



INSTITUTION OF FIRE ENGINEERS, SINGAPORE

THE INTERNATIONAL ORGANISATION FOR FIRE PROFESSIONALS

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Management Council 2024 – 2026

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A WORD FROM THE EDITOR

As we conclude our Golden Jubilee celebrations in 2024, on behalf of the Management Council, we would like to extend our heartfelt gratitude for our members' unwavering support and dedication to IFES. Your contributions have been invaluable in reaching this remarkable milestone, and we look forward to many more years of growth and success together.

As we set our sights on 2025, we are eager to chart a new course for our organization. Your insights and feedback are invaluable to us, and we invite you to share your thoughts at our upcoming Annual General Meeting.

Thank you once again for being an integral part of our journey.

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EVENTS & NEWS

Technical Visit to Civil Defence Academy's Calorimetry and Burn Lab

15th August 2024

On 15th August, 20 members of IFES gathered at the newly upgraded Civil Defence Academy (CDA) to visit the Fire Research Centre (FRC). The FRC is housed in a 17m by 30m fire-tile-clad building that stands 17m high. This facility allows for the recreation of large-scale fires, which can surpass 1,000°C, in a controlled setting.

The centre is equipped with a large calorimeter capable of measuring the heat energy released by a fire. Additionally, it features various sensors to measure conditions such as oxygen consumption.

The IFES members were there to witness a live burn test of personal mobility devices (PMD), focusing particularly on the reaction of the batteries when subjected to thermal runaway.

By observing the fire behaviour during a live burn demonstration, participants were able to gain insight into the fire intensity, fire growth, and fire spread for such fires. This data is crucial for fire engineering analysis.



Photograph: IFES members at the Technical Visit to SCDF CDA



Photograph: Briefing before the live burn test is conducted.



Photograph: Group photograph with SCDF hosts after the visit

EVENTS & NEWS

Golden Jubilee Walkathon

25th August 2024

Early on 25th August 2024, IFES members, along with their friends and family, gathered to participate in a walkathon. The route took them from the current SCDF Headquarters in Paya Lebar to the historic Civil Defence Heritage Gallery and the Central Fire Station, Singapore's oldest fire station. This event celebrated the storied legacy of IFE's first registered office on 7th April 1975.





Photograph: Participants at the starting point at SCDF HQ, midway and at the end point at Central Fire Station

EVENTS & NEWS

Overseas Technical Visit to UL Research Center in Taipei

12th to 15th September 2024

As part of the Golden Jubilee celebration, IFES organized a special trip to UL's Taipei Research Centre in Taiwan.

Day 1: In the main UL Taiwan HQ, we kicked off the program with an engaging introduction by Mr Ray Sung from UL Taiwan, laying out UL Global's strategy and vision, before going into more detail on its initial inception and expansion in Taiwan, as well the services and expertise being offered in the various Taiwan branches/laboratories. This was very useful in setting the stage for an exciting journey into the world of safety testing for the next two days.

Some highlights from today: Materials Testing for Fire Safety – Presentation from Karen Chen (Lab Manager) and Kevin Deng (E&M Manager) on the various tests and objectives for materials testing ensuring materials meet safety standards. A behind-the-scenes Materials Lab Tour, where the group was briefed on the functions of the various labs.

In the afternoon, the group travelled to UL Linku lab, where Dr Carl Wang (R&D Director) presented to us the work done there, including battery research covering new technologies, forensic battery fire investigation, battery testing. Afterwards, Alvin Wu (Lab Manager) took us on tour of their lab facilities, and we witnessed a nail penetration test of the battery cell.

Day 2: In the morning, we visited CFS (Taiwan Fire Protection Safety Center Res Foundation). CFS is a non-profit organization that has the purpose of assisting firefighting authorities by maintaining the quality of firefighting tools, materials and equipment (including the management products of hazardous objects), inspection and approbation systems were established to ensure that such firefighting tools, materials, and equipment are capable of combating and stopping fire-related disaster. Mr Alvin Hung and Mr Ray Sung took us on a tour of the laboratory facilities, which included testing for fire alarm devices, sprinklers, exit signage and occupant warning systems, to international standards such as Japanese, UL, EN, etc.

After a fruitful morning, we headed to UL Luzhu which is purpose built for testing Battery for ESS, charging station, e-bikes. Mr Eric Hu (Lab Manager) explained to us the different tests done for e-vehicles, including safety precautions for the handling of such high-density ESS devices.

All in all, it was a very fruitful 2 days of learning for members of the IFES group, learning more about different batteries safety tests, from material testing, E&M, quality control testing. Additionally, the it was very informative to understand CFS role in safe guarding the quality and certification of fire safety equipment and systems in Taiwan.



Photograph: The IFES group arriving in Taoyuan Airport



Photograph: At the UL Taiwan HQ on Day 1



Photograph: At CFS (Taiwan Fire Protection Safety Center Res Foundation) on Day 2



Photograph: At UL Luzhu on Day 2

EVENTS & NEWS

IFES Fire Code 2023 Update Workshop - 2nd Amendment Webinar

4th October 2024

The recent amendments to the Fire Code 2023 have introduced significant changes aimed at enhancing fire safety standards in buildings, with key updates in architectural design and mechanical design and battery-related systems (in particular basement energy storage systems).

The update workshop webinar was presented by speakers Ar. Chan Kok Way, Er. Yee Poh Kin and Er. Ho Victor.

This workshop is designed to provide building industry professionals with a comprehensive understanding of the new code requirements and their implications.

Notably, this workshop was provided free of charge for IFES members, reflecting our ongoing commitment to supporting industry professionals in staying up to date with the latest fire safety measures.



Photograph: Ar. Chan Kok Way, Er. Yee Poh Kin and Er. Ho Victor setting up at IFES office for the webinar.

EVENTS & NEWS

Fire Safety Engineers Workshop with Daniel Nilsson

15th to 16th October 2024

Dr Daniel Nilsson and Dr Peter Thompson gave a 2-day workshop on “Risk, Fire Engineering, and Practical BIM for Fire Safety Engineers”. This comprehensive course enhanced the knowledge and skills of fire safety engineers through a blend of theoretical insights and practical applications.

The workshop covered various critical aspects of fire safety engineering, including:

- Risk and Risk Perception: Understanding how risks are perceived and managed, along with the criteria for tolerability.
- Movement Through Smoke: Examining the dynamics of human movement in smoke-filled environments.
- Virtual Reality Utilization: Leveraging virtual reality technology to simulate fire scenarios and improve safety strategies.
- Latest Research: Insights into the latest research on pedestrian movement, biomechanics, and real-world data collection.

In addition to these topics, the workshop featured practical tasks that applied the principles of Building Information Modeling (BIM).

Key takeaways for participants included

- A practical re-introduction to essential concepts for fire safety engineers.
- A comprehensive guide on how to implement fire safety engineering principles.
- Hands-on experience with geometry and travel distance operations.

This workshop provided an excellent opportunity for fire safety engineers to update their knowledge, learn new techniques, and apply advanced tools in their practice.



Photograph: Dr Daniel Nilsson and Dr Peter Thompson with the participants



Photograph: Dr Daniel Nilsson and Dr Peter Thompson giving the workshop



Photograph: Modelling crowd densities with the seminar participants



Photograph: Seminar participants during the workshop

EVENTS & NEWS

IFES Golden Jubilee Grand Members' Night

18th October 2024

On October 18, 2024, IFES marked a significant milestone—its Golden Jubilee. The event, held at the Goodwood Park Hotel, was attended by approximately 300 members, affiliates, MOU partners, and esteemed guests.

