

# FSSD Fire Code 2013 Seminar

## Chapter 2 Part 2

### Impacts on design

Song Yew Kee

Associate Director  
DP Architects Pte Ltd  
SIA Rrepresentative

6 March 2013

# Scope of Presentation

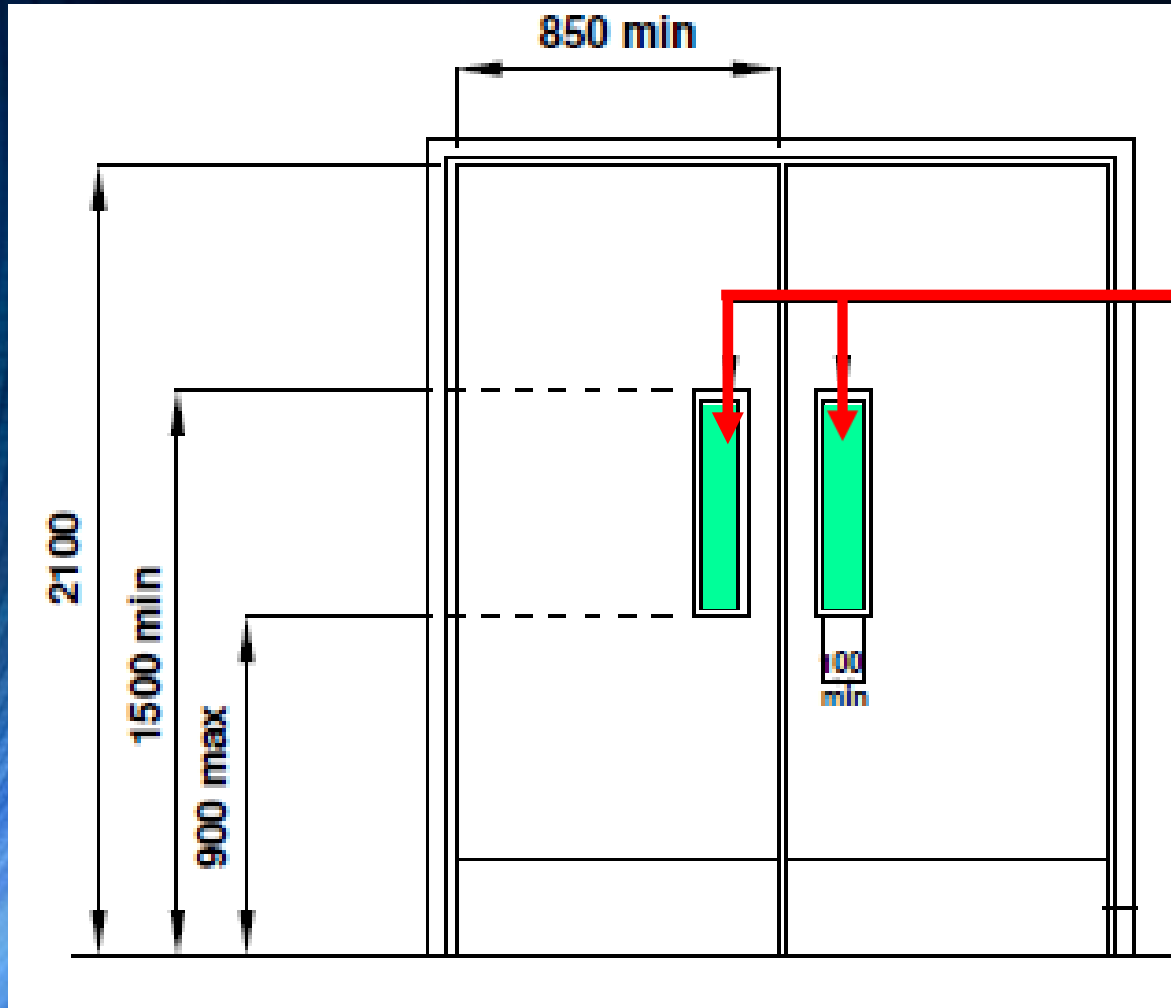
- (1) Fire Door Vision Panel
- (2) 'Storey' and Mezzanine Floor
- (3) Ventilation of Common Internal Corridor
- (4) Hotels, Boarding Houses, Serviced  
Apartments, Hostels, Backpackers Hotels
- (5) Measurement of Travel Distance of Hotel  
Occupancy

# Scope of Presentation

- (6) Minimum Width of Corridors
- (7) New Occupancy Load
- (8) Photo Luminescent Marking
- (9) Outpatient Clinics
- (10) Super High-rise Residential Building

# **(1) Fire Door Vision Panel**

## Chapter 2 Means of Escape – Clause 2.3.9(e) Vision Panel



### Fire Door Vision Panel

- One (1) clear view size only :  
**100mm** (width) x **600mm** (height)
- Protected Staircases, Smoke Stop Lobby, Fire Lift Lobby



## Chapter 2 Means of Escape – Clause 2.3.9(e) Vision Panel



All deviations must obtain **Waiver Approval** by FSSD

## (2) 'Storey' and Mezzanine Floor

**'Storey'**



# Definition of 'Storey'

Fire Code 2013 Cl. 1.2.58(A)

- Any floor or part thereof including platform, mezzanine, attic level and M&E floor

# Definition of 'Storey'

Fire Code 2013 Cl. 1.2.58(A)



3 Storey Building

# Impact of 'Storey' Definition

Fire Code 2013 Cl. 1.2.58(A)

- Smoke Stop Lobby required for buildings (except purpose group I) exceeding 4 STOREYS [2.2.13(a)]
- Re-entry Corridor required for exit staircases serving more than 7 STOREYS [Cl. 2.3.9(L)];
- Refuge Floor required for residential buildings more than 40 STOREYS [Appendix (8)]
- Full compliance of 2 exit staircases, travel distances, fire lifts, fire fighting systems, emergency lights and exit signs, voice communication system etc.

