SINGAPORE CIVIL DEFENCE FORCE

Date : 15 Sep 2020 **Our Ref**: CD/FSSD/12/02/03/01

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,

AMENDMENTS TO FIRE CODE 2018 - 6th BATCH OF AMENDMENTS

SCDF would like to issue the 6th batch of amendments to the Code of Practice for Fire Precautions in Buildings 2018 (Fire Code 2018). The amendments which were deliberated and accepted by the Fire Code Review Committee are attached as Annex A, B & C of this circular.

2. Amendments stipulated in these Annexes shall take effect from the dates specified therein. For those amendments that are to take effect at future dates as specified in Annex A, Qualified Persons are encouraged to comply with the requirements before the effective dates. Any proposed plans of fire safety works for new buildings or existing buildings that are submitted to SCDF for approval on or after the effective dates shall be subjected to the amendments made to the Fire Code.

3. 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.

HQ SINGAPORE CIVIL DEFENCE FORCE, 91 UBI AVENUE 4, SINGAPORE 408827
TEL: 68481457 FAX: 68481490 EMAIL:TAN_Chung_Yee@scdf.gov.sg

4. For any queries, you may contact Mr Randy Tan at DID: 68481461 or Mr Tan Yi Yang at DID: 68481734.

Yours faithfully

(transmitted via email)

LTC Tan Chung Yee
for Commissioner
Singapore Civil Defence Force

Distribution list

CEO, BCA
CEO, URA
CEO, HDB
CEO, JTC
CE, LTA
CE, Enterprise Singapore
President, REDAS
President, IFE
President, SISV
President, FSMAS
President, SCAL
Honorary Secretary, SPM
Manager (Fire Safety & Building Control Unit), DSTA
SCDF Fire Safety Standing Committee
Fire Code Review Committee

HQ SINGAPORE CIVIL DEFENCE FORCE, 91 UBI AVENUE 4, SINGAPORE 408827
TEL: 68481457 FAX: 68481490 EMAIL:TAN_Chung_Yee@scdf.gov.sg

Annex A

S/N	Clause No	Amendment Date	Effective Date	Clause Status	Clause Before Amendment	Clause After Amendment
1	1.4.64	15 Sep 2020	15 Sep 2020	Clarification	Habitable height "Habitable height" refers to the height measured from the lowest level of fire engine accessway or fire engine access road (applicable to buildings under Purpose Group II) to the finished floor level of the highest habitable floor.	Habitable height "Habitable height" refers to the height measured from the ~~lowest~~ level of fire engine accessways or fire engine access roads, whichever is the lowest, ~~(applicable to buildings under Purpose Group II)~~ to the finished floor level of the highest habitable floor.
2	2.2.11	15 Sep 2020	15 Sep 2020	Clarification	Number of exit staircases or exits per storey There shall be at least two independent exit staircases or other exits from every storey of a building, unless otherwise permitted under other subsequent provisions of the Code. For non-habitable roof, at least one exit staircase shall be provided. Where the area of non-habitable roof is large and one-way travel distance to the exit cannot be met, an additional cat/ship ladder adequately separated in accordance with *Cl.2.3.12* and leading to the circulation area of the floor below shall be provided. All access hatches, if provided, shall be readily accessible from the roof. Access hatch opening shall have a minimum clear width of 1m in diameter.	Number of exit staircases or exits per storey There shall be at least two independent exit staircases or other exits from every storey of a building, unless otherwise permitted under other subsequent provisions of the Code. For non-habitable roof, at least one exit staircase shall be provided. Where the area of non-habitable roof is large and one-way travel distance to the exit cannot be met, an additional cat/ship ladder adequately separated in accordance with *Cl.2.3.12* and leading to the circulation area of the floor below shall be provided. All access hatches, if provided, shall be readily accessible from the roof. Access hatch opening shall have a minimum clear width of 1m in diameter. The travel

					The travel distances can be based on that for a sprinkler-protected building for roof areas which are open-to-sky.	distances can be based on that for a sprinkler-protected building for roof areas which are open-to-sky. For protruding structures above the non-habitable roof, namely exit staircase shaft and lift motor room is exempted from this clause.
3	2.2.12	15 Sep 2020	15 Mar 2021	Revised	Location of exits & access to exits All exits and access facilities shall be required to comply with all of the following: a. Exits and access facilities shall be clearly visible or their locations shall be clearly indicated and shall be kept readily accessible and unobstructed at all times. b. Every occupant or tenant within a building or storey of a building shall have direct access to the required exit or exits without the need to pass through the spaces or rooms occupied by other occupants or tenants. c. When more than one exit is required from any room or space or a storey of a building, each exit shall be	Location of exits & access to exits All exits and access facilities shall be required to comply with all of the following: a. Exits and access facilities shall be clearly visible or their locations shall be clearly indicated and shall be kept readily accessible and unobstructed at all times. b. ~~Every occupant or tenant within a building or storey of a building shall have direct access to the required exit or exits without the need to pass through the spaces or rooms occupied by other occupants or tenants.~~ Every occupant within a building or storey of a building shall have direct access to the required exit or exits without the need to pass through another room(s) or other

					placed as remote as possible from the other as permitted under *Cl.2.3.12a., b., c.* or *d.*.	tenanted space(s). Where direct access to the required exit or exits of the storey is not possible, occupants shall only be allowed to pass through a maximum of one other room or space belonging to the same tenant with the following conditions being complied with: (1) the exit access door separating the rooms or spaces which the egress route passes through shall only be fitted with electromechanical device designed in accordance with *Cl.2.3.9k.(2);* (2) the doorway of the exit access door shall not be blocked/obstructed and be kept clear at all times. (3) Warning signs of wording "Exit Access Door - Keep Clear" shall be placed prominently on both sides of the exit access door, and (4) the egress paths through the exit access door shall be suitably demarcated.

