

Your Ref :

Our Ref: CD/FSSD/12/02/03/01

Date : 17 May 2018

Registrar, Board of Architects
Registrar, Professional Engineers Board
President, Singapore Institute of Architects
President, Institution of Engineers, Singapore
President, Association of Consulting Engineers, Singapore

Dear Sir/Mdm

**AMENDMENT TO FIRE CODE – SEEKING PUBLIC CONSULTATION ON
CHANGES TO THE CODE OF PRACTICE FOR FIRE PRECAUTIONS IN
BUILDINGS 2013 EDITION**

The design of fire safety measures in buildings is currently governed by the Code of Practice for Fire Precautions in Buildings 2013 Edition, commonly known as Fire Code.

2. The Fire Code is regularly reviewed by the Fire Code Review Committee, which is chaired by the Singapore Civil Defence Force (SCDF) with representatives from the various professional institutions and regulatory bodies via their representatives¹, to improve its clarity and keep pace with the latest developments in the building industry and urban landscape.

3. A revised edition of the Fire Code is scheduled for publication this year. In this revision, the structure of the Fire Code has been revamped. All fire safety requirements in the

¹ Professional institutions and tertiary institutions such as the Singapore Institute of Architects, Institution of Engineers, Association of Consulting Engineers, Institution of Fire Engineers, Urban Redevelopment Authority, Building & Construction Authority, Housing and Development Board, Land Transport Authority, JTC Corporation, Nanyang Technological University, Real Estate Developers' Association, and Singapore Accreditation Council.



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Appendixes will be integrated into the revised Fire Code. Requirements in the Fire Code have also been laymanised for better understanding of the intents of the clauses. In addition, a new numbering system has been introduced. Some existing clauses have been renumbered.

4. As part of the review process, SCDF would like to invite you to provide valuable feedback on these changes. For ease of reference, all proposed key changes to the Fire Code 2013 edition have been highlighted in Annex A. Do take note that the revised clause numbers will deviate from its existing clause numbers.

5. In order to ensure that the feedback is productive and focused, respondents are kindly requested to adhere to the following guidelines when providing their feedback:

- (i) Identify yourself and the organisation you represent (if any) so that SCDF may follow-up with you to clarify any issues, if necessary.
- (ii) Be clear and concise in your comments. Focus your comments on the proposed key changes and how they can be improved.
- (iii) Substantiate your points with illustrations, examples, data or alternative suggestions whenever possible.

6. Please convey the contents of this circular to members of your Board/ Institution/ Association. This circular is also available in CORENET's e-Info: <http://www.corenet.gov.sg/einfo>. Responders can direct your feedback to Tan_Yi_Yang@scdf.gov.sg. Please use the template provided in Annex A of this circular for your feedback. This consultation exercise will end on 28 June 2018.

Yours faithfully

(transmitted via email)



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SCDF
The Life Saving Force

SINGAPORE CIVIL DEFENCE FORCE



MAJ Tan Chung Yee
Fire Safety & Shelter Department
for Commissioner
Singapore Civil Defence Force

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Note: Please note that the existing clause numbering system will be changed and this may lead to changes in the numbering of appended revised/new clause nos.

S/N	Existing Clause	Revised/New Clause	Rationale	Public Comment
1	2.2.13(b) Smoke-stop lobby a lobby that is separated from the adjoining areas of the building by a wall having a fire resistance of 1 hour. The exit access door shall have fire resistance of half an hour fitted with automatic self-closing device conforming to the requirements of Cl.3.9.2. The design of a smoke-stop lobby must be such as not to impede movement of occupants through the escape route. The floor area of a smoke-stop lobby shall be not less than 3m² and if a smoke-stop lobby also serves as a fire-fighting lobby, the floor area shall be not smaller than 6m² and with no dimension smaller than 2m. The floor shall be graded from the lift door towards the lobby door with a fall not exceeding 1 in 200. A smoke-stop lobby, including fire-fighting lobby, which acts as buffer space for entry into the protected staircase and use by fire fighters during emergency, shall be maintained as common property.	2.2.13b. Smoke-stop lobby (1) A smoke-stop lobby shall be separated from the adjoining areas of the building by a wall having a fire resistance rating of 1 hour. (2) The exit access door shall have ½-hr fire resistance rating fitted with automatic self-closing device conforming to the requirements of Cl.3.9.2. (3) The design of a smoke-stop lobby shall be such as not to impede movement of occupants through the escape route. (4) The floor area of a smoke-stop lobby shall be at least 3m² and with minimum clear width of 1.2m. If a smoke-stop lobby also serves as a fire lift lobby, the floor area shall be not smaller than 6m² and with minimum clear width of 2m.	<i>The smoke-free approach is intended to provide a buffer space to minimise possibility of smoke entering exit staircase. In this revision, the clause is itemised for ease of understanding and compliance.</i> <i>Existing sub-clause (iii) on the size of air well for ventilation is omitted. Modelling studies show the sizes of the air well for ventilation of smoke-stop lobby is inadequate.</i>	

A smoke-stop lobby shall be ventilated by: (i) permanent fixed ventilation openings in the external wall of the lobby; such ventilation openings shall have an area of not less than 15 per cent of the floor area of the lobby and located not more than 9m from an air-well or external recessed space of minimum clear area 93m² and minimum width of 6m. The air-well or external recessed space shall have no obstruction vertically throughout the air space for ventilation; or (ii) mechanical ventilation, except for Purpose Group II, complying with the requirements in Chapter 7, or (iii) permanently fixed ventilation openings of area not less than 15 per cent of the floor area of the lobby and located not more than 9m from any part of the lobby, opening to an open air well which is open vertically to the sky for its full height. The air-well size shall be in accordance with Cl.2.2.13(a)(iii) except for building not more than 4-storey, in which the air-well shall have a horizontal plan area of not less than 10m² or 0.1m² for each 300mm of height of the building,	(5) The floor shall be graded from the lift door towards the lobby door with a fall not exceeding 1 in 200. (6) A smoke-stop lobby, including fire lift lobby, which acts as buffer space for entry into the protected staircase and use by firefighters during emergency, shall be maintained as common property. (7) A smoke-stop lobby shall be ventilated through any of the following: (a) Permanent fixed ventilation openings which are located in the external wall of the lobby and have a total area of not less than 15% of the floor area of the lobby. Each opening shall not be less than 1m² and shall abut an external space or air well having a minimum clear area of 93m² and minimum width of 6m and without obstruction vertically throughout the air space for ventilation. No part of the lobby floor area shall be more than 9m away from the air well or external space. (b) Mechanical ventilation, except for PG II, complying with the requirements in Chapter 7.		
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	whichever is the greater. The minimum width of such air-well space shall not be less than 3000mm. The enclosure walls to the air well shall have a minimum fire resistance of 1 hour and have no openings other than ventilation openings for the smoke-stop lobby, exit staircase and toilets, or (iv) cross-ventilated corridor having fixed ventilation openings in at least two external walls. The openings to each part of the external walls shall not be less than 50 per cent of the superficial area of the opposing external walls. No part of the floor area of the corridor shall be at a distance of more than 13m from any ventilation openings.	(c) Cross ventilated corridor/lobby which complies with all of the following: (i) The corridor/lobby shall have fixed ventilation openings abutting an external space. The ventilation openings shall be located on opposite sides of the corridor/lobby and shall not be less than 50% of the superficial area of the opposing external walls. (ii) No part of the floor area of the corridor/lobby shall be at a distance of more than 12m from the ventilation openings. (iii) The distance of 12m can be measured along the internal corridor via the intermediate ventilation opening to the external space, provided there is no unprotected openings in the walls along the path to the external space. The intermediate ventilation opening shall not be less than 2m in width and 1.2m in height and the width of the path to the external space shall not be less than 2m. Note: For residential buildings of habitable height more than 24m with single exit staircase, the requirements		
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		for the cross ventilated corridor/lobby stipulated in Cl.9.2.1c. shall be complied with.		
2	Nil	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 purposes and evacuation purpose and shall include the locations of the following: (1) Fire lifts (2) Evacuation lifts (3) PWD holding points (4) Hose reels	<i>The fire escape plan serves to orientate the building occupants on the escape routes during a fire emergency.</i>	

		(5) Fire extinguishers (6) Manual alarm call points (7) Rising mains		
3	2.3.2(b) Internal exit passageway (i) an internal exit passageway which serves as required exit of the building shall be enclosed with construction complying with the provisions of Cl.3.3, and (ii) the enclosure walls of an exit passageway shall have not more than two exit doors opening into the exit passageway, and (iii) exit doors opening into an exit passageway shall have fire resistance rating as required for exit doors opening into exit staircases, fitted with automatic self closing device and complying with the requirements of Cl.3.9.2 for fire resisting doors, and (iv) the minimum width and capacity of exit passageway shall comply with the requirements as provided in Table 2.2A, and	2.3.2b. Internal exit passageway An internal exit passageway which serves as required exit of a building shall comply with the following requirements: (1) it shall be enclosed with construction complying with the provisions of Cl.3.3; (2) the enclosure walls shall have not more than two exit doors, excluding the final discharge door and exit staircase door, opening into the exit passageway; (3) exit doors opening into an exit passageway shall have fire resistance rating as required for exit doors opening into exit staircases, be fitted with automatic self-closing device and comply with the requirements of Cl.3.9.2 for fire resisting doors;	<i>The computation of at most two numbers of exit doors for the internal exit passageway shall exclude final discharge door and exit staircase door. This exclusion provides clarity to the practising QP.</i>	

	(v) changes in level along an exit passageway requiring less than two risers shall be by a ramp complying with the provisions under Cl.2.3.8, and (vi) if the exit staircase which connects to the internal exit passageway is pressurised, the internal exit passageway shall not be naturally ventilated but shall be mechanically ventilated, and it shall be pressurised to comply with the requirements in Chapter 7.	(4) the minimum width and capacity of exit passageway shall comply with the requirements as provided in <u>Table 2.2A</u>; (5) changes in level along an exit passageway requiring less than two risers shall be via a ramp complying with the provisions under Cl.2.3.8; and (6) if the exit staircase which connects to the internal exit passageway is pressurised, the internal exit passageway shall also be pressurised to comply with the requirements in Chapter 7.		
4	2.3.3 Exit Staircase: (a) Internal Exit Staircase (i) an internal exit staircase which serves as the required exit of the building shall be enclosed with construction complying with the provisions of Cl.3.8; and (ii) where an internal exit staircase is directly approached from an external exit passageway or external corridor, it shall not be necessary to provide such enclosure between the staircase	2.3.3 Exit staircase a. Internal exit staircase (1) Staircase enclosure An internal exit staircase which serves as the required exit of the building shall be enclosed with construction complying with the provisions of Cl.3.8. The enclosure walls of an interval exit staircase shall not have more than two exit doors opening into the exit staircase shaft at each storey. The two doors shall exclude the final discharge door.	<i>It is essential for exit staircase enclosures to be smoke-free in order to reduce the risk of fire and smoke ingress. Thus, there shall be no more than two doors and these fire doors will be closed fully in order to act as an effective barrier against the spread of fire and smoke. This exclusion provides clarity to the practising QP.</i>	

	and the external exit passageway or external corridor; and (iii) there shall be no unprotected openings of occupancy area within 1.5m horizontally or within 3m vertically below any openings including final discharge openings located in the external wall of the internal exit staircase. (iv) Exception (1)	(2) Approached via external exit passageway or external corridor Where an internal exit staircase is directly approached from an external exit passageway or external corridor, such enclosure between the staircase and the external exit passageway or external corridor is not required. (3) Unprotected openings There shall be no unprotected openings of occupancy area or combustible material/construction within 1.5m horizontally or within 3m vertically below any opening including final discharge openings located in the external walls of the internal exit staircase. (4) Exception (a)		
5	2.3.3(b) External Exit Staircase (i) external exit staircase may be used as required exit in lieu of internal exit staircase provided it complies with the requirements of exit staircase,	2.3.3b. External exit staircase (1) An exit staircase can qualify as an external exit staircase if no part of it is recessed more than 3m from the building façade and has:	<i>This revised clause serves to provide clarity on the requirements of an external exit staircase. The rationale of limiting the recess distance is to facilitate effective smoke</i>	

except for enclosure of an internal staircase, and (ii) there shall be no unprotected openings within 3m horizontally or within 3m vertically below, or adjacent or facing (unless there is adequate separation complying with Cl.3.5) any part of the external exit staircase; and Exception: In building designed with external corridor access, the access to the external exit staircase shall be permitted by means of the open sided external corridor adjoining the occupancy areas, subject to the following: (1) the external corridor shall be served by at least 2 exit staircases; and (2) that unobstructed ventilation openings shall be provided along the long side of the external corridor above the parapet or balustrade. (iii) the external exit staircase shall be located so as to lead directly to a street or open space with direct access to street.	(a) minimum two adjacent sides abutting an external space; or (b) one of the longest side abutting the external space. (2) An external exit staircase can be used as required exit in lieu of internal exit staircase provided: (a) it complies with the requirements of exit staircase, and (b) there is no unprotected opening, or combustible material/construction within 3m horizontally or within 3m vertically below, or adjacent or facing it. Exception: In building designed with external corridor access, the access to the external exit staircase can be by means of the open-sided external corridor adjoining the occupancy areas, subject to the following: (i) the external corridor shall be served by at least two exit staircases; and	<i>dispersal and maintain a smoke-free condition.</i>	
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	(iv) Doors to the external exit staircases can be omitted, if the conditions given in sub-clause 2.3.3(a)(iv) are fully complied with.	(ii) unobstructed ventilation openings shall be provided along the long side of the external corridor above the parapet or balustrade. (c) its final discharge leads directly to an external space. (3) Fire-rated doors to the external exit staircases shall be provided unless the conditions given in Cl.2.3.3a.(4) are fully complied with.		
6	Nil	2.3.3d.(3) Landings The minimum clear width and length of a landing where there is a change in direction, shall not be less than the clear width of the exit staircase. (4) Risers and treads The height of riser for any exit staircase shall not be more than 175mm, and depth of tread shall not be less than: (a) 225mm within residential units and 275mm for common areas of residential buildings; (b) 250mm for PG VI and VIII buildings; and	<i>The appended requirements are reinstated to facilitate evacuation of occupants and accessibility of firefighters to carry out firefighting and rescue operations.</i>	

		(c) 275mm for all other buildings. (5) Headroom The clear headroom shall be at least 2m measured from the pitch line of the exit staircase or finished floor level of the landing to the underside of any obstruction.		
7	2.3.3d.(h) Different modes of ventilation within a single staircase shaft For buildings exceeding 24m in habitable height, the internal exit staircase can be naturally ventilated at its upper part and mechanically ventilated at its lower part provided this lower part does not exceed 24m in habitable height and there shall not be any intermediate staircase landing door separating the two modes of ventilation. If the lower part exceeds 24m in habitable height, this lower part shall be pressurized instead.	2.3.3d.(9) Different modes of ventilation within a single exit staircase shaft For buildings exceeding 24m in habitable height, the internal exit staircase can be naturally ventilated at its upper part and mechanically ventilated at its lower part provided this lower part does not exceed 24m in habitable height and there shall not be any intermediate staircase landing door separating the two modes of ventilation. If the lower part exceeds 24m in habitable height, this lower part shall be pressurised instead. For pressurisation of exit staircase, an intermediate staircase landing door is permitted.	<i>To prevent loss of pressure built-up for the exit staircase pressurisation system, it is necessary to have an intermediate staircase landing door. This clause serves to address different mode of ventilation within a single exit staircase shaft.</i>	