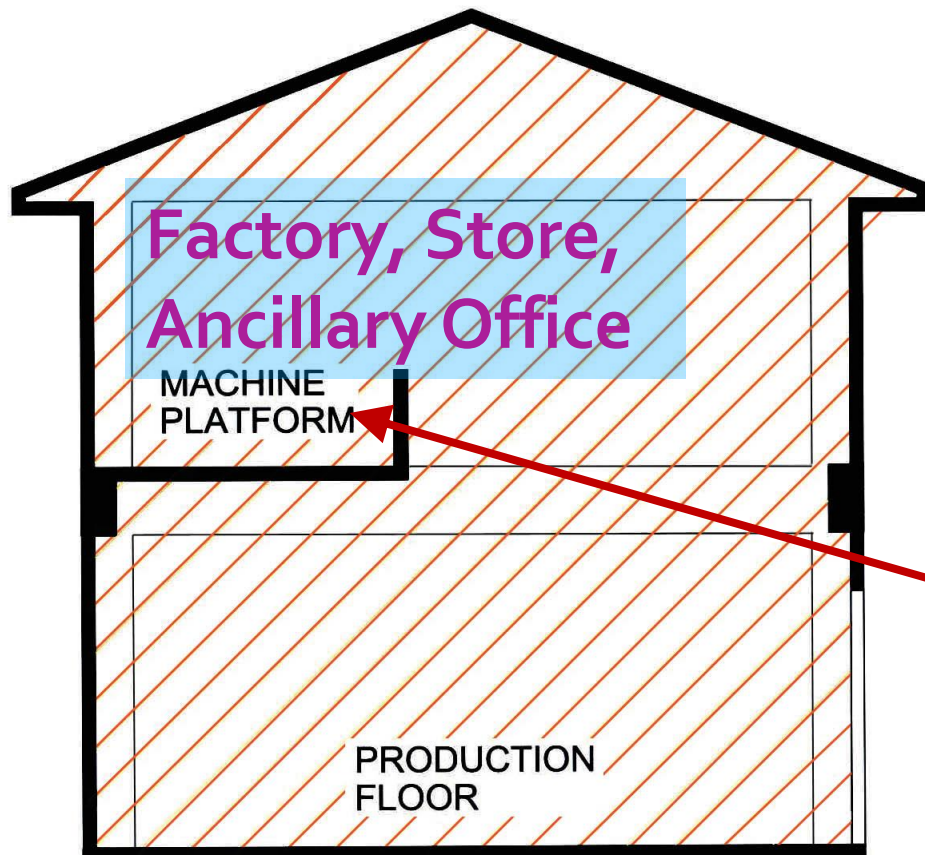


# Mezzanine Floor

## Chapter 2 Means of Escape

– Clause 2.6.2

### Mezzanine Floor



Factory Unit with  
**1 Mezzanine Floor**



## Chapter 2 Means of Escape – Clause 2.6.2

### Mezzanine Floor

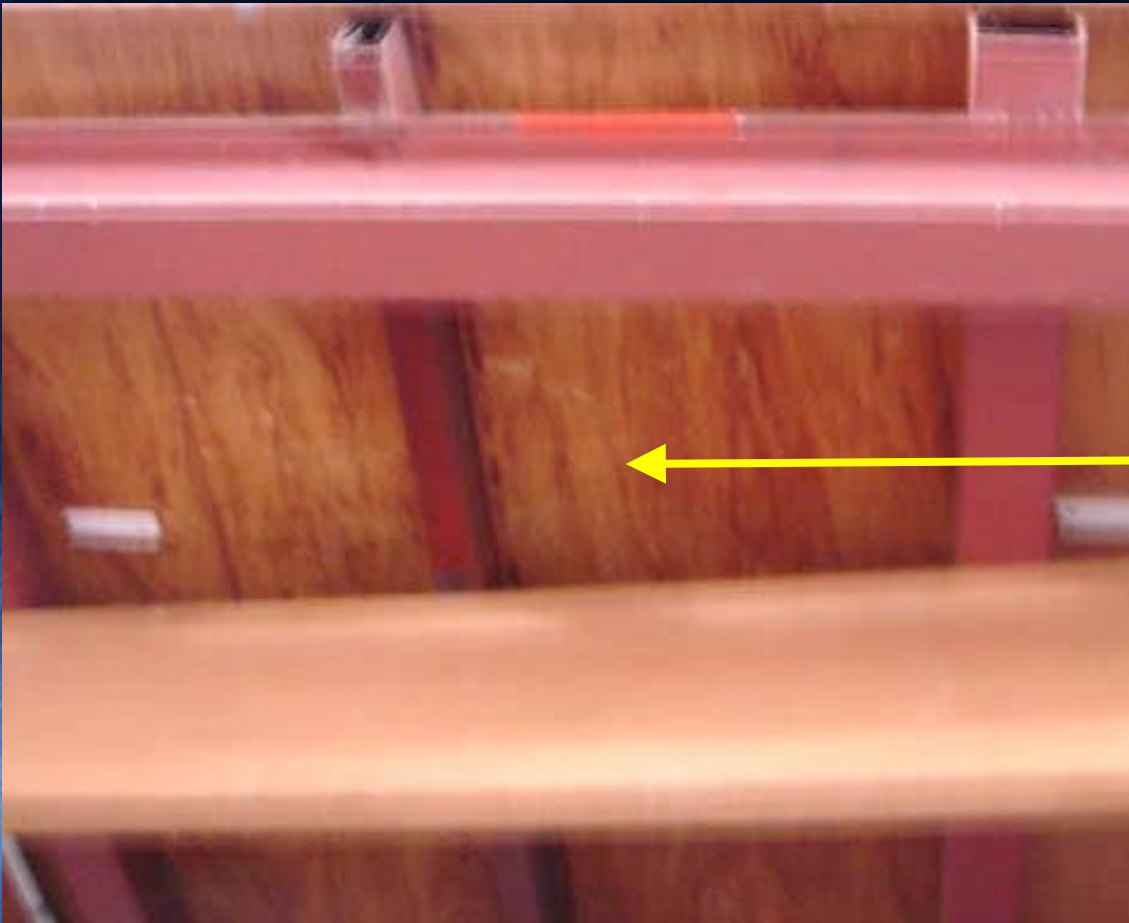


- One (1) open stair
- Only one (1) mezzanine floor above the main factory floor per factory unit
- Fire resistance construction

