2)]. The remainder of the suite is not regulated except for 15% of residential suites [3.8.2.1.(5)]. Hotel suites are different. Review Article 3.8.2.4.
See Figure 10-6.



* Note: Does not apply to residential suites not regulated by Sentence 3.8.2.1(5)

FIGURE 10-5

Table 3.8.3.2.
Ramp Rise and Slope

Forming Part of Sentence 3.8.3.2.(3)

Item	Column 1	Column 2
	Vertical Rise Between Surfaces, mm	**Slope**
1.	75 to 200	1:10 to 1:12
2.	less than 75	1:8 to 1:10

Ramps (3.8.3.4.)

Ramps in a barrier-free path of travel are not permitted to exceed a 1 in 12 slope. Ramps are permitted to extend a maximum of 9 m horizontally between level areas [3.8.3.4.(1)(b) and (d)(i)].

Level areas that divide ramps into intervals of not more than 9 m, are required to be at least 1,670 mm long and at least the same width as the ramp [3.8.3.4.(1)(d)]. The top and bottom of ramps are required to have level areas that are at least 1,670 mm long and 1,670 mm wide [3.8.3.4.(1)(c)]. Ramps are required to have a minimum width of 900 mm between handrails [3.8.3.4.(1)(a)].
See Figure 10-7.

Where the ramp is wider than 2200 mm, it must have an intermediate handrail with a clear width of 900 mm between intermediate hand rail and one of the other handrails.

Wheelchair Spaces and Adaptable Seating (3.8.3.6.)

Assembly areas with fixed seating are required to provide designate minimum number of spaces for wheelchair use and minimum number of fixed seats designate for adaptable seating. [3.8.2.1.(4)]. The floor slope required to the barrier-free path of travel is only intended to apply to the actual designated spaces and seating and aisles leading to the seating area. It is not intended to apply to aisles and floor areas serving fixed seating [3.8.3.6.(1), 3.8.3.6.(2)]

Assistive Listening Devices (3.8.3.7.)

Certain rooms in buildings of Assembly occupancy are required to be equipped with assistive listening systems, if they are greater than 100 m^2 in area and have an occupant load of more than 75 people [3.8.3.7.(1)].

Washrooms (3.8.3.8., 3.8.3.9., 3.8.3.11., 3.8.3.12.)

Where washrooms are required by Subsection 3.7.4., the number of water closet stalls required to be barrier-free washroom must conform to Table 3.8.2.3.B. The dimensional requirements are outlined in Articles 3.8.3.8. and 3.8.3.9. , and lavatories are required to meet the requirements of Article 3.8.3.11.

The minimum number of universal washrooms required for a building is based on the number of storeys within the building as per Table 3.8.2.3.A. The dimensional requirements are outlined in Article 3.8.3.12.

Showers (3.8.3.13.)

Buildings provided with groups of shower stalls are required to be provided with at least one barrier-free shower stall conforming to the dimensional requirements outlined in Article 3.8.3.13. This does not apply within a suite of residential occupancy.

Individual shower stalls provided for patients or residents in a care/ treatment occupancy must be barrier-free.

Public Telephones (3.8.3.15.)

Public telephones provided with built-in shelves or counters are required to meet the dimensional requirements outlined in Article 3.8.3.15.

Wheelchair Spaces and Adaptable Seating (3.8.3.6.)

Assembly areas with fixed seating are required to provide designate minimum number of spaces for wheelchair use and minimum number of fixed seats designate for adaptable seating. [3.8.2.1.(4)]. The floor slope required to the barrier-free path of travel is only intended to apply to the actual designated spaces and seating and aisles leading to the seating area. It is not intended to apply to aisles and floor areas serving fixed seating [3.8.3.6.(1), 3.8.3.6.(2)]

Assistive Listening Devices (3.8.3.7.)

Certain rooms in buildings of Assembly occupancy are required to be equipped with assistive listening systems, if they are greater than 100 m^2 in area and have an occupant load of more than 75 people [3.8.3.7.(1)].

Washrooms (3.8.3.8., 3.8.3.9., 3.8.3.11., 3.8.3.12.)

Where washrooms are required by Subsection 3.7.4., the number of water closet stalls required to be barrier-free washroom must conform to Table 3.8.2.3.B. The dimensional requirements are outlined in Articles 3.8.3.8. and 3.8.3.9. , and lavatories are required to meet the requirements of Article 3.8.3.11.

