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This course is based on the *Building Code Act*, S.O. 1992, C. 23 as amended to April 1, 2010 and the Ontario Building Code 2012 (O. Reg. 332/12) as amended to January 1, 2015.

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EXERCISE # 1 - REQUIREMENTS FOR SIGNS

To complete this exercise, you need to be familiar with the requirements found in Section 3.15. Provide code references, including Division designations, when asked in the questions.

1. An application for a 20 m² roof top sign is being applied for. This sign must be reviewed by an;
 - a) architect or a professional engineer or a combination of both if the roof sign has any face that is more than 10 m²
 - b) architect or engineer only if the sign is more than 7.5 m above the ground
 - c) architect or engineer only if the sign weighs more than 115 kg
 - d) engineer only.

OBC Reference: _____

2. A projecting sign which is attached to a parapet wall must;
 - a) not weigh more than 115 kg
 - b) not be more than 7.5 m above the finished ground
 - c) be designed by a professional engineer or an architect or a combination of both
 - d) is not permitted.

OBC reference: _____

3. A projecting sign overhangs a sidewalk; the minimum clearance to this sign is;
 - a) 4.25 m
 - b) 7.5 m
 - c) 2.4 m
 - d) not permitted.

OBC reference: _____

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- where a door does not swing into a corridor, the corridor width may be reduced to a stated minimum value [Sentence 3.10.2.4.(6)]
- dead end corridors are not permitted [Sentence 3.10.2.4.(7)]
- lighting levels are regulated [Sentence 3.10.2.4.(8)]
- not more than 2 dwelling units are to be contained within one building [Sentence 3.10.2.4.(9)]
- dwelling units are to be separated from the building with a fire separation having a 2 h fire-resistance rating [Sentence 3.10.2.4.(10)]
- if an office area is small (not more than 50 m² in area) and adjacent to the dwelling unit, a fire separation is not required [Sentence 3.10.2.4.(11)]
- no fire separations are required between rental units [Sentence 3.10.2.4.(12)].

Exiting Requirements

The OBC simply states that the exiting requirements for SSSBs must comply with the general rules found in Section 3.4 EXCEPT; [Sentence 3.10.2.5.(1)]

- the clear width of an exit stair is set at a minimum of 1100 mm [Sentence 3.10.2.5.(2)]
- exit doors from rental spaces are NOT required to swing on a vertical axis under specific conditions. [Sentence 3.10.2.5.(3)]

Service Facilities

Horizontal service spaces and service facilities are the same for SSSBs as for all other buildings EXCEPT; [Sentence 3.10.2.6.(1)]

- a service room is required to be provided and separated with a fire separation having a 1 h fire-resistance rating if the fuel-fired appliance does not serve the dwelling unit. [Sentence 3.10.2.6.(2)]

Sanitary Facilities

Once again the provisions of Part 3, more specifically Subsection 3.7.4, apply, EXCEPT; [Sentence 3.10.2.7.(1)]

Clearance to Flammable Material (Applies to ALL tents)

Any combustible material or vegetation must be removed from the ground enclosed by the tent and for at least 3 m outside the tent.
[Sentence 3.14.1.5.(1)]

Flame Resistance (Applies to ALL tents)

Films and fabrics used in the construction of tents or on tents, must comply with either;

- CAN/ULC S-109, or
 - NFPA 701.
- [Sentence 3.14.1.6.(1)]

Design of Framing and Supports (Applies to LARGE tents)

A person suitably qualified and experienced is required to review the structural framing and anchorage for tents having an area greater than 225 m².

[Sentence 1.2.2.1.(7) - Div. C]

Bleachers (Applies to LARGE tents)

Bleachers, where provided in tents, must be designed according to Articles 3.3.2.8. for guards, 3.3.2.10 for conditions specific to bleachers, and 4.1.5. for specific live loads.

[Sentence 3.14.1.7.(1)]

Sanitary Facilities (Applies to LARGE tents)

The number of water closets for tents must comply with Table 3.7.4.3.E. [Sentence 3.14.1.8.(1)]. As well, the privacy requirements found in Article 3.7.4.17. apply. [Sentence 3.14.1.8.(2)]

Other types of disposal methods may be provided (sanitary privies, chemical toilets, etc.).

[Sentence 3.14.1.8.(3)]

Provision for Fire-Fighting (Applies to ALL tents)

Access for fire-fighting must be provided to all tents.

[Sentence 3.14.1.9.(1)]

Electrical Systems (Applies to ALL tents)

The electrical system and equipment in a tent including electrical fuses and switches, must be inaccessible to the public.

[Sentence 3.14.1.10.(1)]

applicable if the bearing stratum is composed of granular material such as gravel, sand or silt.

[Sentence 9.4.4.3.(1)]

Soil Movement

Certain soils exhibit movement due to changes in moisture content, freezing, frost heave, formation of ice lenses, and chemical or biological effects. If the foundations are expected to be affected by these movements, measures must be taken to limit them to such an extent that they do not adversely affect the structure or the effects must be reduced to such an extent that they will not affect the building's stability and the performance of the structure's assemblies. Additional information on this topic may be found in Appendix A.

[Sentence 9.4.4.4.(1)]

Walls Supporting Drained Earth

If foundation walls are NOT constructed according to Section 9.15., "Footings and Foundations", and assuming the soil adjacent to the foundation is drained, the foundations must be designed for a loading of not less than 480 kg/m³ acting as if the soil was a fluid and for a depth of the actual backfill depth, or those foundation walls must be designed to conform with Section 4.2, "Foundations" and are to be capable of resisting the loads stipulated in Article 4.1.2.1., "Loads and Effects".

[Sentence 9.4.4.6.(1)]

If foundations walls are subjected to UNDRAINED backfill, those walls must be designed for the loads for drained backfill as indicated above PLUS the loads imposed by the fluid pressure of the surcharge, or those walls are to be designed in accordance with Part 4, more specifically Section 4.2 and Article 4.1.2.1.

For additional information, refer to Appendix "A".

[Sentence 9.4.4.6.(2)]

- Group F-1 occupancies (which is NOT a Part 9 occupancy),
- buildings which are not intended to be occupied on a daily or full time basis.
[Sentence 9.5.2.1.(1)&(2) - Div. B and 3.8.1.1.(1) - Div. B]

Additionally, where a barrier-free path of travel is provided above the first storey, the requirements of Article 3.3.1.7., "Protection On Floor Areas With A Barrier-Free Path Of Travel, also apply.
[Sentence 9.5.2.2.(1) - Div. B]

In order to get a better appreciation for the requirements for Barrier-Free Design as they apply to Part 9 buildings, we must start with a study of Section 3.8. and Article 3.3.1.7.

Entrances

The number of barrier-free entrances are based on the number of entrances into the building (not necessarily the required exits and therefore entrances) and are tabulated in Table 3.8.1.2.
[Sentence 3.8.1.2.(1)] These entrances are from the parking spaces, etc. to the entrance and not simply the doors themselves.

If there are occupancies on the first storey, or a storey to which a barrier-free path of travel is provided, and those occupancies are separate from the remainder of the building, (example: a strip mall) at least 1 barrier-free entrance must be provided to each such occupancy.
[Sentence 3.8.1.2.(3)]

Article 3.8.3.3. deals with the specifics at the entrance doorway and will be dealt with later in this module.
[Sentences 3.8.1.2.(4)&(5)]

Where barrier-free storeys in different buildings are connected by a walkway or bridge the walkway or bridge must be barrier-free.
[Sentence 3.8.1.2.(6)]

Barrier-Free Path of Travel

The basic requirement is that a minimum width of 1 100 mm be provided in a barrier-free path of travel. [Sentence 3.8.1.3.(1)] There are two exceptions to this general rule which will be addressed shortly.

The barrier-free path of travel (interior and exterior walking surfaces) has certain required design features, namely;

- no openings larger than 13 mm,
 - any elongated openings must be at right angles to the path of travel,
 - be stable, firm and slip-resistance,
 - to have bevelled edges with a 1 in 2 slope max. if the difference in elevation is less than or equal to 13 mm,
 - if the difference in elevation is more than 13 mm, be provided with sloped floors or ramps.
- [Sentence 3.8.1.3.(2)]

Obviously a barrier-free path of travel is permitted to include ramps, elevators and the like in order to bridge differences in elevations.

[Sentence 3.8.1.3.(3)]

Where the width of 1 600 mm cannot be provided throughout the barrier-free path of travel, widened areas of at least 1 800 mm by 1 800 mm are to be provided every 30 m max.