						c. When more than one exit is required from any room or space or a storey of a building, each exit shall be placed as remote as possible from the other as permitted under *Cl.2.3.12a., b., c.* or *d.*.
4	2.3.3c.(1)	15 Sep 2020	15 Mar 2021	Revised	Discharge All exit staircases shall discharge at ground level directly into: (a) an external space, or (b) an open-sided external corridor with no commercial activity and is not more than 5m from the building eave line, or (c) an open-to-sky corridor having minimum width of 1.2m and two-way escape paths leading to an external space. Any unprotected openings along the corridor shall not be located lower than 1.8m from the floor level.	Discharge All exit staircases shall discharge at ground level directly into: (a) an external space, or (b) an open-sided external corridor with no commercial activity and is not more than 5m from the building eave line, or (c) an open-to-sky corridor having minimum width of 1.2m and two-way escape paths leading to an external space. Any unprotected openings along the corridor shall not be located lower than 1.8m from the floor level, or (d) an air well of size complying with *Table 1.4.2* and with discharge point at the grade level having at least 2 separated egress routes with

						direct access through circulation space to the building external.
5	2.3.9k.(2)	15 Sep 2020	15 Sep 2020	Clarification	Access control belonging to tenanted spaces 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 override device in accordance with *Cl.2.3.9k.(1)(b)*. The manual override 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 override device. *Cl.2.3.9k.(1)(a)* is not applicable to tenanted spaces.	Access control belonging to tenanted spaces 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 override device in accordance with *Cl.2.3.9k.(1)(b).*The manual override 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 override device. *Cl.2.3.9k.(1)(a)* is not applicable to tenanted spaces. Where escape is allowed to go through another occupied space in accordance with *Cl.2.2.12b*., the exit access door within the tenant unit for escape purpose shall release when the alarm on that floor activates.

6	2.3.9l.(5)	15 Sep 2020	15 Sep 2020	Clarification	Where locking is required for doors of smoke-free lobby, fire lift lobby or exit staircase on the re-entry floor, they shall be fitted with an electromechanical locking device complying with *Cl.2.3.9k.(1)*. Note: Where the doors of exit staircases, smoke-free lobbies or fire lift lobbies are provided with one-way locking device or electromechanical lock, a signage, though not mandatory, should be provided to warn occupants that they would not be able to re-enter the floor should they exit from it. The signage should be positioned at the entrance into exit staircase, smoke-free lobby or fire lift lobby.	Where locking is required for doors of smoke-free lobby, fire lift lobby or exit staircase on the re-entry floor, they shall be fitted with an electromechanical locking device complying with *Cl.2.3.9k.(1)*. For re-entry floor, manual override device shall be provided on both sides of the door. Note: Where the doors of exit staircases, smoke-free lobbies or fire lift lobbies are provided with one-way locking device or electromechanical lock, a signage, though not mandatory, should be provided to warn occupants that they would not be able to re-enter the floor should they exit from it. The signage should be positioned at the entrance into exit staircase, smoke-free lobby or fire lift lobby.
7	3.2.7	15 Sep 2020	15 Sep 2020	Reinstatement of past requirements	Buildings of high hazard occupancy a. The compartment of buildings of high hazard occupancy shall not exceed one half of the sizes given in *Table 3.2A* and each compartment shall comprise one storey only. b. No storey of a building, the habitable height of which is more than 24m, shall be used for the bulk	Buildings of high hazard occupancy a. The compartment of buildings of high hazard occupancy shall not exceed one half of the sizes given in *Table 3.2A* and each compartment shall comprise one storey only. b. No storey of a building, the habitable height of which is more than 24m, shall be used for the bulk storage of

					storage of goods or substances of highly combustible nature unless the building is provided with a sprinkler system to comply with Chapter 6. c. The type of storage materials or substances shall not include the following: (1) materials with an auto-ignition temperature lower than 200°C; and (2) combustible/highly flammable materials which include those highlighted in sub-clauses *a.*, *b.*, *c.* and *d.* of *Cl.1.4.67.*	goods or substances of highly combustible nature unless the building is provided with a sprinkler system to comply with Chapter 6. c. The type of storage materials or substances shall not include the following: (1) materials with an auto-ignition temperature lower than 200°C; and (2) combustible/highly flammable materials which include those highlighted in sub-clauses *a.*, *b.*, *c.* and *d.* of *Cl.1.4.67.* d. For buildings not listed in *Table1.4A*, including but not limited to buildings used for the manufacture and/or storage of highly combustible substances and/or flammable liquids, etc., the requirements shall be consulted with the SCDF.
8	3.5.9	15 Sep 2020	15 Mar 2021	Revised (relocated to *Cl.9.2.1b.(3))*	Separation of residential floor façade The façade of residential floors above 24m habitable height shall be separated from each other by:	~~Separation of residential floor facade~~ ~~The façade of residential floors above 24m habitable height shall be separated from each other by:~~

					a. a 1-hr fire-rated spandrel of at least 1.5m in height, or b. a 1-hr fire-rated horizontal projection that extends at least 600mm from the building.	~~a. a 1-hr fire-rated spandrel of at least 1.5m in height, or~~ ~~b a 1-hr fire-rated horizontal projection that extends at least 600mm from the building.~~ b. Structural fire precaution (3) For residential buildings exceeding 24m in habitable height, the façade of every residential floors shall be separated from each other by: (a) a minimum 1-hr fire-rated spandrel of at least 1.5m in height, or (b) a minimum 1-hr fire-rated horizontal projection that extends at least 600mm from the building. Note: Balcony and air-con ledge can be used as part of this horizontal projection if they protrude at least 600mm from the building facade and

