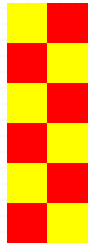




SCDF

The Life Saving Force

... for a safer Singapore



FIRE CODE UPDATES

Mr Randy Tan



Scope of presentation

1. Exit provisions – Cl.2.2.11
2. Fire Escape Plan – Cl.2.3.1c.
3. Exit Directional Sign on Fire Shutter & Smoke Curtain
4. Cavity Barrier
5. Wall & Ceiling Finishes
6. PG III – Workers' dormitory
7. Gas Pipes



Scope of presentation

8. Fire Engine Accessway & Fire Engine Access Road
9. Fire Access Opening to Building for Firefighting & rescue Operations
10. Overhead Clearance
11. Marking of Fire Engine Accessway & Fire Engine Access Road
12. Fire Access Opening (FAP) to compartment or spaces
13. Additional Openings for Ventilation
14. Fire Safety Instruction Manual



Item 1 - Exit provisions

Existing Clause (2013 Code)

Cl.2.2.11 There shall be at least two independent exit staircases or other exits from every storey of a building, unless otherwise permitted under other subsequent provisions of the code.

Incorporating the amended clause released in 2015 via circular

Revised / New Clause 2018

Cl.2.2.11 There shall be at least two independent exit staircases or other exits from every storey of a building, unless otherwise permitted under other subsequent provisions of the Code. **For non-habitable roof, at least one exit staircase shall be provided. Where the area of non-habitable roof is large and one-way travel distance to the exit cannot be met, an additional cat/ship ladder adequately separated in accordance with Cl.2.3.12 and leading to the circulation area of the floor below shall be provided. All access hatches, if provided, shall be readily accessible from the roof. Access hatch opening shall have a minimum clear width of 1m in diameter. The travel distances can be based on that for a sprinkler-protected building for roof areas which are open-to-sky.**

Item 2 - Fire Escape Plan

Existing Clause
(2013 Code)

Revised / New Clause 2018

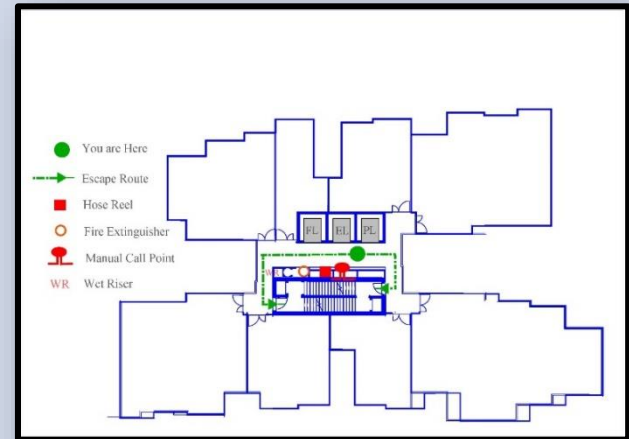
Nil

New Clause

2.3.1c. Fire escape plan

A fire escape plan shall be provided for all buildings except PG I and displayed in common lobbies or lift lobbies such that they are easily viewable by the building occupants and the general public passing through these common areas. The fire escape plan shall have legible letterings and the fire escape routes made clear to the viewer. It shall clearly show the layout of the floor in the correct orientation and highlight the escape routes (in relation to viewer's location), escape corridors and exit staircases using appropriate colours, directional signs and words. Other information required on the plan are for firefighting and evacuation purposes and shall include the locations of the following:

- (1) Fire lifts;
- (2) Evacuation lifts;
- (3) PWD holding points;
- (4) Hose reels;
- (5) Fire extinguishers;
- (6) Manual alarm call points; and
- (7) Rising mains.



Item 2 - Fire Escape Plan

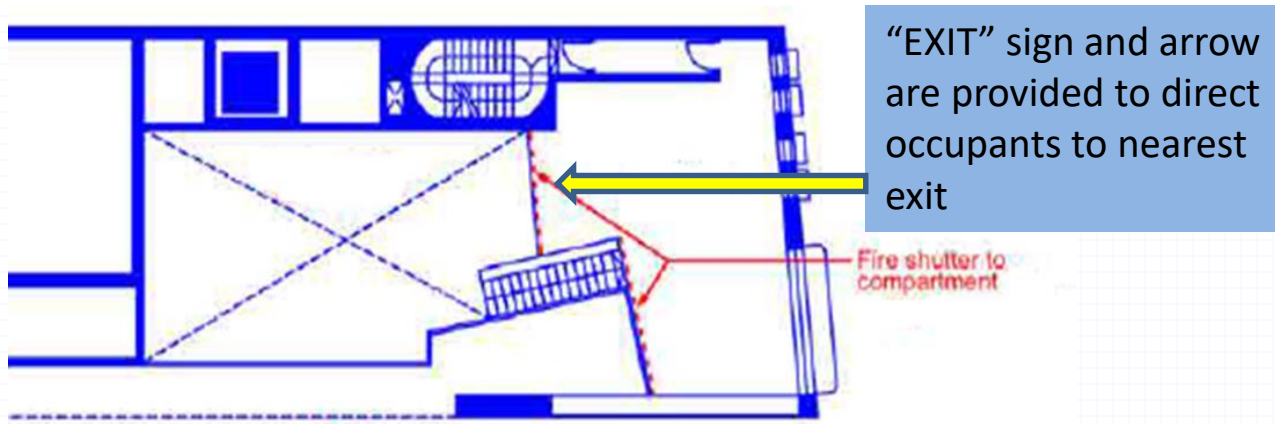


- Orientate the building occupants on the escape routes during a fire emergency.
- The building industry is well aware of such requirements even before implementation.