8	(k) Where access-control is provided to exit door using smart card locking device, magnetic bar and electro-mechanical locking device: (i) The activation of the building fire alarm or sprinkler system shall automatically unlock the door. It shall remain unlocked until the building fire alarm system has been manually reset; and (ii) The door shall be arranged to unlock from a manual release device located within the occupancy space, 1200mm above the floor and within 1.5m of the exit door jamb. The manual override device shall be readily accessible and clearly identified by a sign that reads “Emergency Door Release”. The mechanism to unlock the door shall be fail-safe type.	2.3.9k. Access control using smart card locking device, magnetic bar and electromechanical locking device (1) Where access-control using smart card locking device, magnetic bar and electromechanical locking device are installed at fire-rated door(s) of an exit staircase and smoke-stop/fire lift: (a) the activation of the building fire alarm or sprinkler system shall automatically unlock the door. It shall remain unlocked until the building fire alarm system has been manually reset; and (b) in addition, the door shall be arranged to unlock from a manual override device located within the occupancy space, 1.2m above the floor and within 1.5m of the exit door jamb. The manual over-ride device shall be readily accessible and clearly identified by a sign that reads “Emergency Door Release”. The mechanism to unlock the door shall be fail-safe type. (2) Access control belonging to tenanted spaces	<i>Besides, access-control using smart card locking device, magnetic bar and electromechanical device installed at fire-rated door(s) of exit staircase and smoke-stop/fire lift lobby, this clause is also expanded to include access control belonging to tenanted space. With this inclusion, the QP need not consult SCDF on whether the electromechanical device within the tenanted spaces need to be connected to the building fire alarm system.</i>	
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		Where access control belonging to tenanted spaces are installed with smart card locking device, magnetic bar, electromechanical locking device and the like to prevent unauthorised access, such locking mechanism shall be arranged to unlock from a manual over-ride device in accordance with Cl.2.3.9k.(1)(b). The manual over-ride device serves as a means for occupant to get out of the occupied space during a fire emergency. Any form of staff access control facilitating daily operation shall not be considered as a substitute for manual over-ride device. Cl.2.3.9k.(1)(a) is not applicable to tenanted spaces.		
9	Nil	2.3.10 External corridor External corridor shall comply with the following requirements: a. the vertical height of the unobstructed and uninterrupted ventilation opening measured from the parapet wall/balustrade/grille/railing up to the top edge of the opening or eaves of overhang shall not be less than 1.2m;	<i>This clause list down the specific requirements for an external corridor to ensure that it maintains tenable condition during a fire emergency.</i>	

		b. where the external corridor is roofed over, the depth of the roofed over portion shall not exceed 3m; c. where any room or space with sleeping risk is located along the corridor, a 1-hr fire resistance rating wall of height not less than 1.1m, measured from the finished floor level of the external corridor to the sill level of the opening, shall be provided along the corridor leading to the exits. Any ventilation openings above the fire-rated wall shall be of non-combustible construction; d. the doors opening into the external corridor need not be fire-rated; e. the provision of parapet wall, or balustrade for an external corridor shall be at most 1.1m and at least 1m in height along the outer side of the corridor; and f. the length of external corridor with unobstructed and uninterrupted openings above the parapet wall shall not be less than 6m and shall abut an external space.		
10	2.5 Health Care Occupancy	9.3.2 Healthcare occupancy	<i>Due to the profile of the occupants in such premises,</i>	

2.5.1 The provisions stated herein shall apply to Health Care Occupancies which may be identified under the following categories: (a) Hospital A building used for medical and surgical care and shall include general hospitals, hospitals for psychiatric care, children's hospitals, with 24 hours or in patient service. (i) Basement Patient accommodation area containing beds shall not be located in the basement storey. (ii) Number of exits per ward Each patient accommodation ward area shall be provided with at least 2 exits, which shall be remotely located from each other, if the occupant load exceeds 50 persons. (iii) Provision of area of refuge Every upper storey used for the accommodation of patients shall be provided with at least an area of refuge for horizontal evacuation	a. General Provision of sprinkler is required for healthcare occupancy with patient accommodation if: (1) it comprises more than one storey; or (2) it is located on the upper storey other than first storey; or (3) its largest non-compartmented AFA exceeds 750m². b. Hospital They shall comply with the following additional requirements: (1) Basement Patient accommodation area containing beds shall not be located in basement storeys. (2) Width of exit The minimum clear width of an exit door opening shall be not less than 1.2m. (3) Number of exits per ward	sprinkler system is made mandatory for early alert/intervention to control the development of fire and smoke. This will facilitate swift and safe egress. Reference taken from NFPA where sprinkler is mandatory for healthcare occupancies. To cater for bed-ridden and wheelchair bound occupants in healthcare occupancies.
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	purposes. The size of the area of refuge and the routes leading to it shall comply with clauses 1.2.4 and 2.5.3.	For patient accommodation wards where the occupant load exceeds 50 persons, each ward shall be provided with at least two exits, which shall be remotely located from each other. (4) Provision of area of refuge Every upper storey used for the accommodation of patients shall be provided with at least an area of refuge for horizontal evacuation purposes. The size of the area of refuge shall comply with Table 1.4A. For hospital and nursing home, the area of refuge shall be sized adequately to accommodate the number of beds computed based on occupant load factor of 2.8m²/person for the ward served by the area of refuge. The area of refuge shall be able to accommodate a bed size of minimum dimension 2.55m (length) by 1.1m (width). (a) For area of refuge not adjacent to the patient ward, the routes leading to the area of refuge shall be through an external corridor complying with Cl 2.3.10; or (b) A protected lobby that is separated from the adjoining areas of the	<i>This revised clause serves to provide clarity on the sizing of the area of refuge.</i> <i>To provide alternatives in lieu of external corridor for access to the area of refuge.</i>	
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		building by a wall and door of 1-hr fire resistance rating. The ventilation requirements of the protected lobby shall comply with CI 2.2.13 (b) (i) or (ii). The protected lobby shall have a minimum size of 4m (length) by 2m (width). (c) For area of refuge immediately adjacent to a patient ward, the routes leading to the area of refuge need not be through an external corridor provided both the area of refuge and the adjacent patient ward: (i) are fire compartmented from each other by a wall and door of 1-hr fire resistance rating; (ii) are provided with engineered smoke control and the design smoke layer height shall be $\geq 2.5\text{m}$ above the finished floor; and (iii) provided with minimum of 2 remotely located exit access between them.		
11	2.5.1 The provisions stated herein shall apply to Health Care Occupancies which may be identified under the following categories:	9.3.2b. Hospital (5) Size and compartmentation of patient accommodation area	<i>To introduce a compartment limit even though premises is sprinkler-protected.</i>	

	(a) Hospital (iv) Size and compartmentation of patient accommodation area (1) Each patient accommodation ward shall not exceed a floor area of 750m² and an occupant load of 75 persons, calculated on the basis of gross floor area of 10m² per person. (2) Each patient accommodation ward area shall be constructed as a compartment having fire resistance rating of at least 1-hour for walls/ceilings and ½-hour fire door for protection of door openings. The internal walls between wards shall be constructed to have min. 1-hour fire resistance rating and door opening shall be protected by ½ hour fire door. For walls and doors between ward and main exit access corridor (either internal or external corridor), the requirements given in subclause 2.5.1(a)(vi) and 2.5.1(a)(vii) respectively shall be complied with. This requirement shall not be applicable to patient accommodation floor which is sprinkler protected.	(a) Each patient accommodation ward shall not exceed a floor area of 750m² and an occupant load of 75 persons, calculated on the basis of Accessible Floor Area (AFA) of 10m² per person. (b) For single storey premises not protected by sprinkler, each patient accommodation ward shall be constructed as a compartment having 1-hr fire resistance rating and ½-hr fire resistance rating door for protection of door openings. It shall be provided with both an automatic fire alarm system and manual fire alarm system. (c) For sprinkler-protected premises, patient accommodation ward area shall not exceed a fire compartment size 2100m² and shall be separated by full-height smoke barrier (up to soffit of the slab) for patient rooms of aggregated area not exceeding 750m² within the ward.		
12	2.5.1 The provisions stated herein shall apply to Health Care	9.3.2 Healthcare occupancy	<i>Instead of mandating proper compartmentation for the entire</i>	

	Occupancies which may be identified under the following categories: (f) Outpatient clinics that do not fall under categories described above. Fire safety requirements under Cl.2.5.1(a) are not applicable, except on the provision of separate compartment, which shall comply with Cl.3.2.5(b).	g. Other outpatient clinics For outpatient clinics that do not fall under the above categories, the fire safety requirements under Cl.9.3.2b. are not applicable. Instead, these clinics shall comply with the provision of fire-rated wall to separate the clinics from other usage as stipulated in Cl.3.2.5(b), except for the frontage of the clinic.	<i>outpatient clinics, the frontage of the clinic can be non-fire-rated construction. This relaxation takes into account that outpatient clinics have lower fire risks as compared to hospital occupancy.</i>	
13	3.2.5(o) Areas of Special Hazard (i) Boiler rooms, transformer rooms, generator rooms, storage areas of materials that are highly combustible or flammable, and any other area of special high risk shall be separated from other parts of the building by compartment walls and floors having fire resistance of not less than 2 hours. If the building is protected by an automatic sprinkler system, the fire resistance rating of the compartment walls and floors can be reduced to 1 hour. (ii) Rooms housing transformer containing flammable liquid and generator rooms shall be located against an external wall.	3.2.5j. Areas of special hazard (1) Areas of special high risk in a building (1) Boiler rooms, transformer rooms, generator rooms, storage areas of materials that are highly combustible or flammable, and any other areas of special high risk shall be separated from other parts of the building by compartment walls and floors having 2-hrs fire resistance rating. If the building is protected by an automatic sprinkler system, the fire resistance rating of the compartment walls and floors can be reduced to one hour. (2) Room housing transformer that uses flammable liquid shall be located	<i>Room for dry transformer or transformer using non-flammable liquids or generator in underground stations are not required to be located against an external wall. This is because the flash point of diesel is above 60°C and thus not deemed highly flammable.</i>	

		at ground level against an external wall. (3) Diesel fuel tank for generator need not be located against an external wall.		
14	3.2.8 The requirements of Cl.3.2.1 may be exempted under the following circumstances: (a) Buildings used solely for the sale, storage, processing and packaging of goods and substances of a non-combustible nature, provided that any other parts of the buildings used otherwise as described shall be separated by compartment walls and compartment floors in compliance with the requirements of the relevant provisions for compartment walls and compartment floors, and (b) Single storey buildings of Purpose Group VI, provided that the buildings are used solely for the sale, storage, processing & packaging of goods & substances of a non-combustible nature, and (c) (i) Open sided car parking decks having not less than 50% of the sides permanently open and unobstructed, and such openings being evenly	3.2.8 Exemption on size limitation of compartment The requirements of Cl.3.2.1 for car parking decks can be exempted if both the following are complied with: a. The car parking decks shall be open-sided with not less than 50% of the sides, permanently open and unobstructed. Such openings shall be evenly distributed along each of the perimeter walls and on every individual floor/deck, excluding perimeter wall to air well, so as to provide cross ventilation to all parts of the car parking decks. b. No part of the floor space shall be more than 12m from the openings on the perimeter walls of the building or air well. Air well, where provided for this purpose, shall have a superficial plan area of not less than 10m², or 0.1m² for every 300mm of height, whichever is greater, and have a minimum dimension on plan of 2m,	<i>Existing subclause (a) and (b) are omitted as the given condition of storage, sale, processing & packaging of goods & substances of non-combustible nature, etc. is difficult to monitor as it can be changed over time.</i>	

	distributed along each of the perimeter walls and on every individual floor/deck, excluding perimeter walls to air-well, so as to provide cross ventilation to all parts of the car parking decks; and (ii) No part of the floor space shall be more than 12m from the openings on the perimeter walls of the building or air-well. Air-well where provided for this purpose shall have a superficial plan area of not less than 10m², or 0.1m² for every 300mm of height, whichever is greater, and have a minimum dimension on plan of 2000mm, open vertically to the sky for its full height.	open vertically to the sky for its full height.		
15	3.5.2(a) The requirements of Cl.3.5.1(a)(i) for non combustibility of external walls shall not apply to the external wall of a building or separated part of a building (i) if that wall is: (1) situated 1m or more from the relevant boundary; and (2) not exceeding 15m in height; and	3.5.2 Exceptions on external wall construction a. The requirements of <i>Cl.3.5.1a.(1)</i> for non-combustibility of external walls need not apply to the external wall of a building or part of a building separated as described in <i>Cl.3.3.1b.</i>, if that wall is situated 1m or more from the relevant boundary and it is: (1) of PG I or II buildings of not more than three storeys, or	<i>This clause is amended to provide ease of understanding and clarity.</i>	

(3) separated as described in Cl.3.3.4(b); or (ii) if that wall is situated 1 m or more from the relevant boundary: (1) of Purpose Group I and II of not more than three storeys, or (2) of single storey construction and not exceeding 15m in height and floor area not exceeding Purpose Group III, IV, VII 3000m² Purpose Group V, VI 2000m² Purpose Group VIII 500m²; or (3) other than single storey buildings, but not exceeding 7.5m in height and floor area not exceeding Purpose Group IV, VI, VII 25m²; Purpose Group V, VIII 150m². (b) The requirements of Cl.3.5.1(a)(ii) for fire resistance of external walls shall not apply to the external wall of a building or separated part of a building –	(2) of single storey construction and not exceeding 15m in height and floor area not exceeding: (a) 3000m² for PG III, IV, VII buildings, or (b) 2000m² for PG V, VI buildings, or (c) 500m² for PG VIII buildings, or (3) of other than single storey buildings, but not exceeding 7.5m in height and the compartmented floor area not exceeding: (a) 250m² for PG IV, V, VII buildings, or (b) 150m² for PG VI, VIII buildings. b. The requirements of Cl.3.5.1a.(2) for fire resistance of external walls need not apply to the external wall of a building or part of a building separated as described in Cl.3.3.1b., if that wall is situated 1m or more from the relevant boundary and it is: (1) of a single storey building of a purpose group other than PG VI and		
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	(i) if that wall is situated 1m or more from the relevant boundary: (1) for single storey buildings not exceeding 15m in height and floor area not exceeding 2000m² or 500m² under Purpose Groups VI or VIII respectively; and (2) such wall shall be provided with minimum period of 15 minutes insulation from inside the building under BS 476: Part 20 to 23.	VIII and not exceeding 15m in height, or (2) of a single storey PG VI or VIII buildings not exceeding 15m in height and floor area not exceeding 2000m² or 500m² respectively.		
16	3.5.4 Cladding on External Walls shall comply with the following: (a) If such cladding is situated less than 1 m from any point on the relevant boundary, it shall have surface complying with the requirements for Class `0', and</p> <p>(b) If such cladding is situated 1 m or more from the relevant boundary it shall have, if the building is more than 15m in height, a surface complying with the requirements specified for Class `0', except that any part of such cladding below a height of 15m from the ground may consist of timber of not less than 9mm finished thickness or of a material having a surface	3.5.4 Cladding on external walls Cladding on external walls shall comply with the following: a. Homogenous cladding on external walls shall be constructed of material of limited combustibility when tested in accordance with BS 476 Pt 11 or approved equivalent. For buildings not within PG VI or VIII, any part of such cladding below a height of 15m from the ground, and situated at least 1m away from the relevant boundary can consist of: (1) timber of not less than 9mm finished thickness, or	<i>This clause stipulates the requirements for cladding materials on the external of building. It also provides clarity on the rating and classification of that part of the building below 15m in height and the use of composite panel as cladding material.</i>	

