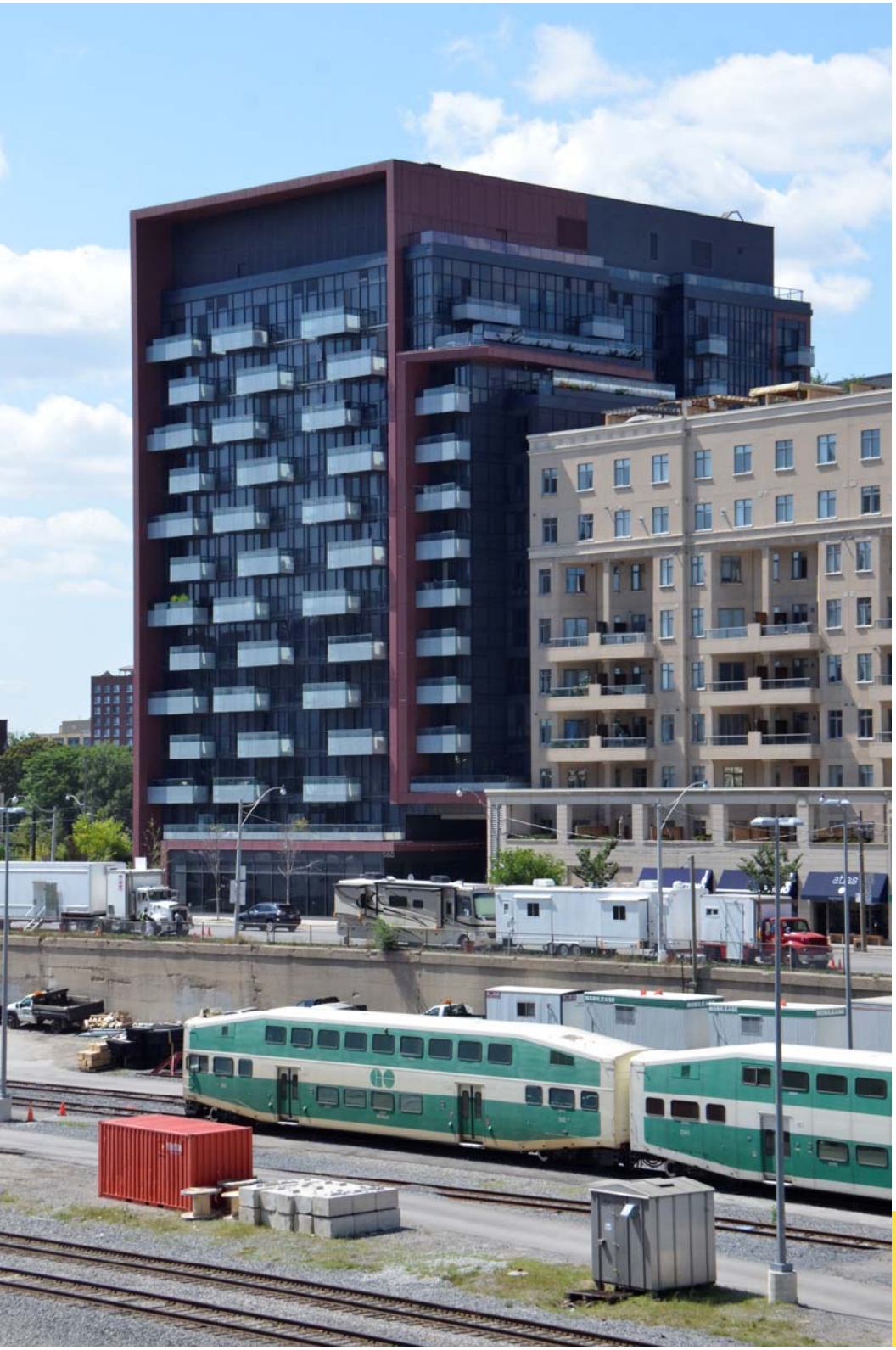
Residential Code Requirements:

Housing has moved from the single family home to various methods with more density, including towers and mid rise buildings.


CONTEXT.CA
MOVE IN NOW!



The Ontario Building Code:

- legal criteria which defines a set of MINIMUM standards for the construction of buildings
- standards which reflect on issues of life safety or fire safety do not permit variances

Residential Definitions:

- Part 9 of the Code has jurisdiction over residential construction (low density, detached, semi detached)
- medium density residential buildings are classed as Group C Occupancy: these include apartments, residential colleges, hotels, motels, dorms, residential schools…

Minimum Room and Space Dimensions:

- the OBC sets out minimum room and space dimensions in an effort to set MINIMUM standards to ensure that spaces are (just) ADEQUATE for inhabitation
- calculated in terms of space per person, minimum dimensions for furniture, headroom clearance

a. Living Areas:

- shall have at least 13.5 m^2 of floor area and no dimension less than 3.0 m
- a minimum of 10% of the floor area must be provided in unobstructed glazing
- natural ventilation shall be provided