Timber stair **NOT** allowed

## Chapter 2 Means of Escape – Clause 2.6.2

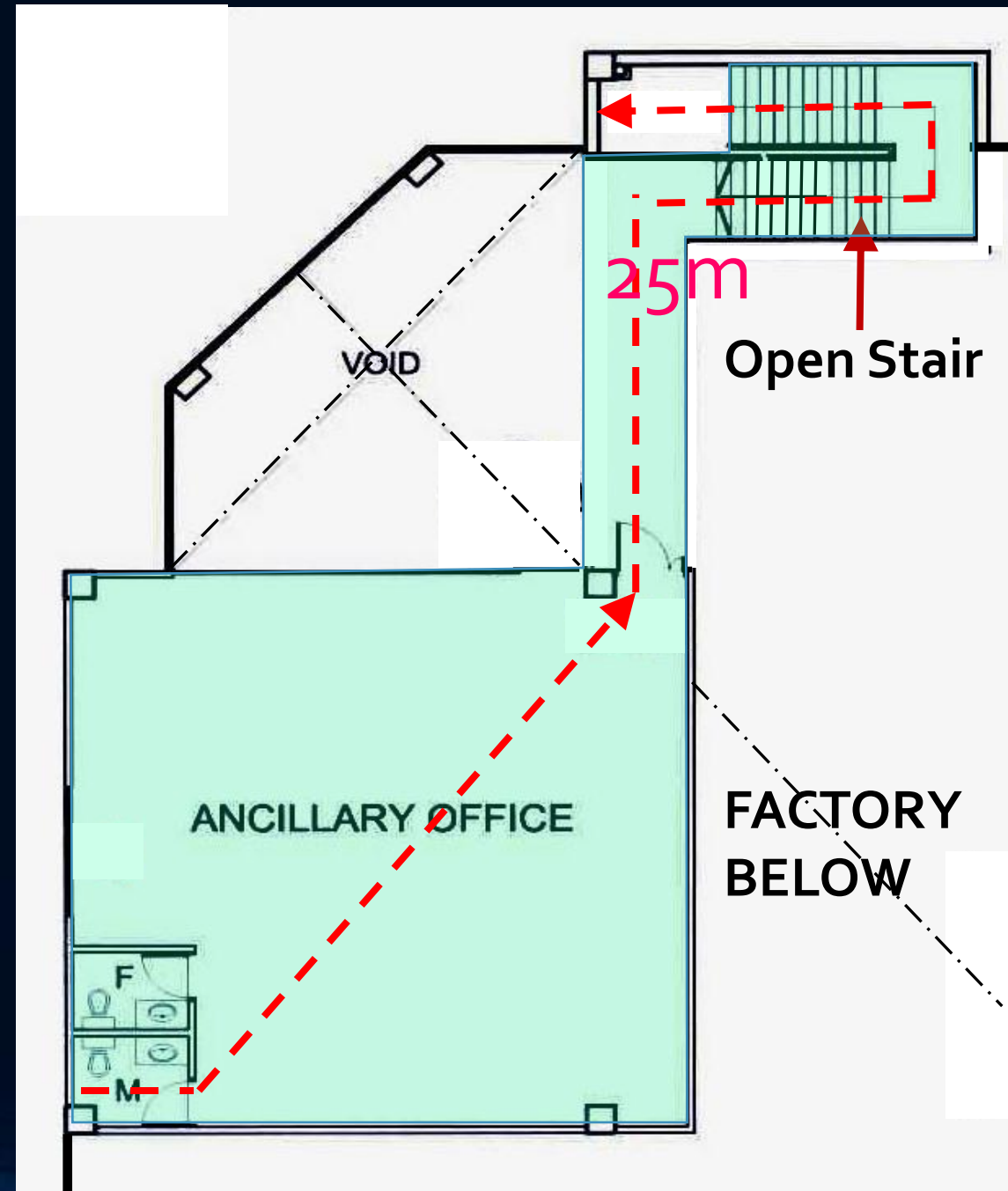
### Mezzanine Floor



Timber floor **NOT** allowed

## Chapter 2 Means of Escape – Clause 2.6.2 Mezzanine Floor

- **Max. One-Way Travel Distance:**
  - **25m** (sprinklered)
  - **15m** (unsprinklered)
- **Max. Floor Area:  $60\text{m}^2$** , including toilets, service ducts, stair, etc.
- **Max. Habitable Height** of mezzanine floor: **24m**