The minimum number of universal washrooms required for a building is based on the number of storeys within the building as per Table 3.8.2.3.A. The dimensional requirements are outlined in Article 3.8.3.12.

Showers (3.8.3.13.)

Buildings provided with groups of shower stalls are required to be provided with at least one barrier-free shower stall conforming to the dimensional requirements outlined in Article 3.8.3.13. This does not apply within a suite of residential occupancy.

Individual shower stalls provided for patients or residents in a care/ treatment occupancy must be barrier-free.

Public Telephones (3.8.3.15.)

Public telephones provided with built-in shelves or counters are required to meet the dimensional requirements outlined in Article 3.8.3.15.

Drinking Fountains (3.8.3.16.)

Drinking fountains are required to meet the dimensional requirements outlined in Article 3.8.3.16.

STOP

EXERCISE #10-8

Take 20 minutes to answer the following questions located in Subsection 3.8.3.

1. What is the minimum clear width of a door serving a bathroom in a barrier-free path of travel in a residential occupancy if the corridor serving the bathroom is 1,070 mm wide?

   a) 760 mm

   b) 790 mm

   c) 810 mm

   d) 900 mm

_____

_____ [ ]

2. What is the latch side clearance of a bathroom door located in a residential suite not regulated by Sentence 3.8.2.1.(5) that swings towards the approach side? Explain.

_____

_____ [ ]

3. What is the minimum clearance within a barrier-free water closet stall that will permit the stall door to swing into the stall?

_____

_____ [ ]

4. What is the minimum dimension of a universal barrier-free washroom?

   a) 1,100 mm

   b) 1,200 mm

   c) 1,500 mm

   d) 1,700 mm

_____

_____ [ ]

5. If a Group B occupancy contains individual shower stalls, what is the required maximum mounting height above the floor of a folding seat that is not spring loaded and is located in a barrier-free shower?

   a) 400 mm

   b) 430 mm

   c) 450 mm

   d) 485 mm

_____ [ ]

STOP

11.1 INTRODUCTION

This module refers to active fire protection and life safety building systems, provisions for fire department access to a building, and interconnected floor spaces other than atriums.

This module will concentrate on requirements in the Building Code for:

- fire alarm and detection systems
- lighting and emergency power systems
- in the Large Buildings - 2012 course, fire department building access, sprinkler systems, mezzanines, interconnected floor spaces (other than atriums) and standpipe systems are reviewed.

This module addresses Part 3 requirements, that are applicable to new buildings, new additions, and where required by Parts 10 and 11, regarding change of use and major renovations.

This module includes a list of defined terms relating to the content in this module. For a complete list of definitions, refer to Division A, Part 1 of the Code.

OBJECTIVES

Upon completion of this module, you will be able to:

- familiarize Code users as to where to find requirements for the above listed systems,
- understand the steps and the process of applying Code requirements,
- demonstrate the procedure/method of applying Code requirements to obtaining your answer.

Upon completion of this module, you will be able to:

- determine fire alarm requirements for a building.
- identify lighting and emergency power requirements.

FIRE DEPARTMENT NOTIFICATION

Article 3.2.4.8. "Signals to Fire Department", identifies conditions where specific signals from the fire alarm system are required to be transmitted to the fire department directly or to a proprietary monitoring station.

The following conditions require the transmission of fire alarm signals to the fire department:

a) Group A (assembly) occupancy with an occupant load exceeding 300 persons,

b) All Group B (detention, care, and care and treatment) occupancies,

c) Group F, Division 1 (high hazard) occupancy,

d) Buildings regulated under Subsection 3.2.6. (high buildings),

e) Buildings that contain interconnected floor spaces that are required to comply with Articles 3.2.8.3. to 3.2.8.11 (atriums), or

f) A retirement home regulated under The Retirement Homes Act, 2010 that is a group occupancy.

Where a single stage alarm is installed in an unsprinklered building, a legible notice shall be affixed to the wall near each pull station stating:

a) fire department is to be notified

b) emergency telephone numbers for either the municipality or the fire department [3.2.4.8.(5)].

It should also be noted that the requirement for automatic fire alarm transmission to the fire department may also originate from Article 3.2.2.17. where a sprinkler system is provided in lieu of a roof fire rating.

