

# BCBC 2024 PART 3 & 9 MEZZANINE PROVISIONS

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## LUCAS GENEREUX, AScT, RHFAC PROFESSIONAL

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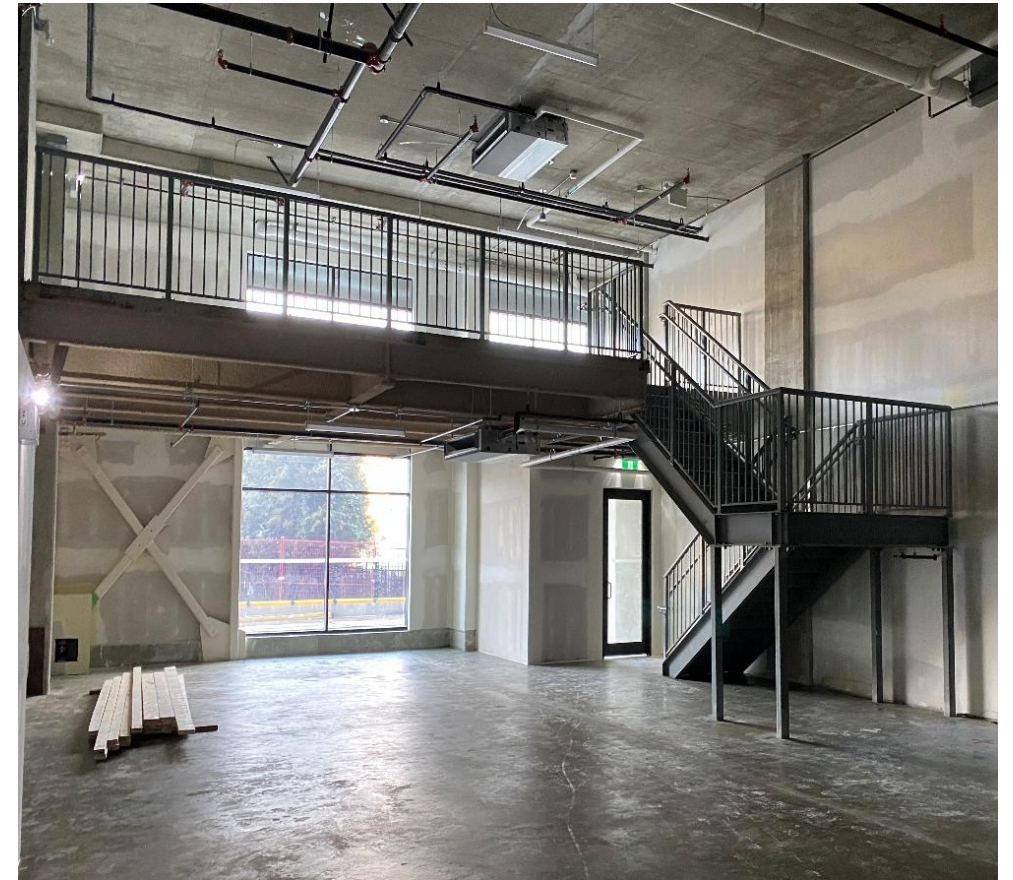
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# WHAT IS A MEZZANINE?

## Definition –

Mezzanine means an intermediate floor assembly between the floor and ceiling of any room or storey and includes an interior balcony.

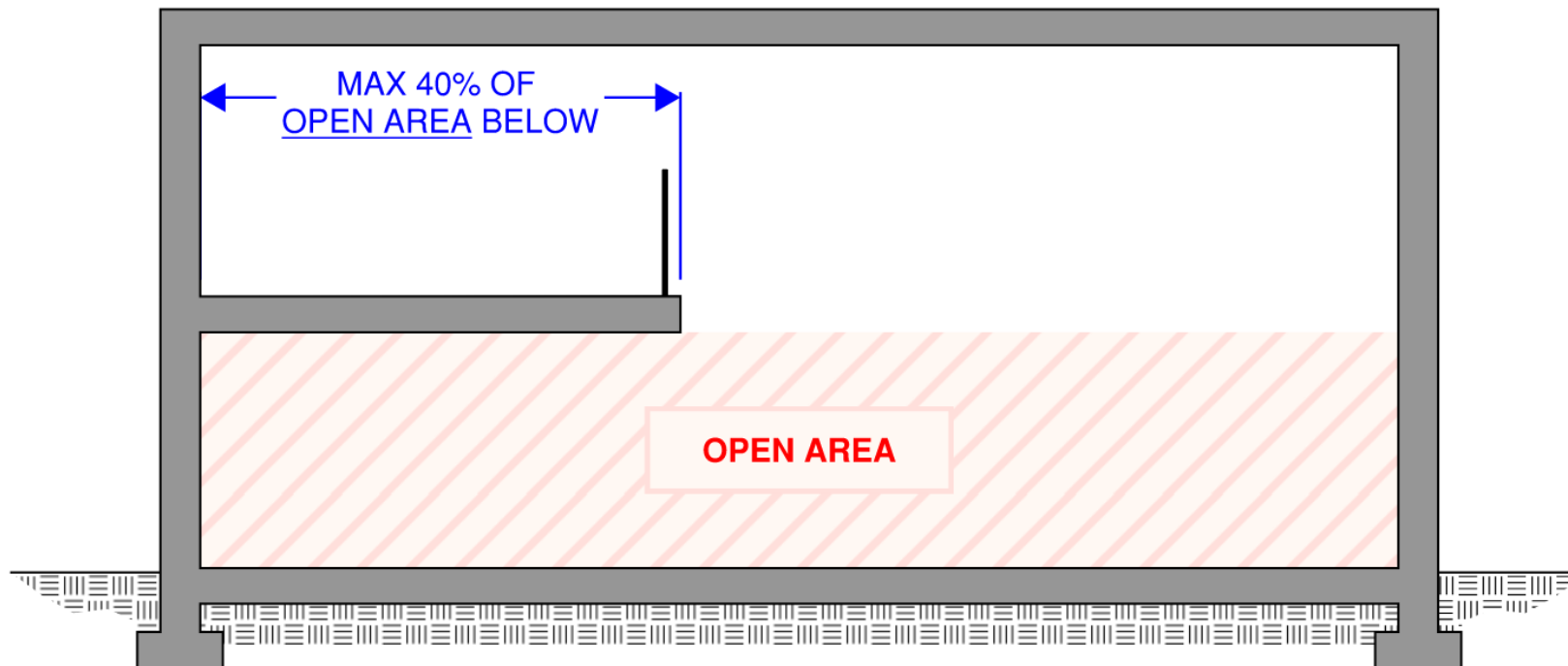


# DETERMINING OPEN MEZZANINE AREA

## OPEN MEZZANINE AREA – 3.2.1.1.(3) / 9.10.4.1.(2)

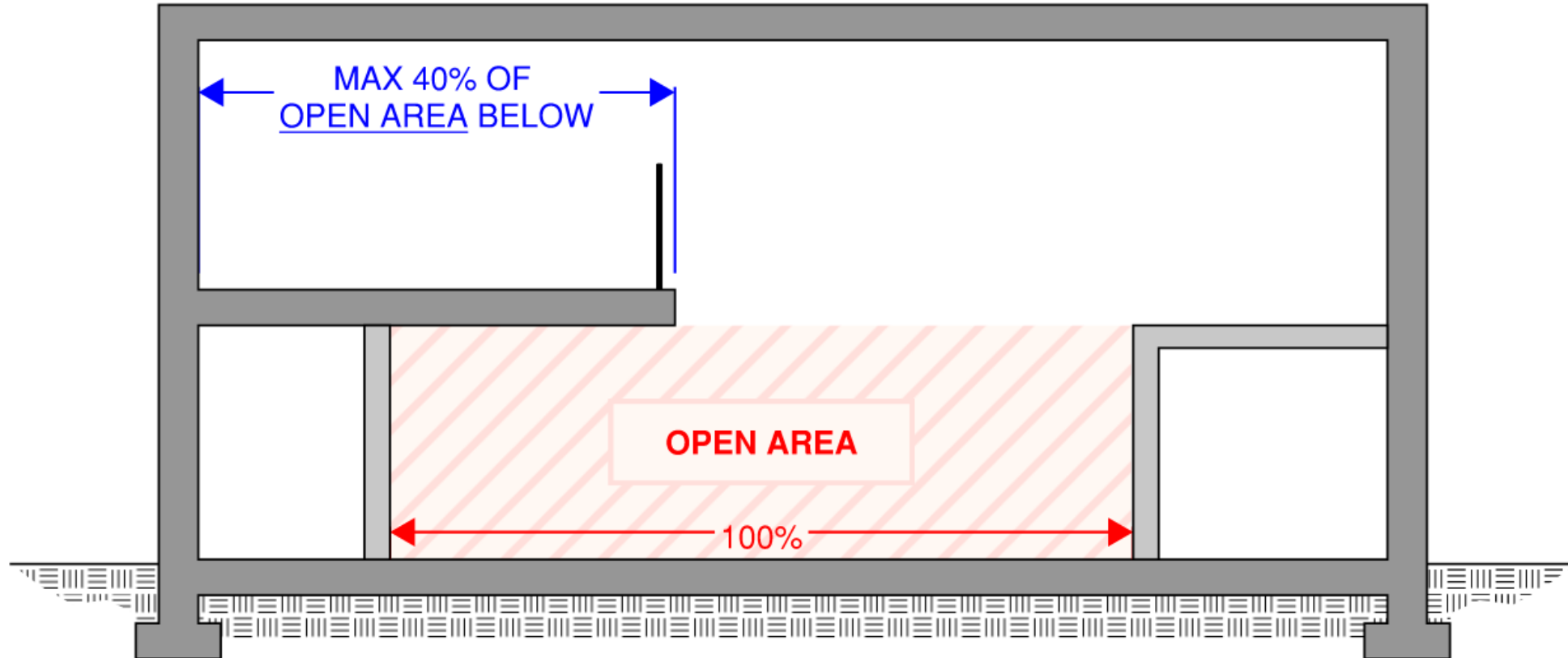
Not considered a storey where the open area of a mezzanine does not exceed 40% of the open area of the room in which it is located.

- “Open Area” excludes enclosed rooms on the floor below including rooms beneath the mezzanine.



# OPEN MEZZANINE AREA – 3.2.1.1.(3) / 9.10.4.1.(2)

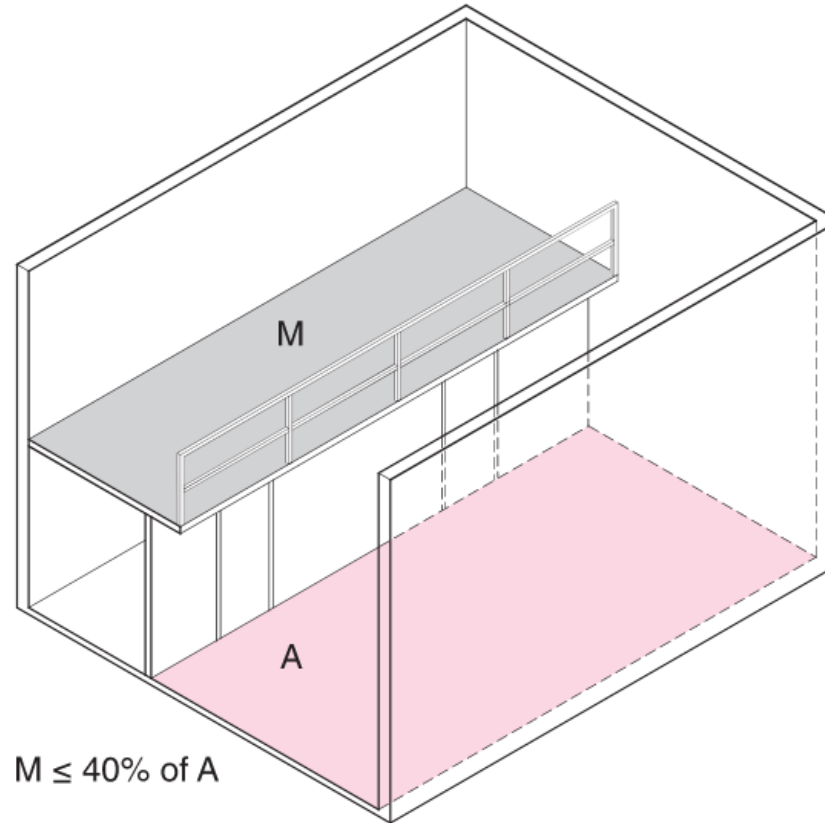
- Example of an open mezzanine with enclosed rooms on level below.



- Significant change to the 2024 BCBC to now exclude enclosed areas beneath the mezzanine as well.
- This is all based on the consideration that a fire could go unnoticed from within these enclosed rooms.

# OPEN MEZZANINE AREA – 3.2.1.1.(3) / 9.10.4.1.(2)

Illustrated User's Guide -  
NBC 2020: Part 9



- Open mezzanine not considered as a storey if
- it occupies  $\leq 40\%$  of the open area of the room, and
  - the space above mezzanine is open (the space below mezzanine can be enclosed).