President K Ramanathan gave the welcoming speech at the opening ceremony of the Golden Jubilee celebration. This was followed by Mr Trent Fearnley the International President-Elec of IFE. Both intending to commemorate IFES's enduring legacy and its commitment to fostering innovation and collaboration in the fire engineering community.



Photograph: Opening ceremony – IFES President K Ramanathan welcoming speech



Photograph: Opening ceremony – Mr Trent Fearnley the International President-Elec of IFE

During the opening ceremony, President K Ramanathan was also presented with a token of appreciation by IFE Malaysia for hosting their delegation in Singapore.

This was followed by one of the highlights of the celebration which was the Light Art Performance that beautifully detailed the founding of IFES and illuminated the history of the organization but also inspired all present with its artistic representation of IFES's journey and accomplishments.

The celebration also featured a variety of fun activities for members and guests, allowing them to showcase their individual talents in singing, dancing, and simply having a good time. These activities added a lively and joyous atmosphere to the event, making it a memorable occasion for everyone involved.

As we look back on 50 years of progress and growth, we also look forward to a future filled with new challenges and opportunities. Here's to the next 50 years of excellence with IFES!



Photograph: Highlights of the night



Photograph: A night to remember



Photograph: Management Council 2024 – 2026

EVENTS & NEWS

IFE Malaysia Visit to Singapore

17th to 19th October 2024

In conjunction with our Golden Jubilee celebrations, we were honored to welcome our sister branch, IFE Malaysia, to Singapore. This visit is part of the annual tradition between our two closely-knit organizations, reflecting the strong bond and collaborative spirit we share.

We extend our heartfelt thanks to IFE Malaysia for their visit and for being an integral part of our Golden Jubilee celebrations.





Photograph: IFEM in Singapore

EVENTS & NEWS

International Fire Conference & Exhibition Malaysia (IFCEM) 2024

21st to 24th October 2024

The IFES delegation attended the International Fire Conference and Exhibition Malaysia (IFCEM) 2024 was held at the Kuala Lumpur Convention Centre (KLCC) from October 22 to 24.

The event was co-organized by Fire and Rescue Department of Malaysia (BOMBA), the Institution of Fire Engineers (IFE) Malaysia Branch, in collaboration with the the Malaysian Fire Protection Association (MFPA), the Society of Fire Protection Engineers (SFPE), and the Confederation of Fire Protection Associations International (CFPA-I).

During the conference, various speakers presented on issues relating to fire mitigation and emergency response systems, leveraging technology to improve fire services readiness and response times. This included topics on the emergence of "green buildings" which pose new fire hazards and fire safety challenges.

This three-day event also hosted the 33rd International Fire Chiefs' Association of Asia (IFCAA) General Conference, participated by 27 Fire Chiefs, representing 19 countries across Asia and Oceania.



Photograph: IFES delegation at the conference



Photograph: Speakers include SAC Daniel Seet from SCDF



Photograph: IFES and IFE HK delegations

UPCOMING EVENTS & ACTIVITIES

IFES 51st Annual General Meeting

Published quarterly by the IFES, we are always looking for members contributions. To provide any articles or feedback, please contact – admin@ife.org.sg



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SCDF
The Life Saving Force
... for a safer Singapore

SINGAPORE CIVIL DEFENCE FORCE



Your Ref :

Our Ref: CD/04/05/01/01

Date : 2 Sep 2024

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 2023 – 2nd BATCH OF AMENDMENTS

SCDF would like to issue the 2nd batch of amendments to the Code of Practice for Fire Precautions in Buildings 2023 (Fire Code 2023). The amendments which were deliberated and accepted by the Fire Code Review Committee are attached as Annexes A & B of this circular.

2. Amendments stipulated in Annexes A & B shall take effect from the date specified therein. Qualified Persons who wish to comply with the requirements in this Circular for any proposed plans of fire safety works for new buildings or existing buildings to be submitted during the 6-month grace period (i.e. 2 Sep 2024 to 1 Mar 2025) can do so and are not required to apply for waivers. Such plans that are submitted to SCDF for approval on or after the effective date 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>.



SCDF – A member of the Home Team

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4. For general queries, you may contact Mr Randy Tan at DID: 68481461 or Mr Tan Yi Yang at DID: 68481734. However, for specific queries relating to edits for:

- a. regulated shelter products, please contact MAJ Rendall Quek at 68481444, or email: Rendall_Quek@scdf.gov.sg.
- b. regulated fire safety products & materials, please contact CPT Muhammad Haziq Bin Mohd Raziff at 68483188, or email: SCDF_PLS@scdf.gov.sg.
- c. battery swap station installation, please contact CPT Alvin Ong at 68481466, or email: Alvin_Ong@scdf.gov.sg.
- d. basement energy storage system installation, please contact CPT Shin Won Tae at 68481494, email: Shin_Won_Tae@scdf.gov.sg, or CPT Amin at 68483236, email: Muhammad_Amin_Isa@scdf.gov.sg.
- e. healthcare occupancy above 120m in habitable height, please contact CPT Shin Won Tae at 68481494, or email: Shin_Won_Tae@scdf.gov.sg.

Yours faithfully

(transmitted via email)

LTC Tan Chung Yee
for Commissioner
Singapore Civil Defence Force

Distribution list

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SCDF Fire Safety Standing Committee
Fire Code Review Committee

S/N	Amendment Date	Effective Date	Clause Status	Clause Before Amendment	Clause After Amendment
1	2 Sep 2024	2 Mar 2025	Revised	2.2.6f. Where permitted under <i>Cl.2.3.3</i> for exit staircases to be entered without the provision of an exit door, the travel distance shall be measured to a position where the exit door would be installed if otherwise required.	2.2.6f. Where permitted under <i>Cl.2.3.3</i> for exit staircases not required to be protected with fire-rated enclosures or to be entered without the provision of an exit door, the travel distance shall be measured to the exit doors at ground level or measured to a position where the exit door would be installed if otherwise required, respectively .
2	2 Sep 2024	2 Mar 2025	Revised	3.6.1 Requirements of separating walls a. Every separating wall shall: (1) form a complete barrier in the same continuous vertical plane through the full height between the buildings it separates, including roofs, and basements and shall be without openings, except where permitted under <i>Cl.3.6.2</i> ; (2)	3.6.1 Requirements of separating walls a. Every separating wall shall: (1) form a complete barrier in the same continuous vertical plane through the full height between the buildings it separates, including roofs, and basements, air-con ledges and balconies , and shall be without openings; except where permitted under <i>Cl.3.6.2</i> ; (2)
3	2 Sep 2024	2 Mar 2025	Revised	3.6.1b. Exception <i>Cl.3.6.1a.(1)</i> need not be applied to wall between car porches of PG I buildings or wall between canopies over private enclosed spaces located on the grade level of PG II buildings. This exception shall	3.6.1b. Exception (1) <i>Cl.3.6.1a.(1)</i> need not be applied shall not apply to wall between car porches of PG I buildings or wall between canopies over private enclosed spaces located on the grade