[Sentence 3.8.1.3.(4)]

If the headroom is less than 1 980 mm high in a barrier-free path of travel, then a guardrail is required not more than 680 mm above the finished floor. This guardrail is to guide the visually impaired away from the reduced headroom location. As such this guardrail is to be located in line with the headroom height of 1 980 mm.

[Sentence 3.8.1.3.(5) and (6)]

If transportation, in the form of escalators or moving walkways, is provided from the entrance floor level and the barrier-free storey, a barrier-free path of travel is also required to those storeys. This may be accomplished by providing elevator(s) or the like. See Appendix "A" from more information.

[Sentence 3.8.1.4.(1)]

The route from an escalator or inclined moving walk to the barrier-free path of travel shall be clearly indicated with appropriate signs and where a moving walk provides access between areas on the same floor level, a barrier-free path of travel shall be provided between the areas served by the moving walk.

[Sentences 3.8.1.4.(2) and (3)]

Controls for the operation of building services; for example, elevator call buttons, thermostats, electrical switches, etc., are required to be located not more than 1 200 mm high in the case of thermostats or pull stations [Subclause 3.1.8.5.(1)(c)(i)] and not less than 900 mm or more than 1 100 mm above the finished floor in the case of all other controls. [Subclause 3.8.1.5.(1)(c)(ii)] In either case the controls must be operable with a force of not more than 22.2 N.
[Clause 3.8.1.5.(1)(b)]

The illumination of a barrier-free path of travel is mandated to be at an average level of at least 50 lx measured at the floor level.
[Sentence 3.8.1.6.(1)]

EXERCISE # 1 - GENERAL REQUIREMENTS FOR BARRIER-FREE ACCESS

To complete this exercise, you need to be familiar with the requirements found in Subsection 3.8.1. Provide code references and Division designations when asked in the questions.

1. Which of the following occupancy is NOT required to be provided with barrier-free access?
 - a) a mercantile occupancy (Group E)
 - b) office occupancies (Group D)
 - c) triplexes
 - d) all occupancies require barrier-free access.

OBC Reference: _____

2. A building has 4 pedestrian entrances. How many of those entrance must be barrier-free entrances?
 - a) 1
 - b) 2
 - c) 3
 - d) 4

OBC reference: _____

3. Interior and exterior walking surfaces forming part of a barrier-free path of travel must;
- a) be continuously kept clear of snow and ice,
 - b) must have a non-slip finish,
 - c) be clearly indicated,
 - d) be provided with a ramp or sloped floor if the difference in elevation is more than 13 mm

OBC Reference: _____

4. If a barrier-free corridor is less than 1 600 mm wide throughout its length, then widened areas must be provided every 30 m max. These widened areas must be a minimum of;
- a) 1 060 wide by 1 060 long
 - b) 1 800 wide by 1 800 long
 - c) 1 060 wide by 1 600 long
 - d) 1 600 wide by 1 060 long

OBC Reference: _____

5. Manual pull stations and thermostats which are located in a barrier-free path of travel must be situated NOT;
- a) more than 1 600 mm above the floor
 - b) more than 900 mm above the floor
 - c) more than 1 200 mm above the floor
 - d) more than 1 060 mm above the floor.

OBC Reference: _____

6. The minimum average level of illumination in a barrier-free path of travel is:
- a) 2 lx measured at floor level
 - b) 100 lx measured at floor level
 - c) 50 lx measured at 1 200 m above the finished floor level
 - d) 50 lx measured at the finished floor level.

OBC reference: _____

STOP

OCCUPANCY CLASSIFICATION (SUBSECTION 3.8.2. - DIV. B)

Areas Requiring Barrier-Free Path of Travel

A barrier-free path of travel is required throughout the entrance storey and within occupied floor areas served by an elevator or similar device, EXCEPT to;

[Sentence 3.8.2.1.(1)]

- service rooms,
- elevator machine rooms,
- janitors rooms,
- service spaces,
- crawl spaces,
- attic or roof spaces,
- high-hazard industrial occupancies,
- assembly areas with fixed seats (except to those areas with seating designated for wheelchair use, adaptable seating or spaces for storage of wheelchairs and mobility assisted devices),
- residential suites located on other than the entrance storey and that have their entrances not located at an elevator stop level,
- inside a suite of residential occupancy except those required to be barrier-free, or
- those parts of a floor areas that are not at the entry level, provided the same amenities are provided elsewhere in a barrier-free path of travel. See Appendix "A" for additional information.

[Sentence 3.8.2.1.(3)]

In addition to the above exceptions a Barrier-free path of travel is NOT required to extend to:

- floor areas in Group B, Div. 2 or 3 occupancies that are not required by Article 3.5.2.1. to be served by a ramp or elevator,
- Group C or D occupancies that are in floor areas in a building that is three storeys or less in height and not exceeding 600 m² in building area,
- Group F, Div. 2 or 3 occupancies that are not required to be served by an elevator as described in Sentence 3.8.2.2.(1),

- Portions of restaurants and bars where the same amenities and uses are provided in other floor areas that have a barrier-free path of travel, or,
- To portions of child care facilities that have an entrance door at floor levels that do not have a barrier-free path of travel.
[Sentence 3.8.2.1.(2) Clauses (a) to (e)]

The minimum number of spaces designated for wheelchair in an assembly occupancy is based on the number of fixed seats and is found in Table 3.8.2.1.

[Sentence 3.8.2.1.(4)]

In Group C buildings, not less than 15% of the suites are to be provided with a barrier-free path of travel from the suite entrance door to the doorway to at least:

- 1 bedroom, and
- 1 bathroom which conforms to the design requirements of 3.8.2.1.(6);
 - has a lavatory, water closet, shower or bathtub, wall reinforcement for grab bars and be designed to permit a wheelchair to turn in an open space not less than 1 500 mm in diameter,
- a kitchen or kitchen space, and
- a living room or space
[Sentence 3.8.2.1.(5)]

The number of barrier-free residential suites shall be in proportion to the number of suites of residential occupancy in the remainder of the building [Sentence 3.8.2.1.(7)] and the suites shall be distributed among storeys that are required by Article 3.8.2.1. to have a barrier-free path of travel, having regard to the height of the suite above grade.

[Sentence 3.8.2.1.(8)]

A barrier-free path of travel shall be provided outside the building and within, from the entrance to;

- the exterior parking area (where one is provided),
- at least one indoor parking level (if the parking is served by a passenger elevator).
[Sentence 3.8.2.2.(1)]

A vertical clearance of at least 2 100 mm must be provided throughout the path a wheelchair accessible vehicle would have to navigate from the entrance to the designated parking space(s).
[Sentence 3.8.2.2.(2)]

Where a barrier-free passenger loading zone is provided, that area must be at least 2 440 mm wide, at least 7 400 mm long and located adjacent and parallel to the vehicle pull-up space. Furthermore, there must be a curb cut if a curb is provided and a clearance of at least 3 600 mm to overhead projections must also be provided.
[Sentence 3.8.2.2.(3)]

Washrooms required to be barrier-free have specific requirements. Where washrooms are required, those washrooms are to be accessible (and these requirements will be detailed later in this module), (See Appendix "A" for more information) EXCEPT;

- in a large floor area, if special washrooms are provided close by (within 45 m),
- in suites of residential occupancies,
- those buildings which are exempt from having barrier-free design.

[Article 3.8.2.3.]

The minimum number of universal washrooms provided in a building in which washrooms are required in Subsection 3.7.4. must conform with Table 3.8.2.3.A.

[Sentence 3.8.2.3.(2)]

Even if more washrooms are provided than required by the Building Code, those washrooms must be barrier-free accessible if the washrooms are located on a storey to which barrier-free access has been provided.

[Sentence 3.8.2.3.(4)]

Where a washroom required by Subsection 3.7.4. is provided in a storey that is NOT required to have a barrier-free path of travel, it must have specific design considerations and be provided with at least one ambulatory water closet stall.

[Sentence 3.8.2.3.(6)]

Other situations where barrier-free washrooms need NOT be provided are;

- in residential suites,
- where other barrier-free washrooms are close by (within 45 m),
- in situations where washrooms are located within the suites and those suites are completely separated from and do not have access to the remainder of the building, (e.g. strip mall situations) in;
- Group D, E or F occupancies, and
- have areas of suites less than 300 m².
[Sentence 3.8.2.3.(5)]

EXERCISE # 2 - OCCUPANCY REQUIREMENTS

Include the Division designator in your answers.

1. A barrier-free path of travel must be provided into the following areas;
 - a) service rooms on the entrance storey
 - b) mercantile occupancies on the entrance storey
 - c) fixed seating areas in an assembly use
 - d) mezzanines.

