Ontario Building Code (OBC)

1. Fire Separations
2. Fire Resistance Ratings – By Classification
3. Fire Resistance Ratings – By Adjacent Use
4. Fire Resistance Ratings – By Specific Space
5. Fire Resistance Ratings - Exits
6. Spatial Separation

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1. Fire Separations

i) Definitions

- Fire separation
- Fire-resistance rating
- Fire-protection rating
- Firewall
- Closure

ii) Conditions to satisfy Code

- must be a continuous element (wall, floor etc.) which means a completely enclosed conditon
- must be of a construction type that gives the assembly a fire-resistance rating.
- Any openings to be protected with a rated closure.

iii) Pertinent Code References?

3.1.8.1. General Requirements

(1) Any wall, partition or floor assembly required to be a fire separation shall,

(a) except as permitted by Sentence (2), be constructed as a continuous element, and

(b) as required in this Part, have a fire-resistance rating as specified.

(2) Openings in a fire separation shall be protected with closures, shafts or other means in conformance with Articles 3.1.8.4. to 3.1.8.18. and Subsections 3.1.9. and 3.2.8.

1. Fire Separations

- 3.1.8.3. Continuity of Fire Separations
- 3.1.8.4. Fire-Protection Rating of Closure (Table)

Column 1 Fire-Resistance Rating of Fire Separation	Column 2 Required Fire-Protection Rating of Closure
30 min	20 min
45 min	45 min
1 h	45 min
1.5 h	1 h
2 h	1.5 h
3 h	2 h
4 h	3 h

1. Fire Separations

- 3.1.8.6. Maximum Openings
- 3.1.8.7. Fire Dampers

iv) Combustible vs. Non-combustible Construction

- Sections 3.1.4. and 3.1.5.

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2. Fire Resistance Ratings – By Classification

i) 3.2.2.20. - .83

- we have already determined classification of our buildings.
- most articles will contain an instruction for floor separations.
- all articles will describe the need for rated construction around load-bearing components.
- may be dependent on whether combustible or non-combustible construction is chosen.
- watch for exceptions for sprinklered buildings.

ii) Implications

- important to know for the requirements of rating building components.
- will determine the separations required for same occupancies of different floors.
- what about adjacent differing occupancies?

2. Fire Resistance Ratings – By Classification

iii) Final Thoughts

- we know our projects will be steel structure.
- will you have the option of exposing steel?
- think final details and final aesthetic.

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3. Fire Resistance Ratings – By Adjacent Use

i) Adjacent Use – single occupancy
- relatively straightforward.
- based on building size and construction (3.2.2.20. – 83.)
- applies to floors of similar occupancy.

ii) Adjacent Use – multiple occupancy
- your building classification tells you one thing for floors, yet Table 3.1.3.1. says something else. What do you do?
- ask yourself: what is the most stringent (severe) condition?
- use the most strict situation you find.

iii) Construction Ratings – multiple occupancies
- We have two occupancies in our projects. Loadbearing construction will be mostly steel.
- One building classification (*A* Assembly) says one thing, the other (*E* Mercantile) will say something else.
- ask yourself: what is the most stringent (severe) condition?
- use the most strict situation you find.

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4. Fire Resistance Ratings – By Specific Space

i) Specific Spaces Requiring Fire-Resistance Ratings

- service spaces (mechanical, etc.)
- service shafts (horizontal and vertical)
- electrical rooms
- transformer rooms
- exit stair shafts
- exit corridors
- barrier-free paths of travel
- corridor walls (public from private space)
- elevator shafts
- janitor rooms

4. Fire Resistance Ratings – By Specific Space

ii) Code References

- 3.2.2.14. – (Fire Separation of) Rooftop Enclosures
- 3.2.2.15. – Stories Below Ground (Fire Separation of Basements)
- 3.3.1.20. – (Fire Separation of) Janitor's Rooms
- 3.3.1.7.(1) & (3) – Fire Separation of Barrier-Free Path of Travel

- 3.4.4. – Fire Separation of Exits (and Lobbies)

- 3.5.3.1. – Fire Separation for Elevator Hoistways
- 3.6.2.1. – Fire Separations Around Service Rooms
- 3.6.3.1. – Fire Separation of Vertical Service Spaces
- 3.6.4.2. – Fire Separation of Horizontal Service Spaces

