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Our Ref: OM-LC/020

14 June 2005

MEMORANDUM

To: All Engineering Staff

From: Richard Teo

CODE OF PRACTICE FOR THE INSTALLATION AND MAINTENANCE OF EMERGENCY LIGHTING AND POWER SUPPLY SYSTEMS IN BUILDINGS – AMENDMENT NO. 2

I am attaching, for your information, a copy of Singapore Standard CP 19: 2000 (Amendment No. 2).

RICHARD TEO

cc TLS/LCT
cc Memo File

/kt

BCA
ISO 9000
CERT. NO.: 236
SS ISO 9001 : 2000

Singapore Standard CP 19 : 2000

CODE OF PRACTICE FOR THE INSTALLATION AND MAINTENANCE OF EMERGENCY LIGHTING AND POWER SUPPLY SYSTEMS IN BUILDINGS

AMENDMENT NO. 2

March 2005

1. Page 3, Contents

a) *Add* new Annex E under 'ANNEXES' as follows:

E Forms and dimensional details of existing 'EXIT' signs

b) *Add* new tables under 'TABLES' as follows:

6 Viewing distances and overall height of graphical symbol signs and 'EXIT' signs – Internally illuminated
7 Viewing distances and overall height of graphical symbol signs and 'EXIT' signs – Externally illuminated (including self-luminous signs)
8 Chromaticity coordinates for emergency exit signs

2. Page 8, Definitions

Add the following new definition:

2.20 Self-luminous sign

A sign powered by gaseous tritium light devices.

3 Page 11, 4.3 Exit signs

Delete the entire 4.3 and *replace* with the following:

4.3 Emergency exit signs

4.3.1 Required locations

Emergency exit signs shall be provided with graphical symbols and/or the word 'EXIT' according to requirements specified in 4.3.2 to 4.3.5.

Emergency exit signs shall be provided at the locations as specified by the relevant authority in the "Code of Practice for Fire Precautions in Buildings".

4.3.2 Illumination

4.3.2.1 General requirement

Emergency exit signs shall be illuminated at all material times in accordance with the requirements of 4.3.2.2, 4.3.2.3, 4.3.2.4 or 4.3.2.5 as appropriate. The sign shall have a uniform appearance when viewed within the range of directions from which it is required to be seen.

4.3.2.2 Electrically operated internally illuminated graphical symbol signs

Electrically operated internally illuminated graphical symbol signs shall comply with 22.16.5 of SS 263 : Part 2 and 11.2 of SS 508-1(table 6) when operated under the conditions as specified in 4.4.

4.3.2.3 Electrically operated internally illuminated 'EXIT' signs

Electrically operated internally illuminated 'EXIT' signs shall be of a type which will comply with the following requirements when operated under the conditions as specified in 4.4:

(a) 'EXIT' signs with a white legend and green background:

(i) The luminance of the background in the area within 25 mm of the legend shall not be less than 8 cd/m^2;
(ii) The ratio of the luminance of the legend to that of the adjacent background shall be not less than 4 : 1;
(iii) The variation in luminance within the legend and within the background shall be not more than 5 : 1.

(b) 'EXIT' signs with a green legend and a white opaque background:

(i) The luminance of the legend shall lie within the range 2 cd/m^2 to 25 cd/m^2;
(ii) The variation in luminance within the legend shall be not more than 5 : 1.

The luminance shall be measured within ± 5 degrees from the normal to the plane containing the legend with a meter which will provide a circular measurement field having a diameter of between 75 percent and 85 percent of the letter stroke thickness of the legend.

NOTE – Green legend and a white opaque background are only recommended where an exit sign is normally viewed under dimmed lighting condition, e.g. in theatres, auditoriums and the like.

4.3.2.4 Externally illuminated signs

Where a sign is illuminated by an external source, the vertical illumination shall be a minimum of 100 lux under normal lighting conditions and provide a minimum of 5 lux with uniformity of 0.7 under mains-failure conditions.

The position of the luminaire(s) relative to the sign shall be such as to cause no reduction in the contrast of the sign (due to reflection of the luminaire in the face of the sign) when viewed from within the required range of directions.