				not apply if the unprotected opening of the car porches/ canopies fails to comply with the setback distance requirements from the other lot boundary.	level of PG II buildings. This exception shall not apply if the unprotected opening of the car porches/ canopies fails to comply with the setback distance requirements from the other lot boundary. (2) <i>Cl.3.6.1a.(1)</i> shall not apply to any sun screen or ledge that protrude from edge of the floor level.
4	2 Sep 2024	2 Mar 2025	Relaxation/ Revised	3.8.7 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 rainwater downpipes serving the roof directly above the exit staircase, and not routed through anywhere outside the staircase; (3) rising mains; and (4) metal water supply pipe and water tap not exceeding 50mm in diameter.	3.8.7 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; (3) rising mains; and (4) metal water supply pipe and water tap not exceeding 50mm in nominal diameter; and (5) access control systems (comprising facial recognition camera, manual override

					mechanism, CCTV, etc.) installed inside naturally ventilated exit staircase for the exit door to allow restricted access to the roof level shall comply with all of the following: (a) Cables shall be housed in metal conduits. (b) Electrical components installation in accordance with SS 638.
5	2 Sep 2024	2 Mar 2025	Relaxation/ Revised	3.9.7 Services running inside and/ or passing through fire lift lobby and smoke-free lobby a. Air ducts, sanitary pipes, gas pipes, electrical conduits/ cable trays, and other services e.g., fan coil units, ventilation fans (essential or non- essential) are permitted to locate, run inside and/ or pass through a fire lift or smoke-free lobby provided 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. b. 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 systems, these need not be separately protected. c. Exception	3.9.7 Services running inside and/ or passing through fire lift lobby and smoke-free lobby a. Air ducts, sanitary pipes, gas pipes, electrical conduits/ cable trays, and other services e.g., fan coil units, ventilation fans (essential or non- essential) are permitted to locate, run inside and/ or pass through a fire lift or smoke-free lobby provided 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. b. 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 systems, these need not be separately protected. c. Exception

				The above requirements are not applicable for services running inside and/ or passing through an external corridor.	(1) The above requirements are not applicable for Services running inside and/ or passing through an external corridor. (2) Metal water supply pipe and water tap not exceeding 50mm in nominal diameter. (3) CCTV systems provided it complies with Cl.3.8.7a.(5).
6	2 Sep 2024	2 Mar 2025	Relaxation/ Revised	4.2.3a. Provision Fire access openings shall be provided on the external wall for external firefighting and rescue operationsWindows, doors, wall panels, or access panels shall be readily openable from the inside and outside. The inside and outside of fire access openings shall be unobstructed at all times during the occupancy of the building. There shall be no furniture or any other obstruction within 1m from the fire access openings at the landing inside the building.	4.2.3a. Provision Fire access openings shall be provided on the external wall for external firefighting and rescue operations.....Windows, doors, wall panels, or access panels shall be readily openable from the inside and outside, unless fitted with non-laminated and breakable glazing (e.g., float, annealed or heat strengthened glass). The inside and outside of fire access openings shall be unobstructed at all times during the occupancy of the building. There shall be no furniture or any other obstruction within 1m from the fire access openings at the landing inside the building.
7	2 Sep 2024	2 Mar 2025	Relaxation/ Revised	6.2.8e. Piping The use of copper or stainless-steel piping is permissible for the connection of the hose reel to the PUB mains.	6.2.8e. Piping The use of copper or stainless-steel piping is permissible for the connection of the hose reel to the PUB mains. Where only 1 number of hose reel is required, water supply pipe with nominal diameter of at least 25mm is permitted if the hose reel meets the required flow rate and pressure as stipulated in SS 575.

8	2 Sep 2024	2 Mar 2025	Relaxation/ Revised	6.4.1c. PG II mixed occupancy (1) For PG II mixed occupancy buildings exceeding 24m in habitable height, the non-residential parts shall be protected by an automatic sprinkler system if they: (a) comprise more than one storey, or (b) are located above the first storey. (2) For PG II mixed occupancy buildings regardless of habitable height, the non-residential parts shall be protected by an automatic sprinkler system if they are not compartmented from the basement storeys. (3) For non-residential parts where sprinkler protection is not required under sub-clauses (1) & (2) above, an automatic fire alarm system shall be provided for the non-residential parts in accordance with Cl.6.3.1b.	6.4.1c. PG II mixed occupancy (1) For PG II mixed occupancy buildings exceeding 24m in habitable height, the non-residential parts shall be protected by an automatic sprinkler system if they: (a) comprise more than one storey, or (b) are located above the first storey. (2) For PG II mixed occupancy buildings regardless of habitable height, the non-residential parts shall be protected by an automatic sprinkler system if they are not compartmented from the basement storeys. (3) For non-residential parts where sprinkler protection is not required under sub-clauses (1) & (2) above, an automatic fire alarm system shall be provided for the non-residential parts in accordance with Cl.6.3.1b. (3) Exemption (a) Intermediate sky terraces used as communal areas without commercial activities, or storage, provided the ventilation openings for the sky terraces are evenly distributed around the external walls, excluding perimeter walls to air wells, with ventilation
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					openings not less than 50% of all external walls.. (b) Open-sided pavilion/ shed used as communal areas in accordance with <i>Cl.6.2.8a.(3)(c)(iv)</i>. (4) For non-residential parts where sprinkler protection is not required under sub-clauses (1), (2) & (3) above, an automatic fire alarm system shall be provided for the non-residential parts in accordance with <i>Cl.6.3.1b..</i>
9	2 Sep 2024	2 Mar 2025	Relaxation/ Revised	6.4.1f. Exemption of sprinkler protection (1) All of the following areas are exempted from sprinkler protection in a sprinkler-protected building: (a) Covered areas Areas which are covered with trellises, louvres or perforated panels, which have 50% or more evenly distributed effective free openings. An alarm sounder and visual alarm shall be provided near the exit staircase in accordance with SS 645. (b) Areas under roof-mounted PV installations on non-habitable roof Each sub-array of PV installation shall not exceed 5m in width, with maintenance aisle of minimum 400mm width in	6.4.1f. Exemption of sprinkler protection (1) All of the following areas are exempted from sprinkler protection in a sprinkler-protected building: (a) Covered areas Areas which are covered with trellises, louvres or perforated panels, which have 50% or more evenly distributed effective free openings. An alarm sounder and visual alarm shall be provided near the exit staircase in accordance with SS 645. (b) Areas under roof-mounted PV installations on non-habitable roof Each sub-array of PV installation shall not exceed 5m in width, with maintenance aisle of minimum 400mm width in

				between the sub-arrays. Each sub-array shall be open-sided without any commercial activities or storage within these areas. The maximum dimensions of PV arrays shall be in accordance with <i>Cl.10.2.1d.</i> .	between the sub-arrays. Each sub-array shall be open-sided without any commercial activities or storage within these areas. The maximum dimensions of PV arrays shall be in accordance with <i>Cl.10.2.1d.</i> . (c) Staircase storey shelter A sprinkler head shall be provided outside the door of the staircase storey shelter on sprinkler-protected floors. The sprinkler head shall be within a horizontal distance of 1m from the centre of this door.
10	2 Sep 2024	2 Mar 2025	New/ Relaxation	Nil	6.6.8 Basement corridor for lift pit access a. Basement corridors used solely to access lift pits for maintenance purposes and are compartmented from the lift pits complying with <i>Cl.3.8</i> are exempted from these requirements: (1) <i>Cl.2.2.11</i> on the provision of at least two independent exits. (2) <i>Cl.6.2.2</i> on the provision of rising main. (3) <i>Cl.6.2.8</i> on the provision of hose reel, provided that all of the following conditions are complied with: (a) a hose reel is located not more than 5m from the lift lobby above the lift pit; and