## **(3) Ventilation of Common Internal Corridor**

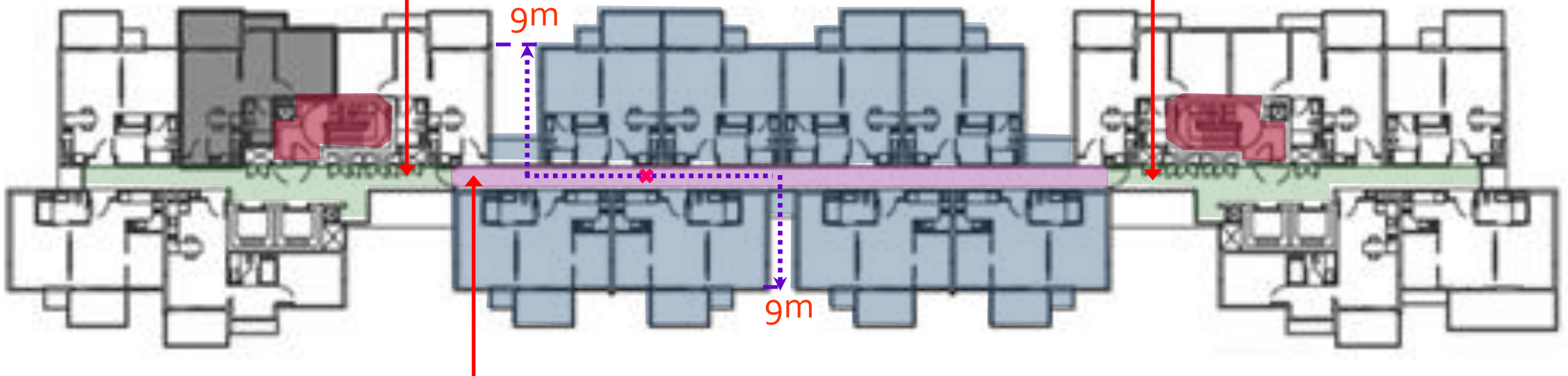


## Chapter 2 Means of Escape – Clause 2.4.13

# Common Internal Corridor – means of ventilation

Smoke Free Approach  
to exit staircase

Smoke Free Approach  
to exit staircase



Common Internal Corridor **NOT** forming part of  
smoke free approach to exit staircase



**(4) Hotels, Boarding Houses,  
Serviced Apartments, Hostels,  
Backpackers Hotels**

## Chapter 2 Means of Escape – Clause 2.7

### Hotel Occupancy

- **Boarding Houses, Serviced Apartments, Hostels, Backpackers Hotels** are now classified under **Hotel Occupancy**





Hotel



Serviced  
Apartments



Backpackers Hotel



Backpackers Hostel



Hostel



# Occupancy Load for Hotel Occupancy

OCCUPANCY LOAD	SCHEDULE 7.1	
PURPOSE GROUP VII	PLACES OF PUBLIC RESORTS	
BUILDING TYPES	HOTELS, HOLIDAY RESORTS, BOARDING HOUSE, SERVICE APARTMENTS, CONVENTION CENTRE, PRIVATE CLUB	
FUNCTIONAL SPACES	REMARKS	OCCUPANCY LOAD (m <sup>2</sup> /person)
Guestroom / Accommodation Unit	Gross floor area of each room. <b>Min. 2 persons</b> per room	<b>15.0</b> (including other areas such as living area, toilet etc.)
Backpacker Hotel	Per room. Subject to a <b>max. of 20 persons</b> . Max. area of a backpacker room shall not exceed <b>60m<sup>2</sup></b>	<b>3.0</b> (including other areas such as living area, toilet etc.)
Service Apartment	Per unit	15.0
SCDF issued circular on <b>2 June 2011</b> to revise Occupant Load for Boarding House / Backpacker Hotel / Budget Hotel. The occupant load of each room shall be calculated separately.		

## Chapter 2 Means of Escape – Clause 2.7.1

### Internal Corridor to Guestroom and Accommodation Unit

(Hotels, Boarding Houses, Serviced Apartments, Hostels, Backpackers Hotels)

➤ **Internal Corridor** to guestroom or accommodation unit shall comply with the followings:

- Fire **Compartmentation** ;
- **Pressurisation** of non naturally ventilated corridor ;
- Subdivide by **Smoke Barriers / Smoke Check Doors** (Clause 2.7.4);
- Provision of additional **low level** or floor mounted **Exit and Exit Directional signs** (Clause 8.1.7(C))