STOP

Duct smoke detection is required by Sentence 3.2.4.13.(1) "Prevention of Smoke Circulation" in an air handling system that serves more than one storey, one suite, one patient/ resident sleeping area fire zone [3.3.3.5.(2)], or is not provided with fire dampers as permitted in Sentence 3.1.8.8.(8).

Article 3.2.4.15. "Elevator Emergency Return" provides requirements for smoke detection for elevator recall lobbies. Only elevators that serve floors above the first storey in an unsprinklered high building are required to be provided with automatic emergency recall [3.2.4.15.(1)].

Article 3.2.4.16. "Sprinklers in Lieu of Fire Detectors" waives fire detector requirements in Article 3.2.4.11. and heat detector requirements in Sentence 3.2.4.12.(2) in sprinklered floor areas, provided that the sprinkler system is electrically supervised in conformance with Sentence 3.2.4.10.(3). However, the smoke detector requirements in Sentence 3.2.4.12.(1) are not waived.

Smoke Alarms (3.2.4.22.)

Smoke alarm is a defined term and is not the same as a smoke detector. A smoke alarm is not connected to a fire alarm system. It is a detection device as well as an audible alarm device. A smoke alarm may be a stand-alone unit or interconnected with other smoke alarms within the same dwelling unit.

Article 3.2.4.22. "Smoke Alarms" applies exclusively to dwelling units, and except for care and detention occupancies that are required to be provided with a fire alarm system, sleeping rooms that are not located within a dwelling unit. Smoke alarms are not required for sleeping rooms in care or detention occupancies that are required to be equipped with a fire alarm system.

Smoke alarms require a visual signalling component conforming to NFPA72 Standard [3.2.4.22.(13)].

Sprinkler Monitoring (3.2.4.17.)

Article 3.2.4.17. "System Monitoring" requires sprinkler systems to be provided with water flow detecting devices, and dictates how those devices are to be annunciated on the fire alarm system. Water flow devices are required to be connected to activate an alarm signal in a single stage fire alarm system and may initiate an alert signal or an alarm signal on a two-stage system.

- aisles, internal corridors, and principal routes providing access to exit in a floor area that is not subdivided into rooms, or that is subdivided into rooms, in Group D, E and F occupancies (i.e. main passageways that lead to exits) [3.2.7.3.(1)].

Emergency lighting is also required at doorways that are equipped with electromagnetic locking devices [Clause 3.4.6.16.(4)(k)].

Article 3.2.7.4. "Emergency Power for Lighting" requires the following minimum duration of emergency power for the emergency lighting required by the previous Article:

- 2 h for high buildings (within the scope of Subsection 3.2.6.),
- 1 h for Group B major occupancies that are not within the scope of Subsection 3.2.6.,
- 1 h for a Building within the Scope of Article 3.2.2.43A. or 3.2.2.50A.
- 30 min for other buildings.

Article 3.2.7.5. "Emergency Power Supply Installation" refers to the CSA-C282, "Emergency Electrical Power Supply for Buildings" standard for emergency power supply installation for buildings other than hospitals.

Article 3.2.7.6. requires emergency power and lighting for health care facilities shall conform to CSA-Z32 "Electrical Safety and Essential Electrical Systems in Health Care Facilities".

The required edition of the above CSA standards is provided in Division B, Part 1, Table 1.3.1.2.

FUEL SUPPLY SHUT-OFF VALVES AND EXHAUST PIPES

Article 3.2.7.7. "Fuel Supply Shut-off Valves and Exhaust Pipes" requires an outdoor shut-off valve for an outdoor source of liquid or gas fuel supply to an engine that drives an emergency electric power system.

Sentence (2) requires that exhaust pipes from an engine of an emergency power system be located in a service shaft that has a fire rating at least equal to the fire separation penetrated but in no case less than 45 min.

EMERGENCY POWER FOR FIRE ALARM SYSTEMS

Article 3.2.7.8. "Emergency Power for Fire Alarm Systems" addresses emergency power requirements for the fire alarm system, and for a voice communication system that is required by Article 3.2.6.8. "Voice Communication System".

Sentences 3.2.7.8.(1) through (4) address the fire alarm system.

Sentence 3.2.7.8.(2) requires an emergency power supply for the fire alarm system to be provided by battery, generator or a combination of both. In the event of a power failure, Sentence 3.2.7.8.(4) requires the transfer from normal electrical power to emergency power to be automatic.