	which, when tested in accordance with BS 476: Part 6 have an index of performance (I) not exceeding 20, provided that if the building is of Purpose Group VI or VIII, such cladding material shall, when tested in accordance with BS 476: Part 6 have an index of performance (I) not exceeding 12 and a sub-index (i_1) not exceeding 6.	(2) a material having a surface which achieves at least: (a) Class 0 flame spread rating tested in accordance with BS 476 Part 6 & 7, or (b) Class B rating classified under EN 13501-1. b. Composite panels used as cladding on external walls shall comply with Cl.3.15.13.		
17	3.5.7 For high and low parts of different compartments of a building abutting each other, either one of the following requirements shall be complied with to prevent spread of fire from the roof close to and lower than the external of the higher part: (a) the roof over the lower part of the building shall be fire rated in accordance with the element of structure for minimum 1 hour for a distance of 5m measured horizontally from the external wall of the higher part of building; or (b) the external wall of the higher part of the building overlooking the roof below shall have the necessary fire	3.5.7 Vertical fire spread a. For high and low parts of different compartments of a building abutting each other, either one of the following requirements shall be complied with to prevent spread of fire between the distinct parts: (1) the roof-over of the lower part of the building shall be 1-hr fire-rated in accordance with the element of structure for minimum 1-hr for a distance of 5m measured horizontally from the external wall of the higher part of building, or (2) the external wall of the higher part of the building overlooking the roof	<i>The high/low separation requirements ensure any activities happening underneath the low parts of building will not cause fire to spread to the floor above.</i>	

	resistance rating in accordance with the element of structures for minimum 1 hour for a vertical height of not less than 9m measured from the roof of the lower part of the building. (c) the above requirements shall not be applicable to buildings or lower parts of the building which are sprinkler protected, or old shophouses which are subject to URA's Conservation Programme or built before 1969 referred to under Cl.1.1.1.1 and Cl.1.1.1.2.	below shall have the necessary fire resistance rating in accordance with the element of structure for minimum 1-hr a vertical height of not less than 9m, measured from the roof of the lower part of the building. b. The above requirements shall not be applicable to: (1) buildings or lower parts of the building which are sprinkler-protected; (2) the buildings under the conservation programme of the authority having jurisdiction, or buildings built before 1969; (3) covered car porches intended solely for the purpose of the boarding and alighting of passengers; (4) open-sided/covered walkways/linkways not exceeding 5m in width with no commercial activities or storage; and (5) canopies over private enclosed spaces or balconies in PG II buildings, provided that the canopy is constructed of non-combustible material.		
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18	Nil.	3.5.8 Non-sprinkler-protected roof For non-sprinkler-protected roof within 4m from the boundary (excluding boundary abutting public street, canal or river), the portion of the roof within this 4m zone shall be 1-hr fire-rated. This requirement is exempted for areas mentioned under Cl.3.5.7c.(2) to (5).	<i>This requirement will prevent fire from spreading to an adjacent building located outside the boundary.</i>	
19	Nil.	3.5.9 Separation of residential floor facade The facade of residential floors above 24m habitable height shall be separated from each other by: a. a 1-hr fire-rated spandrel that, when installed, measures at least 1.5m in height, or b. a 1-hr fire-rated horizontal projection that extends at least 600mm from the building. 3.5.10 External sun-breakers/weather features External sun-breakers or weather features which will result in the channelling of flame upwards during a fire are not permitted.	<i>The proposed building features will serve as an effective barrier to slow down or prevent vertical fire spread.</i>	

20	Nil.	3.7.11 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.	<i>The additional exit directional signage on the fire shutters/smoke curtains will guide occupants to the nearest exits.</i>	

21	Nil.	3.7.12 Emergency generator room a. An emergency generator room shall be compartmented as stipulated under Table 6.4A. b. An emergency generator can be located in an external space provided: (1) the setback distance between the outdoor emergency generator from other surrounding hazards except water tanks shall be at least 3m. (2) if there is more than one outdoor emergency generator, each outdoor emergency generator shall be separated from the other by a dividing wall of masonry construction for the full length and height of the adjacent outdoor emergency generator.	<i>The requirements ensure the operations of emergency generator located outdoor will not be affected by any nearby fire.</i>	
22	Cl.3.8.6 Any door fitted to an opening in protecting structure shall have fire resistance for not less than half the period required by other provisions of the Code for the protecting structure surrounding the opening. Exception:	Cl.3.8.6 Doors in protecting structures a. Any door fitted to an opening in protecting structure shall have fire resistance for not less than half the period required by other provisions of the Code for the protecting structure surrounding the opening. b. Exception	<i>The risk of fire spreading through the hopper door is low. Normally the rubbish containers are damp, hence unlikely a huge fire will occur there and spread into the residential unit via the hopper door. The main risk of smoke spread is addressed by the requirement to provide rubber gasket around the</i>	

	Any door fitted to an opening in protecting structure of a shaft containing services such as electrical cables, pipes (including gas pipe in separate shaft), ducts would not need to have the fire resistance rating if the door is located along the wall facing the external corridor.	(1) Any door fitted to an opening in protecting structure of a shaft containing services such as electrical cables, pipes (including gas pipe in separate shaft), ducts would not need to have the fire resistance rating if the door is located along the wall facing the external corridor. (2) Any door fitted to an opening in protecting structure of a rubbish chute would not need to have the fire resistance rating if: (a) the thickness of metal hopper door is at least 1.5mm; (b) the hopper door is sealed with rubber gasket; and (c) the hopper door shall be self-closing.	<i>hopper door and self-closing mechanism.</i>	
23	3.8.8(h) Private lift Private lifts that are provided for the exclusive use of occupants in residential units under Purpose Group II buildings shall comply with the following requirements: (i) Smoke detectors shall be provided at the lift landing area. The	3.8.8h. Private lift A private lift that is provided for the exclusive use of occupants in residential units under PG II buildings shall comply with all of the following requirements: (1) A smoke detector shall be provided at the lift landing area. The activation	<i>To address typical residential buildings that are designed with only one level of common private lift lobby, there is a need to stipulate the homing requirements when the common private lift lobby is affected by fire.</i>	

	activation of any of the smoke detectors at the lift landing area shall cause the lift to home to the designated floor; and (ii) Emergency power supply from a generating plant shall be provided to home the lift to the designated floor when there is a power failure in the building; and (iii) The designated floor can either be on grade level or one level below grade level. If it is the latter, the lift shall home to a protected lobby, with direct access to an exit; and (iv) The lift shall not be permitted to double-up as a fire lift; and (v) Private lifts shall comply with SS 550.	of any of the smoke detectors at the lift landing area shall cause the lift to home to the designated floor. (2) Emergency power supply from a standby generating plant shall be provided to home the lift to the designated floor when there is a power failure in the building. (3) An alternate designated floor (e.g. any other floor with common lobby) shall be identified. The lift shall be brought to the alternate designated floor in the event that there is a fire at the 1st storey designated floor. For buildings without an alternate designated floor, the lift shall return to the last called floor in the event that the designated floor is on fire. (4) The lift shall not serve dual-purpose as a fire lift. (5) Private lifts shall comply with SS 550.		
24	3.8.9 Protected shaft containing other service installations A protected shaft used for the enclosure of services shall comply with the following:	3.8.9 Protected shaft containing other service installations A protected shaft used for the enclosure of services shall comply with the following:	<i>To address the challenges of fire-stopping the cavity barrier within the trunking, additional fire safety requirements are imposed to prevent the spread of fire. The use of flame retardant</i>	

	(a) (b) Protected shaft used for the enclosure of electrical power services shall be interrupted at every floor level with barriers with fire resistance of at least half an hour. Protected shaft used for the enclosure of telecommunications cables shall be interrupted by barriers with fire resistance of at least half an hour at vertical intervals not exceeding 15m. Such cavity barriers shall comply with the relevant provisions of Cl.3.11. (c) Omission of self-closing devices In the case of protected shafts which are interrupted by barriers with fire resistance of at least half an hour at every floor level or protected shafts containing sanitary pipes or water pipes, fire resisting doors opening into the protected shaft are not required to be installed with automatic self closing devices, provided such doors are kept closed and locked at all times.	a. b. Cavity barriers A protected shaft used for the enclosure of electrical power services shall be interrupted at every floor level with at least ½-hr fire resistance cavity barriers. Protected shaft used for the enclosure of telecommunications services shall be interrupted by at least ½-hr fire resistance cavity barriers at vertical intervals not exceeding 15m. The cavity barriers within trunking enclosing electrical and telecommunication cables can be exempted if all of the following conditions are met: (1) the cables shall be flame retardant type complying with IEC 60332-1-2; (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. c. Self-closing devices	<i>cables reduces the possibility of fire occurring, the sloping of the floor upwards at an angle of at least 45° prevent illegal storage of any combustible materials within the protected shaft. Also, the provision of self-closing devices to the fire resisting doors ensure that the doors are closed at all times and hence prevent fire from spreading.</i>	
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		Automatic self-closing devices are not required to be installed on fire resisting doors opening into protected shafts which are interrupted by at least ½-hr fire resistance cavity barriers at every floor level or protected shafts containing sanitary pipes or water pipes, provided that the fire resisting doors are kept closed and locked at all times.		
25	3.9.3 Pipes (a) Pipes which pass through a separating wall, compartment wall or compartment floor shall be kept as small as possible and fire stopped around the pipe. The nominal internal diameter of the pipe shall be not more than the relevant dimension given in Table 3.9A. Spacing between pipes shall be minimum 50mm or ½-diameter of the largest pipe, whichever is the larger.	3.9.3 Pipes a. Pipes passing through a separating wall, compartment wall or compartment floor shall be kept as small as possible and be fire-stopped around the pipe. The nominal diameter of the pipe shall not be more than the respective dimension given in <u>Table 3.9A</u>. These pipe penetrations are permitted only for conveying non-hazardous & non-combustible substances such as air, water, etc., and approved fire-stopping material shall be applied around the pipe penetration. The clear spacing between pipes shall be at minimum 50mm or half the diameter of the largest pipe, whichever is larger. b. The following pipes of nominal diameter larger than 150mm, subject to	<i>Other than the maximum sizes allowed under <u>Table 3.9A</u>, larger pipes can also be permitted when penetrating a separating wall, compartment wall or compartment floor subject to accompanying conditions to minimize fire risk.</i>	

		the conditions listed under Cl.3.9.3c. below, are permitted to penetrate through a separating wall, compartment wall or compartment floor: (1) emergency standby diesel generator steel exhaust pipes connected directly to the external space; (2) pipes of non-combustible material (such as cast iron or steel) with pipe wall thickness of at least 5mm, and melting point of at least 1200°C; and (3) thermal insulated pipes with pipe wall thickness of at least 5mm and combustible insulation in compliance with Cl.7.1.1c.(1). The metal sheath for insulation material shall be at least 0.6mm thick galvanised steel with the melting point, including pipe support, of at least 1200°C. c. The following conditions shall be complied with for penetration of pipes stipulated under Cl.3.9.3b.: (1) For non-sprinkler-protected area, pipe supports within 3m from the pipe penetration shall be strengthened such that the tensile stress generated on the		
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		supports shall not exceed 10N/mm² and will not be softened or fracture when exposed to a temperature of 800°C. For sprinkler-protected area, the pipe supports and pipe penetrations shall be protected by the sprinkler system; (2) Combustible materials or services (e.g. pipe or ductwork) are not permitted to be placed within 1m before and after the penetration [except for those thermal insulated pipes constructed under Cl.3.9.3b.(3)]. For the purpose of this sub-clause, fire-rated materials are deemed as non-combustible; and (3) The penetration shall not pass through fire-rated wall/floor of exit staircase, fire lift lobby, smoke-stop lobby, electrical switch room, transformer room, generator room, battery room and fan room serving fire protection system, fire pump room, FCC, fuel tank room, and areas handling hazardous materials. Except for exit staircase, the penetration of pipes through the abovementioned rooms/spaces is permitted if the pipes are fully enclosed by fire-rated enclosure with the same fire-rating as		
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		the fire-rated walls/floors it passes through. d. In addition to Cl.3.9.3a., fuel and vent pipes for emergency standby diesel generators and fuel tanks located outside the room they served shall be enclosed in construction having at least 2-hrs fire resistance. They shall not be located in intakes/fresh air vent shafts.		
26	Nil	3.9.8 Gas pipe running inside an internal corridor/lobby 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.	<i>To harmonise with requirements stipulated in other standards.</i>	
27	3.15.12 (a) Composite panels which consist of plastic core shall not be used either for the construction of internal non-load bearing walls, ceilings, external walls or as cladding to external walls of all buildings unless prior approval has been obtained from the Relevant Authority. (b) Materials with surface flame spread rating of not lower than Class 2 shall be permitted to be used for the construction of partition for toilet	3.15.13 Composite panel Composite panels used for the construction of internal non-load bearing walls, as cladding for external/internal walls or as roof covering shall comply with all of the following criteria: a. The outer layers shall be constructed of non-combustible material.	<i>Existing clause on composite panel is expanded further to provide clarity. The relevant test standards are included to facilitate QP's compliance.</i>	

	cubicles. If the material used is of Class 3 surface flame spread rating, total exposed surface area of the partitions within the toilet shall not be more than 60m².	b. The core material (with aggregate thickness exceeding 1mm) of composite panel used for the building interior shall meet the classification stipulated in <u>Table 3.13B</u>. c. The composite panel used for external wall cladding shall be mounted against 1-hr fire-rated wall and shall comply with any of the following: (1) Its core material shall meet at least: (a) Class 0 flame-spread rating tested in accordance with BS 476 Part 6 & 7, or (b) Class B classified under EN 13501-1. (2) The panel assembly shall comply with: (a) limited combustibility when tested in accordance with BS 476 Part 11, or (b) Class A2 classified under EN 13501-1, or (c) NFPA 285, or (d) BS 8414.		
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		d. Composite panel containing plastic shall also comply with Cl.3.15.20.		
28	4.2.2 Accessway for firefighting appliances (a) (i) (a) (ii) (a) (iii) For buildings under PG II that exceed the habitable height of 10m, shall be provided within a travel distance of 18m to the entrance of all exit staircases where the landing valves (dry or wet riser) are provided in accordance with Cl.6.2.2b. The fire engine access road shall have a minimum 4m width and designed to sustain the load of stationary 30 tonnes fire engine fighting appliance, and shall be provided within 18m of dry riser breeching inlets of the building. The breeching inlets shall be located at the exterior, readily visible and accessible from the fire engine access road.	4.2.2 Fire engine accessway/fire engine access road for firefighting appliances a. Provision (1) (2) (3) PG II buildings exceeding 10m habitable height For a building under PG II that exceeds the habitable height of 10m, all of the following shall be complied with: (a) A fire engine accessway/fire engine access road shall be provided within a travel distance of 18m to the entrance of all exit staircases where the landing valves (dry or wet riser) are provided. (b) A fire engine accessway shall be provided to access at least one façade of each block and shall be located at a distance of at least 2m and at most 10m away from the façade of the building.	<i>The provision of fire engine accessway is mandated for residential buildings that exceed 10m in habitable height. This is to facilitate external firefighting and rescue operations via aerial appliances when escape routes are obstructed or not accessible.</i>	