# DETERMINING WHAT IS OPEN MEZZANINE

## **Brief history breakdown on what is considered “open”:**

- In **2006** BC tried to align more closely with the NBC which had took out the word “visually”
- Later in **2006** BC made addendum put back in “visually”
- In **2024** “visually” is removed again

# WHAT IS CONSIDERED AN OPEN MEZZANINE? – BCBC 2018

- **3.2.1.1.(3)(b) / 9.10.4.1.(2)(b)** – except as permitted in Sentences (7) and 3.3.2.13.(3), the space above the mezzanine is used as a **visually open area** without partitions or subdividing walls higher than 1070mm above the mezzanine floor.
- Glazing above 1070mm is permitted as it does not constitute a visual obstruction (BCBC 2018)  
– BCAB Decision [#1111](#) and [#1998](#) [New]
- Other partitions are evaluated based on whether the space above 1070 mm is visually obstructed – BCAB Decision [#1777](#)



# WHAT IS CONSIDERED AN OPEN MEZZANINE? – BCBC 2024

- **3.2.1.1.(3)(b) / 9.10.4.1.(2)(b)** – except as permitted in Sentences (7) and 3.3.2.13.(3), the space above the mezzanine is used as an **open area** without partitions or subdividing walls higher than 1070mm above the mezzanine floor.
- BCBC 2024 harmonized with the NBC 2020 which removed the word “visually” in 2005 .... BUT does this mean the space needs to be physically open now rather than just visually open?

# WHAT IS CONSIDERED AN OPEN MEZZANINE? – BCBC 2024

- **BCAB Decision #1823** – regarding the BCBC 2006, which removed “visually”, it was determined that the sentence does not permit “enclosure with any material including glazing”.

## HOWEVER ....

- **3.2.1.1.(7) / 9.10.4.1.(3)** – The space above a mezzanine is permitted to include an enclosed space whose area does not exceed 10% of the open area of the room in which the mezzanine is located provided the enclosed space *does not obstruct visual communication between the open space above the mezzanine and the room in which it is located.*
- **2005 to 2020 NBC Intent Statement for 3.2.1.1.(3)** – To exclude mezzanines from the calculation of building height if certain conditions are met that limit the size of the mezzanines and their **degree of visual obstruction**, on the basis that this configuration does not pose an undue fire safety risk to persons.
- **NBC 2020 Part 9 Illustrated User’s Guide** –
  - Mezzanines that are **essentially open to view**, so that a fire on the mezzanines would be **visible** from the room below and vice versa, do not have to be counted as a storey in building height if their aggregate area does not exceed 40% of the open area of the room in which they are located.
  - If, however, the condition for **visual communication** is not met from above the mezzanines, the mezzanines are only permitted to not be counted as a storey if their aggregate area does not exceed 10% of the floor area of the building in which they are located and if the area of each mezzanine does not exceed 10% of the area of the room in which it is located.

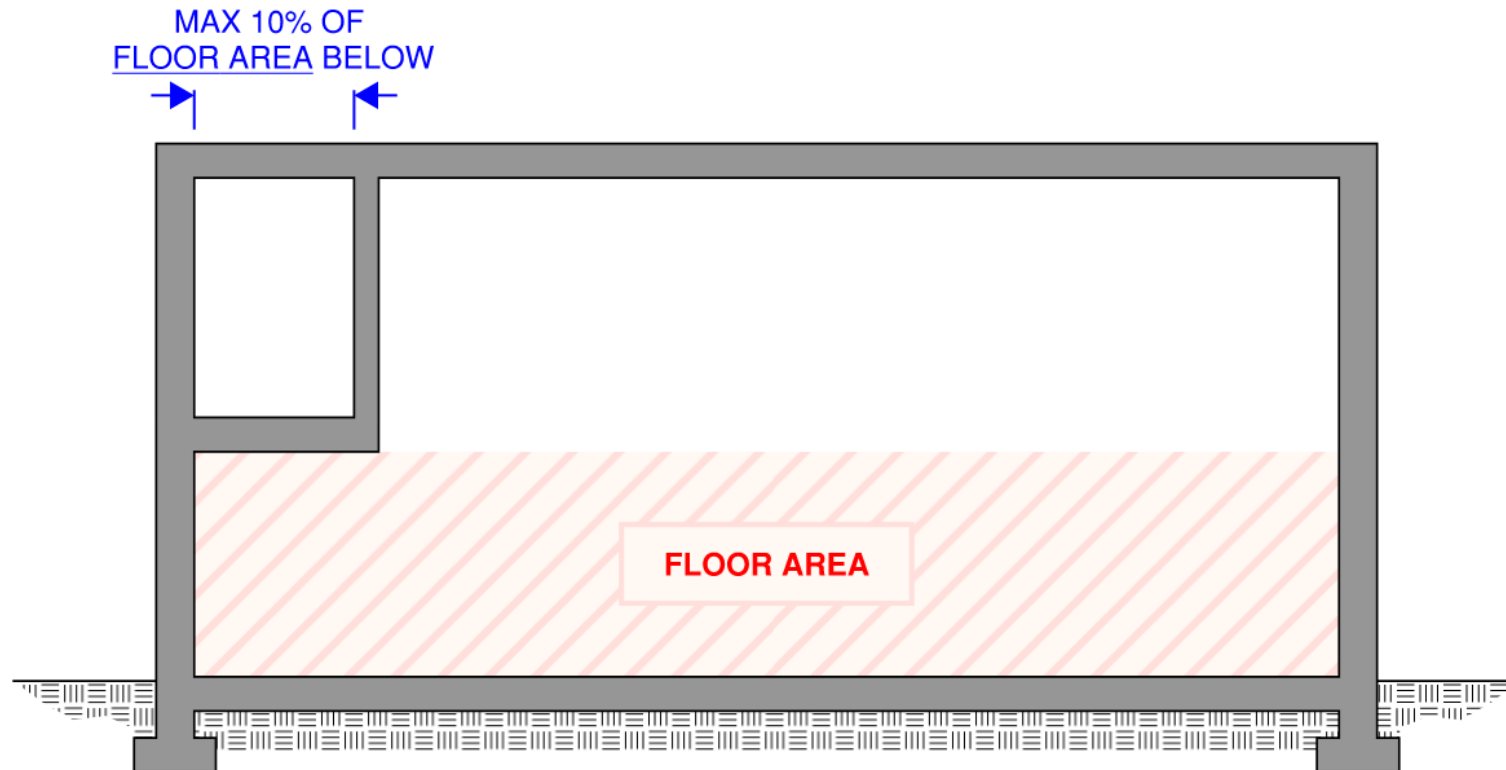
**In summary**, there is still a fair amount of references to “visually” if there was an actual intent change for it not just be about “visual” connection, and in addition, there is no acknowledgement in the proposed Code change to the 1995 NBC that it was an intentional change with a reasoning.

# DETERMINING ENCLOSED MEZZANINE AREA

## ENCLOSED MEZZANINE – 3.2.1.1.(4) / 9.10.4.1.(1)

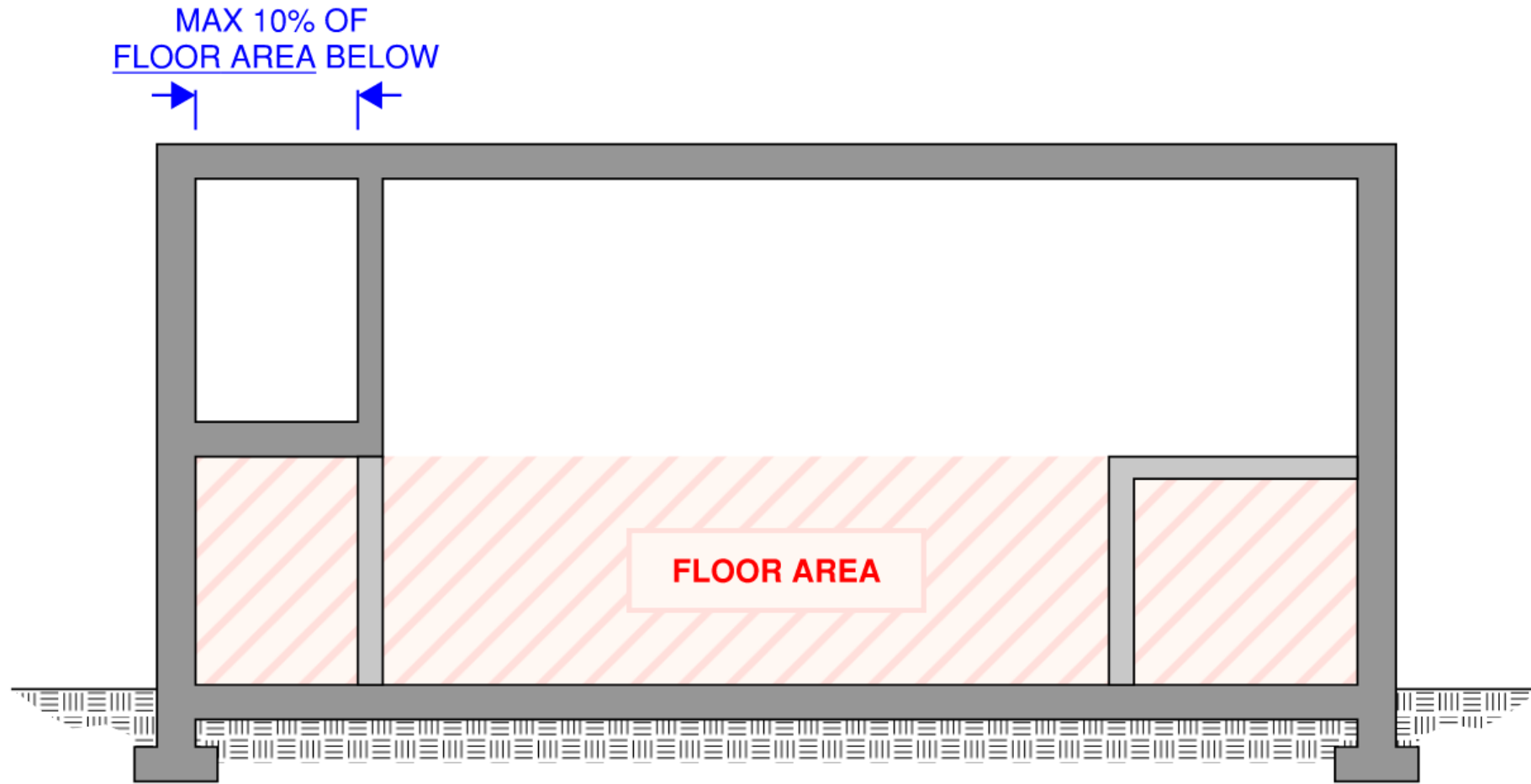
Not considered a storey where the area of an enclosed mezzanine does not exceed 10% of the **floor area** or the area of the suite in which the mezzanine is located.

- Floor area or suite areas is the area of the room or suite including enclosed rooms.



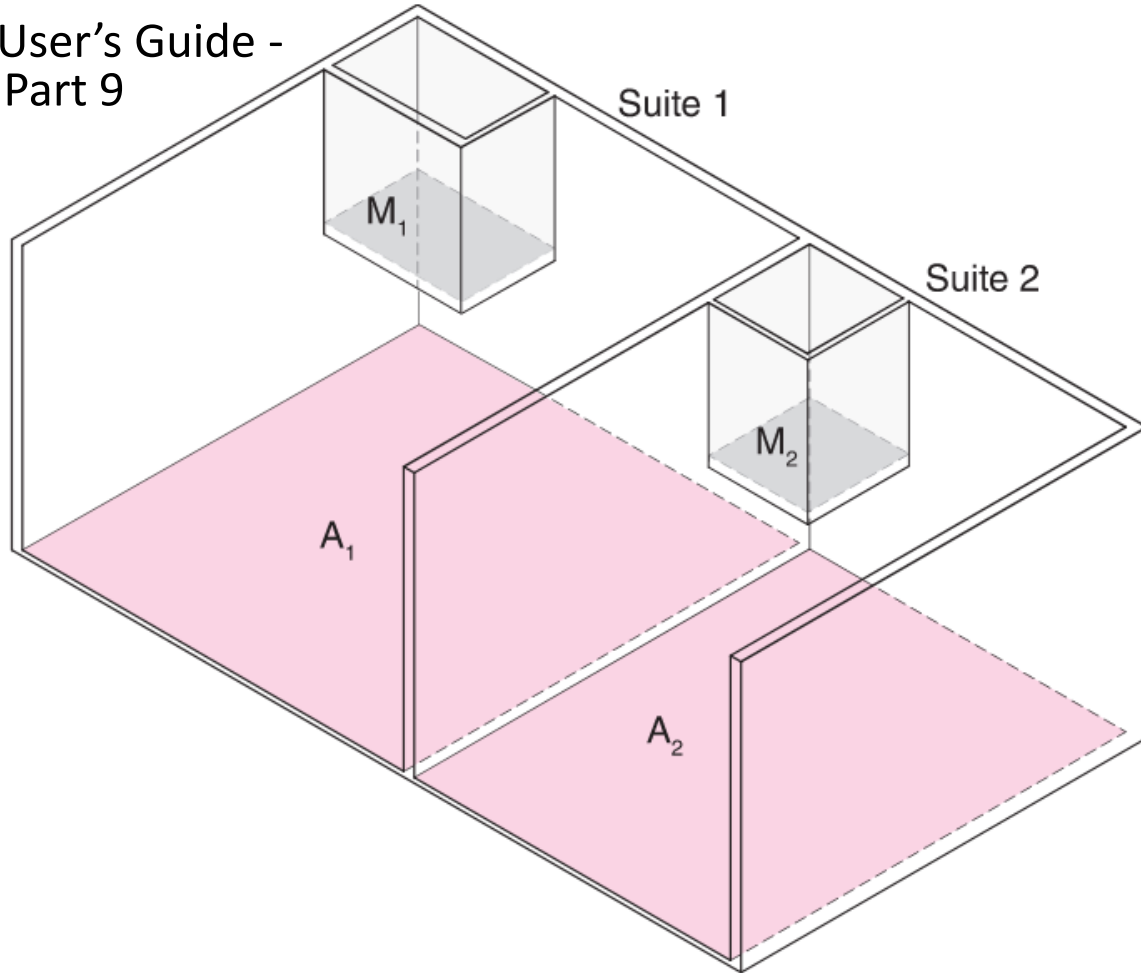
# ENCLOSED MEZZANINE

- Example of enclosed mezzanine with enclosed rooms on level below.