						have at least 1-hr fire-rated construction.
9	3.7.7c.	15 Sep 2020	15 Mar 2021	Revised	Operation The commonly used shutters such as vertical, horizontal and lateral fire shutters shall comply with SS 489 and the following: (1) Vertical fire shutter operated by gravity during a fire Upon activation by a fire alarm system or fusible link, the operating mechanism of curtains/leaves of the vertical fire shutter shall be released. The curtain/leaves shall descend under gravity at a controlled rate. (2) Electrically-operated vertical, lateral and horizontal fire shutter (fusible link is not required) Upon activation by fire alarm system, the electrical motor shall drive the curtains/leaves to descend	Operation The commonly used shutters such as vertical, horizontal and lateral fire shutters shall comply with SS 489 and the following: (1) Vertical fire shutter operated by gravity during a fire Upon activation by a fire alarm system or fusible link, the operating mechanism of curtains/leaves of the vertical fire shutter shall be released. The curtain/leaves shall descend under gravity at a controlled rate. (2) Electrically-operated vertical, lateral and horizontal fire shutter (fusible link is not required) Upon activation by fire alarm system, the electrical motor shall drive the curtains/leaves to descend and shall be backed up by

					and shall be backed up by emergency power supply. The power and signal cables shall be fire-rated.	emergency power supply. The power and signal cables shall be fire-rated. (3) Activation time and closing speed (a) For vertical fire shutter with height not exceeding 6m, the maximum time for full closure of the fire shutter shall not exceed 30 secs from time of activation, with a descending speed not exceeding 0.2m/sec. (b) For vertical fire shutter with height exceeding 6m and not more than 12m, the maximum time of full closure of the fire shutter shall not exceed 60 secs from time of activation, with a descending speed not exceeding 0.2m/sec.
10	3.7.8	15 Sep 2020	15 Mar 2021	Revised	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	~~Exit directional~~ Fire safety signage ~~on~~ for fire shutter and smoke curtain a. 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

					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.	nearest exits if the activated shutters visually obscure the building exit and/or directional signs. The ~~signage~~ sign shall be reflective and the letters at least 100mm in height. b. Signage for alerting persons not to impede the operation of fire shutters/smoke curtains shall be permanently displayed at prominent locations and suitable intervals close to the descending paths of the fire shutters/smoke curtains. The lettering of the sign shall be at least 25mm high in a colour contrasting with the background and states the following where applicable: (1) "FIRE SHUTTER – KEEP CLEAR" (2) "SMOKE CURTAIN – KEEP CLEAR"

11	3.8.1	15 Sep 2020	15 Sep 2020	Revised	Purpose of protected shaft A protected shaft shall not be used for any purpose additional to those given as defined under *Cl.1.4.82*. All services such as, pipe/duct installation shall not be located inside a protected staircase. Likewise, no washroom is allowed to be located inside protected staircase.	Purpose of protected shaft A protected shaft shall not be used for any purpose additional to those given as defined under *Cl.1.4.82*. All services such as, pipe/duct installation shall not be located inside a protected staircase, unless otherwise permitted in *Cl.3.8.7*. Likewise, no washroom is allowed to be located inside protected staircase.
12	3.8.7	15 Sep 2020	15 Mar 2021	Revised	Protected shaft containing exit staircase a. A protected shaft which contains an exit staircase shall not contain any services e.g. pipes, cables, ducts, etc., that are not solely serving the same exit staircase (even if the services are protected with fire-rated dry construction), except for: (1) cut-off sprinkler and pipe for that staircase; (2) UPVC or cast iron rain water downpipes serving the roof directly above the exit staircase, and not routed through anywhere outside the staircase; and (3) rising mains.	Protected shaft containing exit staircase a. A protected shaft which contains an exit staircase shall not contain any services e.g. pipes, cables, ducts, etc., that are not solely serving the same exit staircase (even if the services are protected with fire-rated dry construction), except for: (1) cut-off sprinkler and pipe for that staircase; (2) UPVC or cast iron rain water downpipes serving the roof directly above the exit staircase, and not routed through anywhere outside the staircase; ~~and~~ (3) rising mains; and

						(4) metal water supply pipe and water tap not exceeding 50mm in diameter.
13	3.9.7	15 Sep 2020	15 Sep 2020	Clarification	Services running inside and/or passing through fire lift lobby and smoke-free lobby Air ducts, sanitary pipes, gas pipes, electrical conduits/cable tray, and other services, excluding lifts shall not be permitted to run inside and/or pass through: a. fire lift lobbies, or b. smoke-free lobbies. unless all these services are protected with a 1-hr fire resistance rating enclosure, or separated with a 1-hr fire resistance ceiling from the said lobby. If these services are required for the operation of the above lobbies, they need not be separately protected. However, this requirement need not complied with if the smoke-free approach is through an external corridor.	Services running inside and/or passing through fire lift lobby and smoke-free lobby Air ducts, sanitary pipes, gas pipes, electrical conduits/cable trays, and other services e.g. fan coil units, ventilation fans (essential or non-essential) excluding lifts shall not be permitted to locate, run inside and/or pass through: a. fire lift lobbies, or b. smoke-free lobbies. unless all these services are protected with a 1-hr fire resistance rating enclosure, or separated with a 1-hr fire resistance ceiling from the said lobby. ~~If these services are required for the operation of the above lobbies, they need not be separately protected.~~ For cablings/pipings of firefighting or fire protection systems serving or running through the above lobbies, and for other services that are required for operation of the above lobbies during fire emergency, e.g. lighting, mechanical ventilation system, they need not be separately protected. However, this

						requirement need not complied with if the smoke-free approach is through an external corridor.
14	4.2.2	15 Sep 2020	15 Sep 2020	Clarification	Fire engine accessway and fire engine access road a. Provision (1) PG I and II buildings not exceeding 10m habitable height A fire engine accessway is not required for the following buildings, however, a fire engine access road for access by firefighting appliances shall be provided to within a travel distance of 60m of every point on the projected plan area of the following buildings: (a) PG I buildings; (b) PG II buildings of habitable height not exceeding 10m; and (c) Cluster housing.	Fire engine accessway and fire engine access road a. Provision (1) PG I and II buildings ~~not exceeding 10m habitable height~~ A fire engine accessway is not required for the following buildings, however, a fire engine access road for access by firefighting appliances shall be provided to within a travel distance of 60m of every point on the projected plan area of the following buildings: (a) PG I buildings; (b) PG II buildings of habitable height not exceeding 10m; and (c) Cluster housing.