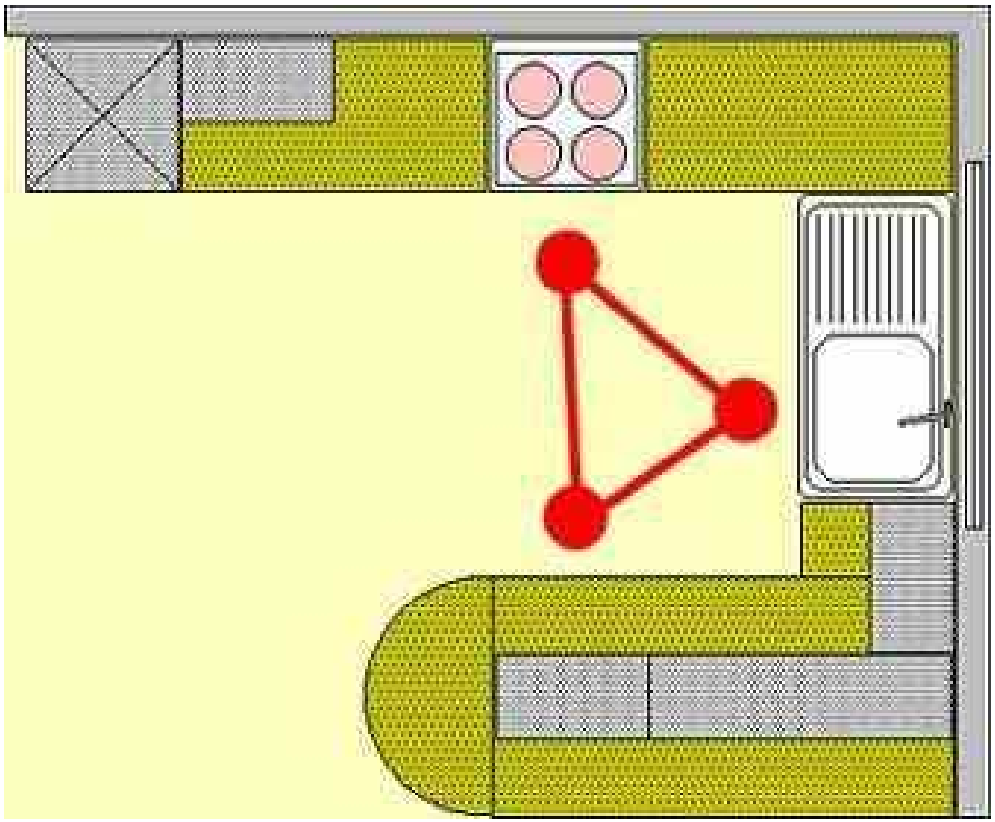
b. Dining Areas:

- shall have at least 3.25 m^2 of floor space when combined with other rooms, and at least 7.0 m^2 of area when not combined
- minimum dimension of 2.3 m
- minimum of 10% of the floor area must be provided as unobstructed glazing
- natural ventilation shall be provided

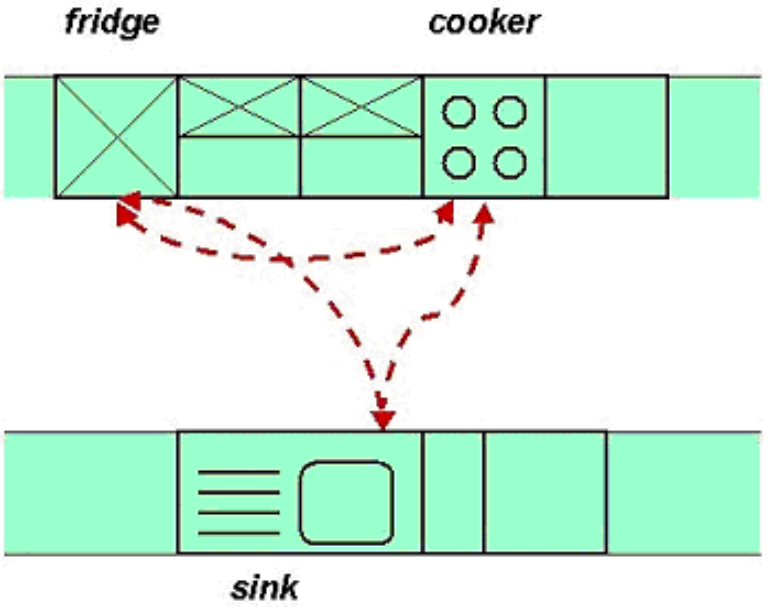
Dining rooms vary greatly in size. You need to be sure that furniture is accommodated. How big is the table? Can the chairs pull out fully? Are there sideboards/hutches?

c. Kitchen Areas:

- shall have at least 4.2 m^2 of floor area including the area occupied by base cabinets
- windows are not legally required
- if operable windows are not provided, mechanical ventilation must be provided (exhaust fan)

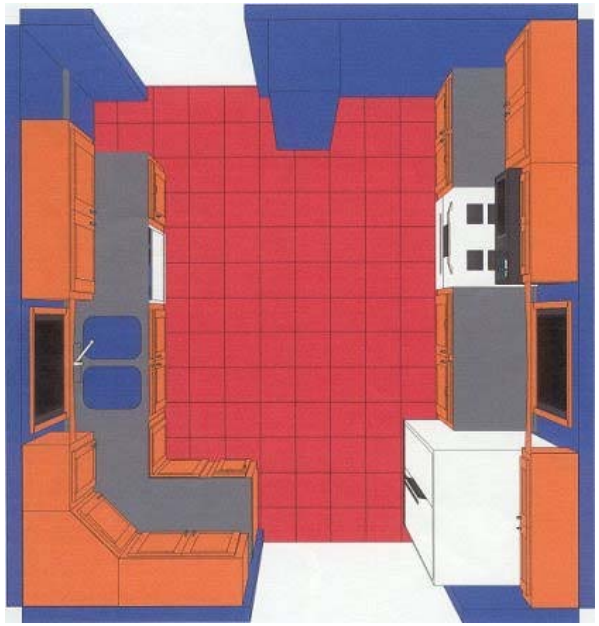


Ensure that appliances can all open without interfering with one another, and that standing space is provided.



Maintaining the “classic work triangle” is NOT a legal requirement. It just makes sense. The triangle should be no longer than 15’ in total.

Required appliances will vary from jurisdiction to jurisdiction. Normal minimum: full fridge, 4 burner cooktop, oven, single sink. Dishwashers and microwaves are not required.



