

**ILLUSTRATED CODE SERIES**

**INTRODUCTION TO  
THE BUILDING CODE  
FOR DESIGNERS**

***ORDERLINE***

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## OBJECTIVE

The objective of this manual is to provide readers with a fundamental understanding of how the Building Code Act (BCA) and the regulations, referred to as the Ontario Building Code (Building Code), can be applied to your own profession. It is not written to provide an in-depth technical appreciation of the Building Code requirements, but rather an overview of the material, a basic introduction to the BCA and the Building Code. More in-depth exploration of the Building Code requirements for housing and other occupancies may be obtained by taking one of the provincial or private sector technical courses. Discussion will involve topics such as: guards, handrails, flame-spread ratings, room sizes, lighting requirements, plumbing, electrical, mechanical systems, means of egress, health and safety on construction sites, and occupancy requirements for dwellings. Also covered is an introduction to business and personal service occupancies and how the Building Code requirements can be applied to a new or existing office.

A case study will be reviewed to illustrate how the Building Code impacts a business and personal services (office) major occupancy. Closely linked with the Building Code is the Ontario Electrical Safety Code (OESC). This manual will provide the appropriate information from the OESC as it relates to a dwelling. Also, it may be necessary to attend construction sites as part of their services provided for their clients and as such designers should be familiar with the requirements of the Occupational Health and Safety Act (OHSA) pertaining to construction sites. Basic knowledge of the OHSA will be provided specifically for designers. Provincial qualifications as a designer will be presented for housing and business (office) occupancy projects.

## INSTRUCTIONAL DESIGN OF MANUAL

This manual has been organized into eight chapters, an appendix, and a glossary. It is intended for those practitioners who desire to become more familiar with the BCA and Building Code, and how these influence their professional projects. It is an illustrative manual presenting Building Code terminology with the aid of diagrams, charts and photos. It is also a valuable companion for learners as well as a practical reference for practicing professionals. The appendix contains other information such as a designer Building Code checklist for the interior of a dwelling and provincial forms.

## APPLICABLE BUILDING CODE REFERENCES

It is important to have a good understanding of the rules governing the design or building of dwelling units. Building Code references have been incorporated at the end of each chapter as they relate best to the issues discussed in the respective chapter. Consideration should be given to purchase a copy of the Ontario Building Code 2012 or Housing Design available from Orderline for future reference, but is not necessary for use of this manual.

## THE ROLE OF THE DESIGNER

Subsection 1.1 (2) of the BCA states:

It is the role of a designer,

- (a) if the designer's designs are to be submitted in support of an application for a permit under this Act, to provide designs which are in accordance with this Act and the building code and to provide documentation that is sufficiently detailed to permit the design to be assessed for compliance with this Act and the building code and to allow a builder to carry out the work in accordance with the design, this Act and the building code;

Commentary: The designer is tasked with the vital responsibility to ensure their designs, specifications and drawings, conform to the requirements of the BCA and the Building Code. The project will be constructed in accordance with designer's specifications and drawings, and everyone involved in the construction process, from the owner to the builder, relies on them to be accurate and allow for the construction of the work to be in compliance with the Building Code. The designer should not totally rely on the municipality to review their drawings for compliance as a substitute for their knowledge and application of the BCA and Building Code when designing.

- (b) to perform the role described in clause (a) in respect of only those matters for which the designer has the qualifications, if any, required by this Act and the building code; and

Commentary: Section 3.2. of Division C of the Building Code sets out the qualifications of building practitioners, including designers, which must be acquired. The purpose of the required qualifications is to ensure building practitioners achieve provincially mandated standards of BCA and Building Code competency. It is a violation of the BCA to carry out design activities and submit the design as part of a building permit application without having the proper qualifications for the category of building. The classes of registration and categories of qualifications are identified in Section 3.5. of Division C of the Building Code.

## WHEN IS A BUILDING PERMIT REQUIRED?



### **Excavation started for a foundation of an addition to a dwelling.**

This is considered start of construction and a building permit is required prior to starting excavation.

## 2. IS THIS A MATERIAL ALTERATION?

As designers, you may be faced with this question many times during the development of a project. It is a good question to ask yourself as you are developing analytic skills similar to a Building Code professional. An opinion from the Ministry of Municipal Affairs and Housing has stated that a material alteration means; **important, essential**. Therefore, what should be determined is how important is the work.