15	4.2.2i.	15 Sep 2020	15 Mar 2021	Revised	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 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	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), or white or yellow road stud reflectors of size not less than 100mm (W) x 100mm (L) x 18mm (H). The markings or reflectors shall be visible at all times ~~night~~ and shall be provided on both sides of the fire engine accessways/fire engine access roads at an alternate interval of not more than 5m. Markings or reflectors shall also mark all corners and turning corners of the fire engine accessway. See *Diagram 4.2.2i.(2)*.

					between 2m and 2.2m. The sign post shall be visible at night and shall not be positioned more than 3m from the fire engine accessway/fire engine access road. Every part of the fire engine accessway/fire engine access road shall not be more than 15m from the nearest sign post. See *Diagram 4.2.2i.(3)*.	(3)	A sign ~~post~~ with white background and red pictogram with upper case wording of not less than ~~50mm~~ 70mm in height shall be provided at the start, junction, and end of a fire engine accessway/fire engine access road. The height measured from the ground to the lowest point of the sign shall be between ~~2m and 2.2m~~ 2.3m and 2.4m. The sign ~~post~~ shall be reflective, visible and unobstructed at all times ~~at night~~ and shall ~~not~~ be positioned adjacent to ~~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.~~ For locations where there are more than one of such signs, the signs can be placed on the same post. See *Diagram 4.2.2i.(3)*.