Sentence 3.2.7.8.(3) requires the emergency power source for the fire alarm system to be capable of providing supervisory power for a minimum duration of 24 h, **plus**

- 2 h under full load for a fire alarm system for buildings within the scope of Subsection 3.2.6. (high buildings), or
- 1 h under full load for a Group B building that is not within the scope of Subsection 3.2.6.,
- 1 h for a building within the scope of Article 3.2.2.43A. or 3.2.2.50A.
- 5 min under full load for a building that is not required to be equipped with an annunciator [refer to Subclause 3.2.4.8.(3)(b)(iii), and
- 30 min under full load for all other buildings.

EMERGENCY POWER FOR BUILDING SERVICES

Article 3.2.7.9. "Emergency Power for Building Services" addresses emergency power provisions for specific building services that include:

- elevators,
- water supply for fire fighting, and
- fans and electrical equipment used for smoke control.

Emergency power for elevators is required by Clause 3.2.7.9.(1) to be provided by generator for:

- every firefighters' elevator (there may be more than one), and

14.1 INTRODUCTION

Even though the majority of the Complex Building course is dedicated to requirements found in Division B, Part 3, a number of additional requirements related to fire protection, health and safety objectives are found in other parts of Division B.

This module will cover requirements found in the following additional parts of Division B:

Part 4 - Structural Design

Part 6 - Heating, Ventilating and Air Conditioning

Part 7 - Plumbing

Part 9 - Housing and Small Buildings

Part 12 - Resource Conservation

In addition, materials in MMAH Supplementary Standards SB-1 and SB-10, which are referred to in the above parts of the Code, will be addressed in this module.

OBJECTIVES

Upon completion of this module you will be able to:

- Provide an understanding of the loading requirements for guards.
- Provide an understanding of the requirements for fireplaces, materials in air duct systems, ducts, duct coverings, linings and insulation materials used in duct systems and return air plenums, clearances between combustible materials and pipes carrying steam or hot water, carbon monoxide alarms and chimneys.
- Provide an understanding of the requirements relating to plumbing facilities, including location of plumbing fixtures, and water temperature control for potable water systems.
- Understand and apply the provisions of the Code relating to measurement of floor areas for dwelling units, ceiling heights, and living areas within dwelling units.

- Understand and apply the provisions of the Code related to doors to bathrooms, glass in doors and sidelights, minimum window and glass areas for rooms in buildings of residential occupancy, the design and construction of interior and exterior stairs, steps, ramps, railings and guards, and lighting outlets.
- Provide an understanding of the Code requirements relating to resource conservation in the design and construction of buildings, including energy efficiency design, and energy efficiency design requirements for which a building permit has been applied for before January 1, 2017, motion sensors, and water efficiency.
- Reference applicable standards.

14.2 STRUCTURAL DESIGN (SUBSECTION 4.1.5.)

In addition to the requirements for loads on handrails which are covered in Sentence 3.4.6.4.(9), Article 4.1.5.14. prescribes the design requirements for guards based on their minimum specified horizontal load, applied either inward or outward at the top of every required guard for:

a) means of egress in grandstands, stadiums, bleachers and arenas,

b) equipment platforms contiguous stairs and other areas where the gathering of people is improbable and for all other locations of guards [4.1.5.14.(1].

Individual elements within the guard such as solid panels and pickets must be designed to withstand a load of 0.5 kN applied over an area of 100 x 100 mm. The point located must be selected to produce the most critical effect on the guard [4.1.5.14.(2)].

The minimum specified load applied vertically at the top of every required guard shall be 1.5 kN/m and does not need to be considered to act simultaneously with the load in Sentence (1) of Article 4.1.5.15. [4.1.5.14.(4)].

The loads required for individual elements do not need to be considered to act simultaneously with the loads provided in Sentences (1) and (4) of Article 4.1.5.14. [4.1.5.14.(3)]

Walls Acting as Guards

Sentence 4.1.5.16.(1) indicates where floor elevation on one side of a wall is more than 600 mm higher than the elevation on the other side, the wall must be designed to resist lateral design loads prescribed in Section 4.1 ("Structural Loads and Procedures") or 0.5 kPa, whichever load produces the most critical effect.

DESIGN AND INSTALLATION OF HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS

Fireplaces (Article 6.2.1.5.)

According to Sentence 6.2.1.5.(1), fireplaces must conform to the requirements of Section 9.22.