# ENCLOSED MEZZANINE

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Enclosed mezzanines not considered as a storey if:

- each mezzanine occupies  $\leq 10\%$  of the floor area of the room in which it is located, and
- the mezzanines occupy  $\leq 10\%$  of the total floor area of the building.

$$M_1 \leq 10\% \text{ of } A_1$$

$$M_2 \leq 10\% \text{ of } A_2$$

$$M_1 + M_2 \leq 10\% \text{ of } (A_1 + A_2)$$

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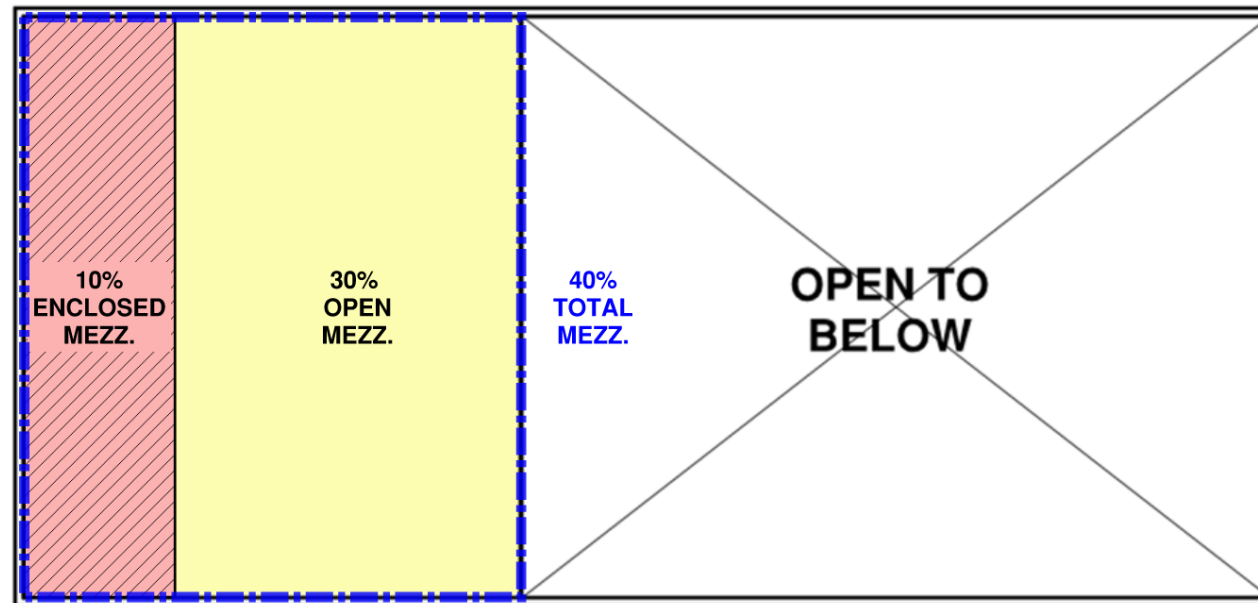
# MIXING OPEN & ENCLOSED MEZZANINE AREAS

## OPEN & ENCLOSED MEZZANINE MIX – 3.2.1.1.(7) / 9.10.4.1.(3)

A mezzanine meeting the 40% area limit in 3.2.1.1.(3) / 9.10.4.1.(1) can include **on it** an enclosed space that does not exceed 10% of the **open area** of the room in which it is located.

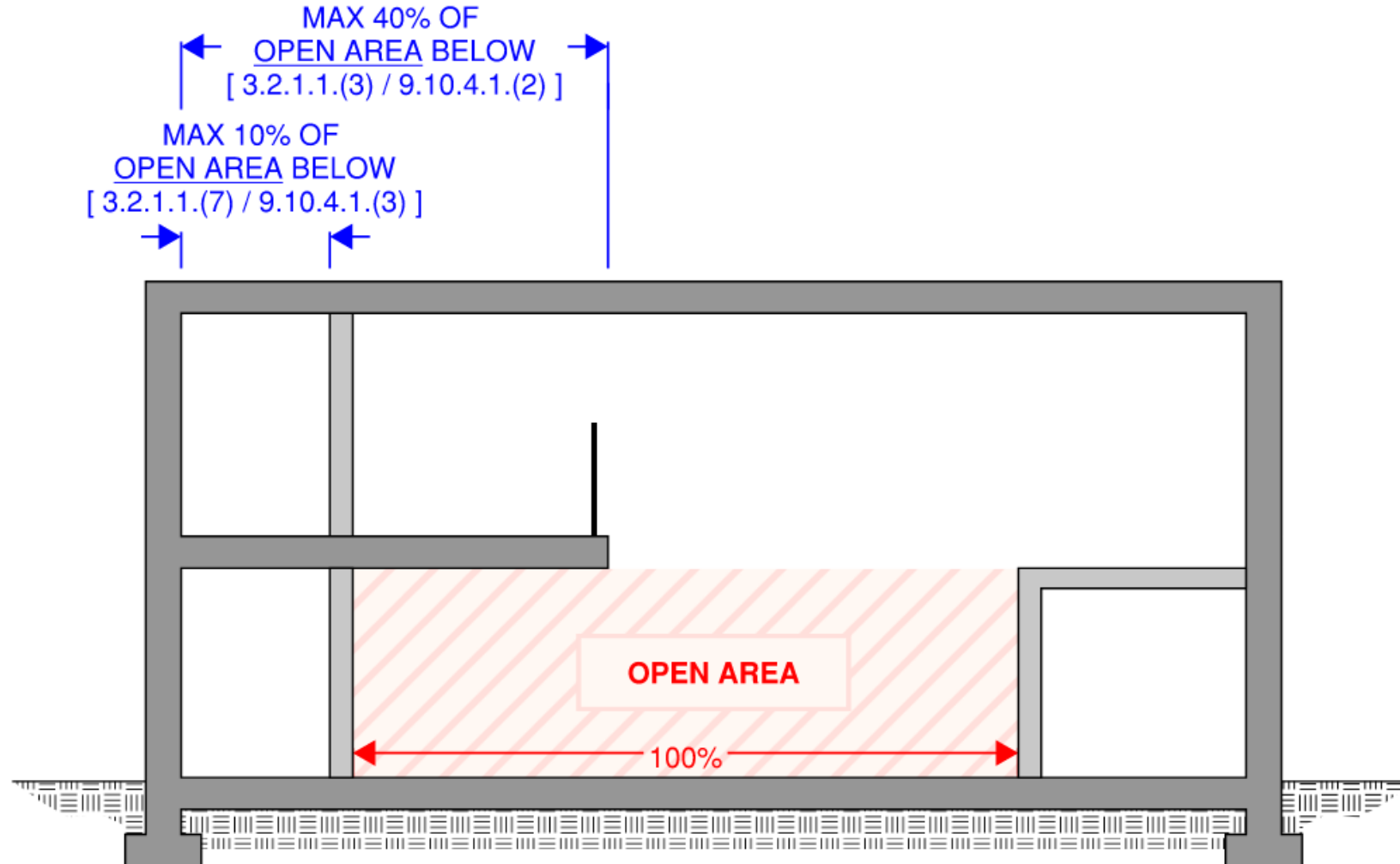
*(10% Enclosed + 30% Open = 40% total mezzanine area)*

- This differs from the enclosed mezzanine in Sentence 3.2.1.1.(4), this is a room on the open mezzanine in Sentence 3.2.1.1.(3). Area is based on “open area” rather than “floor area” of the room below the mezzanine, which means excluding enclosed rooms on the storey below.



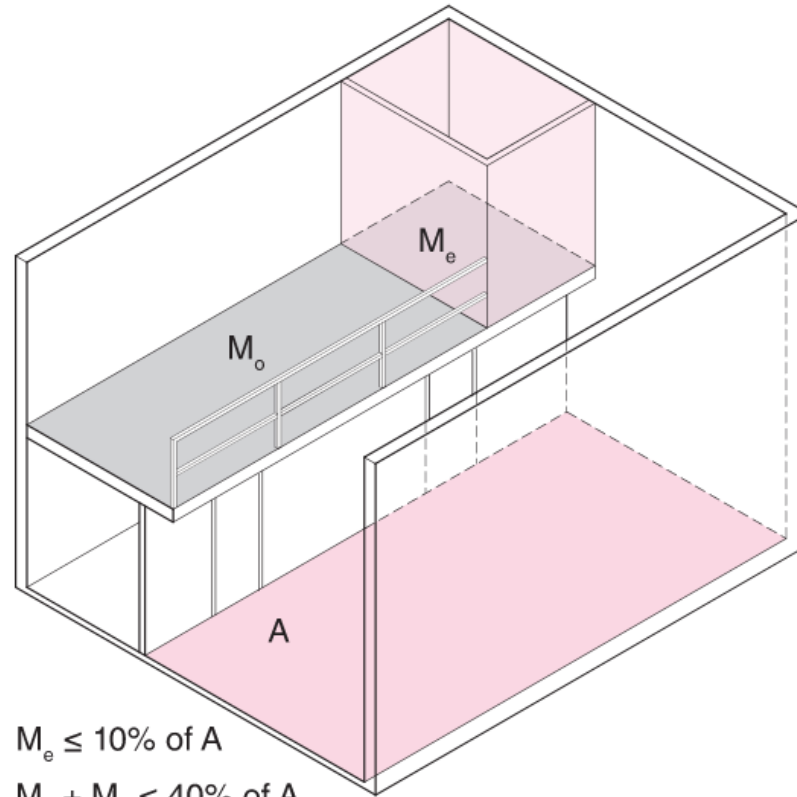
# OPEN & ENCLOSED MEZZANINE MIX

- Example of an enclosed mezzanine on an open mezzanine with enclosed rooms on level below.



# OPEN & ENCLOSED MEZZANINE MIX

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$$M_e \leq 10\% \text{ of } A$$