Item 3 - Exit directional signage

New Cl.3.7.8 Exit directional signage on fire shutter and smoke curtain

Exit directional signage **marked with an arrow and the word “EXIT”** shall be prominently painted/pasted on fire shutters/smoke curtains to redirect building occupants to the nearest exits if the activated shutters visually obscure the building exit and/or directional signs. The signage shall be reflective and the letters at least 100mm in height.



Item 4 - Cavity barrier

Revised Protected shaft containing other services installations

3.8.9b.

A protected shaft used for the enclosure of services shall comply with the followings:

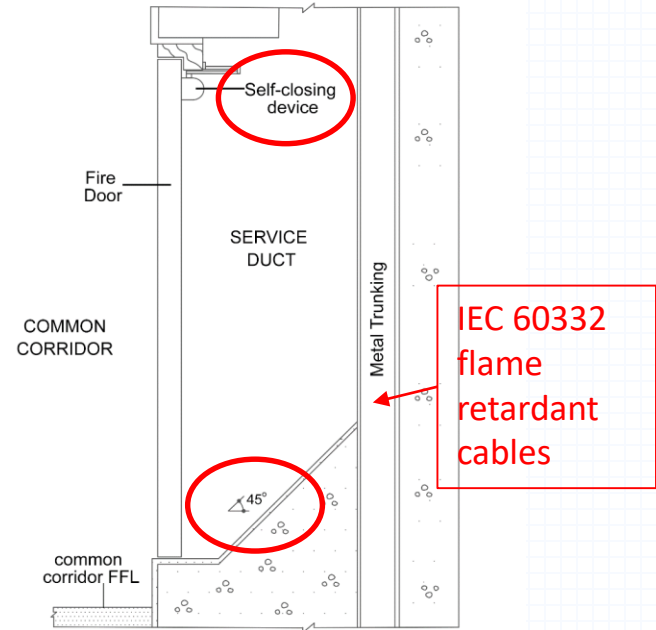
b. Cavity barriers

..... The cavity barriers within trunking enclosing electrical and telecommunication cables can be exempted if the following conditions are met:

- (1) The cables shall be **flame retardant** type complying with IEC 60332;
- (2) The floor within the shaft shall be **sloped upward** with an angle of at least 45° to the floor level; and
- (3) The fire doors to the protected shaft are installed with **self-closing devices**.

Item 4 - Cavity barrier

- Specifically for cavity barrier within trunking
- Cables must be flame retardant type
- Self-closing fire door
- Slope upward to prevent storage within the service shaft



SECTIONAL ELEVATION OF SERVICES DUCT



Item 5 - Wall and Ceiling Finishes

Existing Clause (2013 Code)	Revised / New Clause 2018
<p>Cl.3.13.6 Wall and ceiling finishes in the form of thin sheet of not more than 1.0mm thickness mounted on a non-combustible substrate will not be subject to the requirement of surface spread of flame provisions provided that this exception shall not apply to smoke-stop/firefighting lobbies, exit staircases and passageways.</p>	<p>Cl.3.13.6 Wall and ceiling finishes in the form of thin sheet of not more than 1.0mm thickness mounted to a non-combustible substrate will not be subject to the requirement of surface spread of flame provisions, except for exit staircases and passageways.</p>

Finishes exceeding 1mm

- to comply with requirements stipulated in Table 3.13 (minimum flame spread classification of finishes to wall, column, beam and ceiling)

Building owner to ensure that at all times the exit staircases and protected exit passageways shall be free of any combustible construction

Item 6 – Workers' Dormitory

Existing Cl.2.9.3 Dormitory bedrooms with access through an internal corridor shall comply with the requirements as follows:

- (c) Internal corridors shall be naturally ventilated with fixed openings in an external wall, such ventilation openings being not less than 15% of the floor area of the internal corridor, and
- (d) The ventilation openings in the external walls shall not be less than 3.5m² and shall be unobstructed from parapet wall or balustrade level upwards and be positioned on opposite sides of the corridor such that they provide effective cross-ventilation throughout the entire space of the corridor, and