Section 9.22 provides requirements for masonry fireplaces and includes provisions for the masonry and concrete used [9.22.1.2.], footings [9.22.1.3.], combustion air [9.22.1.4.], fireplace liners comprising fire brick or steel [Subsection 9.22.2.]; fireplace walls [Subsection 9.22.3.], the distance from the back of the fire chamber to the plane of the fireplace opening shall be not less than 300 mm [9.22.4.1.(1)], design of the hearth [9.22.5.], the required dampers and size of damper [9.22.6.1.(1)], the slope of the smoke chamber and wall thickness of the smoke chamber [9.22.7.].

Factory built fireplaces must conform to CAN/ULC-S610 "Factory Built Fireplaces" [9.22.8.1.(1)]. Clearances to combustible materials are described for fireplaces in Sentences 9.22.9.1 (clearance to fireplace opening); 9.22.9.2 metal exposed to the interior, 9.22.9.3 clearances to combustible framing, and 9.22.9.4 heat circulating duct openings.

Fireplace inserts and hearth mounted stoves must be vented through the throat of a fireplace and conform to the Standard ULC-S628, "Fireplace Inserts". The installation of fireplace inserts and hearth mounted stoves vented through the throat of a fireplace shall conform to CSA-B365, "Installation Code for Solid Fuel Burning Appliances and Equipment" [9.22.10].

MATERIALS IN AIR DUCT SYSTEMS (SUBSECTIONS 6.2.3. AND 6.2.4.)

All ducts, duct connectors and associated fittings and plenums used in air duct systems must be constructed of steel, aluminum alloy, copper, clay, asbestos cement, or similar noncombustible material with the following exceptions [6.2.3.2.(1)]:

3. Floor drains shall be provided in public laundry rooms, garbage rooms, incinerator rooms, and boiler heating.

LOCATION OF FIXTURES

According to Sentence 7.1.6.1.(1), plumbing fixtures are not to be installed in a room that is not lighted and ventilated in accordance with requirements of Part 9 and Part 3. Every fixture, plumbing appliance, interceptor, cleanout, valve, device or piece of equipment shall be located such that it is readily accessible for use, cleaning and maintenance [7.1.6.2.(1)].

WATER TEMPERATURE CONTROL FOR POTABLE WATER SYSTEMS

The maximum temperature of water supplied by fixtures in a residential occupancy shall not exceed 49°C. This requirement does not apply to hot water supplied to dish washers or clothes washers [7.6.5.1.(1) and (2)].

The requirements for valves supplying fixed location shower heads, as well as deck mounted or hand-held spray attachments, are located in Article 7.6.5.2.

For Group B, Division 2 or 3 occupancies, or for residents of a group home, home for special care, or residences for adults with developmental disabilities, are required to have one or more temperature gauges and control devices that are:

a) accessible only to supervisory staff, and

b) capable of being adjusted to ensure that the temperature of the water supplied to the fixture does not exceed 49°C. This applies to any bath tub, shower or hand basin that is accessible to residents of these types of facilities [7.6.5.3.].

14.5 HOUSING AND SMALL BUILDINGS (PART 9 REQUIREMENTS)

DESIGN OF AREAS AND SPACES (SECTION 9.5)

This section applies only to dwelling units that are intended for use on a continuing or year-round basis. General requirements for method of measuring areas and spaces, maximum floor areas, combination rooms and rooms with lesser dimensions than permitted in this

section, are located in Subsection 9.5.1. [Part 3 reference which refers to part 9 is 3.7.1.2.(1)].

CEILING HEIGHTS (SUBSECTION 9.5.3.)

Minimum ceiling heights of rooms or spaces in residential occupancies, live/work units, mezzanines and storage garages are detailed in Articles 9.5.3.1., 9.5.3.2., and 9.5.3.3. [Part 3 reference which refers to part 9 is 3.7.1.1.(2)].

LIVING ROOMS OR SPACES WITHIN DWELLING UNITS (SUBSECTION 9.5.4.)

According to Sentence (1) of Article 9.5.4.1., living areas within dwelling units, either separate rooms or in combination with other spaces, shall have an area not less than 13.5 m^2. Where the area of the living space is combined with a kitchen and dining area, the living area alone in the dwelling unit that can accommodate sleeping for not more than two persons, shall be not less than 11 m^2 [9.5.4.1.(2)]. [Part 3 reference which refers to part 9 is 3.7.1.2.(1)].

DOORS (ARTICLE 9.5.11.3.)

