



# SCDF

The Life Saving Force

... for a safer Singapore

SINGAPORE CIVIL DEFENCE FORCE



**Date** : 2 Dec 2019

**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 - 2<sup>nd</sup> BATCH OF AMENDMENTS**

SCDF is pleased to announce the latest round of updates to the Code of Practice for Fire Precautions in Buildings 2018 (Fire Code 2018). The changes which were deliberated and accepted by the Fire Code Review Committee are attached as Annex A of this circular.

2. In anticipation of the increasing trend of adopting Energy Storage System technology in Singapore, SCDF has included a preliminary set of fire safety requirements for these systems in the update. With the advancement of the technology and its applications, SCDF will continue to refine and formulate the fire safety requirements in consultation with the relevant stakeholders. The complete set of the fire safety requirements for Energy Storage Systems will be released at a later date. Other requirements, such as means of escape, compartmentation, setback distance of unprotected openings, fire suppression system, ventilation, signage, etc. which are not included in this release, shall comply with the relevant clauses of the prevailing Fire Code.

3. Amendments stipulated in Annex A of this letter, including the aforesaid preliminary set of amendments, 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 at any time before the effective dates.



## **SCDF – A member of the Home Team**

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4. 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>.

5. For any queries, you may contact Mr Randy Tan at DID: 68481461 or Mr Tan Yi Yang at DID: 68481734. With regard to issue relating to Energy Storage Systems, please contact CPT Tan Ping Hao at DID: 68481410 or Email: [TAN\\_Ping\\_Hao@scdf.gov.sg](mailto:TAN_Ping_Hao@scdf.gov.sg).

Yours faithfully

(transmitted via email)

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

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SCDF Fire Safety Standing Committee  
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Singapore Test Services



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**Annex A**

Clause No	Amendment Date	Effective Date	Clause Status	Clause Before Amendment	Clause After Amendment
All relevant clauses	2 Dec 2019	1 Jun 2020	Revised	All relevant clauses with “smoke-stop lobby” terminology.	The term “smoke-stop lobby” to be replaced with “smoke-free lobby”.
4.2.2k.	2 Dec 2019	1 Jun 2020	New	-	<p>k. Ancillary usage of fire engine accessway/fire engine access road</p> <p>Fire engine accessway/fire engine access road shall not be turned into other usages such as pond, water features, car parking lots (including loading &amp; unloading), etc.. Turfing of fire engine accessway/fire engine access road is only permitted on the straight stretch of the fire engine accessway/fire engine access road with gradient not exceeding 1:15.</p>
6.3.1b.	2 Dec 2019	1 Jun 2020	Revised	<p>b. PG II mixed occupancy</p> <p>For PG II mixed occupancy buildings where an automatic sprinkler system and/or electrical fire alarm system is provided to the non-residential part of the building:</p> <p>(1) Alarm sounders shall be installed within the non-residential units, at the common areas of the non-</p>	<p>b. PG II mixed occupancy</p> <p>For PG II mixed occupancy buildings where an automatic sprinkler system and/or electrical fire alarm system is provided to the non-residential part of the building:</p> <p>(1) Alarm sounders shall be able to produce a minimum sound level of 65dBA, or 5dBA above the ambient noise level,</p>

				<p>residential floors and extended to the immediate two residential floors above the non-residential floor.</p> <p>(2) The alarm sounders shall be able to produce a minimum sound level of 65dBA, or 5dBA above the ambient noise level in all parts of such areas.</p> <p>(3) Connection of the fire alarm system to an approved alarm monitoring company stipulated under <i>Cl.6.3.8</i> is not required if the number of non-residential floors is not more than one storey.</p>	<p>whichever is greater but not more than 120dBA, at all parts of the following areas:</p> <p>(a) the non-residential units;</p> <p>(b) the common areas of the non-residential floors; and</p> <p>(c) the common areas of the immediate two residential floors above the non-residential floor.</p> <p>(2) Connection of the fire alarm system to an approved alarm monitoring company stipulated under <i>Cl.6.3.8</i> is not required if the number of non-residential floors is not more than one storey.</p>
10.2.4	2 Dec 2019	1 Jun 2020	Revised	<p>Design and installation criteria</p> <p>a. The sub-array for the PV installations shall be limited to a maximum size of 40m by 40m.</p> <p>b. A clearance of 3m around the access/hatch opening and in front</p>	<p>Design and installation criteria</p> <p>a. Each array of a PV installation shall not exceed the maximum dimensions of 60m x 40m.</p> <p>b. A clearance of 3m around the access/hatch opening and exit doors shall be provided.</p>