OBC Reference: _____

2. A cinema has fixed seating for 700 people. What is the minimum number of spaces required for wheelchairs?
 - a) 5
 - b) 6
 - c) 7
 - d) none are required.

OBC Reference: _____

3. The minimum vertical vehicle clearance from an entrance to a parking storey provided with barrier-free access is;
- a) 1 600 mm
 - b) 2 000 mm
 - c) 2 100 mm
 - d) 2 750 mm

OBC Reference: _____

4. Washrooms must be provided to accommodate disabled persons EXCEPT in;
- a) mercantile occupancies,
 - b) industrial occupancies,
 - c) assembly occupancies,
 - d) residential (suite) occupancies.

OBC Reference: _____

5. The minimum clearance height in an exterior passenger loading zone is;
- a) 2 000 mm,
 - b) 2 100 mm,
 - c) 3 600 mm,
 - d) 3 000 mm.

OBC Reference: _____

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DESIGN STANDARDS (SUBSECTION 3.8.3. - DIV. B)

Accessibility Signs

When a building is required to have a barrier-free entrance, a sign of the International Symbol of Accessibility is to be installed so as to indicate that entrance and any ramps serving those entrances and exterior passenger loading zones.

[Sentence 3.8.3.1.(1)]

Similarly, signs are to be posted to indicate barrier-free accessibility to washrooms, elevators, telephones and parking spaces.

[Sentence 3.8.3.1.(2)].

If a washroom is NOT equipped for barrier-free access, a sign indicating the location of a barrier-free washroom is to be provided. [Sentence 3.8.3.1.(3)]

It also stands to reason that barrier-free signs are to be posted where necessary to indicate the accessible means of egress. [Sentence 3.8.3.1.(4)]

Barrier-free signs are to be located not less than 1 200 mm and not more than 1 500 mm above the floor. [Sentence 3.8.3.1.(5)]

Exterior Walks

The basic rules for an exterior walkway forming part of a barrier-free path of travel are listed in Sentence 3.8.3.2.(1) and include;

- no steps or sudden changes in level,
- permanent, firm and slip-resistant finish,
- a width at least 1 100 mm and a maximum gradient of 1 in 20 (remember also Sentence 3.8.1.3.(4)),
- if the gradient is more than 1 in 20, the walkway must be designed as a ramp,
- having a different texture than the area surrounding it and be level and even with the surrounding surface,
- be free of obstructions for the full width and to a minimum height of 1 980 mm except that handrails may project 100 mm from either side into the required width,
- have a level area at the entrance doorway which is 1 670 mm wide by 1 670 mm long, and
- Have a tactile attention indicator located to identify entry into a vehicular route or area where no curbs separate the vehicular route from pedestrian route. [Sentence 3.8.3.2.(1)]

Curb ramps may be used if the difference in elevation is not more than 200 mm.

[Sentence 3.8.3.2.(2)] These curb ramps must have a;

- maximum running slope conforming with Table 3.8.3.2.,
- minimum width of 1 500 mm,
- be slip-resistant surface,
- detectable warning surface that is different in colour AND texture from the surrounding area,

- smooth transition, and
- have flare sides with a slope not more than 1 in 10.
[Sentence 3.8.3.2.(3)]

These curb ramps do NOT require handrails nor guards.

[Sentence 3.8.3.2.(4)]

Doorways and Doors (See also Appendix “A”)

Every doorway located in a barrier-free path of travel must have a clear width of at least 850 mm measured when the door is open.

[Sentence 3.8.3.3.(1)]

In every residential suite, except where the bathroom is NOT located on the same level as the barrier-free entrance door, the doorway to at least 1 bathroom and to each bedroom at the same level as the bathroom, shall have a door which is not less than;

- 760 mm wide when the door is served by a corridor not less than 1 060 mm wide, or
- 810 mm where the door is served by a corridor less than 1 060 mm wide.

[Sentence 3.8.3.3.(2)]

Opening devices for doors should be of a design which do not require tight grasping and twisting. Handle-type door opening devices are a good method of complying with this provision.

[Sentence 3.8.3.3.(3)]

Usually entrance doors in a barrier-free path of travel required in Article 3.8.1.2. are required to be equipped with a power door operator in the following occupancies;

- hotels and other Group C occupancies,
- Group B-2 or B-3 occupancies,
- Group A, D or E occupancies.

[Sentence 3.8.3.3.(4)]

If a door equipped with a power operator is located within a vestibule, the door leading from the vestibule to the floor area must also be provided with a power operator for the buildings or occupancies described above.

[Sentence 3.8.3.3.(5)]

It is important to be aware that a power door operator is required where the door serves a washroom for public use required to be barrier-free or a Group A occupancy within a Group C major occupancy apartment building.

[Sentence 3.8.3.3.(6)]

The maximum force necessary to open a door in a barrier-free path of travel is 38 N for exterior doors and 22 N for interior doors

[Sentence 3.8.3.3.(7)] EXCEPT;

- entrance doors to dwelling units,
- where there is a great pressure difference across the door.

[Sentence 3.8.3.3.(8)]

Except for doors serving dwelling units, closures for doors in a barrier-free path of travel shall have a closing period of at least 3 seconds (measured when the door is at a 70° open position to when it is 75 mm from the closed position).

[Sentence 3.8.3.3.(9)]

If the door does not have a power door operator, a clear distance from the edge of the door (on the latch side) is required, and shall be not less than;

- 600 mm where the door swings towards you, and
- 300 mm when it swings away from you, and
- 300 mm beyond both sides of a sliding door.

[Sentence 3.8.3.3.(10)]

Where vestibules are provided in a barrier-free path of travel, the minimum length of the vestibule is 1 500 mm plus the width of the door when the door swings into the vestibule. [Sentence 3.8.3.3.(11)]

If the vestibule is provided with multiple-leaf doors, only the active leaf is required to comply with the barrier-free requirements.

[Sentence 3.8.3.3.(12)]

Except for ramps, the floor surface on each side of a door in a barrier-free path of travel shall have a rectangular level area;

- as wide as the door plus the clearance required on the latch side, and
- the dimension in the direction of travel (i.e., perpendicular to the closed door) is not less than the width of the barrier-free path of travel, but need not be more than 1 500 mm.

[Sentence 3.8.3.3.(13)]

If a door is provided with a vision panel, that panel must;

- be at least 75 mm wide,
- be located so that the bottom of the panel is not more than 900 mm above the floor, and
- the panel is not more than 250 mm from the latch side of the door.

[Sentence 3.8.8.3.(14)]

Should a door in a barrier-free path of travel be made entirely of glass, its presence is required to be marked with a continuous opaque strip;

- the colour of which must contrast with the background,
- be at least 50 mm wide,
- be located from 1 350 mm to 1 500 mm high and extend the full width of the door,
- may incorporate a logo or symbol as long as the logo or symbol does not reduce or diminish the;
 - opacity of the strip,
 - width of the strip,
 - colour or contrast with the background, and
 - continuity of the strip.

[Sentence 3.8.3.3.(15)]

Where power door operators are required, people are to be capable of activating the door from either side.

[Sentence 3.8.3.3.(16)]

The control for the power door operators shall;

- have a face dimension of not less than 150 mm in diameter where the control is circular or 50 mm by 100 mm where the control is rectangular,
- be operable with a closed fist,
- be located so that the centre is between 900 mm and 1 100 mm above the floor or ground level, or it extends from not more than 200 mm to not less than 900 mm above the finished floor or ground,
- be located not less than 600 mm and not more than 1 500 mm beyond the door swing, and
- be clearly visible and be signed.