In the context of any project design, the significance of the work with respect to the mainstays or purposes of the Building Code would need to be ascertained; that is, public health, fire protection, structural sufficiency, conservation, environmental integrity and barrier-free or accessibility. The Ministry also commented that it would be reasonable that the determination with respect to the Building Code mainstays be made by someone knowledgeable in that field of work. Designers should have Building Code knowledge in the field of designing building interiors and be able to perform the determination.

Consider the following Case Law:

*North Cowichan (District) v. Ring, [1998] B.C.J. No. 1458 (B.C. S.C.)*

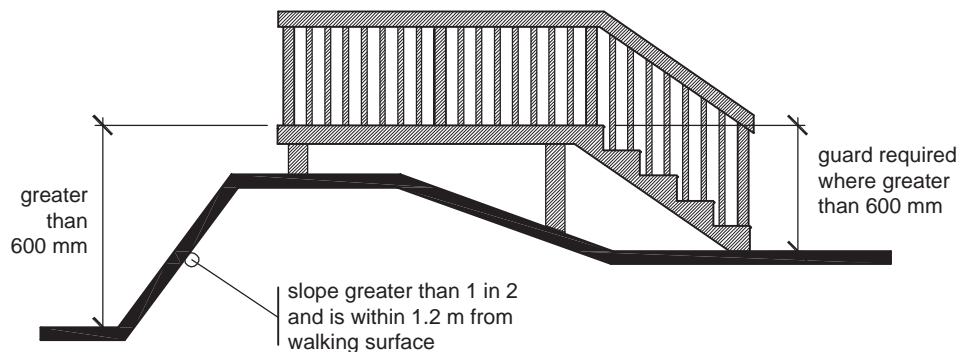
"Work which may be minor in terms of cost and effort can nonetheless have fire safety consequences."

Commentary: The decision above indicates that even a small project design could impact the safety of a dwelling's occupants and a building permit may be required. The interior finish of walls within a building affects the fire protection purpose for the Building Code.

## INTERIOR AND EXTERIOR GUARDS

The intent of **required** guards is to reduce the risk of injury from accidental falls from one level to another where the difference in elevations between the two levels is sufficient to cause significant injury. The requirements for guards in Part 9 of the Building Code are based on the premise that wherever there is a difference in elevation of 600 mm or more between two floors or between a floor or other walking surface and the next lower surface, the risk of injury in a fall from the higher surface is sufficient that there must be some kind of barrier to reduce the chances of such a fall.

Where there is a wall along the edge of the higher surface, this will obviously prevent such a fall, provided the wall is sufficiently strong that a person cannot fall through it. Refer to the Case Law *Mortimer v. Cameron* below. Where there is no wall, a guard is used. A guard clearly provides less protection than a wall; therefore, additional requirements apply to guards to ensure that a minimum level of protection is provided. They include minimum height, openings and design to prevent climbing. Guards must also be installed on all interior stairs that have more than two risers and the side of each stair is not protected by a wall.



### Required guards

Guards are required on landings, porches, deck, etc. where differences in the walking surface is greater than 600 mm or within 1.2 m to an adjacent slope of more than 1 in 2.

A slope of 1 in 2 = a 50% slope, therefore for a slope of 50% or less, the guard would not be required. For example, a slope of 1 in 2.5 = 40% slope would not require a guard to be installed