					(b) the basement corridor is within the 36m coverage of the hose reel mentioned above. (4) Cl.6.3 on the provision of electrical fire alarm system. (5) Cl.6.4 on the provision of automatic sprinkler system. (6) Cl.6.6.4 on the provision of fire lift (7) Cl.7.4 on the provision of smoke control system.
11	2 Sep 2024	2 Sep 2024	Clarification	7.1.11 Ventilation system for engine-driven fire pump room and generator room Where mechanical ventilation is installed to provide a smoke-free environment for the room housing the engine-driven fire pump or emergency generator, such systems shall be independent of each other and of any other system serving other parts of the building, and shall comply with all the following requirements: a.	7.1.11 Ventilation system for engine-driven fire pump room and generator room Where mechanical ventilation is installed to provide a smoke-free environment for the room housing the engine-driven fire pump or emergency generator, such systems shall be independent of each other and of any other system serving other parts of the building, and shall comply with all the following requirements: a.
12	2 Sep 2024	2 Mar 2025	Relaxation/ Revised	8.1.7e. Electrically-powered exit and directional signs	8.1.7e. Electrically-powered exit and/ or directional signs

				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.	(1) The legends, dimensions, design and/ or 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. (2) Exemption (a) Exit signs (other than low level or floor-mounted signs) are permitted to be mounted more than 2.5m and at most 3.5m above the finished floor level provided the following is complied with: (i) For spaces provided with engineered smoke control system, the top edge of the exit sign shall be below the designed smoke layer of the space it serves. (ii) For spaces not provided with engineered smoke control system, there shall be a gap of at least 500mm between the top edge of the exit sign and the soffit of the ceiling/ roof.
13	2 Sep 2024	2 Mar 2025	Relaxation/ New	9.3.1 General (Not in use)	9.3.1 General (Not in use) a. Means of escape

					(1) One exit staircase is permitted to serve an aboveground floor used for educational/ training purposes provided: (a) the habitable height of the floor shall not exceed 15m; (b) the floor shall not be located above 4th storey; (c) the AFA of the floor shall not exceed 200m²; (d) the occupant load of the floor shall not exceed 30 persons; and (e) the exit staircase/ floor in the building shall not be of timber construction.
14	2 Sep 2024	2 Mar 2025	New	Nil	9.3.2b. Hospital (11) Healthcare occupancy above 120m in habitable height Healthcare occupancies with patient accommodation of habitable height more than 120m shall comply with the following requirements: (1) Smoke detectors shall be provided for the entire building. Other types of detectors are permitted in special environmental conditions as stated in SS 645.

					(2) Sprinkler systems installed shall be equipped with fast-response sprinkler heads. (3) Each area of refuge shall be provided with its own dedicated fire escape bed lift. (4) Each area of refuge shall have access to at least two separate areas of refuge complying with <i>Cl.9.3.2b.(4)</i>. (5) All fire escape bed lifts in accordance with <i>Cl.9.3.2b.(6)</i> shall be designed to operate at a minimum average rated speed of 3.5m/s.
15	2 Sep 2024	2 Mar 2025	Revised	9.3.3 Workers' dormitory Workers' dormitories shall comply with the following additional requirements: a. Size Each dormitory bedroom shall not exceed 120m² and an occupant load of 20 persons.	9.3.3 Workers' dormitory Workers' dormitories shall comply with the following additional requirements: a. Size Each dormitory bedroom shall not exceed 120m² and an occupant load of 20 persons.
16	2 Sep 2024	2 Sep 2024	Clarification	9.6.2v.(2)(b) Main isolation shut-off switches shall be provided as per <i>Cl.10.4.2</i>.	9.6.2v.(2)(b) Main isolation shut-off switches shall be provided as per <i>Cl.10.4.2</i> follows: (i) An emergency main isolation shut-off switch for an EV charging station must be located so that a person does not have to travel more than 15m from the EV

					charging station and its associated parking lot to reach the switch. (ii) If there is more than one EV charging station, one or more than one emergency main isolation shut-off switch may be shared between EV charging stations within the same storey. The switch or switches must be located so that a person does not have to travel more than 15m from any EV charging station and its associated parking lot to reach the switch. (iii) Every emergency main isolation shut-off switch for an EV charging station must be located on the same storey as the EV charging station, so that there is a safe means of isolating the main electrical power supply to the entire electric vehicle charging system on the same storey upon activation of any one of those switches. Those switches must be capable of being activated manually without the use of a key or tool, or any special knowledge or effort. (iv) Subject to <i>Cl.9.6.2v.(2)(b)(v)</i>, the nearest edge of an emergency main isolation shut-off switch must be located at least 3m away from an EV charging station and its associated parking lot. (v) An emergency main isolation shut-off switch may be located less than 3m away from an EV charging station and its
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					associated parking lot, if there is at least another emergency main isolation shut-off switch located at least 3m away but within 15m of that EV charging station and its associated parking lot. (vi) An emergency main isolation shut-off switch must be located between 800mm and 1.2m (inclusive of both measurements) above the finished floor level. (vii) An emergency main isolation shut-off switch must be in a clearly visible and easily accessible location, and be clearly labelled. (viii) There must be clear instructions (however indicated) on how an emergency main isolation shut-off switch may be operated. (ix) There must be one or more than one signage, on which any letter must bear a height of at least 50mm and that is displayed in a prominent location from the emergency main isolation shut-off switch, directing a person on how the switch is to be operated. (x) Where an emergency main isolation shut-off switch cannot be seen clearly from, or is not within the line of sight of, an EV charging station and its associated parking lot, any number of additional
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					signages as may be necessary must be displayed for the purpose of directing persons to the emergency main isolation shut-off switch.
17	2 Sep 2024	2 Mar 2025	New	Nil	9.6.2v.(3) Battery Swap Station (BSS) (a) BSS unit located within a petrol station shall be sited in the following order of priority: (i) Open-to-sky areas. (ii) Forecourt. (b) Aggregate stored energy capacity of each BSS unit shall not exceed 20kWh. Where more than 1 BSS unit is installed, a minimum separation distance of 3m between BSS units shall be provided and the total aggregate stored energy capacity of all BSS units shall not exceed 40kWh. (c) Separation distance (i) BSS unit shall be placed at least 6m away from any exit access door. (ii) BSS unit shall be located at least 1m away from parking lots (excluding the lots used for swapping of batteries). (iii) Separation distance specified under <i>Cl.9.6.2v.(2)(c) to (g)</i> for EV

					charging stations shall be applicable to BSS units. (d) Approved types of fire extinguishers of at least 2 numbers of 55A shall be provided. (e) Emergency isolation switch shall be provided for each BSS unit.
18	2 Sep 2024	2 Mar 2025	Relaxation/ New	9.7.1 General (<i>Not in use</i>)	9.7.1 General (<i>Not in use</i>) a. Means of escape (1) One exit staircase is permitted to serve an aboveground floor used as places of public resort except for public accommodation purposes, provided: (a) the habitable height of the floor shall not exceed 15m; (b) the floor shall not be located above 4th storey; (c) the AFA of the floor shall not exceed 200m²; (d) the occupant load of the floor shall not exceed 30 persons; and (e) the exit staircase/ floor in the building shall not be of timber construction.