[Sentence 3.8.3.3.(17)]

Ramps (Refer to Appendix "A" for more information)

The required geometry of ramps in a barrier-free path of travel is as follows;

- minimum width between handrails - 900 mm,
- maximum gradient - 1 in 12,
- must have a level area at least 1 670 mm by 1 670 mm at the following locations;
 - at the top of the ramp,
 - at the bottom of the ramp,
 - where a door is located in a ramp (the level area must also extend at least 600 mm beyond the latch side of the door and if the door swings away from the ramp - 300 mm),
- must have a level area at least 1 670 mm long and as wide as the ramp;
 - at intervals of not more than 9 m, and
 - where there is a change of 90° or more in direction,
- must have a handrail on both sides which are;
 - continuously graspable and having specific dimensions,
 - not less than 865 mm and not more than 965 mm high,
 - be terminated so as not to be dangerous,
 - extend horizontally not less than 300 mm beyond the top and bottom of the ramp,
 - be not less than 50 mm clear to the wall or guard to which it is attached,
 - be designed to resist the loads specifically listed in this Sentence.
- Also be provided with a wall or guard on both sides of the ramp, and when a guard is provided that guard shall;
 - not less than 1 070 mm high,
 - not facilitate climbing between 140 mm to 900 mm high,
 - have a curb at least 50 mm high if the guard is not solid,
 - have the barrier extending to within 50 mm of the ramp surface or be provided with a curb as described above, and

- where the ramp is wider than 2 200 mm an intermediate handrail with a clear width of 900 mm between the intermediate handrail and the walls or guards is required.
[Sentence 3.8.3.4.(1)]

If the ramp serves an aisleway serving fixed seating, the requirements for handrails do NOT apply.
[Sentence 3.8.3.4.(2)]

If a floor slopes more than 1 in 20, those floors shall be designed as ramps as long as the floor is in a barrier-free path of travel.
[Sentence 3.8.3.4.(3)]

Elevators

Passenger-type elevating devices must conform with the provisions of CSA B355 standard, "Lifts for Persons with Physical Disabilities".
[Sentence 3.8.3.5.(1)]

Spaces in Seating Areas

Where spaces for wheelchairs are required in areas with fixed seating or adaptable seating
[Sentence 3.8.2.1.(3)], those areas shall be;

- clear and level or level with removable seats,
- at least 900 mm wide by 1 525 mm long to allow approach from the side and 1 220 mm long where the wheelchair enters from the front or rear,
- have at least 2 such spaces side by side,
- located next to a barrier-free path of travel without blocking egress from the rows or aisles, and
- provided with suitable viewing and a choice of viewing location.
[Sentences 3.8.3.6.(1) and (2)]

Assistive Listening Devices

Wireless sound transmission systems are required in the following occupancies IF the area of the occupancy is more than 100 m² AND the occupant load is more than 75 people;

- assembly occupancy,
- classrooms,
- auditoria,

- meeting rooms, and
- theatres.
[Sentence 3.8.3.7.(1)]

Water Closet Stalls

At least 1 water closet stall enclosure shall meet the following criteria;

- be at least 1 500 mm wide by 1 500 mm deep,
- have a clear turning radius of 1 500 mm,
- have a door which;
 - can be locked from the inside with a mechanism that is operable with a closed fist and the latch can be released from the outside in case of an emergency,
 - has a clear opening of at least 860 mm when the door is open,
 - swings outward or have a larger stall area (clear floor area 820 mm by 1 440 mm),
 - closes automatically,
 - is provided with a door pull next to the latch on both sides of the door , and
 - aligned with the clear maneuvering space adjacent to the water closet.
- the water closet is placed so that the centre line is between 460 mm and 480 mm from the side wall and a clear transfer space of min. 900 mm wide and 1 500 mm deep on the other side of the water closet,
- be equipped with grab bars which;
 - are L-shaped and at least 750 mm long,
 - with the horizontal component 750 mm above the floor and vertical component 150 mm in front of the bowl,
 - be at least 600 mm long, mounted horizontally behind the water closet between 840 mm to 920 mm above the floor and if the water closet has a water tank, 150 mm above the tank,
 - resist the specified loads as listed in this Sentence,
 - be between 30 mm and 40 mm in diameter,
 - have a clearance of between 30 mm and 40 mm from the wall, and
 - be slip-resistant.

- grab bars may also be fold-down, provided on either side of the water closet in compliance with Sentence 3.8.3.8.(8) and a fold-down grab bar may encroach into a clear turning space or transfer space,
- have a coat hook mounted on a sidewall and not higher than 1 200 mm above the floor and project not more than 50 mm,
- the face of the stall must be at least 1 700 mm to an in-swinging door and 1 400 mm from the stall face to any wall mounted fixture or obstruction,
- the toilet paper dispenser must be;
 - wall mounted,
 - located below the grab bar,
 - in line with and not more than 300 mm in front of the seat, and
 - not less than 600 mm above the floor.
- Ambulatory water closet stalls shall be at least 1 500 mm in depth and not less than 890, and not more than 940 mm wide.
[Sentence 3.8.3.8.(1) to (10)]

Water Closets (See also Appendix “A”)

Water closets for the use of people with physical limitations shall meet the following conditions;

- the seat is to be located between 430 and 485 mm above the floor,
- have easily operable hand controls or automatic flushing controls,
- have a back support if there is no seat lid or tank, and
- not have a spring-activated seat.
[Sentence 3.8.3.9.(1)]

Urinals

Where more than one urinal is provided in a washroom requiring barrier-free design;

- at least one urinal shall be wall mounted with a rim located max. 430 mm above the finished floor or be floor mounted with the rim level with the finished floor,
- A vertical mounted grab bar must be installed on each side of the urinal conforming to Sentence 3.8.3.10.(2).
[Article 3.8.3.10.]

Lavatories

A washroom which is required to be barrier-free must be provided with a lavatory;

- the centreline of which is not less than 460 mm from a side wall,
- located not more than 840 mm above the floor,
- have the following minimum clearances below the lavatory:
 - 920 mm wide,
 - 735 mm high at the front edge,
 - 685 mm high at a point 205 mm back from the front edge,
 - 350 mm high from a point 300 mm from the front edge,
- have insulated pipes or water temperature set at 43°C maximum,
- have a minimum 1 370 mm deep floor space to allow for a forward approach of which a maximum of 500 mm can be located under the lavatory,
- have lever-type handles without springs or automatic faucets located not more than 485 mm from the front edge,
- have soap and towel dispensers located:
 - so as to be accessible to a person in a wheelchair,
 - located not more than 1 200 mm above the finished floor,
 - are operable with one hand.

[Sentence 3.8.3.11.(1)]

If mirrors are provided in a barrier-free washroom, at least one mirror shall be;

- located with its bottom edge not more than 1 000 mm above the finished floor, or
- inclined so as to be usable by a person in a wheelchair.

[Sentence 3.8.3.11.(2)]

Any dispensing or hand-operated accessories, other than those found in a toilet stall or soap dispensers, shall be located between 900 mm and 1 200 mm above the finished floor.

[Sentence 3.8.3.11.(3)]

Universal Toilet Rooms (See Appendix “A”)

Sometimes special washrooms are available for use by either sex with physical limitations instead of barrier-free facilities located in

washrooms used by the general public. These special washrooms must be;

- in a barrier-free path of travel,
- equipped with a door capable of being locked from the inside and released from the outside in an emergency and which has;
 - a graspable latch and locking mechanism located between 900 to 1 000 mm above the floor,
 - if the door swings out, be provided with a 140 mm long door pull located so that its midpoint is between 200 mm to 300 mm from the latch side of the door and between 900 mm to 1 000 mm above the floor, and
 - be equipped with an automatic door closure.
- compliant with all the requirements for lavatories in a barrier-free washroom,
- provided with a water closet which complies to the barrier-free accessible washroom requirements and located so that its centre line is;
 - between 460 mm to 480 mm from an adjacent sidewall, and
 - a clear transfer space of min. 900 mm wide by 1 500 mm deep on the opposite side,
- equipped with grab bars as for any barrier-free washroom,
- provided with no dimension less than 1 700 mm,
- equipped with a coat hook as for any barrier-free washroom,
- provided with a shelf located not more than 1 100 mm above the floor and projects not more than 100 mm from the wall,
- designed to permit a wheelchair to back in next to the water closet,
- designed to allow a wheelchair to turn in an open space with a diameter of at least 1 700 mm, and
- provided with a power door operator if the door is self-closing.
- be provided with a mirror above a lavatory and mounted with its bottom edge not more than 1 000 mm above the finished floor or inclined to the vertical to be useful to a person in a wheelchair, and

- Have lighting controlled by a motion sensor conforming to Sentence 12.2.4.1.(2).
[Sentence 3.8.3.12.(1)]
- A universal washroom shall also have an emergency call system consisting of visual and audible signal devices inside and outside the washroom.
[Sentence 3.8.3.12.(2)]
- A clear space not less than 810 mm wide and 1 830 mm long shall be provided for an adult-size change table or wall reinforcement for the future installation of a change table EXCEPT when a universal washroom is located in an individual suite of Group A, D, E or F occupancy and
 - is located in a building less than 300 m² in building area or
 - it is less than 300 m² in area, if located in a building that is at least 300 m² in building area or
 - another universal washroom is located provided on the same floor level within 45 m.
[Sentences 3.8.3.12.(3), (4), (5) and (6)]

Showers and Bathtubs (See Appendix “A” for further information)

Where shower stalls are provided in a building (other than a residential suite), the number of barrier-free showers shall be in accordance with Table 3.8.3.13. and shall be;