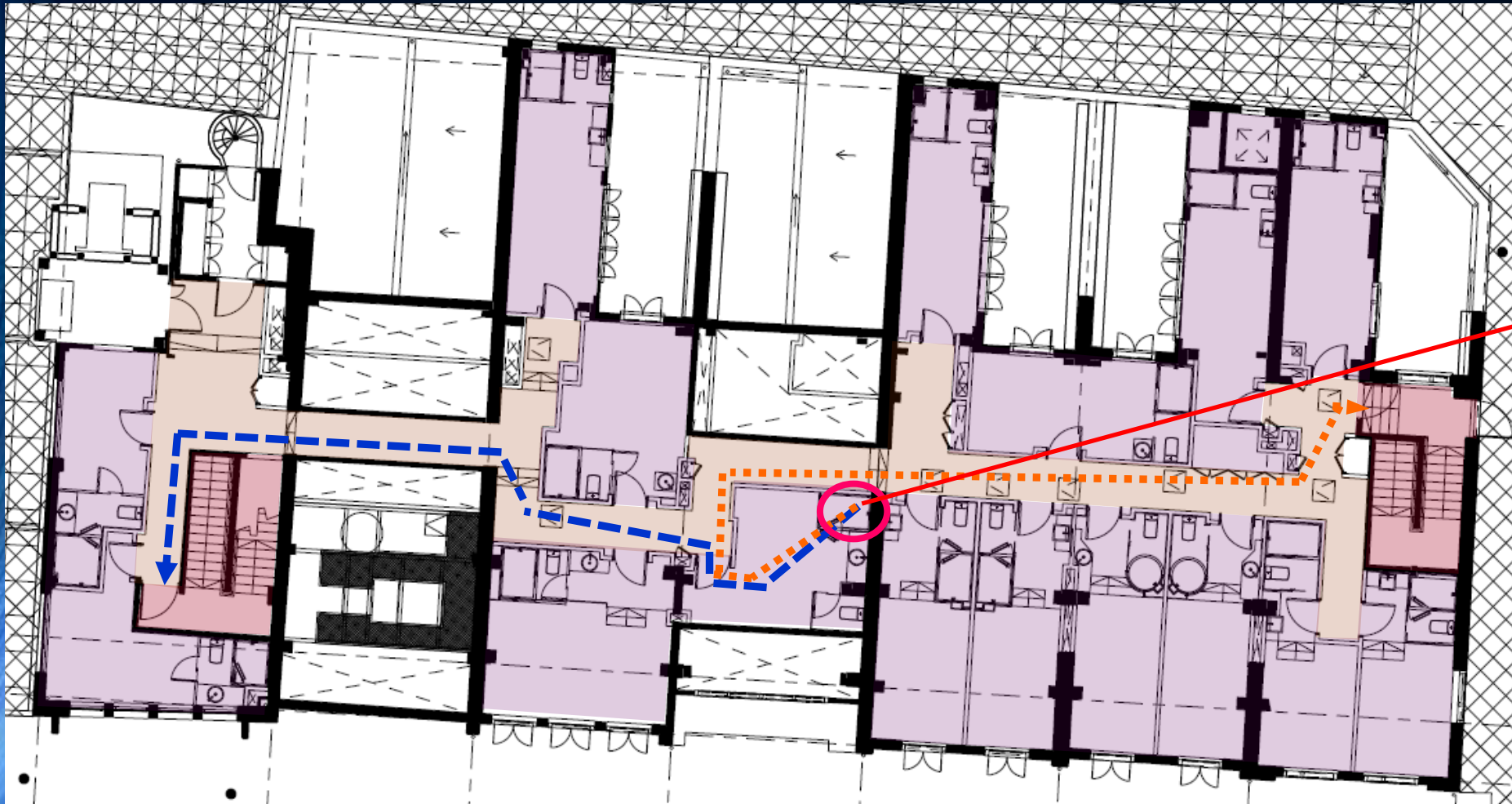


## **(5) Measurement of Travel Distance of Hotel Occupancy**

## Chapter 2 Means of Escape – Clause 2.7.3

# Measurement of Travel Distance

(Hotels, Boarding Houses, Serviced Apartments, Hostels, Backpackers Hotels)



**Most Remote**  
**Point** of  
guestroom or  
suite or  
accommodation  
unit

## Chapter 2 Means of Escape – Clause 2.9.2 (a) & (b)

### Size and Occupant Load of Dormitory Bedroom

- Each dormitory bedroom shall not exceed **120m<sup>2</sup>** and occupant load of **40 persons**.
- Occupant load shall be based on gross floor area on the basis of **3m<sup>2</sup>**. (NOT based on actual number of occupants as shown on plans)

## Chapter 2 Means of Escape – Table 2.2A

### Determination of Exit Requirement (Comparison between fire codes 2007 and 2013)

Type of Occupancy	Max Travel Distance (m) (One-way Travel)		Max Travel Distance (m) (Two-way Escape)		Capacity No. of persons per unit of width (0.5m)				Min. Width (m)	
	Unsprin- klered	Sprin- klered	Unsprin- klered	Sprin- klered	Door Opening		Stairs	Ramps, Corridors, Exit Passageway	Stairs	Corridors
					Ground level	Corridor door				
<b>Fire Code 2007</b>										
Dormitories, Hostels	15	30	45	75	50	40	30	50	1	1
Hotels, Boarding Hse	15	20	30	45	50	40	30	50	1	1
<b>Fire Code 2013</b>										
Hotels, Boarding Houses, Serviced Apts. Hostels, Backpackers Hotels, Dormitories	15	20	30	60	60	50	45	50	1	1.2

## **(6) Minimum Width of Corridors**



# Definition of Corridor

Fire Code 2013 Cl. 1.2.15

- A passage providing means of access from rooms or spaces to an exit

# Definition of Corridor

Fire Code 2013

Cl. 1.2.15



Min. 1200mm

# Minimum Width of Corridors

## Fire Code 2013 Table 2.2A Exit Requirement

Type of Occupancy	Min Width Corridors
High hazard	1.2m
Industrial buildings (factories, workshops, godown / warehouse)	1.2m
Shops	1.2m
Offices	1.2m
Places of Public Resort & Car Parks	1.2m (h)
Schools & educational buildings	1½ (a)
Hospitals	2 (b)
Hotels, Boarding Houses, Serviced Apartments, Hostels, Backpackers Hotels, Dormitories	1.2m
Blocks of flats / maisonette	1.2m
Detached, semi-detached & terrace house, townhouses	0.9m