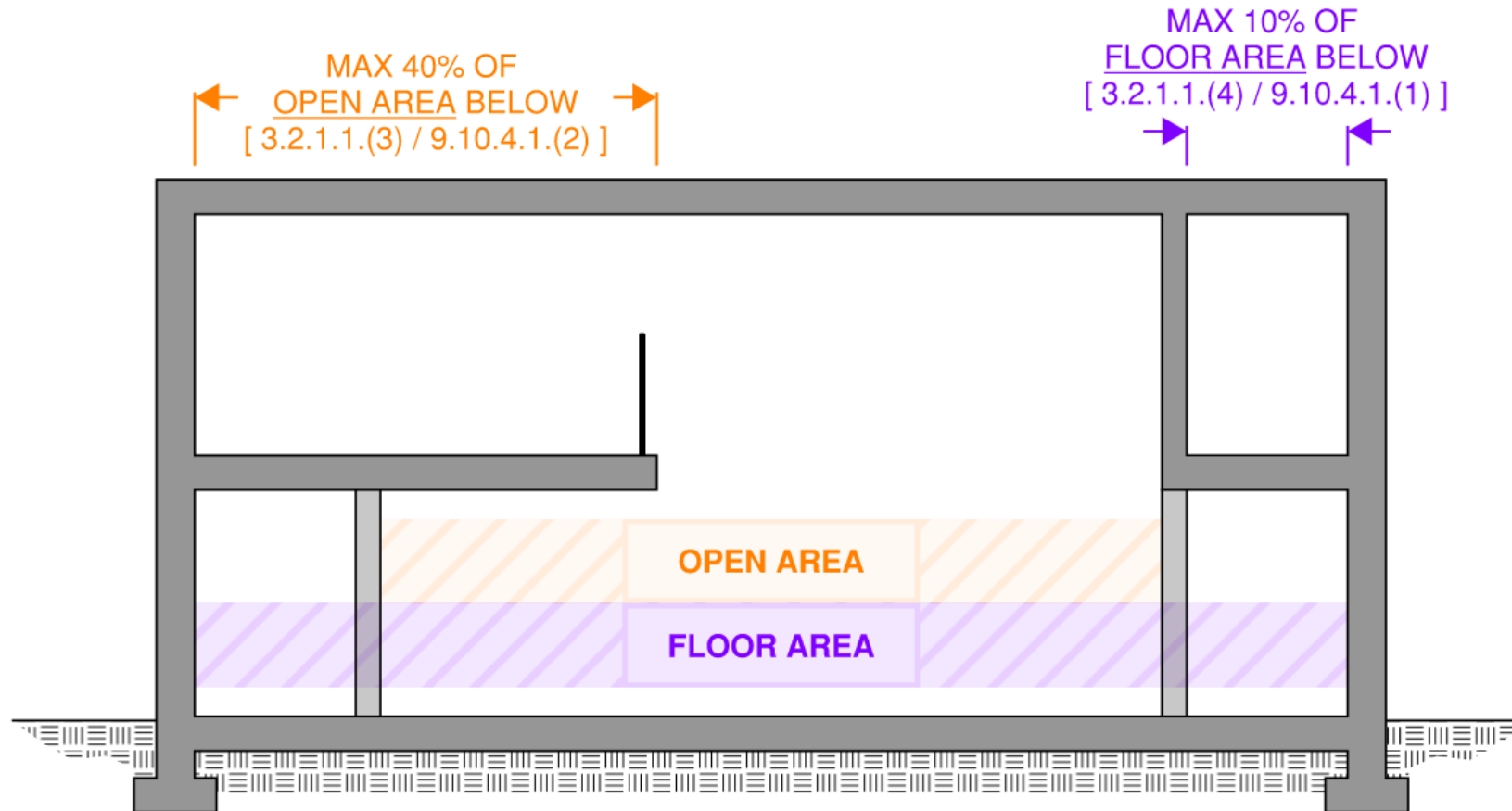
$$M_o + M_e \leq 40\% \text{ of } A$$

Open mezzanine can include an enclosed mezzanine if

- the enclosed mezzanine occupies  $\leq 10\%$  of the open area of the room, and
- walls of the enclosed mezzanine do not block the view of the open area of the mezzanine from the open area of the room.

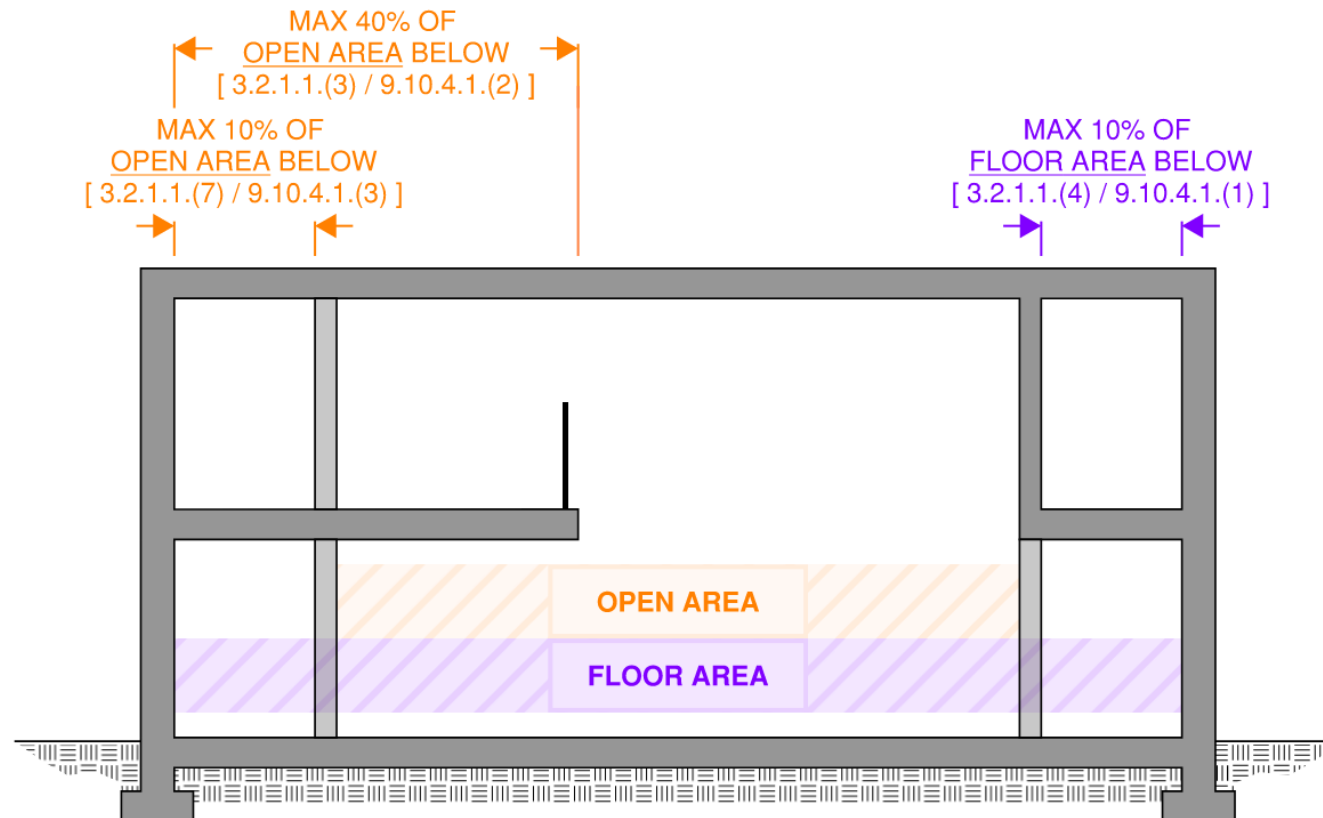
# OPEN & ENCLOSED MEZZANINE MIX

- Example of an open mezz and completely separate enclosed mezzanine with enclosed rooms on level below.
- The Code wording does not link the provisions that a completely separate enclosed mezzanine needs to be looked at in part of the requirements in Sentence (3) & (7).



# OPEN & ENCLOSED MEZZANINE MIX

- Example of an enclosed mezz on an open mezz along with a completely separate enclosed mezzanine with enclosed rooms on level below.
- The Code wording does not link the provisions that a completely separate enclosed mezzanine needs to be looked at in part of the requirements in Sentence (3) & (7).



# OTHER MEZZANINE EXAMPLES & CONSIDERATIONS

# OBSTRUCTED VIEW ON MEZZANINE – 3.2.1.1.(7) / 9.10.4.1.(3)

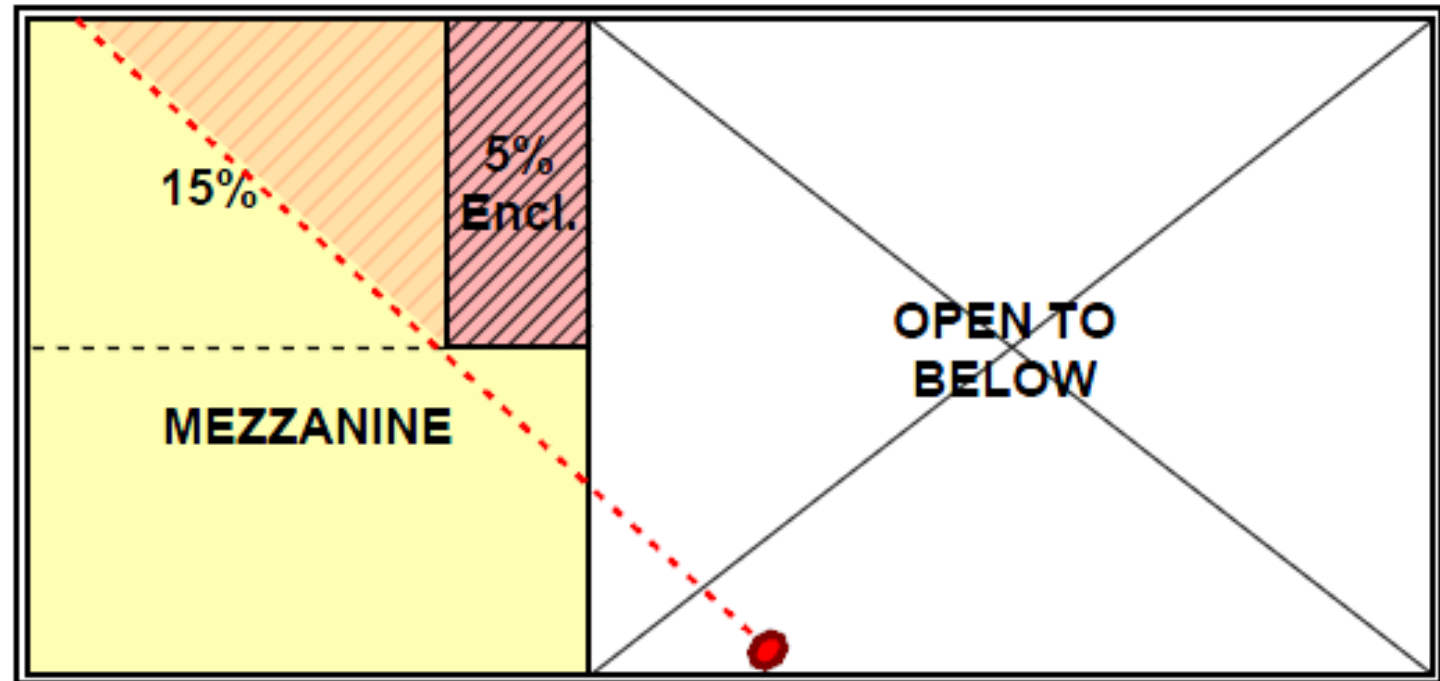
Where a room on the open mezzanine obstructs the visual communication between the open mezzanine and the room in which it is located, the obstructed area is considered to be enclosed.

- Meaning if a portion of the open mezzanine is obstructed from the room below then is included in the 10% area limit for enclosed spaces on open mezzanines.

Example: A portion of this mezzanine (~15%) has a complete obstructed view to the floor below as such needs to be looked at part of the enclosed area of the mezzanine.

Which means this mezzanine's visually obstructed area exceeds the permitted 10% as calculated below.

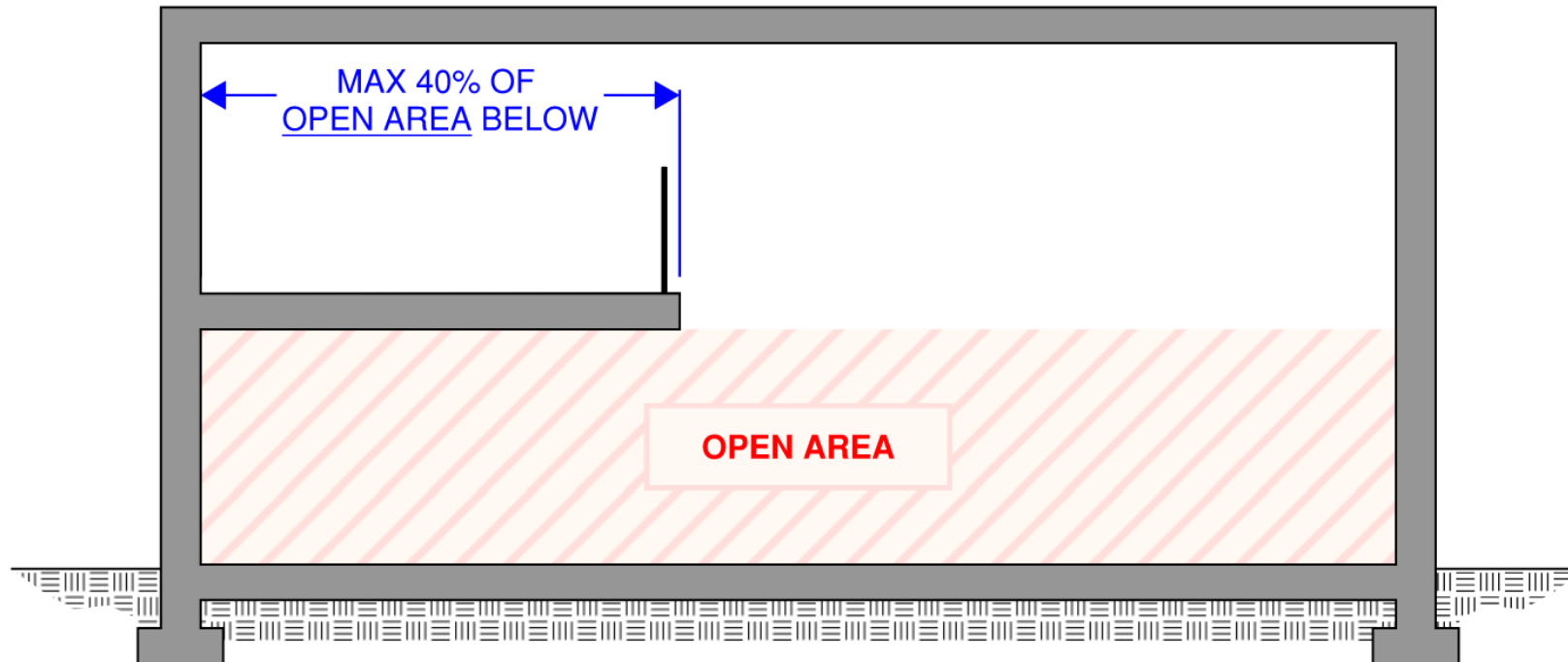
5% Enclosed  
+ 15% Obstructed View  
**20% Obst. Visual Comm.**