19	2 Sep 2024	2 Sep 2024	Clarification	9.8.1b. Structural fire precautions (1) Vehicle parking area Fire compartmentation shall be provided between a vehicle parking area (PG VIII) and other areas, except for ancillary washrooms and other rooms stated in footnote (4) of <u>Table 6.4A</u>, the fire compartment walls and floors shall have at least 1-hr fire resistance rating. Exceptions: (a) For a sprinkler-protected factory, compartmentation between the vehicle parking areas and the factory is not required, provided the vehicle parking area and adjacent driveway are provided with an engineered smoke control system. (b) For a sprinkler-protected warehouse, thermal insulation of the fire-rated shutters between the vehicle parking area and the warehouse is not required, provided the vehicle parking/ loading and unloading area and adjacent driveway are provided with an engineered smoke control system.	9.8.1b. Structural fire precautions (1) Vehicle parking area Fire compartmentation shall be provided between a vehicle parking area (PG VIII) and other areas, except for ancillary washrooms, letter boxes and other rooms stated in footnote (4) of <u>Table 6.4A</u>, the fire compartment walls and floors shall have at least 1-hr fire resistance rating. Exceptions: (a) For a sprinkler-protected factory, compartmentation between the vehicle parking areas and the factory is not required, provided the vehicle parking area and adjacent driveway are provided with an engineered smoke control system. (b) For a sprinkler-protected warehouse, thermal insulation of the fire-rated shutters between the vehicle parking area and the warehouse is not required, provided the vehicle parking/ loading and unloading area and adjacent driveway are provided with an engineered smoke control system.
20	2 Sep 2024	2 Sep 2024	Clarification	10.2.1d. Design and installation criteria (1)	10.2.1d. Design and installation criteria (1)

				(2) (3) Access aisles of minimum clear width of 1.5m shall be provided such that no part of any PV array is more than 20m from any of them. Where the access aisle abuts the edge of the roof, the clear width of the access aisle shall be at least 2.5m unless a perimeter parapet/ railing of height not less than 900mm is provided.	(2) (3) Access aisles of minimum clear width of 1.5m shall be provided such that no part of any PV array is more than 20m from any of them. Where the access aisle abuts the edge of the roof, the clear width of the access aisle shall be at least 2.5m unless a perimeter parapet/ railing of height not less than 900mm is provided to prevent fall from height by the authority having jurisdiction.
21	2 Sep 2024	2 Mar 2025	Revised	10.3 ENERGY STORAGE SYSTEMS 10.3.1 General a. Energy Storage System refers to one or more devices, assembled together, capable of storing energy in order to supply electrical energy at a future time to the local power loads, to the utility grid, or for grid support. b. This set of fire safety requirements need not be applicable to Energy Storage System installations where the total stored energy is less than the Threshold Stored Energy listed in <i>Table 10.3.1</i> below. c. All Energy Storage System installations shall be located at the	10.3 ENERGY STORAGE SYSTEMS Energy Storage System (ESS) refers to one or more devices, assembled together, capable of storing energy in order to supply electrical energy. 10.3.1 General Aboveground ESS installation a. Energy Storage System refers to one or more devices, assembled together, capable of storing energy in order to supply electrical energy This set of fire safety requirements applies to ESS which supply electrical energy at a future time to the local power loads, to the utility grid, or for grid support. It shall apply to ESS installations where the total stored energy exceeds the Threshold Stored Energy listed in <i>Table 10.3.1</i> below.

				same storey as the fire engine accessway/ fire engine access road. d.	b. This set of fire safety requirements need not be applicable to Energy Storage System installations where the total stored energy is less than the Threshold Stored Energy listed in <u>Table 10.3.1</u> below. b. All Energy Storage System installations shall be located at the same storey as the fire engine accessway/ fire engine access road. c.
22	2 Sep 2024	2 Mar 2025	New	Nil	10.3.3 Basement ESS installation Basement ESS installation shall be subdivided into two categories as follows: a. Category 1: Small underground ESS installation having the following requirements: (1) <i>Cl.10.3.1a.</i> on capacity shall not be applicable. (2) <i>Cl.10.3.1b.</i> on location shall not be applicable. ESS units is permitted to be located in basement not exceeding a depth of 9m below the fire engine accessway/ fire engine access road level. (3) The requirements of compartmentation shall apply to any room that is designated as a battery room or of Threshold Stored