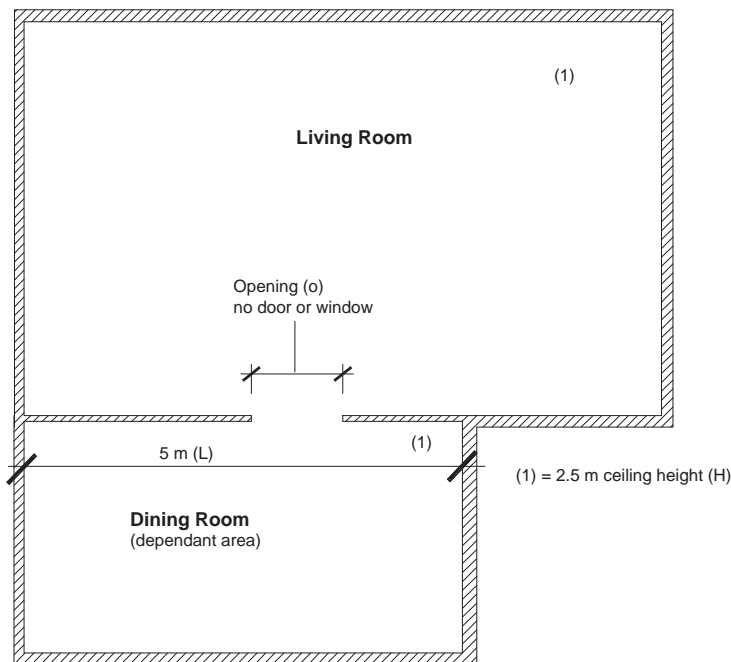
The 1997 Building Code permitted one guard on the side of a stair to an unfinished basement or cellar in a dwelling. The result in many instances is an unguarded side of a stair. If your design project involves finishing the basement, plan on installing another handrail and guard or wall on the unprotected side of the stair. Legally, once you finish a basement for a use other than storage, the stair with an open side no longer complies with the 1997 Building Code.



## FLOOR AREAS AND CEILING HEIGHTS

There are no minimum floor or room dimensions in the Building Code. Dimensions in Section 9.5. of the Building Code apply only to dwelling units that are intended for use on a continuing or year-round basis. Cottages or occasional use buildings would be exempt from complying with the Building Code. The Building Code however, requires rooms to have a **minimum area**. Minimum floor areas specified do not include closets or built-in bedroom cabinets, however, areas of rooms are permitted to be less than required provided you can show that the rooms are adequate for their intended use. Should your design include two or more areas where the opening between the areas occupies the larger of 3 m or 40% or more of the separating plane, the room(s) can be considered a combination room. A combination room may allow you to design a room with less area, compared with designing two separate rooms. This is rationalized on the basis that the occupants will be using one room at a time and therefore 'overcrowding' is not an issue. Typical examples of combination rooms are;

- Dining and living room
- Kitchen and dining room
- Kitchen and bedroom
- Kitchen and sleeping accommodation for not more than two persons



### Combination Room

Calculate the minimum area of the opening required between the living room and dining room for the two areas to be considered a combination room

( the larger area of A or B)

Area (A)  $o = \text{minimum of } 3 \text{ m}^2$

or

Area (B)  $o = \text{minimum of } 40\% \text{ of wall on dependant area,}$

$= 5 \text{ m (L)} \times 2.5 \text{ m (H)} = 12.5 \text{ m}^2$

Therefore  $5 \text{ m}^2 \text{ (B)} > 3 \text{ m}^2 \text{ (A)}$

The opening between areas must be a minimum of  $5 \text{ m}^2$

Should a design of two or more areas, like the dining room and living room in this drawing, have a dividing wall with an opening between the areas of  $3 \text{ m}^2$  or 40% or more of the separating plane, the room(s) may be considered a combination room.