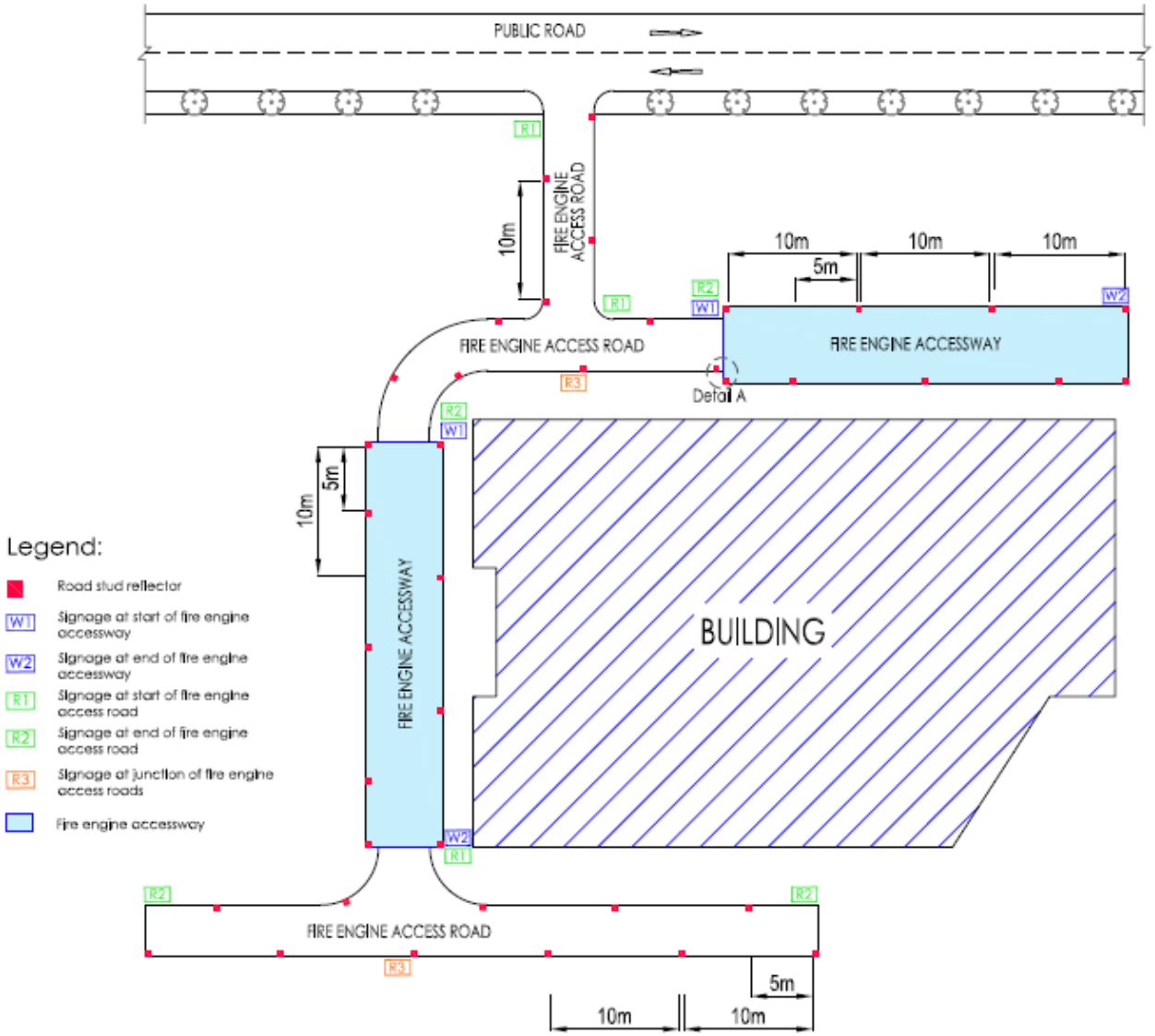
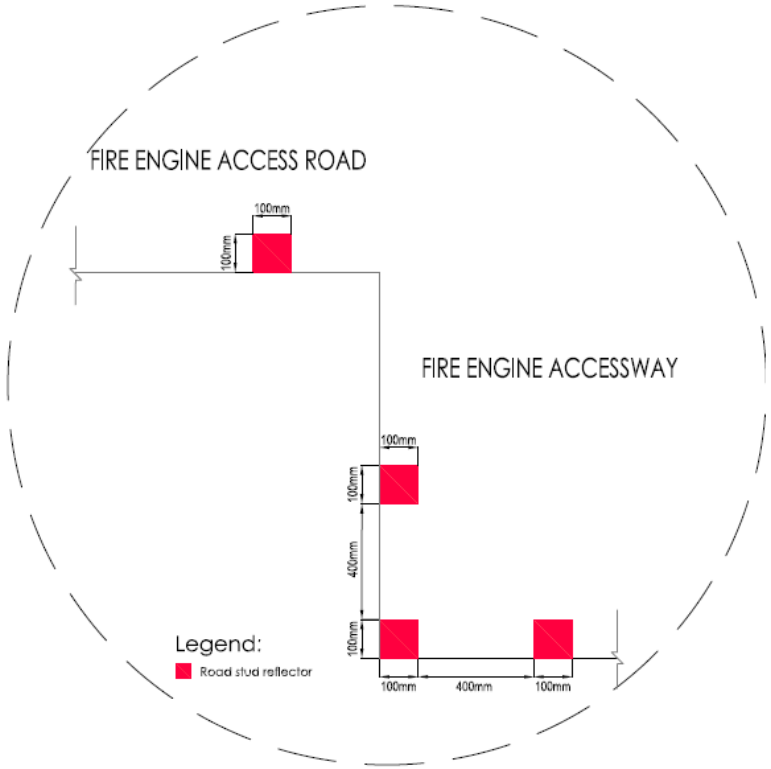
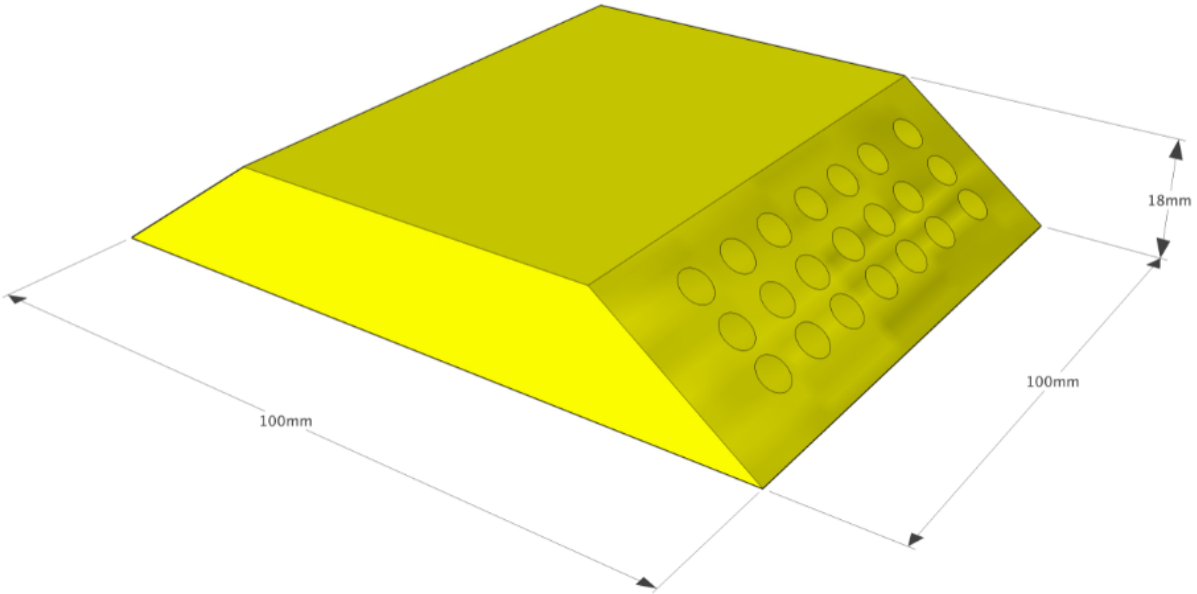


Diagram 4.2.2i.(2) : Marking of fire engine accessway/fire engine access road

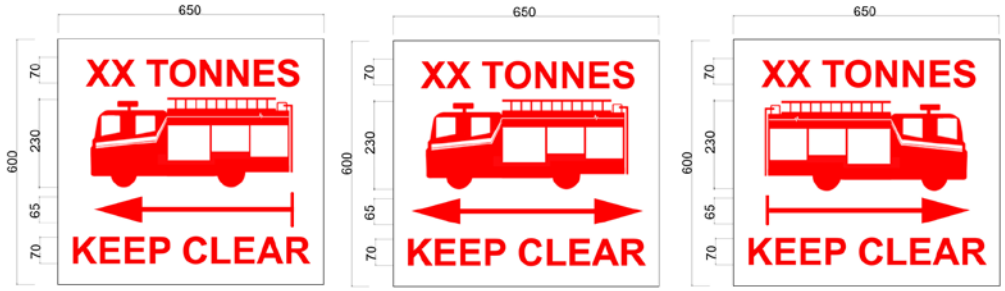


Detail A : Corner marking on fire engine accessway



Isometric view of road stud reflector

Pictogram of fire engine access road for firefighting appliance not exceeding 24 tonnes