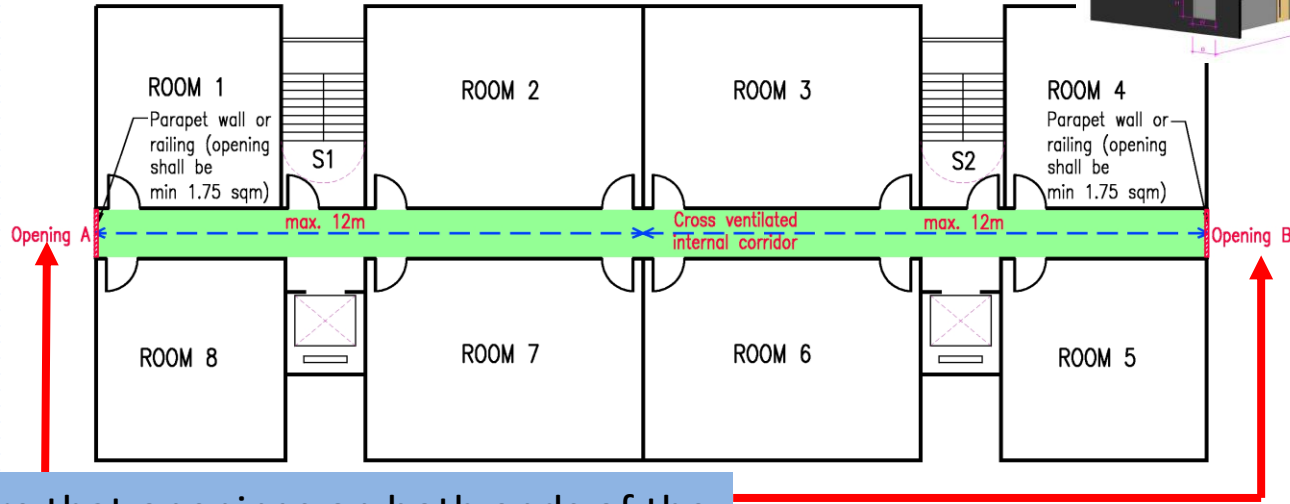
Item 6 – Workers' Dormitory

Revised Workers' dormitory
Cl.9.3.3

e. Internal corridor to dormitory bedrooms

- (3) internal corridors shall be naturally cross-ventilated with fixed openings on the external walls, with such ventilation openings having an aggregate free area of:
 - (a) at least 15% of the total floor area of the internal corridor, or
 - (b) at least 3.5m², whichever is greater.
- (4) **each ventilation openings** in the external walls shall have at least **1.75m² free area, unobstructed by parapet walls or balustrade levels** such that they provide effective **cross-ventilation throughout the entire space of the corridor**;

Item 6 – Workers' Dormitory



- Ensure that openings on both ends of the corridor will always be of the minimum required size.
- Both end openings shall not be further affixed with weather features.

Legend



Cross ventilated internal corridor

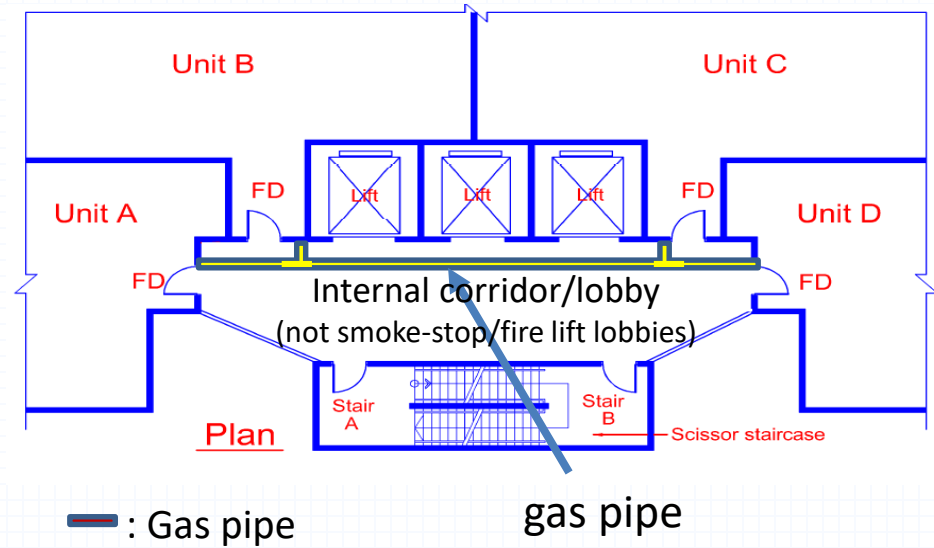
- Aggregate free area of ventilation opening (ie A and B) shall not less than 15% of the floor area of internal corridor, or at least 3.5 sqm, whichever is greater.
- any part of the corridor shall not more than 12m from ventilation openings A and B.



Item 7 – Gas Pipes

New Clause 3.9.8

Gas pipes running inside an internal corridor/lobby without fire resistance enclosure shall be encased with a pipe duct/sleeve vented to an external space.



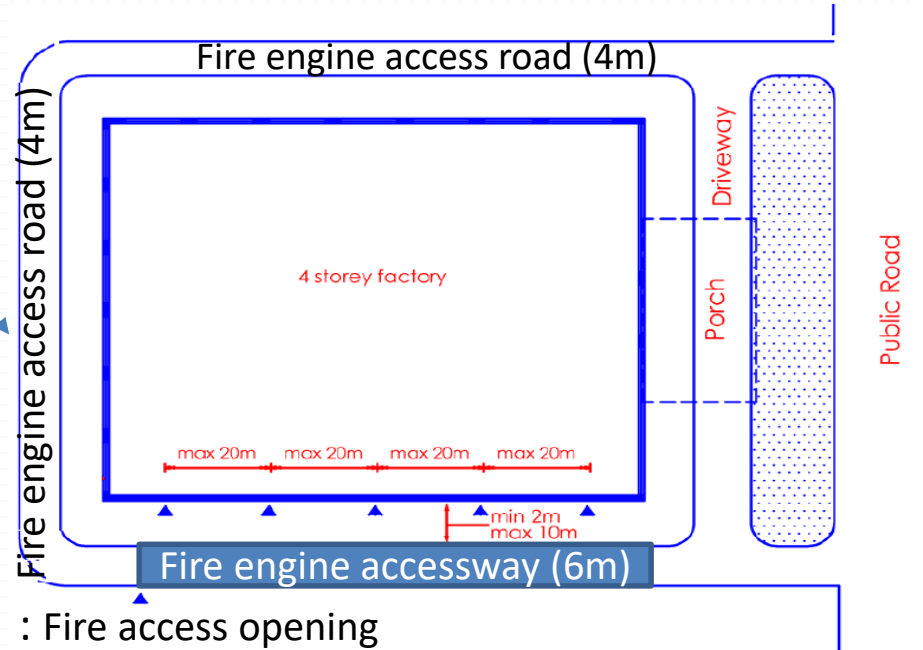
- Not applicable to external corridor
- Gas leak will vent to external so as to minimise chances of catastrophic consequences, such as explosion.