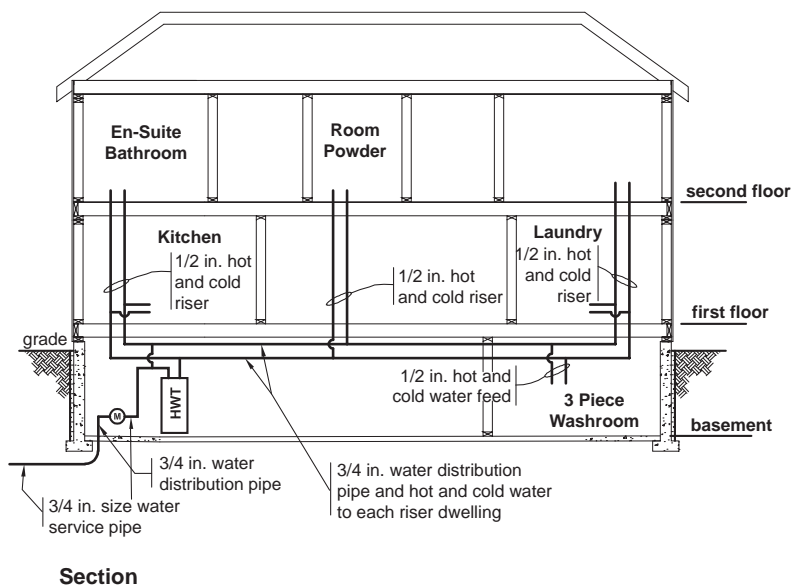
## PLUMBING, ELECTRICAL AND MECHANICAL SYSTEMS

The plumbing, electrical and mechanical systems of a dwelling are among the least understood elements of a building for occupant health and comfort. As a designer, you should understand how the Building Code and other laws can have an impact on your designs. The intention of the plumbing, electrical and mechanical provisions of the Building Code are to ensure the safe and reliable distribution of drinking water, safe removal of sewage, electricity throughout the building and occupant comfort through a proper heating and ventilating system.

## PLUMBING SYSTEMS

The plumbing system in a dwelling includes the potable water supply system, the sanitary and storm drainage systems and the vent piping system. Part 9 of the Building Code does not contain provisions for the construction of plumbing systems. Part 7 of the Building Code provides Code users with prescriptive construction requirements for plumbing systems. However, the information contained in Part 9 is important for designers to understand. Section 9.31. contains the basic plumbing requirements for every dwelling.

Potable water must be supplied to every dwelling from an approved public, community system, or private well where available. All dwellings supplied with potable water are required to be provided with laundry facilities, kitchen sink, lavatory, water closet, a bathtub or shower stall and a floor drain. Dwellings with a piped water supply system must have piping for hot and cold water connected to every kitchen sink, lavatory, bathtub, shower and laundry area.



**Potable water systems installed in a dwelling should provide sufficient quantities of water on demand for bathing, drinking and fixture flushing.**

To eliminate confusion and possible hot water injuries to the occupants, every fixture supplied with separate hot and cold water controls must have the hot water control on the left and the cold on the right. Where hot and cold water are mixed and the temperature is regulated by a single, unmarked, manual control, a movement to the left should increase the temperature and a movement to the right should decrease the temperature.

LIGHTING OUTLETS

When planning a project, the Building Code should be referenced to ensure a reasonable level of lighting convenience for the building occupant has been designed. Lighting will reduce the risk of accidental falls and missteps at the entrance to a building and to reduce the risk of unwanted forced entry. An additional intent is to provide a reasonable level of convenience for the occupant.

An exterior lighting fixture controlled by a wall switch located within the building must be provided at every entrance. A lighting outlet with fixture controlled by a wall switch must be provided in kitchens, bedrooms, living rooms, utility rooms, laundry rooms, dining rooms, bathrooms, water closet rooms, storage rooms, vestibules and hall ways. Fixtures can be omitted in bedrooms and living rooms, provided these rooms have a receptacle controlled by a wall switch. The location of lighting outlets in dwellings is summarized in the following Table.

LIGHTING OUTLETS IN DWELLINGS REQUIRED BY THE BUILDING CODE
Kitchens
Bedrooms*
Living Rooms*
Utility Rooms
Laundry Rooms
Dining Rooms
Bathrooms
Water closet Rooms
Vestibules
Hallways
* Where a receptacle controlled by a wall switch is provided, a lighting outlet is not required.



Electrical  
Safety  
Authority

Electrical facilities in dwellings are governed by the requirements of the Ontario Electrical Safety Code.

Permits for electrical installations are issued by the Electrical Safety Authority (ESA) and they perform the mandatory inspections.