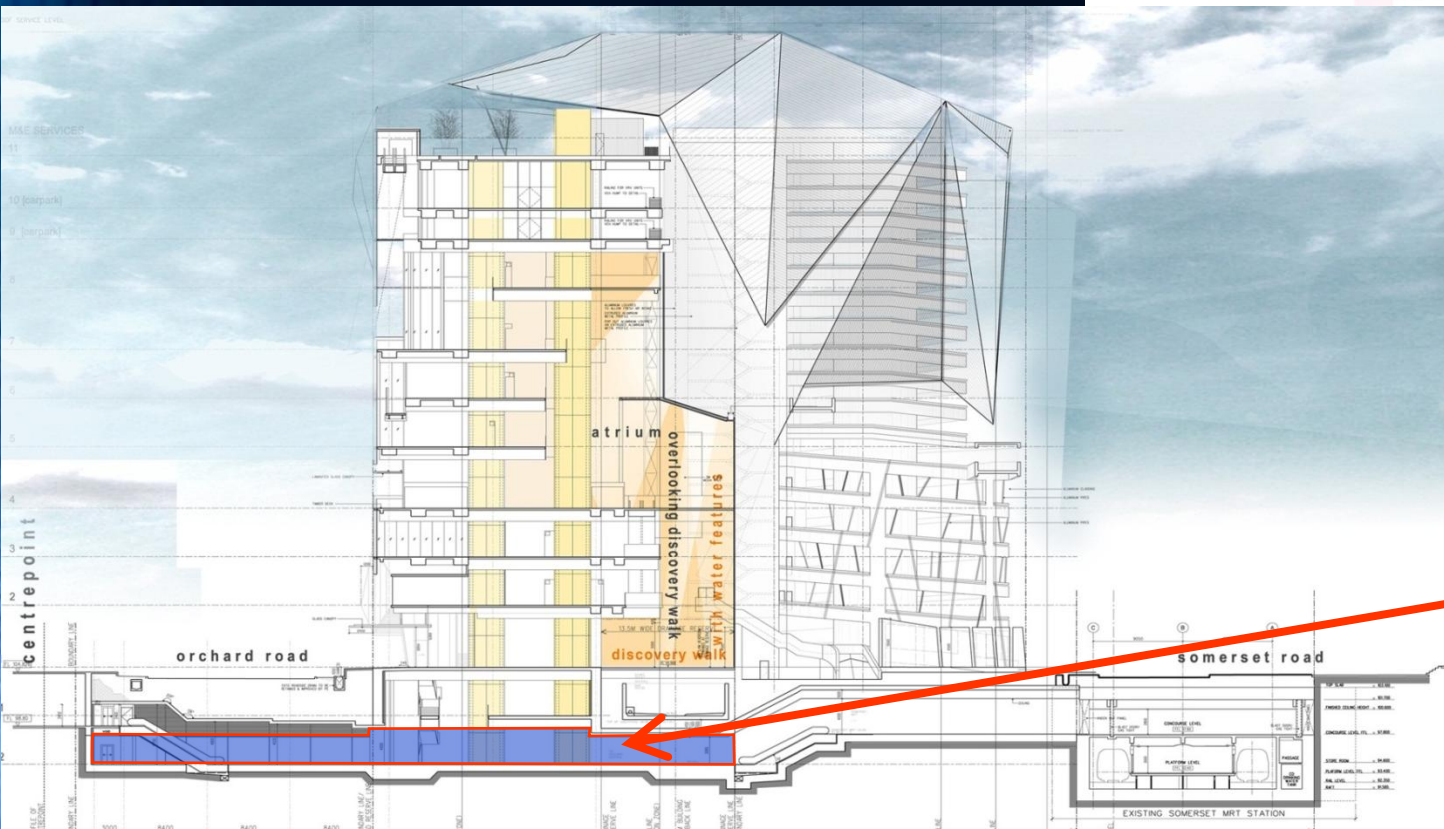
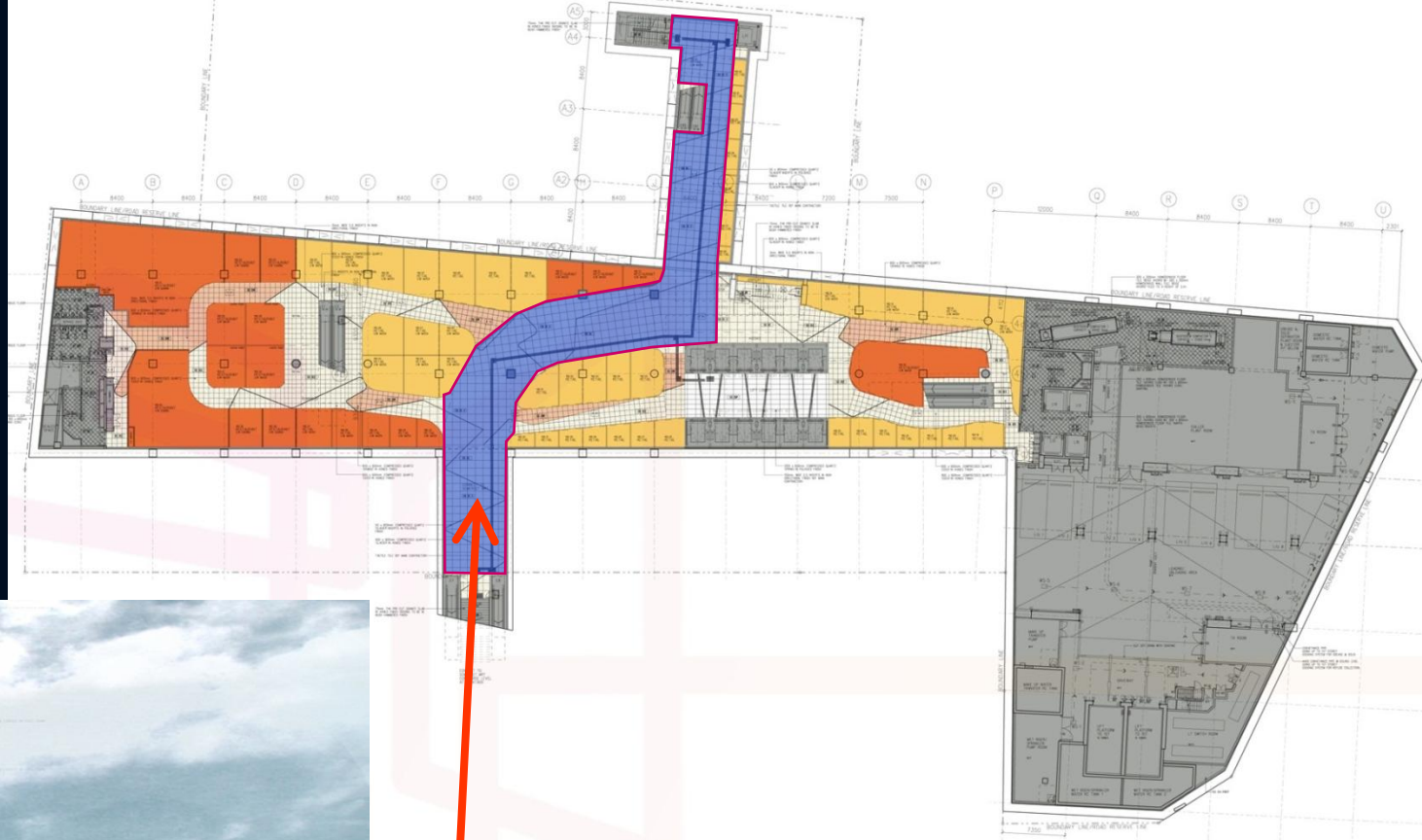
## **(7) New Occupancy Load**