Item 8 – Fire Engine Accessway & Fire Engine Access Road

Existing Clause (2013 Code)	Revised / New Clause 2018
<p>Cl.4.2.1 Accessway shall be provided for accessibility of site to fire fighting appliances. To permit fire-fighting appliances to be deployed, the accessway shall have a minimum width of 6m throughout its entire length. Access openings shall be provided along the external walls of buildings fronting the accessway to provide access into the building for fire-fighting and rescue operations.</p> <p>Accessway shall be provided to within 18m of breaching inlet for buildings that exceed the habitable height of 10m.</p>	<p>Cl.4.2.1 General</p> <ul style="list-style-type: none">a. Fire engine accessways/fire engine access roads shall be provided to ensure site accessibility for firefighting appliances.b. Fire engine accessways shall have an adequate clear width for the deployment of firefighting appliances, in accordance with the habitable height and the type of building, as stipulated in <u>Table 4.2A</u>, <u>Table 4.2B</u> and <u>Table 4.2C</u>.c. Fire engine access roads shall have a clear width of at least 4m.d. Fire access openings shall be provided along the external walls of buildings fronting the fire engine accessway to provide access into the building for firefighting and rescue operations.

Item 8 – Fire Engine Accessway & Fire Engine Access Road

Design load of fire engine access road to comply with fire engine accessway (Cl.4.2.2j.)



- Crucial piece of fire safety requirement for building owner
- Respective loading of fire engine access road & fire engine accessway are clearly stipulated



Item 8 – Fire Engine Accessway & Fire Engine Access Road

Types of Aerial Appliances



Item 8 – Fire Engine Accessway & Fire Engine Access Road

TABLE 4.2B : FIRE ENGINE ACCESSWAY/FIRE ENGINE ACCESS ROAD FOR PG III, IV, V & VII BUILDINGS			
Details	Habitable Height (m)		
	≤ 10	> 10 & ≤ 50	> 50
Width of fire engine access road	≥ 4m		
Width of fire engine accessway	Not required	≥ 6m	≥ 7m
Length of fire engine accessway	-	See Table 4.2.2a.(6)	
Type of firefighting appliance	Pump ladder	CPL 34 & AL 56	AL 56, CPL 60 & HLA 90
Loading capacity of fire engine access road [#]	≥ 24 tonnes	≥ 30 tonnes	≥ 50 tonnes
Loading capacity of fire engine accessway [#]	-	≥ 30 tonnes	≥ 50 tonnes
Axle/Jack loading		See Table 4.2D & Table 4.2E	
Turning facility	See Diagram 4.2.2e .		
U-turn radii			
<p><u>Note :</u></p> <p># = The appended figures for loading capacity of fire engine accessway/fire engine access road are characteristic values.</p>			



Item 8 – Fire Engine Accessway & Fire Engine Access Road

TABLE 4.2C : FIRE ENGINE ACCESSWAY/FIRE ENGINE ACCESS ROAD FOR PG VI & VIII BUILDINGS			
Details	Habitable Height (m)		
	≤ 10	> 10 & ≤ 50	> 50
Width of fire engine access road	≥ 4m		
Width of fire engine accessway	≥ 6m	≥ 6m	≥ 7m
Length of fire engine accessway	See Table 4.2.2a.(7)		
Type of firefighting appliance	CPL 34 & AL 56	CPL 34 & AL 56	AL 56, CPL 60 & HLA 90
Loading capacity of fire engine access road [#]	≥ 30 tonnes	≥ 30 tonnes	≥ 50 tonnes
Loading capacity of fire engine accessway [#]	≥ 30 tonnes	≥ 30 tonnes	≥ 50 tonnes
Axle/Jack loading	See Table 4.2D & Table 4.2E		
Turning facility	See Diagram 4.2.2e.		
U-turn radii			
<p><u>Note :</u></p> <p># = The appended figures for loading capacity of fire engine accessway/fire engine access road are characteristic values.</p>			



Item 9 – Fire Access Opening to Building for Firefighting

Existing Clause (2013 Code)	Revised / New Clause 2018
<p>Cl.4.2.3 Access Opening to Building for Firefighting</p> <p>(a) Openings on the external wall for external fire fighting and rescue operation. Access openings shall include unobstructed external wall openings, windows, balcony doors, glazed wall panels or access panels. Windows, doors, wall panels or access panels must be readily openable from the inside and outside. Inside and outside of access openings shall be unobstructed at all times during the occupancy of the building.</p>	<p>Cl.4.2.3 Fire Access Opening to Building for Firefighting</p> <p>Fire access openings shall be provided on the external wall for external firefighting and rescue operations. This can include unobstructed external wall openings, windows, balcony doors, glazed wall panels and access panels. Windows, doors, wall panels or access panels shall be readily openable from the inside and outside. The inside and outside of fire access openings shall be unobstructed at all times during the occupancy of the building. There shall be no furniture or any other obstruction within 1m from the fire access openings at the landing inside the building.</p>