					Energy exceeding the limits stated in <i>Cl.10.3.1d.</i>. (4) Each compartmented ESS room shall not exceed 25m². (5) Maximum Stored Energy in <i>Table 10.3.1</i> shall not be applicable. Instead, the following shall apply: (a) Batteries forming an ESS unit of up to 50kWh is permitted. (b) Aggregate maximum stored energy of 250kWh comprising multiple ESS units within a single compartment room is permitted provided each ESS unit is spaced a minimum of 1m apart from each other, 1m from walls within the compartmented room and other fire hazards. Where the stored energy capacity or separation distance of the unit exceed the limit, it shall be subjected to the fire and explosion testing specified under <i>UL 9540A</i> and together with the <i>NFPA 855</i> Hazard Mitigation Analysis report to be submitted to SCDF for approval. (c) Aggregate maximum stored energy of 500kWh comprising multiple compartment rooms is permitted. (6) Fire protection system
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					(a) Each compartmented ESS room shall be protected by a sprinkler system classified under high hazard occupancy with a minimum discharge density of 12.2mm/min and areas of operation of 230m² in accordance with the SS CP 52. (b) All ESS units shall be housed in open rack under direct and full coverage of sprinklers. (c) Each compartmented ESS room shall be provided with smoke detectors in accordance with SS 645 and smoke purging system shall be activated upon detections. (7) A dedicated flammable gas detection system shall be provided for each compartmented ESS room to continuously monitor the flammable gases concentration and upon activation of the ventilation system, to limit the maximum concentration of the flammable gases to below 25% lower explosion limit (LEL) within the compartmented ESS room. Smoke purging system shall be activated upon detection. (8) A display panel showing the location, temperature and flammable gases reading status of the affected ESS unit shall be located at the main entrance of
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					each compartmented ESS room. It shall be connected to the SCDF Operations Centre through an approved alarm monitoring company. Thermocouple reading for each compartmented ESS room shall be provided as a means for firefighters to identify if the fire has been effectively extinguished. No point in the compartmented ESS room shall exceed 10m from a thermocouple. (9) CCTV cameras with thermal imaging capabilities and full coverage of the entire compartmented ESS room shall be installed to facilitate situational awareness for the authorised personnel overseeing the situation. 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 company upon activation of the building fire alarm system. (10) Pressure relief provision Each compartmented ESS room shall be designed with pressure relief vent to avoid any excessive built-up of pressure due to the spontaneous ignition of combustible gases. Either one of the following shall be provided:
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					(a) Explosion prevention systems designed, installed, operated, maintained, and tested in accordance with <i>NFPA 69</i>. (b) Deflagration venting installed and maintained in accordance with <i>NFPA 68</i>. (11) Smoke purging system The smoke purging system to be provided for the compartmented ESS room shall be in accordance with <i>Cl.7.4.3</i>. (12) Battery management system Battery management system (BMS) shall be provided for monitoring operating conditions and maintaining voltages, currents, and temperatures within the manufacturer's specifications. The BMS shall remotely isolate the ESS or affected components of the ESS or place the system in a safe condition if potentially hazardous conditions are detected. BMS shall be evaluated for functional safety performance according to relevant internationally recognized standards such as <i>UL 1973</i> or equivalent standards approved by the SCDF. (13) Emergency main isolation switch
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					(a) A clearly identified and easily accessible switch or circuit breaker (main isolation shut-off switch) shall be provided to cut-off the power supply of individual ESS unit. (b) An emergency main isolation shut-off switch shall be provided outside the entrance of the compartmented ESS room, to cut-off power supply of all the ESS units of the affected compartmented ESS room. (14) Firefighting access To facilitate the deployment of unmanned firefighting equipment, exit staircase with at least 1.2m clear width and located within 10m measured from the nearest edge of the compartmented ESS room exit access door to the exit staircase door shall be provided. For any change of direction along the access path from the exit staircase to the compartmented ESS room, directional signages shall be provided with a letter height of at least 50mm. b. Category 2: Large underground ESS installation shall be in accordance with <i>Cl.10.3.3a</i>, unless otherwise stated below: (1) Premises with public accommodation purpose shall not be sited above ESS
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					premises. Premises with ESS installation shall be segregated from other usage. For any routes linking to the ESS installation shall be through: (a) an external corridor complying with <i>Cl.2.3.10</i>, or (b) a protected lobby separated from the adjoining areas of the building by a wall and door of at least 1-hr fire resistance rating. The protected lobby shall have a minimum size of 4m (length) x 2m (width) and ventilated in accordance with <i>Cl.2.2.13b.(7)(a) or (b)</i>. (2) For ESS unit with stored energy capacity exceeding 50kWh, it shall be housed within a 2-hr fire-rated containerised compartment except the deflagration opening(s) located at least 2m above finished floor level. (3) Containerised ESS units shall be housed within a compartmented ESS room with a minimum 2-hr fire resistance rating and area not exceeding 100m². (4) Aggregate maximum stored energy of 600kWh comprising multiple containerised ESS units within a single compartment room is permitted provided each containerised ESS unit is spaced a minimum of 3m apart
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					from each other, 1m from walls within the compartmented room and other fire hazards. (5) There shall not be more than 2 compartmented ESS rooms, unless otherwise permitted under <i>Cl.10.3.3b.(11)</i>. (6) Each containerised ESS unit shall be subjected to the fire and explosion testing specified under <i>UL 9540A</i> and together with the <i>NFPA 855</i> Hazard Mitigation Analysis report to be submitted to SCDF for approval. (7) Fire protection system (a) Each compartmented ESS room shall be protected by a zoned wet deluge system with a minimum discharge density of 7.5mm/min and areas of operation of 230m² in accordance with the <i>SS CP 52</i>. (b) Each containerised ESS unit shall be served by an independent wet deluge system with a minimum discharge density of 12.2mm/min and provided with a breeching inlet to allow direct charging of water supply to the main control valve. (8) Ventilation and detection system
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					(a) A dedicated flammable gas detection system shall be provided for each containerised ESS unit to monitor the flammable gases concentration and upon activation of the ventilation system, to limit the maximum concentration of the flammable gases to below 25% lower explosion limit (LEL) within the ESS installation. (b) Upon activation of flammable gas detection system, a dedicated mechanical ventilation system with air circulation of at least 9 air changes per hour or higher shall be provided for each containerised ESS unit based on the worst-case scenario specified under <i>UL 9540A</i> test and subjected to SCDF's approval. (c) The smoke purging system to be provided for the compartmented ESS room shall be in accordance with <i>Cl.7.4.3</i>. (d) Each compartmented ESS room shall be provided with smoke detectors in accordance with <i>SS 645</i> and smoke purging system shall be activated upon detection. (9) A display panel showing the location, temperature and flammable gases
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					reading status of the affected containerised ESS unit shall be located at the main entrance of each compartmented ESS room. It shall be connected to the SCDF Operations Centre through an approved alarm monitoring company. Thermocouple reading for each compartmented ESS room shall be provided as a means for firefighters to identify if the fire has been effectively extinguished. No point in the compartmented ESS room shall exceed 10m from a thermocouple. (10) Firefighting access (a) For compartmented ESS room, the following shall be provided: (i) The fire lift shall be contained within a protected shaft, constructed to comply with the relevant requirements under <i>Cl.3.8</i>. (ii) The fire lift car specifications: • Minimum clear platform size of 3m (depth) x 3m (width). • Minimum loading capacity of 3 tonnes.
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					(iii) Each fire lift shall be served by a fire lift lobby with a minimum size of at least 4m (length) x 5m (width). (iv) Corridors and door openings serving the fire lift lobby, firefighter staging lobby and compartmented ESS rooms shall be at least 3m in clear width. (v) An access path of minimum width of 3m to every ESS unit shall be provided and the maximum distance measured from the door to the most remote ESS unit shall not exceed 8m. (vi) Firefighter staging lobby shall not serve more than 2 compartmented ESS rooms. (vii) Any entrance to the compartmented ESS room shall be served by a firefighter staging lobby and shall comply with the following requirements: • at least 12m² working space and with minimum clear width of 4m.
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					• fire lift lobbies in accordance with <i>Cl.2.2.13b.(1) to (3), (5) to (6) and (7)(b)</i>. • installed with designated rising mains. • provided with two nos. of standby fire hoses. • provided with portable 50kg AB (foam or chemical powder) type fire extinguishers having minimum 6m throw and discharge hose length of minimum 6m shall be provided. (11) Prior approval from the SCDF is required in situations where the number of compartmented ESS room exceeds 2, in addition to the following: (a) Comply with the requirements in accordance with <i>Cl.10.3.3b.(6)</i>. (b) Provision of on-site Unmanned Firefighting Machine (UFM) within the fire lift lobby. The UFM shall comply with the following general specifications and subjected to the SCDF's approval:
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Annex A