		(c) The fire engine accessway shall be designed to meet the specifications stipulated in <u>Table 4.2A</u> .		
29	Nil	4.2.2 Fire engine accessway/fire engine access road for firefighting appliances (1) ... (2) (3) (4) (5) (6) (7) (8) Mixed-use buildings (a) Where the non-residential component of the building occupies only the lower portion of the building, the measurement of habitable height for determining the provisions of a fire engine accessway/fire engine access road shall be based on the non-residential component of the building.	<i>The new clause serves to clarify the measurement of habitable height for mixed-use building in determining the extent of fire engine accessway/fire engine access road.</i>	

		(b) For mixed-use buildings without PG II usage, the length of fire engine accessway shall be computed based on: (i) the gross cubical extent of the PG VI or VIII usages; or (ii) the larger compartmented floor area, for purpose groups other than PG VI and VIII, - whichever is larger. (c) For mixed-use buildings with PG II usage, the length of fire engine accessway for mixed-use buildings shall be computed based on Cl.4.2.2a.(6) above. In addition, Cl.4.2.2a.(3) shall also be complied with.		
30	4.2.2(d)(ii) The accessway shall have a minimum width of 6m throughout. Such accessway must be able to accommodate the entry and manoeuvring of fire engine, extended ladders pumping appliances, turntable and/or hydraulic platforms.	4.2.2b. Width of fire engine accessway The width of fire engine accessway shall be as specified in <u>Table 4.2A</u>, <u>Table 4.2B</u> and <u>Table 4.2C</u>. Such fire engine accessway shall be able to accommodate the entry and manoeuvring of firefighting appliances, and extended ladder firefighting appliances, with turntable and/or hydraulic platforms.	<i>Existing fire engine accessway width is unable to accommodate current firefighting appliances. As such, it is necessary to revise the specifications to accommodate firefighting appliances.</i>	

31	4.2.2(d)(vii) Overhead clearance Overhead clearance of accessway and fire engine access road shall be at least 4.5m for passage of fire fighting appliances.	4.2.2g. Overhead clearance An overhead structure shall only be permitted over a fire engine accessway/fire engine access road subject to all of the following (see Diagram 4.2.2f.): (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.	<i>The requirement of maximum 10m width of the overhead structure (i.e. link bridge) and the 20m separation distance between them is to ensure adequate openings for smoke ventilation, thus minimizing risk of smoke accumulation under such structures and to provide visual cues to drivers of firefighting appliances that it is safe to travel through the space under the overhead structure.</i>	

32	4.2.2(b)(i) For buildings under Purpose Groups III, IV, V and VII exceeding the habitable height of 10m, accessway shall be located directly below the access openings to provide direct outreach to the access openings. Accessway shall be provided based on the largest gross floor area of the following: (1) any floor including 1st storey, (2) if there are more than one floor interconnected, the aggregate areas of all the floor interconnected.	4.2.2 Fire engine accessway/fire engine access road for firefighting appliances a. Provision (1) (2) (3) (4) (5) (6) PG III, IV, V & VII buildings exceeding 10m habitable height For buildings under PG III, IV, V and VII exceeding the habitable height of 10m, a fire engine accessway shall be located directly below the fire access openings to provide direct reach to the designated fire access panels. The required length of fire engine accessway shall be computed based on the largest Accessible Floor Area (AFA) of any aboveground floors as follows: (a) for interconnected floors, including basements connected to above-ground	<i>The term “gross floor area” will be replaced with accessible floor area to prevent confusion with URA’s GFA. This clause is expanded to address fire engine access requirements for interconnected floor between basement and above-ground floors.</i>	
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		floors, the AFA shall be the aggregate areas of all the interconnected floors, or (b) for buildings with more than one group of interconnected floors, the AFA shall be taken as the largest of the aggregate floor areas among the groups of interconnected floors.		
33	4.2.2(e) Marking of fire engine accessway (i) All corners of accessway shall be marked. (ii) Marking of corners shall be in contrasting colour to the ground surfaces or finishes. (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. (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.	4.2.2i. Marking of fire engine accessway and fire engine access road (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. (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. (3) A sign post with white background and red wording of not less than 50mm	<i>The markings serve to guide our firefighters when responding to a fire incident at night. The sign posts provide clear indications on the locations of fire engine accessway and fire engine access road. It also serve to remind public to keep the fire engine accessway and fire engine access road clear of obstruction at all times.</i>	

		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 1m and 1.5m. 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. See Diagram 4.2.2i.(3).		
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	<u>Sigange for Fire Engine Accessway/Fire Engine Access Road</u> (1) At the start of the fire engine accessway/ fire engine access road xx Tonnes Fire Engine Accessway Keep Clear Start → Fire Engine Access Road Keep Clear Start → (2) Along the fire engine accessway/ fire engine access road xx Tonnes Fire Engine Accessway Keep Clear ← → Fire Engine Access Road Keep Clear ← → (3) At the end of the fire engine accessway/ fire engine access road xx Tonnes Fire Engine Accessway Keep Clear ← End Fire Engine Access Road Keep Clear ← End Diagram 4.2.2i.(3)			
34	Nil	4.2.2 Fire engine accessway/fire engine access road for firefighting appliances j. Design of fire engine accessway (1) Fire engine accessway sizes	<i>This information for the firefighting appliances serve to facilitate QP in the designing of both fire engine accessway and fire engine access road.</i>	

		The minimum width, length and turning radii of a fire engine accessway shall be in accordance with <u>Table 4.2A</u>, <u>Table 4.2B</u> and <u>Table 4.2C</u>. Diagram 4.2.2j(1) – 1 to 3 shows the relationship between the fire engine accessway and parked firefighting appliance with its front and rear jacks extended. (2) Fire engine accessways and fire engine access roads, which can be on suspended slabs, metalled/non-metalled roads, paved/non-paved surfaces, ground laid with strengthened perforated slabs, etc., shall be designed to withstand both stationary and axle loading capacity of firefighting appliances respectively as stipulated in <u>Table 4.2D</u> and <u>Table 4.2E</u>. Where a fire engine access road is used for linking fire engine accessway, its loading and turning radius shall comply with the specifications for fire engine accessway.		
35	Existing Table 4.4.2 – Water Supply & Storage Requirements for Private Hydrant			
	Purpose Group/Requirement	Purpose Group I & II	Purpose Group (*) III, IV, V, VII	Purpose Group (*) VI & VIII
	Minimum running	2 bars	2 bars	2 bars

pressure			
Minimum flow rate	27 L/s	$<1000\text{m}^2$ - 38L/s $<5000\text{m}^2$ - 57L/s $<10000\text{m}^2$ - 76L/s (57L/s if sprinkler protected) Additional 19L/s for subsequence 5000 m ²	500m^2 - 38L/s $<5000\text{m}^2$ - 57L/s $<10000\text{m}^2$ - 76L/s (57L/s if sprinkler protected) Additional 19L/s for subsequence 5000 m ²
Minimum duration	45 mins	45 mins	90 mins

Revised Table for water supply & storage requirements for private hydrant

TABLE 4.4A Water Supply & Storage Requirements for Private Hydrant

Purpose Group	Accessible Floor Area*	Minimum Flow Rate (L/s)	Minimum Running Pressure (bar)	Minimum Water supply and Storage Duration (mins)
PG I & II	-	27	2	45
PG III, IV, V & VII	$\leq 1000\text{m}^2$	38	2	45
	$> 1000\text{m}^2$ and $\leq 5000\text{m}^2$	57		
	$> 5000\text{m}^2$ and $\leq 10000\text{m}^2$	76		
	$> 10000\text{m}^2$	95		
PG VI & VIII	$\leq 500\text{m}^2$	38	2	90
	$> 500\text{m}^2$ and $\leq 5000\text{m}^2$	57		
	$> 5000\text{m}^2$ and $\leq 10000\text{m}^2$	76		
	$> 10000\text{m}^2$ and $\leq 15000\text{m}^2$	95		
	$> 15000\text{m}^2$ and $\leq 20000\text{m}^2$	114		
	$> 20000\text{m}^2$	133		

	Note: * Based on the Accessible Floor Area (AFA) of the largest compartment in the building <i>This revision will significantly reduce the tank size and pump capacity and yet meet operational needs.</i>		
36	5.2.1(g) Mechanical ventilation where required for the following rooms or spaces shall be provided with secondary source of supply. (i) exit staircases and exit passageways; (ii) smoke stop and fire fighting lobbies; (iii) areas of refuge within the same building; (iv) basement car parks; (v) fire command centres; (vi) flammable liquid/gas storage rooms; (vii) emergency power generator room, and engine driven fire pump room; (viii) carpark smoke purging system;	5.2.1g. Mechanical ventilation/pressurisation systems The following systems shall be provided with secondary source of power supply: (1) mechanical ventilation system for the following rooms or spaces: (a) exit staircases; (b) exit passageways; (c) smoke-stop/fire lift lobbies; (d) basement car parks; (e) fire command centres; (f) emergency power generator rooms; (g) engine driven fire pump rooms; (h) rooms involving the use and/or storage of flammable liquid/gas and explosive substances;	<i>The revised requirement aid clarity in specifying secondary power supply for the listed systems.</i>

	(ix) powered smoke control systems; (x) any other fire precautionary measure.	(i) any other areas where such systems are installed; and (2) pressurisation systems for the following areas: (a) smoke-stop/fire lift lobbies; (b) internal exit staircases; (c) hotel corridors; (d) hostel corridors; (e) healthcare corridors; and (f) any other areas where such systems are installed. (3) all smoke control system, including associated equipment forming part of the system.		
37	5.2.3 Emergency generator Where emergency generators are provided as a secondary source of supply, they shall comply with SS 535 Code of Practice for Installation, Operation, Maintenance, Performance and Constructional	5.2.2 Emergency generator a. Where emergency generators are provided as a secondary source of supply, they shall comply with SS 535. b. For outdoor emergency generator, all of the following requirements shall be complied with:	<i>The Code is previously silent for the requirements of outdoor emergency generator. New clauses are added to ensure continual operation of the generator during a fire emergency.</i>	

	Requirements of Mains Failure Standby Generating Systems.	(1) Day tank incorporated within the body of the emergency generator shall be constructed of steel. The day tank shall be of double skin construction. The emergency generator enclosure shall be able to contain any leakage of diesel. (2) Alternatively, an internal bund wall shall be built within the outdoor emergency generator's day tank large enough to contain 100% of the diesel content within the day tank. (3) The maximum quantity of diesel permitted in the day tank is 1000 litres.		
38	6.1.1 General (a) All Purpose Groups, except Purpose Groups I and II (Residential floors) shall be provided with portable fire extinguishers. (b) Portable fire extinguishers where required to be provided shall be constructed in conformity with specifications stipulated under SS EN 3 Specifications for Portable Fire Extinguishers. (c) All portable fire extinguishers	6.1.1 General a. Portable fire extinguishers, where required, shall be constructed in accordance with SS EN 3. b. All portable fire extinguishers, where required to be provided, shall be charged, tested, maintained and properly tagged in accordance with SS 578. 6.1.2 Provision	<i>The list of exception is expanded to include car park floor and non-habitable floor at roof level.</i>	

	where required to be provided shall be charged, tested and maintained in fully operational conditions and properly tagged in conformity with requirements in SS 578 Code of Practice for Use and Maintenance of Portable Fire Extinguishers. 6.1.2 Classification of portable fire extinguishers provided shall be selected in accordance with criteria specified under SS 578 such that the nature of processes and contents within the building concerned can be effectively protected. The size, quantity and siting of these portable fire extinguishers shall comply with the requirements in SS 578 under the respective class of occupancy hazard. 6.1.3 Portable fire extinguishers provided shall be installed and conspicuously marked in accordance with requirements by SS 578.	a. Fire extinguishers shall be provided in all buildings except the following: (1) PG I buildings; (2) residential floors of PG II buildings; and (3) car parking areas in standalone car parks or mixed-use residential buildings. b. Where the roof level is a non-habitable floor, fire extinguishers shall be provided to cover the M&E plants/equipment. 6.1.3 Type, size and siting The classification of portable fire extinguishers provided shall be selected in accordance with SS 578 such that the nature of processes and contents within the building concerned can be effectively protected. The size, quantity and siting of these portable fire extinguishers shall comply with the requirements in SS 578 under the respective class of occupancy hazard. 6.1.4 Installation and marking		
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		Portable fire extinguishers provided shall be installed and conspicuously marked in accordance with requirements by SS 578.		
39	6.2.2(d) Location and provision for landing valves shall comply with SS 575. (i) Landing valve is not required to be provided at the 1st storey level to buildings under Purpose Group II if the breeching inlets are installed in accordance with clause 6.2.3(c). (ii) Where all the exit staircases in a building under Purpose Groups III to VIII are installed with rising mains and standby fire hoses, and yet part of a floor space is beyond the 38m coverage of any landing valve, an additional standby fire hose shall be provided at the landing valve nearest to this floor space.	6.2.2c. Provision for landing valves and standby fire hoses (1) The location and provision for landing valves shall comply with SS 575. Where any part of the 1st storey of a building, except for PG II buildings, is more than 38m (30m hose line length and a jet throw of 8m) from the breeching inlet, a landing valve at the 1st storey shall be provided. (2) Where all the exit staircases in a building under PG III to VIII are installed with rising mains and standby fire hoses, and yet part of a floor space is beyond the 38m (30m hose line length and a jet throw of 8m) coverage of any landing valve, an additional standby fire hose shall be provided at the landing valve nearest to this floor space.	<i>The revision exempt landing valve requirements for small foot plate buildings i.e. less than 38m from remote part of any occupied space to breeching inlet. The measurement of 38m is based on travel distance. An explanation of how the 38m is derived is also added in the revised clause.</i>	

40	6.2.5(c) Mounting The cabinet lock, if provided, shall be one of the type that could be operated manually from the inside without the use of a key when the front plain glass/plastic (minimum 300mm x 300mm) is broken by the fire-fighter.	6.2.5c. Mounting (3) The cabinet lock, if provided, shall be one that can be operated manually from the inside without the use of a key when the front tempered glass (minimum 300mm x 300mm) is broken by firefighters.	<i>The use of plastic material for cabinet front is not acceptable as it will be difficult to break them.</i>	
41	6.2.8 Hose reels (a) Hydraulic hose reel conforming to the requirements in SS 575 Code of Practice for Fire Hydrant Systems and Hose Reels shall be provided in every storey of every building regardless of building height, except the following: (i) Purpose Group I buildings; (ii) Non- residential occupancy at the 1st storey of a residential building, and fulfilling the following conditions: (a) Floor area of the shop or office unit does not exceed 150m²; (b) Compartmented from the residential floors and other parts of the building;	6.2.8 Hose reels a. Provision (1) Hydraulic hose reel(s) conforming to the requirements in SS 575 shall be provided to every storey of every building regardless of building height, except for the following: (2) Where a roof level is a non-habitable floor, fire hose reels shall be provided to cover the M&E plants/equipment. (3) Exemption (a) PG I buildings. (b) Non-residential occupancy at the 1st storey of a mixed commercial-cum-residential building or single storey standalone building and fulfilling all of the following conditions:	<i>The exemption for hose reels is also extended to cover non-shop or non-office premises since the fire risk is similar, given the small size of floor area.</i>	