# New Occupancy Load

OCCUPANCY LOAD	SCHEDULE 4, 5, 7.1, 7.9, 7.10	
PURPOSE GROUP IV, V, VII	OFFICES, SHOPS, PLACES OF PUBLIC RESORTS	
BUILDING TYPES	OFFICES, BANKS, PUBLISHERS, STOCK BROKERS	
	SHOPS, SHOPPING CENTRES & ARCADES	
	HOTELS, HOLIDAY RESORTS, BOARDING HOUSE, SERVICE APARTMENTS, CONVENTION CENTRE, PRIVATE CLUB	
	EATING HOUSES, RESTAURANTS, COFFEE SHOPS, HAWKER CENTRES, FAST FOOD OUTLETS	
	BUS TERMINALS, TRAIN STATION, AIRPORT, FERRY TERMINAL	
FUNCTIONAL SPACES	REMARKS	OCCUPANCY LOAD (m <sup>2</sup> /person)
Aboveground or Underground Pedestrian Linkways with commercial activities		2.0

# New Occupancy Load



Underground pedestrian linkways  
with commercial activities :  
**2.0m<sup>2</sup>/person**

# Occupancy Load for Roof Garden

OCCUPANCY LOAD	SCHEDULE 2, 3.1, 3.2, 3.3, 4, 5, 6, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 7.10, 8	
PURPOSE GROUP II, III, IV, V, VII, VIII	OTHER RESIDENTIAL, OFFICES, SHOPS, FACTORY, PLACES OF PUBLIC RESORTS, STORAGE	
BUILDING TYPES	ALL	
FUNCTIONAL SPACES	REMARKS	OCCUPANCY LOAD (m <sup>2</sup> /person)
Private roof garden/terrace of a residential unit	Non-Simultaneous	---
Children playground (with playground equipment)		5.0
Roof garden for maintenance only		---
Common roof garden / roof terrace accessible to residents, guest, staff or public in the building		1.5 (except areas covered in Annex E)

# Occupancy Load for Roof Garden

## Occupant Load Factors

for Roof Garden / Roof Terrace / Sky Garden / Sky Terrace

**Annex E**

FUNCTIONAL SPACES	REMARKS	OCCUPANCY LOAD (m <sup>2</sup> / person)
1) <b>Sunken</b> planting areas		<b>3.0</b>
2) Planter boxes <b>less than 300mm in height</b> (regardless of whether the planter box is covered with trees / shrubs)		<b>1.5</b>
3) Height of planter box from 300mm to 500mm and covered with trees / shrubs		---
4) Height of planter box from 300mm to 500mm and <b>not covered with trees / shrubs</b>		<b>1.5</b>
5) Height of planter box exceeds 500mm (without access by steps / ramp)		---



# Occupancy Load for Roof Garden

## Occupant Load Factors

for Roof Garden / Roof Terrace / Sky Garden / Sky Terrace

**Annex E**

FUNCTIONAL SPACES	REMARKS	OCCUPANCY LOAD (m <sup>2</sup> / person)
6) Depth / height of sunken / elevated water feature (permanent / fixed structure) less than 300mm		3.0
7) Depth / height of sunken / elevated water feature (permanent / fixed structure) 300mm or more		---
8) Jogging track / designated foot path not exceeding 3m in width		3.0
9) Children playground ( with playground equipment)		5.0
10) Roof without public or occupants access (i.e. for maintenance only)		---

# Occupancy Load for Roof Garden

## Occupant Load Factors

for Roof Garden / Roof Terrace / Sky Garden / Sky Terrace

**Annex E**

### NOTES:

When **A&A works** are carried out at an **existing roof garden, roof terrace, sky garden, sky terrace**, regardless whether the A&A increase the occupant load. **QP shall submit plans to SCDF for approval**

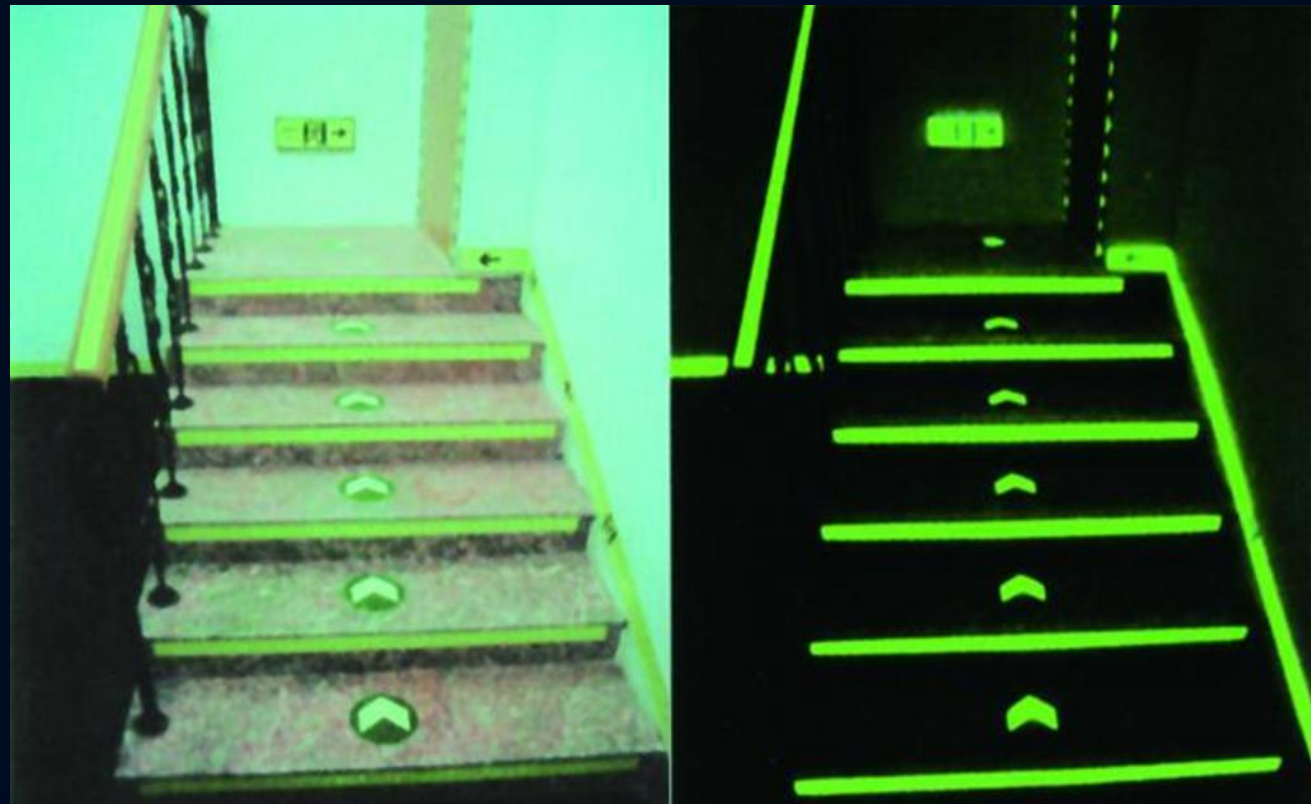
**SCDF circular issued on 1 August 2011**