Item 9 – Fire Access Opening to Building for Firefighting & Rescue Operations



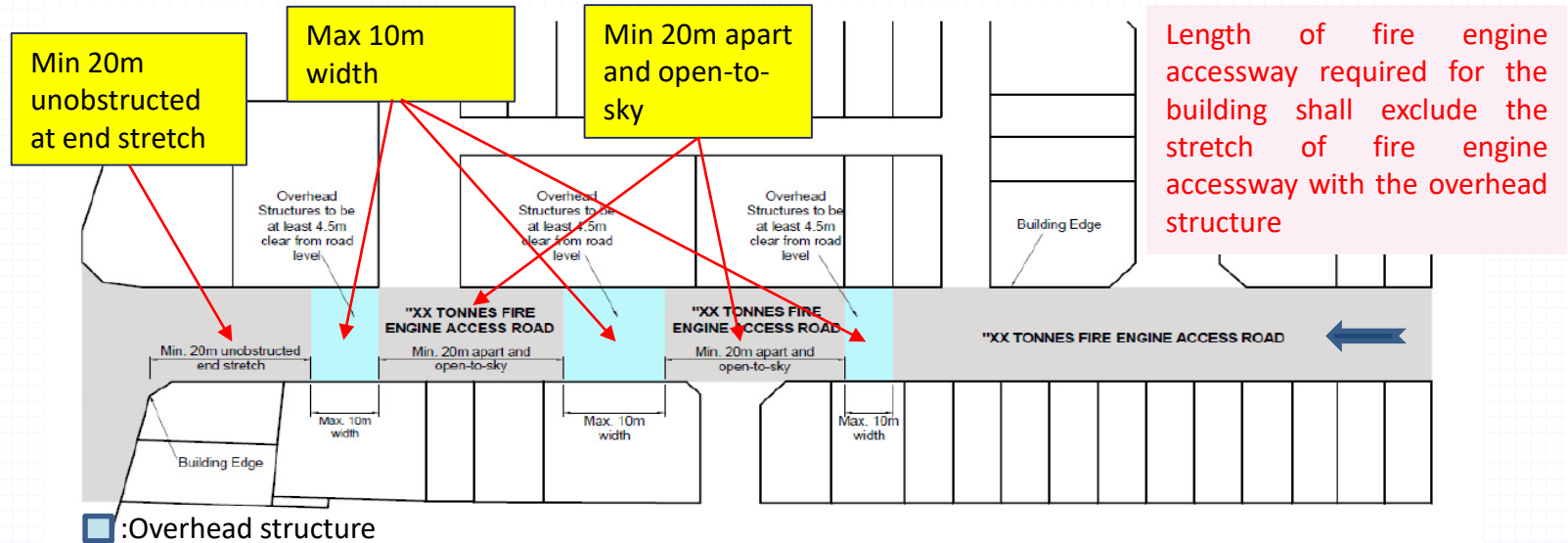
No form of equipment, fixture, furniture or any obstruction are permitted within the stipulated 1m X 1m landing inside the building

Item 10 – Overhead Clearance

Existing Clause (2013 Code)	Revised / New Clause 2018
<p>Cl.4.2.2(d)(vii) Overhead clearance of accessway and fire engine access road shall be at least 4.5m for passage of fire fighting appliances.</p>	<p>Cl.4.2.2f Overhead clearance</p> <p>An overhead structure shall only be permitted over a fire engine accessway/fire engine access road subject to all of the following:</p> <ul style="list-style-type: none">(1) the overhead clearance for passage of firefighting appliances shall be at least 4.5m;(2) the width of the overhead structure shall not be more than 10m;(3) where more than one overhead structure spans across the fire engine accessway/fire engine access road, the separation distance between two adjacent overhead structures shall be at least 20m apart;(4) the length of the end-stretch of the fire engine accessway/fire engine access road shall be at least 20m with no overhead structure; and(5) the length of fire engine accessway required for the building shall exclude the stretch of fire engine accessway with the overhead structure.



Item 10 – Overhead Clearance



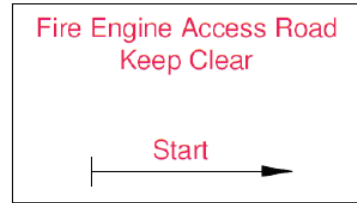
[Building structure over fire engine accessway/fire engine access road](#)

Item 11 – Marking of Fire Engine Accessway & Fire Engine Access Road

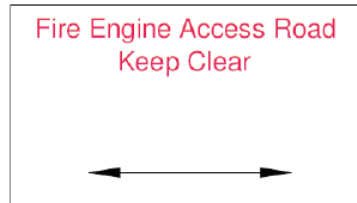
Existing Clause (2013 Code)	Revised / New Clause 2018
<p>Cl. 4.2.2(e) Marking of fire engine accessway</p> <p>(i) All corners of accessway shall be marked.</p> <p>(ii) Marking of corners shall be in contrasting colour to the ground surfaces or finishes.</p> <p>(iii) Accessway provided on turfed area must be marked with contrasting object (preferably reflective) that is visible at night. The markings are to be at an interval not more than 3m apart and shall be provided on both sides of the accessway.</p> <p>(iv) Sign post displaying the wordings 'Fire Engine Access - Keep Clear' shall be provided at the entrance of the accessway. Size of wordings shall not be less than 50mm.</p>	<p>Cl.4.2.2i. Marking of fire engine accessway and fire engine access road</p> <p>(1) All corners of fire engine accessway/fire engine access road shall be marked, except where public roads are designated as fire engine accessway/fire engine access road.</p> <p>(2) Metalled/non-metalled or paved/non-paved surface fire engine accessways/fire engine access roads shall be marked with reflective white or yellow strips of size not less than 100mm (W) x 400mm (L). The markings shall be visible at night and shall be provided on both sides of the fire engine accessways/fire engine access roads at an interval of not more than 5m.</p> <p>(3) A sign post with white background and red wording of not less than 50mm in height shall be provided at the start and end of a fire engine accessway/fire engine access road. The height measured from the ground to the lowest point of the sign shall be between 2m and 2.2m. The sign post shall be visible at night and shall not be positioned more than 3m from the fire engine accessway/fire engine access road. Every part of the fire engine accessway/fire engine access road shall not be more than 15m from the nearest sign post.</p>