- be 1 500 mm wide by 900 mm deep (min),
- have a clear floor space in front of the shower which is at least 900 mm deep and as wide as the shower,
- have a slip-resistant floor finish,
- have a bevelled threshold not more than 13 mm high,
- be equipped with a non-spring loaded hinged seat or a fixed seat that is;
 - 450 mm wide and 400 mm deep,
 - mounted between 430 mm and 485 mm above the finished floor,
 - designed for 1.3 kN (min), and
 - located so that the edge of the seat is within 500 mm of the shower controls.
- be provided with a wall mounted continuous L-shaped grab bar with the horizontal component to be;
 - 900 mm long,

- located not more than 850 mm above the floor,
- located so that the end of the horizontal bar is at least within 100 mm from the edge of the shower seat.
- be provided with pressure equalizing or thermostatic mixing valve controlled by a lever operable with a closed fist from the seated position,
- have a hand-held shower head with at least 1 500 mm of flexible hose placed so it can be reached from a seated position and must be designed so as to also operate as a fixed shower head, and
- have reachable fully recessed soap holders.
[Sentence 3.8.3.13.(1)]
- Individual shower stalls used in Group B-2 or B-3 occupancies must also comply with the requirements listed above.
[Sentence 3.8.3.13.(2)]
- Individual bathtubs used in Group B-2 or B-3 occupancies shall have;
 - non-spring loaded faucet handles or automatic operable,
 - faucets are to be located so as to be accessible when the person is seated,
 - unless the bathtub is free-standing, have an “L”-shaped grab bar as described in Subclauses 3.8.3.8.(7) mounted on the wall having each leg at least 900 mm long, with;
 - the horizontal leg located between 150 mm to 200 mm above and parallel to the rim, and
 - the vertical leg located between 300 mm to 450 mm from the control end of the tub, and
 - where the bathtub is free-standing, have a grab bar conforming to 3.8.3.8.(7) located at both ends of the bathtub, is at least 750 mm long mounted vertically from a point 200 mm above the rim of the tub and within 150 mm from the edge of the tub measured horizontally.
[Sentence 3.8.3.13.(4)]
 - Where a barrier-free bathtub is provided a clear floor space of at least 900 mm wide and 1 400 mm long shall be provided along the full length of the bathtub.
[Sentence 3.8.3.13.(5)]

Shelves or Counters for Telephones

Where shelves or counters are provided for telephones, they shall be level and they also shall;

- be at least 500 mm wide and 350 mm deep,
- have a clear space of at least 810 mm wide and 1 370 mm deep, centred on the telephone and without obstructions within 250 mm above the surface for each telephone.
[Sentences 3.8.3.15.(1) and (2)]

The top surface of the shelf or counter should be between 775 mm and 875 mm above the floor and have a knee space of not less than 740 mm.

[Sentence 3.8.3.15.(3)]

If a wall-hung telephone is provided above a shelf or counter, the telephone is to be located so that the receiver and the coin slot are not more than 1 200 mm above the floor.

[Sentence 3.8.3.15.(4)]

Where more than one telephone is provided for public use in a floor area that is not required to have a barrier-free path of travel, a built-in shelf or counter conforming to the above sentences shall be provided for at least one telephone.

[Sentence 3.8.3.13.(5)]

Drinking Fountains

Where drinking fountains are provided, at least 1 shall be barrier-free and it shall;

- have a spout near the front of the unit not more than 915 mm above the floor, and
- be equipped with controls which are operable using one hand while in a wheelchair and using a force of not more than 22 N or be automatically operable.
- project the water at 100 mm high and provide the water stream at specified vertical angles, and
- be detectable by a cane at a level at or below 680 mm from the finished floor or where the fountain is cantilevered meet requirements of Subclauses 3.8.3.16.(f) (i) to (vi).
[Article 3.8.3.16.]

EXERCISE # 3 - DESIGN STANDARDS

Include the Division designation with your answers.

1. An exterior walkway in a barrier-free path of travel is required to be designed as a ramp if the gradient is;
 - a) greater than 1 in 20
 - b) less than 1 in 20
 - c) greater than 1 in 50
 - d) an exterior walkway is not governed by the building code.

OBC Reference: _____

2. If the vertical rise between surfaces is 50 mm, a curb ramp is limited to a minimum running slope of;
 - a) 1 in 8
 - b) 1 in 9
 - c) 1 in 10
 - d) 1 in 12

OBC Reference: _____

3. A doorway in a barrier-free path of travel must have a clear width of;
 - a) 760 mm wide
 - b) 810 mm wide
 - c) 860 mm wide
 - d) 1060 mm wide

OBC Reference: _____

4. Closers for doors in a barrier-free path of travel and opening into entrances to dwelling units, must open with a force of not more than;
 - a) 22 N
 - b) 38 N
 - c) 1.33 kN
 - d) the code does not state the maximum force.

OBC Reference: _____

8. A space designated for wheelchair use in an assembly occupancy which is designed for a side approach is required to be;
- a) 1 220 mm wide by 1 220 mm long
 - b) 900 mm wide by 1 525 mm long
 - c) 1 525 mm wide by 1 525 mm long
 - d) 900 mm wide by 1 220 mm long

OBC Reference: _____

9. Grab bars in water closet stalls that are required to be barrier-free accessible must be designed to resist the following load(s);
- a) 1.3 kN applied horizontally and vertically
 - b) 1.3 kN applied horizontally or vertically
 - c) 1.3 kN applied horizontally
 - d) 1.3 kN applied vertically

OBC Reference: _____

10. Automatic hand dryers for a lavatory in a Barrier-Free washroom are to be located;
- a) between 900 mm and 1 200 mm above the floor
 - b) not more than 1 200 mm above the floor
 - c) not more than 1 000 mm above the floor
 - d) not more than 1 500 mm above the floor

OBC Reference: _____

11. The minimum turning radius for a wheelchair in a Universal Toilet Room is;
- a) 750 mm
 - b) 1 000 mm
 - c) 1 020 mm
 - d) 1 700 mm

OBC Reference: _____

The adjacent surface within 1.2 m from the walking surface has a slope of more than 1 vertical unit to 2 horizontal units.

[Clause 9.8.8.1.(1)(b)]

Similarly, a guard or wall is required on every open side of **interior** stairs which have more than 2 risers and on every ramp, when the difference in elevation is more than 400 mm.

[Sentence 9.8.8.1.(3)]

Doors in buildings of residential occupancy, where the finished floor on one side of the door is more than 600 mm above the floor or other surface or ground level on the other side of the door, must be protected:

by a guard in accordance with this Subsection,

[Clause 9.8.8.1.(4)(a)]

or

a mechanism capable of controlling the free swinging or sliding of the door so as to limit any clear unobstructed opening to not more than 100 mm.

[Clause 9.8.8.1.(4)(b)]

Openable windows in buildings of residential occupancy must be protected:

by a guard in accordance with this Subsection,

[Clause 9.8.8.1.(5)(a)]

or

a mechanism capable of controlling the free swinging or sliding of the openable part of the window so as to limit any clear unobstructed opening to a size that will prevent the passage of a sphere having a dimension more than 100 mm.

[Clause 9.8.8.1.(5)(b)]

Glazing installed over stairs, ramps and landings that extend to less than 1070 mm above the surface of the treads, ramp or landing must be:

- smooth, even and free of open defects.
[Sentence 9.8.9.6.(1)]

In order to make the stairs and ramps as safe as possible in other than those serving dwelling units, service spaces or service spaces, a colour contrast or distinctive pattern is required at the following locations, the;

- leading edges of treads,
- leading edges of landings, and
- beginning and end of a ramp.
[Sentence 9.8.9.6.(3)]

Another requirement for treads and landings of interior and exterior stairs and ramps is that they be provided with a tactile attention indicator (slip-resistant strips) which do not extend higher than 1 mm above the surface of the tread or landing at the leading edge of landings where the door opens onto the stairs, starting one tread back from the edge of the landing.
[Sentence 9.9.9.6.(4)]

EXERCISE # 3 - GUARDS

Include the Code Division in your answers.

1. A guard is required around an exterior stair that has;
 - a) more than 2 risers
 - b) 6 or more risers
 - c) a difference in elevation greater than 900 mm
 - d) a difference in elevation greater than 600 mm

OBC Reference: _____

2. A guard is required around a landing for an interior stair that has;
 - a) 6 or more risers
 - b) more than 6 risers
 - c) more than 2 risers
 - d) more than 2 risers and a difference in elevation greater than 600 mm

OBC Reference: _____

Access to Exits (Subsection 9.9.7. - Div.B)

Even though certain areas may not be enclosed by walls and or a roof every;

- roof intended for occupancy,
- podium,
- terrace,
- platform, or
- contained open space

must have an access to exit.