				<p>of exit door (of exit staircase) shall be provided.</p> <p>c. For a roof without perimeter parapet/railing, a clear width of not less than 2.5m shall be maintained along the perimeter aisles/gangways. For a roof with perimeter parapet/railing of height not less than 900mm, a clear width of not less than 1.5m shall be provided along the perimeter aisle/gangway.</p> <p>d. There shall be a minimum of 1.5m separation between arrays.</p> <p>e. There shall be no storage or services below the PV installation.</p> <p>f. PV modules, wirings, switchboard assemblies and other equipment shall not cover any ventilation system on the roof (e.g. smoke control/ extraction systems or air well).</p>	<p>c. 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.</p> <p>d. Storages or services located below PV arrays shall be separated from the PV panels as follows:</p> <p>(1) for sprinkler-protected space below arrays, by providing a non-combustible separation, or</p> <p>(2) for non-sprinkler-protected space below arrays, by providing a 1-hr fire-rated separation.</p> <p>e. PV modules, wirings, switchboard assemblies and other equipment shall not cover any ventilation system on the roof (e.g. smoke control/extraction systems or air well).</p>
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10.3	2 Dec 2019	1 Jun 2020	New	-	<p><b>ENERGY STORAGE SYSTEMS</b></p> <p>10.3.1 General</p> <p>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.</p> <p>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.</p> <p>c. All Energy Storage System installations shall be located at the same storey as the fire engine accessway/fire engine access road.</p> <p>d. The allowable Maximum Stored Energy for the various battery technologies in each compartment shall be as listed in <u>Table 10.3.1</u>.</p>
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<b>TABLE 10.3.1: STORED ENERGY CAPACITY OF ENERGY STORAGE SYSTEM</b>		
<b>Type</b>	<b>Threshold Stored Energy<sup>a</sup> (kWh)</b>	<b>Maximum Stored Energy<sup>a</sup> (kWh)</b>
Lead-acid batteries, all types	70	600
Nickel batteries <sup>b</sup>	70	600
Lithium-ion batteries, all types	20	600
Sodium nickel chloride batteries	20	600
Flow batteries <sup>c</sup>	20	600
Other batteries technologies	10	200

Notes:

<sup>a</sup> It shall refer to an aggregated stored energy capacity per compartment. For battery rating in Amp-Hours, kWh is equal to maximum rated voltage multiplied by amp-hr rating divided by 1000.

<sup>b</sup> Nickel battery technologies include nickel cadmium (Ni-Cad), nickel metal hydride (Ni-MH), and nickel zinc (Ni-Zn).

<sup>c</sup> Includes vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte-type technologies.

**Typo correction & clarification for the following clauses:**

2.3.9	2 Dec 2019	2 Dec 2019	Typo	Exit doors and exit access doors h. Door located in a path of travel Exception	Exit doors and exit access doors h. Door located in a path of travel Exception
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				<p>(c) Sliding doors &amp; roller shutters</p> <p>Sliding door and roller shutter as listed in <i>Cl.2.3.9h.(2)(a) to (d)</i> below are permitted to be installed across the exit access leading to exits, including the exterior door openings, except in areas stipulated under <i>Cl.2.3.9c.(1) and (3)</i>. These doors shall not form part of the fire compartment integrity.</p>	<p>(c) Sliding doors &amp; roller shutters</p> <p>Sliding door and roller shutter as listed in <i>Cl.2.3.9h.(2)(a) to (e)</i> below are permitted to be installed across the exit access leading to exits, including the exterior door openings, except in areas stipulated under <i>Cl.2.3.9c.(1) and (3)</i>. These doors shall not form part of the fire compartment integrity.</p>
6.4.7	2 Dec 2019	2 Dec 2019	Typo	<p>b. Water supply</p> <p>(2) Inlets to storage tank</p> <p>The inlets to the storage tank shall be fitted with a non-modulating type of pilot float valve listed by the SCDF.</p>	<p>b. Water supply</p> <p>(2) Inlets to storage tank</p> <p>The inlets to the storage tank shall be fitted with a non-modulating type of pilot float valve listed by the <del>SCDF</del> authority having jurisdiction.</p>
8.2.1	2 Dec 2019	2 Dec 2019	Typo	<p>b. For all buildings belonging to PG III, IV, V, VI, VII, and VIII of more than 24m in habitable height.</p>	<p>b. For all buildings belonging to PG III, IV, V, VI, VII, and VIII of more than 24m in habitable height; or</p>