## MEZZANINE LIMIT – 3.2.8.2.(1)

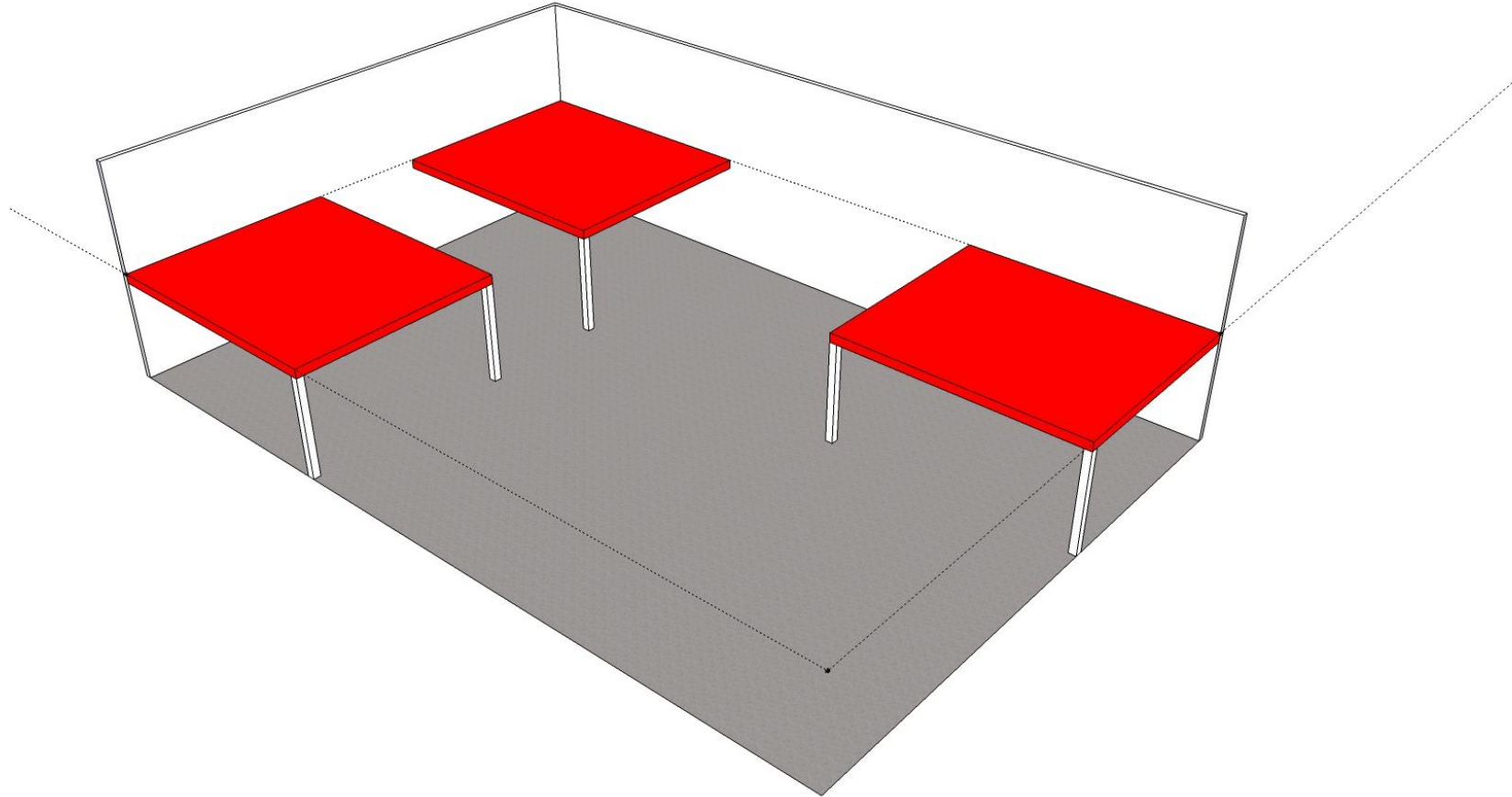
Mezzanines do not need to be enclosed by a vertical fire separation or treated as an interconnected floor space provided it meets Article 3.2.1.1 and the criteria in 3.2.8.2.(1) which limits the area to 500m<sup>2</sup>.

It still may not be a storey but the provisions in Subsection 3.2.8 for interconnected floor spaces apply where the mezzanine area exceeds 500m<sup>2</sup>.



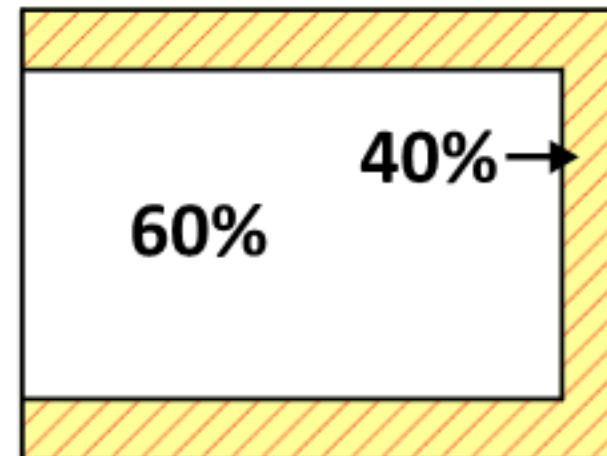
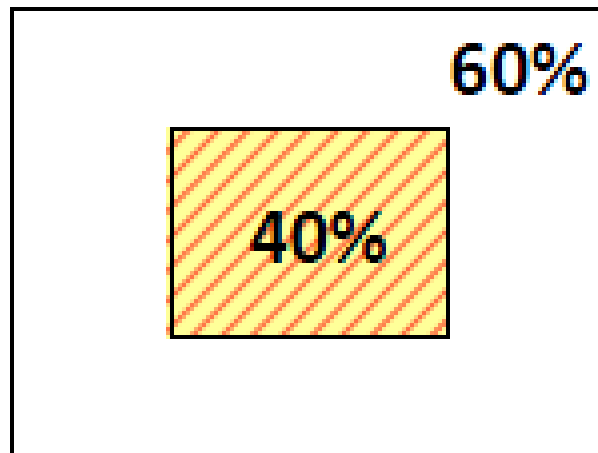
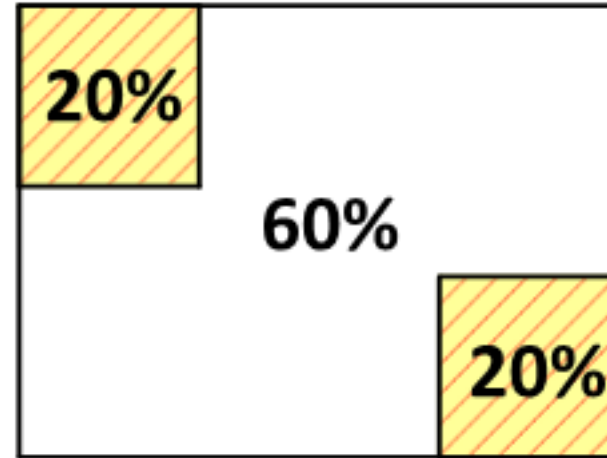
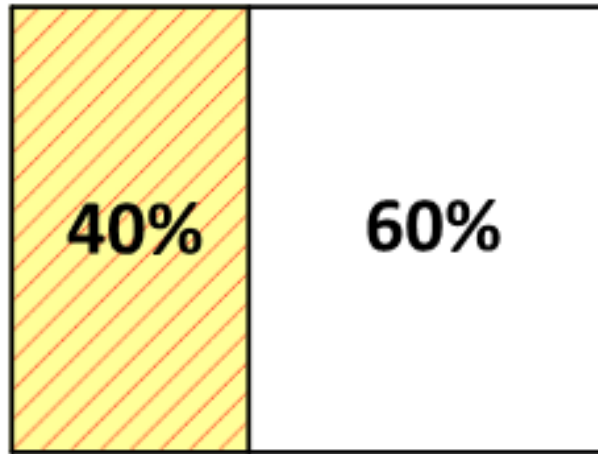
# MEZZANINE AREA EXAMPLE

- Example of mezzanines being split into smaller individual mezzanine areas, provided the total mezz area does not exceed 40% of the open floor area below.



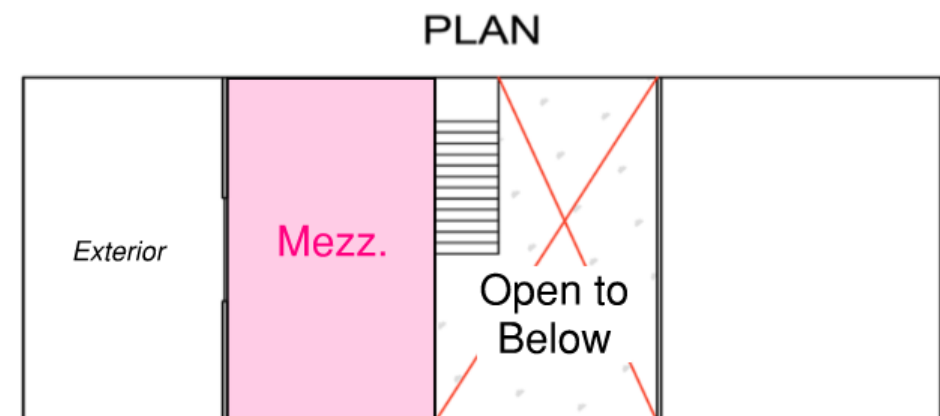
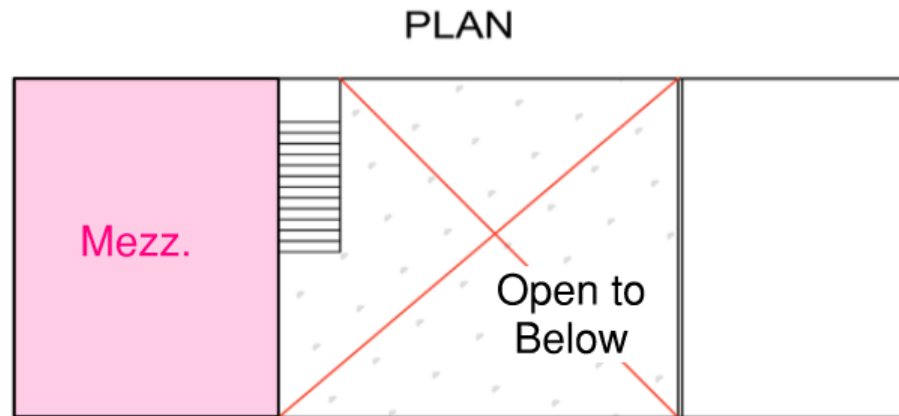
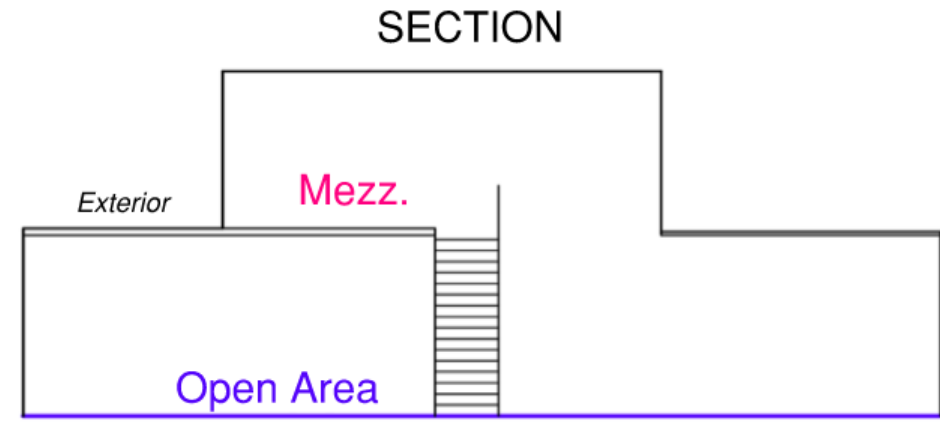
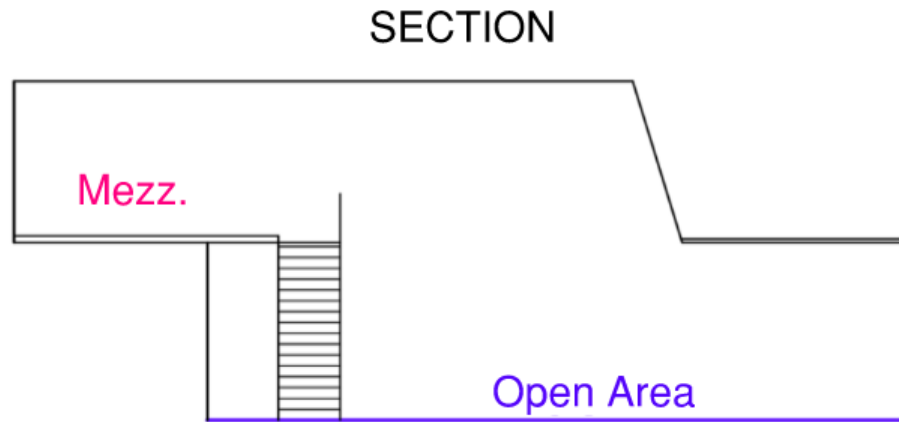
# MEZZANINE AREA EXAMPLE

- Example of mix condition of what a mezzanine could look like.