Either provide natural or mechanical ventilation.

Living, Dining and Kitchen Height Requirements:

- 2.3 m over at least 75% of the required floor area with a clear height of at least 2.1 m at any point over the required area

d. Primary Bedrooms:

- one bedroom shall have at least 9.8 m^2 of floor area where built in cabinets are not provided and 8.8 m^2 where built in closets are provided
- minimum dimension is 2.7 m
- at least 5% of the floor area shall be provided as unobstructed glazing
- natural ventilation must be provided

Bedrooms must have windows for natural light AND ventilation. Windows must also provide for safe FIRE egress. WINDOWLESS BEDROOMS ARE ILLEGAL!

“Legal” bedroom size varies as a function of included space for built-in closets. Not many people have stand-alone “wardrobes” to store their clothes. 1.5m of length per person is the minimum rule.

e. Secondary Bedrooms:

- other bedrooms shall have at least 7.0 m^2 of floor area where built in cabinets are not provided, and 6.0 m^2 where built in closets are provided
- minimum dimension is 2.0 m
- at least 5% of the floor area shall be provided as unobstructed glazing
- natural ventilation must be provided

How big is the bed?

With the exception of twin sized beds, access MUST be provided to 3 sides of the bed in order to make it.

Bedroom Height Restrictions:

- 2.3 m over at least 50% of the required floor area OR 2.1 m over 100% of the required floor area
- any part of the floor area having a height of less than 1.4 m shall not count when calculating required floor area

Not all of the floor area in these rooms “counts”, nor can it all be “used”.

Bedroom Fire Exits:

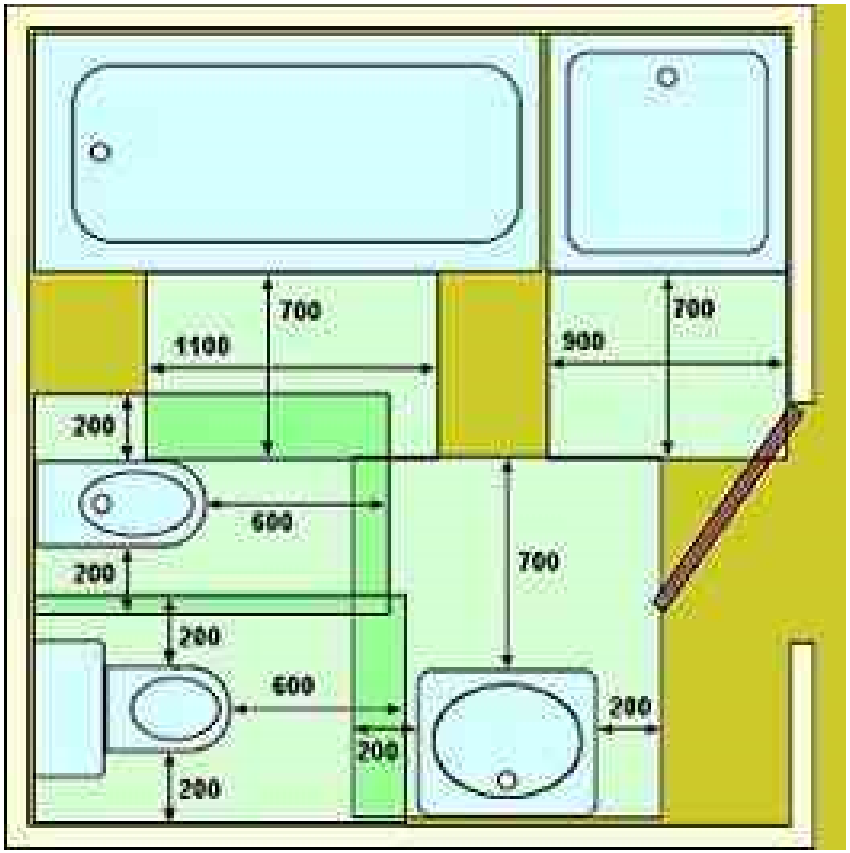
- bedroom windows in houses must be of an operable type such as a casement or slider that allows for egress in case of fire
- sills should be no more than 1.0m above the floor
- bedrooms must be not more than 1 storey above an adjacent grade
- Having a roof below the bedroom window to provide an escape path counts

f. Hallways:

- shall have a width of at least 860 mm except where the overall width of the building is less than 4.3 m, and this may be reduced to 710 mm
- minimum height 2.1 m

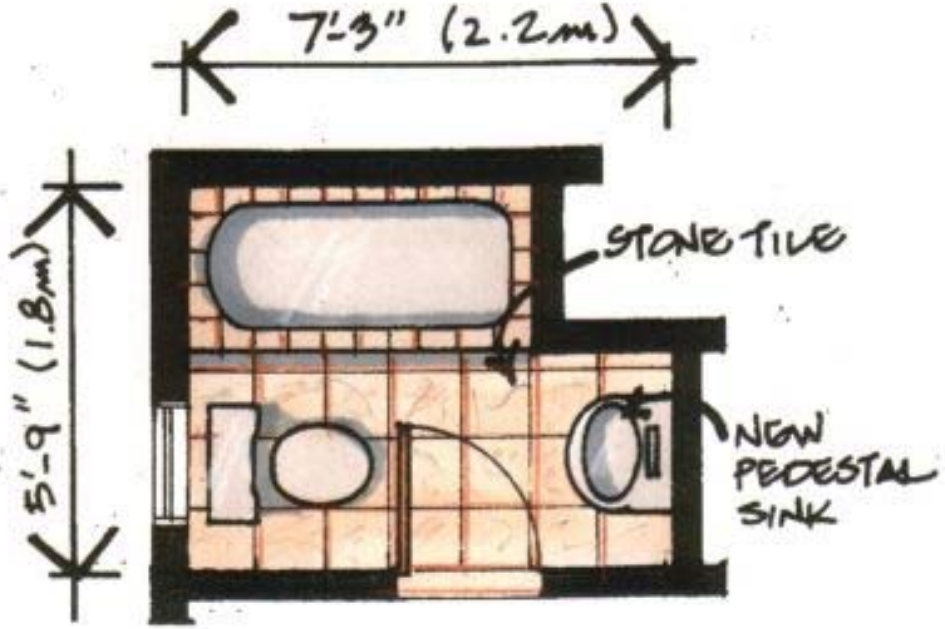
g. Bathrooms:

- every dwelling shall have a bathtub, a toilet and a sink (showers are extras)
- windows are not legally required, but if not provided, mechanical ventilation is required (exhaust fan)
- minimum height of 2.1 m in any area where a person would be in a standing position



Can you open and close the door easily? Airplane washrooms “work”, but they are not very comfortable.

Various bathroom layouts are possible. Make sure that there is adequate room in front of the fixtures to use them.



Egress and Access:

- every dwelling shall have a sufficient number of exits or egress doors so that it is not necessary to travel up or down more than one storey to reach a level served by an exit or egress door to a public corridor or exterior passageway
- where egress is onto a corridor, two exits shall be provided in opposite directions (like in an apartment type building)

Railings:

- Stair handrails 900mm (measure from the toe of the tread to the top of the handrail)
- Guard rails on landings 1.1m
- Platforms under 60cm above grade, no railings required
- Railings cannot be climbable (no horizontals)
- Can use a mesh as long as it is not climbable
- Space between pickets should not permit the passage of a 100mm diameter ball

Construction Type:

- up to 3 storeys, combustible construction is allowed (wood frame)
- 4 to 6 storeys, NON combustible construction, with fire separations of 1 or 2 hours (concrete block, light steel framing)
- over 6 storeys, NON combustible construction with a 2 hour fire separation on floor assemblies (reinforced concrete with concrete block)

FIRE PROTECTIVE DESIGN

Primary Motivation in Design:

No. 1: Life Safety

no loss of life

safe evacuation of occupants

No. 2: Protection of Structure

maintaining integrity of building structure

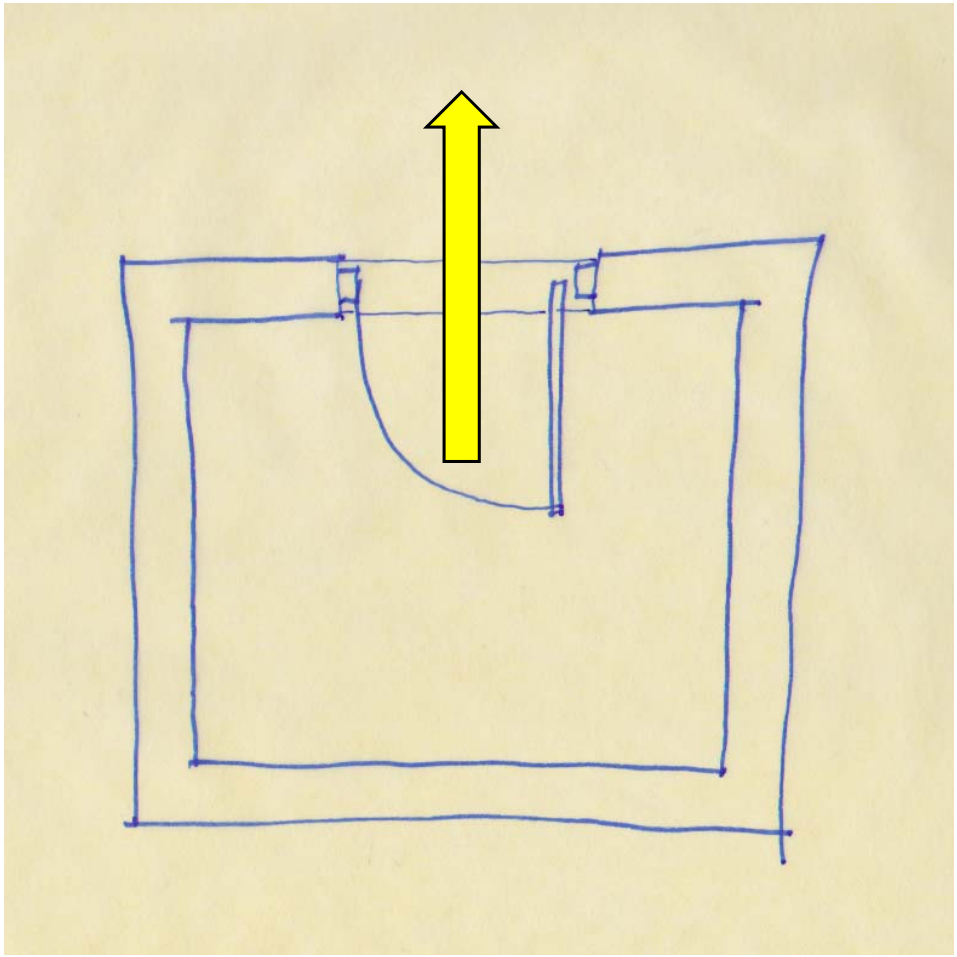
Non Negotiable

- Fire safety is pretty well a fixed, non negotiable Building Code issue
- Building Code is a set of MINIMUM standards designed to PROTECT the public
- You cannot design for SAFETY below MINIMUM
- i.e. Just a few dead people rather than dozens is not acceptable so that you can "make your design" more interesting

Exit Requirements:

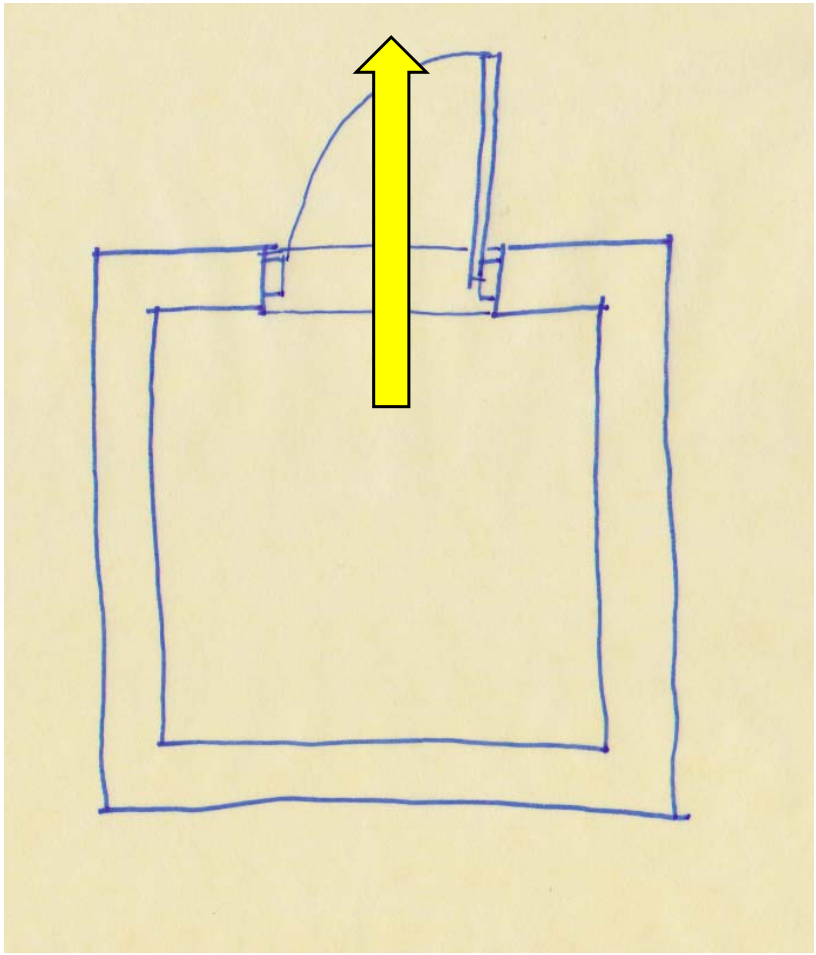
- number and type dependent on occupancy type and load
- i.e. greater risk, more people, more exits
- every floor area must have 2 exits
- travel distance to the exit is limited
- dead end corridors (more than 6m) not permitted
- exits must be fire separated from the rest of the building they are serving

- Low number of people exiting
- Door opens in (in case of obstruction outside)