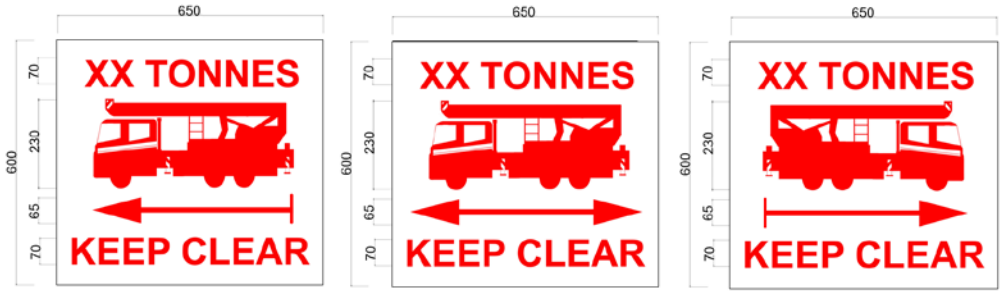


Pictogram to be located at the start or end of fire engine access road, depending on the direction of the fire engine access road

Pictogram to be located at the junction and along the fire engine acceess road (if any) facing travel direction of fire engine

Pictogram to be located at the start or end of fire engine access road, depending on the direction of the fire engine access road

Pictogram of fire engine access road for firefighting appliance of at least 30 tonnes and not exceeding 50 tonnes

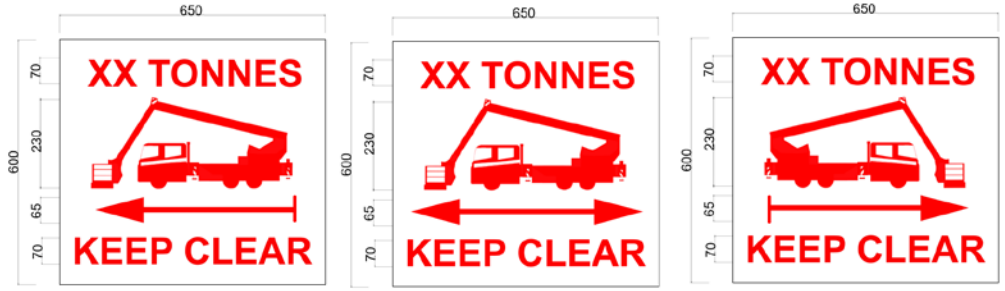


Pictogram to be located at the start or end of fire engine access road, depending on the direction of the fire engine access road

Pictogram to be located at the junction and along the fire engine acceess road (if any) facing travel direction of fire engine

Pictogram to be located at the start or end of fire engine access road, depending on the direction of the fire engine access road

Pictogram of fire engine accessway for firefighting appliance of at least 30 tonnes and not exceeding 50 tonnes



Pictogram to be located at the start or end of fire engine accessway, depending on the direction of the fire engine accessway

Pictogram to be located at the junction and along the fire engine accessway facing travel direction of fire engine

Pictogram to be located at the start or end of fire engine accessway, depending on the direction of the fire engine accessway

Diagram 4.2.2i.(3) : Pictogram signage for fire engine accessway/fire engine access road

16	4.4.1e.	15 Sep 2020	15 Sep 2020	Clarification	Ringed fire hydrant pipes For a building that is required to have an island site fire engine accessway under *Cl.4.4.2b.*, the fire hydrant pipe shall be a ring system. Isolation valves shall be provided on the fire hydrant ring such that individual fire hydrant can be isolated when required for maintenance without affecting the water supply (both designed pressure and flow) to the other fire hydrants on the ring.	Ringed fire hydrant pipes For a building that is required to have an island site fire engine accessway ~~under *Cl.4.4.2b.*~~, the fire hydrant pipe shall be a ring system. Isolation valves shall be provided on the fire hydrant ring such that on any section of ring, not more than one ~~individual~~ fire hydrant can be isolated when required for maintenance without affecting the water supply (both designed pressure and flow) to the other fire hydrants on the ring.
17	4.4.3	15 Sep 2020	15 Mar 2021	Revised	Protection of fire hydrant mains in buildings All fire hydrant mains which pass through a building shall have its full length within the building protected with fire resistance construction complying with *Cl.3.8.7b.* of at least the same fire resistance as the element of structure, provided all of the following requirements are complied with: a. The fire hydrant mains shall be located in common circulation areas, such as car parking spaces and driveways, i.e. they shall not	Protection of fire hydrant mains in buildings All fire hydrant mains which pass through a building shall have its full length within the building protected with fire resistance construction complying with *Cl.3.8.7b.* of at least the same fire resistance as the element of structure, provided all of the following requirements are complied with: a. The fire hydrant mains shall be located in common circulation areas, such as car parking spaces (except spaces used for mechanical car parking) and driveways, i.e. they shall not pass through private or confined spaces.

					pass through private or confined spaces. b. No services (except sprinkler pipes) shall be located above or crossing over the fire hydrant mains. c. The fire hydrant mains shall be located away from explosion risk areas. d. The protective enclosure to the fire hydrant mains shall be labelled with the words "FIRE HYDRANT MAIN" of minimum 50mm height at suitable intervals.	b. No services other than sprinkler pipe shall be located above or crossing over the fire hydrant mains, except under the situations where all of the following conditions are complied with: (1) the services shall only cross over the fire hydrants mains perpendicularly; (2) the tensile stress of the supports for the services shall not exceed $10N/mm^2$; and (3) the services shall be adequately protected by the building's sprinkler system.
18	6.3.5b.	15 Sep 2020	15 Mar 2021	Revised	b. Audio alarm The fire alarm sounder shall have a sound that is readily distinguishable from any other alarm systems. In places of entertainment or areas where sound and/or special effects lighting systems are installed, the sound systems shall be electronically interlocked with the fire alarm system to enable these systems to be automatically cut-off when the fire alarm system is activated.	b. Audio alarm The fire alarm sounder shall have a sound that is readily distinguishable from any other alarm systems. In places of entertainment or areas where sound and/or special effects lighting systems are installed, including KTV kiosks/booths placed within building premises, the sound systems shall be electronically interlocked with the fire alarm system to enable these systems to be automatically cut-off when the fire alarm system is activated.