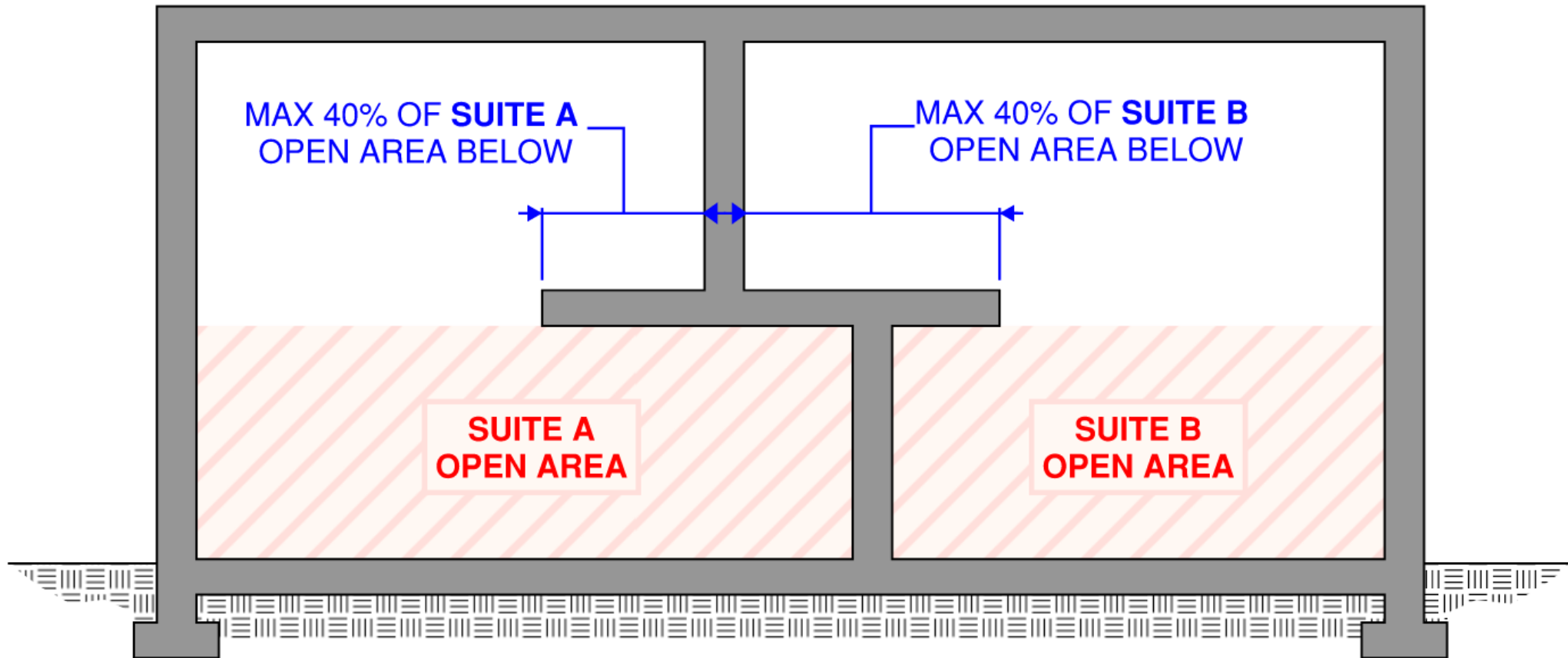
# MEZZANINE AREA EXAMPLE

- Example of mix condition of what a mezzanine could look like.



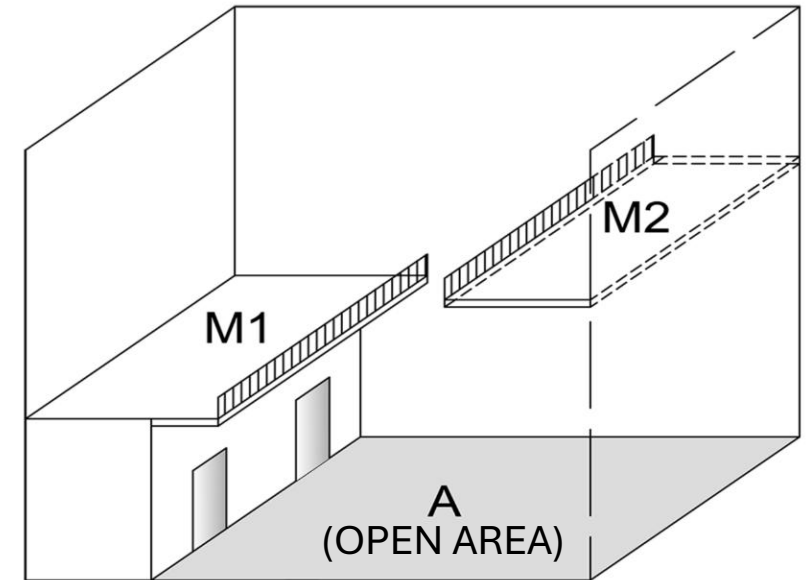
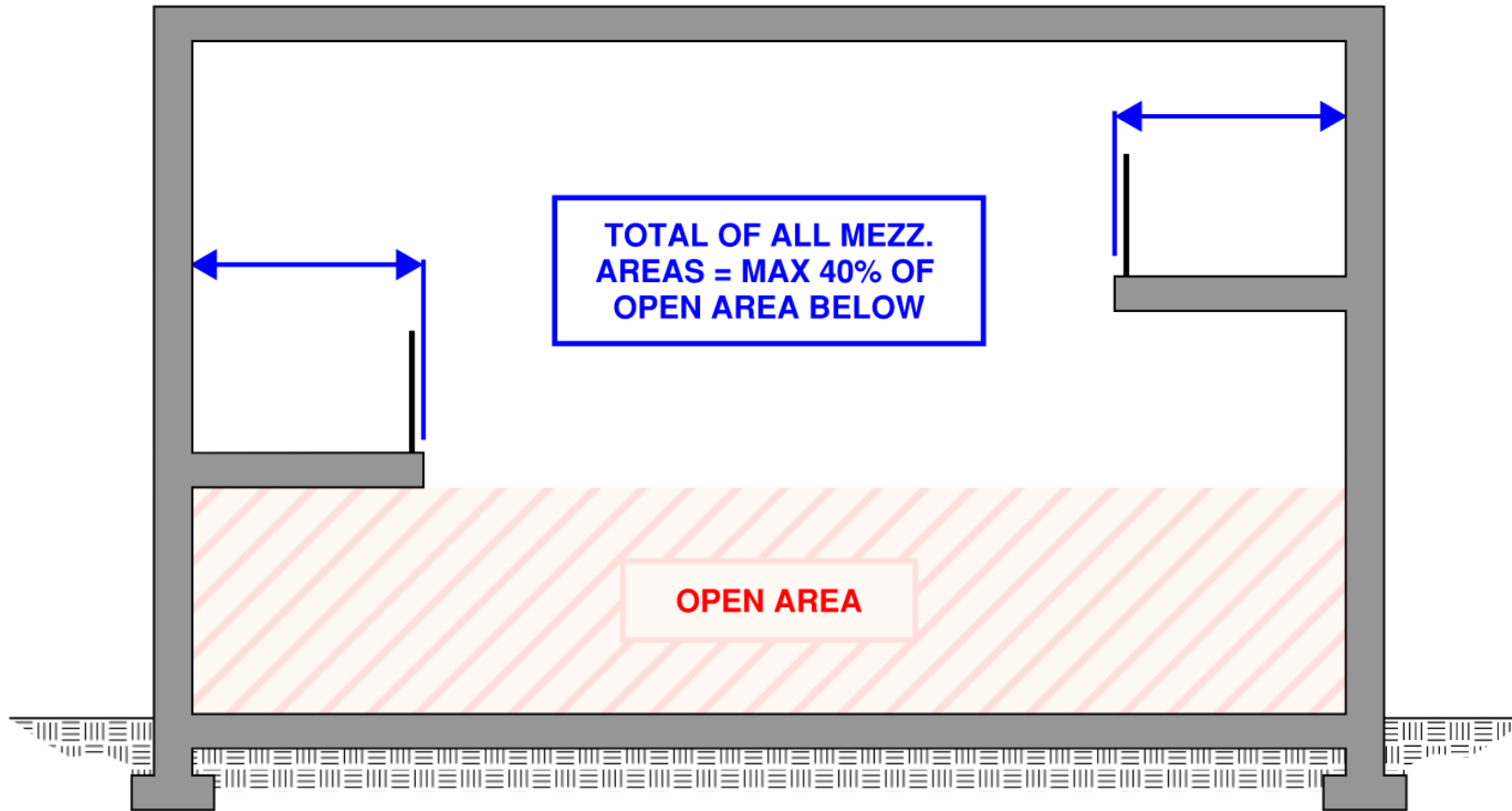
# MEZZANINE AREA EXAMPLE

- Example condition where two suites share a demising separation that jogs at the mezzanine level and how the 40% is evaluated.



# MEZZANINE AREA EXAMPLE

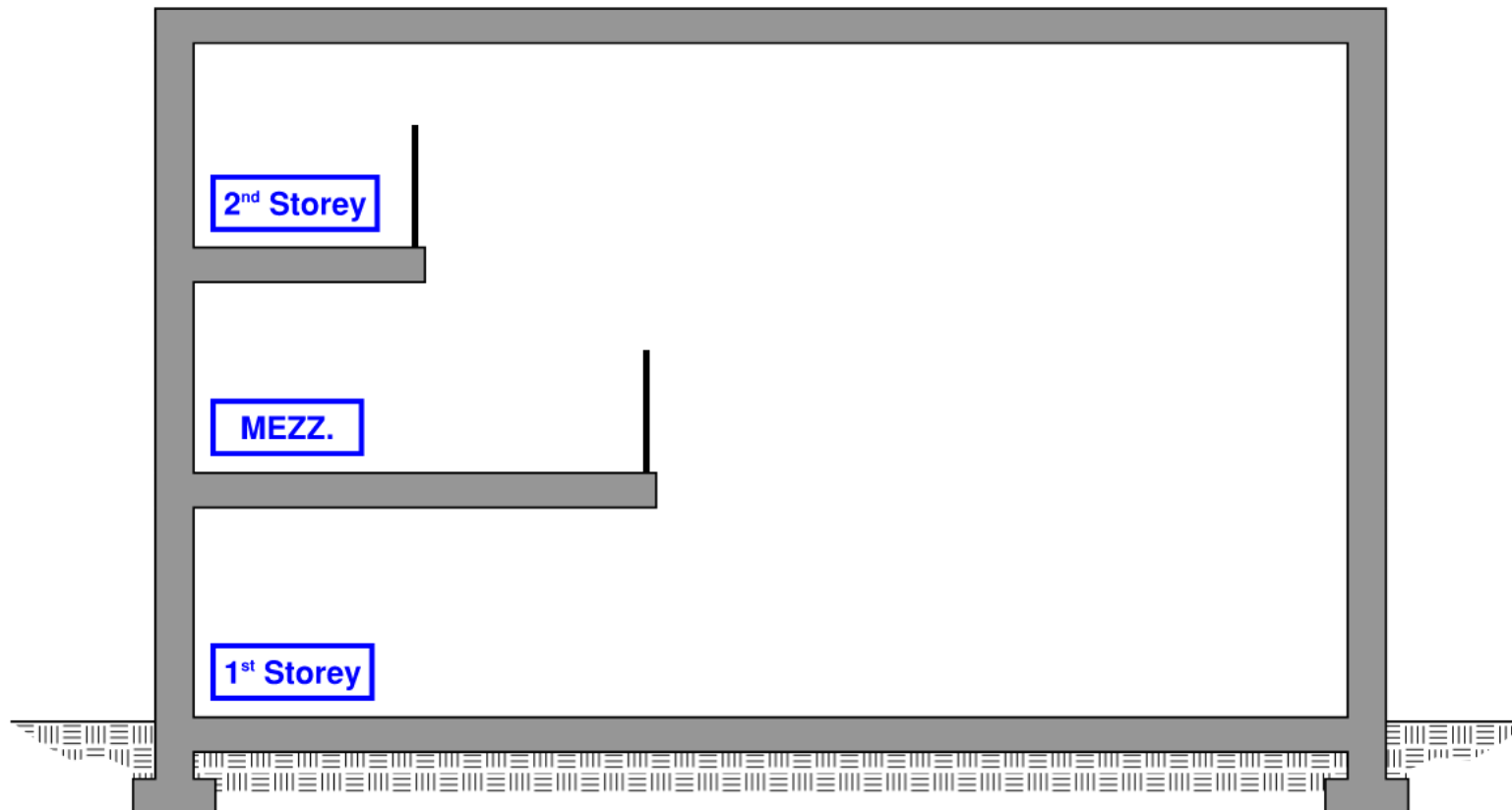
- Example of mezzanines being provided at different elevations is permitted, provided they do not overlap, otherwise .....



$$M1 + M2 = 40\% \text{ of } A$$

# SUPERIMPOSED MEZZANINES – 3.2.1.1.(4) / 9.10.4.2.(1)

- Each mezzanine that is partly or wholly superimposed above the first mezzanine level is required to be considered a storey in building height.