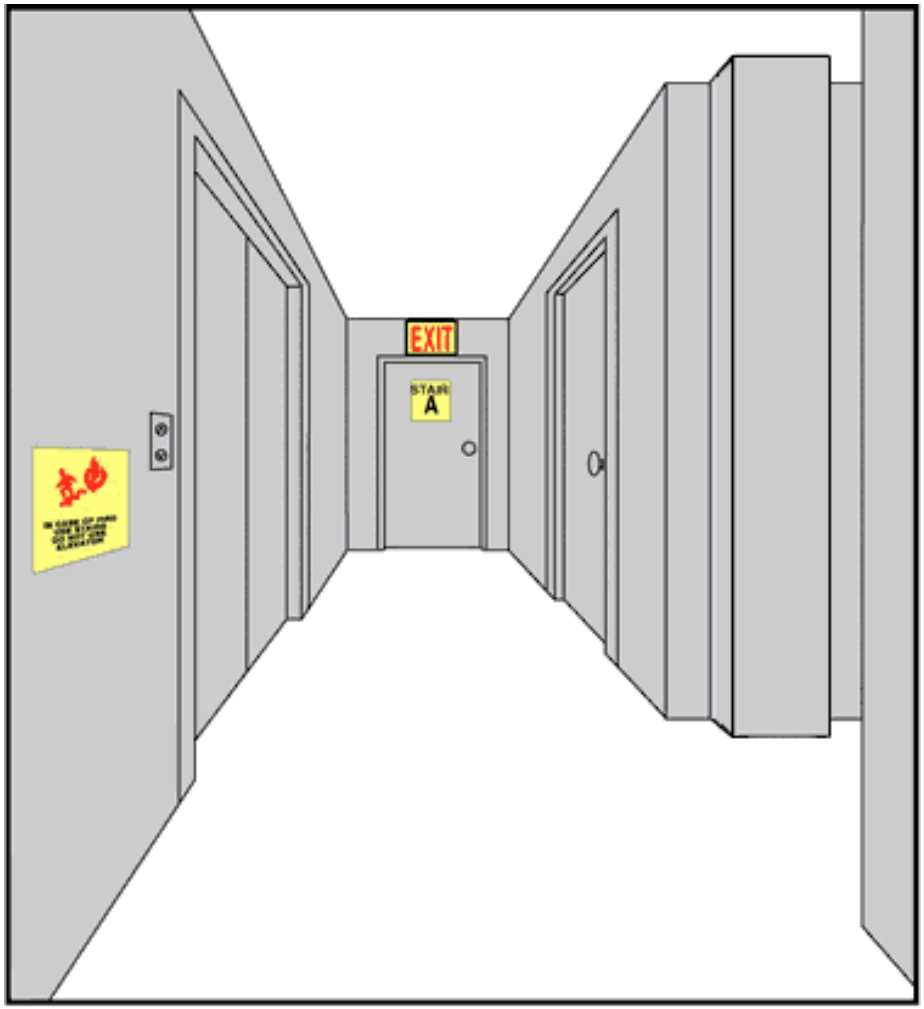
Residential/Single Family

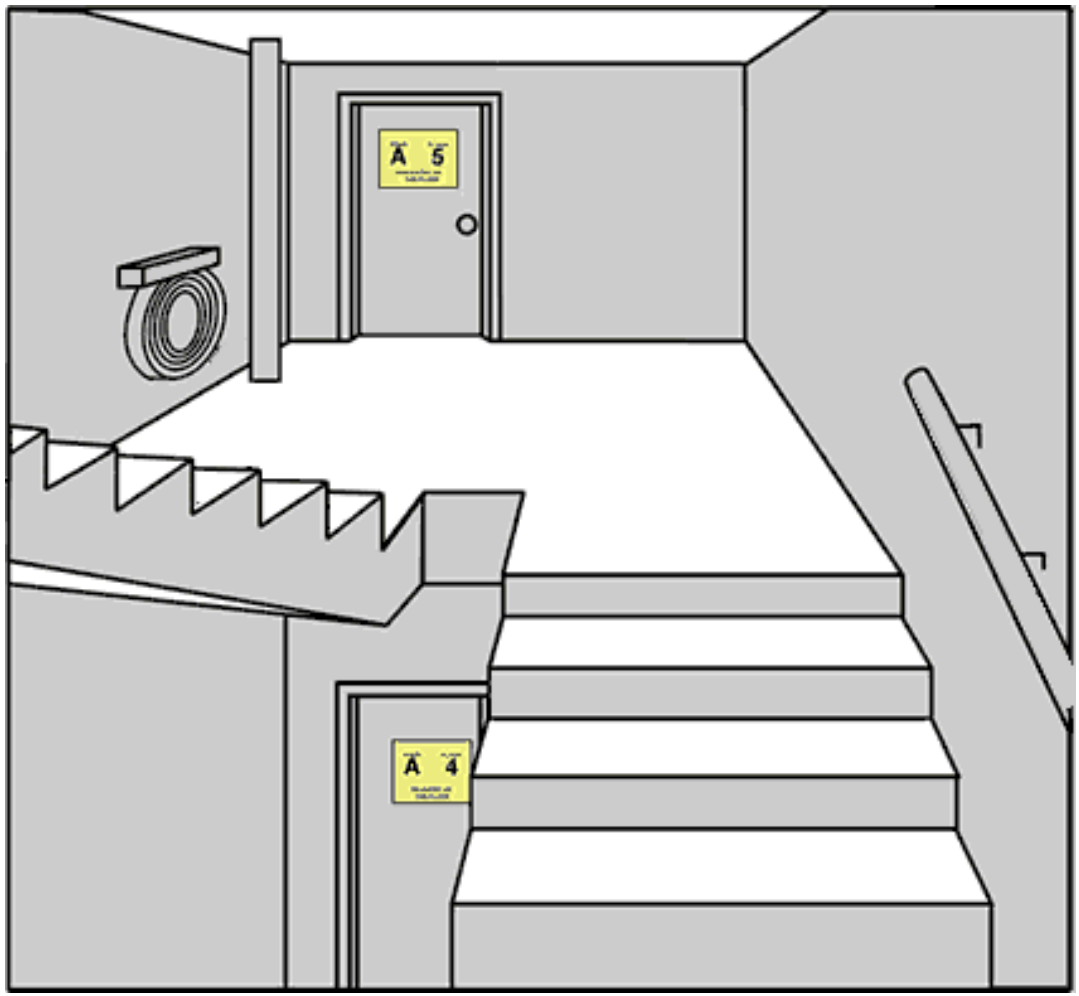
- High number of people exiting (pushing and shoving!)
- Door opens out to prevent crushing



Commercial/Institutional

Buffalo snow storm 2014

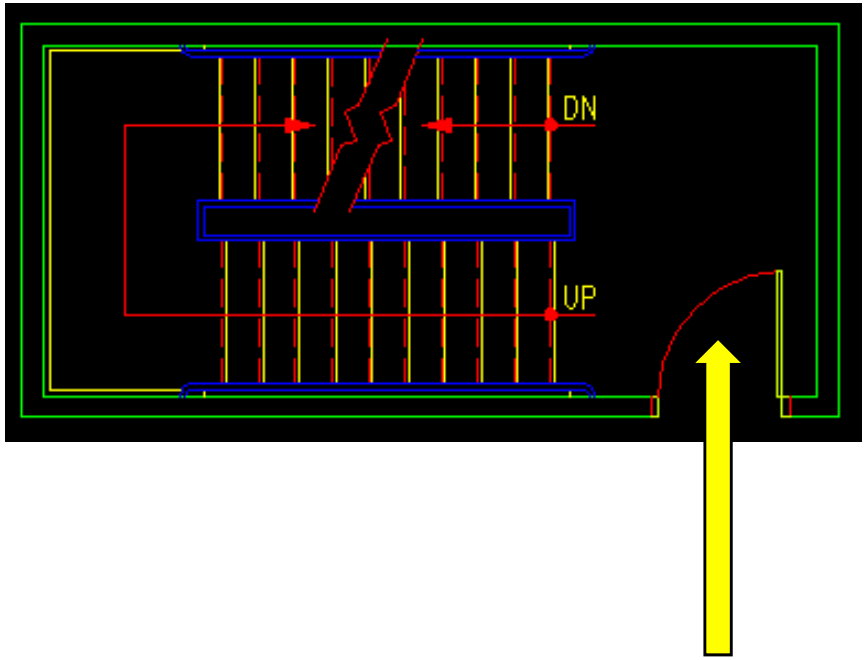




Exits must be clearly marked with “internationally recognized” signage.