Item 11 – Marking of Fire Engine Accessway & Fire Engine Access Road

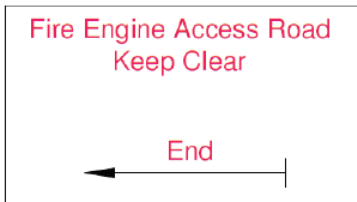
(1) At the start of the fire engine accessway/ fire engine access road



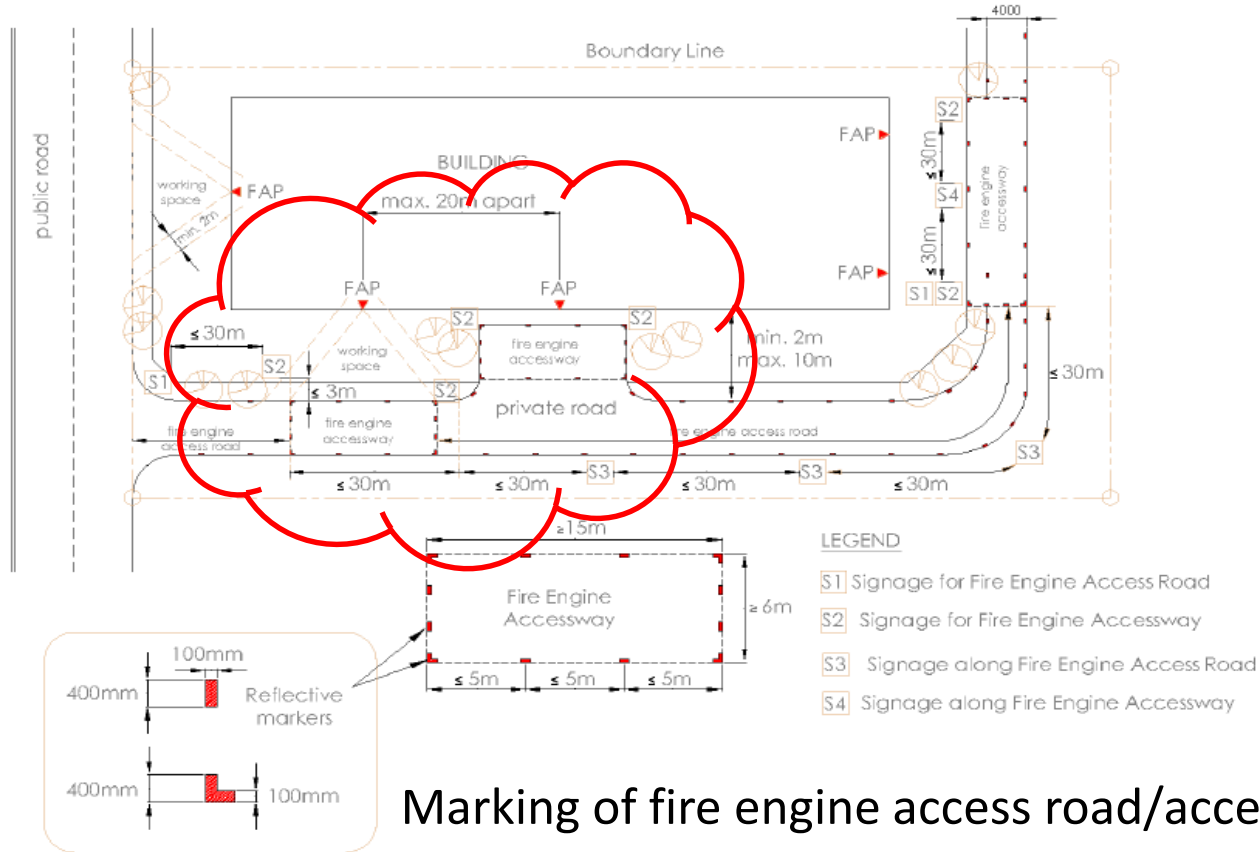
(2) Along the fire engine accessway/ fire engine access road