# STRUCTURAL FIRE PROTECTION RATING

## MEZZANINE FIRE RATING – 3.2.2.X / 9.10.8.

3.2.2.XX – Construction articles specify whether a fire resistance rating is required (unrated, 45min, and 1h).

9.10.8.1.(1) – unrated or 45min fire resistance rating required.

- Supporting structure of the mezzanine requires a fire resistance rating same as the mezzanine rating  
*(Some 3.2.2 construction articles permit a structure to be of noncombustible construction and unrated).*
  
- **Firestopping**
  - Firestopping is only required at penetrations of a fire separation or a membrane forming part of an assembly require to have a fire resistance rating (i.e. gypsum board).
  - Mezzanines are not fire separations and may only require firestopping where penetrates are through a membrane forming part of the mezzanines fire resistance rating (i.e. assemblies with no membrane do not require firestops).



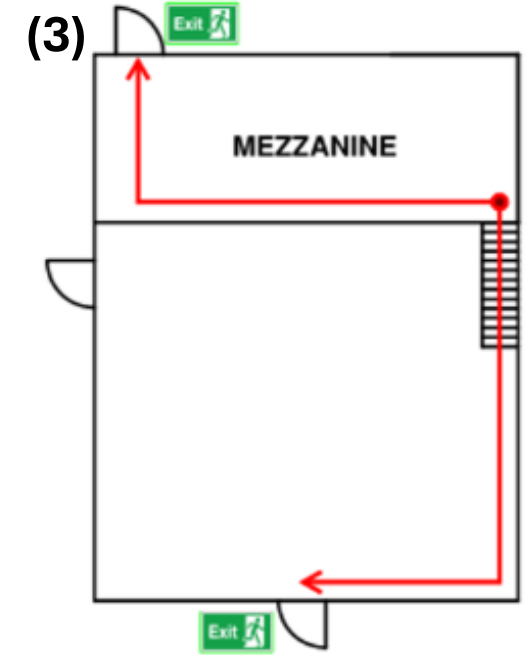
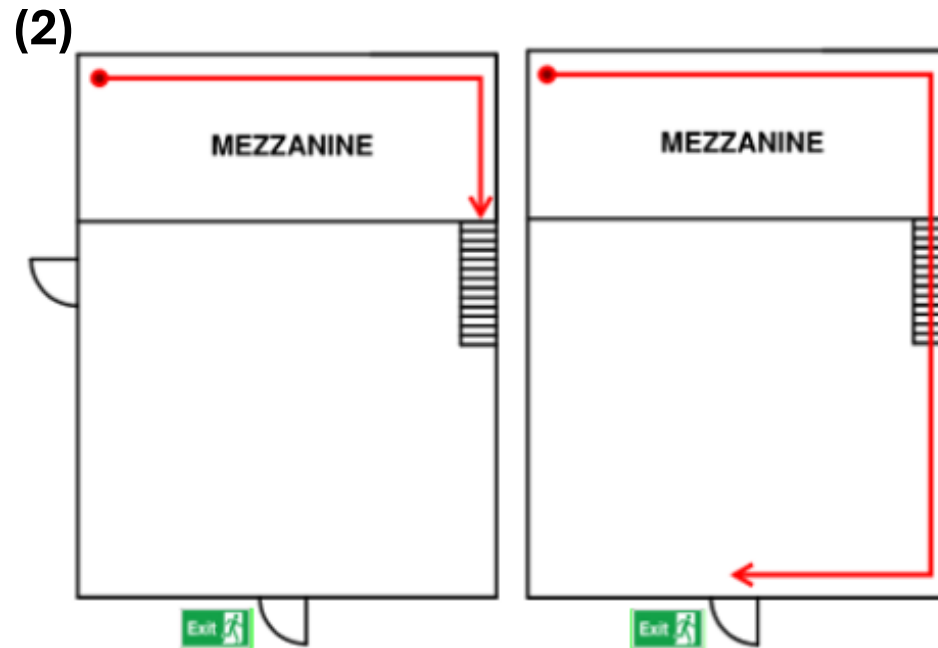
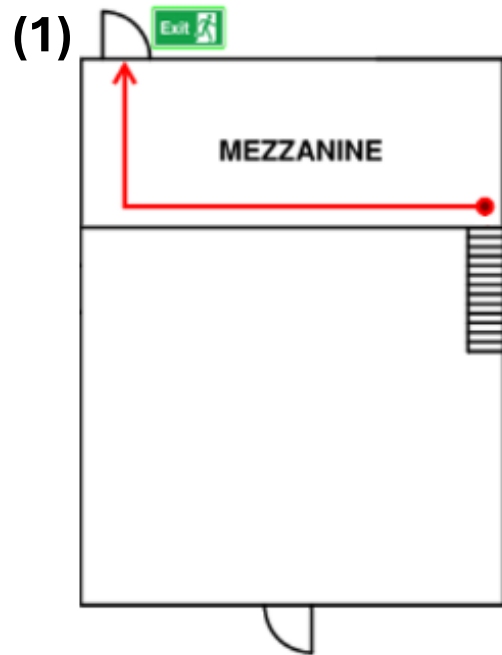
# MEZZANINE EGRESS

# MEZZANINE EGRESS – 3.4.2.2 / 9.9.8.6

Three options for mezzanine egress:

**Provisions are the same for both sprinklered and unsprinklered buildings**

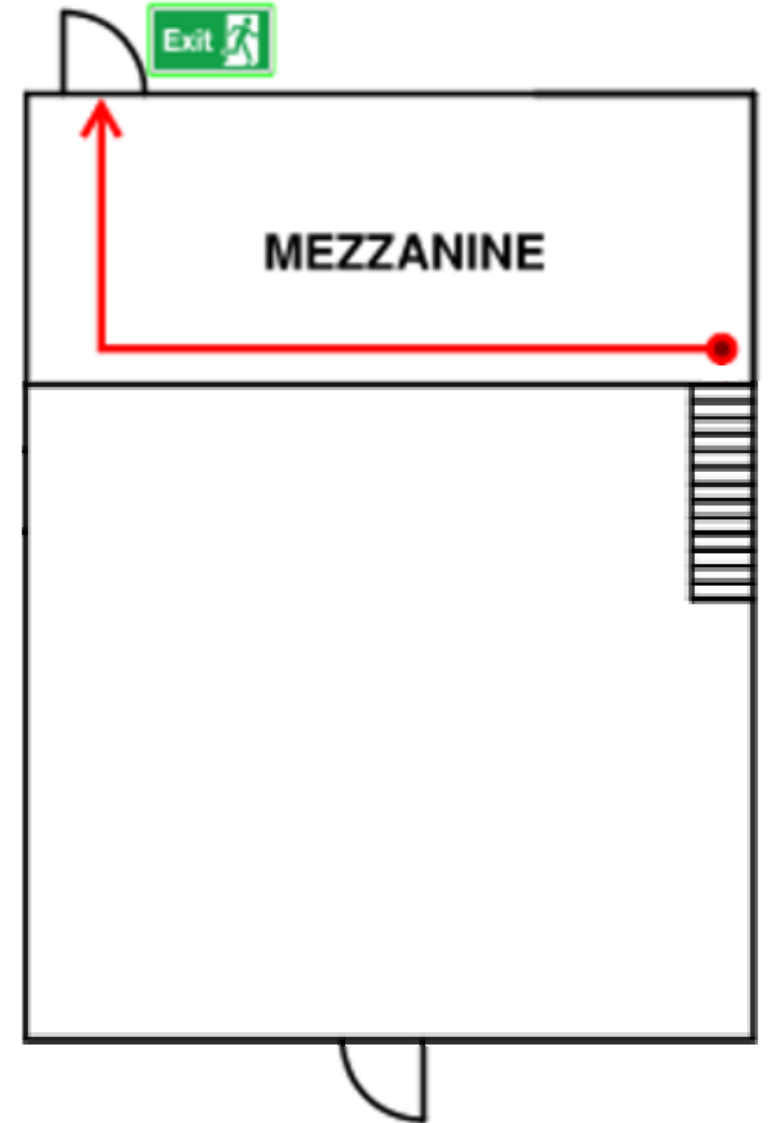
- This is because sprinkler activation is potentially delayed by a higher ceiling in the time required for egress from the mezzanine, thus there is no consequential benefit of sprinkler installation. [Changes to the 1995 NBC – Code Change Rational]



## MEZZANINE EGRESS – SENTENCE (1)

**3.4.2.2.(1) / 9.9.8.6.(1)** – Mezzanine to be served by means of egress at the mezzanine level.

- Maximum 25m travel distance to a single means of egress at the mezzanine level,  
OR
- Two+ means of egress provided at the mezzanine level.

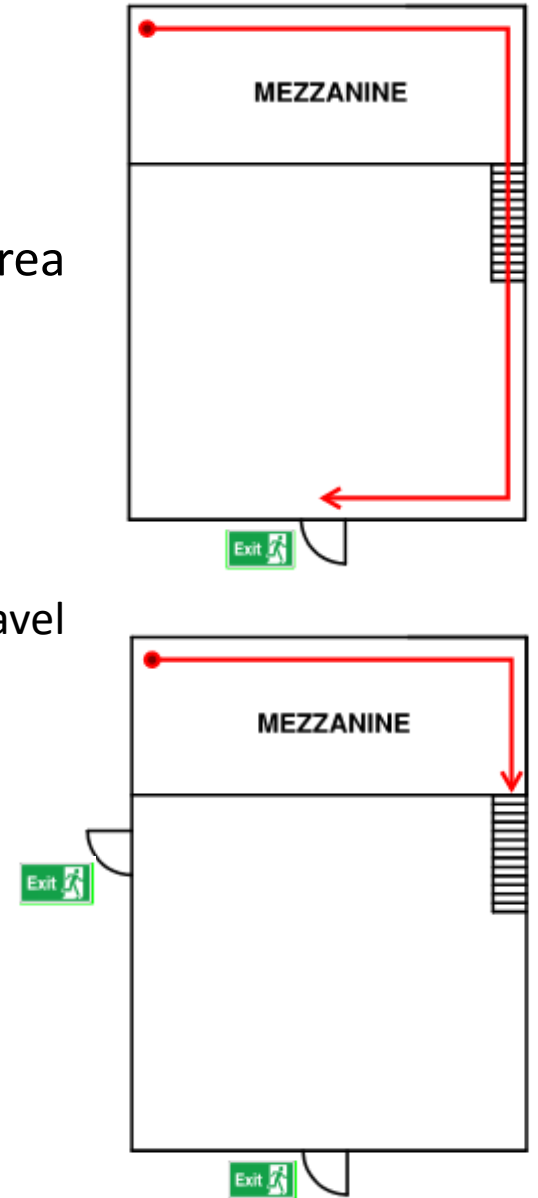


# MEZZANINE EGRESS – SENTENCE (2)

**3.4.2.2.(2) / 9.9.8.6.(2)** – Permits means of egress down an open stair to the floor area below provided:

- Max occupant load is 60 persons.
- Mezzanine area limited per Table 3.4.2.2. / 9.9.7.4.
- Travel distance limited per 3.4.2.2 / 9.9.7.4, from anywhere on the mezzanine:
  - To an egress door at the floor area below (**Single egress door**) (this rarely works as travel distance is very restrictive)
  - To the open stair with access to egress doors at the floor area below in conformance with 3.3.1.5. / 9.9.7.4.(1) (**Multiple egress doors**)

Occupancy of Space	Maximum Area, m <sup>2</sup>	Distance Limits, m
Group A - Assembly occupancy (Part 3 Only)	150	15
Group C - Residential occupancy	100	15
Group D - Business and personal services occupancy	200	25
Group E - Mercantile occupancy (Part 3 Only)	150	15
Group F-2 - Medium-hazard industrial occupancy	150	10
Group F-3 - Low-hazard industrial occupancy	200	15