	(c) Not being used as an eating establishment, storage of flammable materials; (d) Not being used as public entertainment outlet; (e) Not belonging to Purpose Group VI & VIII. (iii) Any other small standalone single-storey guardhouse, bin centre, electrical sub-station and open-sided shed not exceeding 200m² (excluding those in Purpose Group VI & VIII). (iv) Subject to compliance with Cl.2.6.2, provision of hose reel on the mezzanine floor of factory unit is not required provided the coverage distance of the nearest hose reel at the main floor to the most remote point of the mezzanine floor shall not exceed 36m.	(i) Floor area of the non-residential unit does not exceed 150m². (ii) Individually compartmented except for the parts of the unit fronting and within 3m from the external. (iii) Not being used as an eating establishment, or for storage of flammable materials. (iv) Not being used as a public entertainment outlet. (v) Not belonging to PG VI or VIII. (vi) Not being used as a dormitory, hostel, etc. where sleeping risk is involved. (c) Other standalone buildings as follows: (i) Single-storey guard houses. (ii) Bin centres. (iii) 22kV (and lower) electrical substations. (iv) Open-sided sheds (excluding those for PG VI and VIII usages with floor		
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		areas not exceeding 200m²) and openings that constitute not less than 80% of the perimeter wall area (measured along the roof eaves). (d) Mezzanine floor of factory unit, subject to compliance with Cl.2.6.2, and provided the coverage distance of the nearest hose reel at the main floor to the most remote point of the mezzanine floor does not exceed 36m (30m hose path and 6m throw).		
42	6.2.8(d) Siting & installation The hose shall be of 20mm or 25mm nominal diameter and conform to EN 694, not exceeding 30m in length and terminating in ‘shut-off’ branches with 4mm or 6mm nozzles.	6.2.8d. Siting and installation (1) Siting and details of installation for hose reels shall comply with the requirements in SS 575. (2) Installation for hose reels shall comply with the requirements in SS 575. (3) Hose reels shall be sited in prominent and accessible locations within a distance of 5m from the exit door but not inside exit staircases. If there are parts of the floor space that are beyond the 36m coverage (30m hose path and 6m throw) of the hose reel, additional hose reels shall be provided at the common area or at a	<i>The revised clause provide clarify on the location of siting hose reels.</i>	

		distance of not more than 5m from the exit access door of a room. (4) Hose reels located within a room shall not be used for covering the areas outside the room.		
43	6.3.3 Manual alarm call points (c) Manual call points should be fixed at a height of 1.4m above the floor and shall be located at easily accessible and conspicuous positions free from obstructions. The installation of the sounding device shall be in accordance with SS CP 10. (d) Manual break-glass alarm call points can be omitted in carparks, irrespective whether the parking facility is stand-alone type or forms part of a building.	6.3.3 Manual alarm call points c. Manual call points shall be located between 800mm and 1.2m above the finished floor level and shall be located at easily accessible and conspicuous positions free from obstructions. The installation of the sounding device shall be in accordance with SS CP 10. d. Exemption Manual call points can be omitted for the following: (1) car parks, irrespective whether the parking facility is standalone type or forms part of a building; (2) open-to-sky roof gardens/terraces, provided an alarm sounder is extended to this level and positioned near the exit staircase except for developments where fire alarm system is not required.	<i>To lower the current height requirement of the manual call point in order to facilitate activation of the call point by Persons with Disabilities.</i> <i>This clause is expanded to include alarm sounder at roof garden/terrace. Without the alarm sounder at the roof level, occupant may be caught unaware of fire at lower floors during an emergency.</i>	

		(3) mezzanine floor of factory unit, subject to compliance with Cl.2.6.2, and provided no person on the mezzanine floor need to travel more than 30m to activate the nearest manual call point located on the main floor.		
44	Nil	6.3.11 Video image fire detection system a. Video Image Fire Detection System (VIFDS) complying with SS CP 10 can be used to complement smoke, heat and flame detectors in an electrical fire alarm system. b. VIFDS shall be installed in addition to the electrical fire alarm system for buildings which meet all of the following conditions: (1) It is an unmanned buildings belonging to PG III to VIII. (2) It has open spaces of more than 2000m² or ceiling heights of more than 12m. (3) It requires the provision of automatic fire alarm system in accordance with <u>Table 6.3A</u>.	<i>This new clause allows VIFDS to be used to complement conventional smoke, heat and flame detectors in an electrical fire alarm system. It is best installed in premises with large open space and high roofs such as production areas, halls, warehouses etc. VIFDS can cover gaps where smoke detectors are unable to detect particles due to high air flow and can help reduce false alarm. It is compulsory to install VIFDS in unmanned buildings as there are no security or operation personnel to check and confirm whether there is an actual fire when the fire alarm system is activated after office/operating hours.</i>	

		c. It shall be connected to the SCDF Operations Centre through an approved alarm monitoring company. Alarm signals and live video images of fire and/or smoke captured shall be transmitted to the approved alarm monitoring station upon activation of the building fire alarm system.		
45	6.4.1 The following shall be provided with an automatic sprinkler system (e) Exemption of sprinkler protection With the exception of industrial buildings, such as factories (PG VI), warehouses and storage depots (PG VIII), the following areas are exempted from sprinkler protection in a sprinklered building: (i) (ii) (iii) Atrium ceilings which exceed the height of 12m, measured from the finished floor level of the atrium floor to the ceilings of the atrium roof or to the level of half the vertical height of the ceilings of the atrium roof in the case of irregular roof profile. In lieu of the provision of sprinklers,	6.4.1 The following shall be provided with an automatic sprinkler system e. Exemption of sprinkler protection With the exception of industrial buildings, such as factories (PG VI), warehouses and storage depots (PG VIII), the following areas are exempted from sprinkler protection in a sprinkler-protected building: (1) (2) (3) Atrium space An automatic fire sprinkler system shall be provided for an atrium space not exceeding 18m in height. For an atrium with ceiling height exceeding 18m (in whole or in part), mode of fire protection by water monitor or deluge	<i>The provision of water monitor, deluge or/or extended-throw sprinkler system has been included in SS CP 52. This new clause provide avenue for QP to use other types of protection system when height of atrium exceeds 18m.</i>	

	approved effective detectors (eg. smoke, infra-red, etc) shall be installed in accordance with the approved standards and there shall be no commercial activities or storage within the floor spaces below the atrium roofs.	system with extended-throw side wall sprinklers shall be provided to cover the entire atrium space.		
46	6.4.3(b) Installation of fire pumps for sprinkler system shall comply with requirements of SS CP 52. Sprinkler pumps shall be installed within a fire compartmented fire pump room, whose fire rating shall be in accordance with Table 6.4A. The sprinkler pump room floor level shall not be lower than the main floor level. Sprinkler control valve(s) shall be located in the following order of priority: (i) facing external within close proximity to Fire Command Centre; (ii) within fire-fighting lobby/smoke-stop lobby; and (iii) within sprinkler pump room that has proper access; and	6.4.3c. The sprinkler control valve(s) shall be located in one of the following areas: (1) Facing an external space within a travel distance of 10m from entrance to the FCC. (2) Within a fire lift lobby/smoke-stop lobby. (3) Within a sprinkler pump room. (4) Within a 1-hr fire-rated enclosure, located at most 10m travel distance from the entrance to the exit staircase. d. Location plan A floor plan showing the locations of the sprinkler tank room, sprinkler pump room, breeching inlets and control valves shall be prominently displayed within the FCC. In the absence of the FCC, the floor plan shall	<i>This revision provides flexibility in the sitting of sprinkler control valve.</i> <i>The floor plan serves to show the locations of essential services.</i>	

	(iv) within fire compartmented enclosure located near to fire-fighting stair and readily accessible from the common areas.	be located in the following order of priority: (1) within the guard house, or (2) next to the main fire alarm panel.		
47	6.6.2(b) Buildings which require the provision of standby generating plant for special emergency operations. Provision for special emergency operation for lifts shall comply with the requirements in SS 550 for the following: (i) Public buildings; (ii) Buildings under Purpose Group II exceeding the habitable height of 60m; (iii) Buildings under Purpose Group II where the passenger lifts serve the upper storey residential floors and the non-residential basement; (iv) Mixed developments where the passenger lifts serve both the residential and non-residential floors;	6.6.2b. A standby generating plant shall be provided for: (1) homing of lifts during an emergency for: (a) PG II buildings with private lifts or that which exceed the habitable height of 60m; (b) mixed-use residential buildings where the lifts serve the residential and/or non-residential floor(s); (c) PG III to VIII buildings exceeding four storeys; and (d) all basement occupancies; (2) operating of the following lifts during an emergency: (a) fire lifts; (b) PWD evacuation lifts for buildings exceeding four storeys and buildings	<i>The revised clause adds clarity and addresses homing of lifts found in most buildings categories.</i>	

	(v) Industrial buildings under Purpose Group VI and VIII, which are multi-storey. (vi) All basement occupancies. (c) The power supply to the lift shall be connected to a sub-main circuit exclusive to the lift and independent of any other main or sub-main circuit. The power cables serving the lift installation shall be routed through an area of negligible fire risk.	which require the provision of such lifts; and (c) fire escape bed lifts. c. The power supply to the lift shall be connected to a sub-main circuit exclusive to the lift and be independent of any other main or sub-main circuits. The power cables serving the lift installation shall be routed through an area of negligible fire risk.		
48	6.6.3(b) A fire lift shall be adjacent and accessible to an exit staircase and be approached by a fire-fighting lobby at each storey. The fire lift shaft shall be continuous throughout the building and serve every storey.	6.6.3b. A fire lift shall be located such that the travel distance between the nearest edges of the lift landing door and exit staircase door is not more than 5m. In addition, the exit staircase shall be approached through a fire lift lobby at each storey	<i>The term “adjacent” previously used is ambiguous. It is replaced with a specific distance for clarity. 5m is considered a reasonable distance to the fire lift lobby.</i>	
49	6.6.4 Homing of lifts (a) Homing of lifts for buildings which are required to be provided with fire alarm system. In a fire emergency when any one of the fire detection devices or fire alarm systems is activated, all the passenger lifts shall be brought to the designated floor (usually) 1st storey) and park	6.6.6 Homing of lifts a. Homing of lifts for buildings which are required to be provided with fire alarm system. Homing of lifts for buildings which are required to be provided with fire alarm system. In a fire emergency when any one of the fire detection devices or fire alarm systems is activated, all the lifts,	<i>The requirement of alternate designated floor is applicable to all building occupancies. It is now weaved into the relevant clauses.</i>	

	there with the lift landing doors remaining opened.	including passenger, service, designated fire and designated evacuation lifts, shall be brought to the designated floor (usually 1st storey) or alternate designated floor (if the designated floor is a fire floor) and park there with the lift landing doors remaining opened. Goods lifts with automatic doors shall be similarly homed to the designated floor. Goods lifts with manual doors shall be homed if the doors are closed.		
50	6.6.4(c) Homing of lifts for buildings which are not required to have standby generating plant. All passenger lifts, including hydraulic lifts, shall be provided with Automatic Rescue Device (ARD). The ARD shall permit the lifts to move and park at the nearest lift landing floor with the lift/landing doors in the opened position in the event of power failure. Homing any of the lifts to a basement storey is not permitted.	6.6.6c. Homing of lifts for buildings which are not required to have standby generating plant and buildings with standby generating plant but without automatic fire alarm or sprinkler system. (1) For buildings without standby generating plants, the smoke/heat detectors shall form part of the lift system and shall be connected to the lift control panel to home the lift under normal power upon activation. All lifts, including hydraulic lifts, shall be provided with Automatic Rescue Device (ARD). The ARD shall permit the lifts to move and park at the nearest lift landing floor with the lift/landing doors open in the event of power	<i>Smoke/heat detectors form part of the lift system. To harmonise the requirements mandated under SS 550, these requirements is integrated in the relevant clauses.</i>	

		failure. Homing any of the lifts to a basement storey is not permitted. (2) Smoke/heat detectors shall be provided at all lift lobbies such that all lifts serving the same lobby shall be brought to the designated floor or alternative designated floor upon activation of the detectors. For buildings without a fire alarm system, the smoke/heat detectors shall form part of the lift system and shall be connected to the lift control panel to home the lift under normal power upon activation.		
51	6.6.4(d) Homing of lifts for Mixed developments comprising residential and non-residential components (i) All passenger lifts which serve the residential and non-residential floors shall be required to home to the designated or alternative designated floor in the event of power failure and/or fire. The lifts shall be provided with secondary power supplies from standby generating plant of sufficient capacity. (ii) Where the passenger lifts serve only the residential floors and by-pass the non-residential floors in a	6.6.6d. Homing of lifts for mixed developments comprising residential and non-residential components (1) All lifts which serve the residential and non-residential floors shall be required to home to the designated or alternate designated floor (if the designated floor is a fire floor) in the event of power failure and/or fire. The lifts shall be provided with secondary power supply from standby generating plant of sufficient capacity. (2) Where the passenger lifts serve only the residential floors and by-pass the non-residential floors in a protected	<i>The term “alternative designated floor” is reworded as “alternate designated floor” in accordance with SS 550.</i>	

	protected shaft, the lifts shall be required to be installed with Automatic Rescue Device (ARD), provided the habitable height of the highest floor does not exceed 60m. (iii) Where the passenger lifts serve the upper residential floors and the basement non-residential floor/s, including car parks, the lifts shall be provided with emergency power supply from standby generating plant for homing to the designated floor when there is a power failure in the building. In a fire emergency, the passenger lifts shall be brought to the designated floor when any of the fire alarm system in the basement non-residential floor/s is activated.	shaft, the lifts shall be required to be installed with Automatic Rescue Device (ARD), provided the habitable height of the highest floor does not exceed 60m. (3) Where the lifts serve the upper residential floors and the basement non-residential floor(s), including car parks, the lifts shall be provided with emergency power supply from a standby generating plant for homing to the designated floor when there is a power failure in the building. In a fire emergency, the lifts shall be brought to the designated floor or alternate designated floor (if the designated floor is a fire floor) when any of the fire alarm systems in the basement non-residential floor(s) is activated.		
52	6.6.4(e) Alternative designated floor (i) Where the lifts open directly into an occupancy area in a designated floor, for example, a shopping floor or an office floor, an alternative designated floor (eg 2nd storey) shall also be identified. The lifts shall be brought to the alternative floor in the event that there is a fire in the designated floor, in close vicinity of the lift landing door. The activation of	6.6.6e. Alternate designated floor (1) An alternate designated floor (e.g. 2nd storey) shall be identified. The lifts shall be brought to the alternate designated floor in the event that there is a fire at the designated floor. Localised detector(s) shall be provided to cover the lift landing space at the designated floor. The activation of any of the localised detectors or any other detectors or sprinklers covering the	<i>The revised clause provides specific coverage requirements for detectors at non-compartmented lift lobby area.</i>	