Any light source provided specifically for the purpose of lighting the sign shall be screened from the view of persons moving through the exit.

NOTE – There are different methods of ensuring satisfactorily external illumination of signs (e.g. illumination from luminaires in the vicinity, lamp attachment on the sign, etc).

4.3.2.5 Self-luminous signs

Self-luminous signs may be used either as externally illuminated or internally illuminated signs.

For self-luminous signs used as externally illuminated sign, the requirements of 4.3.2.4 shall apply.

For self-luminous signs used as internally illuminated sign, the vertical illumination shall be at least 100 lux under normal lighting conditions. Under mains-failure conditions, the sign shall have luminance complying with the requirements of 4.2 of BS 5499 : Part 2.

NOTE 1 – There are different methods of ensuring satisfactory external illumination of signs (e.g. illumination from luminaires in the vicinity, lamp attachment on the sign, etc).

NOTE 2 – Since the luminance of self-luminous sign is low, its viewing distance would be up to 7.5 m (see Table 6) under mains-failure conditions.

4.3.3 Mounting height

Emergency exit signs shall be positioned as required by 4.3.1 between 2 m and 2.5 m above floor level. If this is not possible, the relevant authority should be consulted.

4.3.4 Dimensions and viewing distances

4.3.4.1 Graphical symbol signs

The dimensions of graphical symbol signs shall be in accordance with SS 508-1 and SS 508-3 and Tables 6 or 7 below.

4.3.4.2 'EXIT' signs

Dimensions of these signs shall comply with Annex E. The letter style for 'EXIT' signs shall be helvetica light. The overall height for 'EXIT' signs shall be in accordance with Tables 6 or 7 below. There shall be a minimum of 25 mm border all round the legend.

The use of arrows with 'EXIT' signs shall be as specified in Figure E1 (a) or Figure E1 (b).

The legend of 'EXIT' signs and directional arrows where incorporated, shall be as shown in Figure E2 (a) or Figure E2 (b). The use of directional arrow with or without shaft is optional. However, it is recommended that the arrow with shaft should be used where possible. The letter height and background dimensions of the legend shall be not less than those specified in Figure E2. A clearance of at least 25 mm shall be maintained between the directional arrow and the legend.

Table 6 – Viewing distances and overall height of graphical symbol signs and 'EXIT' signs – Internally illuminated

Type of sign	Lighting condition	Viewing distance, m	Overall height (H) both of graphical symbol and overall height (H) of 'EXIT' (all upper case letters), m
Electrically operated	Normal lighting & mains-failure	1. up to 25	0.15
		2. over 25	Dimensions of the pictogram and 'EXIT' legend to be increased proportionately by adopting the requirements of SS 508-1 Clause 10 with Z = 170 [1) 2)]
Self-luminous	Normal lighting	3. up to 25	0.15
		4. over 25	Dimensions of the pictogram and 'EXIT' legend to be increased proportionately by adopting the requirements of SS 508-1 Clause 10 with Z = 170 [1) 2)]
Self-luminous	Mains-failure	5. up to 7.5	0.15
		6. over 7.5	Dimensions of the pictogram and 'EXIT' legend to be increased proportionately by adopting the requirements of SS 508-1 Clause 10 with Z = 50 [1) 2)]

Table 7 – Viewing distances and overall height of graphical symbol signs and 'EXIT' signs – Externally illuminated (including self-luminous signs)

Lighting condition	Viewing distance, m	Overall height (H) of both graphical symbol and overall height (H) of 'EXIT' (all upper case letters), m
Normal lighting	1. up to 25	0.15
	2. over 25	Dimensions of the pictogram and 'EXIT' legend to be increased proportionately by adopting the requirements of SS 508-1 Clause 10 with Z = 170 [1) 2)]
Mains-failure	3. up to 15	0.15
	4. over 15	Dimensions of the pictogram and 'EXIT' legend to be increased proportionately by adopting the requirements of SS 508-1 Clause 10 with Z = 95 [1) 2)]

NOTES.

1) Viewing distance is derived as follows:

D = Z x H, where

D (m) is the viewing distance; Z is the distance factor, and

H (m) is the overall height of graphical symbol/'EXIT' sign.