					• Minimum dimensions: 2m x 1.1m x 2m • Minimum weight: 1.75 tonnes • Design flow rate for monitor: 1800L/min • Monitor throw distance: up to 60m in length • Wireless transmission: range of up to 300m • Ventilation capacity: 90000m³/h (c) A holding area of 2m x 3m for UFM shall be provided in addition to the fire lift lobby of area 20m².
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23	2 Sep 2024	2 Mar 2025	New	Nil	10.3.4 Battery Swap Station a. General Battery Swap Station (BSS) is a facility where swappable detachable batteries of motor vehicles are available for motorists to exchange their depleted batteries. Battery charge and swap stations are EV chargers that are used for charging and exchanging depleted swappable detachable batteries, while battery store and swap stations only contain stored detachable batteries. b. Aboveground installations (1) BSS installations shall be located at the same storey as the fire engine accessway/ fire engine access road. (2) BSS shall be located at vehicle parking areas that are naturally ventilated in accordance with <i>Cl.3.2.8</i>, or provided with mechanical ventilation in accordance with <i>Cl.6.4.5</i>. Exception: (a) BSS that abuts an external wall of building and is installed away from any unprotected openings, exits or combustible material/ construction within 1.5m horizontally or within 3m
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					vertically, or adjacent to or facing it. c. Underground installations (1) BSS is allowed to be located within basement car parks protected by mechanical ventilation in accordance with <i>Cl.6.4.5</i> and automatic sprinkler system in accordance with <i>Cl.6.4.1d.</i> (2) The maximum allowable depth shall not exceed 9m below the average grade level, and not more than one level below grade level. d. Aggregate stored energy capacity (1) Aboveground installations Aggregate stored energy capacity of each BSS unit shall not exceed 20kWh. Where more than 1 BSS unit is installed, a minimum separation distance of 3m between BSS units shall be provided and the total aggregate stored energy capacity of all BSS units shall not exceed 100kWh. (2) Underground installations Aggregate stored energy capacity of BSS within basement car parks shall not exceed 10kWh.
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					e. Fire safety requirements (1) BSS units shall be located at least 6m away from the nearest edge of exit staircase/ fire lift lobby/ smoke-free lobby. (2) BSS units shall be located at least 1m away from: (a) Non-essential equipment rooms; and (b) Parking lots (excluding the lots used for swapping of batteries). (3) Approved types of fire extinguishers of at least 2 numbers of 55A shall be provided. (4) Emergency isolation shut-off switch shall be provided at each BSS unit. (5) BSS installation at petrol service stations shall comply with specifications stipulated under <i>Cl.9.6.2v.(3)</i>.
24	2 Sep 2024	2 Sep 2024	Clarification	10.4 ELECTRIC VEHICLE (EV) CHARGING INSTALLATION 10.4.1 General The requirements in <i>Cl.10.4.2</i> are exempted for PG I buildings.	10.4 ELECTRIC VEHICLE (EV) CHARGING INSTALLATION 10.4.1 General The requirements in <i>Cl.10.4.2</i> are exempted for PG I buildings.

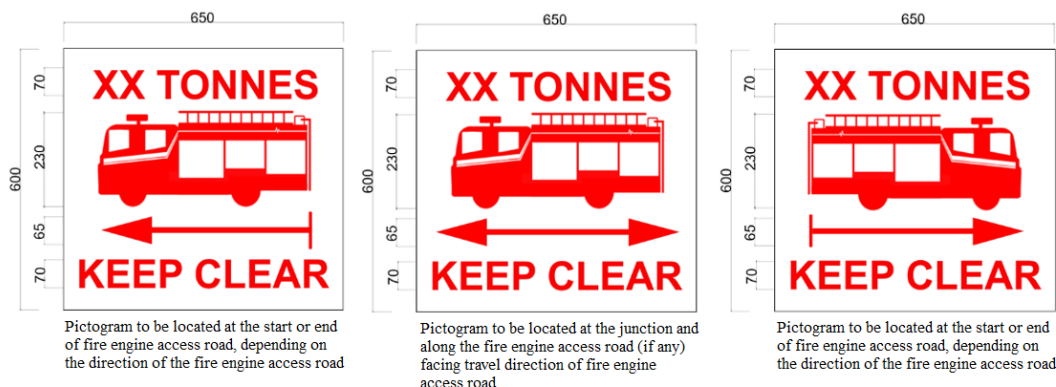
				10.4.2 Emergency main isolation shut-off switches a. Each EV charging station shall be provided with at least one emergency main isolation shut-off switch(es) located such that no person need to travel more than 15m from the EV charging station and its parking lot(s) to reach a main isolation shut-off switch. b. If more than one EV charging station is provided, the main isolation shut-off switch(es) shall be provided such that no person need to travel more than 15m from any EV charging station and its associated parking lot(s) to reach a main isolation shut-off switch. c. Main isolation switch(es) shall be located on the same storey as the EV charging station(s) they serve. The purpose of such main isolation shut-off switch(es) is to provide a safe means of isolating the main electrical power supply to the entire EV charging system on the same storey. d. Every EV charging stations and EV parking lots shall be located at least 3m away from the nearest edge of	10.4.2 Emergency main isolation shut-off switches a. Each EV charging station shall be provided with at least one emergency main isolation shut-off switch(es) located such that no person need to travel more than 15m from the EV charging station and its parking lot(s) to reach a main isolation shut-off switch. b. If more than one EV charging station is provided, the main isolation shut-off switch(es) shall be provided such that no person need to travel more than 15m from any EV charging station and its associated parking lot(s) to reach a main isolation shut-off switch. c. Main isolation switch(es) shall be located on the same storey as the EV charging station(s) they serve. The purpose of such main isolation shut-off switch(es) is to provide a safe means of isolating the main electrical power supply to the entire EV charging system on the same storey. d. Every EV charging stations and EV parking lots shall be located at least 3m away from the nearest edge of
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				any main isolation shut-off switches. Exception Main isolation shut-off switches can be allowed to be less than 3m from an EV charging station and its parking lot(s), as long as there is at least one other main isolation shut-off switch located at least 3m away but still within 15m of this EV charging station and its parking lot(s). e. Main isolation shut-off switches shall be located between 800mm and 1.2m above the finished floor level and shall be located in a clearly visible and easily accessible location. f. All main isolation shut-off switches shall be clearly labelled. Clear instructions shall be indicated on how to operate the main isolation shut-off switch. Signages shall be provided with a letter height of at least 50mm. g. Where main isolation shut-off switch(es) cannot be seen clearly or not within line of sight from the EV charging station and its parking lot(s), additional signages shall be	any main isolation shut-off switches. Exception Main isolation shut-off switches can be allowed to be less than 3m from an EV charging station and its parking lot(s), as long as there is at least one other main isolation shut-off switch located at least 3m away but still within 15m of this EV charging station and its parking lot(s). e. Main isolation shut-off switches shall be located between 800mm and 1.2m above the finished floor level and shall be located in a clearly visible and easily accessible location. f. All main isolation shut-off switches shall be clearly labelled. Clear instructions shall be indicated on how to operate the main isolation shut-off switch. Signages shall be provided with a letter height of at least 50mm. g. Where main isolation shut off switch(es) cannot be seen clearly or not within line of sight from the EV charging station and its parking lot(s), additional signages shall be
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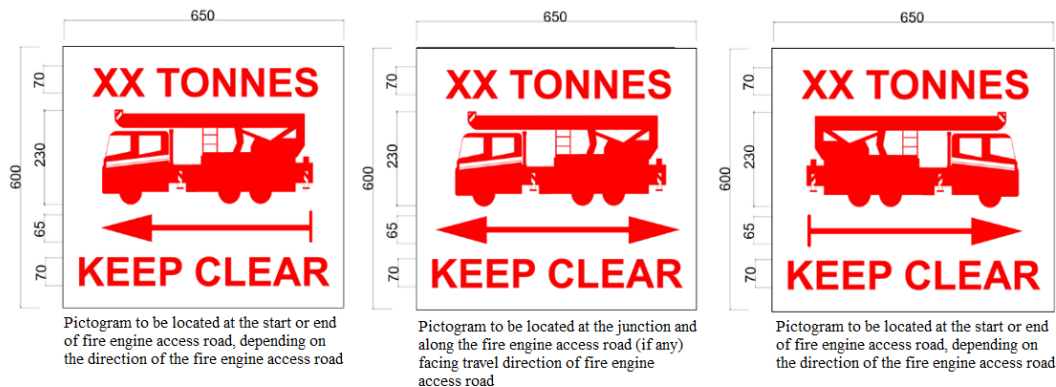
Annex A

				provided to direct persons to the main isolation shut-off switch(es).	provided to direct persons to the main isolation shut-off switch(es). <i>Note: Cl.10.4 is omitted as these requirements are specified in the First Schedule of the “Electric Vehicles Charging (Electric Vehicle Chargers) Regulations 2023”</i> https://sso.agc.gov.sg/SL/EVCA2022-S786-2023
25	2 Sep 2024	2 Sep 2024	Clarification	Existing <u>Table 3.15A, Table 3.15B, Table 3.15C & Table 9.8.2c.(2)</u>	See <u>Annex B</u> (affected portion of <u>Table 3.15A, Table 3.15B, Table 3.15C & Table 9.8.2c.(2)</u>)
26	2 Sep 2024	2 Sep 2024	Clarification	Existing <u>Diagram 4.2.2i.(3)</u>	See <u>Annex B</u> (Revised <u>Diagram 4.2.2i.(3)</u>)
27	2 Sep 2024	2 Sep 2024	Clarification	Existing <u>Table 11A, item 41 & 42</u>	See <u>Annex B</u> (affected portion of <u>Table 11A</u>)

