

SINGAPORE CIVIL DEFENCE FORCE
Fire Safety Bureau

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Please quote our ref. No in all future correspondences

Our Ref: FSB 34/86

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21 June 2001

Registrar, Board of Architects (BOA)
Registrar, Professional Engineers Board (PEB)
President, Singapore Institute of Architects (SIA)
President, Institute of Engineers, Singapore (IES)
President, Association of Consulting Engineers, Singapore (ACES)

Dear Sir/Madam

Code of Practice For Fire Precautions In Buildings Or Fire Code 1997 -

Further to our circular dated 18th May 2001 on the 2nd Release of Changes/Amendments to Fire Code 1997, please be informed that Clause 1.2.60 of the Fire Code needs to be updated to tie-in with the new sub-clause 2.3.4(c), which stipulates the remoteness of exit doors to the scissors staircases. In addition, sub-clause 2.3.3(a)(ii) is to be reinstated with partial deletion and the requirements for private lifts have been placed under new sub-clause 3.8.8 (h).

2. A reprint of the relevant pages of the Fire Code incorporating the changes/amendments, which are highlighted by a black vertical line on the right side of each relevant clause, are given in Annex A. The changes/amendments as given in Annex A shall take effect as from 1st June 2001.

3 Please convey the contents of this circular and Annex A to members of your Institution/Association/Board/Organisation. You may reprint or photocopy the relevant pages in Annex A for dissemination to your members. This circular is also available in our website: <http://www.scdf.gov.sg>

Yours faithfully

Teo Lim Teck
for Commissioner
Singapore Civil Defence Force

cc: CEO, BCA
All members of FSB Standing Committee
All members of Fire Code Review Committee
President, REDAS
President, IFE
President, SISV
CEO, HDB
Group President, PSA
CEO, JTC
CE, LTA (Attn: Mr Mohinder Singh)
CE, PSB (Attn: Mr Lau Keong Ong/Ms Tan Chiew Wan)

**CHANGES/AMENDMENTS
TO FIRE CODE 1997**

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unless otherwise permitted under this Code as in the case of hotel bedrooms (Cl.2.7.4), residential apartments or maisonettes (Cl.2.4.7) and exit to Area of Refuge (Cl. 2.2.6(f)).

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|--------|---|--|
| 1.2.60 | Where more than one exit is required from a building or portion thereof, such exits shall be remotely located from each other and shall be arranged and constructed to minimise the possibility that more than one can be blocked by any one fire or other emergency condition. | Two-way escape (Remoteness of exits) |
| (a) | If two exits or exit access doors are required, they shall be placed at a distance from one another equal to or not less than half the length of the maximum overall diagonal dimension of the building or area to be served, measured in a straight line between the nearest edges of the exit doors or exit access doors (see diagram 1.2.60(a)(i) to (v)), subject to : | Two-way escape Amended under Supplement 4/2001 dated 21 June 2001 Effective date 1 June 2001 |
| (i) | If the distance between the 2 exits or exit access doors is less than half the length of the maximum overall diagonal dimension of the building or area to be served, it shall be considered as a one-way escape arrangement; and | |
| (ii) | The separation distance measured in a straight line between the nearest edges of the doors of the two exits (exit staircases, exit passageways or exit ramps) shall not be less than 7m. | |
| (b) | In buildings protected throughout by an approved automatic sprinkler system which complies with the requirements of chapter 6, the minimum separation distance between two exits or exit access doors measured in accordance with sub-clause 1.2.60(a) shall be not less than one third the length of the maximum overall diagonal dimension of the building or area to be served. The separation distance measured in a straight line between the nearest edges of the doors of the two exits (exit staircases, exit passageways or exit ramps) shall not be less than 7m. | Reduction in exit separation |
| (c) | Where two exit staircases, exit passageways or exit ramps are inter-connected by a corridor, exit separation shall be permitted to be measured along the line of travel within the exit access corridor. The exit access corridor connecting the exit staircases, exit passageways or exit ramps shall be protected by minimum one hour fire rated enclosures. Doors opening into this corridor shall have minimum half hour fire resistance rating (see diagram 1.2.60(c)). The separation distance measured along the line of travel within the exit access corridor between the nearest edges of the doors of the two exits (exit staircases, exit passageways or exit ramps) shall not be less than 7m. | Exit separation measured along exit access corridor |