[Sentence 9.9.7.1.(1)]

Additionally, if a roof has an occupant load more than 60 people, two means of egress are required.

[Sentence 9.9.7.1.(2)]

Occupied open spaces such as terraces and platforms must have egress requirements based on those that would be required for rooms or suites of similar sizes and use.

[Sentence 9.9.7.1.(3)]

When there is more than one suite on a floor area, each suite is to have;

- an exterior exit door, or
- a doorway which opens into a public corridor or onto an exterior passageway.

[Sentence 9.9.7.2.(1)]

When the situation of a door opening into a public corridor occurs, it must be possible to travel in opposite directions to separate exits; in other words you must not be in a situation of having to travel in one direction to an exit to the two exits. [Sentence 9.9.7.2.(2)] The situation where you have only one direction of travel is called a dead end corridor and will be examined next.

An example of a dead end corridor is shown in Figure 7-5. Dead end corridors are permitted if the conditions listed in Table 9.9.7.3. are complied with. In addition to the travel distance and occupant load limitations found in Table 9.9.7.3., it is important to keep in mind certain other conditions which must be present, namely;

- the doors in the dead end portion must be equipped with self-closing devices, or

conform to the dimensions indicated in ISO 7010, "Graphical Symbols - Safety Colours and Safety Signs - Safety Signs in Workplaces and Public Areas", for the following symbols

- E001 emergency exit left,
- E002 emergency exit right,
- E005 90-degree directional arrow, and
- E006 45-degree directional arrow
[Clause 9.9.11.3.(2)(c)]

and

externally illuminated exit signs shall be illuminated at all times by a light fixture supplied by an electrical circuit.
[Sentence 9.9.11.3.(4)]

Internally illuminated exit signs shall be continuously illuminated and;

where illumination of the sign is powered by an electrical circuit, be constructed in conformance with CSA 22.2 No. 141, "Emergency Lighting Equipment",
[Clause 9.9.11.3.(3)(a)]

or

where illumination of the sign is not powered by an electrical circuit, be constructed in conformance with CAN/ULC-S572, "Photoluminescent and Self-Luminous Signs and Path Marking Systems" and be labelled in accordance with the time duration for which they have been tested and listed.
[Clause 9.9.11.3.(3)(b)]

The circuitry serving lighting for externally and internally illuminated exit signs must,

serve no equipment other than emergency lighting in the area where the exit signs are installed,
[Clause 9.9.11.3.(5)(a)]

and

be connected to an emergency power supply as described in Sentences 9.9.12.3.(2),(3) and (7).
[Clause 9.9.11.3.(5)(b)]

3. A floor area has multiple occupancies. One is a Group E and occupies 25% of the area, another is a Group D and occupies 70% of the area and another is a medium hazard industrial occupancy which takes up 5% of the area. The floor area should be classified as;
- a) Group E major occupancy
 - b) Group D major occupancy
 - c) Groups D & E major occupancies
 - d) Groups D, E & F-2 major occupancies

OBC reference: _____

4. The standard for the determination of flame-spread ratings for structural lumber is;
- a) CAN/ULC-S102.1-M
 - b) CAN/ULC-S102.2-M
 - c) CAN/ULC-S102-07
 - d) CAN/ULC-102.2-M06

OBC Reference: _____

5. A ceiling assembly required to have a fire-resistance rating is to be tested with the fire exposure from;
- a) the underside
 - b) both sides
 - c) an assembly which is not a fire separation need not be rated
 - d) ceiling assemblies are not assigned fire-resistance ratings

OBC reference: _____

6. A floor assembly is required to be a fire separation with a 1 hour fire-resistance rating. The assembly is required to be tested with the fire exposure from;
- a) the underside
 - b) both sides
 - c) from the underside as long as due allowance is made for the effects of heat radiation
 - d) as determined from the test report

OBC reference: _____

provided the annular space create by the penetration of the fire sprinkler is covered by a metal escutcheon plate in accordance with NFPA 13.

[Sentence 9.10.9.6.(11)]

Combustible piping for central vacuums may penetrate a fire separation as long as the installation of the piping complies with the requirements for the installation of combustible piping as found in Sentences 9.10.9.7.(2) to (6).

[Sentence 9.10.9.6.(12)]

Fire dampers are permitted to penetrate a fire separation or membrane forming part of an assembly required to have a fire-resistance rating without having to meet the fire stop requirements provided;

- installed in conformance with NFPA 80, "Fire Doors and Other Opening Protectives", or
- designed specifically with a fire stop.

[Sentence 9.10.9.6.(13)]

Subject to the exceptions that follow, combustible piping is not to be used if any part of the piping system penetrates any part of **a fire separation required to have a fire-resistance rating**.

[Sentence 9.10.9.7.(1)]

The first exception is for combustible piping that is NOT in a vertical shaft. This piping may penetrate a **fire separation required to have a fire-resistance rating** (or a membrane of an assembly) as long as the pipe is sealed at the penetration point with a firestop system that has an F Rating not less than the fire resistance rating required for the fire separation. [Sentence 9.10.9.7.(2)] This rating is determined by the CAN/ULC-S115 standard. In addition to the test criteria, the code requires that a pressure differential of 50 Pa be present on the exposed side during the testing of the assembly.

[Sentence 9.10.9.7.(3)]

Combustible DRAIN PIPING is allowed to penetrate **a horizontal fire separation required to have a fire-resistance rating** as long as the drain leads directly from a noncombustible water closet through a concrete floor slab.

[Sentence 9.10.9.7.(4)]

SMOKE ALARMS (SUBSECTION 9.10.19. - DIV.B)

Smoke alarms (NOT to be confused with smoke detectors) are required to be installed in every dwelling unit and each sleeping room not in a dwelling unit (e.g., hotel room). These units are to conform with the CAN/ULC-S531, "Smoke Alarms" standard.

[Sentence 9.10.19.1.(1)]

Required smoke alarms shall have a visual signalling component conforming to the requirements in 18.5.3. (Light, Color and Pulse Characteristics) of NFPA 72, "National Fire Alarm and Signalling Code".

[Sentence 9.10.19.1.(2)]

The visual signalling component need not be integrated with the smoke alarm provided it is interconnected to it, be on battery back-up, or have synchronized flash rates, when installed in a dwelling unit.

[Sentence 9.10.19.1.(3)]

Visual signalling components shall have a luminous intensity of minimum 175 cd (candelas) when installed in a bedroom.

[Sentence 9.10.19.1.(4)]

Installation of required smoke alarms shall be on or near the ceiling.

[Sentence 9.10.19.1.(5)]

The sound patterns of smoke alarms must meet the temporal patterns of alarm signals [Clause 9.10.19.2.(1)(a)] or be a combination of temporal pattern and voice relay.

[Clause 9.10.19.2.(1)(b)]

Within dwelling units, sufficient smoke alarms must be installed so that [Sentence 9.10.19.3.(1)] there is one on each storey, including basements [Clause 9.10.19.3.(1)(a)] and on any storey of a dwelling unit containing sleeping rooms, a smoke alarm is installed, [Clause 9.10.19.3.(1)(b)] in each sleeping room, [Subclause 9.10.19.3.(1)(b)(i)] and in a location between the sleeping rooms and the remainder of the storey, and if the sleeping rooms are served by a hallway, the smoke alarm must be located in the hallway.

[Subclause 9.10.19.3.(1)(b)(ii)]

A smoke alarm must be installed in conformance with CAN/ULC-S553, "Installation of Smoke Alarms".

[Sentence 9.10.19.3.(2)]

Smoke alarms must be installed on or near the ceiling.
[Sentence 9.10.19.3.(5)]

As a general rule, smoke alarms must be installed by permanent connections to an electrical circuit and shall have no disconnect switch between the overcurrent circuit device and the smoke alarm. [Clause 9.10.19.4.(1)(a) and 9.10.19.4.(1)(b)] and in case of the regular power supply to the smoke alarm is interrupted, be provided with a battery as an alternative power source that can continue to provide power to the smoke alarm for a period of not less than 7 days in the normal condition, followed by 4 minutes of alarm. [Clause 9.10.19.4.(1)(c)]

As an exception to the general rule, where the building (House) is not supplied with electrical power, smoke alarms are permitted to be battery operated.
[Sentence 9.10.19.4.(2)]

Suites of residential occupancy are permitted to be equipped with smoke detectors in lieu of smoke alarms, provided the smoke detectors are capable of independently sounding audible signals within the individual suites, [Clause 9.10.19.4.(3)(a)], are installed in conformance with CAN/ULC-S524, Installation of Fire Alarm Systems [Clause 9.10.19.4.(3)(b)] and form part of the fire alarm system [Clause 9.10.19.4.(3)(c)].