	any detector or sprinkler head covering the lift landing space at the designated floor would cause the lift to be re-directed to home to the alternative floor. (ii) The alternative floor shall have minimum fire hazard and pre-selected for the homing of passenger lifts, and where people can escape to safety in an exit staircase or other exit from the lift landing door. (iii) (iv)	designated floor shall cause all the lifts to be re-directed to home to the alternate designated floor. The localised detector(s) shall cover the area within at least 3m surrounding the lift landing door opening. Where the lift landing is protected by a fire-rated enclosure, only the space within the enclosure is required to be covered by localised detector(s). (2) The alternative alternate floor shall have minimum fire hazard and pre-selected for the homing of passenger lifts, and where people can escape to safety in an exit staircase or other exit from the lift landing door. (3) (4)		
53	Nil	6.7 Colour scheme of fire protection systems 6.7.1 Equipment, fixtures and fittings The following equipment/fixtures/fittings for the fire protection systems shall be painted in red. For those equipment/fixtures/fittings not listed	<i>The colour scheme of some fire protection system/components are not explicitly stipulated in any Standards and that had created uncertainty amongst the QPs. The purpose of this clause is to compile the colour scheme of commonly used fire protection system/components for QP's reference.</i>	

		below, the colour scheme shall be in accordance with that specified in the relevant codes of practice. a. Fire sprinkler system (1) Fire pump & control panel (2) Breeching inlet (excluding breeching inlet cabinet/enclosure) (3) Sprinkler control valve (4) Sprinkler water proofing system/device b. Electrical fire alarm system (1) Main fire alarm panel/cabinet (2) Sub fire alarm panel/cabinet (3) Manual call point (4) Visual alarm light housing (Note: fire alarm bell need not be in red) c. Private fire hydrant (1) Wet pillar hydrant (with yellow band in accordance with SS 575)		
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		(2) Dry pillar hydrant (whole hydrant in yellow) d. Wet/dry rising mains (1) Fire pump & control panel (2) Breeching inlet (excluding breeching inlet cabinet/enclosure) (3) Rising mains pipe (4) Landing valve (5) Standby hose cabinet/enclosure e. Hose reel system (1) Fire pump & control panel (2) Hose reel drum (excluding cabinet/enclosure) f. Total flooding fire extinguishing system (1) Manual release control (2) Abort switch (3) Breathing apparatus cabinet/enclosure		
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		g. Emergency Voice Communication System Handset/cabinet/enclosure h. Fire extinguisher Housing cabinet/enclosure (Note: Alternatively, red graphic signage or red wordings “Fire Extinguisher” of minimum size 20mm shall be provided.) i. Electro-mechanical locking system (for exit and exit access door) Emergency door release 6.7.2 Pipework, conduits, trunkings and cable trays For fire protection systems pipework/conduits/trunkings/cable trays which are not required to be painted in red, red colour bands of width not less than 20mm and labelling shall be provided at an interval of not more than 6m apart.		
54	Nil	6.8 REDUNDANCY FOR FIRE PUMPING SYSTEM	<i>This aspect of redundancy in firefighting systems is important</i>	

		6.8.1 The pumping system for wet rising mains, hose reels, sprinklers and hydrants shall be provided with redundancy such that the system performance is not affected when one of the pumps and/or the associated control system is out of operation due to routine maintenance or break-down.	<i>to ensure reliability and availability of the system during an emergency. It is stated in this Code since most Code of Practices is not explicit.</i>	
55	7.1.1(j) Fire rated duct (i) (ii) (iii) (iv)	7.1.1j. Fire-rated duct (1) (2) (3) (4) (5) Control panels serving engineered smoke control and smoke purging systems shall be clearly visible and located within a common location readily accessible for operation and maintenance, preferably within circulation space, with a mounting height of not less than 1.5m or more than 1.8m from the finished floor level. For smoke purging systems in car parks, the control panel shall be sited at least 1.5m away from any car park lot or other fire hazards.	<i>The control panel serving the fans of smoke control systems are crucial and shall not be located within any smoke layer to ensure that the integrity of the whole smoke control system is maintained, as the exhaust systems would be non-operable if the control panels fail.</i>	

		If a common accessible location is not possible, the control panels shall be protected with at least 1-hr fire resistance rating.		
56	7.1.7(b) Sharing of kitchen exhaust system for food and beverage outlets is allowed provided the following conditions are complied with: (i) For a food court (1) the food court shall be under a single ownership/operator; (2) there must be provision for maintenance and cleaning of the exhaust system; (3) the food court owner/operator shall ensure that the kitchen exhaust system is degreased and cleaned regularly; and (4) all kitchen exhaust ducts running outside the food court shall have fire resistant rating of at least 1 hour or shall not be less than that for the elements of structure, whichever is the higher. (ii) For restaurants	7.1.1b. Sharing of kitchen exhaust system for food and beverage outlets is allowed, provided the following conditions are complied with: (1) For a food court (a) the food court shall be under a single ownership/operator; (b) the food court owner/operator shall ensure that the kitchen exhaust system is degreased and cleaned at an interval of at least 12 monthly; and (c) all kitchen exhaust ducts running outside the food court shall have fire resistance rating of at least 1-hr, or shall not be less than that for the elements of structure, whichever is higher. (2) For restaurants/small F&B outlets (e.g. snack bars, food kiosks, etc.) (a) restaurants and small F&B outlets that are sharing the same kitchen	<i>For ease of reference, the restaurants category is extended to cover smaller F&B outlets. As such, the same KED sharing requirements for restaurants can be applicable for smaller F&B outlets. Current restaurant aggregate floor area of 1000m² control is too restrictive, it has been revised to allow for more effective sharing of kitchen exhaust duct.</i> <i>The revision to include limitation of 50m in zone length would restrict the running length of the shared ducts and reduce fire risk.</i>	

	(1) the restaurants that are sharing the same kitchen exhaust system shall be located next to each other and be on the same storey; (2) the aggregate floor area of the restaurants shall not exceed 1,000m²; (3) common duct shall be provided with common exhaust fan; (4) there must be provision for maintenance and cleaning of the common exhaust system; (5) the common kitchen exhaust system shall be degreased and cleaned regularly; (6) the building shall be protected by an automatic fire sprinkler system; (7) the exhaust hood shall be fitted with a wet chemical fire extinguishing system; and (8) the fire rating of the common kitchen exhaust duct running outside the restaurants shall have fire resistance rating of at least 1 hour or shall not be less than that for the	exhaust system shall be located on the same storey and within the aggregate zone area not exceeding 2000m². The maximum length of the aggregate zone covering from the first to the last restaurant/F&B outlet shall not exceed 50m. (b) the aggregate floor area of the restaurants and F&B outlets shall not exceed 1000m²; (c) common ducts shall be provided with a common exhaust fan; (d) the building owner/MCST shall ensure that the entire kitchen exhaust system, including those within individual restaurant/F&B outlet, is degreased and cleaned at an interval of at least 12 monthly; (e) the building shall be protected by an automatic fire sprinkler system; (f) the exhaust hood shall be fitted with a wet chemical fire extinguishing system; and (g) the fire rating of the common kitchen exhaust duct running outside the restaurants shall have fire resistance rating of at least 1-hr, or		
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elements of structure, whichever is the higher. (iii) For other smaller F&B outlets such as snack bars, food kiosks etc. (1) the F&B outlets that are sharing kitchen exhaust system shall be: * within close proximity from each other; * within a zone of 1,000m²; * with hood-to-hood distance of not more than 10m; and * located on the same storey. (2) the kitchen exhaust duct running outside the F&B outlets shall have fire resistance rating of at least 1 hour or shall not be less than that for the elements of structure, whichever is the higher; and (3) all other conditions stipulated in (ii)(3) to (7) above shall be complied with. (Note: Kitchen exhaust duct includes both horizontal and vertical ducts)	shall not be less than that for the elements of structure, whichever is higher. (Note: Kitchen exhaust ducts include both horizontal and vertical ducts.)		
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57	7.1.8 Rooms involving use of Flammable and Explosive Substances (a) Mechanical ventilation system where required for rooms which involve the use of flammable and explosive substances shall be independent from those serving other parts of the building. It shall comply with the following requirements: (i) (ii) (iii) No fire damper shall be fitted in either supply or exhaust duct required under this Clause; and (iv) Ducts serving other areas shall not pass through rooms involving use of flammable and explosive substances.	7.1.8 Rooms involving use of flammable and explosive substances a. Ventilation system shall consist of exhaust and supply part with a rate of 20 air changes per hour or any other rates acceptable to the SCDF. The exhaust shall direct to the external and shall not be less than 5m from any air intake openings; (1) Where such ducts run outside the room they shall either be enclosed in a structure or be constructed to give at least the same fire rating as the room which they serve or that of the room through which they traverse, whichever is higher. The rating shall apply to fire exposure from both internal and external of the duct or structure. Where the duct risers are required to be enclosed in a protected shaft constructed of masonry or drywall complying with <i>Cl.3.8.9a</i>, they shall be compartmented from the rest of the shaft space containing other ducts or services installations; (2) No fire damper shall be fitted in either supply or exhaust duct required under this Clause. However, a common fire-rated supply air duct can	<i>Subclause (2) is expanded to include common fire-rated supply air duct that serve various compartments within the same floor level or other floor levels. The purpose is to add clarity.</i>	
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		serve various compartments within the same floor level or other floor levels, provided: (a) the compartment is sprinkler-protected; (b) the compartments serve the same purpose, and (c) the duct is fitted with fire damper where it passes through the wall or floor of each fire compartment. (3) A dedicated exhaust duct shall be provided for individual fire compartment and shall be maintained in operation (with the minimum flow rate) even it is under fire mode situation to prevent smoke entering into other fire compartments; and (4) Ducts serving other areas shall not pass through rooms involving use of flammable and explosive substances.		
58	Nil	7.1.9 Ventilation system for rooms housing batteries Rooms housing batteries shall comply with the following requirements:	<i>The revision is in line with NFPA to limit the maximum concentration of hydrogen to 1 percent of the total volume of the room. The provision of 6 air changes is adequate to address</i>	

		a. The batteries shall be either vented or sealed type. b. The room ventilation system shall be designed to limit the maximum concentration of Hydrogen (H₂) gas to 1% of the total volume of the room during the worst case event of simultaneous “boost” charging of the batteries. The inlets and outlets of the ventilation system shall be properly located so that there is no stagnant area in the room. c. Adequate hydrogen gas detector shall be provided inside the room to monitor the hydrogen concentration and to activate the fan, if necessary to ensure that the hydrogen concentration level at any part of the room does not exceed 1% of the total volume of the room. Display panel showing the readings of the detectors shall be located at the entrance to the room. At the same time, an alarm signal shall be sent to manned station such as security control room, guard house or FCC. d. The design of the battery room ventilation shall be in accordance with EN 50272-2 & EN 50272-3 or 6 air change per hour whichever is higher.	<i>accumulation of hydrogen within the battery room.</i>	
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		e. No fire damper shall be provided in the essential ventilation system and ducts passing through other compartments shall have 2-hrs fire-rating. f. Essential fans and associated electrical controls etc. shall be back-up with secondary source of power supply.		
59	7.3 PRESSURISATION OF INTERNAL CORRIDORS IN HOTELS 7.3.1 Where internal corridors in hotels are required to be pressurised in compliance with Cl.2.7.1(c), the pressure within such corridors shall be higher than that in the guest rooms and the pressure within the internal exit staircases higher than that of the corridors.	7.3 PRESSURISATION OF INTERNAL CORRIDORS IN HOTELS 7.3.1 Pressure differences a. Where internal corridors in hotels are required to be pressurised in compliance with Cl.2.7.1c., the pressure within such corridors shall be higher than that in the guest rooms by 12.5 Pa. Corridor pressurisation shall be activated on the floor on fire and two floors above. b. The pressure within the smoke-stop lobby/fire lift lobby serving these internal corridors shall be higher than that of the internal corridors by 12.5 Pa. The pressurisation fans serving the smoke-stop lobby/fire lift lobby shall activate on all floors during a fire.	<i>The revision is in line with NFPA recommended pressure differential of 12.5 Pa between smoke barriers at different spaces. Previous requirements requiring pressurisation of internal corridors on all floors would require very huge fans which has significant impact on cost and better utilising of spaces.</i>	

		c. Pressure within the internal exit staircases shall comply with Cl.7.2.2a..		
60	7.4.1 (b) Where the total aggregate floor area of all basement storeys exceeds 2000m², an engineered smoke control system that complies with the requirements stipulated in Cl.7.4.3 shall be provided for all parts of basement with the following exceptions: (i) (ii) Plant/equipment room with floor area not exceeding 250m² and compartmented from rest of the basement, and provided with two doors for better reach in fire fighting operation. (iii)	7.4.1 (b) Where the total aggregate floor area of all basement storeys exceeds 2000m², an engineered smoke control system that complies with the requirements stipulated in Cl.7.4.3 shall be provided for all parts of basement with the following exceptions: (i) (ii) A plant/equipment room with floor area not exceeding 250m² and compartmented from rest of the basement, two doors remotely located from each other for better reach in firefighting operations shall be provided. The provision of single door opening for this room is permitted provided the remote part of the room is less than 8m and the equipment located within this room shall not obstruct the throw of water jet from firefighting hose, and (iii)	<i>This revised clause provides alternative of two door opening provided the entire room is within the throw of a firefighting hose.</i>	
61	7.6.25 Fire damper shall not be fitted in the smoke ventilation system.	7.4.5o. Fire damper shall not be fitted in the smoke ventilation system, except	<i>This revised clause serves to allow the use of combination</i>	

		where used in an engineered smoke control system. In such a situation, a combination fire and smoke damper shall be constructed in accordance with SS 333, and its electric actuator shall be tested in accordance with the requirements of UL 555S for at least 2-hrs at 250°C. The damper shall be in closed position during fail-safe mode. The combination fire and smoke damper, and any duct extension between it and the protected vent shaft, shall be of the same rating as the element of structure. Sprinkler protection shall be provided to the electric actuator. The electrical power supply cables to the electric actuator shall be fire resistant.	<i>fire and smoke damper in engineered smoke control system.</i>	
62	Nil	7.5 REDUNDANCY FOR MECHANICAL VENTILATION AND PRESSURISATION SYSTEMS 7.5.1 The fan and its associated controller for the following systems shall be provided with redundancy such that the system performance is not affected when one of the fans and/or controllers is out of operation due to routine maintenance or break-down: a. mechanical ventilation system for	<i>This aspect of redundancy is not explicitly stated in most Code of Practices. By mandating it in this Code, it serves to inform the designer its system redundancy for mechanical ventilation and pressurisation.</i>	

		(1) smoke-stop/fire lift lobbies; (2) exit staircases; (3) essential rooms (e.g. sprinkler/wet riser/hydrant/hose reel pump room, standby generator room, FCC, etc.); b. engineered smoke control system; c. carpark smoke purging system; and d. pressurisation systems for smoke-stop/fire lift lobbies, exit staircase and hotel internal corridor.		
63	8.1.3 Emergency Lighting for Occupied Areas (a) For all buildings except Purpose Group I or II, emergency lighting shall be provided in the occupied areas following the guidelines below: (i) (ii) (b) Notwithstanding the requirements in (a) above, emergency lighting shall be provided in the following locations:	8.1.3 Emergency lighting for occupied areas a. For all buildings except PG I or II, emergency lighting shall be provided in the occupied areas following the requirements below: (1) along paths exceeds 13m, or (2) over the whole lobbies and exits. b. The provision of emergency lighting is exempted for:	<i>In view that there is less concern of smoke-log in open-to-sky roof garden, the provision of emergency lighting is not needed.</i> <i>Being a single storey open-sided building, occupants can evacuate in any directions.</i>	