- (d) (i) A one-way travel or “common path” exists if a floor space is arranged or provided with partitioning works such that occupants within that space are able to travel in only one direction to reach any of the exits or to reach the splitting point where they have the choice of two or more routes of travel to remote exits.
- (ii) The travel distance from the most remote point to the splitting point shall not exceed the permissible one-way travel distance allowed in Table 2.2A. At the splitting point, the angle of divergence between any two alternative routes shall not be less than 90 degrees in order that the routes originating from the splitting point can be considered as two-way travel.

One-way
travel
**New sub-
clause added
under
Supplement
4/2000 dated
17 Nov 2000**

- (v) exit doors opening into an external exit passageway shall have fire resistance for at least half an hour and fitted with automatic self-closing device.

(d) Ventilation

- (i) all internal exit passageways shall be naturally ventilated by fixed ventilation openings in an external wall, such ventilation openings being not less than 15 per cent of the floor area of the exit passageway, and
- (ii) internal exit passageways that cannot be naturally ventilated shall be mechanically ventilated to comply with the requirements in Chapter 7.

2.3.3 Exit Staircase:

(a) Internal Exit Staircase

- (i) an internal exit staircase which serves as the required exit of the building shall be enclosed with construction complying with the provisions of Cl. 3.8, and
- (ii) where an internal exit staircase is directly approached from an external exit passageway or external corridor, it shall not be necessary to provide such enclosure between the staircase and the external exit passageway or external corridor.

Internal exit staircase

Note :

Part of Subclause 2.3.3(a)(ii) has been deleted

Amended under Supplement 3/2001 dated 18 May 2001

(Updated on 21 June 2001)

Effective date 1 June 2001

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|--|--|
| <ul style="list-style-type: none"> (iii) there shall be no unprotected openings of occupancy area within 1.5m horizontally or within 3m vertically below any part of the ventilation openings located in the external wall of the internal exit staircase. | Unprotected openings |
| <ul style="list-style-type: none"> (b) External Exit Staircase <ul style="list-style-type: none"> (i) external exit staircase may be used as required exit in lieu of internal exit staircase provided it complies with the requirements of exit staircase, except for enclosure of an internal staircase, and (ii) there shall be no unprotected openings within 3 m horizontally or within 3 m vertically below, or adjacent or facing (unless there is adequate separation complying with cl.3.5) any part of the external exit staircase; and (iii) the external exit staircase shall be located so as to lead directly to a street or open space with direct access to street. | External exit staircase Amended under Supplement 3/2001 dated 18 May 2001 Effective date 1 June 2001 |
| <ul style="list-style-type: none"> (c) All exit staircases shall discharge at ground level directly into a safe exterior open space. However, in sprinkler protected building, maximum 50% of the total building exits may be allowed to discharge directly to the ground level circulation space subject to the following: <ul style="list-style-type: none"> (i) The discharge point of the exit staircase shall be at a location in the circulation space at ground level within sight of and with direct access to a safe exterior open space; and (ii) The maximum distance between the discharge point of an exit staircase and the exterior open space shall not exceed 10m. | Discharge |

- (iii) Drywall shall meet the criteria, in terms of impact and deflection performance, when subject to the tests of BS 5588 Pt 5 Appendix A and BS 5234 Pt 2; and
- (iv) Drywall shall meet the criteria, in terms of water absorption and bending strength performance, when subject to the test of BS 1230 Pt 1 (for gypsum plaster board) or ISO 1896 (for calcium silicate or cement board); and
- (v) The building shall have at least two independent exit staircase shafts (scissors staircases are considered as single shaft).