Smoke detectors are permitted to be installed in lieu of smoke alarms as provided in Sentence 9.10.19.3.(3) and are permitted to sound localized alarms within individual suites and need not sound an alarm throughout the rest of the building.

Where more than one smoke alarm is required in a dwelling unit, the smoke alarms must be wired so that the activation of one alarm will cause all alarms within the dwelling unit to sound.
[Sentence 9.10.19.5.(1)]

A manually operated device is permitted to be incorporated within the circuitry of a smoke alarm installed in a dwelling unit so that it will silence the signal emitted by the smoke alarm for a period of not more than 10 minutes, after which the smoke alarm will reset and again sound the alarm if the level of smoke in the vicinity is sufficient to reactuate the smoke alarm.
[Sentence 9.10.19.6.(1)]

The water closet and lavatory in a universal toilet room may be counted as part of the required number of fixtures if more than 1 water closet is required for each sex.

[Sentence 3.7.4.2.(7)]

Also, instead of where one water closet is required for males and one water closet required for females, one universal washroom plus one washroom containing one water closet may be used by both males and females as long as the door can be locked from the inside.

[Sentence 3.7.4.2.(8)]

Both sexes are permitted to be served by a single water closet if the occupant load is not more than 10 persons in an assembly occupancy except for elementary and secondary schools, child care facilities, places of worship and undertaking facilities.

[Sentence 3.7.4.2.(9)]

Additionally, shelves or projections above lavatories are to be located so as not to be hazards.

[Sentence 3.7.4.2.(10)]

Also, lavatories in other than dwelling units are to be operated automatically or have lever handles that do not close with a spring action.

[Sentence 3.7.4.2.(11)]

PLUMBING FIXTURES FOR DWELLING UNITS

Every dwelling unit is to be provided with a;

- kitchen sink,
- lavatory,
- water closet, or drainless composting watercloset, and
- bathtub or shower

where a piped water supply is available.

[Sentence 3.7.4.5.(1)]

PLUMBING FIXTURES FOR OTHER RESIDENTIAL OCCUPANCIES

The number of water closets are based on occupant load and Table 3.7.4.6.

[Sentence 3.7.4.6.(1)]

The spa is to be surrounded with a hard-surfaced pool deck with a;

- minimum 1.8 m clear space at the main entrance point,
- 900 mm on all sides,
- sloped away from the spa to waste drains with specific slopes depending if the spa is located inside or outside.
[Sentence 3.12.2.1.(4)]

The exceptions to the deck requirements above are that one portion of the deck that does not exceed 25% of the perimeter of the spa may be 300 mm if;

- the spa has an area less than 6 m², and
- no interior dimension greater than 2.5 m.
[Sentence 3.12.2.1.(5)]

The maximum depth of water above a seat or bench is limited to 600 mm.

[Sentence 3.12.2.1.(6)]

When steps are provided into the spa, the steps are;

- to be equipped with a handrail,
- have a non-slip finish, and
- have a contrasting colour band along the entire side and top edges.
[Sentence 3.12.2.1.(7)]

Every spa is to be provided with dressing rooms, water closets and shower facilities conveniently located.

[Sentence 3.12.2.1.(8)]

If there is a space between the ladder treads and the side of the spa, that space is to be not more than 150 and not less than 75 mm.

[Sentence 3.12.2.1.(9)]

If a ramp is provided into the spa, not more than 50% of the perimeter of the spa may be replaced with a ramp.

[Sentence 3.12.3.1.(1)]

Where a ramp is provided, the spa is to comply with Article 3.11.5.1. and Sentences 3.11.5.2.(3) and (4).

[Sentence 3.12.3.1.(2)]

If material alterations or repairs concern any pool fitting that passes water or air, or both, in or out of the pool tank, the affected fitting is

INTRODUCTION

There are a few conditions that are addressed in Section 9.34. dealing with electrical matters in situations which are not covered by The House - 2012 manual.

Most of the conditions dealing with electrical facilities as they relate to dwelling units have already been covered in The House - 2012 manual and as usual, only those conditions relating to electrical facilities in other facilities will be addressed in this particular module.

Of course this entire discussion is based on the presumption that electrical services are available to the building in question.

OBJECTIVES

When you have completed this module, you will be able to;

- a) state the conditions relating to the location of equipment in public areas,
- b) explain the conditions relating to various wiring and cable requirements,
- c) describe the minimum lighting requirements in various public and service areas,
- d) explain the conditions for emergency lighting.

Location of Equipment in Public Areas (Article 9.34.1.3. - Div.B)

Any type of electrical equipment (e.g., switches, meters, panel boxes, etc) is NOT to be located in a public area unless precautions are untaken to prevent tampering.

[Sentence 9.34.1.3.(1)]

Wiring and Cables (Article 9.34.1.5.)

Optical fibre cables and electrical wires and cables installed in a building permitted to be of combustible construction must;

- not convey flame or continue to burn for more than 1 minute when tested in conformance with the Vertical Flame Test in Clause 4.11.1. of CSA No. C22.2 No. 0.3, "Test Methods for Electrical Wires and Cables", (FT1 Rating), or
- be located in,
 - totally enclosed noncombustible raceways,
 - masonry walls,
 - concrete slabs, or

GENERAL REQUIREMENTS FOR ENERGY EFFICIENCY, CARBON DIOXIDE EQUIVALENTS AND PEAK ELECTRIC DEMAND (SECTION 12.2 - DIV. B)

Energy Efficiency Design (Subsection 12.2.1. - Div. B)

These new construction requirements apply to construction for which a permit has been applied for BEFORE January 1, 2017.

[Sentence 12.2.1.1.(1)]

There are two methods of comply with this Section for a Part 9 building or part of a building containing a **residential occupancy** which is intended for year-round occupancy;

1. Meet the performance level that is equal to a rating of 80 or more when evaluated in accordance with NRCan, "Energuide for New Homes: Administrative and Technical Procedures", or
 2. Conform to Chapters 1 and 2 of MMAH Supplementary Standard SB-12, "Energy Efficiency for Housing".
- [Sentence 12.2.1.1.(3)]

For all other buildings that do not contain a residential occupancy that is within the scope of Part 9, the energy efficiency of all buildings must conform to Division 1 and 2 or 4 of MMAH Supplementary Standard SB-10, "Energy Efficiency Requirements".

[Sentence 12.2.1.1.(2)]

The requirements stated above do not apply to;

1. Farm buildings,
 2. A building that does not use electrical power or fossil fuel,
 3. Manufactured buildings as described in Article 9.1.1.9., and
 4. A seasonal recreational building, described in Sections 9.36 and 9.38.
- [Sentence 12.2.1.1.(4)]

For all buildings for which a permit has been applied for after December 31, 2016, the following energy efficiency design requirements apply:

[Sentence 12.2.1.2.(1)]

1. The energy efficiency of all buildings must;
 - be designed to exceed not less than 13% the energy efficiency levels required by Sentence 12.2.1.1.(2), or

MODULE 2 B

(MODULE 2 B) EXERCISE # 1 - REQUIREMENTS FOR SIGNS

1. An application for a 20 m² roof top sign is being applied for. This sign must be reviewed by an;
 - a) architect or a professional engineer or a combination of both if the roof sign has any face that is more than 10 m²

OBC Reference: Clause 1.2.2.1.(8)(c) - Div. C

2. A projecting sign which is attached to a parapet wall must;
 - c) be designed by a professional engineer or an architect or a combination of both

OBC reference: Sentence 1.2.1.2.(7)- Div. C

3. A projecting sign overhangs a sidewalk; the minimum clearance to this sign is;
 - c) 2.4 m

OBC reference: Sentence 3.15.5.2.(1) - Div. B

EXERCISE # 2 - CONDITIONS SPECIFIC TO SELF-SERVICE STORAGE BUILDINGS

1. What is the maximum number of dwelling units permitted within a self-service storage building?
 - b) two

OBC Reference: Sentence 3.10.2.4.(9) - Div. B

2. A single self-service storage building has an occupant load of 50. How many water closets and lavatories are required?
 - c) 2

OBC Reference: Sentence 3.10.2.7.(2) → 3.7.4.9.(2) - Div. B

3. For a 3 storey self-service storage building, what is the minimum distance between buildings for spatial separations requirements to another SSSB on the same property?
 - c) 9 m or as determined from Section 3.2.3.