Doors to Bathrooms

According to Article 9.5.11.3., where a barrier-free path of travel conforming to Section 3.8 is provided into a suite of residential occupancy, and where the bathroom within this suite is at the level of the suite entrance door, the doorway to the bathroom and to each bedroom at the same level as the bathroom, when the door is in the open position, shall have a clear width of not less than 760 mm if the door is served by a corridor or space not less than 1060 mm wide, and 810 mm where the door is served by a corridor space less than 1060 mm wide [9.5.11.3.(1)]. [Part 3 reference which refers to part 9 is 3.8.3.3.(2).

Glass in Doors and Sidelights

Glass in doors and sidelights for doors shall conform to Sentence 9.6.1.4.(1). If the glass in the sidelight is greater than 500 mm wide, such that it could be mistaken for doors, and glass in storm doors and sliding doors at an entrance to a dwelling unit and in public areas, the safety glass of the tempered or laminated type conforming to:

a) CAN/CGSB 12.1-M, "Tempered or Laminated Safety Glass", **OR**

b) wired glass conforming to CAN/CGSB 12.11-M, "Wired Safety Glass".

If the glass in entrance doors to dwelling units in public areas exceeds .5 m^2 and extends to less than 900 mm from the bottom of the door, the glass shall be safety glass or wired glass as previously described [9.6.1.4.(2)].

This requirement does not apply to sliding glass partitions provided they are suitably marked to indicate their position and existence [9.6.1.4.(4)]. [Part 3 reference which refers to part 9 is 3.3.1.18.(5)].

Minimum Window Areas

Except as provided in Sentences 3.7.2.1.(2) and (3), every room used for sleeping in any building and every principle room such as a living room, dining room or combination of them in dwelling units, must be provided with windows having areas conforming to Part 9 (specifically Article 9.7.2.3.), except that Article 9.9.10.1. for bedroom windows does not apply [3.7.2.1.(1)].

Long-term care homes have specific requirements for window areas, as detailed in 3.7.2.1.(2).

Play activity rooms in a child care facility and work areas in live/work units shall have one or more windows that conform to Clause 3.7.2.1.(2)(a).

The requirements in Table 9.7.2.3 that is referenced for minimal window glass areas vary depending upon whether or not electrical lighting is provided in the room and the location of the room.

STAIRS, RAMPS, HANDRAILS AND GUARDS (SECTION 9.8.)

This section applies to the design and construction of interior and exterior stairs, steps, ramps, railings and guards.

Section 9.8 is broken down into the following Subsections: 9.8.1., Application, 9.8.2., Stair Dimensions, 9.8.3., Stair Configurations, 9.8.4., Step Dimensions, 9.8.5., Ramps, 9.8.6., Landings, 9.8.7., Handrails, 9.8.8., Guards. 9.8.9., Construction, and 9.8.10., Cantilevered Pre-cast Concrete Steps. [Part 3 reference which refers to part 9 is 3.3.4.7.(1)].

The Subsection 9.8.9., Construction, includes Articles describing loads on stairs and ramps, construction requirements for exterior concrete stairs, exterior wood stairs, wooden stair stringers, treads and finishes for treads, landingsand ramps.

EXERCISE #10-6

Take 2 minutes to scan Subsection 3.8.1. and answer the following questions. Provide Code references with answers where applicable.

1. Which of the following types of buildings may require barrier-free design?

   a) high hazard industrial occupancies

   b) boarding and rooming houses

   c) buildings occupied on a part-time basis such as pump houses and substations

   d) houses, including townhouses and row houses

   b) Boarding or rooming houses serving 8 people or more [3.8.1.1.(1)(a)]

2. What is the total number of pedestrian entrances required to be barrier-free in a building that contains a total of (6) six entrances, where (4) four of the entrances serve mercantile occupancies, and (2) two entrances serve an assembly occupancy which is completely separated from the remainder of the building (i.e. assembly occupancy is not accessible via entrances serving mercantile occupancies)? Why?

Three barrier-free entrances are required. The mercantile occupancy requires two barrier-free entrances. The assembly occupancy requires one barrier-free entrance because there is no other access from the mercantile occupancy [3.8.1.2.(3)] and Table 3.8.1.2 (refer to Figure 10-4).

3. If at a required barrier-free entrance there are six exterior doors, all doors are required to be designed in accordance with Section 3.8. True or false?