(3) At the end of the fire engine accessway/ fire engine access road



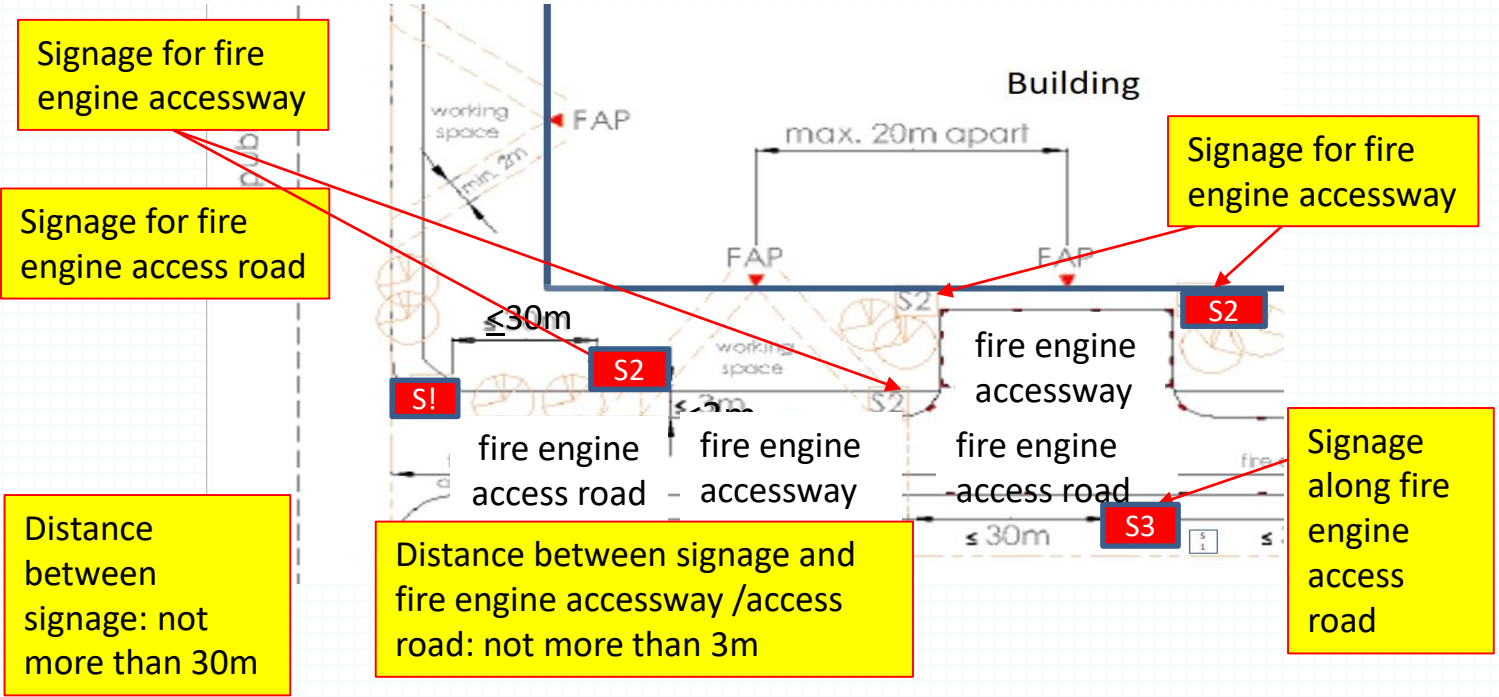
Item 11 – Marking of Fire Engine Accessway & Fire Engine Access Road



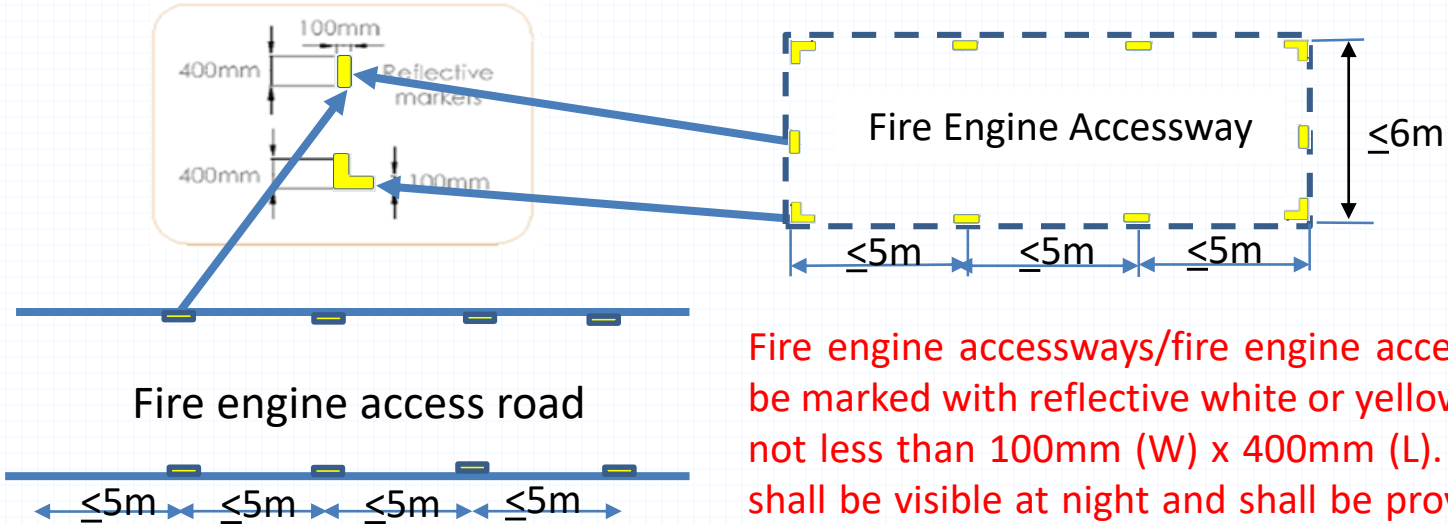
Marking of fire engine access road/accessway



Item 11 – Marking of Fire Engine Accessway & Fire Engine Access Road



Item 11 – Marking of Fire Engine Accessway & Fire Engine Access Road



Fire engine accessways/fire engine access roads shall be marked with reflective white or yellow strips of size not less than 100mm (W) x 400mm (L). The markings shall be visible at night and shall be provided on both sides of the fire engine accessways/fire engine access roads at an interval of not more than 5m.