- 3.1.8. – Fire Separation and Closures (specifically doors)

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5. Fire-rating of Exits: Stairs and Corridors

i) Code References: 3.4.4.1. & 3.3.1.4.

ii) = to floor but not less than 45 min or more than 2hrs

iii) 1 HR unless flr 45min then 45min

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6. Spatial Separation

3.2.3. Spatial Separation and Exposure Protection
3.2.3.1. Limiting Distance and Area of Unprotected Openings

(1) Except as permitted by Articles 3.2.3.10. to 3.2.3.12., the area of unprotected openings in an exposing building face for the applicable limiting distance shall be not more than the value determined in accordance with,

(a) Table 3.2.3.1.A. or Table 3.2.3.1.B. for an exposing building face conforming to Article 3.2.3.2. of a building or fire compartment that is not sprinklered, or

(b) Table 3.2.3.1.C. or Table 3.2.3.1.D. for an exposing building face conforming to Article 3.2.3.2. of a sprinklered fire compartment that is part of a building that is sprinklered in conformance with Section 3.2.

(2) The area of the unprotected openings in an exposing building face shall be the aggregate area of unprotected openings expressed as a percentage of the area of the exposing building face in Table 3.2.3.1.A., Table 3.2.3.1.B., Table 3.2.3.1.C. or Table 3.2.3.1.D.

(3) For the purpose of determining the type of construction and cladding and the fire-resistance rating of an exterior wall,

(a) the exposing building face shall be taken as the projection of the exterior wall onto a vertical plane located so that no portion of the exterior wall of the building or of a fire compartment, if the fire compartment complies with the requirements of Article 3.2.3.2., is between the vertical plane and the line to which the limiting distance is measured, and

(b) the area of unprotected openings shall be determined from Table 3.2.3.1.A., Table 3.2.3.1.B., Table 3.2.3.1.C. or Table 3.2.3.1.D.

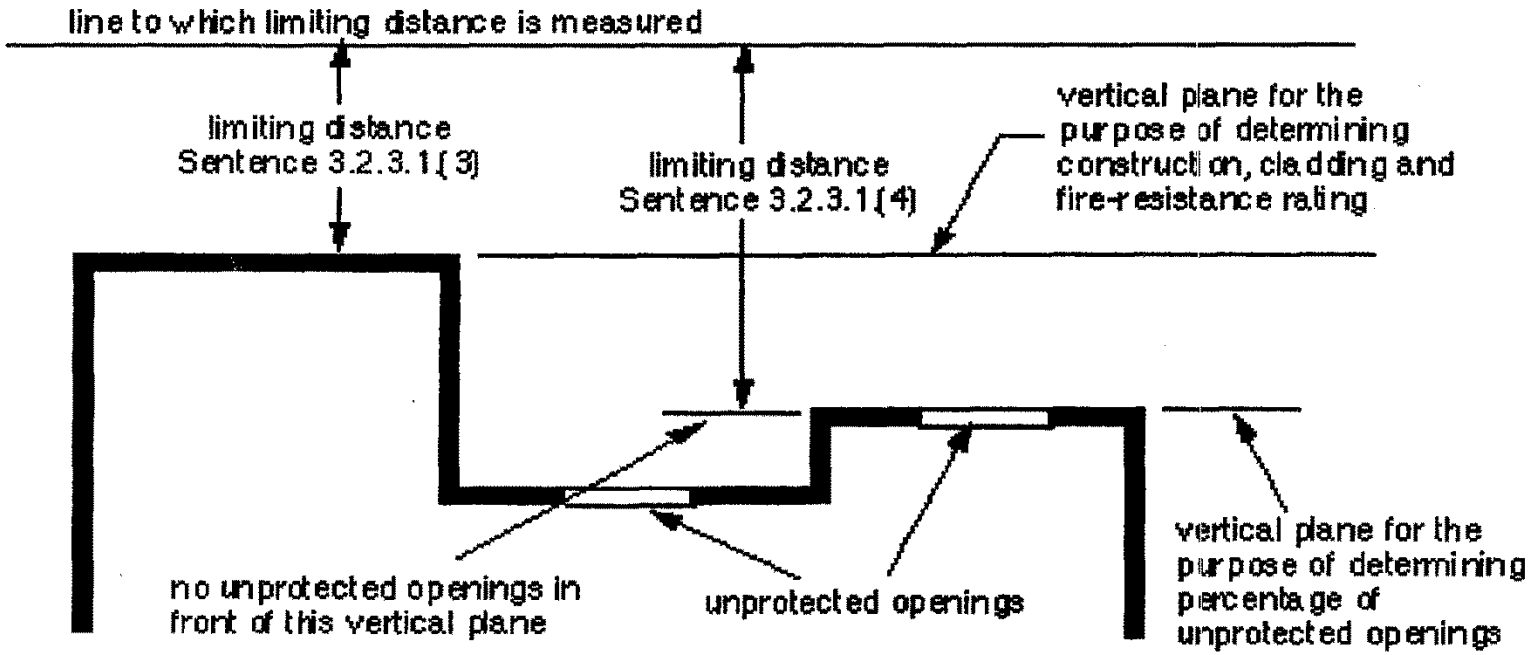
(4) For the purpose of determining the actual percentage of unprotected openings permitted in an exterior wall, the location of the exposing building face is permitted to be taken at a vertical plane located so that there are no unprotected openings between the vertical plane and the line to which the limiting distance is measured.