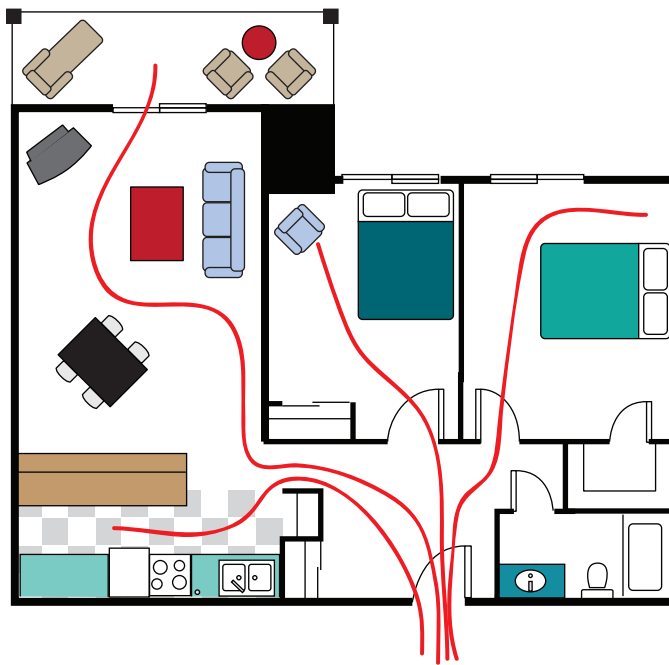
For additional information or to find an electrical contractor in your design area visit [www.esasafe.com](http://www.esasafe.com)

## MEANS OF EGRESS

The Building Code defines “means of egress” as a continuous path of travel provided for the escape of persons from any point in a building . . . to . . . an open public thoroughfare. Means of egress includes exits and access to exits. Dwellings must be designed and constructed to fulfill the following functions:

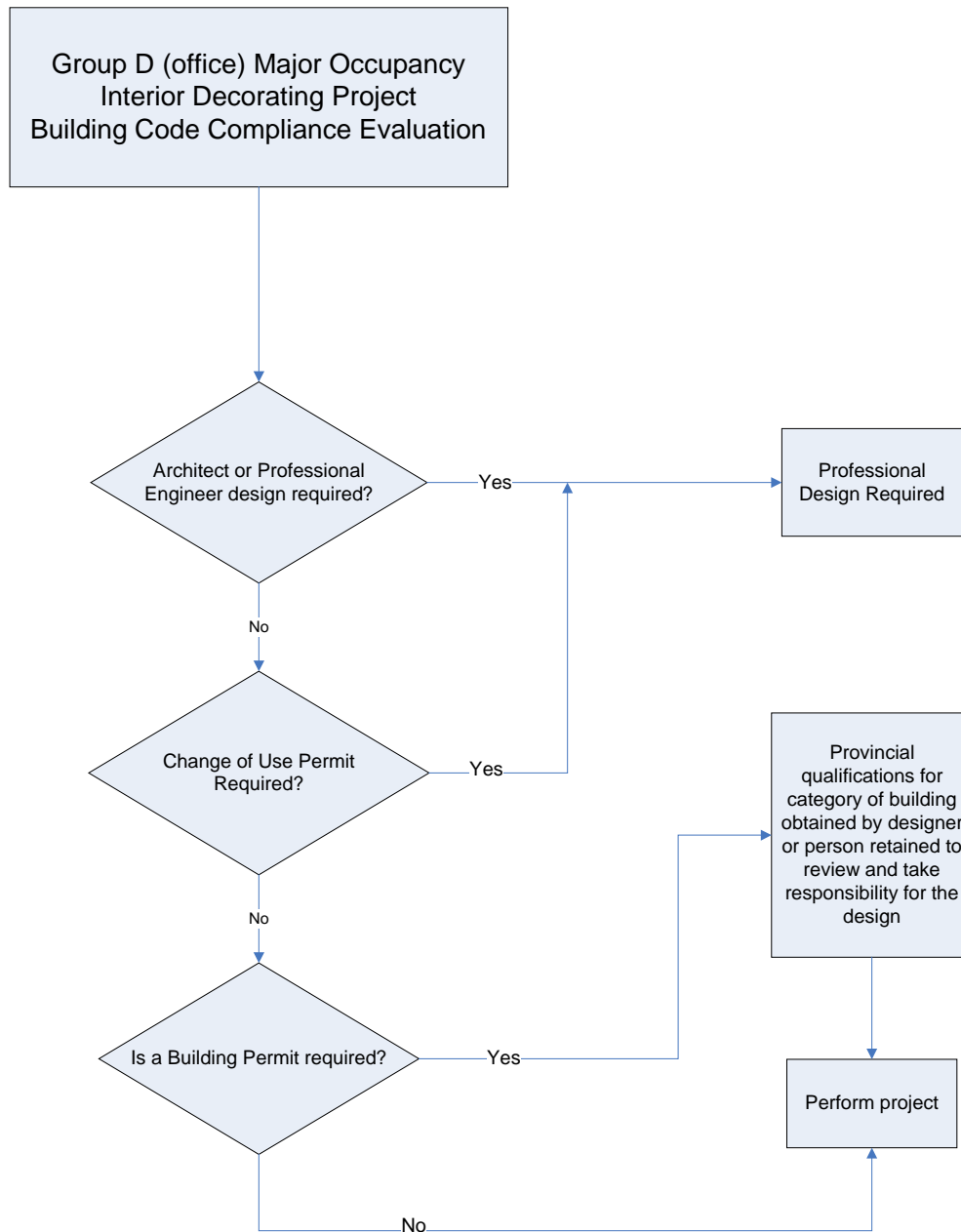
- Allow occupants a safe means of escape from a building in an emergency, and
- Allow the safe passage of occupants from one floor to another and allow the movement of occupants within and between rooms.