8.2.2	2 Dec 2019	2 Dec 2019	Typo	<p>Two-way emergency voice communication system</p> <p>a. Two-way emergency voice communication system shall be provided for</p> <p>(1) buildings, which are required to be provided with one-way emergency voice communication system under Cl.8.2.1 a., b. and c.; and</p>	<p>Two-way emergency voice communication system</p> <p>a. Two-way emergency voice communication system shall be provided for</p> <p>(1) buildings, which are required to be provided with one-way emergency voice communication system under Cl.8.2.1 a., b. <del>and</del> <b>or</b> c.; and</p>
9.8.4	2 Dec 2019	2 Dec 2019	Typo	<p>d. Provision of fire engine accessway</p> <p>(2) At least one external wall of the warehouse shall be directly fronting an empty space (such as turf area) of minimum width 2m. One of the access doors provided along this external wall shall be placed not more than 300m (for type K1) or 15m (for type K2) from the fire engine accessway/ fire engine access road for ease of firefighting.</p>	<p>d. Provision of fire engine accessway</p> <p>(2) At least one external wall of the warehouse shall be directly fronting an empty space (such as turf area) of minimum width 2m. One of the access doors provided along this external wall shall be placed not more than <b>30m</b> (for type K1) or 15m (for type K2) from the fire engine accessway/ fire engine access road for ease of firefighting.</p>

All relevant clauses	2 Dec 2019	2 Dec 2019	Typo	All relevant clauses with SS CP 55.	All relevant clauses with SS CP 55 to be replaced with <b>SS 578</b> .
TABLE 1.4B	2 Dec 2019	2 Dec 2019	Clarification	Occupant load factor for “reading room” is missing.	Occupant load factor for “reading room” is <b>5m<sup>2</sup>/person</b> .
4.2.2a.(6)	2 Dec 2019	2 Dec 2019	Clarification	<p>(6) PG III, IV, V &amp; VII buildings exceeding 10m habitable height</p> <p>For buildings under PG III, IV, V and VII exceeding the habitable height of 10m, a fire engine accessway shall be located directly below the fire access openings to provide direct reach to the designated fire access panels. The required length of fire engine accessway shall be computed based on the largest Accessible Floor Area (AFA) of any aboveground floors as follows:</p> <p>(a) for interconnected floors, including basements connected to aboveground floors, the AFA shall be the aggregate areas of all the interconnected floors, or</p>	<p>(6) PG III, IV, V &amp; VII buildings exceeding 10m habitable height</p> <p>For buildings under PG III, IV, V and VII exceeding the habitable height of 10m, a fire engine accessway shall be located directly below the fire access openings to provide direct reach to the designated fire access panels. The required length of fire engine accessway shall be computed based on the largest Accessible Floor Area (AFA) of any aboveground floors as follows:</p> <p>(a) for interconnected floors, including basements connected to aboveground floors, the AFA shall be the aggregate <b>AFA areas</b> of all the interconnected floors, or</p>

				(b) for buildings with more than one group of interconnected floors, the AFA shall be taken as the largest of the aggregate floor areas among the groups of interconnected floors.	(b) for buildings with more than one group of interconnected floors, the AFA shall be taken as the largest of the aggregate floor areas among the groups of interconnected floors.
6.4.8	2 Dec 2019	2 Dec 2019	Clarification	<p>Combined sprinkler and wet riser systems</p> <p>a. Combining sprinkler and wet riser systems is permitted provided their design complies with the provisions stipulated in SS CP 52 and SS 575 respectively.</p>	<p>Combined sprinkler and wet riser systems</p> <p>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.</p>