19	6.4.8	15 Sep 2020	15 Sep 2020	Clarification	Combined sprinkler and wet riser systems a. Combining sprinkler and wet riser systems is permitted for buildings of ordinary hazard category classification provided their designs comply with the provisions stipulated in SS CP 52 and SS 575 respectively. b. There is no necessity to cater for water storage for the sprinkler system's demand separately. c. Pump sets shall be designed for the simultaneous operation of both the sprinkler and wet riser systems. d. The combined systems' sprinkler riser and wet riser stacks shall not be interconnected by sprinkler system piping or a single riser that serves both systems.	Combined firefighting water tank for sprinkler and wet riser systems a. Combining firefighting water tank for sprinkler and wet riser systems is permitted for buildings of ordinary hazard category classification provided their designs comply with the provisions stipulated in SS CP 52 and SS 575 respectively. b. ~~There is no necessity to cater for water storage for the sprinkler system's demand separately.~~ The water storage shall be based on the larger water storage demand of the systems. c. Separate pump sets shall be provided to allow for the simultaneous operation of the sprinkler and wet riser systems. d. The combined systems' sprinkler riser and wet riser stacks shall not be interconnected by sprinkler system piping or a single riser that serves both systems.

20	7.4.5g.	15 Sep 2020	15 Sep 2020	Clarification	Discharge of smoke For cases where smoke is removed from circulation space or atrium space, the rooms discharging smoke into the circulation space/atrium spaces shall either: (1) have a floor area of not exceeding 1000m² (for natural ventilation system) or 1300m² (for mechanical ventilation system), or (2) be subdivided such that smoke is vented to the circulation space or atrium only from part of the room with floor area not exceeding 1000m² (for natural ventilation system) or 1300m² (for mechanical ventilation system), that is adjacent to the circulation space or atrium. However, the remainder of the room needs to be provided with an independent smoke ventilation system(s).	Discharge of smoke (1) Removal of smoke For cases where smoke is removed from a circulation space or atrium space, the rooms discharging smoke into the circulation space/atrium spaces shall either: (a) have a floor area of not exceeding 1000m² (for natural ventilation system) or 1300m² (for mechanical ventilation system), or (b) be subdivided such that smoke is vented to the circulation space or atrium only from part of the room with floor area not exceeding 1000m² (for natural ventilation system) or 1300m² (for mechanical ventilation system), that is adjacent to the circulation space or atrium. However, the remainder of the room needs to be provided with an independent smoke ventilation system(s). (2) Exhaust points

						The minimum number and siting of exhaust points within a smoke reservoir shall be determined to prevent "plug-holing" effect at the exhaust points. The exhaust point shall comply with the following plugholing equation. $M_{CRIT} = \frac{2.05\ \rho_o\ (g\ T_0\ \theta_l)^{0.5}\ D^2\ W_V^{0.5}}{T_l}$ where: M_{CRIT} = critical exhaust rate at an exhaust point prior to the onset of 'plugholing' (kgs^{-1}), ρ_o = density of air at ambient temperature (kgm^{-3}), g = acceleration due to gravity (ms^{-2}), D = depth of smoke layer below the exhaust point (m), T_0 = absolute ambient temperature (K), θ_l, = excess temperature of smoke layer (°C), T_l = $T_0 + \theta_l$ (K) W_v = characteristic width of the ventilator (m) (eg the diameter, or the diameter of the circle of the same area).
21	7.4.5i.	15 Sep 2020	15 Sep 2020	Clarification	Replacement air (1) Replacement air shall by natural means be drawn directly from the external space. (2) The design replacement air discharge velocity shall not exceed 5m/s to prevent the escapees being hindered by the air flow.	Replacement air (1) Replacement air shall by natural means be drawn directly from the external space. (2) The design replacement air discharge velocity shall not exceed 5m/s to prevent the escapees being hindered by the air flow.

					(3) Replacement air intake shall be sited at least 5m away from any exhaust air discharge. (4) Replacement air shall be discharged at a low level, at least 1.5m beneath the designed smoke layer, to prevent fogging up of the lower clear zone. (5) Where the inlet cannot be sited at least 1.5m below the smoke layer, a smoke curtain or a barrier shall be used to prevent replacement air disrupting the smoke layer. (6) Where replacement air is taken through inlet air ventilators or door-ways, devices shall be incorporated to automatically open such inlet ventilators and doors to admit replacement air upon activation of the smoke ventilation system. (7) Where the automatic roller shutters are used at replacement air inlets in the design and installation of an engineered smoke control system, it shall be of perforated type having the required effective free area for	(3) Replacement air intake shall be sited at least 5m away from any exhaust air discharge. (4) Replacement air shall be discharged at a low level, at least 1.5m beneath the designed smoke layer, to prevent fogging up of the lower clear zone. (5) Where the inlet cannot be sited at least 1.5m below the smoke layer, a smoke curtain or a barrier shall be used to prevent replacement air disrupting the smoke layer. (6) Where replacement air is taken through inlet air ventilators or door-ways, devices shall be incorporated to automatically open such inlet ventilators and doors to admit replacement air upon activation of the smoke ventilation system. (7) Where the roller shutters are used as replacement air inlets in the design and installation of an engineered smoke control system or smoke purging system, they shall be of perforated type, having the required effective free area for the effective operation of the engineered smoke