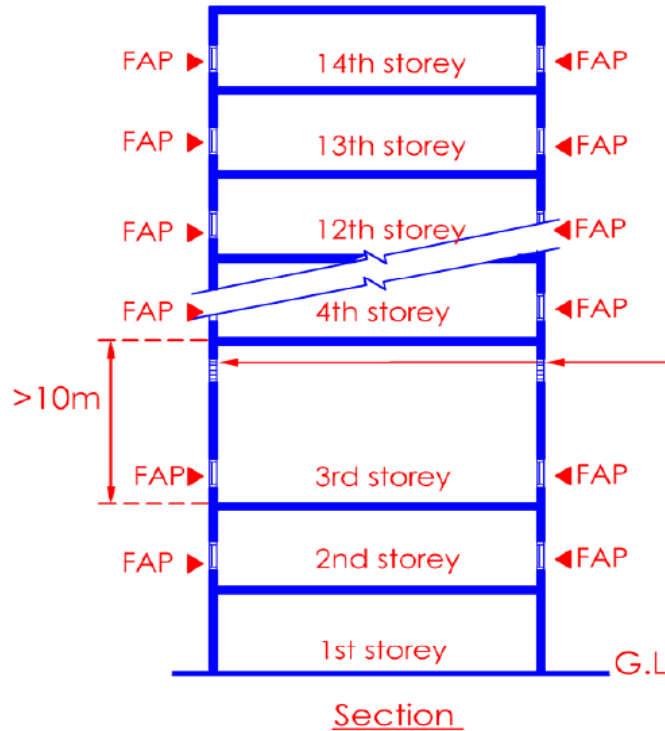
Item 12 – Fire Access Opening (FAP) to compartment or spaces

Existing Clause (2013 Code)	Revised / New Clause 2018
<p>Cl.4.2.3(f) Number and position of access openings for buildings other than residential:</p> <p>(i) For buildings under PG III, IV, V and VII exceeding the habitable height of 10m, and up to 60m, access opening is required at every storey level, other than 1st storey, opening directly onto accessway</p> <p>(b) For building under Purpose Groups VI and VIII, access openings located over accessway shall be provided and evenly distributed along the external walls, up to a habitable height of 60m.</p>	<p>Cl.4.2.3e.(3) Fire access opening to compartment or spaces</p> <p>(a) For buildings under PG III, IV, V and VII exceeding the habitable height of 10m, and up to 90m, fire access openings are required at every storey level, other than the 1st storey, and shall face the fire engine accessway directly.</p> <p>(b) For building under PG VI and VIII, fire engine access openings located over a fire engine accessway shall be provided along the external walls, up to a habitable height of 90m.</p>

Item 13 – Additional Openings for Ventilation

Existing Clause (2013 Code)	Revised / New Clause 2018
<p>Cl.4.2.3(f)(iv) additional openings</p> <p>For buildings under Purpose Groups III IV, V, VI, VII and VIII where an area or space has a ceiling height greater than 10m, additional high level access openings for smoke venting and fire-fighting purposes shall be provided and located in the external walls opening into the area or space.</p>	<p>Additional openings for ventilation</p> <p>For buildings under PG III to VIII where an area or space has a ceiling height greater than 10m, additional high level ventilation openings for smoke venting and firefighting purposes shall be provided and located in the external walls opening into the area or space. The ventilation opening shall meet the following criteria:</p> <ul style="list-style-type: none">(a) the number and location of the openings shall comply with <i>Cl.4.2.3e.(1)</i> and <i>cl.4.2.3e.(2)</i>.(b) the dimensions of the openings shall comply with <i>Cl.4.2.3d.</i>;(c) the openings can be in the form of openable panels/louvres, breakable glazing, or permanent openings; and(d) the openings shall not be indicated with the triangular signage as mentioned under <i>Cl.4.2.3c.</i>, but instead be labelled with red wording, “DO NOT ENTER – FOR SMOKE VENTING ONLY”, of height not less than 50mm and visible from the building exterior.

Item 13 – Additional Openings for Ventilation



Label with red wording
“DO NOT ENTER – FOR SMOKE
VENTING ONLY”, of height not less
than 50mm and visible from the
building exterior

No triangle sign is required

Item 14 – Fire Safety Instruction Manual

- What is Fire Safety Instruction Manual?
 - Is this new?
 - Who will prepare?
 - Applicable to which building type?
-
- Existing fire safety requirements
 - Found in existing 2013 Fire Code Appendices i.e. Appendix 20 Cl.8.1, Appendix 21 Cl.4, Appendix 13 (Annex H – Note), Appendix 16 Cl.8, Appendix 17 Cl.5, etc.
 - Project QP

Item 14 – Fire Safety Instruction Manual

- A document prepared by the project QP to remind the building owner, MCST, tenant, operator and/or contractor on the management of fire safety provisions for the building.
- Includes maintenance regimes, evacuation procedures, and other relevant documents to be kept and maintained by the relevant parties
- Any subsequent additions and alteration works shall be updated in the fire safety instruction manual by the QP carrying out the A/A works
- A copy of which shall be handed officially to the relevant parties for information and safe keeping before occupation of the building
- The QP can expand or modify the fire safety instruction manual to suit his presentation so as to convey the fire safety intents/requirements to the relevant parties.

Rationale

- Critical fire safety requirements scattered within the Appendices
- Consolidated into a single Appendix
- Easy reference
- Building owner are informed of specific maintenance regimes
- Additional fire safety requirements crucial to building owner



THANK
YOU