	(i)	(1) open-to-sky roof terrace/garden; and (2) open-sided single storey building, with floor area not exceeding 200m² and openings that constitute at least 80% of the perimeter wall area (measured along the roof eaves). c. Notwithstanding the requirements in Cl.8.1.3a. above, emergency lighting shall be provided in the following locations: (1)	<i>Furthermore, the chances of smoke-log condition are not high, hence emergency lighting can be exempted.</i>	
64	8.1.7 Exit and Directional Signs (a) (b) Directional signs In long corridors, in open floor areas, and in all situations where the location of the exits may not be readily visible, directional signs shall be provided to serve as guides from all portions of the corridors or floors. (c) (d)	8.1.7 Exit and exit directional signs a. b. The provision of exit directional signs is exempted for open-to-sky roof terrace/garden. c. The provision of exit and exit directional signs is exempted for open-sided single storey building, with floor area not exceeding 200m² and openings that constitute at least 80% of the perimeter wall area (measured along the roof eaves). d. Directional signs	<i>In view that there is less concern of smoke log in open-to-sky roof garden, the provision of exit directional signs is not needed.</i> <i>The ventilation openings which constitute more than 80% of the open-sided single storey perimeter wall area are crucial as it facilitate cross ventilation and address smoke-log within such premises, hence exit and exit directional sign can be exempted.</i>	

	(e) The legends, dimensions, design and installation of the exit signs and directional signs shall comply with SS 563. (f) Self-illuminating exit and directional signs with letters in green and powered by radioactive material are allowed for use in buildings, provided the signs comply with BS 5499 Part 2, SS 508 and SS 563 under sub-clause 8.1.7(e). With respect to the design of signage, either graphic or text is acceptable. (g) Where the direction of travel to exit discharge is upward, the staircase signage required under Cl.2.3.1 (b) shall comply with SS 508 – Specification for Fire Safety Signs.	In long corridors, in open floor areas, and in all situations where the location of the exits may not be readily visible, directional signs shall be provided to serve as guides from all portions of the corridors or floors. e. f. g. The legends, dimensions, design and installation of electrically-powered exit and directional signs shall comply with SS 563. Either graphic or text format can be used for the design of the signage. h. Self-illuminating signs The use of self-illuminating exit and directional signs powered by radioactive material are permitted in buildings, provided the signs comply with UL 924, SS 563 and SS 508 (Part 1, 2, 3 & 5). Either graphic or text format can be used for the design of the signage. In addition, SS 563 Part 1 shall be complied with for determination of the viewing distance with distance factor (Z) fixed at 50.	<i>The standards are updated to remain relevant.</i>	
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		i. Where the direction of travel to exit discharge is upward, the staircase signage required under <i>Cl.2.3.1b.</i> shall comply with SS 508.		
65	8.2 VOICE COMMUNICATION SYSTEM AND FIRE COMMAND CENTRE 8.2.1(a) One-way emergency communication system and a fire command centre shall be provided as follows: (i) For all large buildings under Purpose Groups III (not applicable to primary school, secondary school and junior colleges), IV, V, VI, VII & VIII with gross floor area greater than 5000sq m or having a total occupant load exceeding 1000 persons; or (ii) (iii)	8.2 EMERGENCY VOICE COMMUNICATION SYSTEM AND FIRE COMMAND CENTRE (FCC) 8.2.1 Provision a. One-way emergency voice communication system and a FCC shall be provided as follows: (1) For all large buildings under PG III (not applicable to primary school, secondary school and junior colleges) to VIII with AFA greater than 5000m² or having a total occupant load exceeding 1000 persons. The calculation of AFA and occupant load shall exclude the aboveground or underground car park; or (2) (3) ...	<i>The revision involved omission of car park as its fire risk is relatively low. Subjecting the calculation of accessible floor area in car park buildings will result in many developments requiring the provision of FCC and one-way emergency voice communication system, which is excessive and may not be practical.</i>	
66	8.2.3 (c) Location The Fire Command Centre shall be located at the same level as the fire	8.2.3c. Location (1) The FCC shall be located at the same level as the fire engine accessway	<i>The term “adjacent” previously used is ambiguous, it is replaced with specific distance for clarity. 5m is considered a</i>	

	engine accessway or access road and in the following order of priority: (i) every fire-fighting lobby, including 1st storey; (ii) in the case where there is no fire-fighting lobby, it shall be located within vicinity of the fire engine accessway or access road and adjacent to one of the protected stairs serving all storeys of the development. (iii) at any other location as may be designated by the Relevant Authority.	or fire engine access road and its entrance shall be located in the following order of priority: (a) It shall be within 5m from entrance of the fire lift lobby at the designated storey of the building. (b) In the case where there is no fire lift lobby, it shall be located within vicinity of the fire engine accessway or fire engine access road and within 5m from the entrance of one of the protected stairs serving all storeys of the development. (c) It shall be at any other location as may be designated by the SCDF. (2) In the case of a site consisting of more than one building which required FCC in accordance with Cl.8.2.3a., each building shall be provided with its own FCC.	<i>reasonable distance to the fire lift lobby.</i>	
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Note: Please note that the existing clause numbering system will be changed and this may lead to changes in the numbering of above appended revised/new clause nos.

TABLE 4.2A FIRE ENGINE ACCESSWAY/FIRE ENGINE ACCESS ROAD FOR PG II BUILDINGS

Details	Habitable Height (m)			
	≤ 10	> 10 & ≤ 33	> 33 & ≤ 60	> 60
Width of fire engine access road	≥ 4m			
Additional fire engine accessway to access minimum one façade of each block	Not required	Required. See requirements below		
Type of firefighting appliance	Pump ladder	CPL 34	AL 56 & CPL 60	HLA 90
Width of fire engine accessway	-	≥ 6m	≥ 6m	≥ 7m
Length of fire engine accessway	-	≥ 15m	≥ 15m	≥ 15m
Loading capacity of fire engine accessway	≥ 24 tonnes	≥ 30 tonnes	≥ 40 tonnes	≥ 50 tonnes
Loading capacity of fire engine access road	≥ 24 tonnes	≥ 30 tonnes	≥ 40 tonnes	≥ 50 tonnes
Axle/Jack loading	See <u>Table 4.2D</u> & <u>Table 4.2E</u>			
Inner turning radius	4m	6.5m	7.5m	7.5m
Outer turning radius	8m	10.5m	12m	12m
Clearance turning radius	8.5m	12m	13.5	15m
Turning facility/U-turn	See Diagram 4.2.2e.(1) – 1 to 4 and Diagram 4.2.2e.(2) – 1 to 4			
<u>Note:</u> The appended figures for loading capacity of fire engine accessway/fire engine access road are characteristic values				

TABLE 4.2B – FIRE ENGINE ACCESSWAY/FIRE ENGINE ACCESS ROAD FOR PG III, IV, V & VII BUILDINGS

Details	Habitable Height (m)			
	≤ 10	> 10 & ≤ 33	> 33 & ≤ 60	> 60
Width of fire engine access road	≥ 4m			
Fire engine accessway	Not applicable	Required. See requirements below		
Type of firefighting appliance	Pump ladder	CPL 34	AL 56 & CPL 60	HLA 90
Width of fire engine accessway	-	≥ 6m	≥ 6m	≥ 7m
Length of fire engine accessway	See Table 4.2.2a.(6)			
Loading capacity of fire engine accessway	≥ 24 tonnes	≥ 30 tonnes	≥ 40 tonnes	≥ 50 tonnes
Loading capacity of fire engine access road	≥ 24 tonnes	≥ 30 tonnes	≥ 40 tonnes	≥ 50 tonnes
Axle/Jack loading	See Table 4.2D & Table 4.2E			
Inner turning radius	4m	6.5m	7.5m	7.5m
Outer turning radius	8m	10.5m	12m	12m
Clearance turning radius	8.5m	12m	13.5	15m
Turning facility/U-turn	See Diagram 4.2.2e.(1) – 1 to 4 and Diagram 4.2.2e.(2) – 1 to 4			
<u>Note:</u> The appended figures for loading capacity of fire engine accessway/fire engine access road are characteristic values				

TABLE 4.2C FIRE ENGINE ACCESSWAY/FIRE ENGINE ACCESS ROAD FOR PG VI & VIII BUILDINGS

Details	Habitable Height (m)			
	≤ 10	> 10 & ≤ 33	> 33 & ≤ 60	> 60
Width of fire engine access road	≥ 4m			
Fire engine accessway	Required. See requirements below			
Type of firefighting appliance	Pump ladder	CPL 34	AL 56 & CPL 60	HLA 90
Width of fire engine accessway	≥ 6m	≥ 6m	≥ 6m	≥ 7m
Length of fire engine accessway	See Table 4.2.2a.(7)			
Loading capacity of fire engine accessway	≥ 24 tonnes	≥ 30 tonnes	≥ 40 tonnes	≥ 50 tonnes
Loading capacity of fire engine access road	≥ 24 tonnes	≥ 30 tonnes	≥ 40 tonnes	≥ 50 tonnes
Axle/Jack loading	See Table 4.2D & Table 4.2E			
Inner turning radius	4m	6.5m	7.5m	7.5m
Outer turning radius	8m	10.5m	12m	12m
Clearance turning radius	8.5m	12m	13.5	15m
Turning facility/U-turn	See Diagram 4.2.2e.(1) – 1 to 4 and Diagram 4.2.2e.(2) – 1 to 4			
<u>Note:</u>				
The appended figures for loading capacity of fire engine accessway are characteristic values				

TABLE 4.2E – JACK LOADING OF FIREFIGHTING APPLIANCES				
Type of Firefighting Appliances	CPL 34	AL56	CPL 60	HLA 90
Jack load contact area	5625 cm ²	5625 cm ²	7125 cm ²	7125 cm ²
Maximum pressure per Jack (4 jacks per vehicle)	37 N/cm ²	37 N/cm ²	37 N/cm ²	50 N/cm ²
<u>Note:</u> The appended figures for jack loading are characteristic values				