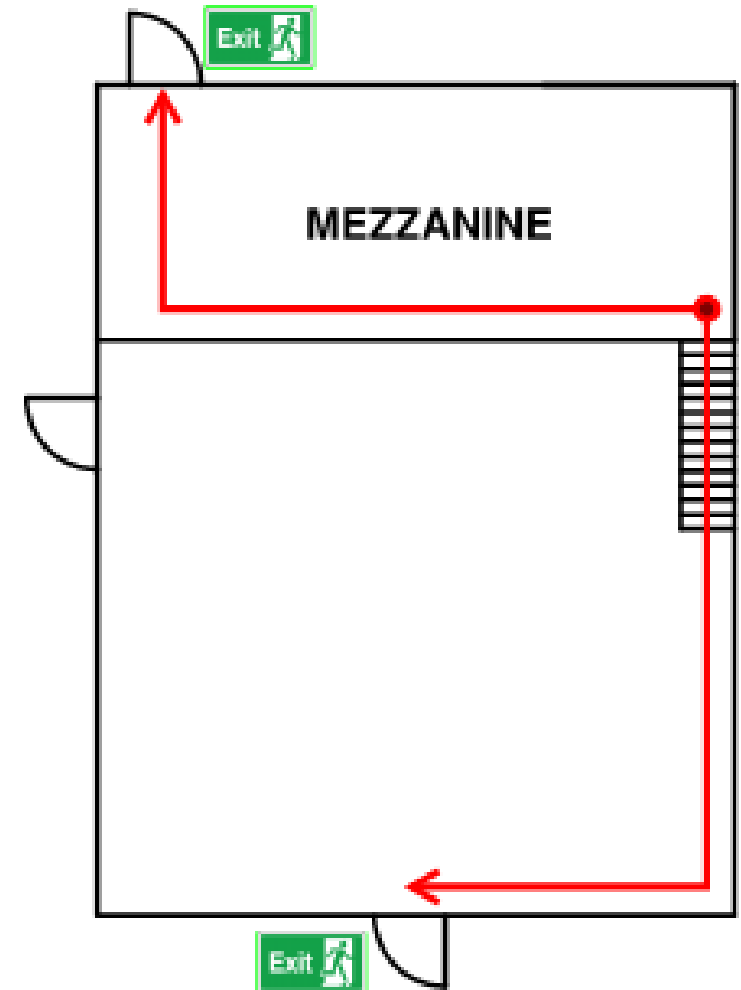


## MEZZANINE EGRESS – SENTENCE (3)

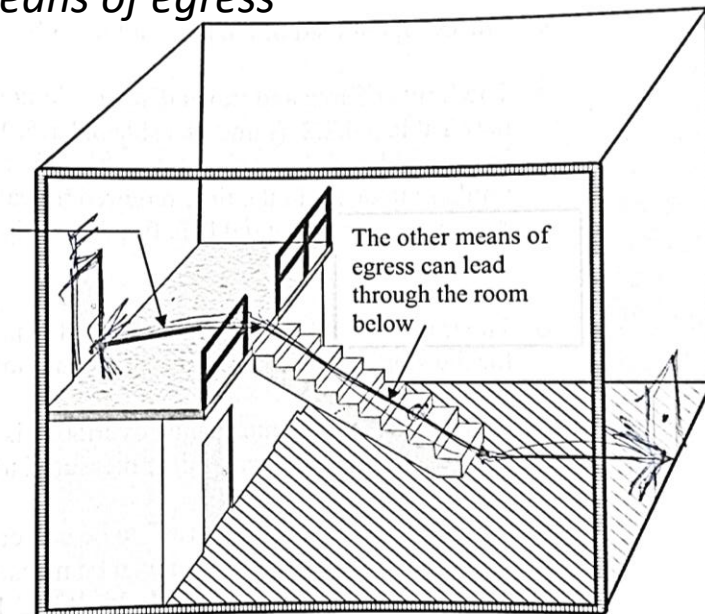
**3.4.2.2.(3) / 9.9.8.6.(3)** – Where the egress does not meet Sentence (2) then a means of egress can be provided at the

- mezzanine level  
**AND**
  - Via an open stair to the floor area below
- Typical travel distance limits now apply

*Note: Wording in Part 3 and Part 9 is a bit different where there are more than two means of egress*



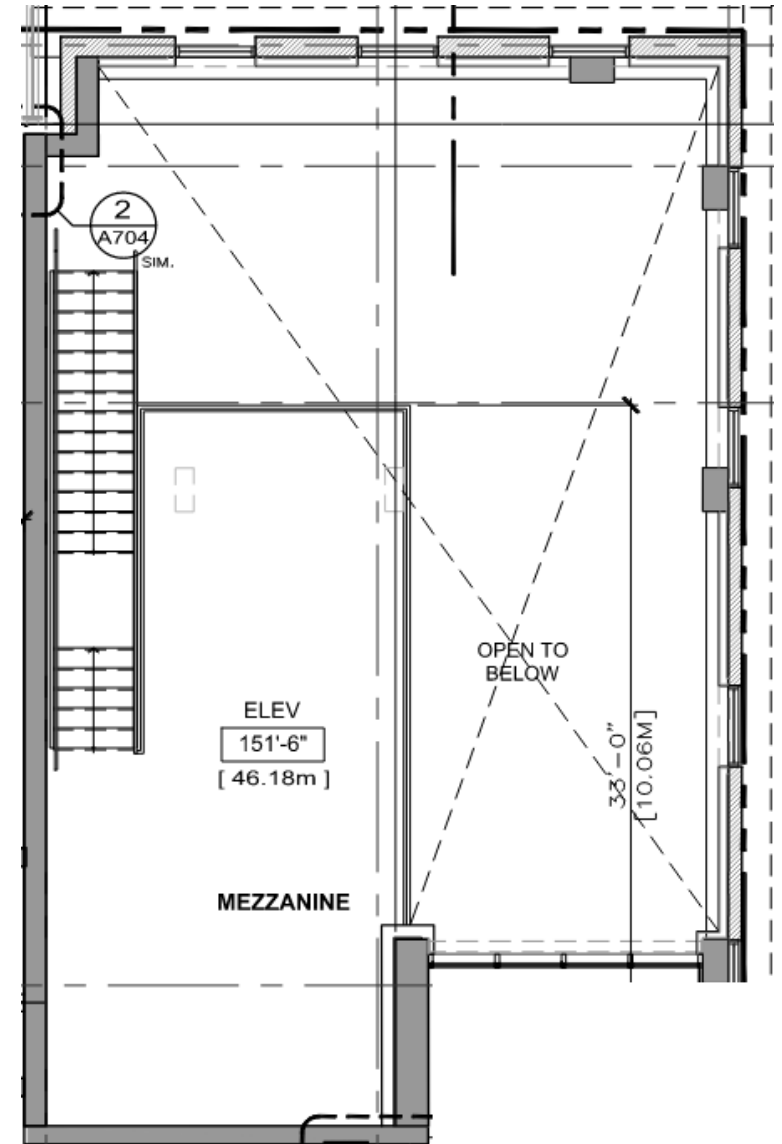
At least half of the means of egress must be at the mezzanine level



# ACCESSIBILITY

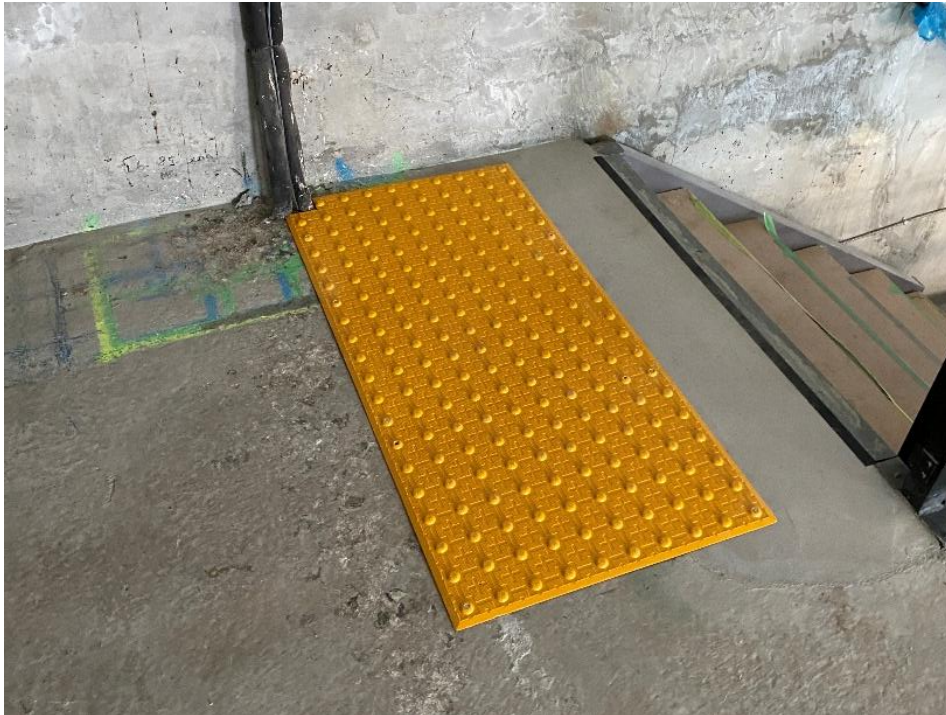
# MEZZANINE ACCESSIBILITY

- **3.8.2.3.(1)** – Access is to be provided throughout all normally occupied areas of the building.
- **3.8.2.3.(2)(g)** – Mezzanines need not be accessible, provided the mezzanine:
  - Is not served by a ramp, passenger elevating device,
  - Is less than 600m<sup>2</sup> in area,
  - Contains facilities that are also on the level below,
  - Does not contain an assembly occupancy more than 100m<sup>2</sup> in area.



# MEZZANINE ACCESSIBILITY

- 3.3.1.19. – Tactile walking surface to be provided at top of open stairs.



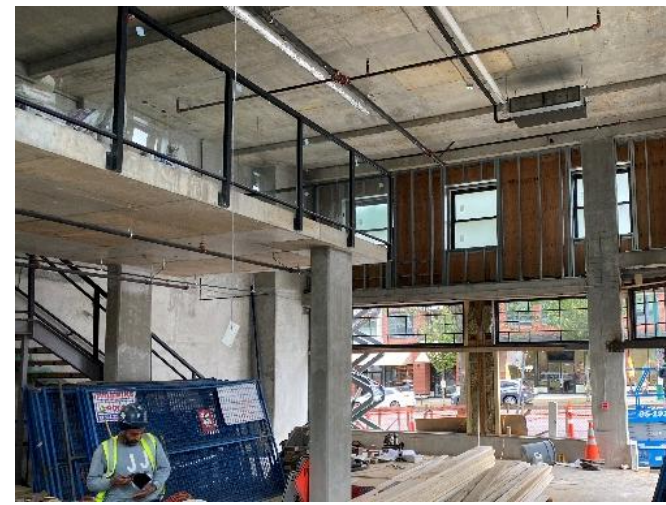
# EXISTING MEZZANINE CONSIDERATIONS

# EXISTING MEZZANINES

- Mezzanines constructed to previous editions of the Building Code may not meet the 2024 provisions, but the Code is not applied retroactively.  
(Note – Mezzanine requirements have generally not changed except in how the 40% mezzanine area is determined)
- Existing mezzanines designed in conformance with previous editions still comply and the attention to basic life safety is still maintained.
- It should not be necessary to make changes to meet the latest edition unless an element is being renovated or replaced (i.e. stairs, guards, handrails).

## Elements that can change the basic life safety :

- Area of enclosed rooms decreases
- Area of enclosed rooms increases
- Change of occupancy



# EXISTING MEZZANINES – CONSTRUCTED WITHOUT A PERMIT

Mezzanines constructed without a permit:

- Question is – Does it lack basic life safety? (Example: area, fire resistance rating, egress).
- If it does lack attention to basic life safety, then it should be improved.

## NBC 1995 Users Guide

Because building owners are frequently unaware of the need to prevent obstructions in these areas, there will be many situations in which partitions have been built, as well as other obstructions. In the case of small buildings, it may be possible to examine the building as if it were one more storey in height and still satisfy the NBC 1995. In other cases, it may be necessary to remove obstructions or provide compensating measures, such as fire alarm and detection systems or automatic fire suppression systems, as well as improving and separating means of egress.

- Users guide acknowledges that mezzanines are often built and retrofitted by people without a permit but does not necessarily mean it needs to be torn down but that there may need to be compensating measures to make the basic life safety better

# EXISTING MEZZANINES – EMPTY TENANT SPACE

Empty tenant space with a mezzanine that is now being fitted out under a tenant improvement, one of the main elements to consider is the mezzanine area:

- If a mezzanine area is already at 40% based on the fully open floor area of the room, then newly enclosed rooms in the floor area below (e.g. washrooms, storage, service rooms) will reduce the permitted mezzanine area (40%) because the open floor area is reduced.
- How to address where the open floor area is being reduced? ..... possibly Alternative Solutions

# ALTERNATIVE SOLUTIONS

# COMMON ALTERNATIVE SOLUTIONS FOR MEZZANINES

## **NBC 2020 3.2.1.1.(3) Intent Statement**

To exclude mezzanines from the calculation of building height if certain conditions are met that limit the size of the mezzanines and their degree of visual obstruction, on the basis that this configuration does not pose an undue fire safety risk to persons.

- It is possible to maintain a level of sensory connection through an alternative solution by replacing one sensory connection (visual) with another (audible).
- A sensory connection can be maintained through the use of smoke detectors or smoke alarms to alert occupants earlier to the need to take action.



# QUESTIONS?

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