2) a) Under normal lighting conditions for all types of signs, the factor Z = 170 would apply.

b) Under mains failure conditions, the following Z factors would apply:
   i) For electrically operated internally illuminated signs, Z = 170.
   ii) For externally illuminated signs and self-luminous signs treated as externally illuminated signs, Z = 95
   iii) For self-luminous signs treated as internally illuminated signs, Z = 50

4.3.5 Colour

Colour of graphical symbol signs and 'EXIT' signs shall be in accordance with Table 8 below.

Table 8 – Chromaticity coordinates for emergency exit signs

Colour	Chromaticity coordinates of corner points determining the permitted colour area				
		1	2	3	4
Green	x	0.201	0.285	0.170	0.026
	y	0.776	0.441	0.364	0.399
White	x	0.385	0.300	0.250	0.335
	y	0.355	0.270	0.320	0.405
Note: The above chromaticity coordinates are based on Table 2 SS 508-1 but modified to the extent required due to limitation of plastic materials presently available to the manufacturing industry					

4. Page 55, Publications referred to in this standard

Add the following references:

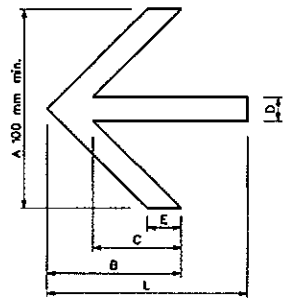
SS 508 :- Graphical symbols - Safety colours and safety signs
Part 1 : 2004 Design principles for safety signs in workplaces and public areas
Part 3 : 2004 Safety signs used in workplaces and public areas

BS 5499 :- Fire safety signs, notices and graphic symbols
Part 2 : 1986 Specification for self-luminous fire safety signs

5. After Annex D, *add* the following new Annex E.

Annex E

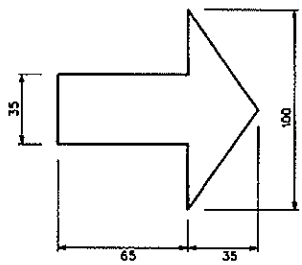
Forms and dimensional details of 'EXIT' signs



Directional arrow proportions

B	C	D	E	L
0.67A min	0.44A min	0.12A min	0.17A min	1A min

Figure E1 (a)



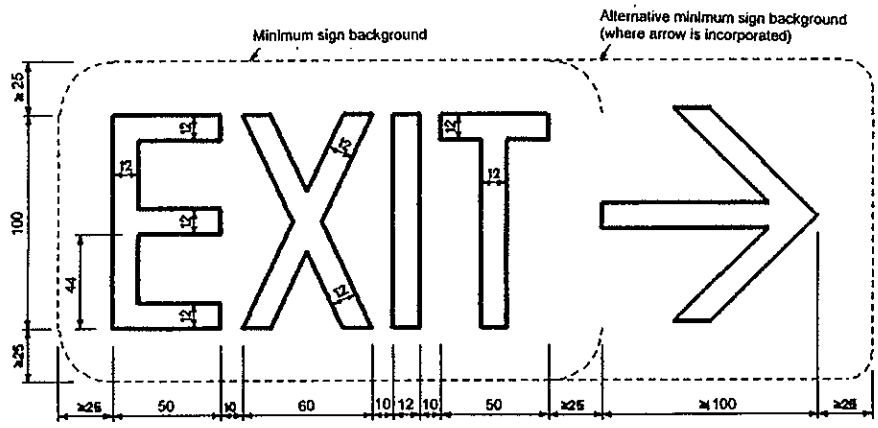
Directional arrow proportions

NOTE. The diagrams are not to scale

Dimensions in mm
Tolerances: ± 1.0 mm

Figure E1 (b)

Figure E1 – Forms and dimensional details of directional arrow


Minimum sign background
Alternative minimum sign background
(where arrow is incorporated)
EXIT
≥25
100
44
12
50
60
10
≥100