Fire Stairs

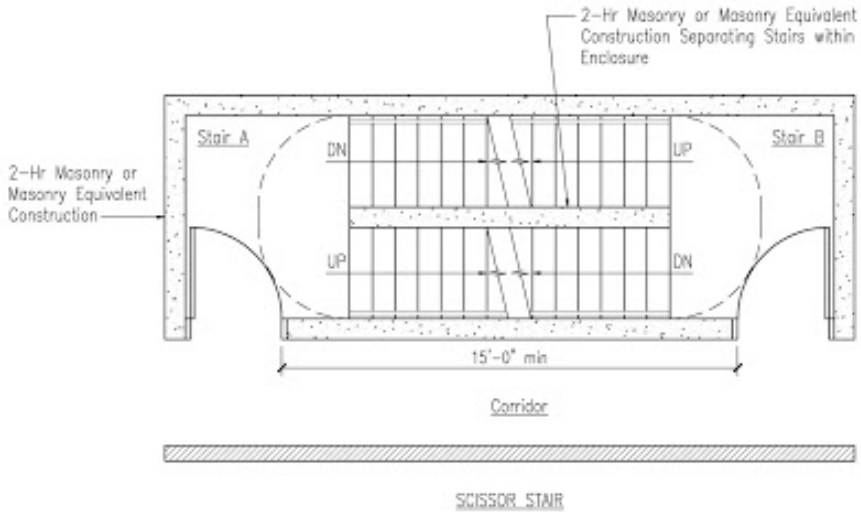
- Must be a safe route
- Minimal glazing allowed into the building
- Door opens into the stair
- Enough space between door and riser to allow someone to pass by (30cm minimum)

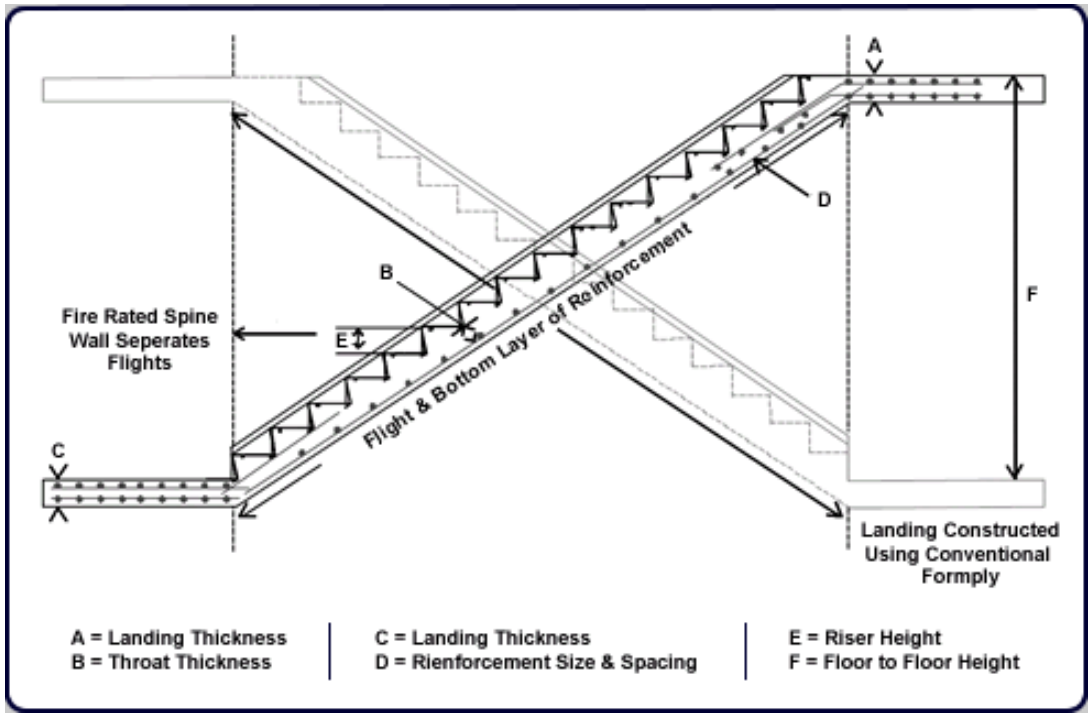


- People exiting into stairwell
- Door opens IN

Scissor Stairs

- Ingenious way to intertwine two fire egress stairs





With rare exceptions (like in stand alone houses), almost all building areas require at least 2 means of egress.

In buildings over one floor in height this normally means at least 2 sets of fire safe stairs.

What is a fire safe stair??? One that is enclosed. Very little glass (often only a wee pane in the door). Has doors that open into the stairwell. Is pressurized so that if the door is left open no smoke can enter. Usually provides an exit directly to the exterior of the building.

i.e. It is really boring architecturally speaking -- but SAFE.