## **(8) Photo Luminescent Marking**

## Chapter 2 Means of Escape – Clause 2.10.3

# Photo Luminescent Marking

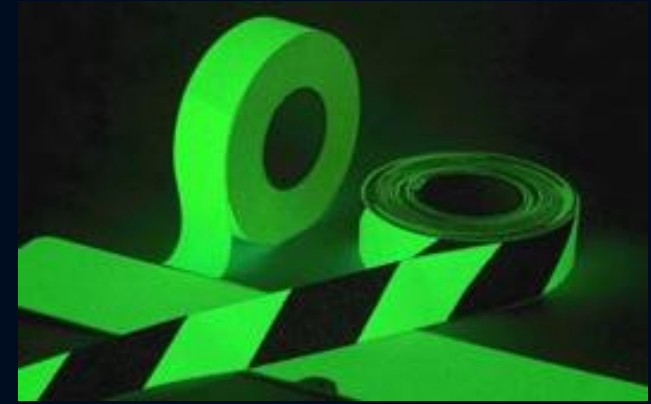
- All buildings **except Purpose Group I & II**
- Along **internal walls** and/or **floors**, and **doors** of the **exit staircase, smoke stop lobby and fire fighting lobby**
- Along **corridor** with exit directional signs





Chapter 2 Means of Escape – Clause 2.10.3

## Photo Luminescent Marking

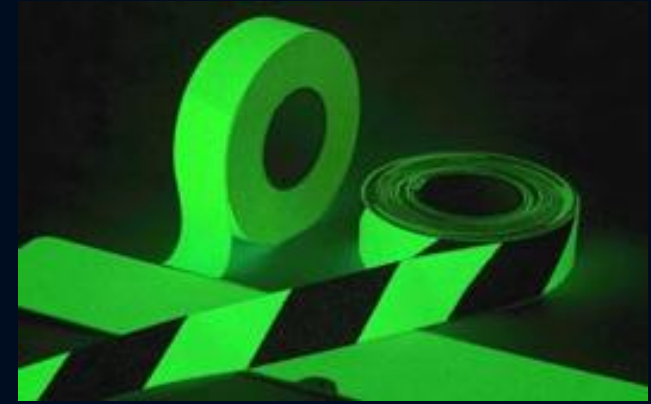


Conditions for **Omission** of Photo Luminescent Marking / Tape

(i) **Emergency power supply** of the Exit Lightings, Exit Signs & Exit Directional signs at the evacuation routes shall be **Battery Pack** or **Central Battery Supply** backed up by **Stand-by Generator**;

Chapter 2 Means of Escape – Clause 2.10.3

## Photo Luminescent Marking



Conditions for **Omission** of Photo Luminescent Marking / Tape

(ii) At least **two (2) Emergency luminaires** in the **Smoke Stop Lobby, Fire Fighting Lobby** and **Corridor** with exit directional signs;

Chapter 2 Means of Escape – Clause 2.10.3

## Photo Luminescent Marking



Conditions for **Omission** of Photo Luminescent Marking / Tape

(iii) At least **one (1) Emergency luminaires** at **every Exit**  
**Staircase Landing.**

## (9) Outpatient Clinics



## Chapter 2 Means of Escape – New Clause 2.5.1 (f)

### Outpatient Clinics

- A new clause to set out the requirements for Outpatient type of Clinic without operating theatre facility and does not provide accommodation ward to house patients on 24 hour basis,
- Not required to comply with hospital requirements ;
- Outpatient Clinics if located within a shopping centre or office building shall be fire compartmented if the building is **not sprinkler protected**

# **(10) Super High-rise Residential Building**

## Chapter 2 Means of Escape – Appendix H: Section B2b

# Additional Fire Safety Requirements for Super High-rise Building

- At least 50% of the gross floor area of the **Refuge Floor** shall be designated as Holding Area. There shall be **NO Residential Unit or part of the unit** on the **Refuge Floor**

## Chapter 2 Means of Escape – Appendix H: Section B2k

# Additional Fire Safety Requirements for Super High-rise Building

- Display signage FIRE EMERGENCY HOLDING AREA inside the staircase and on wall immediately outside staircase at the **Refuge Floor**



## Chapter 2 Means of Escape – Appendix H: Clause C4 **Additional Fire Safety Requirements for Super High-rise Building**

- At least **2 nos.** of **Fire Lifts** shall be provided for the super high-rise residential building

The background is a deep blue gradient. On the left side, there is a faint, light blue grid pattern. On the right side, there are several concentric, curved lines that create a sense of depth and movement, resembling a tunnel or a stylized eye.

Thank you