Pictogram of fire engine access road for firefighting appliance equal or more than 24 tonnes but less than 30 tonnes



Pictogram of fire engine access road for firefighting appliance equal or more than 30 tonnes



Pictogram of fire engine accessway appliance for firefighting appliance equal or more than 30 tonnes

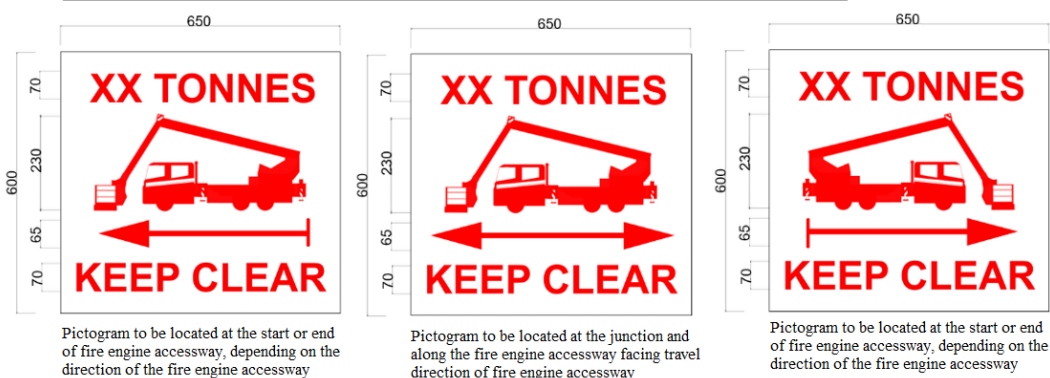


Diagram 4.2.2i.(3): Pictogram signage for fire engine accessway/ fire engine access road

TABLE 3.15A: PLASTIC FLOOR MATERIAL/ FINISHES			
Test Category	Fire Risk	Applicable Fire Test Standards	Acceptance Criteria
A	Toxicity Emission	BS EN 45545 – 2	CIT < 0.75
		EN ISO 5659 – 2 EN 17084 Method 1 (25kw/m ²)	CIT < 0.75
B	Smoke Density	EN 13501 – 1	Smoke classification: s1 rating
		EN 14041	
		EN ISO 9239 – 1	
		ASTM E662	Smoke density, D _{s,max} < 450
		NFPA 258	
		EN ISO 5659 – 2	Smoke density, D _{s,max} < 150
C	Flame Spread	EN 13501 – 1	1. Sprinkler-protected premises a. Sleeping occupancy: Class C _{fl} or better b. Non-sleeping occupancy: Class D _{fl} or better
		EN 14041	
		EN ISO 9239 – 1	
		ASTM E648	2. Non-sprinkler-protected premises a. Sleeping occupancy: Class B _{fl} or better b. Non-sleeping occupancy: Class C _{fl} or better Critical Radiant Flux (CRF) > 0.45 W/cm ²
		NFPA 253	

TABLE 9.8.2c.(2): TOXICITY EMISSION AND SMOKE DENSITY REQUIREMENTS		
Fire Risk	Applicable Fire Test Standards	Acceptance Criteria
Toxicity Emission	BS EN 45545-2; or	CIT < 0.75
	EN ISO 5659 – 2 EN 17084 Method 1 (50kw/m ²)	
Smoke Density	EN 13501-1; or	(a) Smoke classification to be of s1 rating (b) Flaming droplet classification to be d0 rating
	EN ISO 5659-2	VOF ₄ < 300 min

TABLE 3.15B: PLASTIC WALL/ CEILING MATERIAL/ FINISHES			
Test Category	Fire Risk	Applicable Fire Test Standards	Acceptance Criteria
D	Toxicity Emission	BS EN 45545 – 2	CIT < 0.75
		EN ISO 5659 – 2 EN 17084 Method 1 (50kw/m²)	CIT < 0.75
E	Smoke Density	EN 13501 – 1	1. Smoke classification to be of s1 rating. 2. Flaming droplet classification to be d0 rating
		EN ISO 5659 – 2	VOF ₄ < 300 min
F	Flame Spread	EN 13501 – 1	1. Internal Wall Finishes: To comply with Cl.3.13 2. External Wall Finishes: To comply with Cl.3.5
		BS 476 – 6/ 7	
		NFPA 285	To pass criteria in NFPA 285
<u>Note:</u> Test categories D and E are not required for external wall finishes.			

TABLE 3.15C: PLASTIC ROOF MATERIAL COVERING MATERIAL			
Test Category	Fire Risk	Applicable Fire Test Standards	Acceptance Criteria
G	Toxicity Emission	Not Critical. Generally exposed to external	
H	Smoke Density	EN 13501 – 1	1. Generally not critical if exposed to external 2. If exposed as ceiling on the underside, requirements for ceiling (achieve s1-d0 rating)
J	Flame Spread	EN 13501 – 5	Class B _{ROOF}
		BS 476 - 3	Class AA/AB/AC
		BS 476 – 6/7	Class 1
		ASTM E 108	Class A

TABLE 11A: LIST OF REGULATED FIRE SAFETY PRODUCTS & MATERIALS

S/N	Products/Materials	Acceptable Standards	Certification Scheme	Surveillance Regime	
				Testing	Factory/Site Inspection
41.	Household shelter door	Refer to SCDF's circulars on the: (a) Technical Requirements of Household Shelters 2001 & Product Listing Scheme for Household Shelter (HS) Door dated 28 Feb 2002 and (b) Product Listing Scheme (PLS) for Household Shelter (HS) Doors—Revision in Rubber Gasket Specification dated 17 Mar 2004 and (c) Product Listing Scheme for Household Shelter Doors—Revision in Cathode Electro-Deposition (CED) Coating Test Specification dated 8 Feb 2000	Scheme 5 (Labels issued)	Once every 3 years for cyclic test. Annually for water tightness test, dimension check, CED coating test & rubber gasket test	Factory inspection to be conducted at least once <u>annually</u> and Site inspection to be conducted for every 200 labels
42.	Storey shelter door	Refer to SCDF's circular on the Product Listing Scheme (PLS) for Storey Shelter (SS) Door dated 8 Feb 2006	Scheme 5 (Labels issued)	Once every 3 years for cyclic test. Annually for water tightness test, dimension check, CED coating test & rubber gasket test	Factory inspection to be conducted at least once <u>annually</u> and Site inspection to be conducted for every 200 labels