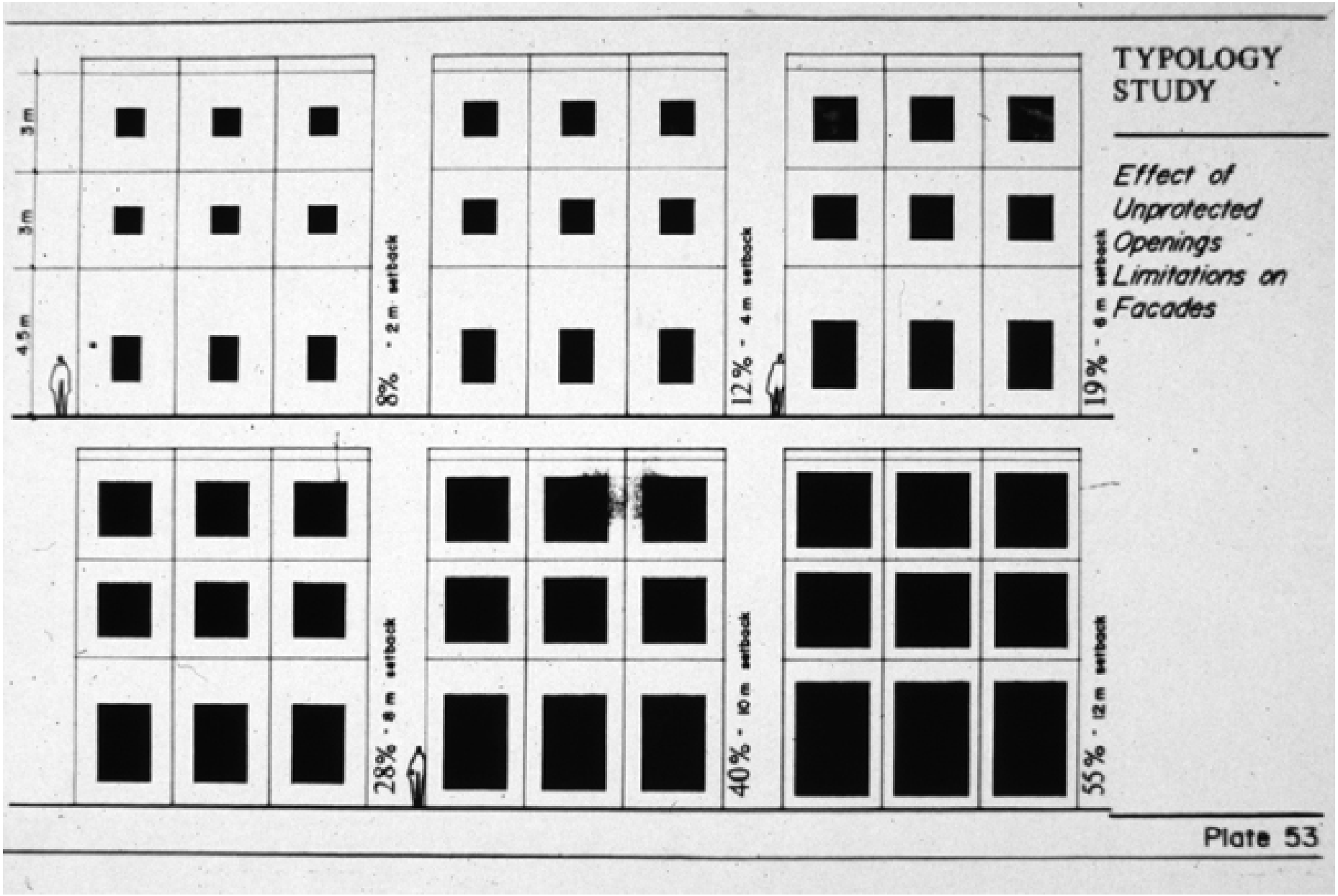
Exit through lobby:

- one of the two exits may pass through a lobby space IF:
  - lobby floor not more than 4.5m above grade
  - path of travel does not exceed 15m
  - rooms adjacent to lobby are fire separated (ie. doors and walls)
  - lobby is not part of an interconnected atrium space

Fire escapes are no longer permitted as a means of egress in NEW construction.

Unprotected Openings:

- any portion of an exterior building face that does not meet the fire resistance rating required for the building face (ie. windows, doors, vent grilles)
- steel window frames, wired glass and glass block allow for a doubling of the OBC maximums
- sprinklering allows for a doubling of areas


TYPOLOGY STUDY
Effect of Unprotected Openings Limitations on Facades
3m
3m
4.5m
8% - 2m setback
12% - 4m setback
19% - 6m setback
28% - 8m setback
40% - 10m setback
55% - 12m setback
Plate 53

Sizing Unprotected Openings:

- limits are based on distance from property lines, as a % of the building face area
- ie. for residential (50 s.m. building face):
  - less than 1.2m setback allows 0%
  - 1.2m setback allows 7%
  - 1.5m setback allows 8%
  - 2.0m setback allows for 10%
  - 4.0m setback allows for 28%

TABLE 1 Minimum Construction Requirements for Exposing Building Face

Occupancy Classification of Fire Compartment	Percentage of Unprotected Openings Permitted	Minimum Required Fire-Resistance Rating for Exposing Building Face	Minimum Construction Requirements	Minimum Cladding Requirements
Group A, B, C, D and Group F, Division 3	0 — 10%	1-hour	Noncombustible construction	Noncombustible
	Greater than 10% up to 25%	1-hour	Can be combustible construction if building allowed to be of combustible construction	
	Greater than 25% up to 99%	¾-hour		Can be combustible if building allowed to be of combustible construction
	100%	None required		
Group E, Group F, Division 1 and Group F, Division 2	0 — 10%	2-hour	Noncombustible construction	Noncombustible
	Greater than 10% up to 25%	2-hour	Can be combustible construction if building allowed to be of combustible construction	
	Greater than 25% up to 99%	1-hour		Can be combustible if building allowed to be of combustible construction
	100%	None required		

Limiting Distance:

- refers to the distance between an exposing building face and the property line or to an imaginary line between two buildings on the same property.
- if the two buildings are the same (area of face and glass) the line will be midway; if they are different, the distance will be proportional

Exposing Building Face:

- is the area of an exterior wall of a building, between the ground level and the ceiling of the top storey, facing in one direction
- where a building is divided into “fire compartments”, the exterior wall of each fire compartment becomes an exposing building face and is calculated separately