					the effective operation of the engineered smoke control system.	control system. Non-perforated type of roller shutters with solid surface shall not be used.
22	9.2.2a.	15 Sep 2020	15 Sep 2020	Reinstatement of past requirements	Refuge floor A super high-rise residential building shall be provided with at least one refuge floor at an interval of not more than 20 storeys, i.e. each refuge floor shall not serve more than the 20 storeys immediately above it. The refuge floor shall comply with all of the following requirements:	Refuge floor ~~A~~ Super high-rise residential buildings, with or without mixed occupancies, shall be provided with at least one refuge floor at an interval of not more than 20 storeys, i.e. each refuge floor shall not serve more than the 20 storeys immediately above it. The refuge floor shall comply with all of the following requirements: (13) A sign depicting "EVACUEE HOLDING AREA" shall be displayed inside the exit staircase and on wall immediately outside the exit staircase at the refuge floor. The sign of lettering size of at least 50mm shall be displayed at a height of 1.5m above the landing/finished floor level.
23	9.3.2g.	15 Sep 2020	15 Sep 2020	Clarification	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	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~~

					wall to separate the clinics from other usage as stipulated in *Cl.3.2.5b.*, except for the frontage of the clinic.	~~to separate the clinics from other usage as stipulated in *Cl.3.2.5b.*, except for the frontage of the clinic.~~ shall be categorised as PG V occupancy and shall comply with all relevant requirements for such premises/usage.
24	Table 1.4B	15 Sep 2020	15 Mar 2021	Revised	Existing Table 1.4B	See Annex B (affected portions of Table 1.4B)
25	Table 6.4B	15 Sep 2020	15 Sep 2020	Clarification	Existing Table 6.4B	See Annex C (affected portions of Table 6.4B)
26	Table 7.4.5C.(1)	15 Sep 2020	15 Sep 2020	Clarification	Existing Table 7.4.5C.(1)	See Annex C (affected portion of Table 7.4.5C.(1)
27	Table 11A	15 Sep 2020	15 Mar 2021	Revised	Existing Table 11A	See Annex C (affected portion of Table 11A)

Annex B

TABLE 1.4B : OCCUPANT LOAD FACTORS		
FUNCTIONAL SPACES	**FACTOR (m^2/person)**	**REMARKS**
Roof garden/roof terrace, public health/exercise corner	5	with exercise equipment
jogging track/designated foot path ≤ 3m in width	3	
planter box <300mm high	1.5	
planter box ≥ 300mm ~~& ≤ 500mm high~~	---	fully covered ~~fully~~ with trees/shrubs
planter box ≥ 300mm & ≤ 500mm high	1.5	~~not covered fully with trees/shrubs~~ turf
planter box >500mm high	---	without step/ramp access
sunken/elevated water feature <300mm in depth/height	3	permanent or fixed structure
sunken/elevated water feature ≥ 300mm in depth/height	---	permanent or fixed structure
sunken planting area	~~3~~ ---	fully covered with trees/shrubs
sunken planting area	1.5	turf
other areas	1.5	

TABLE 6.4B : REQUIREMENTS FOR VENTILATION, SMOKE PURGING SYSTEM & AUTOMATIC FIRE SPRINKLER SYSTEM IN ABOVEGROUND CAR PARKS (STANDALONE OR WITHIN BUILDINGS)

Habitable Height		Aboveground Car Park							
		Criteria for the Largest Car park Compartment				Smoke Purging System	Automatic Fire Sprinkler System	Type of Fire Alarm Systems	
Building	Car Park	Area	Cubicle Extent	No. of Storey	Ventilation (as per *Cl.3.2.8*)			Auto	Manual
≤ 24m	≤ 24m	≤ 4000m^2	≤ 15000m^3	≤ 3-storey	NR	NR	NR[2]	NR[1]	NR
		> 4000m^2 and ≤ 5000m^2	≤ 15000m^3	≤ 3-storey	Comply	NR	NR[2]	R	NR
					Not comply	NR	R	NR	NR
		Cubical extent > 15000m^3 or Area > 5000m^2 or more than 3 storey			Comply	NR	NR[2]	R	NR
					Not comply	R	R	NR	NR
> 24m	Any	≤ 5000m^2	-	≤ 3-storey	NR	NR	R	NR	NR
		Area > 5000m^2 or more than 3 storey			Comply	NR	R	NR	NR
					Not comply	R	R	NR	NR

Note:

NR – Not required
R – Required
[1] Automatic fire alarm system shall be extended to the car park if the building is protected with automatic fire alarm system
[2] Sprinkler shall be extended to the car park if the building is protected with automatic fire sprinkler system

Annex C

TABLE 7.4.5C.(1) : FIRE SIZE FOR NON-INDUSTRIAL BUILDINGS		
Occupancy (Sprinkler-protected)	Fire Size	
	Heat Output (MW)	Perimeter of Fire (m)
Shops	5	12
Shops (fast response sprinklers)	2.5	9
Offices	1	14
Hotel Guest Room	0.5	6
Hotel Public Areas	2.5	12
Assembly Occupancy with Fixed Seating	2.5	12

TABLE 11A : LIST OF REGULATED FIRE SAFETY PRODUCTS & MATERIALS					
S/N	**Products / Materials**	**Acceptable Standards**	**Certification Scheme**	**Surveillance Regime**	
				Testing	**Factory/Site Inspection**
23.	Fire shutter/fire curtain	(a) SS 489 Clause ~~4.5.1 &~~ 5 or EN 1634-1~~; and the fire shutter/fire curtain shall close at between 10 sec and 30 sec~~ For fire shutter/fire curtain certified to either SS 489 or EN 1634-1, the closing time and speed of the fire shutter/fire curtain shall comply with *Cl.3.7.7c.* of this Code.	Scheme 1b (Labels issued)	Fire test once every 3 years	Batch inspection (11) and Site inspection triggered by certification body for each batch (10)