OBC Reference: Sentence 3.10.3.2.(2) - Div. B

MODULE 3 B**(MODULE 3 B) EXERCISE # 1 - GENERAL REQUIREMENTS FOR BARRIER-FREE ACCESS**

1. Which of the following occupancy is NOT required to be provided with barrier-free access?

c) triplexes

OBC Reference: Sentence 9.5.2.1.(2) - Div. B → 3.8.1.1.(1) - Div. B

2. A building has 4 pedestrian entrances. How many of those entrance must be barrier-free entrances?

b) 2

OBC reference: Sentence 3.8.1.2.(1) - Div. B → Table 3.8.1.2.

3. Interior and exterior walking surfaces forming part of a barrier-free path of travel must;

d) be provided with a ramp or sloped floor if the difference in elevation is more than 13 mm

OBC Reference: Clause 3.8.1.3.(2)(e)

4. If a barrier-free corridor is less than 1 600 mm wide throughout its length, then widened areas must be provided every 30 m max. These widened areas must be a minimum of;

b) 1 800 wide by 1 800 long

OBC Reference: Sentence 3.8.1.3.(4)

5. Manual pull stations and thermostats which are located in a barrier-free path of travel must be situated NOT;

c) more than 1 200 mm above the floor

OBC Reference: Sentence 3.8.1.5.(1)

6. The minimum average level of illumination in a barrier-free path of travel is:

d) 50 lx measured at the finished floor level.

OBC reference: Sentence 3.8.1.6.(1)→3.2.7.1.(1)

EXERCISE # 2 - OCCUPANCY REQUIREMENTS

1. A barrier-free path of travel must be provided into the following areas;

b) mercantile occupancies on the entrance storey

OBC Reference: Sentence 3.8.2.1.(1) - Div. B

2. A cinema has fixed seating for 700 people. What is the minimum number of spaces required for wheelchairs?

c) 7

OBC Reference: Sentence 3.8.2.1.(4) - Div. B → Table 3.8.2.1.

3. The minimum vertical vehicle clearance from an entrance to a parking storey provided with barrier-free access is;

c) 2 100 mm

OBC Reference: Sentence 3.8.2.2.(2) - Div. B

4. Washrooms must be provided to accommodate disabled persons EXCEPT in;

d) residential (suite) occupancies.

OBC Reference: Clause 3.8.2.3.(5)(a) - Div. B

5. The minimum clearance height in an exterior passenger loading zone is;

c) 3 600 mm

OBC Reference: Clause 3.8.2.2.(3)(c) - Div. B

ANS

EXERCISE # 3 - DESIGN STANDARDS

1. An exterior walkway in a barrier-free path of travel is required to be designed as a ramp if the gradient is;

a) greater than 1 in 20

OBC Reference: Clause 3.8.3.2.(1)(d) - Div. B

2. If the vertical rise between surfaces is 50 mm, a curb ramp is limited to a minimum running slope of;

c) 1 in 10

OBC Reference: Clause 3.8.3.2.(3)(a) - Div. B → Table 3.8.3.2.

3. A doorway in a barrier-free path of travel must have a clear width of;

c) 860 mm wide

OBC Reference: Sentence 3.8.3.3.(1) - Div. B

4. Closers for doors in a barrier-free path of travel and opening into entrances to dwelling units, must open with a force of not more than;

d) the code does not state the maximum force.

OBC Reference: Sentence 3.8.3.3.(8) - Div. B

5. Doors in a barrier-free path of travel are required to be provided with clear wall space on the latch side of the door. Where a door swings away from the approach side, the wall space shall be;

a) 300 mm

OBC Reference: Clause 3.8.3.3.(10)(b) - Div. B

6. Handrails provided on both sides of ramps in a barrier-free path of travel are required to resist the following loads;

d) either a point load of 0.9 kN or a uniformly distributed load of 0.7 kN/m

OBC Reference: Subclause 3.8.3.4.(1)(e)(vi) - Div. B

7. Floors in a barrier-free path of travel are required to be designed as ramps if the gradient is greater than;

d) 1 in 20

OBC Reference: Sentence 3.8.3.4.(3) - Div. B

8. A space designated for wheelchair use in an assembly occupancy which is designed for a side approach is required to be;

b) 900 mm wide by 1 525 mm long

OBC Reference: Clause 3.8.3.6.(1)(b) - Div. B

9. Grab bars in water closet stalls that are required to be barrier-free accessible must be designed to resist the following load(s);

b) 1.3 kN applied horizontally or vertically

OBC Reference: Subclause 3.8.3.8.(7)(a) - Div. B

10. Automatic hand dryers for a lavatory in a Barrier-Free washroom are to be located;

- a) between 900 mm and 1 200 mm above the floor

OBC Reference: Sentence 3.8.3.11.(3) - Div. B

11. The minimum turning radius for a wheelchair in a Universal Toilet Room is;

- d) 700 mm

OBC Reference: Clause 3.8.3.12.(1)(h) - Div. B

12. The spout on a drinking fountain located in a Barrier-Free path of travel is to be located a maximum of;

- c) 915 mm above the floor

OBC Reference: Clause 3.8.3.16.(1)(a) - Div. B

EXERCISE # 4 - PROTECTION WITHIN FLOOR AREAS

1. A floor area is divided into 2 zones. The occupancy on the floor area is Group D. What is the maximum travel distance from the most remote point in one zone to the door leading into the other zone?

- b) 40 m

OBC Reference: Subclause 3.3.1.7.(1)(b)(ii) - Div. B →3.4.2.5.(1)(b) - Div. B

2. The fire-resistance rating for the fire separation which creates the zones in a barrier-free path of travel when the floor is required to have a fire-resistance rating of 1 h is;

- b) 1 h

OBC Reference: Sentence 3.3.1.7.(4) - Div. B

3. A residential suite has an occupant load of 4 people. What is the minimum area for a balcony used to provide protection on the floor area?

- d) 2.0 m².

OBC Reference: Sentence 3.3.1.7.(7) - Div. B

MODULE 5 B

(MODULE 5 B) EXERCISE # 1 - WINDOWS AND SKYLIGHTS

1. In a three storey Group D building, the windows located above the first storey are required to;

d) not regulated by the Ontario Building Code.

OBC Reference: Sentence 9.8.8.1.(5) - Div. B

2. A sliding glass partition is located between an office and the corridor in a single tenancy building. The sliding glass partition is required to be;

d) not specifically addressed by the code.

OBC reference: Sentence 9.6.1.4.(4) - Div. B

3. In a building serving a Group D occupancy only, a third storey window located in an exit stair extends to 1 000 mm above the finish floor. That window must be;

c) protected with a guard

OBC Reference: Clause 9.8.8.1.(7) - Div. B

4. A window in a waiting area in a third storey doctor's office extends from the finish floor to the finished ceiling. That window must;

d) is not addressed by the code.

OBC Reference: Sentence 9.8.8.1.(9) - Div. B

5. A second storey window in a lounge area in a seniors' apartment building (i.e., Group C Residential and NOT Group B Institutional) extends to within 300 mm of the finish floor. That window is required to be;

c) may be made of regular glass,

OBC Reference: Sentence 9.8.8.1.(9) - Div. B

ANS

3. A floor area has multiple occupancies. One is a Group E and occupies 25% of the area, another is a Group D and occupies 70% of the area and another is a medium hazard industrial occupancy which takes up 5% of the area. The floor area should be classified as;

d) Groups D, E & F-2 major occupancies

OBC reference: Sentences 9.10.2.4.(1) and 9.10.2.1.(1) - Div.B

4. The standard for the determination of flame-spread ratings for structural lumber is;

c) CAN/ULC-S102-07

OBC Reference: Sentence 9.10.3.2.(1) - Div. B → 3.1.12.1.(1) → Table 1.3.1.2.

5. A ceiling assembly required to have a fire-resistance rating is to be tested with the fire exposure from;

a) the underside

OBC reference: Sentence 9.10.3.3.(1) - Div. B

6. A floor assembly is required to be a fire separation with a 1 hour fire-resistance rating. The assembly is required to be tested with the fire exposure from;

a) the underside

OBC reference: Sentence 9.10.3.3.(1) - Div. B

7. An interior wall separating different occupancies is determined to be required to be a fire separation with a 45 minute fire-resistance rating. The wall would be required to be exposed from a fire from;

c) from both sides

OBC reference: Sentence 9.10.3.3.(3) - Div.B

8. An enclosed mezzanine is located in a suite on a floor area. The area of the mezzanine is 15% of the suite in which it is located and is in turn 9% of the area of the storey. This mezzanine is;

a) considered a storey in calculating building height

OBC reference: Clause 9.10.4.1.(1)(a) - Div.B