The occupant load of a dwelling is based on two persons per sleeping room. The maximum occupancy load in a dwelling is not usually enforced by any government agency. All occupants must be able to use the means of egress in the event of an emergency. Doors, stairs, ramps, corridors, hallways, floor areas all represent the most common means of egress within a dwelling. The Building Code establishes standards for safety of the occupants under normal and emergency conditions. Under normal conditions, the means of egress should provide the occupants with a safe passage to move around the dwelling. Under emergency conditions, the Building Code has provisions for the safe means of egress for the occupants to escape or exit from the dwelling.



**Means of egress paths are indicated by the drawn lines on the floor plan**

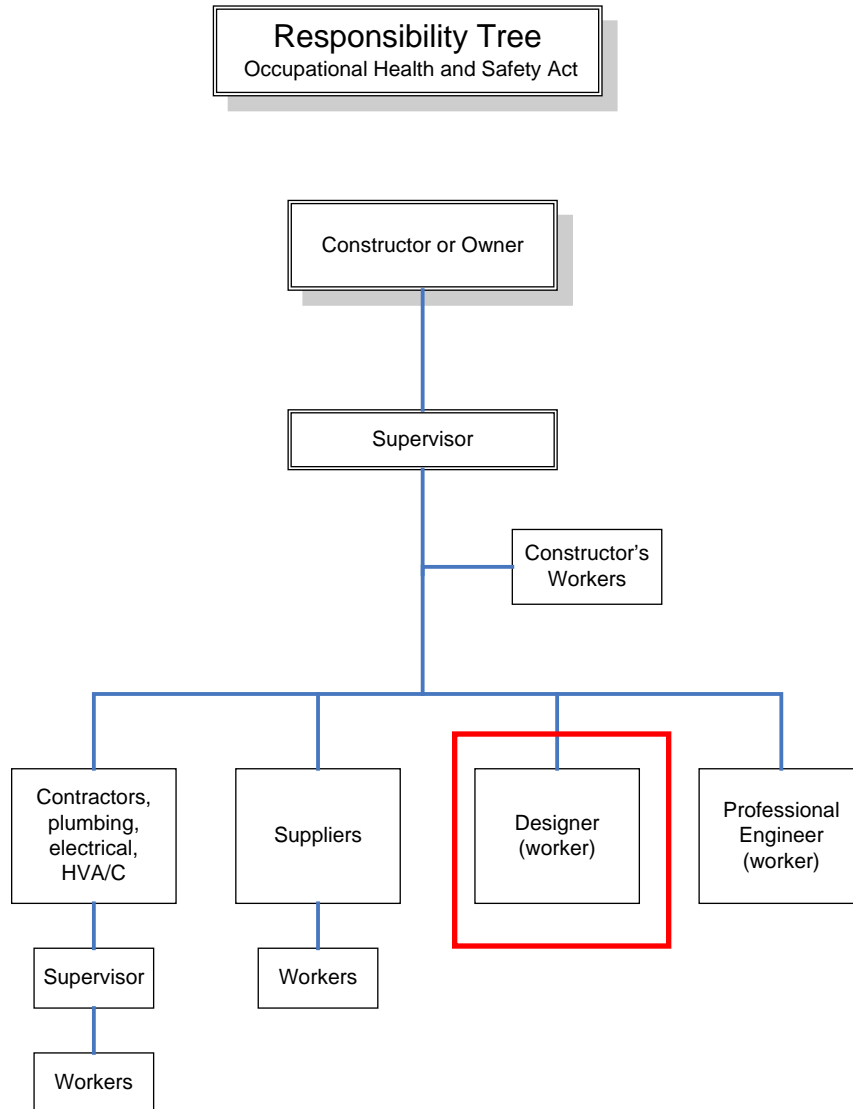
Basically the means of egress is any part of the floor area that can be occupied. The means of egress would continue from the suite door, along the corridor to an exit door that leaves the building. (not shown)