6. Spatial Separation

HOW THIS WORKS – DO THIS FOR EVERY ELEVATION

i) Pick the appropriate Table – by occupancy governing your design, and sprinkler or non-sprinklered.
ii) Calculate elevation surface area based on projecting the elevation onto a flat surface.
iii) What is the least distance of that elevation to the property line? That will be your limiting distance.
iv) Determine the ratio of your building height to building length along that elevation.
v) Read off your percentage.
vi) That percentage is taken from your total elevation surface area: your allowed area of Unprotected Openings.
vii) Compare your current glazing design……changes necessary?

6. Spatial Separation



6. Spatial Separation

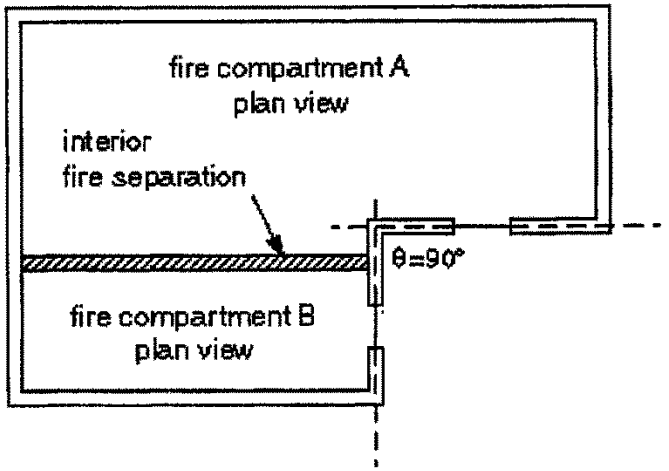


Figure A-3.2.3.13.A. Openings in walls at a right-angle corner

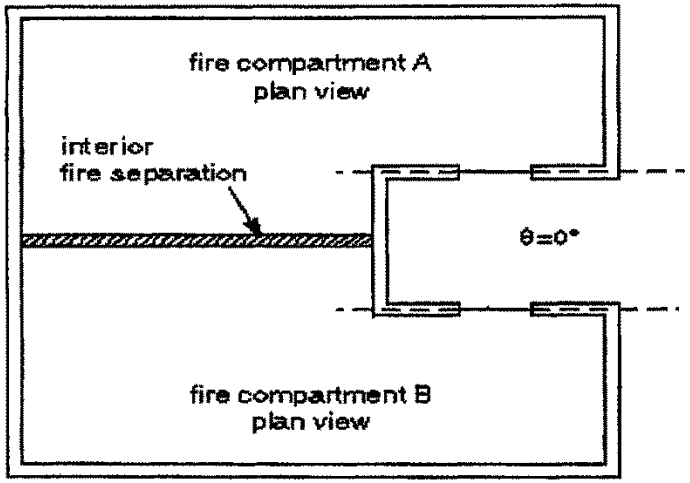


Figure A-3.2.3.13.B. Openings in walls which are parallel to one another