3.8.8 A protected shaft which contains a lift shall comply with the following: Lift shaft

- (a) It shall not contain any pipe conveying gas or combustible liquid, other than those in the mechanism of a hydraulic lift.
- (b) The protecting structure shall be constructed of masonry, or drywall. If drywall construction is used, the following conditions shall be complied with :
 - (i) Drywall shall be non-combustible; and
 - (ii) Drywall shall have the requisite fire resistance rating at least equal to that of elements of structure; and
 - (iii) Drywall shall meet the criteria, in terms of impact and deflection performance, when subject to the tests of BS 5588 Pt 5 Appendix A and BS 5234 Pt 2; and
 - (iv) Drywall shall meet the criteria, in terms of water absorption and bending strength performance, when subject to the test of BS 1230 Pt 1 (for gypsum plaster board) or ISO 1896 (for calcium silicate or cement board); and
 - (v) Drywall shall meet the criteria of Cyclic Loading and Dynamic test as specified under Cl. 3.3 of Building Code of Australia Specification C 1.8.
- (c) Where a lift is either located at the edge of atrium floors or at the external wall and outside the building, the lift shall be considered as not enclosed within a protected shaft.

New subclause added under Supplement 1/2000 dated 19 Aug 2000

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| <p>(d) The protected shaft shall be vented in accordance with SS CP 2 Code of Practice for Installation, Operation and Maintenance of Electric Passenger and Goods Lifts. The vents shall be so arranged as to induce exhaust ventilation of the shaft. Where vents could not be provided because of the location of the lift shaft, ventilation duct protected by drywall complying with C1.3.8.8(b) serving as ventilation of the shaft may be provided instead. If the duct is not to be fire rated, fire dampers shall be provided to the duct at the wall of the lift shaft, provided such relaxation shall not apply to shaft containing fire lift.</p> | <p>Amended under Supplement 1/2000 dated 19 Aug 2000</p> |
| <p>(e) Openings may be permitted for the passage of lift cables into the lift motor room and if the lift motor room is at the bottom of the shaft, the opening shall be as small as practicable.</p> | <p>Amended under Supplement 3/2001 dated 18 May 2001</p> |
| <p>(f) Transom panel above lift entrance shall be considered as part of the protecting structure and shall therefore conform to the fire resistance requirements of the protected structure.</p> | <p>(Updated on 21 June 2001)</p> |
| <p>(g) If it serves any basement storey and not adjoining any void connecting to upper levels or any external spaces, there shall be provided a lobby enclosed by walls having fire resistance of not less than 1 hour and fire door of not less than half an hour.</p> | <p>Effective date 1 June 2001</p> |
| <p>(h) Private lifts that are provided for the exclusive use of occupants in residential units under purpose group II buildings shall comply with the following requirements :</p> | <p>Private Lift</p> |
| <p>(i) Smoke detectors shall be provided at the lift landing area. The activation of any of the smoke detectors at the lift landing area shall cause the lift to home to the designated floor; and</p> | <p>Amended under Supplement 3/2001 dated 18 May 2001</p> |
| <p>(ii) Emergency power supply from a generating plant shall be provided to home the lift to the designated floor when there is a power failure in the building; and</p> | <p>Effective date 1 June 2001</p> |
| <p>(iii) The lift shall not be permitted to double-up as a fire lift; and</p> | |
| <p>(iv) Private lifts shall comply with SS CP 2.</p> | |

- 3.8.9 A protected shaft used for the enclosure of services shall comply with the following:
- Protected shaft containing other services installations
- (a) The protecting structure for protected shaft containing kitchen exhaust ducts and mechanical ventilation ducts serving areas specified in Cl.5.2.1(g)(i) to (iii) and (h) which pass through one or more floor slabs shall be of masonry or drywall. Such shaft shall be completely compartmented from the rest of the shaft space containing other ducts or any other services installations. Protected shaft containing ducts serving other areas which pass through two or more floor slabs shall be constructed of drywall. If the protecting structure for the protected shaft is constructed of drywall, the following conditions shall be complied with :
- (i) Drywall shall be non-combustible; and
 - (ii) Drywall shall have the requisite fire resistance rating at least equal to that of elements of structure; and
 - (iii) Drywall shall meet the criteria, in terms of impact and deflection performance, when subject to the tests of BS 5588 Pt 5 Appendix A and BS 5234 Pt 2; and