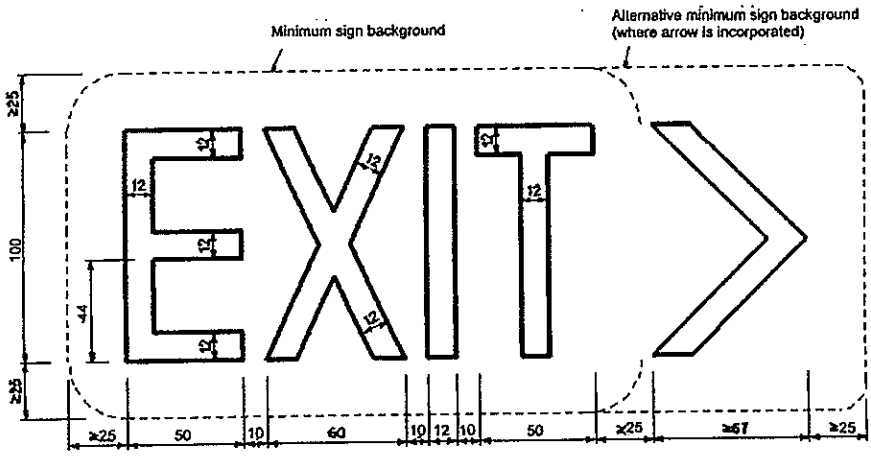
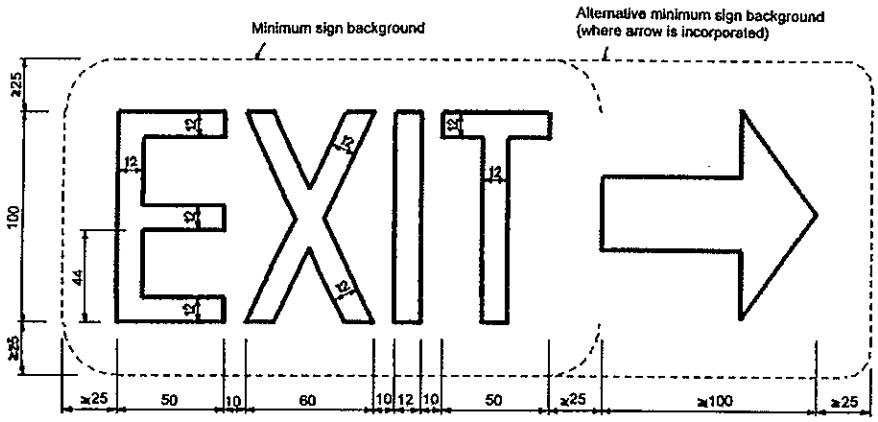

Minimum sign background
Alternative minimum sign background
(where arrow is incorporated)
EXIT
≥25
100
44
12
50
60
10
≥57

Figure E2 (a)



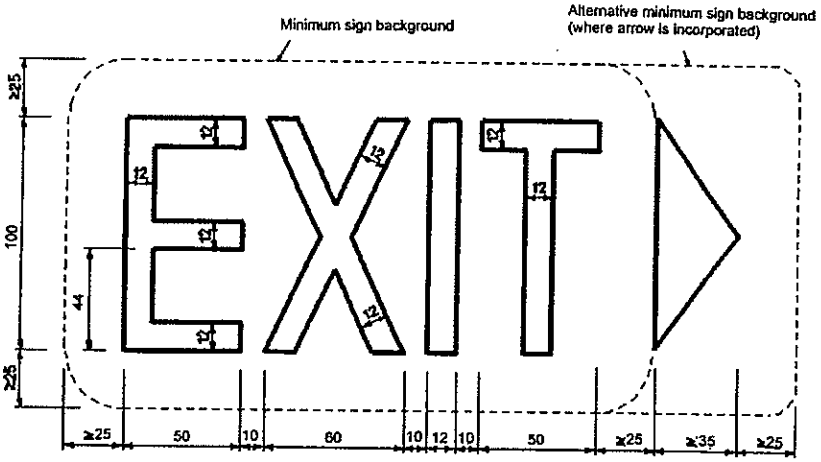


Figure E2 (b)

Figure E2 – Forms and dimensions of 'EXIT' signs

Dimensions in mm
Tolerances: ± 1.0 mm