### **APPLICABLE ARCHITECT'S ACT REFERENCES**

**11. (1)** No person shall engage in the practice of architecture or hold himself, herself or itself out as engaging in the practice of architecture unless,

- (a) the person is licensed under this Act;
- (b) the person is the holder of a certificate of practice or the person is doing so as a member of a partnership that holds a certificate of practice; or



## APPLICABLE OHSA AND O. REG. 213/91 REFERENCES

### OHSA

#### Duties of constructor

- 23. (1)** A constructor shall ensure, on a project undertaken by the constructor that,
- (a) the measures and procedures prescribed by this Act and the regulations are carried out on the project;
  - (b) every employer and every worker performing work on the project complies with this Act and the regulations; and

## RECEPTACLES IN GENERAL



### Kitchen Receptacles

A sufficient number of receptacles (15A split or 20A T-slot) must be located along the wall behind the counter work surfaces so that no point along the wall is more than 900 mm from a receptacle measured horizontally along the wall line. Therefore, the location of the receptacles cannot exceed a maximum of 1800 mm from receptacle to receptacle.

A permanently fixed island counter requires at least one receptacle when the island is at least 600 mm for the long dimension and 300 mm for the short dimension. For small islands or when the island has equipment or a sink that covers almost the entire counter space, a receptacle is not required. Since the receptacle cannot be located in or on the work surface, it must be located on the side of the island cabinet, just under the work surface, i.e. not more than 300 mm below the counter work surface. This will allow standard kitchen appliance cords to reach the receptacle. You may be able to install a receptacle in a partial wall or raised backsplash where they are available above the counter. Check with your local electrical inspector.

Similar to the rules for a island counter, a kitchen peninsula also requires its own receptacle. A peninsula is a counter that is attached to the counter work surface that is attached to a wall. An additional receptacle is required for a peninsula counter space that is at least 600 mm for the long dimension and 300 mm for the short dimension.

## DESIGNER CHECKLIST 2012 CODE

## BUILDING CODE CHECKLIST

## Designer Housing Projects (2012 OBC)

Project Data				
<p>This checklist can be used by designers as an aid for evaluating their project for Building Code compliance. It is not a complete list; however, it contains items that a designer should consider during the design, specification and installation stage of a project. Consult the Building Code Act and Building Code for full compliance. All work to comply with the Ontario Building Code.</p> <p>Municipal Address: _____ Project No.: _____</p>				
Checklist Items				✓
1.	<b>BUILDING CODE REVIEW</b>	a	Is there construction proposed in the project?	
		b	Does the project involve a material alteration?	
		c	Is it a building as defined by the BCA?	
		d	If the answer is yes to a, b, or c, advise the client that a building permit may be required	
		e	Other:	
2.	<b>GUARDS AND HANDRAILS</b>	a	Guard minimum of 900 mm in height where the landing, etc., is 1.8 m or less above the surface	
		b	Guard minimum of 1070 mm in height where the landing, etc., is greater than 1.8 m above the surface	
		c	Opening in required guards prevent the passage of a spherical object more than 100 mm diameter	
		d	Opening in non-required guards are not between 100 mm and 200 mm	
		e	Guards are designed to prevent climbing. Submit suspect designs for approval before fabrication	
		f	Handrails installed on sides of stairs where required	
		g	Handrail height between 865 mm and 965 mm	
		h	Handrail is graspable. Submit suspect designs for approval before installation	
		i	Part 11 compliance alternative:	
		j	Other:	