CPL 34 Firefighting Appliance - Wheels & Jacks Layout

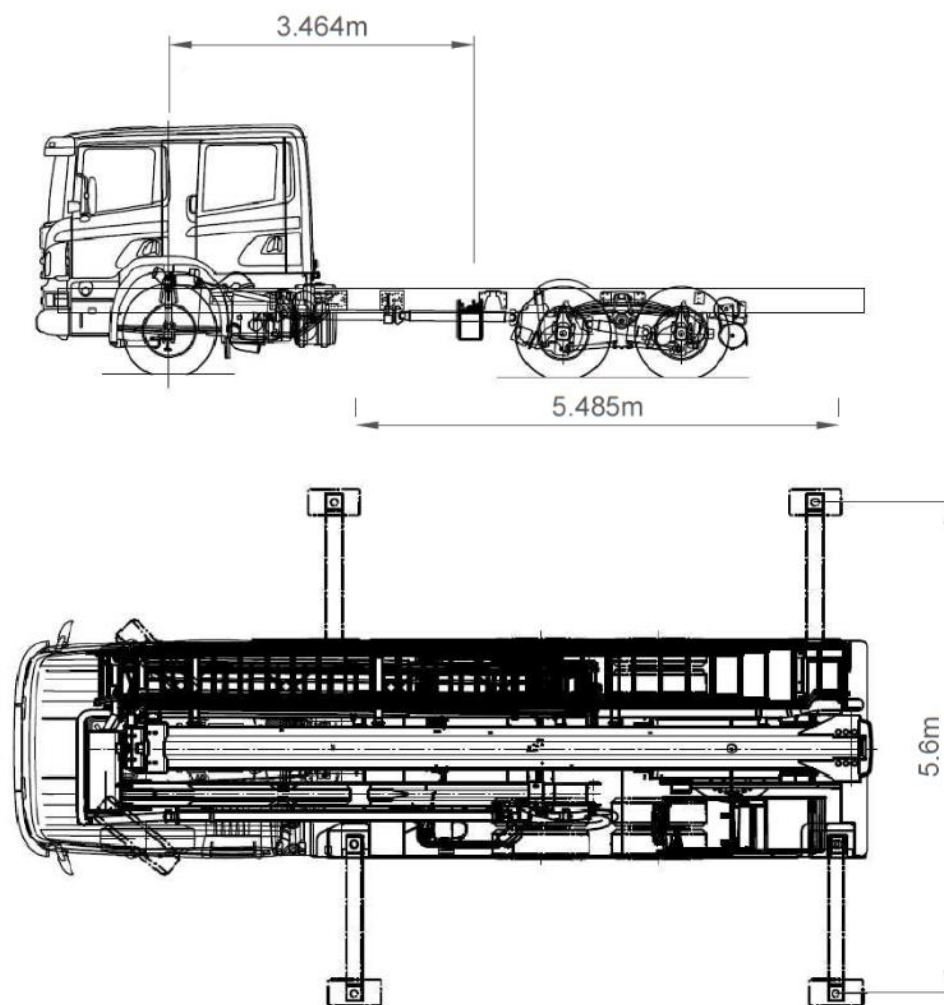


Diagram 4.2.2j.(1) - 1

AL 56 & CPL 60 Firefighting Appliances - Wheels & Jacks Layout

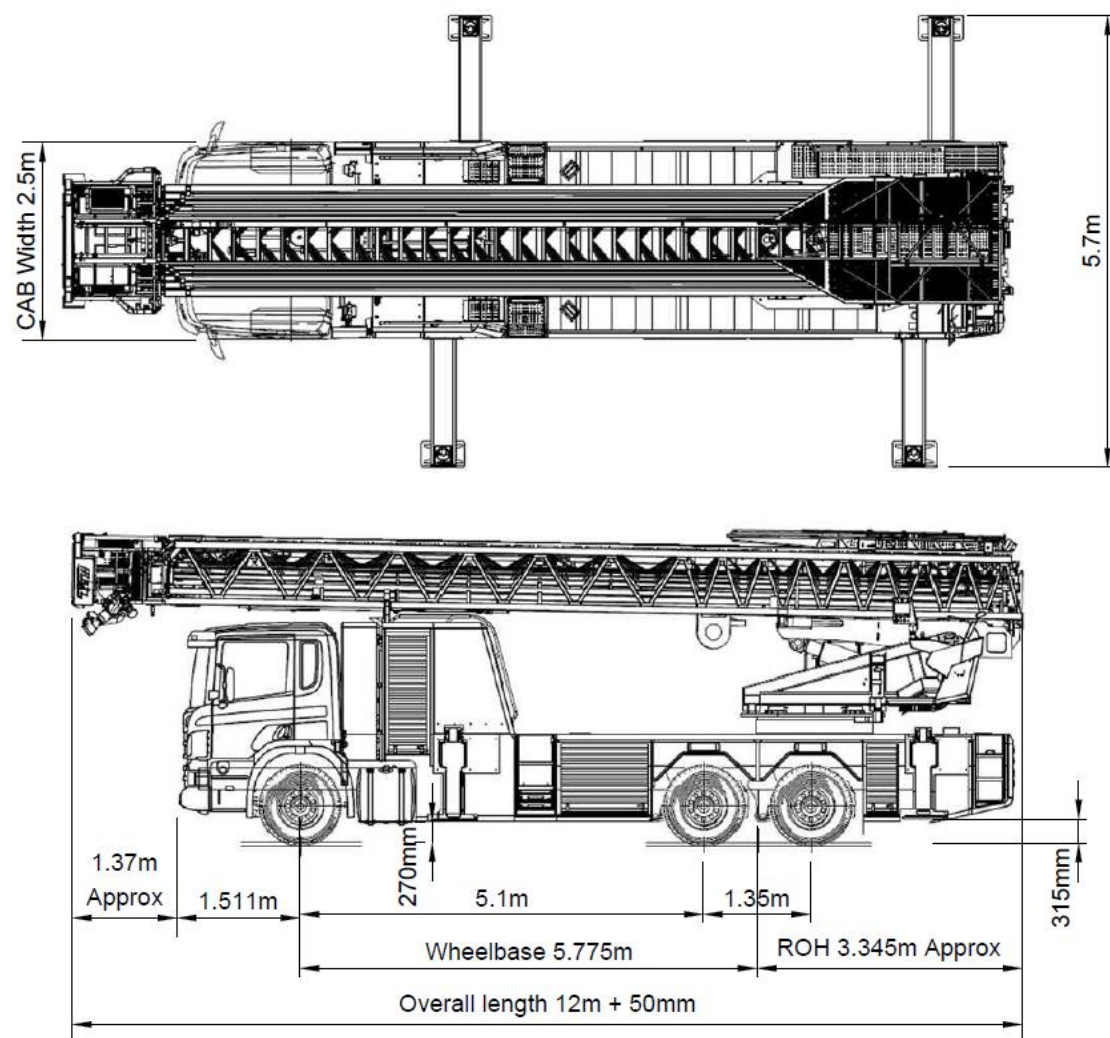


Diagram 4.2.2j.(1) - 2

HLA 90 Firefighting Appliance - Wheels & Jacks Layout

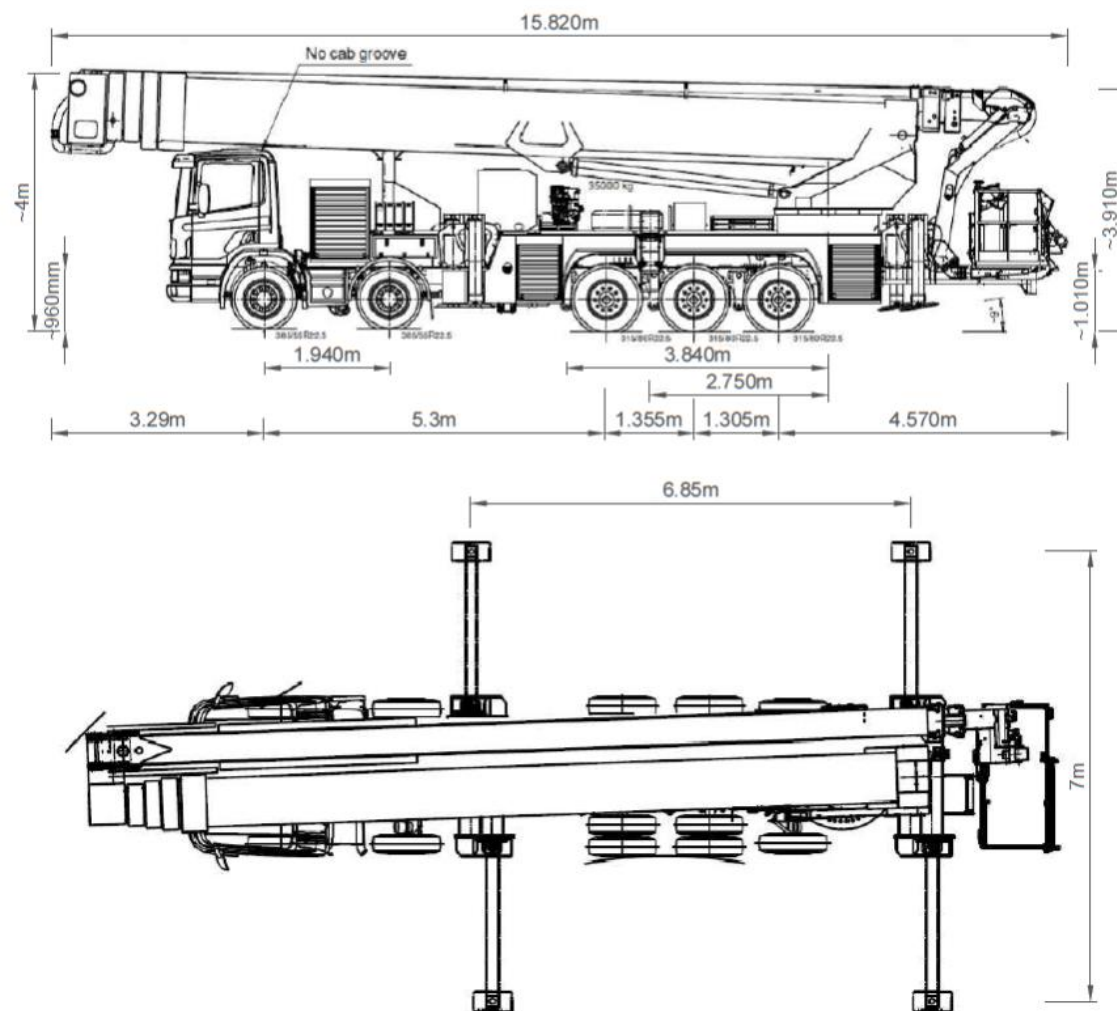
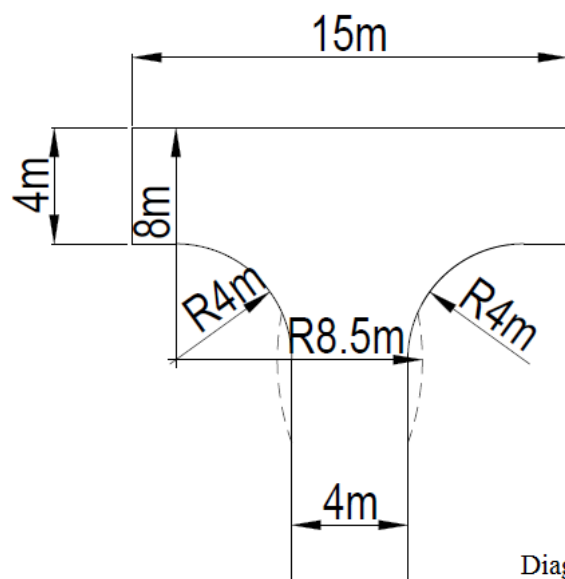
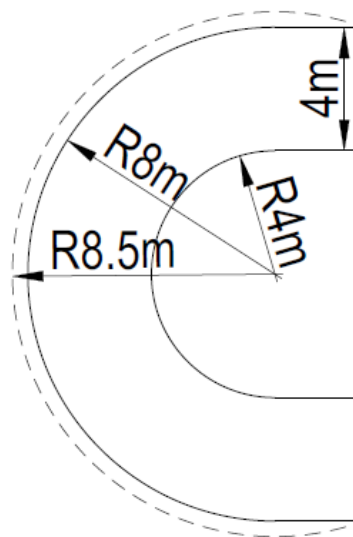


Diagram 4.2.2j.(1) - 3

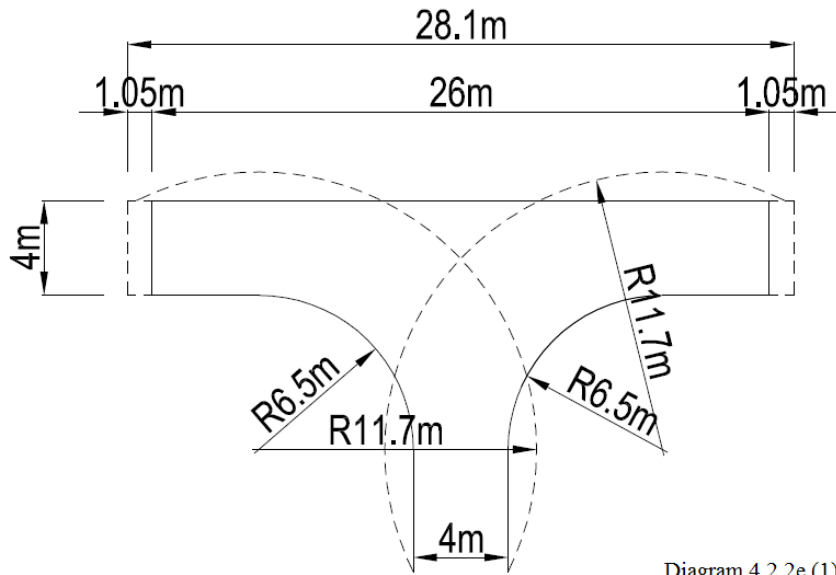
**Turning Facilities for Pump Ladder
Firefighting Appliance (24 tonnes)**



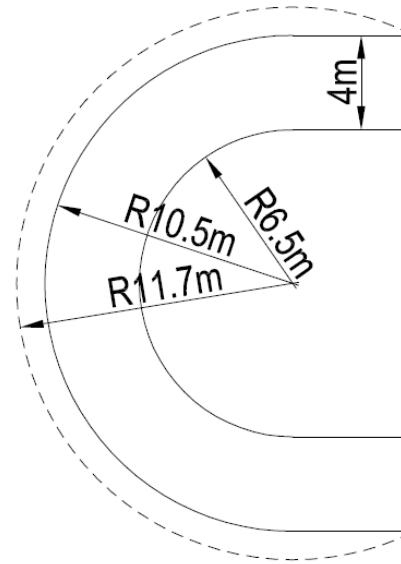
**U-Turn Radii of Pump Ladder
Firefighting Appliance (24 tonnes)**



Turning Facilities for CPL 34 Firefighting Appliance (30 tonnes)



U-Turn Radii of CPL 34 Firefighting Appliance (30 tonnes)



Turning Facilities for AL 56 & CPL 60 Firefighting Appliances (40 tonnes)

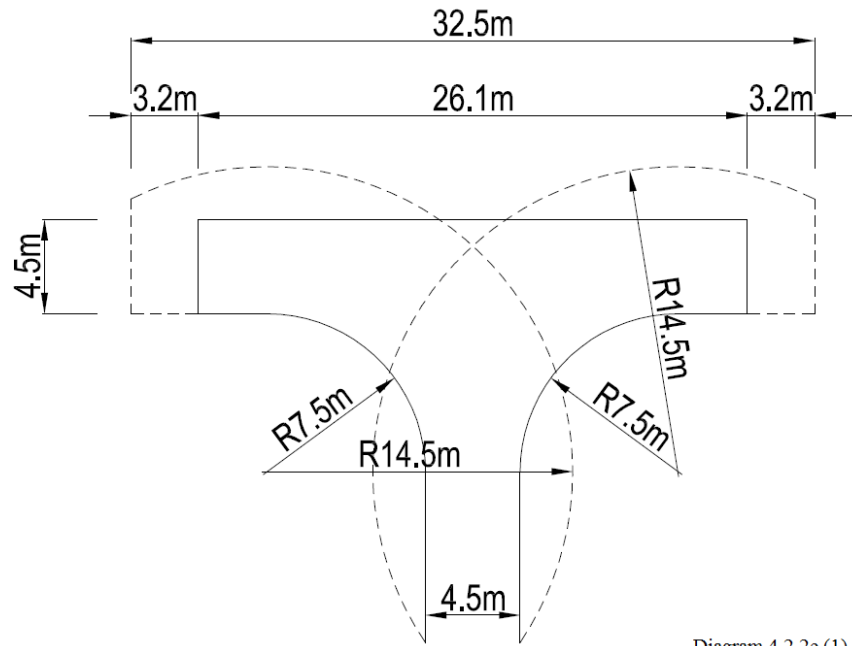


Diagram 4.2.2e.(1) - 3

U-Turn Radii of AL 56 & CPL 60 Firefighting Appliances (40 tonnes)

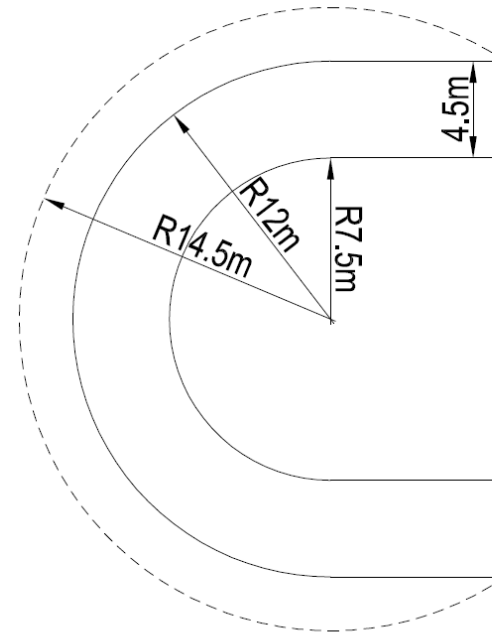
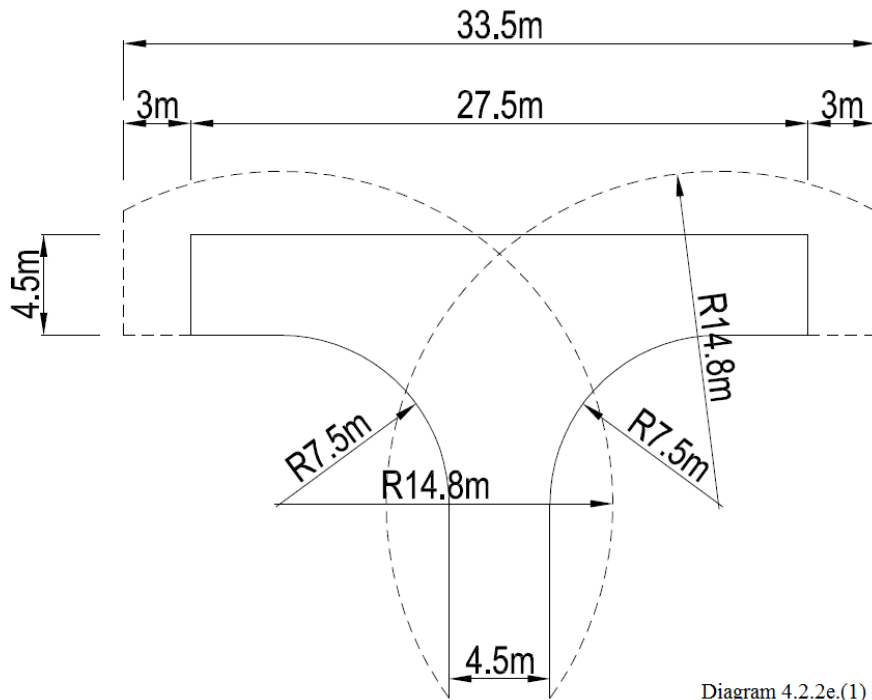


Diagram 4.2.2e.(2) - 3

Turning Facilities for HLA 90 Firefighting Appliance (50 tonnes)



U-Turn Radii of HLA 90 Firefighting Appliance (50 tonnes)