False. Only one of the doors in a barrier-free entrance that includes more than one doorway is required to meet requirements of OBC Article 3.8.3.3.(12) [3.8.1.2.(5)]

4. The Code requires a barrier-free path of travel to be provided with an unobstructed space not less than 1,800 mm x 1,800 mm at certain intervals to allow persons in wheel chairs to pass one another. What is the maximum interval for these spaces.

   a) 25 m

   b) 30 m

   c) 45 m

   d) 60 m

   b) located not more than 30 m apart [3.8.1.3.(4)]

EXERCISE #10-7

Read Subsection 3.8.2. and answer the following questions.

1. Other than as required by Sentence 3.8.2.1.(5), the provision of a barrier-free path of travel for residential occupancies applies to which of the following:

   a) into suites that are located in storeys above the entrance storey and not served by an elevator

   b) into suites served by an elevator

   c) within all portions of suites served by an elevator

   d) egress from suites served by an elevator

   b) A barrier-free path of travel is required to the entrance of a suite served by an elevator [3.8.2.1.(2)(i)].

2. When is a balcony in a dwelling suite required to be barrier-free accessible? (Hint: Review requirements of Article 3.3.1.7.)

Balconies are required to be used as an area of refuge where no elevator meeting the high-rise requirements is provided for the rescue of persons requiring assistance, and where the barrier-free path of travel is not divided into at least two zones by a fire separation [3.3.1.7.(2)].

3. Consider a two storey shopping mall with a public corridor and a food court area with washrooms located within 45 m of the food court area. How many universal washrooms are required?

   a) 0

   b) 1

   c) 3

   d) 2

b) Provide 1 universal washroom [3.8.2.3.(2)., Table 3.8.2.3.A.]

4. Consider a strip mall with individual mercantile suites. Which mercantile suites do not require a barrier-free washroom?

Suites which have an area less than 300 m^2, provided that the strip mall is served with public washrooms that are designed to accommodate disabled persons in conformance with Articles 3.8.3.8. to 3.8.3.12. [3.8.2.3.(1) and (5)].

EXERCISE #10-8

Take 20 minutes to answer the following questions located in Subsection 3.8.3.

1. What is the minimum clear width of a door serving a bathroom in a barrier-free path of travel in a residential occupancy if the corridor serving the bathroom is 1,070 mm wide?

   a) 760 mm

   b) 790 mm

   c) 810 mm

   d) 900 mm

   a) 760 mm door width, Sentence 3.8.3.3.(2)

2. What is the latch side clearance of a bathroom door located in a residential suite not regulated by Sentence 3.8.2.1.(5) that swings towards the approach side? Explain.

Not applicable. The clearance requirement does not apply within the suite [3.8.2.1.(2)(5)].

3. What is the minimum clearance within a barrier-free water closet stall that will permit the stall door to swing into the stall?

820 mm x 1,440 mm clear floor area provided within the stall [3.8.3.8.(1)(b)(iii)]

4. What is the minimum dimension of a universal barrier-free washroom?

   a) 1,100 mm

   b) 1,200 mm

   c) 1,500 mm

   d) 1,700 mm

d) 1,700 mm, 3.8.3.12.(1)(f)

5. If a Group B occupancy contains individual shower stalls, what is the required maximum mounting height above the floor of a folding seat that is not spring loaded and is located in a barrier-free shower?

   a) 400 mm

   b) 430 mm

   c) 450 mm

   d) 485 mm

   d) 485 mm is the maximum mounting height prescribed [3.8.3.13.(2)(e)(ii)]

EXERCISE #11-1

Refer to Articles 3.2.4.1. and 3.2.4.2., and using the above procedure, answer the following questions.

(Circle the correct answer and cite Code reference)

1. Is a fire alarm system required for a two storey building where both storeys are classified as Group F, Division 2 industrial occupancy, and the occupant load of each storey is 60 persons?

   a) Yes

   b) No

   b) No. A fire alarm system is required only if the occupant load of the second floor (medium hazard industrial occupancy) exceeds 75 persons [3.2.4.1.(2)(h)].

2. Refer to Figure 11-1. A two storey addition is proposed to be constructed to the one storey existing building located at the northwest corner of North Shore Avenue and Sunset Beach Road.

The addition will be separated from the existing building by a fire separation with a minimum 1 h fire-resistance rating.

The existing one storey building is a restaurant with an occupant load of 143 persons. The two storeys of the addition will be used for offices. The calculated occupant load of the ground floor addition is 85 persons and the second floor is 90 persons.